WINTER PARK MOUNTAIN BASE AREA PRELIMINARY DEVELOPMENT PLAN
SUBMITTAL

July 2024
Nov 2024 Revision 1
Feb 2025 Revision 2
Apr 2025 Revision 3
May 2025 Revision 4

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ACKNOWLEDGMENTS

Public Services Team

TOWN OF WINTER PARK
Community Development
Building Division
Planning Division
Fraser Winter Park Police
Public Works
Town Manager
Transit

Consultant Team

APPLICANT
Alterra Mountain Company

PROJECT LEAD & ARCHITECTURE
SAR+ Architects

CIVIL ENGINEERING
JVA Consulting Engineers

MOBILITY
Fehr & Peers

LANDSCAPE ARCHITECTURE
Wenk Associates

LEGAL
Brownstein Hyatt Farber Schreck

LAND SURVEY
Flatirons, Inc.

GEOTECH
Kumar & Associates, Inc.

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INTRODUCTION

The Preliminary Development Plan (PDP) for the Winter Park Mountain Base Area envisions a mixed-use, vibrant and active community that thrives year-round.

The PDP for the Winter Park Mountain Base Area contains a conceptual plan for development of the land area to be rezoned to the Planned Development zone district or land area currently zoned Planned Development that requires an updated plan. The land area depicted in Figure 1.2 - Plan Area Site & Context in the PDP represents the land area subject to the PDP and the future Final Development Plans (FDPs) governing development of such land, which is hereinafter referred to as the 'Plan Area.'

The PDP provides a framework for the Plan Area that is aligned with the Town of Winter Park's (Town) guiding principles, as established in the Town of Winter Park, Imagine Winter Park Comprehensive Plan (Town Comp Plan), among other applicable planning documents that aim to enhance community character while providing flexibility for innovative design and responses to future needs.

Vested Rights for the PDP and each individual FDP will be addressed in the Development Agreement.

The Plan Area consists of four portions identified as 'Planning Neighborhoods,' and a portion of a Planning Neighborhood is called a 'Sub-Area'. These are described in detail in Chapter 4 Plan Elements. The 'Mountain,' which is outside of the Plan Area, is the land area accessible for recreational use and commonly known as the land area within the ski boundary, as depicted on the Winter Park Trail Map. The 'Base Area' is within the Plan Area and generally comprises the Resort Village Planning Neighborhood and Mountain Base Sub-Area.

Development potential in the Plan Area will encourage mixes of active uses to support the year-round vibrancy of the Plan Area. While the Mountain will continue to foster active winter and summer activities like skiing and mountain biking, access to the Fraser River and Arapahoe National Forest, new areas of the Mountain, and new development in and around the Base Area will provide visitors with a complete user experience. Recreation will be complemented by intentional programming for cultural events, leisure activities, food-and-beverage experiences, and more. All activities will be curated to support the vibrancy of each unique Planning Neighborhood and will be connected with green space and trails centered around the Fraser River.

Finally, and fundamental to everything outlined above, development in the Plan Area will set a new standard for sustainable infrastructure and development. Alterra Mountain Company (the Applicant) recognizes that the future of the Town, Winter Park Resort, and the surrounding land area requires the Plan Area to exemplify sustainability, laying the groundwork for carbon and energy-use reductions, and environmental stewardship. The Applicant is committed to creating a future Plan Area that is vibrant, active, and most importantly, sustainable.

RELATION TO OTHER PLANS

The plans identified below were reviewed in conjunction with preparation of this PDP for background and to ensure alignment of common goals and objectives.

The 2019 Imagine Winter Park Comprehensive Plan acknowledges existing land use patterns and establishes visions, principles, and strategies for future land use and development within the Town.

The Town Unified Development Code (UDC) establishes baseline rules, regulations, and standards for future development in the PDP. Any modifications to rules, regulations, and/or standards contained in the UDC applicable to this development are noted in this PDP. Subsequent Final Development Plans (FDPs), Design Guidelines, and/or the Development Agreement may further modify standards.

With respect to the Plan Area, the PDP and subsequent FDPs supersede the 1998 Winter Park Village Final Development Plan (1998 WPV FDP) in its entirety. This PDP covers much of the same land area as the 1998 WPV FDP and includes an additional approximate 108 acres (the Additional Land Area) not covered by the 1998 WPV FDP. The Plan Area shown in the PDP includes approximately 177 acres in total, representing the 1998 WPV FDP plus Additional Land Area. Excluded areas will continue to be governed by the 1998 WPV FDP.

The Winter Park Resort Master Plan (WPRA Master Plan) establishes a comprehensive framework for redevelopment of portions of the Plan Area per the terms of the agreements between the Winter Park Recreational Association (WPRA)/City of Denver and Alterra Mountain Company. The WPRA Master Plan was published in 2009 and has been amended over time to update the development vision and reflect needs of the Resort. Alterra Mountain Company will amend the WPRA Master Plan, as necessary, to contemplate the development plan provided in the PDP and subsequent FDPs. The above-referenced agreements between the WPRA and Alterra Mountain Company specify that certain amendments to the WPRA Master Plan require approval from the Mayor of the City of Denver. Amendments not requiring such approval may be approved solely by the WPRA to the extent required under the above-referenced agreements, as amended.

The 2022 Mountain Master Development Plan developed under the Forest Service (USFS) was considered in development of this PDP. The vision for the Plan Area assumes build out of improvements to the Base Area in concert with on-mountain improvements included in the Mountain Master Development Plan.

1998 Winter Park Village Final Development Plan

2009 Winter Park Resort (WPRA) Master Plan

2019 Imagine Winter Park Comprehensive Plan

2022 Winter Park Resort Mountain Master Development Plan

THE VISION

The vision for the Plan Area is to create a vibrant, year-round experience for a diverse group of residents, guests, and employees. Fundamental to this vision is a diversity of uses, ease of circulation and mobility to and around the Plan Area, and a variety of housing product types. The character, connectivity, recreation, and environment envisioned for the Plan Area are supportive of and complementary with the Downtown Winter Park (Downtown) vision.

The PDP envisions and will support a more diverse and inclusive Plan Area, creating varied amenities for all groups and establishing a thriving, year-round community through strategic seasonal programming. An emphasis on the public realm prioritizes a human-scale, people-focused environment throughout the Plan Area to connect lodging and other uses, and to provide safe and efficient mobility and circulation for day skiers, resort guests, employees, and residents.

The Plan Area will connect to surrounding communities by mountain, road, trail, train and aerial transport. Connectivity to, from, and within the Plan Area will be user-friendly, experience-driven, and broken into unique Planning Neighborhoods with their own identities. Trail connectivity will be enhanced and improved throughout the Plan Area; Mountain-to-Downtown Aerial transport system is envisioned to land visitors at the heart of the Base Area; bus and shuttle routes will be expanded to provide greater accessibility to the Mountain and throughout the Plan Area; and the process of driving, entering the Plan Area, and parking a car will be facilitated by an enjoyable arrival experience that will have two primary parking facilities at the North and South main entrances.

The PDP endeavors to strategically grow Winter Park Resort into a year-round world-class destination for all demographics and age groups. The Winter Park Resort will be known as Colorado's destination to "Venture Out" for soul-fulfilling experiences and continue to grow an inclusive community with unrivaled passion for mountain adventure.

The PDP also recognizes the importance of enhanced connectivity between Winter Park Resort and Downtown - experientially, economically, and manifested in the built environment - establishing a framework that balances the ease of access for both local enthusiasts and new visitors.

FIGURE 1.1 FUTURE POTENTIAL

DESIGN INSPIRATION

The evolution of Winter Park Resort draws inspiration from its rich local history and the modern alpine architectural style. This design ethos celebrates the use of natural materials like wood and stone, seamlessly integrating them with expansive glass portals, overhangs, and balconies. The resort will embody a harmonious blend of interior and exterior experiences, creating large welcoming openings to invite gathering, complimented by more intimate unique spaces for private or semi-private experiences. These elements will be enhanced by casual outdoor seating, natural landscapes, fire pits, and soft evening lighting, enhancing the resort's warm and inviting atmosphere throughout the day and well into the night.

KEY FEATURES AND AMENITIES

- **Landmark Lodging:** The resort offers a variety of accommodations, ranging from cozy single-story cabins to 6-8 story lodgings, each meticulously designed to enhance the guest experience and respond appropriately to the immediate surroundings.
- **Culinary Experiences:** Guests can indulge in extraordinary culinary experiences within casual, lounge-like atmospheres that prioritize comfort and relaxation.
- **Skier Services:** The resort provides world-class skier services, ensuring that every guest's needs are met seamlessly.
- **Cultural Programming:** A celebration of local art, music, and culture through curated programs that engage guests and the community alike.
- **Event Programming:** Opportunities for both public and private events year-round, encouraging a vibrant and dynamic atmosphere.
- **Celebration of Nature:** Enhancement and expansion of the existing natural habitats to create a lush "green belt" through the site, connecting organically into the surrounding ecosystems.

LOCATION HIGHLIGHTS

Nestled within the stunning Rocky Mountains, the resort's architecture is thoughtfully designed to blend seamlessly with its natural surroundings.

Harmonious Integration: The resort's use of natural wood and stone materials reflects regional building practices and complements the forested mountain landscape, providing a warm and inviting feel.

Panoramic Views: Large glass openings and rooftop amenities offer breathtaking panoramic views of the surrounding peaks, ensuring guests have an immersive mountain experience.

Active Ground Floor: The ground floor is highly active with retail and dining spaces that integrate indoor and outdoor areas, encouraging interaction with the natural environment and community of people.

ARCHITECTURAL STYLE, SCALE, AND MATERIALS

Alpine minimalism emphasizes simplicity through clean lines, organic materials, and a thoughtful integration of the landscape that does not overshadow the natural beauty of the surroundings. By connecting intimately with the environment, the resort aims to bring nature in while having as little impact on it as possible. This approach ensures that the resort not only provides an enhanced experience and comfort but also remains in harmony with its stunning natural backdrop.

EXISTING SITE & CONTEXT

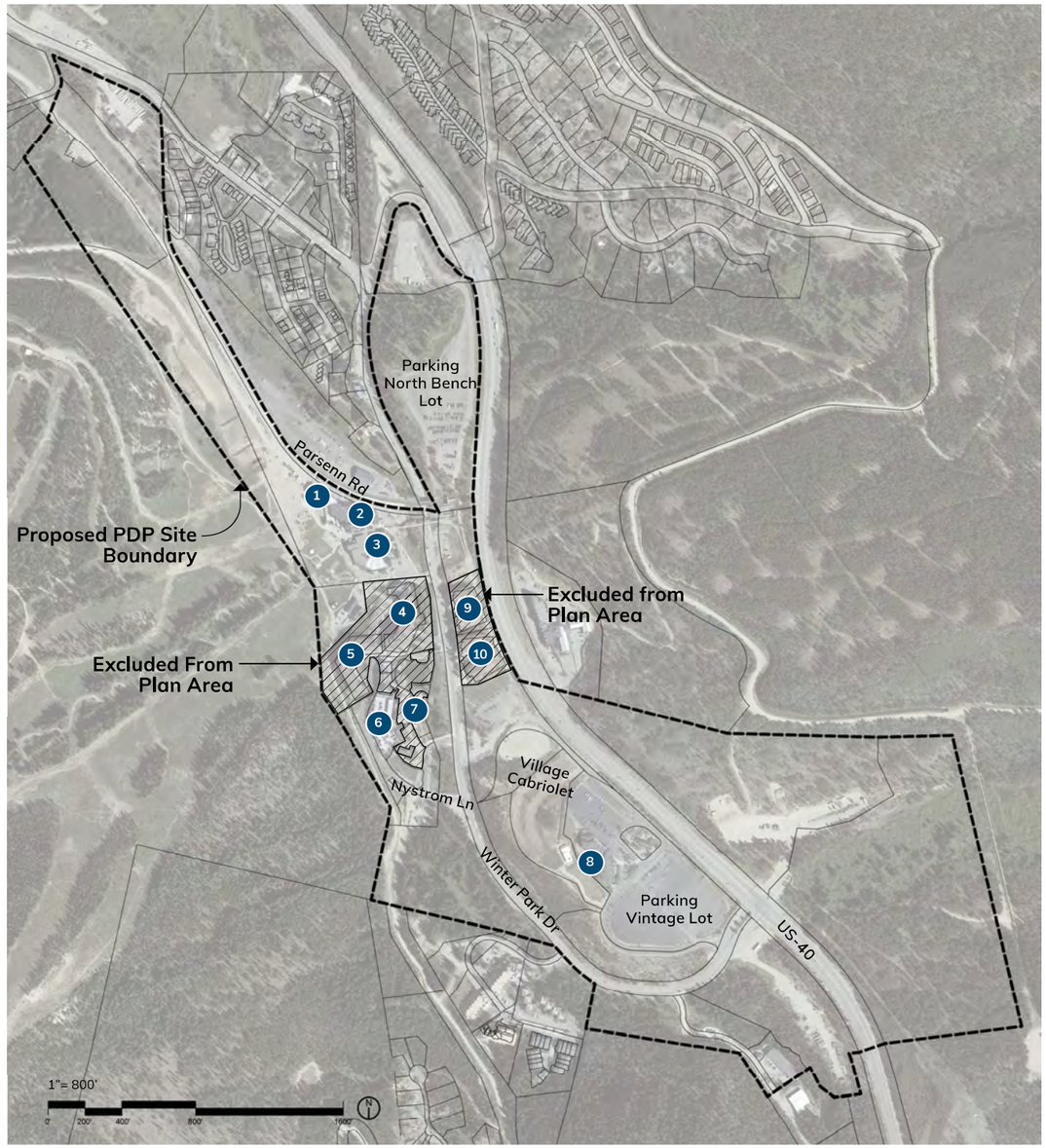
The Plan Area is an approximately 169-acre site bounded by US Highway 40 to the east, the Mountain to the west, residential areas to the north and south, and by the Arapaho National Forest in the Jim Creek area. New development in the Plan Area will be generally concentrated on previously disturbed land used for Winter Park Resort facilities including skier services, parking, lodging and commercial uses.

The topography of the Plan Area has considerable grade changes making development difficult on the Mountain side. Thus, development is concentrated on the flatter areas of the Plan Area.

While most of the flat, developable areas within the Plan Area are currently occupied by surface parking lots and service pads, almost all of this land contains little to no subterranean disturbance. The future vision for this Plan Area focuses on maximizing land use efficiency to unlock its value responsibly. This approach is beneficial for both the Plan Area development and preservation of the existing natural landscape.

Existing condominium units owned by third parties will be excluded from the PDP and Development Agreement by legal description. The 1998 Winter Park Village Final Development Plan will continue to apply to areas excluded from the PDP. To the extent that making improvements envisioned in the PDP requires HOA approvals on excluded parcels, the Applicant will seek that approval. The PDP demonstrates that development constructed pursuant to the PDP will not negatively impact existing condominium units in terms of pedestrian connectivity, parking, utility easements, or other relevant considerations.

FIGURE 1.2 PLAN AREA SITE & CONTEXT



- Existing Buildings
- Proposed Plan Area Site Boundary
- 1 Denver Health E. Grand Community Clinic & Emergency Center
- 2 West Portal
- 3 Balcony House
- 4 Zephyr Mountain Lodge-Riverside
- 5 Zephyr Mountain Lodge-Slopeside
- 6 Parking Garage
- 7 The Village
- 8 Vintage Hotel
- 9 Fraser Pointe
- 10 Fraser Crossing
- Not Included In Plan Area

EXISTING ZONING

The Plan Area encompasses several current zone districts. The intent of this PDP is to utilize the D-C zone district as the base zone district for the Plan Area, with provisions of this PDP, subsequent FDPs, and the Development Agreement providing overlaid and combining standards. Areas that are excluded from the PDP remain under the existing 1998 Winter Park Village Final Development Plan.

CURRENT ZONING DISTRICTS LOCATED WITHIN THE PLAN AREA

DESTINATION CENTER ZONE - **D-C (Mixed Use)**
A planned mixture of high density and upper-floor residential and commercial uses in horizontal and vertical formats that are arranged to create a walkable pedestrian environment.

PLANNED DEVELOPMENT & PLANNED DEVELOPMENT (DESTINATION CENTER) - **P-D & PD (D-C)**
Legacy districts to be rezoned and superseded by this PDP.

RESIDENTIAL-COMMERCIAL SERVICE ZONE DISTRICT - **R-C (Mixed Use)**
Single-family attached uses within close proximity to commercial uses.

ADJACENT ZONING DISTRICTS (NOT WITHIN THE PLAN AREA)

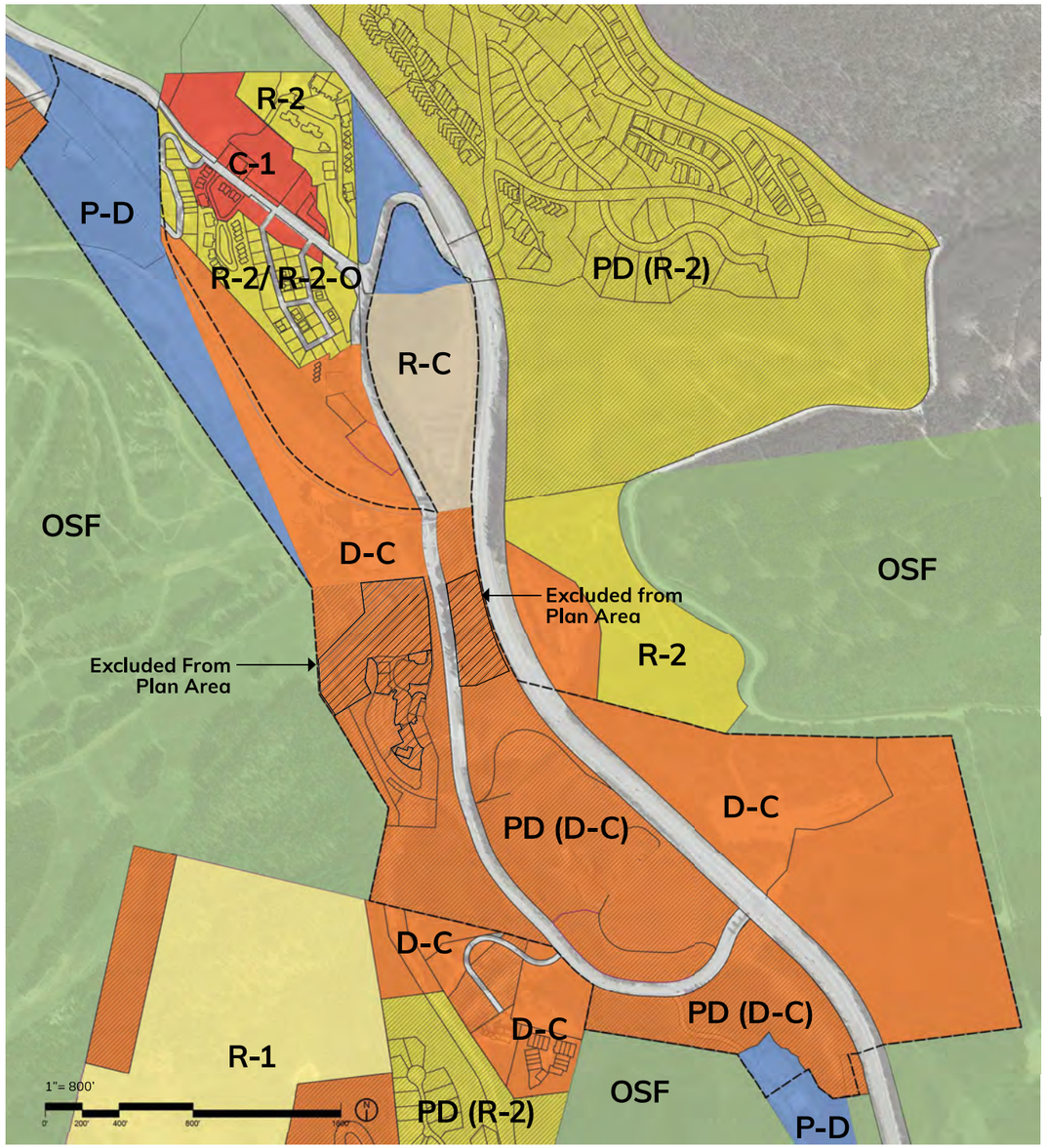
MULTIPLE-FAMILY RESIDENTIAL - **R-2 (Medium Density Residential)**
Single-family detached residences on smaller lots, together with single-family attached and multiple family dwelling types developed in proximity to, but not abutting Main Street, and in proximity to the Base Area.

MULTIPLE-FAMILY RESIDENTIAL DISTRICT WITHIN OLD TOWN ZONE DISTRICT -
R-2-O (Varied Density Residential) Lot and building standards that are flexible and unique to the Old Town neighborhood where development preceded incorporation into the Town and hence the types and patterns of lots and buildings do not conform to a uniform set of requirements.

SINGLE FAMILY RESIDENTIAL - **R-1 (Low Density Residential)**
Single-family detached residential neighborhoods on moderately sized lots, including provision for varying lot areas and widths, home siting, and by-right cluster development to preserve resources, protect sensitive lands, and accommodate natural topography.

OPEN SPACE / FORESTRY / AGRICULTURAL / RECREATIONAL - **OSF (Forest and Open Land)**
Preservation of the US Forest Service Property; protection of the Fraser River and associated creeks and their wetland and riparian areas; provision of agricultural areas and uses; and expanding upon the recreational amenities and assets of the Town.

FIGURE 1.3 EXISTING ZONING



SITE PROPERTIES & OWNERSHIP

The Plan Area includes all or part of 35 parcels, all of which are owned or controlled by Alterra Mountain Company or Winter Park Recreation Association (WPRA). This PDP does not intend to rezone, modify any applicable standards, or require redevelopment of properties controlled by others, including, but not limited to, residential condominiums without their consent.

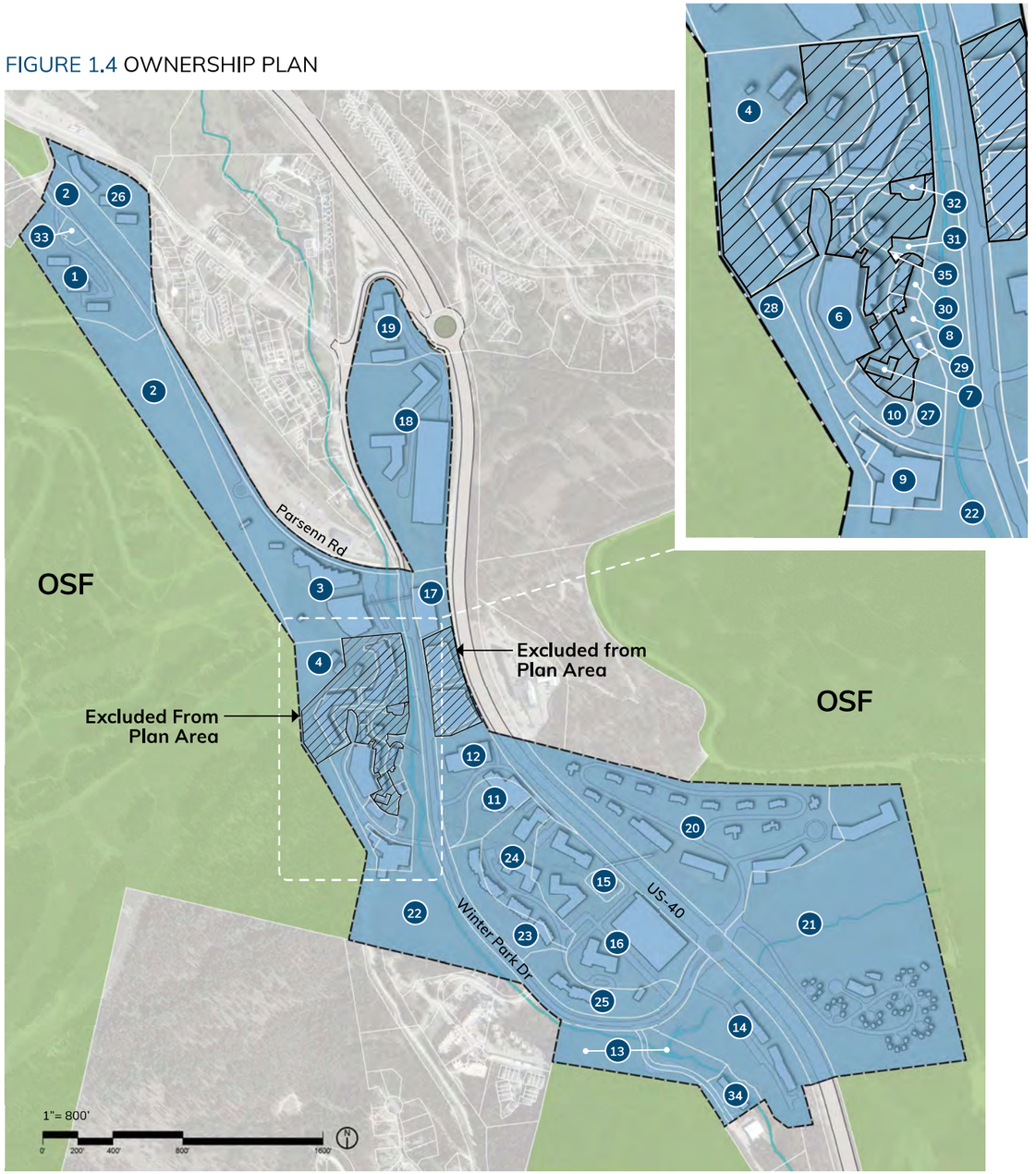
Such properties located in or near the properties covered by this PDP are specifically excluded from the Plan Area and retain their original zoning. Development constructed pursuant to the PDP will not negatively impact existing residential condominium units in terms of pedestrian connectivity, parking, utility easements, or other performance standards.

TABLE 1.1 SITE OWNERSHIP

ID	ACREAGE	OWNER	ADDRESS OR LEGAL	PARCEL ID	ZONING
1	5.468	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	TRACT 41 MINOR SUB LOT 2	170510204002	P-D
2	12.765	WINTER PARK RECREATIONAL ASSOCIATION	TRACT 41 MINOR SUB LOT 3	170510204003	P-D
3	10.645	WINTER PARK RECREATIONAL ASSOCIATION	W E EVANS SUB DIV EX FINAL 11.07 AC A TRACT OF LAND BEING PART OF W E EVANS SUBDIVISION EXEMPTION & HES 117, WEST PARCEL, SEC 10 T2S R75W DESC AT REC 9600 8224 & PLAT 9600 8223	170510408001	P-D
4	1.66	WINTER PARK RECREATIONAL ASSOCIATION	VILLAGE AT WINTER PARK SUBDIVISION 1.66AC 145 PARSENN RD	170510405001	D-C
5	N/A	N/A	N/A	N/A	N/A
6	1.091	WINTER PARK RECREATIONAL ASSOCIATION	WINTER PARK VILLAGE CORE LOT: H EXEMPTION #2, PARKING GARAGE 200 NYSTROM LN	170510420008	PD/D-C
7	0.85	WINTER PARK RECREATIONAL ASSOCIATION	WINTER PARK VILLAGE CORE LOT: I EXEMPTION #1, 103 PARRY PEAK WY	170510420009	PD/D-C
8	0.171	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	WINTER PARK VILLAGE CORE LOT: N EXEMPTION #1, 110 PARRY PEAK WY	170510420033	PD/D-C
9	0.856	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	WINTER PARK VILLAGE CORE EX#3 LOT: K 105 NYSTROM LN	170510424001	PD/D-C
10	0.425	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	WINTER PARK VILLAGE CORE EX#3 LOT: J	170510424002	PD/D-C
11	2.013	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	VILLAGE AT WINTER PARK RESORT MINOR SUBDIVISION LOT: 2A 435 VINTAGE WAY	170510417015	PD/D-C
12	4.082	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	VILLAGE AT WINTER PARK RESORT MINOR SUBDIVISION LOT: 1	170510417013	PD/D-C
13	4.901	WINTER PARK RECREATIONAL ASSOCIATION	MINOR SUBDIVISION OF TR 44A LOT: 44A1	170514201001	PD/D-C
14	7.498	WINTER PARK HOUSING DEVELOPMENT COMPANY	JIM CREEK WEST SUB EXEMPT LOT: 1 1 WINTER PARK DR	170514202011	PD/D-C
15	0.568	WINTER PARK RECREATIONAL ASSOCIATION	VILLAGE AT WINTER PARK RESORT MINOR SUBDIVISION LOT: 2B 102 VINTAGE WAY	170510417017	PD/D-C
16	11.609	WINTER PARK RECREATIONAL ASSOCIATION	VILLAGE AT WINTER PARK RESORT MINOR SUB FILING NO. 2 LOT: 3 100 VINTAGE WAY	170515111003	PD/DC
17	1.466	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	VILLAGE AT WINTER PARK RESORT MINOR SUBDIVISION LOT: 1 NORTH	170510417004	PD/D-C
18	12.230	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	METES & BOUNDS 75 ALL 12.306 AC IN TRACTS 38B, 45 AND 49 NE4 SEC 10 T2S R75W	170510100020	PD/D-C
19	2.223	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	METES & BOUNDS 75 ALL T2S SEC 10 PT TRACT 40 2.223 AC+/- TRACT 38A AND TRACT 40 DESC IN PATENT REC 94006810 LESS NORTH BENCH FLG NO 1 MS PLAT 200701361 IN NE4 SEC 10 T2S R75W	170510100023	R-C
20	23.423	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	JIM CREEK MINOR SUBDIVISION LOT: 1 82705 US HWY 40	170514202008	P-D
21	34.714	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	JIM CREEK MINOR SUBDIVISION LOT: 2 84255 US HWY 40	170514202009	D-C

22	10.473	WINTER PARK RECREATIONAL ASSOCIATION	VILLAGE AT WINTER PARK RESORT MINOR SUBDIVISION LOT: 3	170515109001	PD/D-C
23	3.656	WINTER PARK RECREATIONAL ASSOCIATION	VILLAGE AT WINTER PARK RESORT MINOR SUB FILING NO. 2 LOT: 2	170515111002	PD/D-C
24	4.482	WINTER PARK RECREATIONAL ASSOCIATION	VILLAGE AT WINTER PARK RESORT MINOR SUB FILING NO. 2 LOT: 1	170515111001	PD/D-C
25	3.420	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	VINTAGE SUBDIVISION MINOR SUB PLAT LOT: 1 BLOCK: 1	170510422001	PD/D-C
26	3.587	WINTER PARK RECREATIONAL ASSOCIATION	TRACT 41 MINOR SUB LOT: 1	170510204001	P-D
27	1.87	IW/WP VILLAGE CORE DEVELOPMENT, LLC	WINTER PARK VILLAGE CORE EX#3, LOT E	170510424003	PD/D-C
28	1.012	WINTER PARK RECREATIONAL ASSOCIATION	WINTER PARK VILLAGE CORE LOT L	170510420012	PD/D-C
29	0.094	ALTERRA MTN CO REAL ESTATE DEVELOPMENT, INC.	WINTER PARK VILLAGE CORE LOT O	170510420015	PD/D-C
30	0.073	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	WINTER PARK VILLAGE CORE LOT B, EXEMPTION #1	170510420030	PD/D-C
31	0.123	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	WINTER PARK VILLAGE CORE LOT C	170510420031	PD/D-C
32	0.126	WINTER PARK RECREATIONAL ASSOCIATION	WINTER PARK VILLAGE CORE LOT A	170510420001	PD/D-C
33	0.335	WINTER PARK RECREATIONAL ASSOCIATION	TRACT 41 MINOR SUB LOT: 4	170510204004	P-D
34	1.473	WINTER PARK RECREATIONAL ASSOCIATION	MINOR SUBDIVISION OF TR 44A, LOT: 44A3	170514201003	P-D
35	0.004	ALTERRA MTN CO REAL ESTATE DEVELOPMENT CO, INC.	WINTER PARK VILLAGE CORE LOT F	PENDING	PD/D-C

FIGURE 1.4 OWNERSHIP PLAN



Property Within Plan Area
OSF
Plan Area Boundary
Not Included In Plan Area

2. PLAN ORGANIZATION

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AMENDMENTS TO THE PDP

The process of approving and amending the PDP shall follow the Town UDC procedure, except as provided in this PDP or in the Development Agreement.

MODIFICATIONS TO EXISTING PLANNED DEVELOPMENTS

Proposed amendments to the approved PDP will follow the procedures outlined in the Town UDC, Article 5.C.; and proposed appeals, modifications, and interpretations of the approved PDP will follow the procedures outlined in the Town UDC, Article 5.F; except as otherwise provided in this PDP and the Development Agreement.

MINOR AMENDMENTS - APPROVAL PROCESS

Minor amendments, variances, and modifications to this PDP may be approved administratively by the Director, including but not limited to the following:

- Relocation of off street parking spaces, so long as overall parking counts in a Planning Neighborhood or FDP are satisfied
- Minor modifications to traffic circulation and public utilities
- Transfers of units, gross square footage (GSF), or density within and between Planning Neighborhoods of 15% or less, so long as the aggregate maximum unit count, GSF, or density in the approved PDP is not exceeded
- Co-location of multiple uses on a parcel and/or within buildings
- Construction and/or placement of temporary uses and/or structures

The Director may determine that other proposed amendments to this PDP are minor amendments in the Director's reasonable discretion. Within 30 days after receipt of a request for proposed minor amendment to this PDP, the Director shall approve, approve with conditions, or deny the proposed minor amendment.

RELATION TO DEVELOPMENT AGREEMENT

In connection with approval of the PDP in the Plan Area, a Development Agreement shall also be executed in a form agreed upon between the Town and the Applicant extending the statutorily vested rights that will be created at the time the Town adopts its Ordinance approving the PDP, and automatically conferring vesting on any subsequent FDP, for a period agreed upon in the Development Agreement.

RELATION TO TOWN UDC

The PDP for the Plan Area will utilize the D-C zone district as the base zone district, subject to this PDP overlay as a combining district and any subsequent FDP. This will maximize opportunities for mixes of use and activation, while providing flexibility for implementation over time.

SUMMARY OF MODIFICATIONS TO DEVELOPMENT STANDARDS

An outline of Development Standards modified by this PDP are as follows, and the new standards are provided in detail in Chapter 7: Development Standards - Building & Site Design:

Code Section	Section Title
UDC	
2-B-1	Use Tables - Use by District
2-B-4-F	Retaining Walls as Accessory Structures
Table 3-A-3	Residential Lot and Building Standards
3-A-7-E	Measurements, Computations, and Exceptions - Building Height
3-A-8	Design Guidelines
3-C-2-2	Protection of Hillsides and Ridgelines
3-C-2-5-E-2	Hillside and Ridgeline Design Standards- Retaining Walls
3-C-2-5-F	Hillside and Ridgeline Design Standards - Ridgeline Setback and Landscape Bufferyard
3-C-2-5-H	Hillside and Ridgeline Design Standards - Slopes of 30% or More
3-C-3-2	Water Quality Setback
3-H-3	Required Parking
3-H-6	Off Street Loading Requirements
3-I-5	Landscaping | Bufferyards
Town of Winter Park Water and Sanitation District Rules and Regulations	
3.C.3.B	Insulation at Water Mains
Town of Winter Park Standards and Specifications for Design and Construction Manual	
6.2.5, X	Stormwater Detention
3.6.1	Grades
3.7.4	Grades

RELATION TO DESIGN GUIDELINES

The Mountain Base Area Design Guidelines supplement the Town of Winter Park Design Guidelines in order to implement the vision shown in the PDP. The Mountain Base Area Design Guidelines will provide guidance on general design intent for the entire Plan Area and specific design guidelines at the parcel level. Where the Mountain Base Area Design Guidelines conflict with the Town of Winter Park Design Guidelines, the Town of Winter Park Design Guidelines shall control, unless a deviation from the Town of Winter Park Design Guidelines has been approved by the Town at the time of FDP or MSP submittal. The Winter Park Base Area Design Review Board will be responsible for review of each MSP against the Mountain Base Area Design Guidelines and Town Design Guidelines. The Winter Park Base Area Design Review Board will recommend MSP submittals which satisfy the Town of Winter Park Design Guidelines and the Mountain Base Area Design Guidelines to the Town of Winter Park for review, prior to review of the MSP by the Town against the Town of Winter Park Design Guidelines.

3. PLAN VISION

PDP Vision in Relation to Town Comp Plan 24

PDP VISION IN RELATION TO TOWN COMP PLAN

The PDP establishes an approach to align future development with the aspirations and goals of the Town Comp Plan.

The Town Comp Plan creates a framework for priorities for development within the Town of Winter Park. The Town Comp Plan informed the project vision outlined in the PDP and intent to ensure that development of the Plan Area contributes to achievement of broader goals for Winter Park.

The concepts listed below are noted on Figure 3.1 Illustrative Full Buildout Plan to indicate alignments with the principles described in the Town Comp Plan.

1. **Create a Year-Round Community**
   Be consistent with the community envisioned in the Town Comp Plan and foster diverse year-round opportunities for living, working, and recreating.

2. **Create Unique Public Spaces**
   Create unique public spaces where the community can gather, recreate, connect with nature, and be creative.

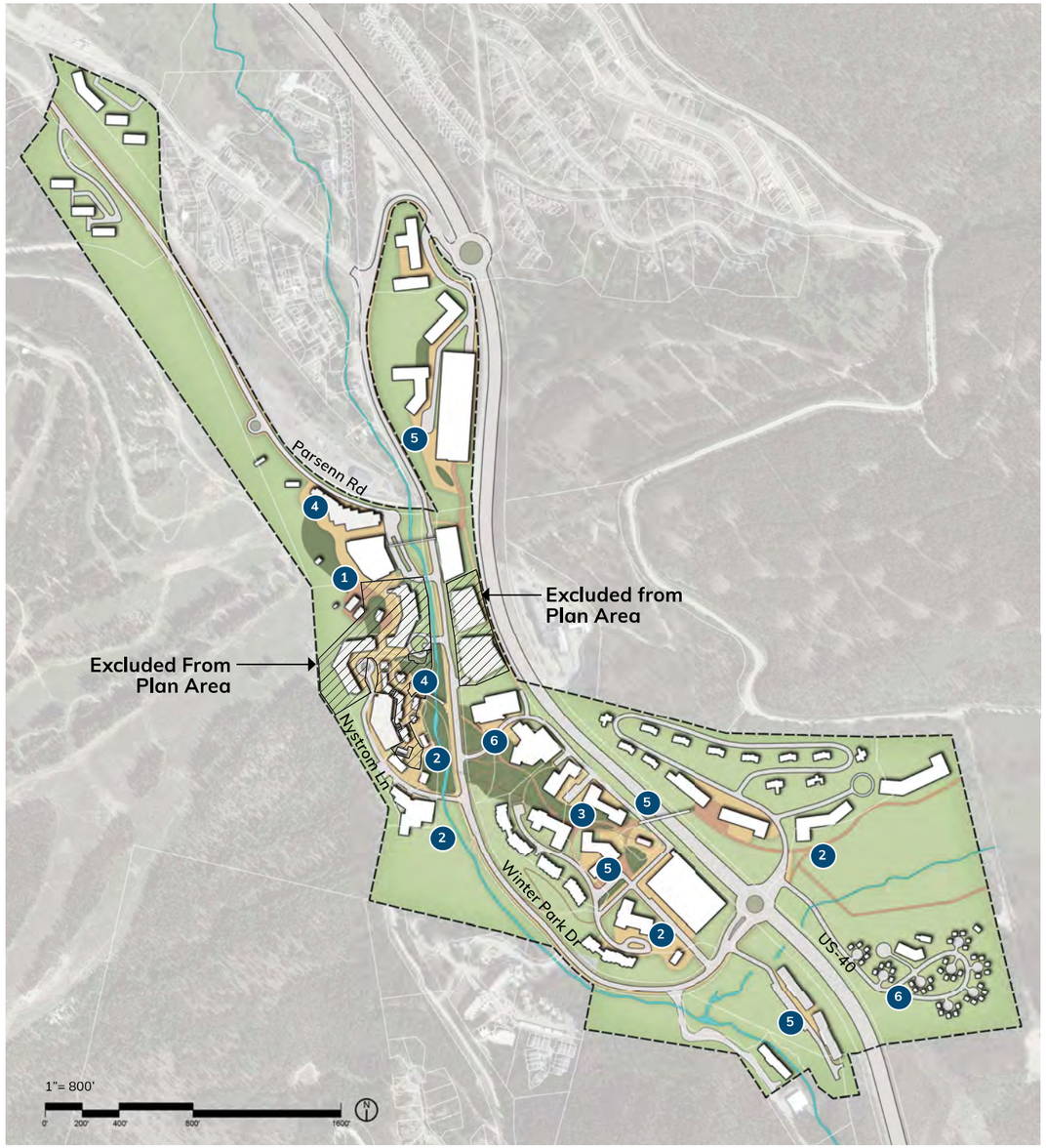
3. **Establish A Sustainable Approach to Density**
   Create a pillar of sustainable development consistent with the Town Comprehensive Plan to improve resource management and development practices. Encourage sustainable growth and development as a tool to increase community amenities and economic opportunities.

4. **Revitalize, Enhance, and Renew the Resort Areas**
   Emphasize compact, tourist-related mixed-use neighborhoods that are connected, safe, and walkable.

5. **Enhance A Sense of Inclusiveness**
   Create a community that is inclusive and equitable through mobility, economic opportunity, housing, services, and employment for a diversity of ages, incomes, and household compositions. This includes the recently completed affordable housing facility providing living opportunities for Winter Park's workforce.

6. **Be Authentic**
   Develop a year-round community that is family-oriented and rooted in the spirit of Winter Park's adventure seeking enthusiasm.

FIGURE 3.1 ILLUSTRATIVE FULL BUILDOUT PLAN



- Existing Buildings
- Proposed Buildings
- Open/Green Space
- Circulation Space
- Site Boundary

Note: The Illustrative Full Buildout Plan depicts a representation of where development could occur based on the zoning and design standards set forth by the PDP. Actual placement and design of individual buildings will be determined in future FDP and Major Site Plan processes and is subject to change from this illustrative plan.

The following section highlights key strategies from the Town Comp Plan and corresponding information within the PDP which they informed.

CHAPTER 3: OUR CHARACTER AND OUR CULTURE

CC Strategy 1.3: Ensure that the built environment continues to be seamlessly integrated with mountain and recreational amenities (e.g. connections to trails, integration with the Fraser River, bikeable paths, etc.).

- Refer to Ch. 4 Open Space and Pedestrian and Bicycle Mobility - Trails sections for description of how the project will integrate with the mountain and recreational amenities.

CC Strategy 1.5: Strengthen the sense of connection between Downtown and Winter Park Resort.

- Refer to Ch. 1 The Vision section for description of the intent to strengthen connection between Downtown and Winter Park Resort including the planned Mountain-to-Downtown aerial transport system.

CC Strategy 2.1: Incorporate public places into future development.

- Refer to Ch. 4 Planning Neighborhoods section for description of how integration of public spaces informs the design of each Planning Neighborhood and Ch. 4 Open Space for the PDP's vision to deliver both programmed and passive public spaces throughout the Plan Area.

CC Strategy 2.7: Support quality design and encourage unique and high-quality building construction and energy-efficiency.

- Refer to Ch. 5 Sustainability Approach for an overview of the project's approach to integrating sustainability including reducing energy consumption.

CC Strategy 2.8: Build on Winter Park's designations as "Mountain Bike Capital USA" and Colorado's "Top Adventure Town" as a way to attract growth that supports our recreational heritage.

- Refer to Ch. 1 The Vision section for description of the vision for development of the Plan Area to support increased visitation and support Winter Park's growth as a top outdoor destination.

CC Strategy 3.1: Work with developers to provide recreational and cultural amenities that benefit both residents and guests alike.

- Refer to Ch. 4 Planning Neighborhood Narratives section for description of different areas within the plan intended for event programming.

CC Strategy 5.1: Allow for publicly accessible parks, plazas, and open spaces in both design and policy, meeting the goal of being an inviting community.

- Refer to Ch. 4 Open Space section for the PDP's vision to deliver both programmed and passive public spaces throughout the Plan Area.

CC Strategy 5.2: Include neighborhood-scale parks and open spaces within developments that are fully accessible to the public.

- Refer to Ch. 4 Open Space section for the PDP's vision to deliver both programmed and passive public spaces throughout the Plan Area.

CC Strategy 5.6: Continue to support community gatherings and events that bring people together.

- Refer to Ch. 4 Planning Neighborhood Narratives section for description of different areas within the plan intended for event programming.

CHAPTER 4: OUR GLOBAL AND LOCAL CONNECTIVITY

CO Strategy 1.2: Provide enhanced connections between the Resort and Downtown such as a ski back trail, a direct gondola, and circulator bus routes.

- Refer to Ch. 4 Transit section for discussion of proposed transit improvements including The Lift service, resort shuttle, and Aerial Transport System.

CO Strategy 1.3: Enhance facilities at the Winter Park Resort Transit Center to serve as a secondary transit hub. As the base area redevelops, evaluate options to consolidate or better connect the existing three transit areas (base of Cabriolet, Balcony House/Zephyr Mountain Lodge area, rail platform) into a single seamless transit hub.

- Refer to Ch. 4 Transit section for discussion of proposed transit improvements including The Lift service, resort shuttle, and Aerial Transport System.

CO Strategy 1.4: Ensure the Resort Transit Center includes easy pick-up/drop-off capability allowing both resort guests and non-resort guests to make regional connections.

- Refer to Ch. 4 Street Sections section for discussion of proposed improvements to Winter Park Drive which would include a transit 'flex lane' to improve transit pick-up / drop off and circulation.

CO Strategy 2.6: Examine the need for requirements for passenger drop-off and loading zones within new development to accommodate transportation options such as resort shuttles, microtransit, and autonomous vehicles (AV).

- Refer to Ch. 4 Street Sections section for discussion of proposed improvements to Winter Park Drive which would include a transit 'flex lane' to improve transit pick-up / drop off and circulation.

CO Strategy 3.7: Enhance existing pedestrian crossings to increase pedestrian safety and visibility as well as motorist compliance.

- Refer to Ch. 4 Street Sections section for description of the project's approach to prioritizing pedestrian, bicycle, and transit mobility and safety through the Plan Area through redesigned right-of-ways.

CO Strategy 3.13: Complete the Fraser River Trail to ensure it functions as the primary north-south bicycle corridor.

- Refer to Ch. 4 Pedestrian & Bicycle Mobility section for discussion of extensions of the Fraser River Trail which will extend throughout the Plan Area to create a North-South extension.

CO Strategy 3.14: Focus on improving motorist awareness and mutual share-the-road behavior on all north-south roadways through signage and appropriate roadway widths.

- Refer to Ch. 4 Street Sections section for description of project's approach to prioritizing pedestrian, bicycle, and transit mobility and safety through the Plan Area through redesigned right-of-ways.

CO Strategy 3.16: Explore roadway changes such as narrowed drive lanes, consolidated driveways, curb bulb-outs at intersections, street trees, and median refuges to balance road functions.

- Refer to Ch. 4 Street Sections section for discussion of proposed improvements to Winter Park Drive which would include a transit 'flex lane' to improve transit pick-up / drop off and circulation.

CO Strategy 5.1: Emphasize a District Parking approach based on increased use of existing public parking structures.

- Refer to Ch. 4 Parking Strategy and Ch. 7 Modified Standards sections for modified commercial parking requirements to reflect the project's shared parking strategy.

CO Strategy 5.3: Integrate shared parking into the code as an allowable option where appropriate.

- Refer to Ch. 4 Parking Strategy and Ch. 7 Modified Standards sections for modified commercial parking requirements to reflect the project's shared parking strategy.

CO Strategy 5.4: Consider zoning code updates to support smart parking strategies such as maximum parking requirements (foregoing minimum requirements), flexibility in providing parking off-site, and incentives for shared parking.

- Refer to Ch. 4 Parking Strategy and Ch. 7 Modified Standards sections for modified commercial parking requirements to reflect the project's shared parking strategy.

CHAPTER 5: OUR WORLD-CLASS OUTDOOR RECREATION

OR Strategy 1.1: Integrate dedicated recreation paths throughout the Town into a comprehensive regional network.

- Refer to Ch. 4 Pedestrian & Bicycle Mobility section for discussion of extensions of the Fraser River Trail which will extend throughout the Plan Area to create a North-South extension.

OR Strategy 1.3: Design roadways with hikers and cyclists in mind, with particular attention to posted speeds, width, and other pedestrian/cyclist awareness measures.

- Refer to Ch. 4 Pedestrian & Bicycle Mobility and Street Sections sections for description of inclusion of multi-modal paths and trails which will provide safe routes for pedestrian/cyclists throughout the Plan Area.

OR Strategy 1.4: Maintain trailhead and forest access points and easements within and through residential and commercial developments. This access can be as simple as signage and a hiker / biker / horse width easement.

- Refer to Ch. 4 Pedestrian and Bicycle Mobility - Trails section for description of general trail considerations for implementation of trail connections throughout the Plan Area.

OR Strategy 2.1: Develop recreational opportunities suited to short, daily activities (e.g. shorter, close-to-town trails, opportunities for water play, fishing ponds, etc.).

- Refer to Ch. 4 Open Space section for description of open spaces which will be designed to provide opportunities for daily activities.

OR Strategy 3.8: Capitalize on and enhance existing recreational facilities.

- Refer to Ch. 1 The Vision section for the description of the vision to enhance Winter Park Resort and Ch. 4 Open Space section for description of open spaces which will be designed to provide opportunities for daily activities.

CHAPTER 6: OUR HEALTH AND THRIVING ENVIRONMENT

EN Strategy 1.1: Protect and increase physical and visual access to waterways within and around the Town.

- Refer to Ch. 4 Planning Neighborhood Narratives which includes the vision for restoring the Fraser River, preserving natural habitat, and improving public access.

EN Strategy 1.4: Strengthen the Fraser River and its associated floodplain as a recreational and economic amenity while preserving the riparian habitat.

- Refer to Ch. 4 Planning Neighborhood Narratives section which includes the vision for restoring the Fraser River, preserving natural habitat, and improving public access.

EN Strategy 1.5: Protect the viability of natural wetlands and watercourses as a key component of our natural and built environments.

- Refer to Ch. 4 Planning Neighborhood Narratives section which includes the vision for restoring the Fraser River, preserving natural habitat, and improving public access. Refer to Ch. 5 River & Wetland Delineation section for the project's intent to preserve wetlands area.

EN Strategy 1.7: Restore or enhance degraded or disturbed waterways to improve ecological conditions, aesthetics, and recreation.

- Refer to Ch. 4 Planning Neighborhood Narratives which includes the vision for restoring the Fraser River, preserving natural habitat, and improving public access.

EN Strategy 2.2: Design trail routes to minimize ecological impacts while enhancing access and recreation.

- Refer to Ch. 4 Pedestrian and Bicycle Mobility - Trails section for description of general trail considerations for implementation of trail connections throughout the Plan Area.

EN Strategy 3.1: Encourage density in appropriate locations and clustering of development to maximize open space.

- Refer to Ch. 1 PDP Vision section for the PDP's establishment of a "Sustainable Approach to Density" as a key project pillar.

EN Strategy 4.6: Increase energy-efficiency, renewable energy, and carbon-neutral energy in Winter Park.

- Refer to Ch. 5 Sustainability Approach section for an overview of the project's approach to integrating sustainability including reducing energy consumption.

EN Strategy 4.8: Promote green building practices in new construction and existing buildings.

- Refer to Ch. 5 Sustainability Approach section for an overview of the project's approach to integrating sustainability including reducing energy consumption.

4. PLAN ELEMENTS

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LAND-USE PLANNING NEIGHBORHOODS

The conceptual land-use plan divides the Plan Area into distinct Planning Neighborhoods, and each embodies its location, existing conditions, scale, sense of place and resort function. This PDP provides a range of possible uses and development scenarios that could occur within the Plan Area. The exact density, magnitude and mix of use and development locations will be determined in the future by timing, market factors and feasibility.

The four Planning Neighborhoods created by this PDP are as follows:

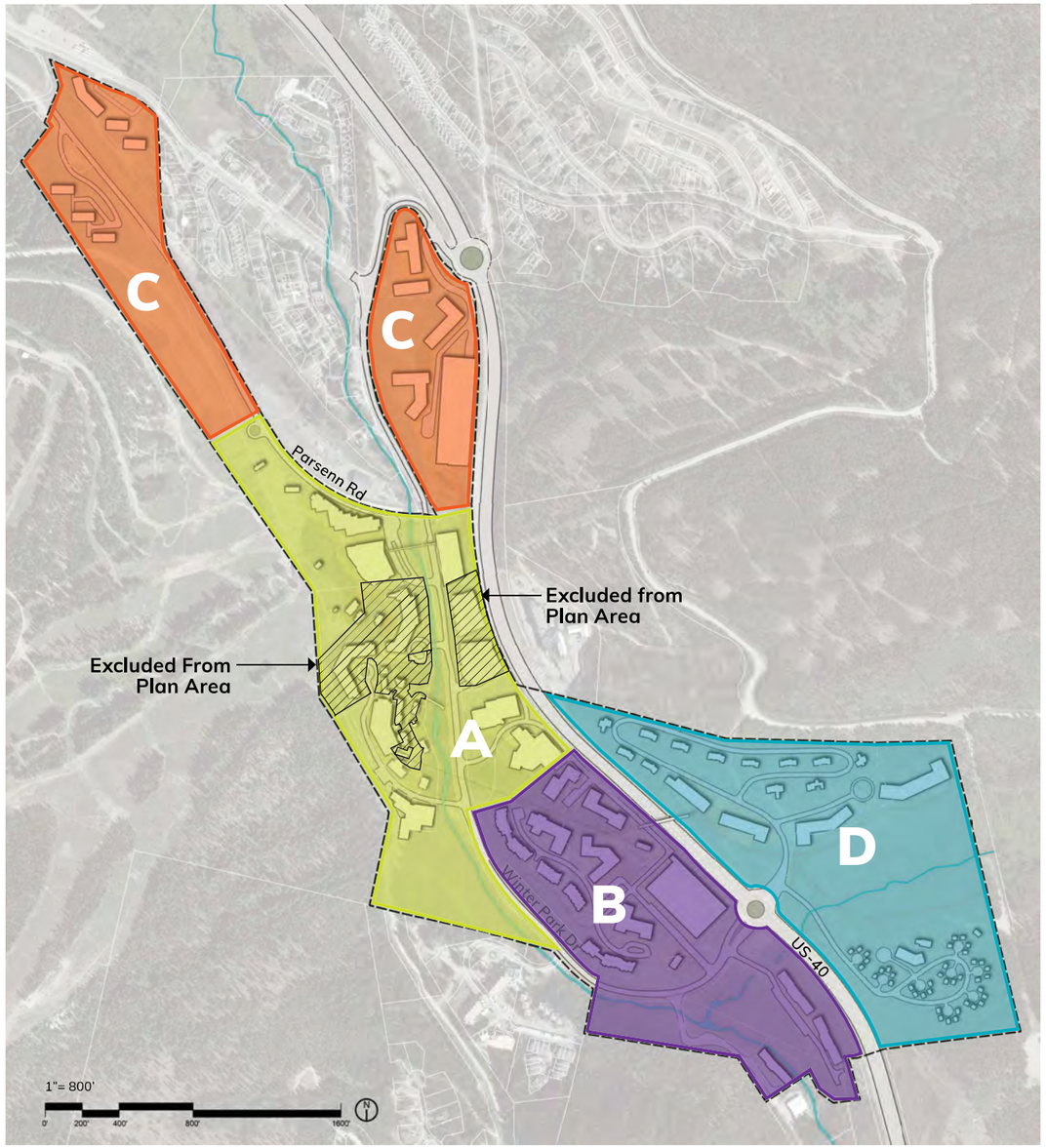
RESORT VILLAGE (AREA A)
The Resort Village Planning Neighborhood is a convergence of activity located directly at the Base Area. Density and use are planned around multiple modes of transportation fostering an efficient and elevated arrival experience, high-intensity activation, community connection, the engagement and celebration of nature, and a dynamic choreography of places, spaces, programming, and functions.

WELCOME VILLAGE (AREA B)
The Welcome Village Planning Neighborhood is set to significantly elevate Winter Park Resort's arrival experience with an efficiently upgraded Highway 40 entrance/exit, a public parking structure, and an array of retail, hospitality, and residential options to bolster a year-round destination experience and provide a welcoming gateway to Winter Park Resort.

OLD TOWN (AREA C)
The Old Town Planning Neighborhood will strengthen the connection between Downtown and the Mountain, re-envisioning this arrival and offering an opportunity for future development and growth over time.

RETREAT (AREA D)
The Retreat Planning Neighborhood offers an opportunity to embrace Winter Park Resort's harmony with the natural ecosystems and surrounding environment, championing responsible development in a more serene setting.

FIGURE 4.1 LAND-USE PLANNING NEIGHBORHOODS



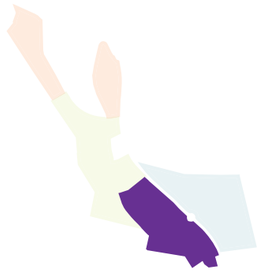
- Planning Neighborhood A - Resort Village
- Planning Neighborhood B - Welcome Village
- Planning Neighborhood C - Old Town
- Planning Neighborhood D - Retreat

TABLE 4.1 LAND-USE PLANNING NEIGHBORHOOD SUMMARY

* Areas are approximate. Land Area excludes public rights-of-way.

Resort Village	
Zoning	PD (D-C)
Land Area (Acres)	36.8
Land Area (SF)	1,603,008
Existing Building Area (SF)	110,729

Welcome Village	
Zoning	PD (D-C)
Land Area (Acres)	37.6
Land Area (SF)	1,637,856
Existing Building Area (SF)	68,334



Old Town	
Zoning	PD (D-C)
Land Area (Acres)	36.6
Land Area (SF)	1,594,296
Existing Building Area (SF)	3,795

Retreat	
Zoning	PD (D-C)
Land Area (Acres)	58.1
Land Area (SF)	2,530,836
Existing Building Area (SF)	0

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PLANNING NEIGHBORHOOD NARRATIVES

The following descriptions and plans reflect a conceptual vision for the four Planning Neighborhoods identified in Figure 4.1 Land-Use Planning Neighborhoods.

RESORT VILLAGE (AREA A)

The Resort Village (Area A) includes the Base Area composed of buildings, parking, and circulation, the existing Winter Park Village corridor, the Fraser River frontage, undeveloped land just south of Nystrom Lane, and the current Lot B surface parking lot south of Iron Horse Resort. This area is expected to see more activity and a variety of year-round uses, with improved traffic flow for vehicles, pedestrians, and cyclists to enhance efficiency and safety.

The Resort Village (Area A) is divided into Sub-Areas, portions of a Planning Neighborhood, with Key Elements and Supporting Elements as outlined below:

1 Mountain Base

Key Elements: This area encompasses the revitalization of the current base, including the Balcony House, to establish a new vibrant core of experience and activity for Winter Park Resort. It opens avenues for enhancing base services like ticketing, lockers, wayfinding, and the NSCD programs, serving as the gateway to the Mountain. A mix of retail, dining, guest services, hospitality, and placemaking initiatives will shape a lively, year-round destination.

Supporting Elements: Anticipated enhancements to Winter Park Drive, including new bus drop offs and parking garages, aim to boost shuttle accessibility and efficiency, while elevating the multi-modal pedestrian experience.

2 Mountain Base North

Key Elements: A planned Aerial transport system is set to establish a direct link to Downtown and the proposed on-mountain ski school. Enhancements and extensions to the existing West Portal are expected to cater to potential ridership growth on the Ski Train, and to streamline Winter Park Resort's skier services and educational programs.

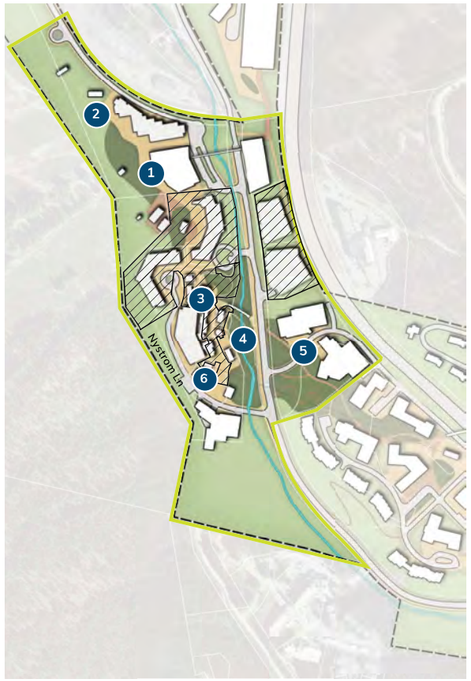
Supporting Elements: Further amenities and services will be considered to enhance the base area and guest arrival experience for travelers utilizing these forthcoming modes of transportation.

3 Village Corridor

Key Elements: Enriching the Village Corridor to create a lively, inclusive, and distinctive atmosphere involves promoting local culture through curated retail, art displays, engaging activities, enhanced green spaces, natural play areas, public squares, parks, and a strong link to the Fraser River. Vibrant hospitality will be centered at the southern Village, featuring indoor/outdoor cafes, public events, dining options, and lodging.

Supporting Elements: Enhancements to the current village may encompass repaving, additional amenities, pocket plazas, and upgrades to the Cabriolet landing. A promenade skirting the revitalized existing structures and running alongside the river will facilitate a more vibrant, varied, and interactive pedestrian flow. A potential footbridge crossing the Fraser River will establish a multi-use trail connection to Winter Park Drive and the proposed developments to the east and south.

FIGURE 4.2 AREA A DETAIL



4 River Park

Key Elements: The Fraser River corridor is a crucial natural asset within the Plan Area, deserving recognition, restoration, and celebration. Channelization through the resort over the years has led to steep banks, limiting visibility and visitor engagement. Improvements to River Park will include opening up the existing culvert, widening the river base, creating a more gentle grade along the banks, and natural habitat restoration. The Fraser River will become a central component of River Park through increasing public access to the river, improving summer recreation opportunities, expanding programming, supporting habitat health, and raising awareness of the river's importance to natural ecosystems.

Supporting Elements: The River Park offers year-round recreational opportunities. Its open spaces, including lawns, amphitheaters, promenades, and play areas, can animate the park, serving as venues for both formal events and casual interactions.

5 Village Overlook

Key Elements: Elevated above the Village Corridor, the Village Overlook serves as a vital link connecting the lively Base Area to the serene landscape and upper arrival experience of Winter Park Resort. It bridges the southern edge of the Resort Village with the northern edge of the Welcome Village, blending the vibrancy of the surroundings with the natural beauty. This intersection harmoniously combines hospitality, lodging, events, and culinary delights that engage and honor the landscape, creating a communal and inviting ambiance.

Supporting Elements: Natural gathering places and meandering paths provide connectivity, while enhanced vehicular and bicycle circulation optimize safety and efficiency.

WELCOME VILLAGE (AREA B)

Located east of the main Winter Park Resort exit at Highway 40, the Welcome Village (Area B) serves as the new gateway to this premier destination, warmly greeting visitors, guests, and locals. Winter Park Drive runs through the neighborhood to the south and borders it to the west. At present, this area is home to the Vintage Hotel, the upper Winter Park Village Cabriolet station, the tubing hill, and several surface parking lots. The PDP seeks to protect the coniferous trees between Winter Park Drive and the crest of the western slope with minimal disruption, ensuring the preservation of the natural beauty to the fullest extent possible.

The Welcome Village (Area B) is divided into Sub-Areas with Key Elements and Supporting Elements as outlined below:

1 The Gateway

Key Elements: A new entrance off Highway 40 into the Plan Area will include a vehicular roundabout, enhancing the arrival experience, improving traffic flow, and offering direct access to a large parking structure at the southeast corner. This entrance will also lead to an enhanced upper Cabriolet experience in a new plaza with retail amenities, services, and programming. The new public parking garage location enables visitors to quickly park upon arrival followed by a variety of options for venturing further into the resort, including direct access to a potential future Mary Jane gondola connection. Plans also include a new lodging experience at the renovated Vintage Hotel site, elevating the Plan Area's front door with expanded accommodations and amenities. The existing workforce housing complex completes the gateway at this entrance.

Supporting Elements: Surrounding the improved Cabriolet, a plaza will offer gathering spaces and serve as the foundation for a landmark pedestrian bridge connecting over Highway 40 to Jim Creek and the upcoming Retreat development areas. This will weave together the natural "green belt" across the site, linking to existing hiking and bike trails. A transit drop-off area will be located adjacent to the Cabriolet plaza, providing connections with the public transit network. Centralizing multiple current surface parking lots into one structure boosts parking density, streamlines efficiency, and readies adjacent surface lots for future development prospects.

2 The Green

Key Elements: Located directly west of Highway 40 on the current Vintage Hotel parking lot site, this Sub-Area proposes a diversity of accommodations and amenities that interact directly with the lush "green belt" running through the site, the beauty of nature and the outdoors is embraced as a link from the upper Welcome Village to the Resort Village at the Mountain Base below.

Supporting Elements: Terraces, meandering paths, and natural landscapes terrace down the hill as the cabriolet cars travel in the air above, and cafes/restaurants spill out from the adjacent lodging accommodations and pop-ups in the parks.

3 The Bluffs

Key Elements: Lodging accommodations hug the upper terrain of the western edge of the Welcome Village, celebrating a perimeter of evergreens and extraordinary views in all directions, as the slope of Winter Park Drive falls down into the village below.

Supporting Elements: Quaint restaurants and shops fill the ground floor of lodging accommodations, providing both public and private space for leisure, recreation, and tranquility.

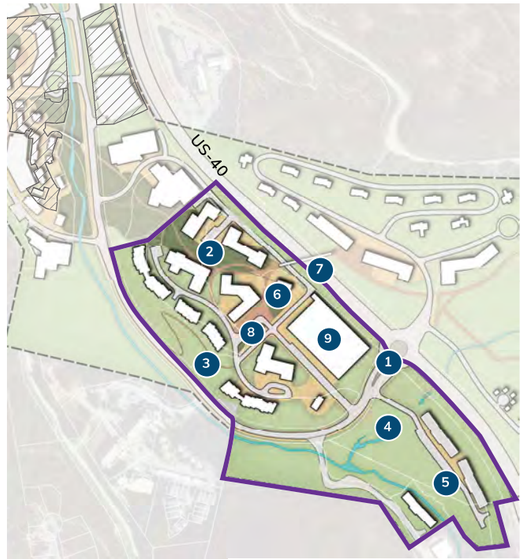
4 South River

Key Elements: Located directly west of Highway 40 and just south of the main Winter Park Resort arrival experience at Winter Park Drive, this area provides workforce housing for a diverse group of Winter Park Resort employees.

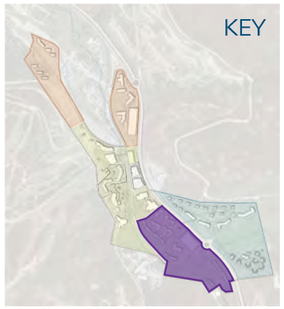
(Note: 332 units of workforce housing have already been implemented in this Sub-Area by Winter Park Resort and will be adaptable to support future needs.)

Supporting Elements: Additional/alternative development should remain adaptable to include future resort operations facilities, as well as enhanced open space along the Fraser River.

FIGURE 4.3 AREA B DETAIL



1 The Gateway
2 The Green
3 The Bluffs
4 South River
5 Workforce Housing (Existing)
6 Cabriolet Landing
7 Multi-Use Bridge Connection
8 Transit Drop-Off Area
9 Welcome Village Parking Garage



OLD TOWN (AREA C)

The Old Town Planning Neighborhood (Area C) lies to the north of the train tracks, bordered by Highway 40 to the east, Winter Park Drive and Old Town Drive to the west and north, and Winter Park Resort to the south. Currently composed mostly of surface parking lots, the upcoming development aims to utilize the already disturbed open spaces to minimize environmental impact to existing natural landscapes, watersheds, and topography. This area offers a unique opportunity not only to welcome people to the resort, but also to seamlessly integrate with and enhance the cultural charm of the historic Old Town setting.

Old Town (Area C) is divided into Sub-Areas with Key Elements and Supporting Elements as outlined below:

1 Old Town East

Key Elements: Serving as the Northern Gateway to Winter Park Resort and adjacent to Highway 40, the existing traffic light will be replaced by a vehicular roundabout to slow traffic, optimize vehicular flow, and pronounce a welcoming arrival experience from the north. This will include a new consolidated parking structure with associated services and amenities to greet visitors and locals to the resort, while also providing additional lodging and accommodations integrated into the culture of the Old Town district. The new lodging buildings will be developed at a scale which is responsive to the character and scale of the existing single family and multifamily buildings in the Old Town neighborhood. Building heights will step down from the eastern to western boundaries of the neighborhood to where they meet the existing Old Town neighborhood. Existing natural vegetation buffers from existing neighborhoods will be retained and enhanced.

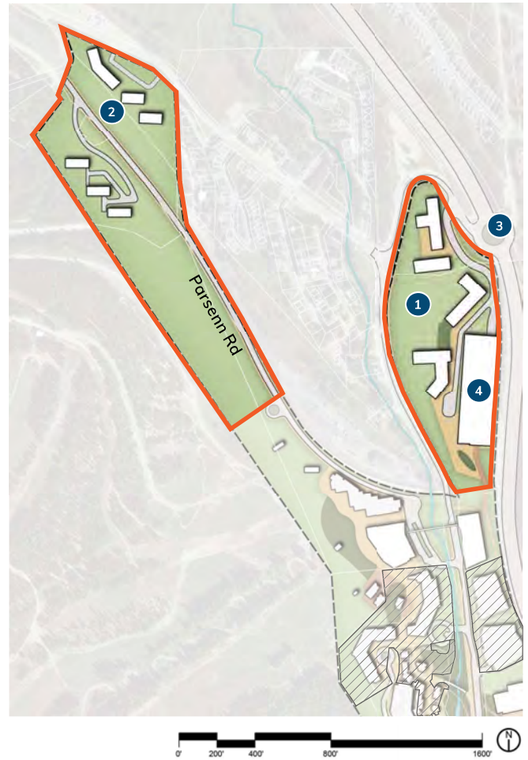
Supporting Elements: Ensuring safety and efficiency in vehicular arrivals will be complemented by an exceptional pedestrian experience that seamlessly connects individuals to the Resort Village and Base Area. Thoughtfully designed grade separations and vertical circulation will enhance access and movement for pedestrians. Enhancements to Winter Park Drive, along with expanded trails and multi-use pathways, will enhance safety and connectivity within the resort and extend beyond to the broader regional trail network.

2 Old Town West

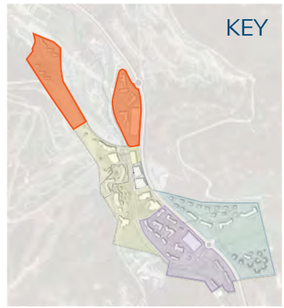
Key Elements: Positioned at the northwestern corner of the Plan Area and situated parallel to the train tracks on either side, this Sub-Area aims to provide accommodations and amenities with potential for direct connection to the Mountain, as well as integration into the culture of Old Town. Accommodations will be developed at an appropriate scale for the existing neighborhood. Existing natural vegetation buffers from existing neighborhoods will be retained.

Supporting Elements: Pedestrian and trail upgrades will enhance connectivity to the Winter Park Resort.

FIGURE 4.4 AREA C DETAIL



1 Old Town East
2 Old Town West
3 Roundabout B
4 Old Town Parking Garage



RETREAT (AREA D)

The Retreat Planning Neighborhood (Area D) lies to the east of US Highway 40 and will be accessed via the southern entrance of Winter Park Resort via the proposed vehicular roundabout. Thoughtful lower-density development plans involve utilizing the current surface parking lots while striving to minimize site disruption. This approach ensures that the charm and serenity of the site and its surrounding wetlands are preserved and cherished. The area boasts dense forestation and envelops a sizable wetland encircling Jim Creek. A key goal for the Retreat Planning Neighborhood is the conservation and enrichment of its natural open spaces for guests, locals, and nature lovers to enjoy. Existing ADA accessible trail system connections shall be maintained and enhanced.

The Retreat (Area D) is divided into Sub-Areas with Key Elements and Supporting Elements as outlined below:

1. **Retreat North**

   Key Elements: Connected directly to the rest of Winter Park Resort via the landmark pedestrian bridge over Highway 40, this Sub-Area becomes the natural connection between the Base Area and extensive natural habitat surrounding Jim Creek, the wetlands, trails, and mountains beyond. A collection of low and mid-density lodging and residential accommodations sit responsibly on the site, with associated amenities, natural parkscapes, and meandering publicly accessible trails for adventurers and tranquility seekers to enjoy.

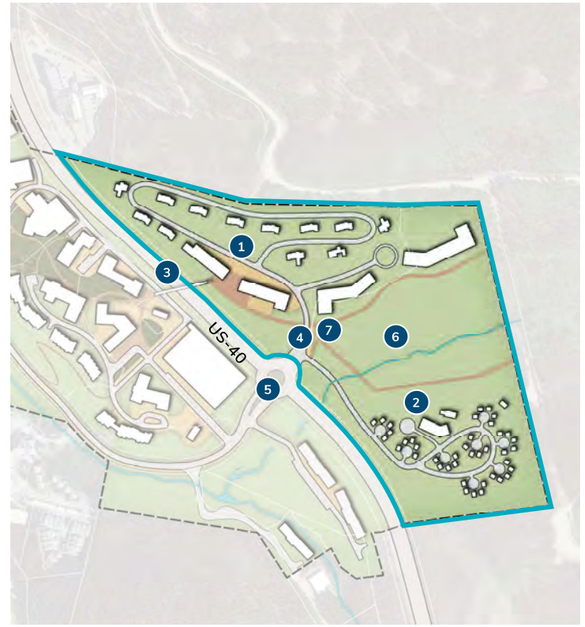
   Supporting Elements: Trail connections, pocket parks, event/wellness platforms, and celebrated natural habitats establish a meaningful relationship with the local ecosystem for all to enjoy.

2. **Retreat South**

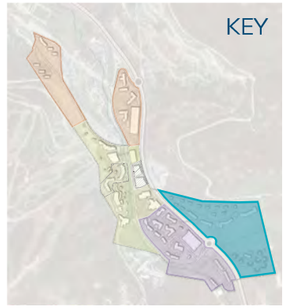
   Key Elements: Situated east of Highway 40 and south of the Jim Creek Wetlands, this Sub-Area is accessible via a proposed vehicular/pedestrian bridge spanning responsibly over the protected habitats. A collection of lower-density accommodations are situated responsibly on the site with associated amenities and gathering places to embrace the natural landscape.

   Supporting Elements: Meandering pedestrian paths and passive parks touch lightly on the natural landscape, offering minimal impact to the local habitat.

FIGURE 4.5 AREA D DETAIL



1. Retreat North
2. Retreat South
3. Multi-Use Bridge Connection
4. New Primary Street Access
5. Roundabout A
6. Jim Creek Wetlands
7. Jim Creek Accessible Trailhead



OPEN SPACE

The foundation of Winter Park Resort was based on providing visitors and nearby residents access to mountain activities, specifically winter sports and skiing, and celebrating the open space inherently provided by its location tucked into the Rocky Mountains, adjacent to the Fraser River and close proximity to Denver.

Since its opening day in 1940, that core value has not changed, but expanded to greater outdoor possibilities. Development in the Plan Area aims to enhance the existing site conditions, provide additional public gathering spaces for both small groups and large events, improve pedestrian, vehicular, and multi-modal circulation, restore habitat and ecological functions, and provide additional outdoor recreational opportunities for year-round activity.

Preservation of the natural open space is critical to protect the authentic mountain character and shall be protected. Where possible, each development shall look to preserve existing trees and vegetation and to develop on previously disturbed areas of land. The open space surrounding the developments shall not only support the use of the development through active programming, passive experiences, and interactive learning, but also act as the connective tissue for newly introduced landscape to integrate into the fabric of the surrounding natural open space.

OPEN SPACE BY PLANNING NEIGHBORHOOD

The PDP utilizes the UDC definition of Open Space (included in Appendix A-Terms and Definitions), which includes areas used for bufferyards, resource protection, outdoor recreation, and leisure areas with permeable ground surfaces, naturalized stormwater best management practices, and vegetative landscaping. Open Space must meet UDC standards to be counted towards minimum PDP Open Space requirements. Specifically, to meet the UDC definition, open space must have permeable surface.

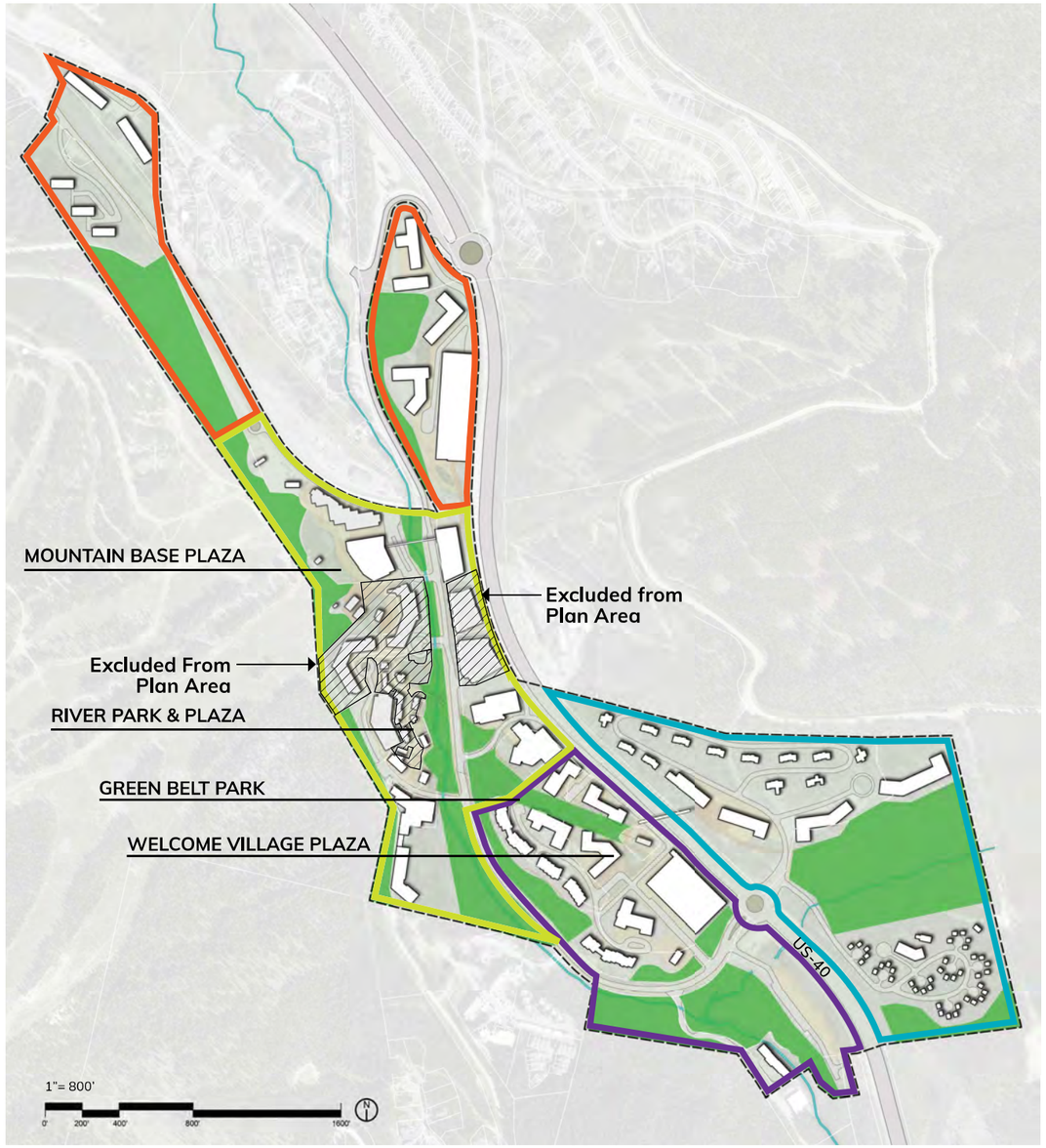
Individual development parcels are not subject to minimum open space requirements. However, at full buildout, the Plan Area shall include a minimum amount of Open Space within each Planning Neighborhood as identified in Table 4.2 Required Open Space by Planning Neighborhood.

Open Space areas shown in Figure 4.6 Open Space are conceptual and subject to change during the FDP process. Minimum amounts of Open Space shall be provided in FDP/MSP in conformance with the Open Space Standards in UDC Section 4-A-9.

TABLE 4.2 REQUIRED OPEN SPACE BY PLANNING NEIGHBORHOOD

	Resort Village	Welcome Village	Old Town	Retreat
Total Area (Acres)	36.8 ac	37.6 ac	36.6 ac	58.1 ac
Minimum % Open Space	10%	10%	10%	20%
Minimum Area (Acres) Open Space	3.68 ac	3.76 ac	3.66 ac	11.62 ac

FIGURE 4.6 OPEN SPACE



- Planning Neighborhood A - Resort Village
- Planning Neighborhood B - Welcome Village
- Planning Neighborhood C - Old Town
- Planning Neighborhood D - Retreat
- Open Space

Note: Open Space plan is for illustrative purposes only. Minimum amounts of Open Space shall be provided based on requirements in Table 4.2

PROGRAMMED AND PASSIVE PUBLIC SPACE

The PDP aims to create a comfortable and dynamic pedestrian and bicycle circulation network within the Plan Area supporting the vision of an outdoor recreation destination. In addition to sidewalks, this will primarily be accomplished through high quality and accessible public space connections to different areas through pathways, parks, and a robust trail network.

The Plan Area will include a mix of programmed space for both daily public use and special events, as well as passive space areas, which will protect and celebrate the alpine landscape as a shared resource. The balance between passive and programmed space will differ between Planning Neighborhoods. In general, the amount of area that will be programmed increases with proximity to active ground floor uses such as retail, food and beverage, and skier/visitor services.

Programmed Public Space is primarily focused on centralized, active areas adjacent to active recreation and retail uses, and includes areas where large, permitted events may be held. The programmed public space shall be a balance of hardscape and softscape that can support active activities. This may include sidewalks, plazas, turf lawns, seating areas, lighting, and areas for primary pedestrian circulation. Programmed public spaces shall be linked by a continuous pedestrian trail network, and include pedestrian connections to adjacent roadways, building parcels, and soft-surface trails within passive public spaces.

Passive Public Space is focused on creating protected areas for habitat and wildlife, promotes recreational uses such as walking, biking, and hiking, and helps advance fire mitigation practices. The passive public space shall be primarily softscape (trees and shrubs) with natural surface trails and/or areas that support the adjacent building uses. Passive public spaces shall also include natural areas for the reflection and enjoyment of the native surroundings. Vehicles shall be allowed to operate in passive space for performing infrastructure maintenance within areas pursuant to permitted Temporary Uses.

FIGURE 4.7 PROGRAMMED AND PASSIVE PUBLIC SPACE

SITEWIDE MOBILITY

Consistent with the Town Comp Plan goals, the PDP prioritizes the creation of diverse transportation options. The mobility framework described in this section aims to adequately serve the proposed land uses, while also improving current circulation and parking systems.

The concept plan will create a resort that is highly accessible to residents and visitors by train, bus, aerial transport, or bike, and allows drivers to park once and easily walk to all destinations. The proposed circulation and parking patterns will promote the pedestrian realm while serving day-to-day practicalities of service, parking access, and pickup/drop-off functions.

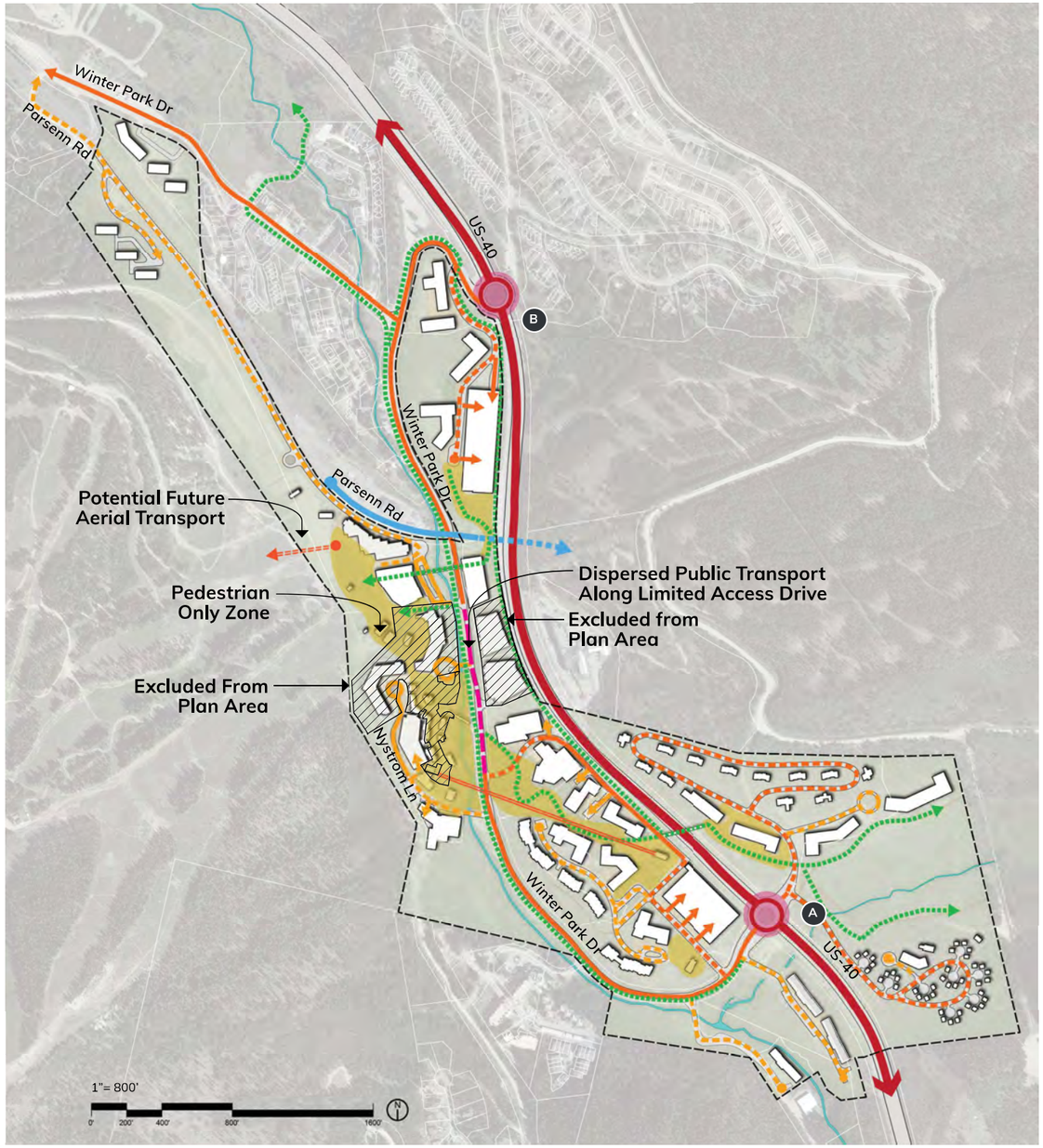
- **Proposed Primary Streets**
  As the Plan Area develops, additional collector streets will be needed for access, parking, and services for new facilities. These roads will extend from existing vehicular infrastructure (such as Winter Park Drive and US-40) to distribute traffic flow and improve primary site circulation.
- **Proposed Roundabouts and Highway US-40 Enhancements**
  Roundabouts at existing intersections on US-40 are proposed to improve circulation, reduce congestion, and allow for signature gateways to and from Winter Park Resort.
- **Fraser River Trail Extension**
  Serving as an important multi-use path for the Plan Area, the Fraser River Trail acts as an undisturbed connection point between the Plan Area and Downtown. It currently ends just short of the Mountain Base Area. This PDP envisions a formal extension of the trail through the development and across US-40 to connect with the Jim Creek area trail network.
- **Pedestrian Zones**
  Various areas of the development embrace pedestrian centric zones - dense, highly walkable areas with bicycle dismounts and no vehicle access. These environments contribute to a safe, intimate and highly connected public realm for guests.
- **Accessibility**
  The PDP aims to maintain existing and expand accessible routes and elements throughout the Plan Area.

WINTER PARK MOBILITY STUDY

The Winter Park Mobility Study (Appendix F) documents potential transportation-related impacts to the surrounding multi-modal network from proposed development in the Plan Area. The Mobility Study considers existing conditions, future adjacent forecasted conditions (beyond the Plan Area and Winter Park Resort), and proposed future Winter Park Resort conditions in its evaluation.

Points of access/ingress/egress, multi-modal circulatory routes, and parking in and around the site are analyzed with regard to existing conditions and performance, as well as future potential conditions and performance. The street network as shown in Figure 4.9 Vehicular Circulation, including the proposed roundabouts at the intersections on US-40, was the basis for the analysis in the Mobility Study. The Mobility Study informed the assumptions for the design of the roundabouts to ensure the highest level of service possible.

FIGURE 4.8 OVERALL SITE MOBILITY



ROAD NETWORK

Intersections from US-40 will be the primary access points for the Plan Area. The placement of multiple roundabouts at both existing and newly proposed access points along US-40 will help slow traffic, provide a safer driving and pedestrian condition, and promote an improved arrival experience to Winter Park Resort.

The road network shows a combination of public and private road rights-of-way. Winter Park Drive, which will retain its current alignment, will remain within the public ROW. The major enhancements to Winter Park Drive will occur between the Village Corridor and Base Area - further slowing the flow of traffic and devoting more protected space to pedestrians and bicycles. As shown in the proposed street cross sections (Figure 4.15 & 4.16 Winter Park Drive Typical Street Sections), Winter Park Drive will be reconfigured to provide a linear transit 'flex lane' , minimum vehicular travel lanes, and a widened pedestrian/bicycle zone within the existing public ROW width. New private roads within the Plan Area will improve circulation and connect both existing and future developments.

VEHICLE ACCESS, INGRESS / EGRESS

- Two new roundabouts at the existing intersections along US-40 facilitate traffic flow and increase resort access.
- Winter Park Drive will continue to have controlled access gates through the Plan Area to limit personal vehicle through-traffic and improve safety in the public realm.
- Improved drop-off at the Base Area expands access and connection.

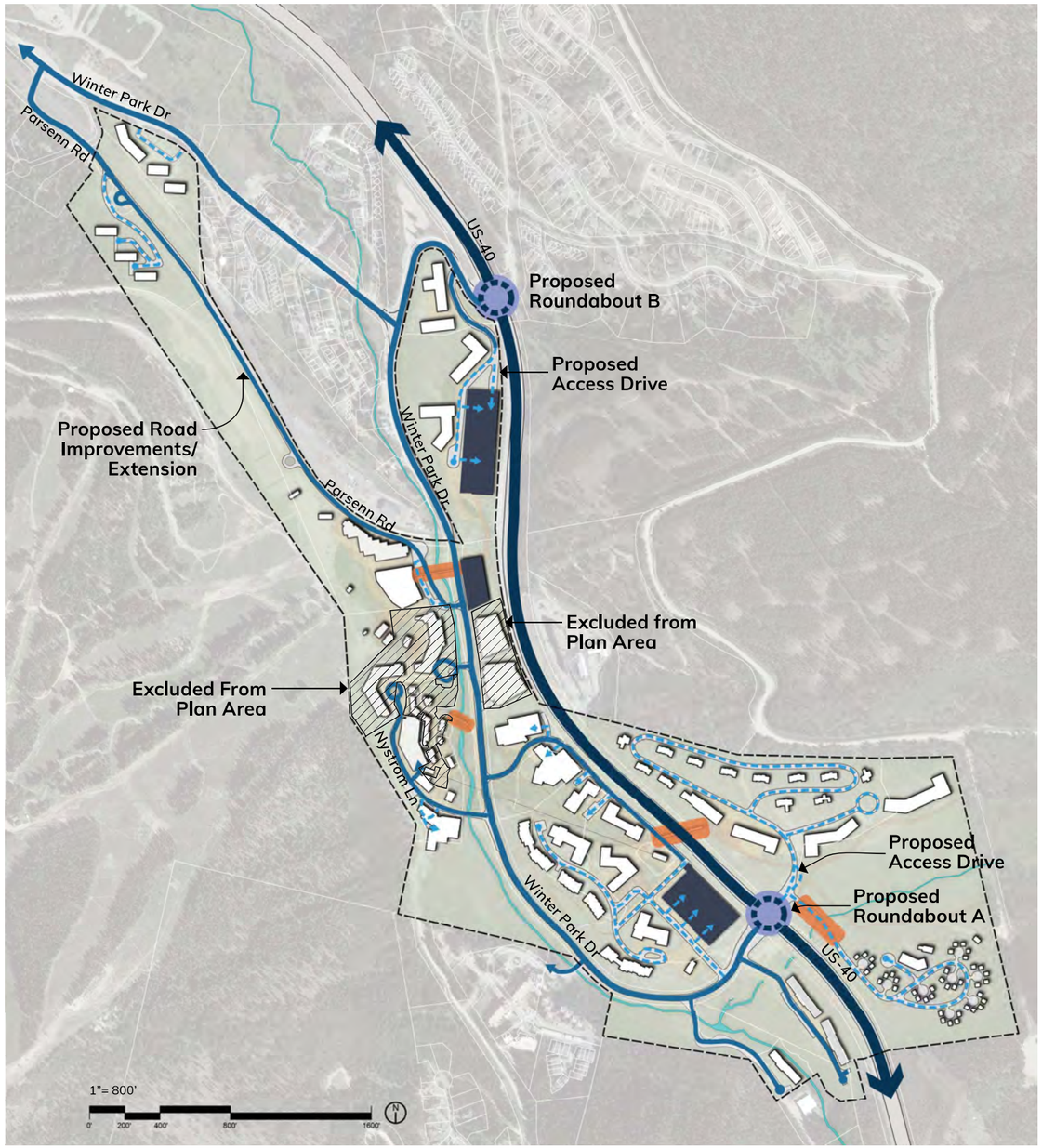
CIRCULATION

- Universal roadway enhancements throughout the Plan Area.
- New private streets established within individual Planning Neighborhoods connect new developments and parking.
- Formal extension of Parsenn Rd. and improvements to connect Parsenn Rd. to Winter Park Dr.

ROAD MAINTENANCE

- Highway US-40 and future adjoining roundabouts are to be maintained and serviced by the Colorado Department of Transportation (CDOT).
- Winter Park Drive, a public ROW, is and will continue to be maintained by the Town.
- Maintenance of all circulatory private roads, access drives and parking lots/structures shall be addressed by Winter Park Resort on behalf of the WPRA.
- Private parking stalls, driveways and access points associated with independent developments within the Plan Area shall be maintained by the owner or operator of each individual property.

FIGURE 4.9 VEHICULAR CIRCULATION



PUBLIC AND PRIVATE ROADWAYS

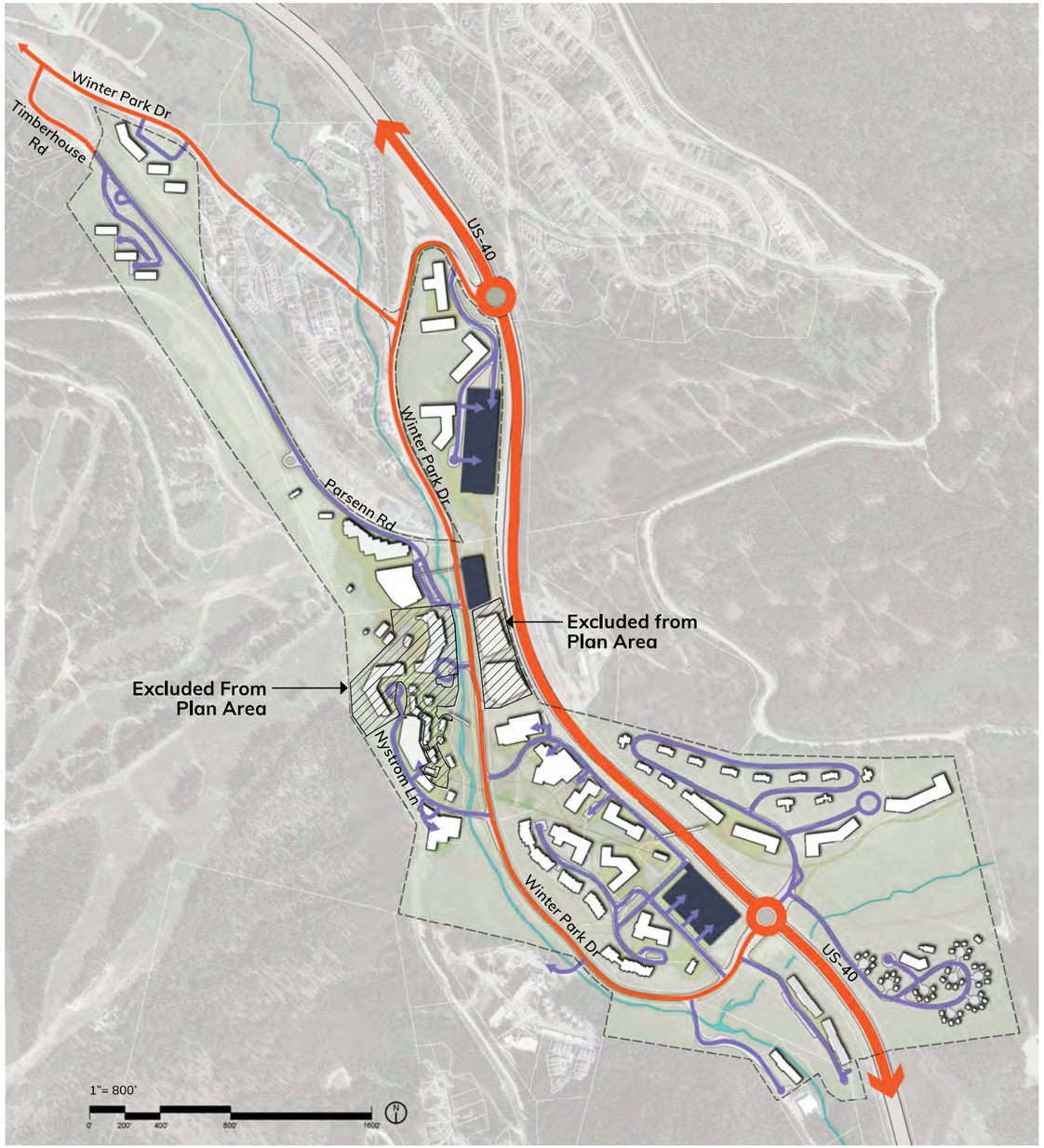
The public and private road network will be enhanced to improve access throughout the Plan Area.

Highway US-40 will remain under the jurisdiction of CDOT. Winter Park Drive, Old Town Drive, and the existing segment of Timber House Road will remain under the jurisdiction of the Town.

All other existing and proposed new roads will be owned, operated, and maintained by either a project Metro District, Owner's Association, or other private ownership. Easements will be dedicated as needed to allow for public access through the preliminary and final plat process.

Identification of roads as public or private roadways is subject to change will be finalized with FDP submittals.

FIGURE 4.10 PUBLIC AND PRIVATE ROADWAYS



Public Roadways

Metro District, Owner's Association or other Privately Owned and Maintained Roadways

PARKING STRATEGY

The PDP envisions a strategic parking approach that improves parking opportunities through the use of both public and private parking garages distributed across the Plan Area. The intent is to increase parking capacity while better connecting guests with resort functions and limiting vehicular traffic within the Plan Area.

The approach includes public parking structures, off-street parking spaces, private parking areas per individual development, and a limited number of surface lots to support short-term parking.

Parking for Winter Park Resort day-use and public visitors will primarily be accommodated by two structured garages, located near the north and south ends of the Plan Area respectively, with access from the new roundabouts on Highway 40 for ease of arrival. The intent is to provide abundant, accessible, and readily available areas for guests to quickly park and enter the Winter Park Resort. These garages will for the most part replace surface parking displaced by future development.

At full build-out, the parking within individual site developments will need to meet parking requirements, as identified in PDP Chapter 7 - Development Standards, and may be located under buildings, in associated parking structures, or surface lots, as applicable.

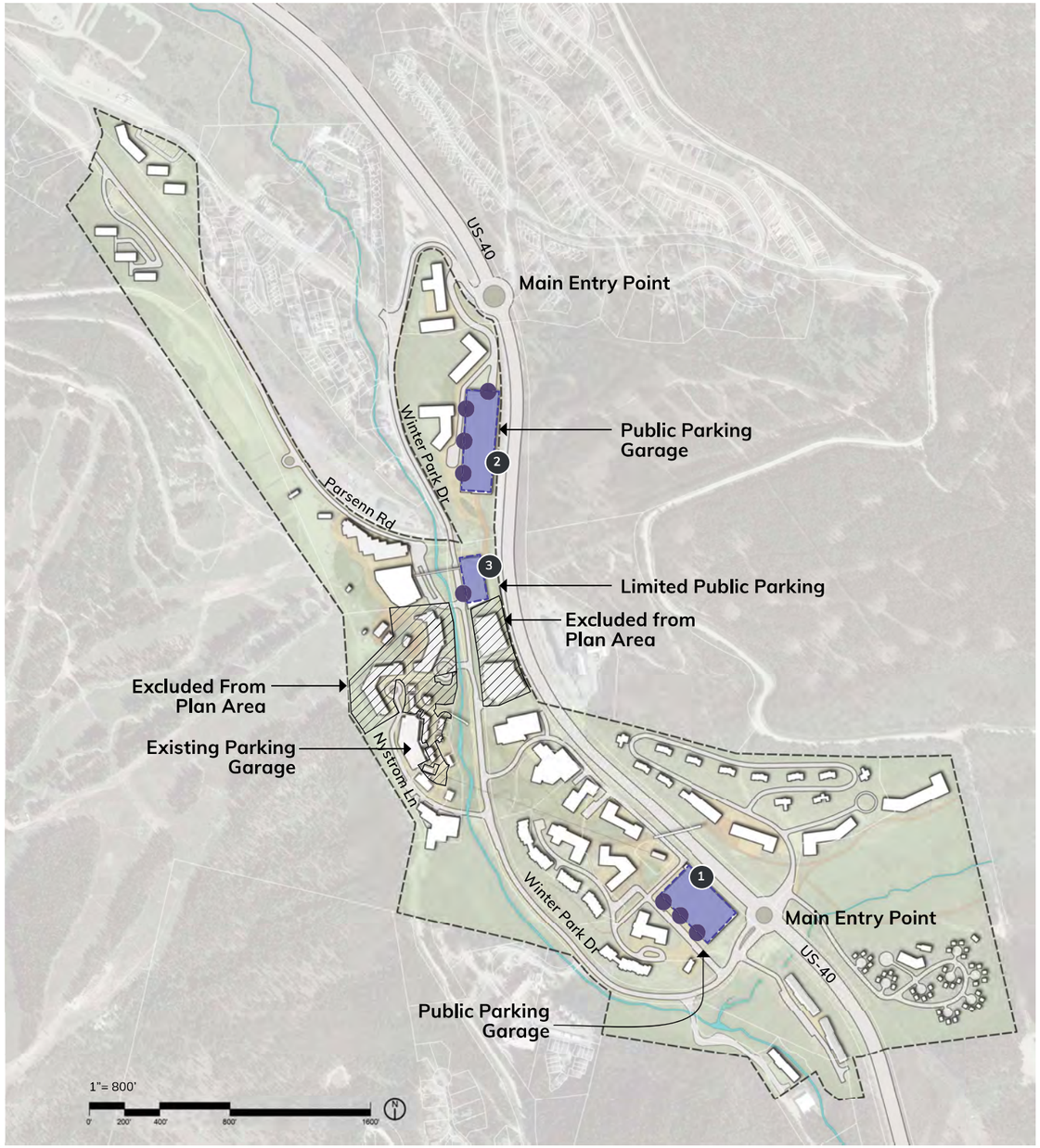
TRANSPORTATION DEMAND MANAGEMENT AND SHARED PARKING ZONES

Transportation demand strategies for reducing vehicle trips are based on the destination resort and mixed-use concept of the visitor "parking once" and leaving the vehicle behind, or arriving by transit or other means, to enter a pedestrian dominant environment. Internal capture of trips within the development due to the adjacency of a mix of uses and improvements supporting pedestrian mobility reduces the total number of vehicle trips and resultant demand for parking. The shared parking strategy for the development allows for parking to be shared between different land uses resulting in a lower demand for parking than if parking was provided for individual land uses.

SNOW STORAGE AND REMOVAL

Appropriate snow removal and storage locations shall be provided for all parking areas/structures and associated driving surfaces within the Plan Area. Storage and removal practices shall comply with the Town UDC Section 3-H-5-A Parking Design Standards / Snow Storage.

FIGURE 4.11 PARKING APPROACH



TRANSIT

Providing an extensive and convenient public transportation network with both local and regional transit options is an integral part of the PDP vision. An enhanced network of shuttles/buses and rail works to build a more accessible, connected and sustainable future for the Plan Area.

The Applicant, in conjunction with the Town, shall ensure that adequate public transportation (mass transit) options are provided for guests and residents of the area. These transit routes shall connect throughout the various Planning Neighborhoods, parking facilities, and main resort destinations. It is essential that any new transit options work in close collaboration with existing transportation routes to most efficiently and effectively serve the Plan Area. The transportation network shall operate in full capacity during peak season(s) and may additionally operate on a situational basis during special events and other times deemed necessary by Winter Park Resort.

WINTER PARK TRANSIT SYSTEM - THE LIFT

The PDP will maintain existing transit routes that connect the Winter Park Resort area, neighboring properties, and Downtown. Additional stops or alterations may be considered to existing transit routes in order to service future developments. Currently, the Old Town West Plan Area is not well-served by existing transit routes. It will be considered as a location to be served by a possible future transit route and corresponding stop in conjunction with the formal extension of Parsenn Road. All requested changes or additions/alterations to any local transit lines must be reviewed, approved, and implemented by the Winter Park Transit Department, with additional supervision provided by the town Transit Advisory Committee (TAC).

RESORT SHUTTLE

A local shuttle, circulating guests between public parking accommodations and the Base Area, may be considered as an asset to better connect Winter Park Resort and minimize walking distance for guests.

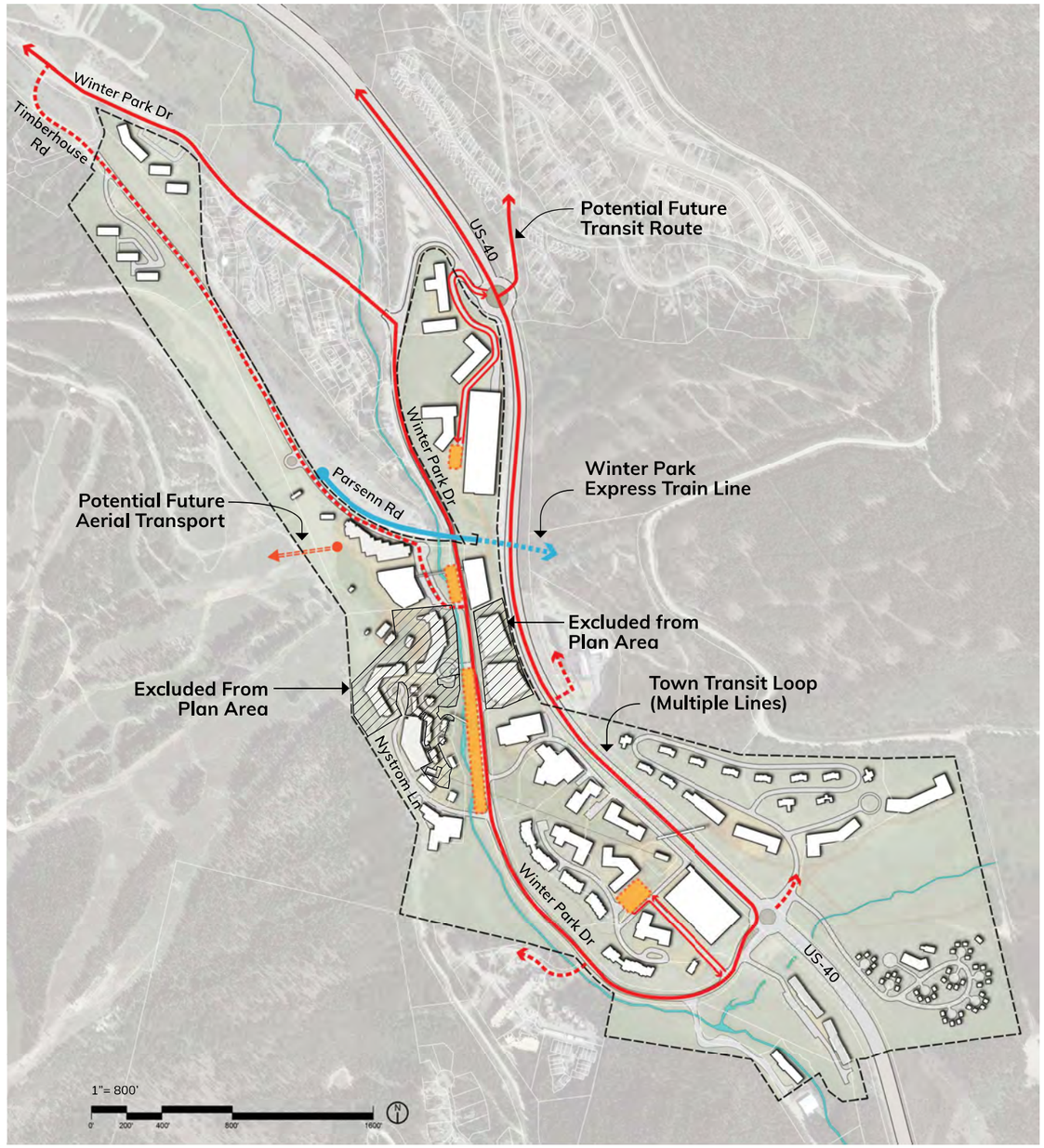
WINTER PARK EXPRESS - AMTRAK

Amtrak provides rail services to Winter Park Resort as part of the Amtrak Winter Park Express, operating from January through the end of March. With a station located just north of the Base Area along Parsenn Rd., this train provides an efficient and uninterrupted transit alternative from Denver to the Base Area's front doorstep. Future improvements to this station area may be considered to help increase train staging capacity, bolster platform infrastructure and loading conditions, and expand this unique entry portal and transit option for the Winter Park Resort. Coordination with Amtrak, Union Pacific Railroad, and all other associated rail entities will be necessary in the progression of this effort.

AERIAL TRANSPORT SYSTEM

A potential aerial transport system would connect the Base Area and Downtown, providing a new means of public access to Winter Park Resort.

FIGURE 4.12 TRANSIT CIRCULATION



The Lift Bus Lines
Potential Transit Route
Winter Park Express (Amtrak) Railroad Line
Potential Primary Public Transit Pick-Up/Drop-Off Area
Potential Aerial Transport

PEDESTRIAN & BICYCLE MOBILITY

A planned mixture of pedestrian pathways, protected and shared bicycle lanes, and an extensive multi-use trail network creates a safe, interconnected pedestrian and bicycle-centric environment throughout the Plan Area.

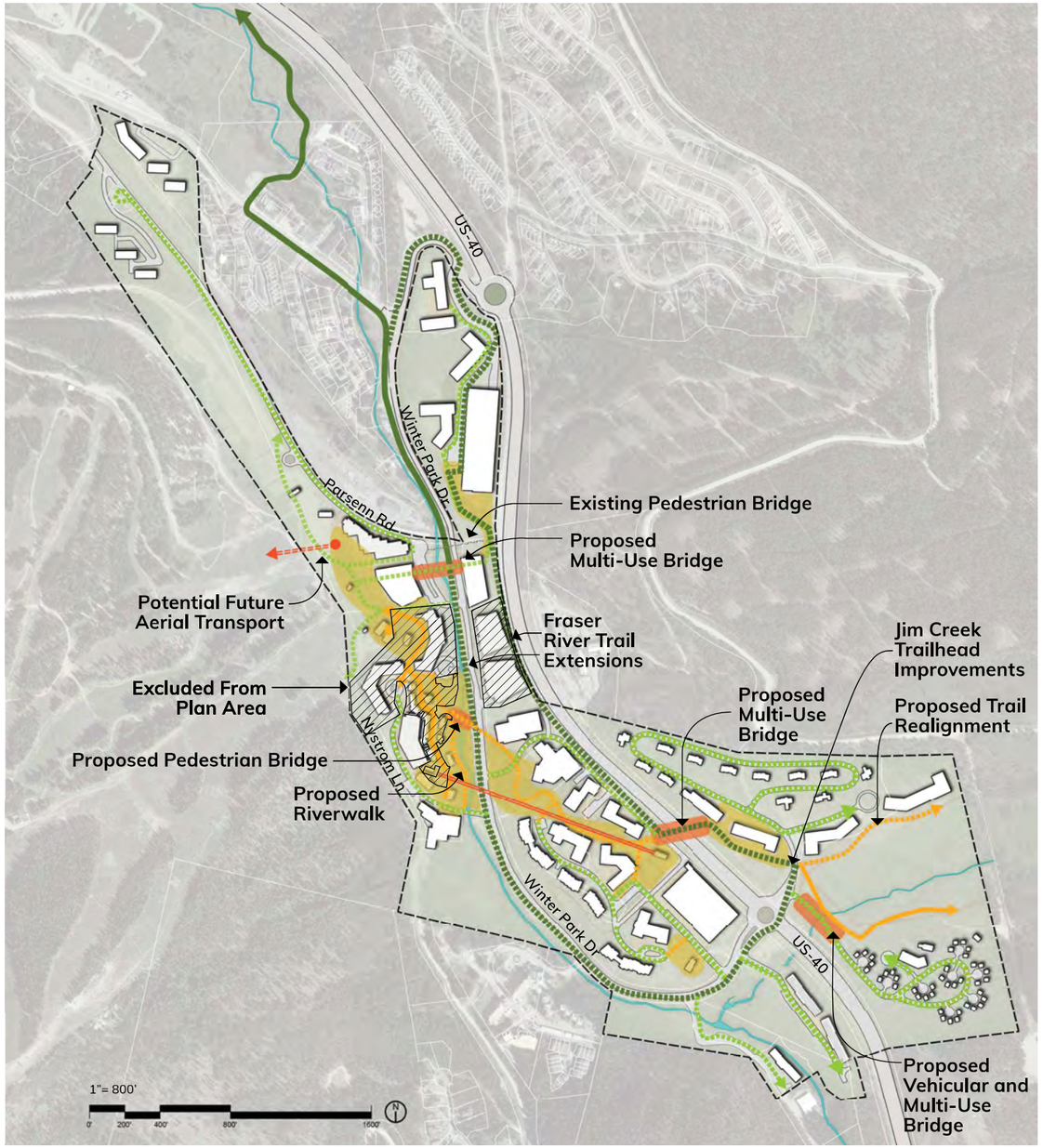
Improvements to existing paths and trails join multiple new pedestrian and bicycle connections into the Plan Area. Important access points and extensions to the Fraser River Trail network improve connections between Winter Park Resort and Downtown. A formal, protected pedestrian and bike trail over US-40 provides access to surrounding open space and trail networks and establishes a necessary link to the future Retreat Planning Neighborhood.

1. Mobility & Circulation
This PDP prioritizes increasing the vibrancy and accessibility of the public realm. An improvement to existing pedestrian and bicycle infrastructure will support circulation in a convenient and enjoyable manner for guests. In addition, an expansion of such infrastructure will continue to advance mobility options and discourage a car-centric environment. It is essential that all future developments prioritize pedestrian mobility and circulation in an effort to promote a healthy and vibrant public realm.

2. Proposed Pedestrian Bridges
As illustrated in Figure 4.12 Pedestrian & Bicycle Mobility, multiple proposed pedestrian and multi-use, which are shared for pedestrians and bicycles, bridges will improve connections between Planning Neighborhoods and individual developments, providing undisturbed, continuous paths of travel throughout the Plan Area. Bridges crossing Winter Park Drive and US-40 will promote a safer circulation pattern that improves the walkability in and between various Planning Neighborhoods. New and improved bridges as part of the River Park bring guests closer to the Fraser River, while improving walkability within the Resort Village Planning Neighborhood.

3. Connect with the Fraser River Trail
A new vehicular and multi-use bridge in the Retreat Planning Neighborhood will provide access across Jim Creek. Extensions to the Fraser River Trail through the Plan Area are proposed to enhance connections from the Winter Park Resort to Downtown and provide a through connection from the Jim Creek trailhead to the Fraser River Trail. One route will include a trail next to the Fraser River and a multi-use path adjacent to the Winter Park vehicular right-of-way. A second trail route will run parallel to US-40 within the boundaries of

FIGURE 4.13 PEDESTRIAN & BICYCLE MOBILITY



TRAILS

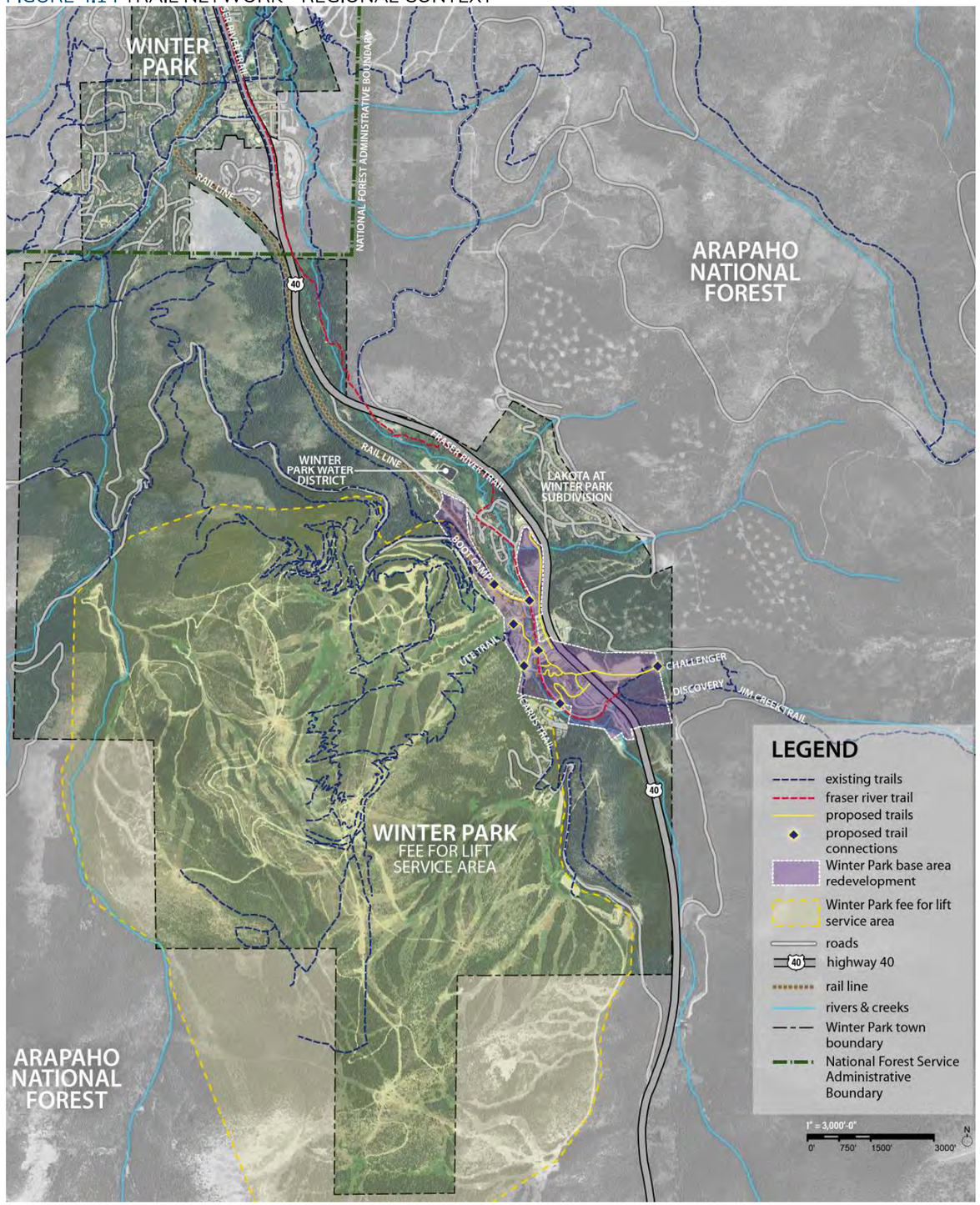
The trail network shows general location rather than exact alignments. The intent of the trail network is to provide a cohesive system of trails to connect to, from, and through the Plan Area. An extension of the Fraser River Trail will provide the backbone for the trail network. Improvements to this regional connection should be considered high-priority. Trail connections to adjacent developments should spur from the Fraser River Trail.

Multi-use trails for walking, biking, and hiking should be incorporated where possible. Existing trailheads in the Jim Creek area will be improved as part of this project.

General Trail Considerations:

- Trail locations shall avoid trail-user conflicts with adjacent land users, steep slopes, wetland setback requirements, wildlife movement/mitigation corridors and other key wildlife habitats or any other environmental constraints
- Trails shall minimize the number of driveway and road crossings
- Alternate pedestrian and trail routes shall be provided when existing trails are impacted by construction
- Trails shall be designed in a manner that take advantage of natural, existing vegetation to buffer the trails from development and mitigate any safety hazards
- Provide clear signage for directional and safety purposes
- Trails should slope to drain
- Maximum cross slope shall be 2%; Maximum slope in direction of travel should not exceed 10%; however, 5-10% is optimal
- Trails should follow best practices set forth by the Town for design and layout

FIGURE 4.14 TRAIL NETWORK - REGIONAL CONTEXT

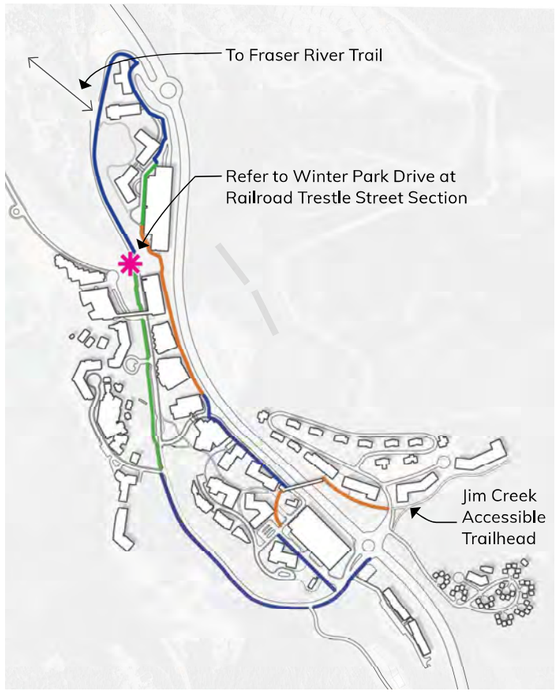


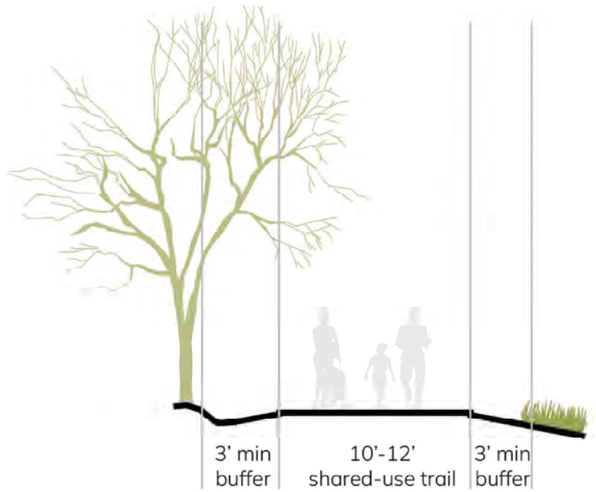
MULTI-USE PATHS & TRAILS

The trails proposed in the PDP aim to improve connectivity of the pedestrian and cyclist realm through Winter Park Resort and to better connect Old Town to the Jim Creek trail system in the Retreat Planning Neighborhood. A two-pronged approach is proposed - a curb separated mixed-use trail that follows the Winter Park Drive right-of-way and a 'Village Bypass Trail' trail route which parallels Highway US-40.

The following diagrams provide conceptual guidelines for multi-use paths and trails throughout the Plan Area. Final trail layout shall adhere to the minimum dimensions shown wherever possible, but deviations from typical sections shown may be acceptable provided that a continuous and safe route is maintained.

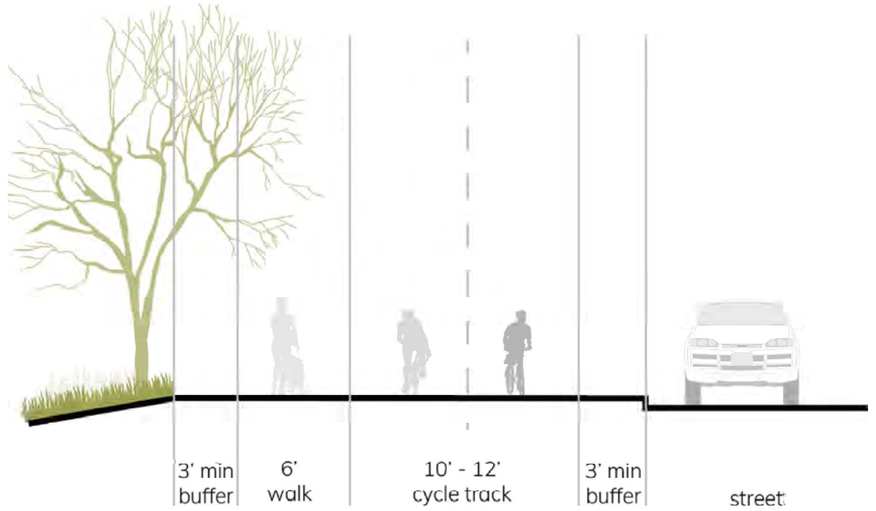
FIGURE 4.15 MULTI-USE PATHS & TRAILS - TYPICAL SECTIONS





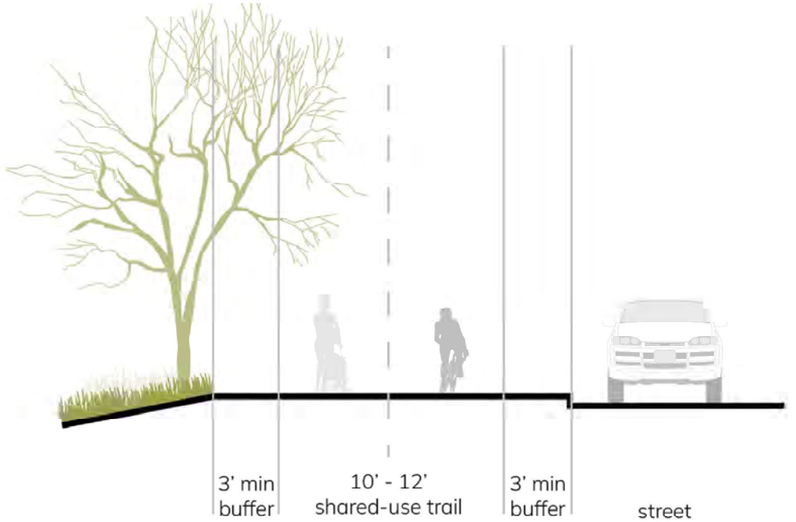
MULTI-USE TRAIL - TYPICAL

0' 2.5' 5' 10'



MULTI-USE TRAIL ALONG STREET - IDEAL

0' 2.5' 5' 10'



MULTI-USE TRAIL ALONG STREET - MINIMUM

0' 2.5' 5' 10'

STREET SECTIONS

COMPREHENSIVE MOBILITY NETWORK

Today, visitors to Winter Park arriving by bus or shuttle are all dropped off at the end of the existing village at the transit turnaround. With the expansion of hospitality, dining, and other program offerings at other areas of the site, full buildout will require a more dispersed transit network rather than one centralized location. Additionally, the existing transit turnaround prevents expansion of the village and limits opportunities to restore the Fraser River. Therefore, the PDP proposes reconfiguring the transit network throughout the Plan Area.

An improved drop-off along Winter Park Drive at the Mountain Base will bring people to the Base Area and potential Mountain-to-Downtown Aerial transport system. A shuttle loop could bring visitors across the Plan Area and improve circulation and the overall visitor experience. Although the turnaround plaza is vehicular, it should cater to the pedestrian experience and safety. The material and character should extend towards the Base Area to connect the plaza and drop-off areas.

WINTER PARK DRIVE

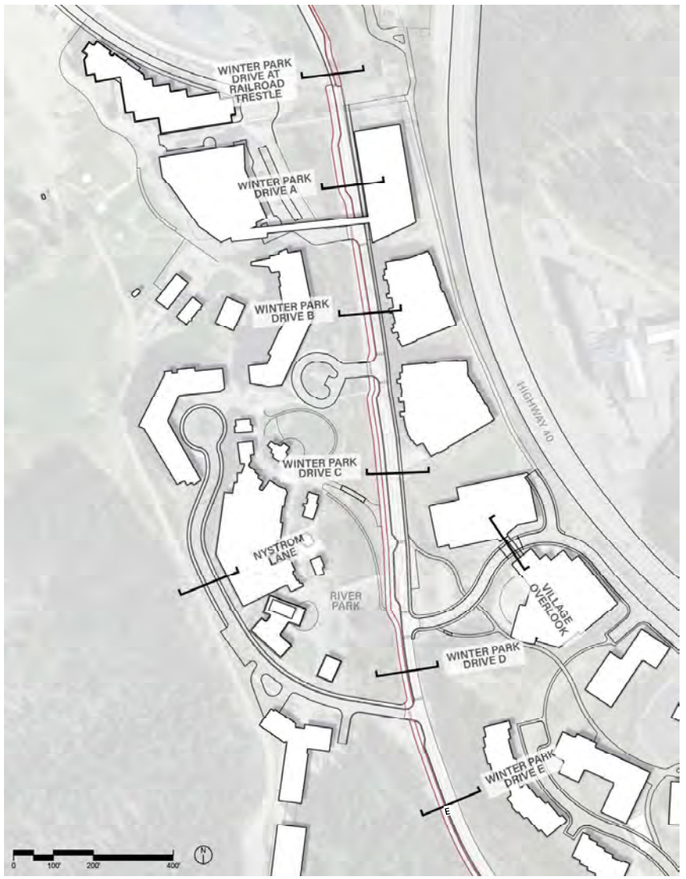
Proposed improvements to Winter Park Drive are intended to improve pedestrian and bike access, transit circulations, and pick-up / drop-off throughout the plan area. Dedicated transit stops in a 'flex' lane along Winter Park Drive will provide spaces for bus and shuttle drop off. Passenger vehicle traffic through the resort will continue to be controlled during peak hours. Sidewalks and waiting areas should be pedestrian-friendly and consider crowd circulation, bus queuing, and comfort. The transit lane will be flexible to allow for reduced summer operations and special event closures/street activations with the adjacent River Park area. The attached sidewalk along the Fraser River will be widened as much as possible to accommodate a multi-use trail for pedestrians and bikes as well as transit stop infrastructure.

The current right-of-way for the majority of Winter Park Drive within the development is 60'-0". The existing roadway width for the majority is 35'-0" wide. A section of the existing roadway between Zephyr Way and Parry Peak Way is narrower at 26'-0" wide. To improve pedestrian and cyclist circulation and safety, drive lanes on Winter Park Drive shall be reduced to 12' width when adjacent to curb (or 11' for interior lanes). This will reduce the pedestrian crossing distance and help calm traffic. At crosswalks, breaks or 'bumpouts' in the transit flex lane should be provided to further increase pedestrian safety. Feasibility of on-street parking along the roadway to the south will be further evaluated in the FDP.

Improvements to Winter Park Drive generally begin at the easternmost existing curb line, in order to not disrupt loading and access infrastructure for existing buildings. Should improvements or modifications need to be made to the eastern sidewalk, coordination will be required with existing property owners to maintain access and functionality. At the constrained portion of the roadway just south of the railroad bridge, the centerline of the roadway travel lines may be shifted or 'chicaned' in order to accommodate a transit stop near the Base Area. The intention is to keep Winter Park Drive as two-way, with potential signalization of a single alternating one-way lane under the railroad trestle bridge, to make room for a curb separated multi-use trail.

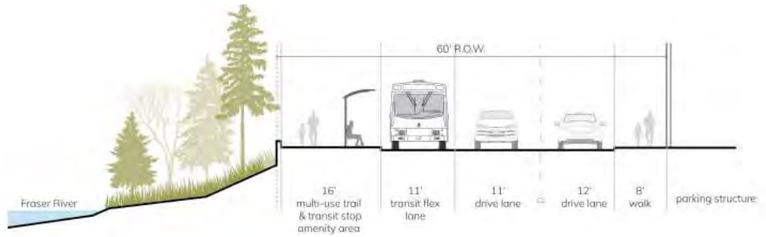
This plan is conceptual in nature and subject to future alterations as design is advanced and subsequent FDPs are submitted.

RESORT VILLAGE STREETS AND WINTER PARK DRIVE

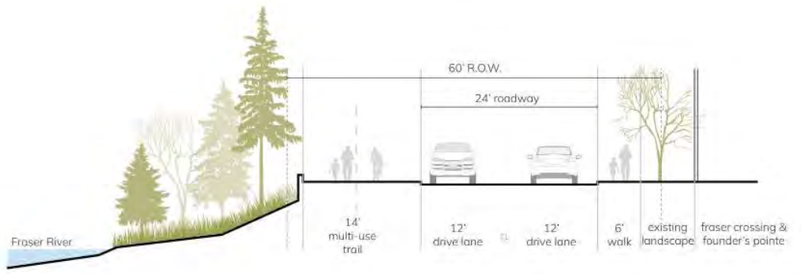


N.T.S.

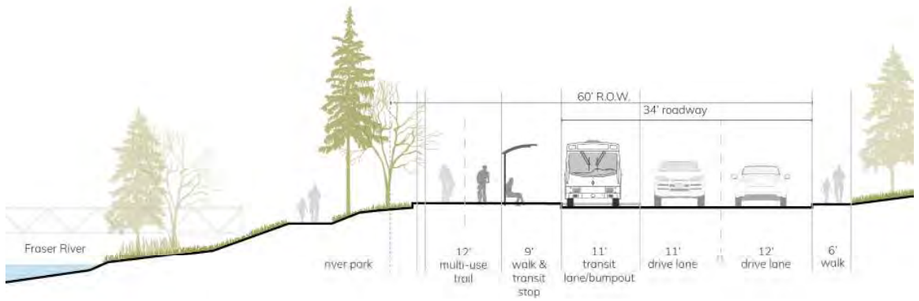
FIGURE 4.16 WINTER PARK DRIVE - TYPICAL STREET SECTIONS



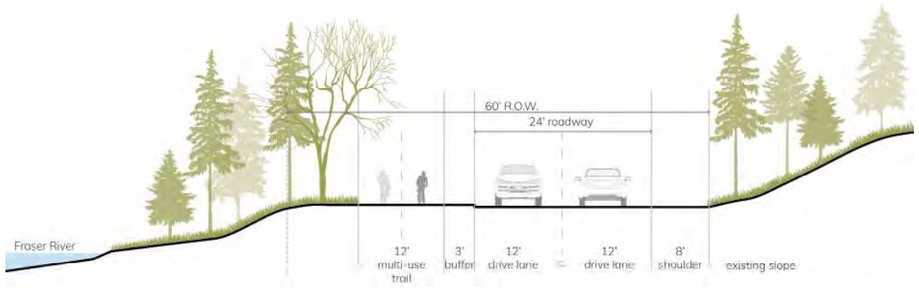
WINTER PARK DRIVE: SECTION A



WINTER PARK DRIVE: SECTION B

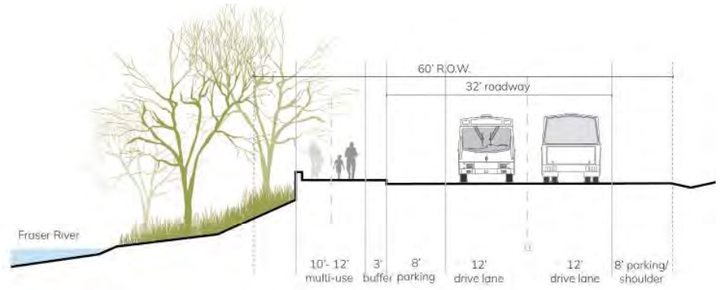


WINTER PARK DRIVE: SECTION C

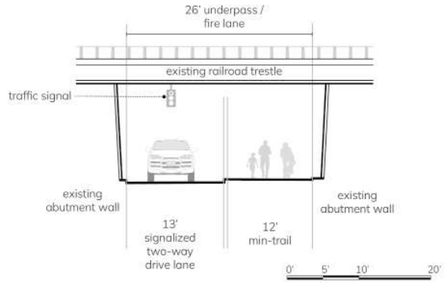


WINTER PARK DRIVE: SECTION D

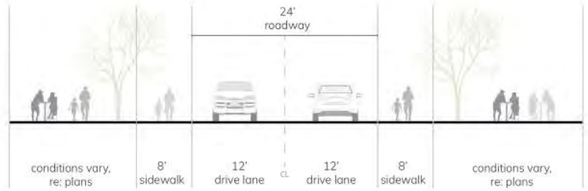
FIGURE 4.17 WINTER PARK DRIVE & RESORT VILLAGE STREETS - TYPICAL STREET SECTIONS



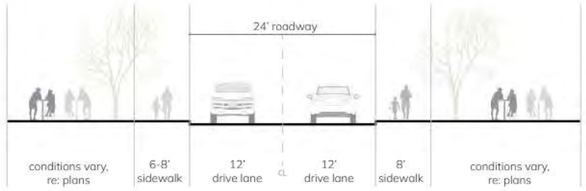
WINTER PARK DRIVE: SECTION E



WINTER PARK DRIVE: AT RAILROAD TRESTLE



VILLAGE OVERLOOK SECTION



NYSTROM LANE SECTION

PRIMARY PRIVATE STREETS - WELCOME VILLAGE AND OLD TOWN

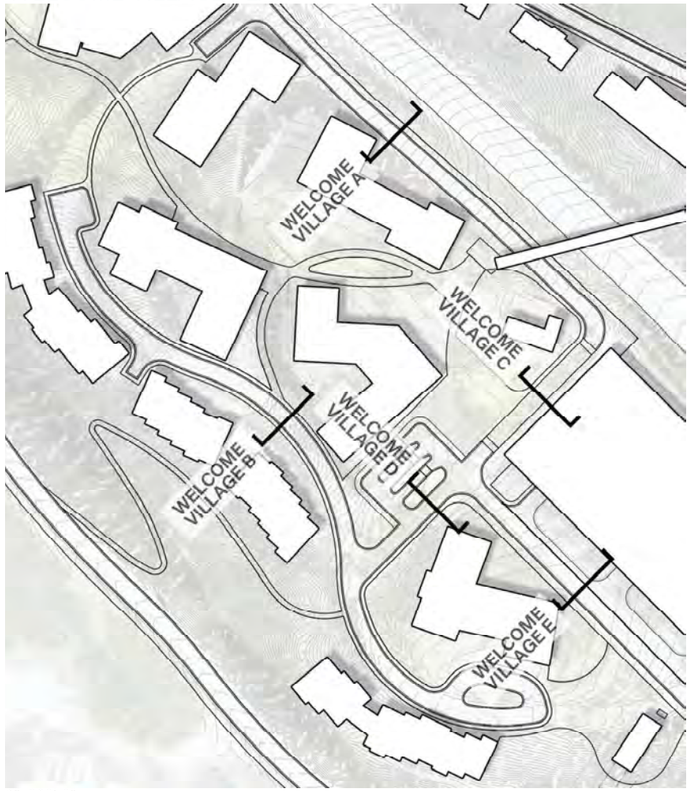
The streets that are not Town right-of-way roads shall be designed for improved vehicular and pedestrian circulation. These private roadways will be the backbones for adjacent development within their respective Planning Neighborhoods. Depending on the adjacent use, the roadway profile may change to include parking, loading, bike lanes, and/or expanded sidewalks or promenades.

The desire is to create a pedestrian friendly streetscape for street activation and to provide improved pedestrian circulation. There are multiple ways to accomplish this including (but not limited to) narrowing drive lane widths and/or parking stall dimensions, creating curbless roadways, increasing the sidewalk widths, and/or creating a tree lined promenade. Street sections are shown for design intent and final roadway design and engineering will be completed as part of the FDP.

*Actual design and dimensions of the cross sections may vary based on needs of the adjacent use, snow storage and removal, grading restriction and possible unforeseen conditions. These plans are conceptual in nature and are subject to future alterations with future analysis during the FDP process.

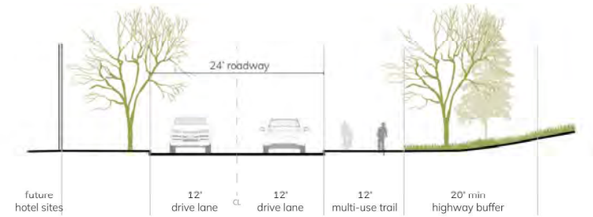
WELCOME VILLAGE PLAN

N.T.S.

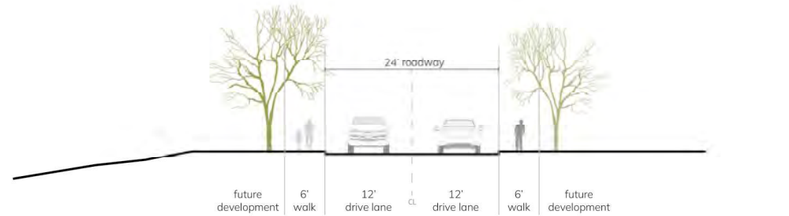


1"=200'-0"

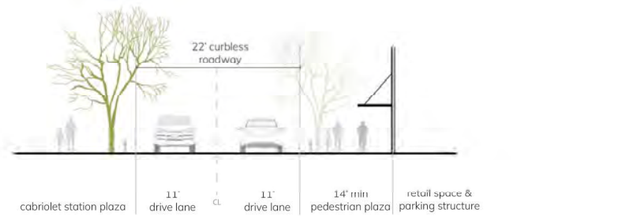
FIGURE 4.17 PRIMARY PRIVATE STREETS - TYPICAL STREET SECTIONS



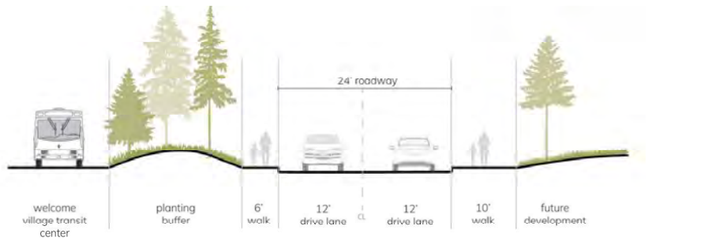
WELCOME VILLAGE: SECTION A



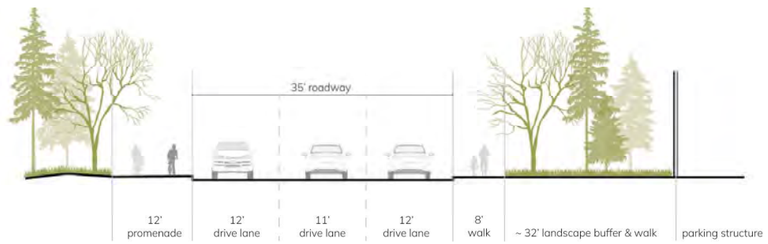
WELCOME VILLAGE: SECTION B



WELCOME VILLAGE: SECTION C

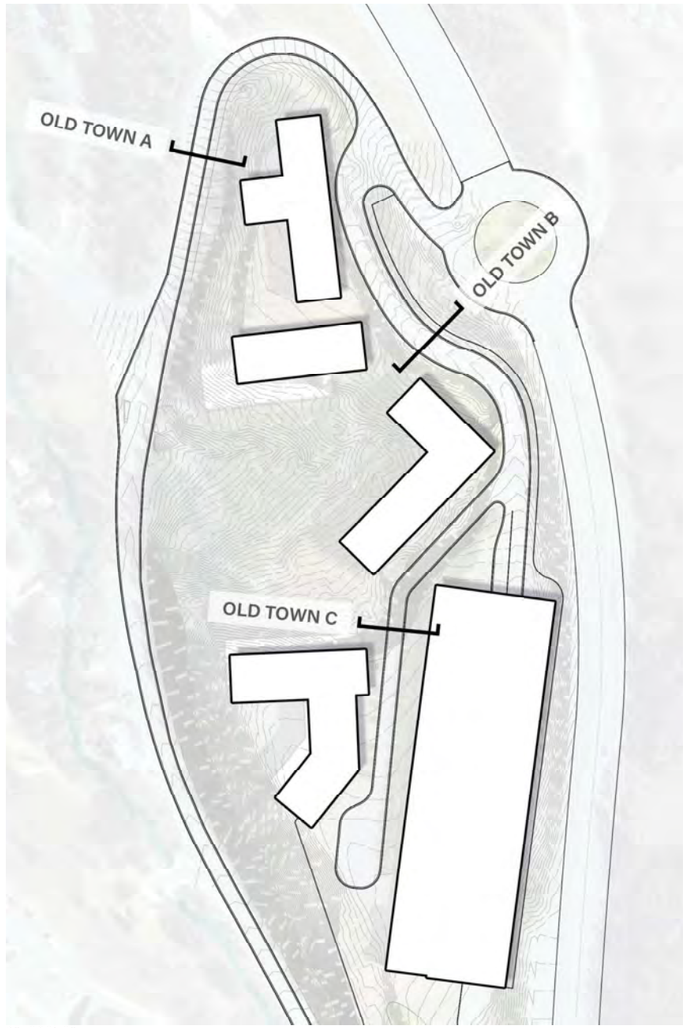


WELCOME VILLAGE: SECTION D



WELCOME VILLAGE: SECTION E

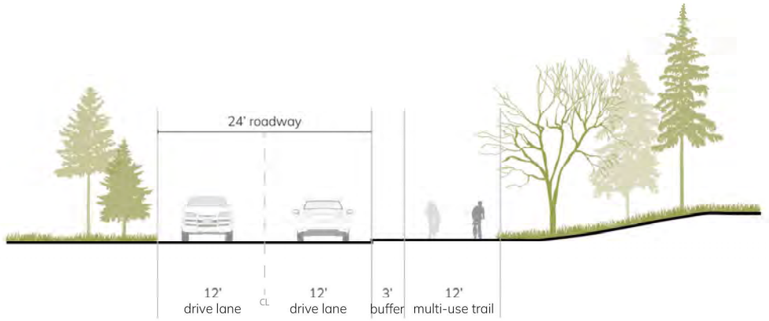
OLD TOWN PLAN



N.T.S.

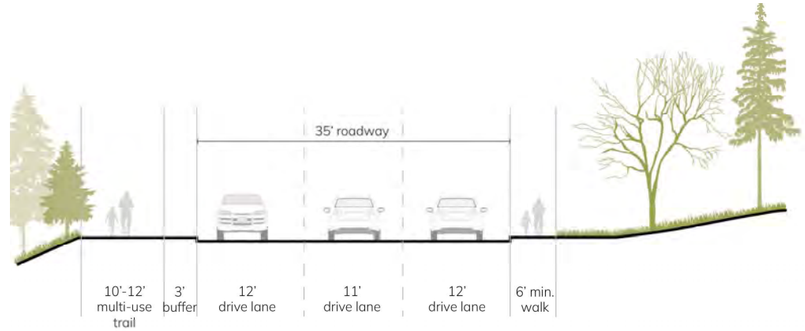
1"=200'-0"

FIGURE 4.19 PRIMARY PRIVATE STREETS - TYPICAL STREET SECTIONS



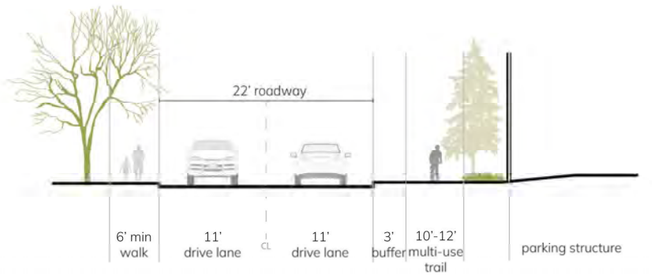
OLD TOWN: SECTION A

0' 5' 10' 20'



OLD TOWN: SECTION B

0' 5' 10' 20'



OLD TOWN: SECTION C

0' 5' 10' 20'

5. INFRASTRUCTURE & RESOURCE MANAGEMENT

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GRADING

Slopes greater than 20% have been identified in the Plan Area. Within the areas to be developed, the design team will identify areas requiring mitigation such as walls, building steps, and slope stabilization in order to maximize the development potential.

DEVELOPMENT CRITERIA

Building on continuous slopes over 30% is avoided where possible, particularly along the mountain side and on significant continuous slopes along the east side of Winter Park Drive. Any development of utility lines, walkways, roads, etc. that must occur in these areas will be carefully analyzed, sited, and stabilized. Clearing and drainage will be managed to minimize visual scars, erosion, and ecological disturbance. Proposed modifications to UDC sections related to development on steep slopes and retaining walls are included in the Development Standards - Site and Building Design section of the PDP and will be evaluated in further detail in subsequent FDPs.

LANDSCAPE CONCEPT

Over the years, the Plan Area has been subject to significant modification including the construction of the Moffat Tunnel, development of roads, surface parking lots, and additional supportive infrastructure. As a result, much of the natural environment within the Plan Area has already been disturbed. Proposed development within the Plan Area will feature a natural landscape and limit disturbance or grading as much as possible to accommodate trails, utility lines, and roads that are close to the existing grade.

The UDC Hillside Review process and PDP standards intend to reduce disturbance on slopes that are predominantly 30% or greater and in areas that have not been previously disturbed or modified. Therefore, the PDP permits development on slopes greater than 20% in the Resort Village and Welcome Village Planning Neighborhoods. Development on predominant slopes greater than 30% will be limited and is subject to the UDC Hillside Review process as described in UDC Section 3-C-2-2 for slopes greater than 20% in the Old Town West and Retreat Planning Neighborhoods as well as the areas along the eastern edge of Winter Park Drive highlighted in Figure 5.1 Areas of 20% and Greater Slopes.

Hillside Review will ensure that the UDC intent to limit substantial disturbance to natural hillsides is met while permitting minor encroachments deemed reasonable and necessary to meet the intent of the PDP.

FIGURE 5.1 AREAS OF 20% (OR GREATER) SLOPE

20% Slope to < 30% Slope
30% Slope and Greater
Protected Areas Subject to Hillside Review

EASEMENTS

Common areas and facilities will be held through a variety of easement and ownership arrangements depending on the purpose to be served and the operation and management responsibility.

MAJOR EASEMENT CONSIDERATIONS

Multiple large, high value easements exist within the Plan Area, notably the Denver Water Syphon Easements and the existing Union Pacific Railroad Easements. The team will be working closely with each entity to facilitate maximum coordination and avoid potential conflicts.

Required easements for new or rerouted utilities, new trail connections, and other uses will be dedicated at the time of platting each sub-phase.

*These exhibits, executed by JVA Consulting Engineers, can be found in greater detail at the end of this document in Appendix C - Utility, Easement and Grading Exhibits.

FIGURE 5.2 EASEMENTS

Easement

UTILITIES

This section summarizes how utilities and public services are to be provided. More detailed information and engineering reports are provided in Appendix C - Utility, Easement, and Grading Exhibits.

DRY UTILITIES

Existing dry utility corridors will require re-routing and updating in order to serve future developed areas. Where possible, the development will follow existing corridors, but in some cases there will be a need to install completely new utilities and associated infrastructure to access these areas and service new development. The individual utility providers will assist in the design, review, and approval of these updates and additions.

DOMESTIC WATER

The domestic water system is managed by Winter Park Water & Sanitation District (WPWSD) and the proposed design will adhere to WPWSD standards. The current water distribution system has multiple areas of aging or damaged infrastructure that requires redesign, replacement, or repair. Available water for proposed development will be coordinated with WPWSD.

SANITARY SEWER

The sanitary sewer system is managed by WPWSD and the proposed design will adhere to WPWSD standards. The current sanitary collection system has multiple areas of aging or damaged infrastructure that requires redesign, replacement, or repair. Multiple existing sewer collection mains on site currently go directly through building foundations and will need to be re-routed. Available capacity for proposed development will be coordinated with WPWSD.

WATER AND SEWER PIPE INSULATION

Due to steep topography, the presence of bedrock, and existing utilities that do not meet burial depth requirements it will be necessary to utilize polystyrene insulation. Insulation equal to Styrofoam 40 High Load Square EXE, ASTM C518, C578, and D1621 shall be placed over the water or sewer service line and detailed on construction drawings where cover is not able to be maintained.

*These exhibits, executed by JVA Consulting Engineers, can be found in greater detail at the end of this document in Appendix C - Utility, Easement and Grading Exhibits.

FIGURE 5.3 EXISTING UTILITIES

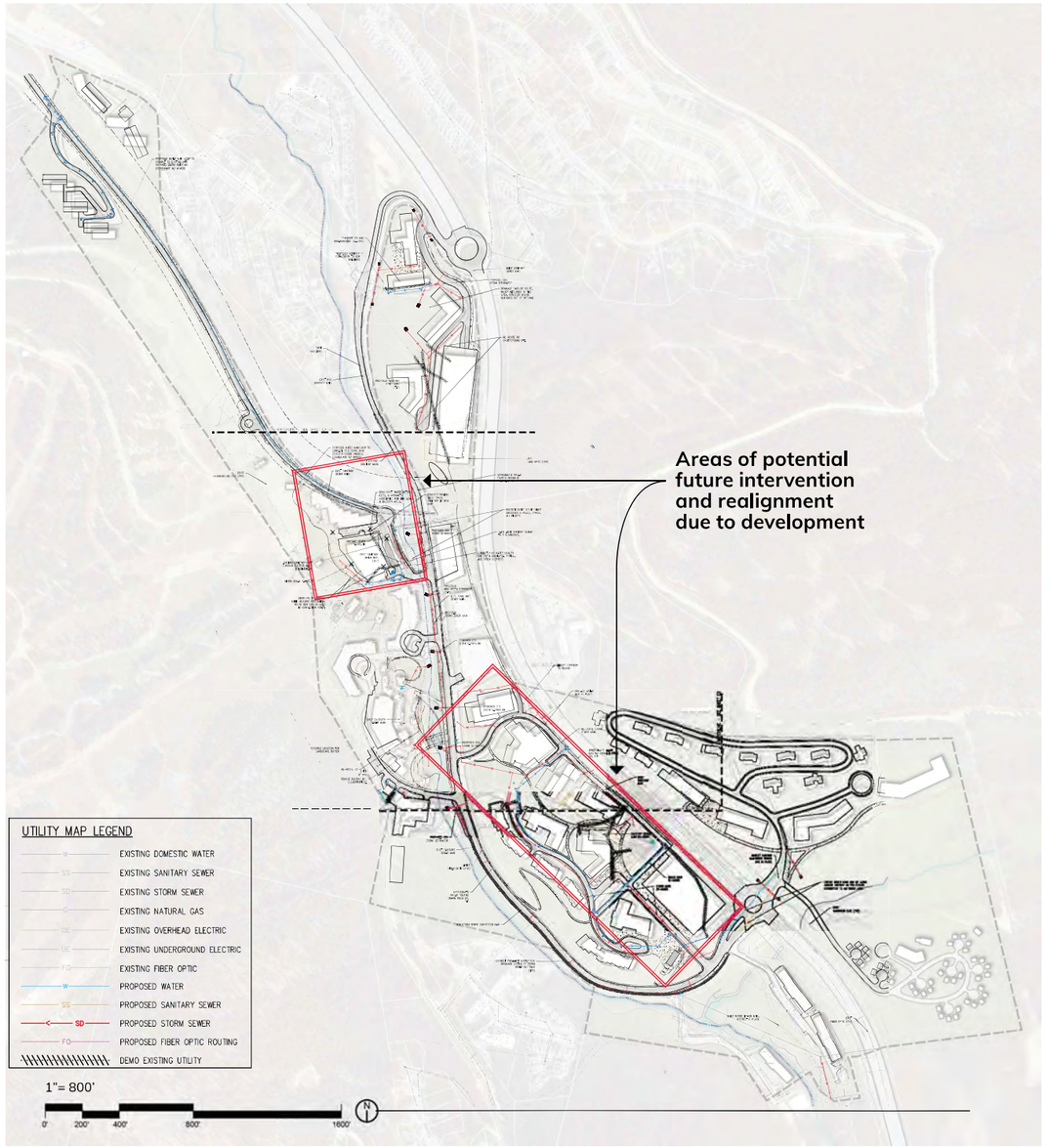
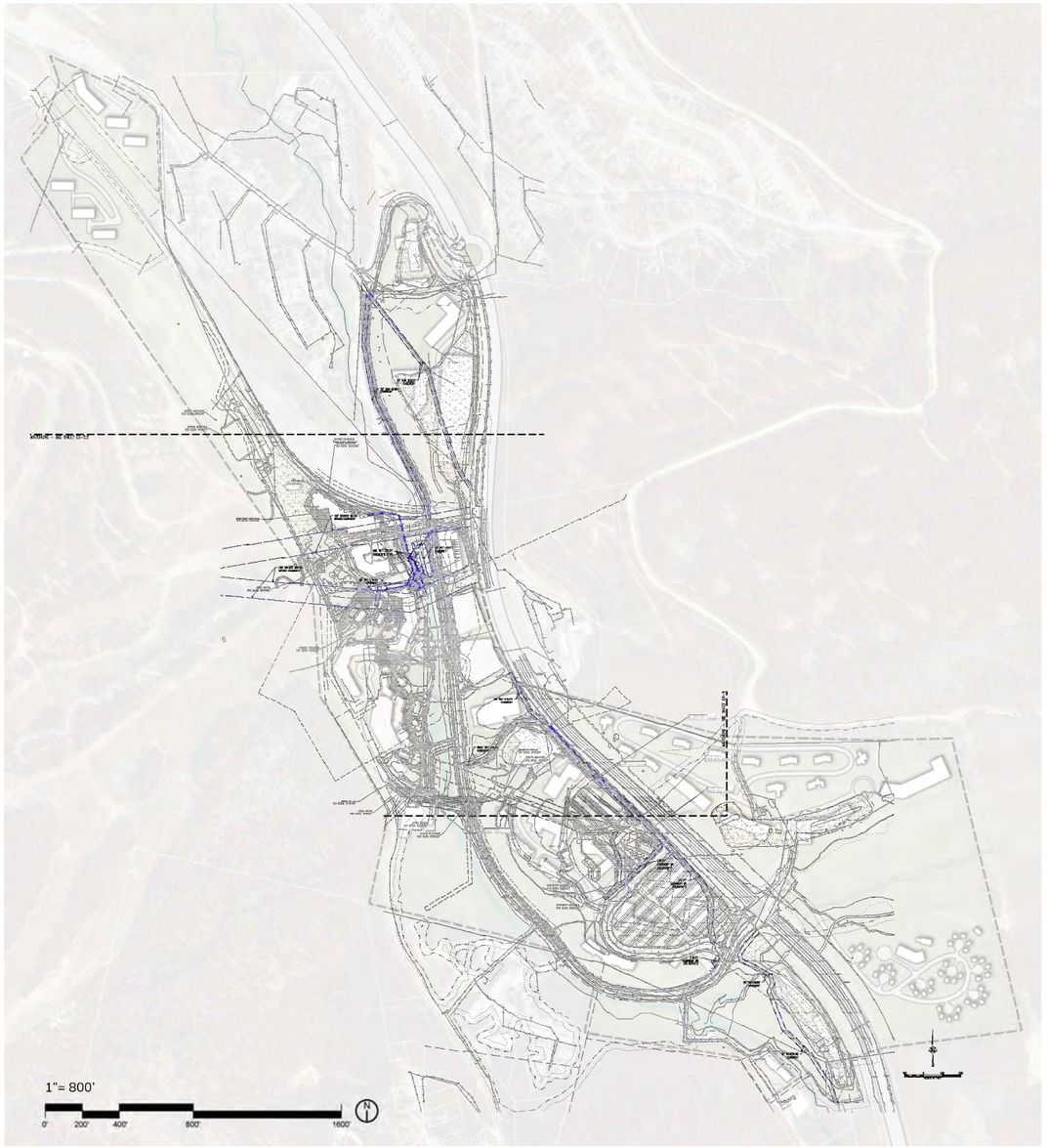


FIGURE 5.4 DRY UTILITIES PLAN

Dry Utility Easements

FIGURE 5.5 WET UTILITIES PLAN



Wet Utility Easements

FIBER-OPTIC AND TELECOMMUNICATION FACILITIES

Fiber-optic planning represents high level desirable pathways and future routing.

Impacts to existing fiber needs to be evaluated on a site-specific, per project basis as it relates to function, scale and capacity. Stub conduit, pull-boxes and hand holes, as well as additional hub locations for fiber interconnects are to be evaluated. All new pathways are to be aligned with existing utilities corridors as much as possible as to avoid any unnecessary or excessive environmental impacts.

All telecommunication facilities, including ground mounted equipment, within the Plan Area shall abide by provisions and regulations set forth in the Winter Park Code of Ordinances Title 8. The Town Planning Department may administratively review and approve any new facilities on a per project basis based on size, placement, appearance, and general nature.

Figure 5.6 Fiber-Optic Telecommunication Plan illustrates a potential future fiber-optic network that works to expand capacity to new neighborhoods and better service development outside of the Base Area. Specific areas are identified where major re-routing of existing pathways may occur due to new development.

The list below details specific areas of importance that require special consideration when improving and expanding telecommunication facilities.

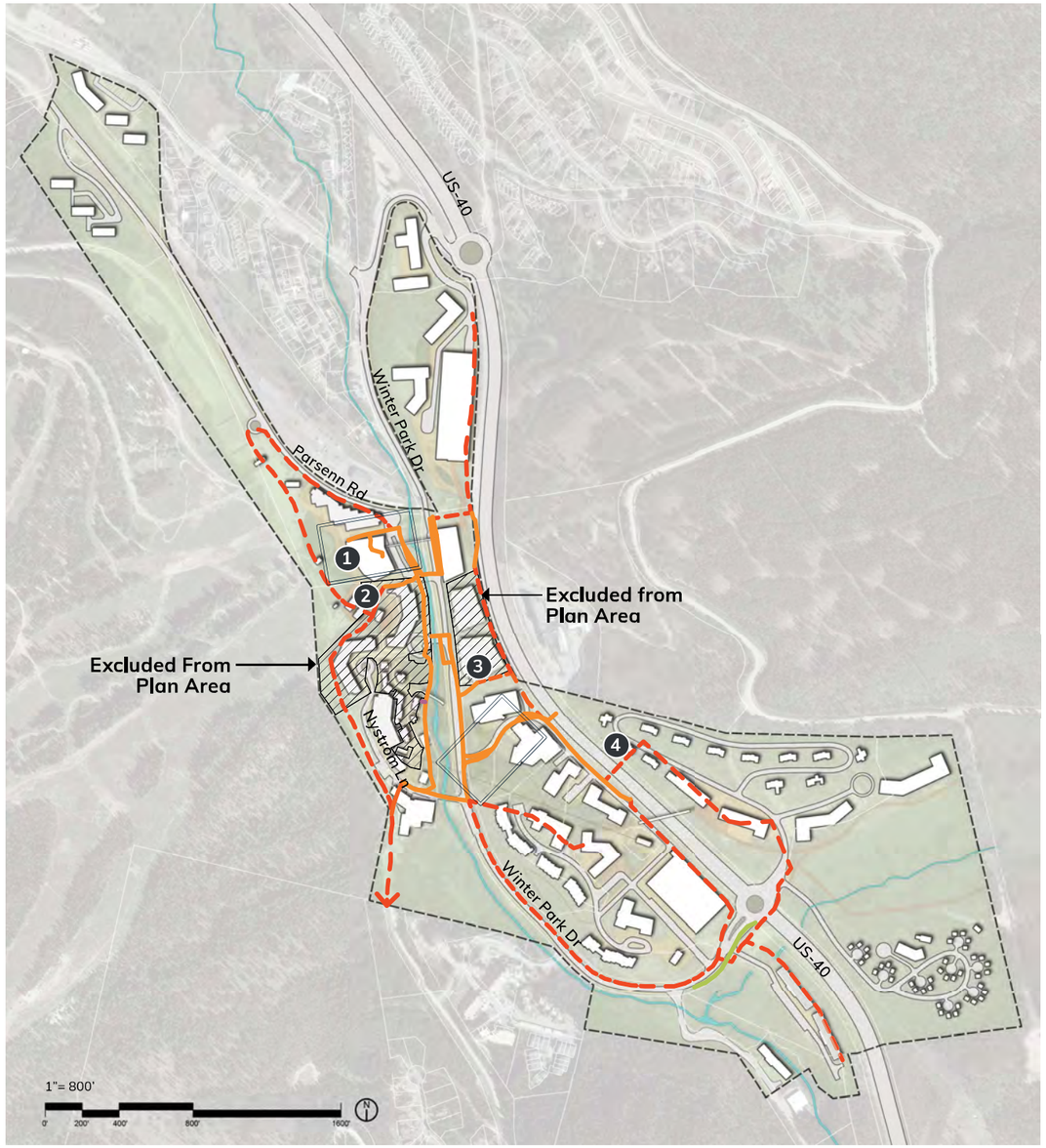
1. Admin Building - Future Mountain Lodge Site
Current Resort data-center with main ingress for CenturyLink and telecommunications. Any future redevelopment must consider this site function. Facilities are to be retained and improved or relocated to another location.

2. Aerial Transport Building
Fiber-optic hub and site for future routing connections.

3. FCFP
Main ingress for fiber-optic and Comcast circuits. Site for future routing connections.

4. US-40 / Retreat Extension
Redundant loop and alternate pathways support future development and growth.

FIGURE 5.6 FIBER-OPTIC TELECOMMUNICATION PLAN



- Existing Fiber Optic Routing
- Potential New Fiber Optic Routing
- Non-Resort Fiber Optic
- Potential Areas of Re-routing Around Future Development

1. Admin Building - Future Mountain Lodge Site
2. Aerial Transport Building
3. FCFP
4. US-40 / Retreat Extension

WATER QUALITY STRATEGY

The Base Area is part of the Fraser River watershed, and is directly adjacent to the Fraser River itself. In order to improve and maintain the stormwater quality of runoff to the Fraser River, a water quality strategy will be implemented utilizing the best management practices defined by the Mile High Flood District (MHFD) Urban Storm Drainage Criteria Manual. The main strategy to be used is mechanical separation through the use of underground storm sewer pipe networks to convey runoff to water quality manholes that discharge to the watershed. In addition to mechanical separation, the use of grass buffers, low gradient grass lined swales, and infiltration basins will be implemented where feasible to further enhance site stormwater quality.

With a close proximity to natural drainage and wetlands areas, water quality from snowmelt is a concern for this development in the Base Area. Several measures can be implemented that will improve the quality of the water prior to entering the wetlands and waterways, including the use of water quality swales and ponds within the Plan Area. These elements promote sedimentation and release runoff with improved water quality. The strategy for maintaining water quality will be closely coordinated with Winter Park Resort and Town snow removal operations to ensure excess sediment does not make it to the Fraser River.

STORMWATER MANAGEMENT

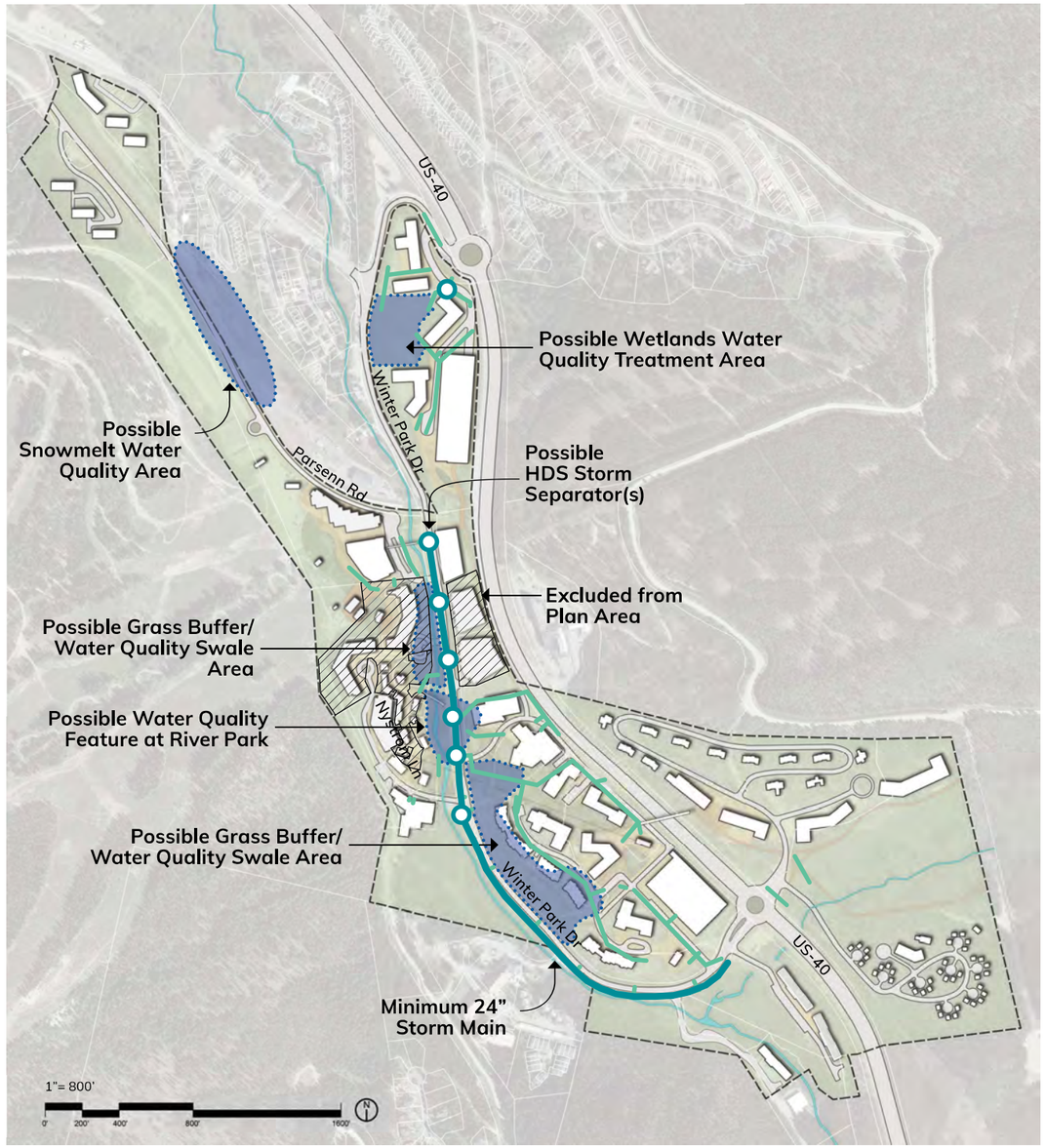
Due to Plan Area proximity to the Fraser River, detention facilities will not be proposed as is common along the Fraser River corridor in order to avoid peak flows from detention sites coinciding with peak flows from the overall watershed. Currently, few water quality enhancement features exist within the Plan Area. The design team will be working to enhance the water quality discharge from the Base Area and incorporate best management practices per the MHFD into the design. Each FDP will have a separate drainage report.

Winter Park Resort is in a unique location adjacent to both sides of the Fraser River, which bisects the Plan Area. To ensure the peak flows from the site do not coincide with the peak flows from the overall Fraser River Watershed, peak flows from the major and minor storm events will be allowed to release naturally into the adjacent Fraser River, undetained, regardless of historic discharge rates. This methodology has commonly been called “beat the peak” and has been granted as a variance from Town UDC Section 6.2.5 of the Standards for Design and Construction elsewhere within the Fraser River watershed. This variance shall be utilized for the PDP Plan Area as indicated in Ch. 7 Development Standards. This variance will only apply to the areas of the base that ultimately discharge directly to the Fraser river, and detention will be provided to maintain existing flows where stormwater discharges into neighboring properties.

DRAINAGE REPORT

A Phase 1 drainage report, executed by JVA Consulting Engineers, can be found in Appendix B - Water Quality / Drainage Report. In summary, the Drainage Report illustrates existing drainage conditions for the site as well as preliminary design concepts for future development. There will be no on-site detention and the drainage design will be solely designed to protect water quality. The included analysis conceptually demonstrates that the water quality and development runoff impacts and quantities can be appropriately mitigated in accordance with the requirements for development in the Town.

FIGURE 5.7 WATER QUALITY & STORMWATER PLAN



RIVER & WETLAND DELINEATION

WETLANDS

Existing wetlands have been mapped and are primarily located within the existing drainage corridors. A Wetland Delineation Report has been included in the PDP for review in Appendix E - Wetland Report and summarizes jurisdictional and non-jurisdictional wetlands. The intent is to incorporate preservation of the existing drainage and wetland corridors to the extent practicable. Where not practicable, compensatory mitigation will be implemented per the Town UDC and United States Army Corps of Engineers (USACE) permitting requirements.

Impacts to jurisdictional wetlands will be processed and approved with the regulations outlined by the USACE. All development within the Plan Area will be subject to the 30' setback as defined in the Town UDC Article 3.E. Flood Hazard Reduction unless a variance is applied for and granted by the Town. Any mitigation required will be permitted per Section 404 of the Clean Water Act Permit Requirements through the USACE and the Town.

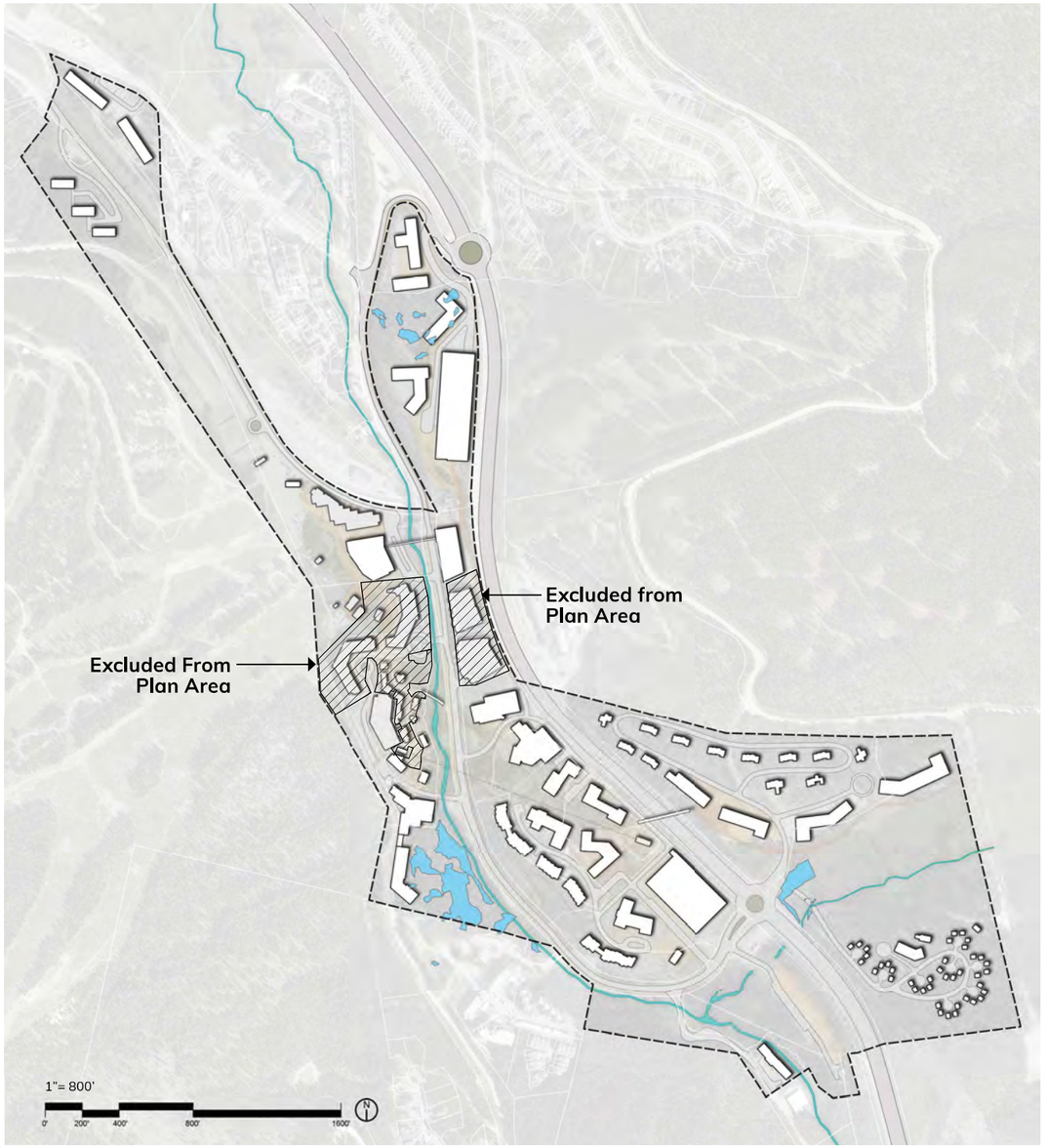
The water quality of the Fraser River is paramount to the local ecology as it is one of the main headwaters of the Colorado River. Winter Park Resort will continue to follow the recommendations of the Fraser River Source Water Protection Partnership, Source Water Protection Plan, and the East Grand Water Quality Board. This PDP is proposing water quality enhancement through treatment of stormwater and snowmelt adjacent to the Fraser River as well as sustainable development and enhancement of the natural vegetation, wildlife, and topography.

WETLANDS REPORT

A complete Plan Area wetland evaluation executed by Owl Ridge Natural Resource Consultants can be found in Appendix E - Wetland Report.

The full extents of the Plan Area have not yet been fully evaluated and mapped for wetland areas; refer to Wetland Report (Appendix E) document for maps of areas studied.

FIGURE 5.8 WETLAND DELINEATION



Wetland Area

Approximate River Limits Based On Site Survey

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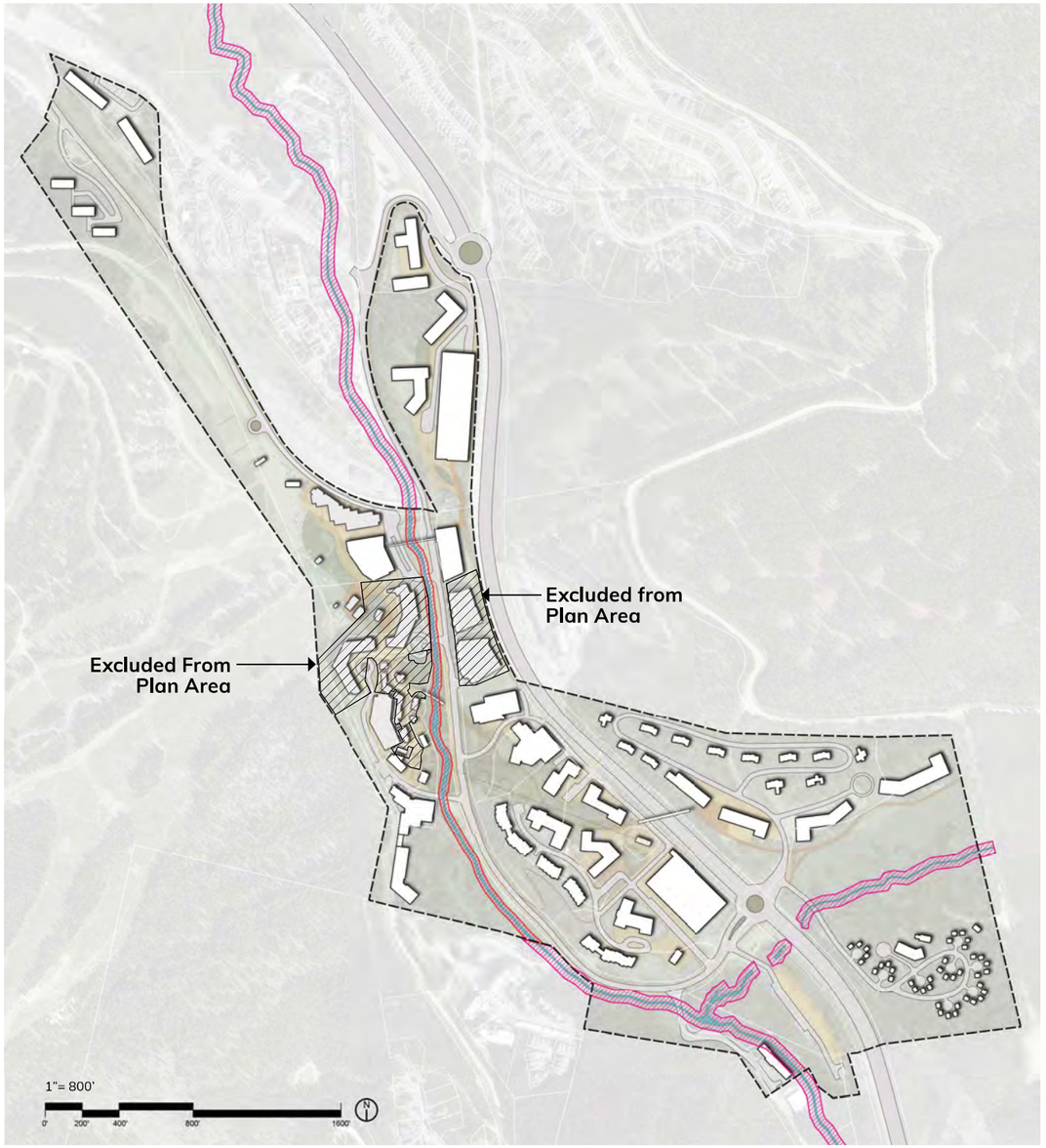
FIGURE 5.9 RIVER OFFSET PLAN



Approximate Extents of 15' Offset from Water Surface Level - Water Quality Setback (Resort Village Planning Neighborhood Only)

Approximate Extents of 30' Offset from Water Surface Level - Water Quality Setback

SNOW MANAGEMENT

Plan Area snow management services will be executed in partnership by the Town and Winter Park Resort operations teams based on current practices and procedures. Snow removal at the proposed roundabouts along US Highway 40 will be added as part of CDOT Operations.

SNOW STORAGE AND REMOVAL

Snow removal shall be provided for all paved roads, paths and trails, and other circulatory areas to be plowed, unless otherwise permitted. Snow storage shall exist in strategic locations throughout the site to accommodate snow removal loads. In dense, active development spaces that cannot accommodate high volumes of snow storage, snow may be transported to appropriate snow storage locations detailed in Figure 5.10 Snow Removal Plan.

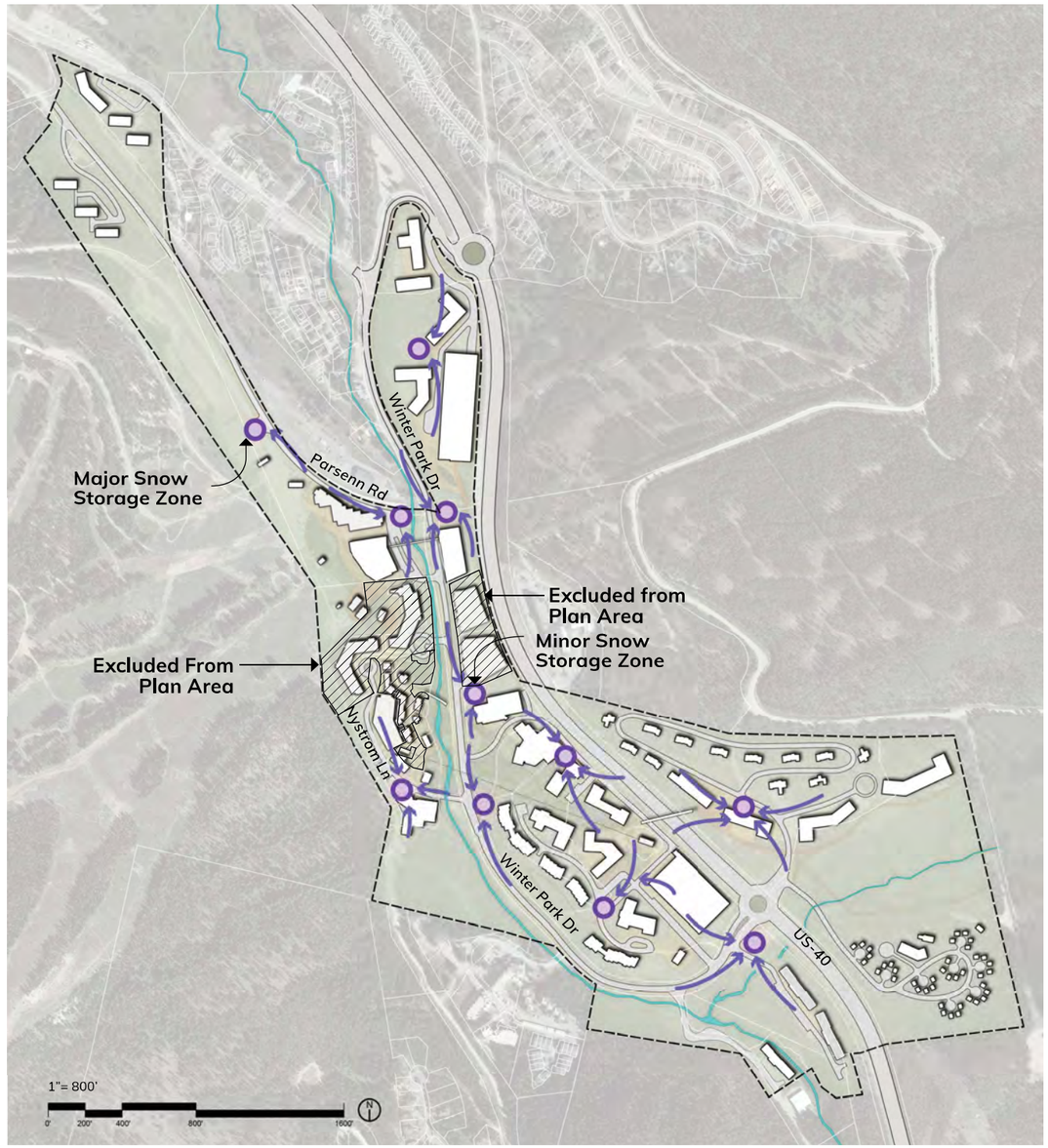
Figure 5.10 Snow Removal Plan presents a conceptual on-site snow removal plan based off a layout of potential future conditions and development volumes. The Snow Removal Plan outlines specific optimal areas of snow storage based on surrounding conditions, along with a pattern for directional movement and removal. This layout concentrates storage along Winter Park Dr. where future Hydrodynamic Storm Separators (HDS) and main lines may be located, helping manage high volume runoff and increase drainage capacity. Additional locations shall be allocated on a per neighborhood basis in response to site specific conditions.

Maintenance and operation of services beyond those provided by the Town, such as snow removal and storage, will ultimately be the responsibility of the developer or owner of each individual property.

SNOW-MELT SYSTEMS

Where on-site snow melting systems or heated paving exists, the area served by the system may not be necessary in snow storage and removal processes.

FIGURE 5.10 SNOW REMOVAL PLAN



SNOW-MELT WATER QUALITY

This snow management strategy is intended to work in close coordination with the Water Quality / Drainage Report (Appendix B) and Wetland Report (Appendix E) to utilize best management practices. Snow storage shall not be located in wetlands, and where practicable, shall not be stored within 25' of wetlands. Special considerations are to be made in close proximity to the Fraser River watershed that work to maintain water quality standards and avoid the movement and intrusion of salt/sand or other pollutant materials into the drainage basin.

With a close proximity to natural drainage and wetlands areas, water quality from snowmelt is a concern for the Plan Area that is not currently mitigated. Several measures can be implemented that will improve the quality of the water prior to entering the wetlands and the Fraser River. These include the use of water quality swales and ponds in snow storage zones and mechanical separation through the use of storm separators for snowmelt runoff. These elements promote sedimentation and release runoff with improved water quality. Other options to be implemented where practical include off-site snow storage and small landscaping berms to contain the snowmelt. A sand filter or piped outlet will allow for sedimentation to occur prior to the release.

SUSTAINABILITY APPROACH

Consistent with the Town and Applicant objectives to develop projects that are sustainable and resilient, this PDP promotes sustainable design and implementation of future projects. Where the Town's design guidelines are inconsistent with sustainable design objectives and building systems and materials, the Town will support the option with a more positive sustainability impact.

ENERGY USE AND ANALYSIS

As part of a holistic sustainability approach, the Applicant seeks to reduce energy use across the Plan Area. Reducing climate impact is critical to preserving the climate that attracts visitors and residents to Winter Park. The Applicant is exploring approaches to reduce overall energy demand, minimize natural gas use, and employ innovative energy recovery technology. Local bodies of water, sanitary and sewer drains, domestic cold water, and the ground itself all provide opportunity to recover, relocate, or reuse energy throughout the Plan Area.

The specific approach to reducing energy use by phase will be detailed in subsequent FDP and Major Site Plan submittals. As part of FDP submittals, the Applicant will consider preparing greenhouse gas analysis to estimate the project's impacts and identify strategies to reduce greenhouse gas emissions.

PRESERVATION OF THE NATURAL ENVIRONMENT

The vision prioritizes preservation of natural areas and emphasizes concentrating the most development in previously disturbed areas. New development will incorporate low-impact development strategies, implement green infrastructure practices where possible, and take measures to celebrate and enhance the existing environmental and ecological systems. Colorado Division of Wildlife guidance for best practices will be referenced to mitigate the impact of development on wildlife and support the preservation of existing natural habitat.

6. DEVELOPMENT DENSITY & POTENTIAL PHASING

Development Density & Potential Phasing 96

DEVELOPMENT DENSITY & POTENTIAL PHASING

The PDP envisions a more dense, walkable and highly connected mountain environment providing guests and local residents a newly re-imagined, year-round adventure, leisure, and lifestyle experience.

DEVELOPMENT DENSITY

The following table provides the maximum densities that will be permitted by Planning Neighborhood.

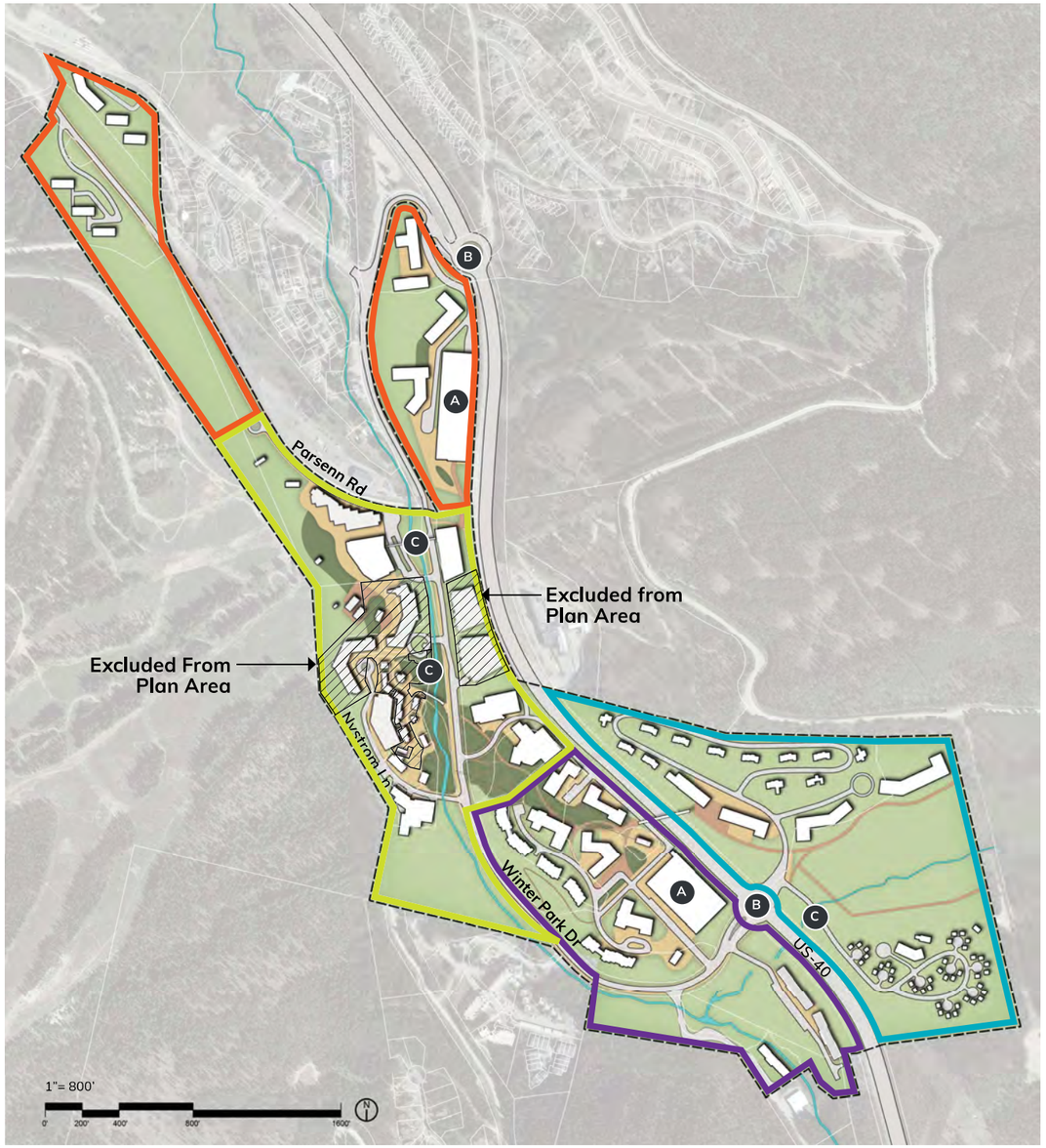
TABLE 6.1 MAXIMUM PERMITTED DENSITY

PLANNING NEIGHBORHOOD	MULTIFAMILY DWELLING / OVERNIGHT ACCOMMODATION UNITS *	RETAIL / COMMERCIAL SF	PUBLIC PARKING STRUCTURE SPACES**
Resort Village	550	140,000	400
Welcome Village	1,000	50,000	1,500
Retreat	650	50,000	--
Old Town	750	10,000	1,500
Total	**2,950 Units**	**250,000 SF**	**3,400 Spaces**

* Units denote the total maximum number of Multifamiliy Dwelling units and Overnight Accommodation rooms. Units and rooms are considered equivalent for these purposes.

** Maximum for public parking structure spaces only. Parking spaces for vertical developments shall be provided as required by the PDP.

FIGURE 6.1 FULL BUILDOUT



The following table provides an illustrative overview of project phasing. This phasing is subject to change.

TABLE 6.2 PROPOSED PHASING

PHASE	PLANNING NEIGHBORHOOD	MULTIFAMILY DWELLING / OVERNIGHT ACCOMMODATION UNITS*	RETAIL / COMMERCIAL SF	PUBLIC PARKING STRUCTURE SPACES
1	Resort Village, Welcome Village, Old Town	750	140,000	1,900
2	Welcome Village	1,000	50,000	--
3	Retreat	650	50,000	--
4	Old Town	550	10,000	1,500
	Total	**2,950 Units**	**250,000 SF**	**3,400 Spaces**

* Units denote the total maximum number of Multifamiliy Dwelling units and Overnight Accommodation rooms. Units and rooms are considered equivalent for these purposes.

** Maximum for public parking structure spaces only. Parking spaces for vertical developments shall be provided as required by the PDP.

PHASING

The development plan is intended to be built out in multiple phases. The description of phasing included here provides a conceptual overview of key areas of focus in the initial phases of development, along with subsequent phases of the Plan Area as currently contemplated. Phasing is subject to change due to market conditions or other external factors.

Phasing of public improvements and other private improvements will be determined in connection with the PDP, subsequent FDPs, Development Agreement, subdivision plats, resort operations/ programming, market demands, and other considerations.

Interim parking phasing will be a key focus of the project phasing. A sufficient amount of parking and corresponding operations must be retained to allow for ongoing operation of the resort during build out of the plan. Prioritization of construction of the first public parking structure will allow for parking currently accommodated in surface lots to be shifted to the new parking structure, allowing for the redevelopment of existing surface parking lots for other uses.

Apart from the proposed public parking structures, parking for individual projects will be addressed in subsequent vertical project FDPs.

KEY PRIORITIES

The initial phases of development will include numerous infrastructure improvements to support future development, enhance the Resort experience and operations, and improve mobility. Initial development will be anchored by proposed upgrades at the Mountain Base, additional lodging and residential options, and improvements to the public realm to enhance connectivity and vibrancy throughout the Plan Area.

A new public parking structure will improve the arrival experience and concentrate vehicular traffic entering the Resort, promoting a safer, pedestrian- and bicycle centric environment. The initial phases will also include the expansion of strategic program to activate the public realm year-round and provide support facilities for future development.

Key priorities for the initial phases of development include:

- Public parking structure and ancillary infrastructure and connection to Highway US-40
- Provision of parks, placemaking, and public realm improvements
- Enhancements to the overall Resort experience
- Increasing the bed and key count with initial focus on the Resort Village Planning Neighborhood
- Mobility improvements to Winter Park Drive
- Utility upgrades to support future development
- Skier services improvements at the Mountain Base
- Improvements to enhance guest arrival at the Mountain Base adjacent to the existing Ski Train platform and base of the planned aerial transport system link to the town

The phasing plan for the project contemplates that the elements of the Resort Village will be delivered first in closest proximity to the existing resort base. Following that, the first public parking structure will be delivered, enabling redevelopment of existing surface parking lots.

7. DEVELOPMENT STANDARDS

Development Standards - Building & Site Design 102

DEVELOPMENT STANDARDS - BUILDING & SITE DESIGN

Both the quality and quantity of development must be planned to conserve, protect, and enhance the aesthetic, ecological and environmental assets of the Plan Area. Development within the Plan Area will adhere to the Town UDC, except as modified by the PDP.

Title 7 of the Town UDC establishes baseline regulations and standards for future development in the Plan Area, including but not limited to, permitted uses, building heights, parcel coverage, and parking requirements. The intent of the PDP is to utilize the D-C zone district as the base zone district for the Plan Area. Modifications to sections of the UDC are outlined in Table 7.2 Modified Standards with new standards that apply to the PDP Plan Area. Subsequent FDPs and the Development Agreement may further refine these standards. Where the PDP, subsequent FDPs, and the Development Agreement do not modify UDC standards, the site zoning defers to development standards set for the base D-C zoning in the UDC.

PERMITTED USES

All uses permitted in the D-C zone district shall be permitted in the Plan Area in accordance with UDC Article 2.B Use Standards. The PDP modifies UDC Section 2-B-1 Use Tables so that Permitted Uses shall also include Place of Public Assembly and Outdoor Swimming Pools as Residential Accessory Uses and Non-Residential / Mixed-Use Accessory Uses. Mobile Vending is permitted without requiring a Special Use Permit.

REQUIRED PARKING

Parking requirements for the Plan Area follow the UDC except as identified in the PDP. Public parking garages will be utilized for daytime skier parking as well as visitors to all commercial and retail uses throughout the Plan Area, including commercial and retail spaces that are part of mixed-use developments with a different primary use.

Therefore, per the PDP, Non-Residential and Mixed-Use developments, including all Commercial, Civic, and Institutional Uses are not required to provide any parking spaces on site.

UDC Table 3-H-3-1, Residential Parking Requirements shall be utilized for Residential Uses, with a revision to the requirements for Overnight Accommodations - Hotel as follows:

Use Category	Land Use	Minimum Parking Required
Overnight Accommodations	Hotel or Motel	0.75 space per guest room

OFF-STREET LOADING REQUIREMENTS

Off-street loading requirements for the Plan Area shall follow UDC Section 3-H-6, except the PDP replaces UDC Table 3-H-6-1 for the quantity of off-street loading spaces with the following:

Total Gross Floor Area Per Lot	Required Loading Spaces
<5,000 SF	1 space, if determined necessary at Major Site Plan review
5,000 to 50,000 SF	1 space
>50,000 SF to 300,000 SF`	2 spaces
>300,000 SF	3 spaces

The PDP also permits proximate but detached buildings to share off-street loading spaces if applicant is able to demonstrate a clear path for loading between buildings.

RESIDENTIAL LOT AND BUILDING STANDARDS

The PDP replaces UDC Table 3-A-3 for Residential Lot and Building Standards with the following criteria:

Density: The total quantity of Multifamily and Overnight Accommodations units in the Plan Area shall not exceed the number of units identified in Table 6.2 - Full Buildout.

Open Space: Individual lots are not subject to minimum Open Space requirements. At full buildout, the Plan Area shall include minimum percentages of Open Space in each Planning Neighborhood as identified in Table 4.2 Required Open Space by Planning Neighborhood and as follows:

Planning Neighborhood	Min % Open Space
Resort Village	10%
Welcome Village	10%
Old Town	10%
Retreat	20%

Each FDP submittal will provide a calculation of open space proposed by Planning Neighborhood for tracking purposes. The Final FDP proposed in a Planning Neighborhood will be required to demonstrate that minimum open space percentage by Planning Neighborhood has been met.

Maximum Building Coverage: No maximum building coverage

Minimum Lot Dimensions: No minimum lot dimensions

Maximum Building Heights: Maximum building heights permitted in the Plan Area support the development of a vibrant, mixed-use base area with taller buildings focused in the Resort Village and Welcome Village and transitioning to moderate and lower scales in the Old Town and Retreat Planning Neighborhoods.

Maximum building heights are identified in Figure 7.1 Building Standards - Maximum Height. Additional stepbacks to building height will be proposed at each FDP submittal based on site conditions, unless determined not applicable at time of FDP.

Stepbacks will be determined so that building massing and scale integrate with context and topography within the permitted allowable building heights.The height at which a stepback occurs and depth of stepback to be determined in the FDP.

Planning Neighborhood	Maximum Building Height
Resort Village	
Resort Village A	120'
Resort Village B	150'
Welcome Village	100'
Old Town	
Old Town West A	75'
Old Town West B	60'
Old Town East A	100'
Old Town East B	85'
Retreat	
Retreat North	95'
Retreat South	35'

The PDP proposes a building specific Base Plane method as basis for determining the Building Height (refer to Appendix A - Terms & Definitions). The use of this method intends for buildings to be integrated into the topography and height determined based on the average grades at prominent building corners.

Shadow Study: Buildings proposed over 55' in height will be required to prepare a shadow study and submit to the Town for review at the MSP stage.

Minimum/Maximum Building Setbacks: General building setbacks in the following table assist in delineating areas where building can occur. Other site conditions that limit development, such as the edges of wetlands, steep slopes, and the Fraser River should be considered based on detailed survey information at time of Major Site Plan.

Condition	Setback (Minimum)
Public Road ROW	15'
Private Road ROW	5'
US Highway-40 ROW	25'
Lot - Side Property Line	5'
Old Town West (per Figure 7.1)	35'

FIGURE 7.1 BUILDING STANDARDS - MAXIMUM HEIGHT

- Planning Neighborhood A - Resort Village
- Planning Neighborhood B - Welcome Village
- Planning Neighborhood C - Old Town
- Planning Neighborhood D - Retreat

*Dashed areas within Planning Neighborhoods are approximate and will be verified through the FDP for that parcel.

BUFFERYARDS

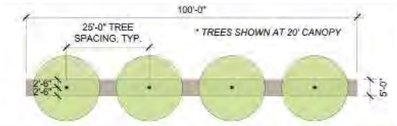
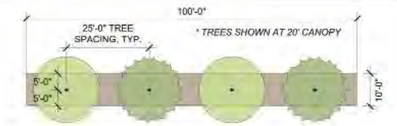
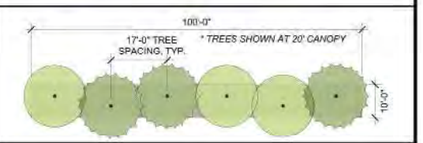
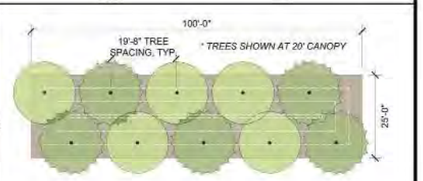
The PDP modifies UDC Section 3-I-5 for the required location of Landscape Bufferyards based on Planning Neighborhood.

The Resort Village and Welcome Village Planning Neighborhoods are the higher density pedestrian cores of the Plan Area and shall be exempt from bufferyard requirements as defined in the UDC.

The Old Town and Retreat Planning Neighborhoods are outside of the higher density pedestrian core and shall provide bufferyards where required per UDC Section 3-I-5.

The PDP replaces UDC Table 3-I-5-1 with Table 7.1 Bufferyard Classifications, which describes the planting composition for four different types of bufferyards which vary in the amount of screening they provide.

TABLE 7.1 BUFFERYARD CLASSIFICATIONS

BUFFER YARD CLASSIFICATIONS						
TYPE	WIDTH	REQUIRED PLANTING PER 100 LINEAR FEET			HEIGHT OF BERM	BUFFERYARD EXAMPLE DIAGRAM
		DECIDUOUS TREE	EVERGREEN TREE	SHRUBS		
TYPE A	5'	4	0	15	N/A	
TYPE B	10'	2	2	30	N/A	
TYPE C	10'	4	4	30	N/A	
TYPE D	25'	10	10	60	3' HT. 4:1 SLOPE	

MODIFIED STANDARDS

Exemptions from or modifications to standards in the following sections of the Town UDC may be further defined in the PDP, subsequent FDPs, and the Development Agreement. Additional sections may be considered if applicable.

TABLE 7.2 MODIFIED STANDARDS

UDC Section	UDC Section Title	PDP Section Description
2-B-1	Use Tables - Use by District	All uses permitted in the D-C zone district shall be permitted in the Plan Area in accordance with UDC Article 2.B Use Standards. The PDP modifies UDC Section 2-B-1 Use Tables so that Permitted Uses shall also include Place of Public Assembly, Outdoor Swimming Pools as Residential Accessory Uses and Non-Residential / Mixed-Use Accessory Uses, and Mobile Vending is permitted without requiring a Special Use Permit.
2-B-4-F	Retaining Walls as Accessory Structures	The PDP limits the height of a retaining wall to 10'. Where retaining walls of greater heights must occur, use a series of terraced or stepped walls. The width of a retaining terrace shall not be less than 5'. The Director may vary the retaining wall height and width requirements depending on site conditions. Proposed retaining walls over 48" in height shall be designed and stamped by a Structural Engineer licensed in the state of Colorado. Retaining walls shall be of a construction type that blends with the natural environment. MSE walls shall be permitted subject to final Town review of the MSP.
Table 3-A-3	Residential Lot and Building Standards - Density	The total quantity of Multifamily and Overnight Accommodations units in the Plan Area shall not exceed the number of units identified in PDP Table 6.1 - Maximum Permitted Density.
Table 3-A-3	Residential Lot and Building Standards - Open Space	Individual lots are not subject to minimum Open Space requirements. At full buildout, the Plan Area shall include minimum percentages of Open Space in each Planning Neighborhood as identified in PDP Table 4.2 Required Open Space by Planning Neighborhood and as follows: Resort Village = 10% Open Space minimum Welcome Village = 10% Open Space minimum Old Town = 10% Open Space minimum Retreat = 20% Open Space minimum Each FDP submittal will provide a calculation of open space proposed by Planning Neighborhood for tracking purposes. The Final FDP proposed in a Planning Neighborhood will be required to demonstrate that minimum open space percentage by Planning Neighborhood has been met.
Table 3-A-3	Residential Lot and Building Standards - Maximum Building Coverage	The PDP does not limit maximum building coverage.
Table 3-A-3	Residential Lot and Building Standards - Minimum Lot Dimensions	The PDP does not require minimum lot dimensions.

UDC Section	UDC Section Title	PDP Section Description
Table 3-A-3	Residential Lot and Building Standards - Maximum Height	Residential Lot and Building Standards for the maximum Building Height for Multifamily and Overnight Accommodations Uses in the D-C Zone District are modified by PDP Planning Neighborhood as shown in Figure 7.1 Building Standards - Maximum Height: Planning Neighborhood — Maximum Building Height Resort Village: Resort Village A 120' Resort Village B 150' Welcome Village: 100' Old Town: Old Town West A 75' Old Town West B 60' Old Town East A 100' Old Town East B 85' Retreat: Retreat North 95' Retreat South 35' (2 structures permitted with max height of 45' for residential amenity use purposes)
Table 3-A-3	Residential Lot and Building Standards - Minimum/Maximum Building Setbacks	The PDP utlizes the general building setbacks listed as follows to assist in delineating areas where building can occur. Subsequent FDPs may provide additional building setbacks for individual development parcels. Public Road ROW = 15' minimum setback Private Road ROW = 5' minimum setback US Highway-40 ROW = 25' minimum setback Lot - Side Property Line = 5' minimum setback Old Town West - East Property Line (per Figure 7.1) = 35' setback
3-A-7-E	Measurements, Computations, and Exceptions - Building Height	It is the responsibility of the property owner to design a structure that will fit the natural or existing contours of a site. When calculating building height in the PDP D-C Zone District, a horizontal datum called the Base Plane shall be established at the average elevation of the original or finished grade, whichever is lower, at the primary building corners. The vertical distance above this Base Plane measured to the highest point of coping for a flat roof or the midpoint of a pitched or hipped roof determines the Building Height. The overall Building Height may not exceed the heights indicated in Figure 7.1 Building Standards - Maximum Height by Planning Neighborhood.
3-A-8	Design Guidelines	The Mountain Base Area Design Guidelines supplement the Town of Winter Park Design Guidelines in order to implement the vision shown in the PDP. The Mountain Base Area Design Guidelines will provide guidance on general design intent for the entire Plan Area and specific design guidelines at the parcel level. The Winter Park Base Area Design Review Board will be responsible for review of each MSP against the Mountain Base Area Design Guidelines and Town Design Guidelines. The Winter Park Base Area Design Review Board will recommend MSP submittals which satisfy the Town of Winter Park Design Guidelines and the Mountain Base Area Design Guidelines to the Town of Winter Park for review, prior to review of the MSP by the Town against the Town of Winter Park Design Guidelines.
3-C-2-2	Protection of Hillsides and Ridgelines	Disturbance shall be reduced on slopes that are predominantly 30% or greater and in areas that have not been previously disturbed or modified. The PDP permits development on slopes greater than 20% in the Resort Village and Welcome Village Planning Neighborhoods. Development on predominant slopes greater than 30% will be limited and is subject to the UDC Hillside Review process as described in UDC Section 3-C-2-2 for slopes greater than 20% in the Old Town West and Retreat Planning Neighborhoods as well as the areas along the eastern edge of Winter Park Drive highlighted in Figure 5.1 Areas of 20% and Greater Slopes.

UDC Section	UDC Section Title	PDP Section Description
3-C-2-5-E-2	Hillside and Ridgeline Design Standards - Retaining Walls	The PDP limits the height of a retaining wall to 10'. Where retaining walls of greater heights must occur, use a series of terraced or stepped walls. The width of a retaining terrace shall not be less than 5'. The Director may vary the retaining wall height and width requirements depending on site conditions. Proposed retaining walls over 48" in height shall be designed and stamped by a Structural Engineer licensed in the state of Colorado. Retaining walls shall be of a construction type that blends with the natural environment.
3-C-2-5-F	Hillside and Ridgeline Design Standards -Ridgeline Setback and Landscape Bufferyard	This PDP replaces the UDC Section on Bufferyards with new criteria applicable to the different PDP Planning Neighborhoods as described in Development Standards - Building & Site Design and Table 7.1 Bufferyards.
3-C-2-5-H	Hillside and Ridgeline Design Standards -Slopes of Thirty Percent (30%) or More	Development on slopes of 30% will be limited as much as possible. However, this PDP does allow for development in areas of 30% or greater slopes.
3-C-3-2	Water Quality Setback	All new structures located within the Resort Village Planning Neighborhood shall have a minimum Water Quality Setback (WQS) of fifteen feet (15') from the Fraser River, measured from the approximate high-water mark of the river embankment. The PDP allows for limited encroachment for grading and structures within the WQS riparian buffer from the Fraser River within the Resort Village Planning Neighborhood, provided the encroachment enhances public recreational access to the watercourse. Within the proposed River Park area, one (1) constructed concrete or stone low-flow crossing shall be permitted within the watercourse. The proposed low-flow crossing shall meet UDC 3-C-3-2-E7 and shall not endanger adjacent or upstream property owners or fully impede the watercourse. Allowable encroachments to the WQS within the Resort Village Planning Neighborhood shall take into account the retention of existing mature vegetation wherever feasible and maintain at least 60% of the total WQS within the Planning Neighborhood as a vegetated buffer. With the exception of the the Resort Village Planning Neighborhood, all other Planning Neighborhoods shall maintain a WQS of thirty feet (30') as specified in the UDC.
3-H-3	Required Parking	The PDP Plan Area utilizes the Parking Requirements by Use Category outlined in UDC Section 3-H-3, with exceptions as indicated in the PDP for the following: Overnight Accommodations - Hotel: 0.75 spaces required per guest room, 0 spaces required for secondary commercial use such as event rooms or restaurant.
3-H-6	Off Street Loading Requirements	Off-street loading requirements for the Plan Area shall follow UDC Section 3-H-6, except the PDP replaces UDC Table 3-H-6-1 for the quantity of off-street loading spaces with the following: <u>Required Number of Spaces</u> < than or equal to 5,000 SF = 1 space, if determined necessary at MSP review 5,000 to 50,000 SF = 1 space >50,000 and to 300,000 SF = 2 spaces >300,000 SF = 3 spaces The PDP also permits proximate but detached buildings to share off-street loading spaces if applicant is able to demonstrate a clear path for loading between buildings.

UDC Section	UDC Section Title	PDP Section Description
3-I-5	Landscaping | Bufferyards	The PDP modifies UDC Section 3-I-5 for the required location of Landscape Bufferyards based on Planning Neighborhood. The Resort Village and Welcome Village Planning Neighborhoods shall be exempt from bufferyard requirements as defined in the UDC. The Old Town and Retreat Planning Neighborhoods shall provide bufferyards where required per UDC Section 3-I-5. The PDP replaces UDC Table 3-I-5-1 with Table 7.1 Bufferyard Classifications, which describes the planting composition for four different types of bufferyards which vary in the amount of screening they provide.
Town of Winter Park Water and Sanitation District Rules and Regulations - Section 3.C.3.B	Insulation at Water Mains	Due to steep topography, the presence of bedrock, and existing utilities that do not meet burial depth requirements, it will be necessary to utilize polystyrene insulation. Insulation equal to Styrofoam 40 High Load Square EXE, ASTM C518, C578, and D1621 shall be placed over the water or sewer service line and detailed on construction drawings where cover is not able to be maintained and/or where a 9' burial depth cannot be met.
Town of Winter Park Standards and Specifications for Design and Construction Manual - Section 6.2.5,X	Stormwater Detention	Winter Park Resort is in a unique location adjacent to both sides of the Fraser River, which bisects the Base Area. To ensure the peak flows from the site do not coincide with the peak flows from the overall Fraser River Watershed, peak flows from the major and minor storm events will be allowed to release naturally into the adjacent Fraser River undetained regardless of historic discharge rates. This methodology has commonly been called "beat the peak" and has been granted as a variance from Section 6.2.5 of the Town of Winter Park Standards and Specifications for Design and Construction Manual elsewhere within the Fraser River watershed and shall be utilized for the PDP Plan Area. New development shall also comply with the Town's water quality standards and regulations. The "beat the peak" methodology will only apply to the areas of the base that ultimately discharge directly to the Fraser River, and detention will be provided to maintain existing flows where stormwater discharges into neighboring properties.
Town of Winter Park Standards and Specifications for Design and Construction Manual - Section 3.6.1	Grades	This PDP allows a maximum grade of 8.99% for roads.
Town of Winter Park Standards and Specifications for Design and Construction Manual - Section 3.7.4	Grades	This PDP allows a grade of up to 5% for 50 feet. Given existing site constraints, an increase in the allowable grade approaching intersections will reduce site disturbance while still improving roadways from existing conditions.

8. APPENDICES

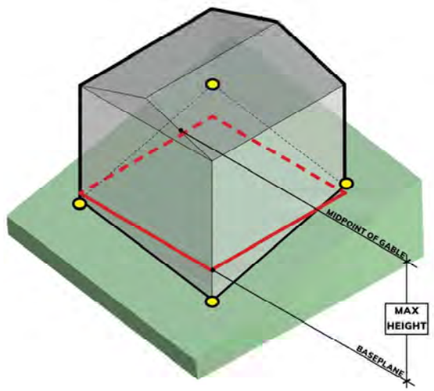
A - Terms and Definitions
B - Water Quality / Drainage Report
C - Utility, Easement & Grading Exhibits
D - Geotech Report
E - Wetland Report
F - Mobility Study

APPENDIX-A
TERMS AND DEFINITIONS

TERMS AND DEFINITIONS:

Applicant - Alterra Mountain Company and where the context so indicates, affiliates and/or successor developers.

Base Area - the area generally comprising the Resort Village Planning Neighborhood and Mountain Base Sub-Area.



Base Plane - a horizontal plane established at the average elevation of the original grade or finished grade, whichever is lower, of the primary corners of a building. The vertical distance above the base plane will establish the overall building height.

Building Height - the vertical distance above a referenced datum, the base plane, measured to the highest point of the coping for a flat roof or the midpoint of a pitched or hipped roof.

Downtown - the central district of the Town of Winter Park, located north of the Plan Area along US Highway 40, containing commercial, residential, and civic uses.

Final Development Plan (FDP) - the second of two phases of provisions for development of a planned development, which may include, but need not be limited to, easements, covenants and restrictions relating to use, location and bulk of buildings and other structures, density of development, utilities, private and public streets, pedestrian areas and parking facilities, common open space and other public facilities.

Mountain - the land area accessible for recreational use, commonly known as the land area within the Ski Boundary, as depicted on the Winter Park Trail Map.

Mountain Base Area Design Guidelines (Base Area Design Guidelines) - the Mountain Base Area Design Guidelines supplement the Town of Winter Park Design Guidelines in order to implement the vision shown in the PDP. The Base Area Design Guidelines will provide guidance on general design intent for the entire Plan Area and specific design guidelines at the parcel level. The Winter Park Base Area Design Review Board will be responsible for review of each MSP against the Base Area Design Guidelines and Town Design Guidelines. The Winter Park Base Area Design Review Board will recommend MSP submittals which satisfy the Town Design Guidelines and the Base Area Design Guidelines to the Town of Winter Park for review, prior to review of the MSP by the Town

against the Town Design Guidelines.

Multi-Use Trail - a paved two-way shared pedestrian/bicycle/other non-motorized vehicle trail.

Open Space - The PDP utilizes the UDC definition of Open Space, which means all areas of a parcel proposed for development that are open from ground to sky and are used for bufferyards, resource protection, outdoor recreation, and leisure areas with permeable ground surfaces, naturalized stormwater best management practices, and vegetative landscaping, except landscape areas that: (1) are used to reduce the depth of a parking stall; and/or (2) are less than five feet (5') in any dimension.

Plan Area - the collective land area of parcels subject to the PDP, as illustrated in Figure 1.2 - Plan Area Site & Context of the PDP.

Planning Neighborhood - a portion of the Plan Area, as depicted on the respective Area Detail maps. The four Planning Neighborhoods are the Resort Village Planning Neighborhood, Welcome Village Planning Neighborhood, Old Town Planning Neighborhood, and Retreat Planning Neighborhood.

Preliminary Development Plan (PDP) - the first of two phases of provisions for development of a planned development, which may include, but need not be limited to, easements, covenants and restrictions relating to use, location and bulk of buildings and other structures, density of development, utilities, private and public streets, pedestrian areas and parking facilities, common open space and other public facilities.

Sub-Area - a portion of a Planning Neighborhood, as depicted on the respective Area Detail map.

Town - the Town of Winter Park, Colorado.

Town Comp Plan - the Town of Winter Park, Imagine Winter Park Comprehensive Plan, adopted in January 2019.

Town of Winter Park Design Guidelines (Town Design Guidelines) - the Design Guidelines provided by the Town as a policy document to alert builders, developers, and property owners to the Town's desired style of future development and incorporated into the UDC in Section 3-A-8.

Town UDC - the Town of Winter Park Unified Development Code, as may be amended.

Winter Park Mobility Study - the mobility study prepared for Alterra Mountain Company by Fehr & Peers.

Winter Park Resort - the ski areas on the Mountain and related operations and amenities.

Woonerf - a curbless, shared street designed to prioritize pedestrian movement while accommodating vehicles at reduced speeds. Proposed woonerf locations will be identified in the Base Area Design Guidelines and future FDPs.

APPENDIX-B
WATER QUALITY / DRAINAGE REPORT

DRAINAGE LETTER

FOR WINTER PARK RESORT – PRELIMINARY DEVELOPMENT PLAN

85 PARSENN RD

WINTER PARK, COLORADO 80482

FOR

TOWN OF WINTER PARK

50 VAZQUEZ ROAD
WINTER PARK, CO 80482

JVA, INC.

CONSULTING ENGINEERS

1319 SPRUCE STREET

BOULDER, CO

PHONE: 303-444-1951

JVA PROJECT NUMBER: 3494.2C

JUNE 26, 2024

JVA, Incorporated
1319 Spruce Street
Boulder, CO 80302
303.444.1951
info@jvajva.com

www.jvajva.com

July 19, 2024

James Shockey, Community Development Director
Town of Winter Park
50 Vazquez Road
P.O. Box 3327
Winter Park, Colorado 80482

RE: Drainage Letter for Winter Park Resort – Preliminary Development Plan
JVA, Inc. Job No. 3494.2c

Dear James:

Introduction

Alterra Mountain Co. is proposing to redevelop the Winter Park Resort base area and associated properties with improvements to commercial, hospitality, recreation, and various residential land uses. The intent of this drainage letter illustrates existing drainage conditions for the site as well as proposed conditions with preliminary design concepts for the Preliminary Development Plan (PDP) for the base area. The purpose of this report is to conceptually demonstrate that the water quality and developed runoff impacts can be appropriately mitigated in accordance with the requirements and standards for development in the Town of Winter Park.

Location

The proposed redevelopment will be to the existing Winter Park Resort base area, located along the south side of US Highway 40 (US 40) adjacent to both banks of the Fraser River. The existing property is approximately 167.60-acres and consists of trees, native vegetation, landscaped areas, paved and unpaved pedestrian areas, asphalt and gravel drives, paved and gravel parking areas, and buildings.

Existing

For the historic analysis, existing drainage basins and our site limits have been delineated as depicted in Figure 1. Basin OS2 is an area of the site designated for development, that will be further analyzed once survey data is received. The total impervious area for the existing 178.05-acres within the boundaries analyzed was 24.0%.

JVA, Incorporated
1319 Spruce Street
Boulder, CO 80302
303.444.1951
info@jvajva.com

www.jvajva.com

Historic Basin Information:

Basin Name	Design Point	Area (acres)	Imperviousness (%)	Q100 (cfs)
H1	1	43.02	11.1	71.90
H2	2	14.09	15.1	39.52
H3	3	11.67	74.9	37.03
H4	4	47.26	31.6	110.48
Z1	5	6.50	51.6	21.16
OS1	6	47.34	18.4	81.38
OS2	7	8.17	2.0	17.61
Total	-	178.05	24.0	369.08

Proposed

As shown in Figure 2, for this analysis, the proposed drainage conditions were analyzed within the same basin boundaries as the historic. OS2 is an area of the site designated for development, that will be further analyzed once survey data is received. Basin A4 (Historic "H4") contains a complex drainage system that will need to be analyzed in detail going forward. The total impervious area for the proposed 178.05-acres within the boundaries analyzed is 33.3%, a total increase of approximately 9.3%.

Proposed Basin Information:

Basin Name	Design Point	Area (acres)	Imperviousness (%)	Q100 (cfs)
A1	1	43.02	15.8	77.84
A2	2	14.09	31.0	35.41
A3	3	11.67	42.9	31.55
A4	4	47.26	47.2	125.35
B1	5	6.50	51.5	21.14
OS1	6	47.34	34.8	91.17
OS2	7	8.17	12.9	19.75
Total	-	178.05	33.3	402.22

CONSULTING ENGINEERS

JVA, Incorporated
1319 Spruce Street
Boulder, CO 80302
303.444.1951
info@jvajva.com

www.jvajva.com

Detention and Water Quality

Winter Park Resort is in a unique location adjacent to both sides of the Fraser River, which bisects the base area. To ensure the peak flows from the site do not coincide with the peak flows from the overall Fraser River Watershed, peak flows from the major and minor storm events will be allowed to release naturally into the adjacent Fraser River undetained regardless of historic discharge rates. This methodology has commonly been called “beat the peak”.

In order to improve and maintain the stormwater quality of runoff to the Fraser river a water quality strategy will be implemented utilizing the best management practices defined by the Mile High Flood District Urban Storm Drainage Criteria Manual. The main strategy to be used is mechanical separation through the use of underground storm sewer pipe networks to convey runoff to water quality manholes that discharge to the watershed. In addition to mechanical separation the use of grass buffers, low gradient grass lined swales, and infiltration basins will be implemented where feasible to further enhance site stormwater quality.

Conclusion

In summary, this drainage letter illustrates existing drainage conditions for the site as well as preliminary design concepts for the Final Development Plan (FDP). There will be no proposed onsite detention and the drainage design will be solely in consideration of water quality. The above analysis begins to conceptually demonstrate that the water quality and developed runoff impacts can be appropriately mitigated in accordance with the requirements for development in the Town of Winter Park. All Water Quality implementation will follow existing Town of Winter Park standards.

Sincerely,

JVA, Inc.

_____

Dylan Dunn, P.E.
Project Engineer

_____

Sam Redfield, P.E.
Project Manager

JVA Incorporated
PO Box 1860
47 Cooper Creek Way, S 328
Winter Park, CO 80482
Ph: (970) 722 7677

Job Name: Winter Park Resort FDP
Job Number: 3494.2c
Date: 7/19/24
By: DAM

Winter Park Resort FDP

Historic Runoff Coefficient & Time of Concentration Calculations

Location: Winter Park, CO
Minor Design Storm: 5
Major Design Storm: 100
Soil Type: C/D

Basin Design Data

	I (%) =	100%	90%	90%	40%	25%	25%	2%	2%			I (%)	Runoff Coeff's			
Basin Name	Design Point	$A_{paved\ streets}$ (sf)	$A_{drives/conc}$ (sf)	A_{roof} (sf)	A_{gravel} (sf)	A_{plygnd} (sf)	$A_{art.\ turf}$ (sf)	$A_{lscape\ (B\ soil)}$ (sf)	$A_{lscape\ (C/D\ soil)}$ (sf)	A_{Total} (sf)	A_{Total} (ac)	Imp (%)	C2	C5	C10	C100
H1	1	97,767	0	4,220	185,025	0	0	0	1,586,919	1,873,931	43.02	11.1%	0.07	0.13	0.21	0.53
H2	2	47,565	247	713	86,958	0	0	0	478,085	613,568	14.09	15.1%	0.10	0.16	0.24	0.55
H3	3	335,524	18,965	26,629	3,882	0	0	0	123,341	508,341	11.67	74.9%	0.60	0.65	0.69	0.79
H4	4	439,515	39,963	117,685	106,302	0	0	0	1,355,399	2,058,863	47.26	31.6%	0.23	0.29	0.37	0.61
Z1	5	80921.6175	0	69492.6	0	0	0	0	132,761	283,175	6.50	51.6%	0.40	0.46	0.51	0.70
OS1	6	194965	0	0	385425	0	0	0	1,481,701	2,062,091	47.34	18.4%	0.12	0.19	0.27	0.56
OS2	7	0	0	0	0	0	0	0	356,098	356,098	8.17	2.0%	0.01	0.05	0.15	0.49
TOTAL SITE		1,196,258	59,175	218,739	767,591	0	0	0	5,514,305	7,756,068	178.05	24.0%	0.17	0.23	0.31	0.58

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Winter Park, CO 80482
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Job Name: Winter Park Resort FDP
Job Number: 3494.2c
Date: 7/19/24
By: DAM

Winter Park Resort FDP

Composite Runoff Coefficient Calculations

Location: Winter Park, CO
Minor Design Storm: 5
Major Design Storm: 100
Soil Type: C/D

CA 100yr = 0.78i + 0.11
CB 100yr = 0.47i + 0.426
CC/D 100yr = 0.41i + 0.484)

Basin Design Data

	I (%) =	100%	90%	90%	40%	25%	25%	2%	2%			I (%)	Runoff Coeff's			
Basin Name	Design Point	$A_{paved\ streets}$ (sf)	$A_{drives/conc}$ (sf)	A_{roof} (sf)	A_{gravel} (sf)	A_{plygnd} (sf)	$A_{art.\ turf}$ (sf)	$A_{lscape\ (B\ soil)}$ (sf)	$A_{lscape\ (C/D\ soil)}$ (sf)	A_{Total} (sf)	A_{Total} (ac)	Imp (%)	C2	C5	C10	C100
A1	1	145,578	42,836	75,508	28,635	0	0	0	1,581,374	1,873,931	43.02	15.8%	0.10	0.16	0.25	0.55
A2	2	89,893	35,546	59,648	16,027	0	0	0	412,454	613,568	14.09	31.0%	0.22	0.29	0.36	0.61
A3	3	50,717	74,971	103,393	3,703	0	0	0	275,557	508,341	11.67	42.9%	0.32	0.39	0.45	0.66
A4	4	339,331	220,525	449,913	20,187	0	0	0	1,028,906	2,058,863	47.26	47.2%	0.36	0.42	0.48	0.68
B1	5	79,337	1,366	69,493	0	0	0	0	132,980	283,175	6.50	51.5%	0.39	0.46	0.51	0.70
OS1	6	291,290	150,000	270,000	54,441	0	0	0	1,296,360	2,062,091	47.34	34.8%	0.25	0.32	0.39	0.63
OS2	7	7,894	13,751	21,629	0	0	0	0	312,824	356,098	8.17	12.9%	0.08	0.14	0.23	0.54
TOTAL SITE		1,004,040	538,995	1,049,584	122,993	0	0	0	5,040,456	7,756,068	178.05	33.3%	0.24	0.31	0.38	0.62

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Winter Park, CO 80482
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Job Number: 3494.2c
Date: 7/19/24
By: DAM

Winter Park Resort FDP

Time of Concentration Calculations

Location:	Wheat Ridge
Minor Design Storm:	5
Major Design Storm:	100
Soil Type:	C/D

Sub-Basin Data				Initial Overland Time (t_i)			Travel Time (t_t) t_t=Length/(Velocity x 60)						t_c Comp	tc Urbanized Check ON		t_c Final
Basin Name	Design Point	A_{Total} (ac)	C5	Upper most Length (ft)	Slope (%)	t_i (min)	Length (ft)	Slope (%)	Type of Land Surface	C_v	Velocity (fps)	t_t (min)	Time of Conc $t_i + t_t = t_c$	Total Length (ft)	t_c=(L/180) +10 (min)	Min t_c
A1	1	43.02	0.16	500	33.0%	12.0	1200	15.0%	Paved areas & shallow paved swales	20	7.7	2.6	14.5	1700	19.4	14.5
A2	2	14.09	0.29	300	33.0%	8.0	175	10.0%	Paved areas & shallow paved swales	20	6.3	0.5	8.5	475	12.6	8.5
A3	3	11.67	0.39	20	5.0%	3.4	1400	5.0%	Paved areas & shallow paved swales	20	4.5	5.2	8.6	1420	17.9	8.6
A4	4	47.26	0.42	50	10.0%	4.1	1500	5.0%	Paved areas & shallow paved swales	20	4.5	5.6	9.7	1550	18.6	9.7
B1	5	6.50	0.46	20	5.0%	3.1	1000	10.0%	Paved areas & shallow paved swales	20	6.3	2.6	5.7	1020	15.7	5.7
OS1	6	47.34	0.32	500	5.0%	18.7	720	25.0%	Paved areas & shallow paved swales	20	10.0	1.2	19.9	1220	16.8	16.8
OS2	7	8.17	0.14	100	20.0%	6.5			Paved areas & shallow paved swales	20	0.0	0.0	6.5	100	10.6	6.5

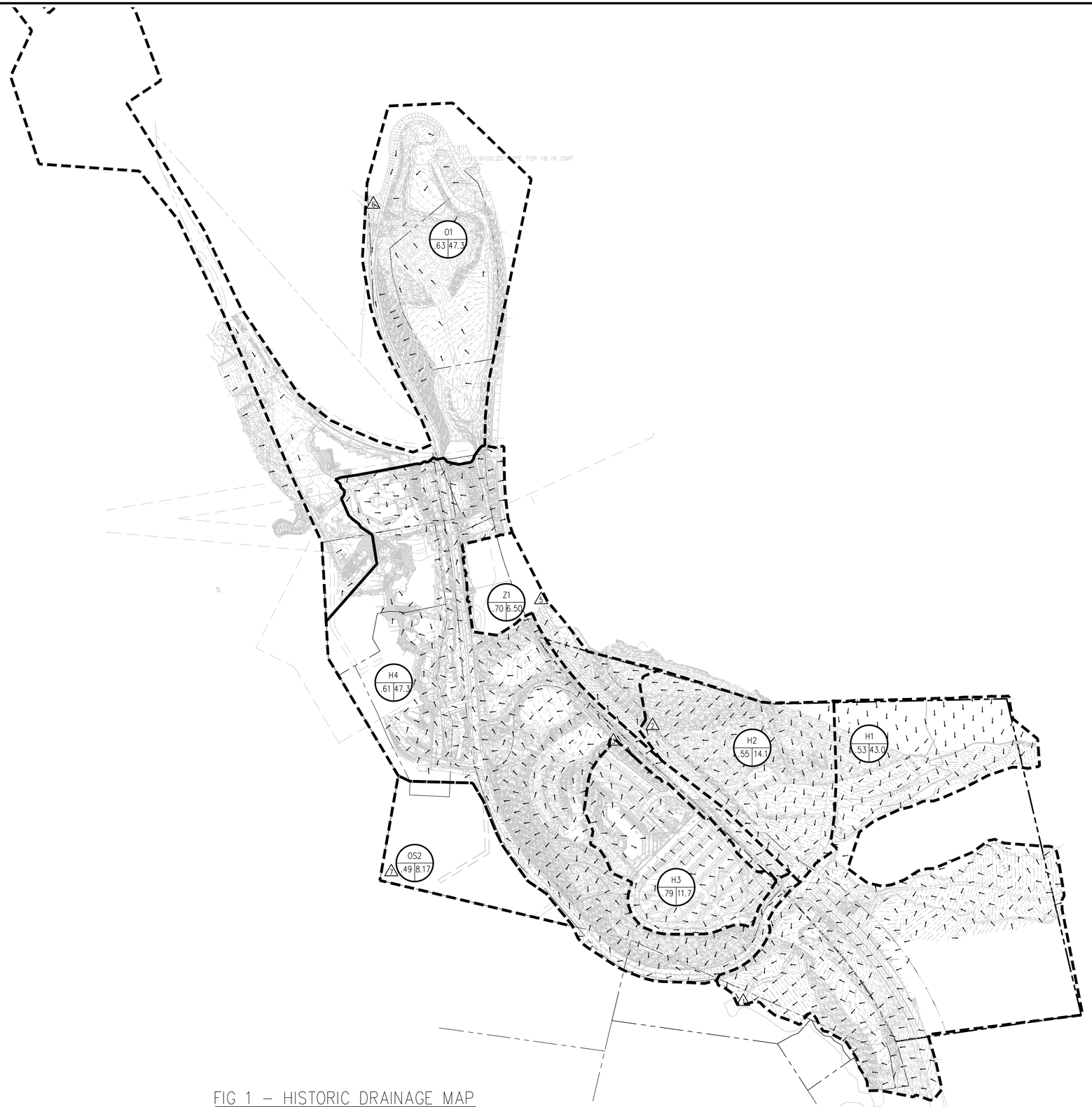
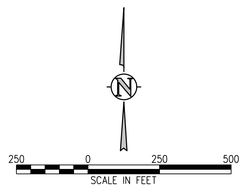


FIG 1 – HISTORIC DRAINAGE MAP



HISTORIC DRAINAGE SUMMARY				
BASIN	DESIGN POINT	AREA(AC)	5YR-COEF	100YR-COEF
H1	1	43.02	0.13	0.53
H2	2	14.09	0.16	0.55
H3	3	11.67	0.65	0.79
H4	4	47.26	0.29	0.61
Z1	5	06.50	0.46	0.70
OS1	6	47.34	0.19	0.56
OS2	7	08.17	0.05	0.49

DRAINAGE MAP LEGEND

- EXISTING INDEX CONTOUR (5220)
- EXISTING INTERMEDIATE CONTOUR (5221)
- PROPOSED INDEX CONTOUR (20)
- PROPOSED INTERMEDIATE CONTOUR (21)
- +03.3 EXISTING SPOT ELEVATION
- +03.54 PROPOSED SPOT ELEVATION
- HISTORIC DRAINAGE BASIN BOUNDARY (MAJOR BASIN)
- HISTORIC DRAINAGE BASIN BOUNDARY (SUB BASIN)
- DEVELOPED DRAINAGE BASIN BOUNDARY (MAJOR BASIN)
- DEVELOPED DRAINAGE BASIN BOUNDARY (SUB BASIN)
- DIRECTION OF FLOW (HISTORIC)
- DIRECTION OF FLOW (DEVELOPED)
- 1 BASIN DESIGN POINT
- A / 50 / 1.0 DRAINAGE BASIN IDENTIFICATION BUBBLE

A = DEVELOPED BASIN DESIGNATION
.50 = 100-YR RUNOFF COEFFICIENT
1.0 = AREA ACRES

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HISTORIC DRAINAGE EXHIBIT

SHEET NO.
FIG-1

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FIG 2 – DEVELOPED DRAINAGE MAP

250 0 250 500
SCALE IN FEET

DEVELOPED DRAINAGE SUMMARY				
BASIN	DESIGN POINT	AREA(AC)	5YR-RUNOFF	100YR-RUNOFF
A1	1	43.02	0.16	0.55
A2	2	14.09	0.29	0.61
A3	3	11.67	0.39	0.66
A4	4	47.26	0.42	0.68
B1	5	06.50	0.46	0.70
OS1	6	47.34	0.32	0.63
OS2	7	08.17	0.14	0.54

DRAINAGE MAP LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- HISTORIC DRAINAGE BASIN BOUNDARY (MAJOR BASIN)
- HISTORIC DRAINAGE BASIN BOUNDARY (SUB BASIN)
- DEVELOPED DRAINAGE BASIN BOUNDARY (MAJOR BASIN)
- DEVELOPED DRAINAGE BASIN BOUNDARY (SUB BASIN)
- DIRECTION OF FLOW (HISTORIC)
- DIRECTION OF FLOW (DEVELOPED)
- BASIN DESIGN POINT
- DRAINAGE BASIN IDENTIFICATION BUBBLE

A = DEVELOPED BASIN DESIGNATION
.50 = 100-YR RUNOFF COEFFICIENT
1.0 = AREA ACRES

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DEVELOPED DRAINAGE EXHIBIT

SHEET NO.
FIG-2

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APPENDIX-C
UTILITY, EASEMENT & GRADING EXHIBITS

APPROX LOCATION OF
200' RAILROAD EASEMENT

STORM MANHOLE
RIM ELEV: 9110.39'

STORM MANHOLE
RIM ELEV: 9110.48'

STORM MANHOLE
RIM ELEV: 9093.04'

MATCHLINE – SEE SHEET EX-1.2

100 0 100 200
SCALE IN FEET

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ACCESS & MISC EASEMENTS

SHEET NO.

EX-1.1

MATCHLINE – SEE SHEET EX-1.1

STORM MANHOLE
RIM ELEV: 9093.04'

SANITARY MANHOLE
RIM ELEV: 9094.12'

AREA DRAIN
RIM ELEV: 9093.00'

ACCESS EASEMENT

14' ROAD EASEMENT

30' ROAD EASEMENT

30' PEDESTRIAN WALKWAY EASEMENT

ROAD EASEMENT

AREA DRAIN
RIM ELEV: 9092.60'

STORM MANHOLE
RIM ELEV: 9093.59'

14' ROAD EASEMENT

24' ACCESS EASEMENT

100' TRAMWAY EASEMENT

STORM MANHOLE
RIM ELEV: 9159.84'

STORM MANHOLE
RIM ELEV: 9159.47'

STORM GRATE
GRATE ELEV: 9182.58'

STORM GRATE
GRATE ELEV: 9175.64'

STORM GRATE
GRATE ELEV: 9159.67'

STORM GRATE
GRATE ELEV: 9150.28'

SNOW MAKING LINE EASEMENT

PARKING EASEMENT #3

AREA DRAIN
RIM ELEV: 9124.42'

AREA DRAIN
RIM ELEV: 9119.01'

AREA DRAIN
RIM ELEV: 9123.53'

AREA DRAIN
RIM ELEV: 9124.03'

AREA DRAIN
RIM ELEV: 9121.08'

STORM GRATE
GRATE ELEV: 9133.25'

STORM MANHOLE

N

100 0 100 200
SCALE IN FEET

MATCHLINE – SEE SHEET EX-1.3

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ACCESS & MISC EASEMENTS

SHEET NO.
EX-1.2

MATCHLINE – SEE SHEET EX-1.2

PARKING EASEMENT #3

PARKING EASEMENT C

TRAMWAY EASEMENT

PARKING EASEMENT #3

PARKING EASEMENT #2

LANDSCAPE EASEMENT

ACCESS EASEMENT #2

PARKING EASEMENT D

ACCESS EASEMENT #3

PARKING EASEMENT 5A

PARKING EASEMENT #1

PARKING EASEMENT A

ACCESS EASEMENT 4C

PARKING EASEMENT 5B

PSCO EASEMENT

ACCESS EASEMENT 4

ACCESS EASEMENT #1

AREA DRAIN
RIM ELEV: 9124.03

STORM MANHOLE
RIM ELEV: 9127.24'

STORM GRATE
GRATE ELEV: 9133.25

SANITARY MANHOLE
RIM ELEV: 9204.93'

SANITARY MANHOLE
RIM ELEV: 9206.74'

SANITARY MANHOLE
RIM ELEV: 9208.85'

75.64'

ORM GRATE
!ATE ELEV: 9196.67'

STORM GRATE
GRATE ELEV: 9[illegible]0.28'

9216.04'

9216.84'

100 0 100 200
SCALE IN FEET

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ACCESS & MISC EASEMENTS

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EX-1.3

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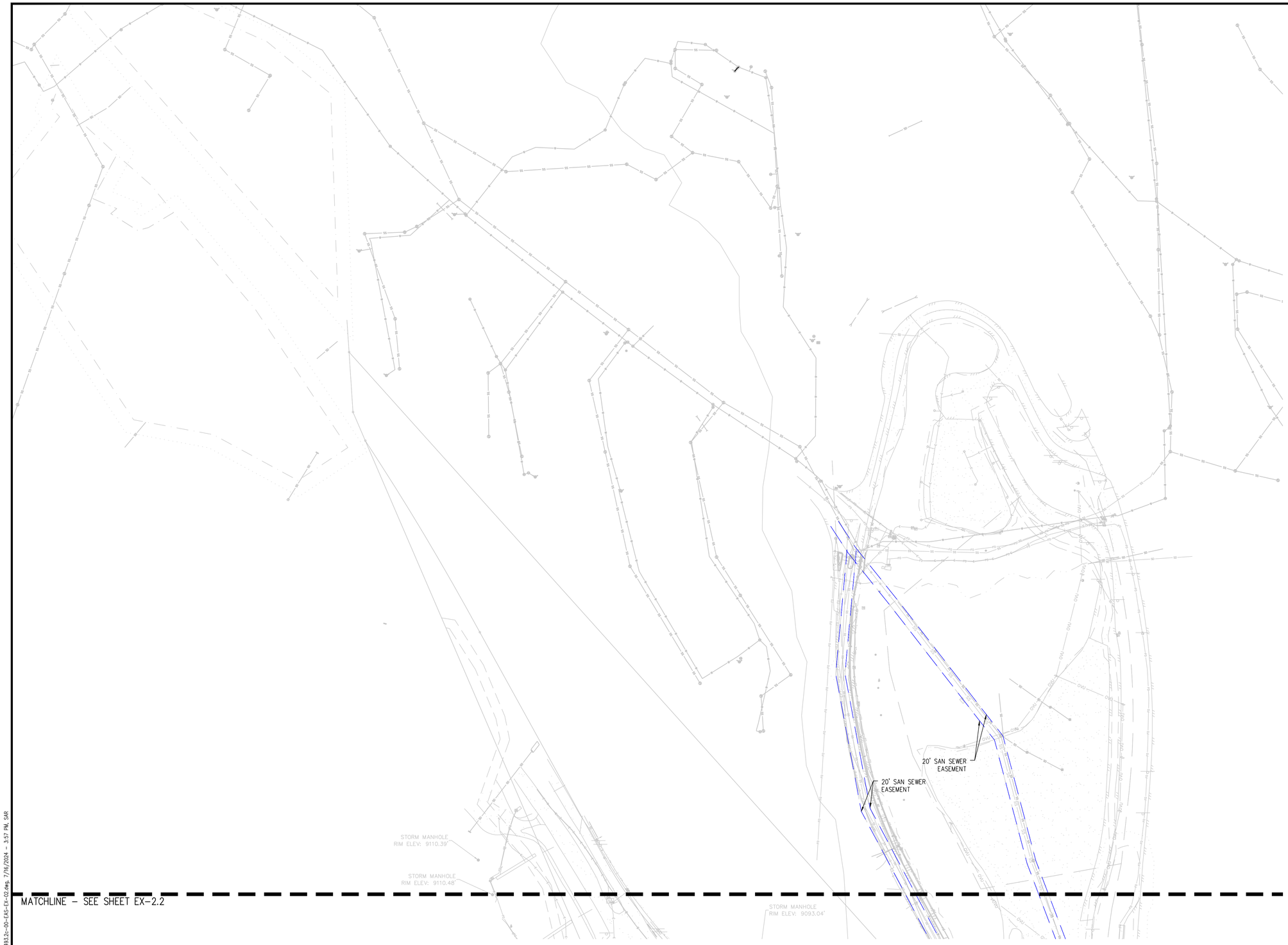

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WET UTILITY EASEMENTS

SHEET NO.

EX-2.1

K:\3494.2c-Winter Park Resort FDP\Drawings\3493.2c-00-EAS-EX-02.dwg, 7/16/2024 - 3:57 PM, SAR

MATCHLINE – SEE SHEET EX-2.1

STORM MANHOLE
RIM ELEV: 9093.04'

SANITARY MANHOLE
RIM ELEV: 9094.12'

100' DENVER WATER
SIPHON EASEMENT

AREA DRAIN
RIM ELEV: 9093.05'

MIS. WET UTILITY
EASEMENTS (TYP)

30' WET UTILITY
EASEMENT

100' DENVER WATER
SIPHON EASEMENT

30' WET UTILITY
EASEMENT

AREA DRAIN
RIM ELEV: 9092.60'

STORM MANHOLE
RIM ELEV: 9093.59'

20' WET UTILITY
EASEMENT

MISC. WET UTILITY
EASEMENT

STORM MANHOLE
RIM ELEV: 9159.84'

STORM MANHOLE
RIM ELEV: 9159.47'

STORM GRATE
GRATE ELEV: 9182.58'

STORM GRATE
GRATE ELEV: 9175.64'

STORM GRATE
GRATE ELEV: 9159.67'

STORM GRATE
GRATE ELEV: 9150.28'

AREA DRAIN
RIM ELEV: 9124.42'

AREA DRAIN
RIM ELEV: 9119.01'

AREA DRAIN
RIM ELEV: 9123.53'

AREA DRAIN
RIM ELEV: 9124.03'

AREA DRAIN
RIM ELEV: 9121.08'

STORM GRATE
GRATE ELEV: 9133.25'

STORM MANHOLE

100 0 100 200
SCALE IN FEET

MATCHLINE – SEE SHEET EX-2.3

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WINTER PARK, GRAND COUNTY, CO

WET UTILITY EASEMENTS

SHEET NO.
EX-2.2

MATCHLINE – SEE SHEET EX-2.2

75.64'

ORM GRATE
!ATE ELEV: 9195.67'

STORM GRATE
GRATE ELEV: 9[illegible]0.28'

AREA DRAIN
RIM ELEV: 9124.03'

STORM MANHOLE
RIM ELEV: 9127.24'

STORM GRATE
GRATE ELEV: 9133.25'

SANITARY MANHOLE
RIM ELEV: 9204.93'

SANITARY MANHOLE
RIM ELEV: 9206.74'

SANITARY MANHOLE
RIM ELEV: 9208.95'

UTILITY
EASEMENT #4
(RE: SURVEY)

UTILITY
EASEMENT #2
(RE: SURVEY)

9216.04'

9216.84'

UTILITY
EASEMENT #8
(RE: SURVEY)

20' WATERLINE
EASEMENT

20' WATERLINE
EASEMENT

100 0 100 200
SCALE IN FEET

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WET UTILITY EASEMENTS

SHEET NO.

EX-2.3

STORM MANHOLE
RIM ELEV: 9110.39'

STORM MANHOLE
RIM ELEV: 9110.48'

STORM MANHOLE
RIM ELEV: 9093.04'

MATCHLINE – SEE SHEET EX-3.2

100 0 100 200
SCALE IN FEET

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DRY UTILITIES EASEMENTS

SHEET NO.
EX-3.1

MATCHLINE – SEE SHEET EX-3.1

STORM MANHOLE
RIM ELEV: 9093.04'

SANITARY MANHOLE
RIM ELEV: 9094.12'

AREA DRAIN
RIM ELEV: 9093.69'

MOUNTAIN PARKS
ELECTRICAL EASEMENT

20' ELEC
EASEMENT

20' TCI CABLE
EASEMENT

AREA DRAIN
RIM ELEV: 9092.60'

STORM MANHOLE
RIM ELEV: 9093.59'

20' TCI CABLE
EASEMENT

STORM GRATE
GRATE ELEV: 9175.64'

STORM MANHOLE
RIM ELEV: 9159.84'

STORM MANHOLE
RIM ELEV: 9159.47'

STORM GRATE
GRATE ELEV: 9182.58'

STORM GRATE
GRATE ELEV: 9176.67'

STORM GRATE
GRATE ELEV: 9160.28'

20' ELEC
EASEMENT

AREA DRAIN
RIM ELEV: 9124.42'

AREA DRAIN
RIM ELEV: 9119.01'

AREA DRAIN
RIM ELEV: 9123.53'

AREA DRAIN
RIM ELEV: 9124.03'

AREA DRAIN
RIM ELEV: 9121.08'

STORM GRATE
GRATE ELEV: 9133.25'

STORM MANHOLE

MATCHLINE – SEE SHEET EX-3.3

N

100 0 100 200
SCALE IN FEET

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DRY UTILITIES EASEMENTS

SHEET NO.
EX-3.2

MATCHLINE – SEE SHEET EX-3.2

75.64'

STORM GRATE
GRATE ELEV: 9196.67'

STORM GRATE
GRATE ELEV: 9200.28'

AREA DRAIN
RIM ELEV: 9124.03'

STORM MANHOLE
RIM ELEV: 9127.24'

STORM GRATE
GRATE ELEV: 9133.25'

20' ELEC
EASEMENT

SANITARY MANHOLE
RIM ELEV: 9204.93'

SANITARY MANHOLE
RIM ELEV: 9206.74'

SANITARY MANHOLE
RIM ELEV: 9208.36'

20' TCI CABLE
EASEMENT

20 ' ELEC
EASEMENT

UTILITY EASEMENT #1

9216.04'

9216.84'

100 0 100 200
SCALE IN FEET

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CONSULTING ENGINEERS

JVA, Inc.
47 Cooper Creek Way
Winter Park, CO 80482
www.jvajva.com
PO Box 1860
Suite 328
970.722.7677
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

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DRAWN BY:	DAD
CHECKED BY:	SAR/KEV
JOB #:	3494.2c
DATE:	07/19/2024

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WINTER PARK, GRAND COUNTY, CO

DRY UTILITIES EASEMENTS

SHEET NO.
EX-3.3

LEGEND

AREAS OF SURFACE WITH SLOPE GREATER THAN 30%

250 0 250 500

SCALE IN FEET

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EXISTING SURFACE SLOPE STUDY

SHEET NO.

EX-4.0

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UTILITY MAP LEGEND

- W — EXISTING DOMESTIC WATER
- SS — EXISTING SANITARY SEWER
- SD — EXISTING STORM SEWER
- G — EXISTING NATURAL GAS
- OE — EXISTING OVERHEAD ELECTRIC
- UE — EXISTING UNDERGROUND ELECTRIC
- FO — EXISTING FIBER OPTIC
- W — PROPOSED WATER
- SS — PROPOSED SANITARY SEWER
- SD — PROPOSED STORM SEWER
- FO — PROPOSED FIBER OPTIC ROUTING
- DEMO EXISTING UTILITY

GENERAL NOTES:

ALL EXISTING ELEC, FO, AND GAS SERVICES TO BALCONY HOUSE TO BE DEMOLISHED. SEVERAL UTILITIES ROUTE TO WEST PORTAL THROUGH BALCONY HOUSE. THOSE CONNECTION POINTS TO WEST PORTAL TO BE RE-USED IF POSSIBLE IN FUTURE DESIGN.

N

100 0 100 200
SCALE IN FEET

PROPOSED WATER MAIN LOOP TO CONNECT TO EXISTING MAIN CROSSING UNDER RAILROAD (COORDINATE W/ WPWSD)

RE-ROUTE FO AND UNDERGROUND ELECTRIC

PROPOSED SANITARY CONNECTION TO NEW BUILDINGS

EXIST SANITARY SEWER MAIN

PROPOSED CDS STORM SEPARATOR

DRAINAGE PATH RE ROUTE, MAJOR WETLANDS IN THIS AREA, CONSIDER MOVING BUILDINGS OUT OF WETLANDS

RE-ROUTE OR UNDERGROUND OHE

EXIST GAS (TYP)

EXIST PVC SANITARY MAIN

PROPOSED SANITARY SEWER MAIN (TYP)

STORM MANHOLE RIM ELEV: 9110.39'

STORM MANHOLE RIM ELEV: 9110.48'

STORM MANHOLE RIM ELEV: 9093.04'

PROPOSED WATER MAIN LOOP TO

MATCHLINE - SEE SHEET EX-02

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CONSULTING ENGINEERS
JVA, Inc. PO Box 1860
47 Cooper Creek Way Suite 328
Winter Park, CO 80482 970.722.7677
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OVERALL UTILITY EXHIBIT

SHEET NO.
EX 01

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MATCHLINE – SEE SHEET EX-01

PROPOSED WATER MAIN LOOP TO CONNECT TO EXISTING MAIN CROSSING UNDER RAILROAD (COORDINATE W/ WPWSD)

EXIST PVC SANITARY MAIN

EXIST FIBER OPTIC (TYP)

EXIST UNDERGROUND ELEC (TYP)

EXIST SANITARY SEWER MAIN

APPROXIMATE WATER ROUTING DRAWN IN FROM GIS, TYP

DEMO EXIST WATER METERS, FDC'S, & HYDRANTS ASSOCIATED WITH THE ADMIN & BALCONY HOUSE,

CONNECT EXISTING WEST PORTAL SANITARY TO NEW MAIN

PROTECT EXITST UTILITY RIVER CROSSINGS IN PLACE, TYPICAL ALL PHASES

PROPOSED CDS STORM SEPARATOR

DEMO EXIST SANITARY SEWER TO THIS MANHOLE,

SANITARY SEWER RE-ROUTE

EXIST SANITARY SEWER MAIN (TYP)

CURRENTLY NO WATER QUALITY FOR STORM DISCHARGE, TYPICAL, ADD STORM SCEPTERS

EXISTING SANITARY GOES THROUGH EXISTING ADMIN BUILDING HERE

STORM SEWER RE-ROUTE

DEMO UTILITY SERVICES WITHIN BUILDING FOUNDATION, ROUTE NEW SERVICE LINES TO CONNECTION POINTS

PROPOSED CDS STORM SEPARATOR (TYP)

EXIST SANITARY SEWER MAIN

PROPOSED STORM SEWER MAIN

PROPOSED CDS STORM SEPARATOR

UTILITY CORRIDOR TO REMAIN

PROTECT WATER MAIN IN PLACE

PROPOSED CDS STORM SEPARATOR

EXIST SANITARY SEWER MAIN

RE-ROUTE STORM SEWER MAIN

PROPOSED CDS STORM SEPARATOR

APPROXIMATE WATER ROUTING DRAWN IN FROM GIS, TYP

POSSIBLE LOCATION FOR LANDSCAPE BUFFER

RE-ROUTE FO

EXIST 8" PVC

REMOVE EXISTING BOX CULVERT BRIDGE

EXIST SANITARY MAIN

MATCHLINE – SEE SHEET EX-03

UTILITY MAP LEGEND

- W — EXISTING DOMESTIC WATER
- SS — EXISTING SANITARY SEWER
- SD — EXISTING STORM SEWER
- G — EXISTING NATURAL GAS
- OE — EXISTING OVERHEAD ELECTRIC
- UE — EXISTING UNDERGROUND ELECTRIC
- FO — EXISTING FIBER OPTIC
- W — PROPOSED WATER
- SS — PROPOSED SANITARY SEWER
- SD — PROPOSED STORM SEWER
- FO — PROPOSED FIBER OPTIC ROUTING
- DEMO EXISTING UTILITY

GENERAL NOTES:

ALL EXISTING ELEC, FO, AND GAS SERVICES TO BALCONY HOUSE TO BE DEMOLISHED. SEVERAL UTILITIES ROUTE TO WEST PORTAL THROUGH BALCONY HOUSE. THOSE CONNECTION POINTS TO WEST PORTAL TO BE RE-USED IF POSSIBLE IN FUTURE DESIGN.

N

100 0 100 200
SCALE IN FEET

CONSULTING ENGINEERS
JVA, Inc. PO Box 1860
47 Cooper Creek Way Suite 328
Winter Park, CO 80482 970.722.7677
www.jvajva.com
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EX 02

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MATCHLINE – SEE SHEET EX-02

UTILITY MAP LEGEND

- EXISTING DOMESTIC WATER
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING NATURAL GAS
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND ELECTRIC
- EXISTING FIBER OPTIC
- PROPOSED WATER
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED FIBER OPTIC ROUTING
- DEMO EXISTING UTILITY

GENERAL NOTES:

ALL EXISTING ELEC, FO, AND GAS SERVICES TO BALCONY HOUSE TO BE DEMOLISHED. SEVERAL UTILITIES ROUTE TO WEST PORTAL THROUGH BALCONY HOUSE. THOSE CONNECTION POINTS TO WEST PORTAL TO BE RE-USED IF POSSIBLE IN FUTURE DESIGN.

N

100 0 100 200
SCALE IN FEET

PROPOSED CDS STORM SEPARATOR

EXIST SANITARY SEWER MAIN

EXIST FIBER OPTIC (TYP)

APPROCIMATE WATER ROUTING DRAWN FROM GIS, TYP

NEW STORM SEWER CONNECTION MAIN

CONNECT PAVEMENT SUBSURFACE DRAINAGE SYSTEM TO STORM SEWER OUTFALLS (TYP)

SANITARY SEWER MAIN RE-ROUTE

WATER MAIN RE-ROUTE

STORM MAIN RE-ROUTE

PROTECT EXISTING RAW WATER SIPHON LINE IN PLACE

EXTEND WATER MAIN AND SS MAINS ACROSS HIGHWAY 40 FOR FUTURE CONNECTION TO JIM CREEK AREA

EXIST OVERHEAD ELEC (TYP)

EXIST WATER SIPHON MAIN, PROTECT IN PLACE

EXIST FIBER OPTIC (TYP)

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47 Cooper Creek Way Suite 328
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APPENDIX-D
GEOTECH REPORT

Kumar & Associates, Inc.
Geotechnical and Materials Engineers
and Environmental Scientists

ACEC
MEMBER

240 Annie Road | PO Drawer 1887
Silverthorne, Colorado 80498
Fax: (970) 468-5891
Phone: (970) 468-1989
Email: hpksummit@kumarusa.com

Office Locations: Denver (HQ), Colorado Springs, Fort Collins, Glenwood Springs Parker and Summit County, Colorado

PRELIMMINARY GEOTECHNICAL ENGINEERING STUDY
PROPOSED WINTER PARK MASTER PLAN PHASE 1
U.S. HIGHWAY 40 AND WINTER PARK DRIVE
WINTER PARK, COLORADO

Prepared by:

James A. Parker, P.E, P.G

Reviewed by:

Steven L. Pawlak, P.E.

PREPARED FOR:

ALTERRA MOUNTAIN COMPANY
ATTN: STEVEN PETERSON
3501 WAZEE STREET, SUITE 400
DENVER, COLORADO 80216

speterson@alterramtnco.com

Project No. 22-6-160.01

December 21, 2022

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FIG. 1 – VICINITY MAP
FIG. 2 – LOCATION OF EXPLORATORY BORINGS
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APPENDIX A – WINTER PARK CORE GEOTECHNICAL STUDY DATA (Project No. 05-1-390)

PURPOSE AND SCOPE OF STUDY

This report presents the results of a preliminary geotechnical engineering study for the proposed Winter Park Master Plan Phase 1 project, located at U.S. Highway 40 and Winter Park Drive, in Winter Park, Colorado. The project vicinity is shown on Fig. 1, and the project area is shown on Fig. 2. Kumar & Associates previously performed a geotechnical engineering study update to the 2005 report for the workforce housing portion of the project, located in the southern portion of the project area, as shown on Fig. 2, and presented findings and recommendations in a report dated August 2, 2022, Project No. 22-6-160.

The purpose of the study was to perform additional field exploration, supplement, and update recommendations provided in a geotechnical engineering study report for the Winter Park Core Development, performed by Kumar & Associates, Project No. 05-1-390, dated October 11, 2005. Our 2005 study was reviewed as part of the scope of this update report, and is attached as Appendix A. Our services were conducted in accordance with our proposal for geotechnical engineering services to Alterra Mountain Company, dated May 2, 2022, Proposal P6-22-170.

A field exploration program, consisting of exploratory borings and a site reconnaissance, was conducted to obtain information on the surface and subsurface conditions and supplement exploration performed in the project area for the referenced 2005 study, with respect to the current proposed construction. Samples of the subsoils obtained during the field exploration were tested in the laboratory to determine their classification and other engineering characteristics. The results of the field exploration and laboratory testing were analyzed to develop recommendations for foundation types, depths and allowable pressures for the proposed structure foundations. This report summarizes the data obtained during this study and presents our conclusions, recommendations for preliminary design and other geotechnical engineering considerations based on the proposed construction and the subsoil conditions encountered.

PROPOSED CONSTRUCTION

Project planning was preliminary at the time of this report and we understand that construction will be phased over the next ten years. Based on review of the Winter Park Master Plan Phase 1 Projects planning package, provided by the Client, we understand that the project will include the construction of workforce housing, a new entry “Arrival Experience” and roundabout on U.S. Highway 40, 200,000 square foot Adventure Center Hotel, 50,000 square foot Adventure Center Building, 1,200 space Central Parking Garage, Mountain Center and New Base Experience, River Center with 2,000 person amphitheater and associated park area, roadway improvements, and improvements to the River Park and Village area, generally as shown on

Fig. 1. Associated infrastructure and paved parking and drive lanes will also be constructed. We assume the structures will range from concrete, masonry and structural steel, to wood-frame and light gauge steel construction, and will be up to four to five-stories in height. Grading for the project is assumed to be relatively minor to moderate with anticipated grading cuts and fills of about 8 to 25 feet. We assume relatively light to heavy foundation loadings, typical of the proposed types of construction.

When final building locations, plans, grading and structural load information have been developed, we should be notified to re-evaluate the recommendations presented in this report and conduct additional analysis and subsurface exploration as needed.

SITE CONDITIONS

The project site is located around the base village area of the Winter Park Ski Resort, west of U.S. Highway 40, roughly bounded to the north by the West Portal of the Moffat Tunnel and just south of Winter Park Drive and northeast of the Fraser River, as shown on Figures 1 & 2. At the time of our exploration the project area was occupied by numerous residential and commercial structures, open space and park areas, paved roadways and asphalt-paved, and unpaved, gravel surfaced parking areas.

FIELD EXPLORATION

The current field exploration for the project was conducted on September 28 & 29 and October 24 & 25, 2022. Seventeen exploratory borings were drilled in proposed development areas to evaluate the subsurface conditions. The borings were advanced with 4-inch diameter continuous flight augers powered by a truck-mounted CME 45 drill rig. The borings were logged by a representative of Kumar and Associates, Inc. Boring and exploratory pit logs from the referenced 2005 study, presented in Appendix A, were also reviewed.

Samples of the subsoils were taken with 1 3/8 and 2-inch I.D. spoon samplers. The samplers were driven into the subsoils at various depths with blows from a 140-pound hammer falling 30 inches. This test is similar to the standard penetration test described by ASTM Method D-486. The penetration resistance values are an indication of the relative density of the granular subsoils. Depths at which the samples were taken, and the penetration resistance values are shown on the Logs of Exploratory Borings, Fig. 3. The samples were returned to our laboratory for review by the project engineer and laboratory testing.

LABORATORY TESTING

Samples of soils obtained from the exploratory borings were visually classified in the laboratory by the project manager and samples were selected for laboratory testing. Laboratory testing

performed on samples obtained from the borings consisted of natural moisture content, percent passing the No. 200 sieve, and gradation analyses. Laboratory testing from the borings from the 2005 study also included Atterberg limits, pH, and water-soluble sulfates. Results of gradation analyses from the pits, performed on the minus 3-inch fraction of the natural coarse granular soils are shown on Fig.'s 6 & 7. The laboratory test results are summarized on the Logs of Exploratory Borings, Fig's. 3 & 4, and on Table 1.

GEOLOGIC CONDITIONS

The US Geological Survey Geologic Map of the Fraser 7.5-Minute Quadrangle indicates the project area is primarily underlain by granular soils consisting of glacial till material of the Pinedale Till (Qtp). The till consists of sand, gravel, cobbles and boulders, with varying amounts of clay and silt fines. The till is likely underlain by granitic to gneissic bedrock across the project site. Bedrock was encountered in the 2005 study in Borings B-6, B-7, B-11, and B-16 (Appendix A), at depths of 15 to 17 feet. Bedrock was not encountered in borings drilled for the current study.

SUBSURFACE CONDITIONS

Soil Types Encountered - Graphic logs of the subsurface conditions encountered in the borings from the current study are shown on Fig's. 3 & 4. A Legend and Notes from the current study is presented on Figure 5.

Existing fill, ranging in depth up to about 20 feet below the existing site grade was encountered in all borings with the exception of Borings 4, 5 and 10. The shallow fill typically consisted of aggregate base course, and deeper fills consisted of silty sand, gravel, and cobbles with scattered boulders and debris. A shallow depth of topsoil was encountered in Borings 4 and 5, and Borings 1 – 3, 7, and 11 – 16 were drilled through asphalt pavement. Below the fill, topsoil, and pavement, and ground level in Boring 10, the natural soils consisted of medium dense to very dense, silty sand (SM) and medium dense to very dense, silty gravel (GM) with variable amounts of cobbles and boulders. Drilling in the coarse granular soils was difficult due to the cobbles and boulders, and practical refusal to auger drilling was encountered at depths of 4 to 30 feet in all borings with the exception of Borings 14 and 17, which were drilled to planned termination depths of 24 and 10 feet, respectively.

We understand that much of the granular fill material placed in the project area consists of rock fragments and matrix material generated from the Moffat Tunnel construction in the mid to late 1920's. The fill reportedly contains variable amounts of debris including timbers and steel debris from the tunnel construction.

Groundwater: Groundwater was not encountered in the borings at the time of drilling. Although not encountered during the current study, performed during assumed seasonal low groundwater levels in October and November 2022, relatively shallow ground water conditions were encountered within the project area in the referenced 2005 study, at depths as shallow as 5 feet in the central and southern portions.

The depth to groundwater can vary based on seasonal and climatic factors, and perched water can occur seasonally over frozen ground. Dewatering of foundation and utility excavations during construction could be needed.

GEOTECHNICAL ENGINEERING CONSIDERATIONS

Subsurface data indicates that medium dense to very dense, natural silty sand and gravel, with cobbles and boulders, and typically medium dense, existing fill, will likely be the predominant materials encountered beneath shallow foundation, floor slab, flatwork and pavement areas.

The granular natural soils at anticipated foundation levels are generally considered good to excellent for shallow foundation support. Undocumented, non-engineered existing fill, was placed in unknown conditions, contains deleterious material, and should typically be removed from beneath foundation, floor slab and pavement areas.

In areas with deeper depths of existing fill where full removal of the fill is not economically practical, possible alternatives to removing all of the fill material include supporting a spread footing or stiffened mat foundation on subgrade soils where only the upper portion of the existing fill is excavated and replaced, or the existing fill is improved using compaction grouting or other deep foundation techniques such as piers or piles down into the natural granular soils or bedrock. Some of these options would entail acceptance of a higher risk of building movements and associated damage by the building owner. Provided the higher risk option is acceptable to the owner, we recommend that partial excavation of the fill material can be considered only for lightly loaded building structures, where the existing fill is relatively free of construction debris and other deleterious material. Existing fill encountered within 5 feet beneath the foundation, and to an equal distance outside the foundation footprint, should be excavated and replaced with structural fill.

Plans for individual structures, and civil grading plans, were not available at the time of this report. A civil engineer licensed in the State of Colorado should prepare a final grading plan for

each planned structure. Once building locations, foundation plans, elevations, and structural loads for each structure have been established by the designer, we should review the final plans for each structure and re-evaluate the recommendations provided in this report for additional analysis and subsurface investigation, as needed.

Additional exploration, consisting of exploratory borings, should typically be performed for heavily loaded structures, such as parking garages, to confirm the validity of the preliminary recommendations in this report with respect to the proposed construction and structural loads, and the need for adjusting recommended allowable bearing pressure for foundations provided in this report.

Our recommendations contained in this report are contingent upon reviewing final building locations and project plans once they are complete.

SITE GRADING

The following recommendations should be followed for grading, site preparation, and fill compaction.

1. Where fill is to be placed, topsoil, existing fill (or specified depth of existing fill), loose, disturbed, or otherwise unsuitable material should be removed prior to placement of new fill. The exposed soils should then be scarified to a depth of 6 inches, moisture conditioned and compacted to the minimum requirements of the overlying fill. Soils should be compacted with appropriate equipment for the lift thickness placed. Lift thickness should be no more than 8 loose inches subsequently compacted at the recommended moisture content and to the minimum required density.
2. Permanent unretained cut and fill slopes should be graded at 2.5 horizontal to 1 vertical (2.5:1) or flatter and protected against erosion by revegetation or other means. The risk of slope instability will be increased if seepage is encountered in cuts and flatter slopes may be necessary. If seepage is encountered in permanent cuts, an investigation should be conducted to determine if the seepage will adversely affect the cut stability. This office should review site grading plans for the project prior to construction.
3. Slopes of 4:1 or steeper should be benched to provide a level surface for compaction.
4. All backfill should be processed so that it does not contain fragments larger than 6-inches in diameter and placed at the recommended moisture content.

5. The following compaction requirements should be used:

TYPE OF FILL PLACEMENT	MOISTURE CONTENT	SOIL TYPE - Compaction Percent (ASTM D698 – Standard Proctor)
Below Foundations	± 2% Optimum	Structural Fill – 100%
Foundation Wall Backfill	± 2% Optimum	Processed On-site or Structural Fill – 95%
Below Floor Slabs	± 2% Optimum	Structural Fill – 95%
Landscape Areas	± 2% Optimum	Processed On-site – 95%
Below Concrete Flatwork/Pavements	± 2% Optimum	Structural Fill – 95%
Utility Trenches	As they apply to the finished area	

Suitability of On-Site Soil

Natural soils consisting of silty sand and gravel with cobbles and boulders were encountered across the project area and are anticipated in foundation excavations. The on-site sand and gravel soils are suitable as backfill after processing to remove all plus 6-inch material and moisture treatment. The on-site topsoil is not suitable for reuse except in the upper 6 to 12 inches of backfill in landscape areas. Existing fill, encountered to significant depths across portions of the project area, should be evaluated for suitability by Kumar & Associates at the time of excavation, but should typically be suitable for use as structural fill after processing and removal of deleterious material.

Considerable processing will be necessary to reduce the on-site soil and existing fill to fragments of minus 6-inches. Processing may include screening, rock raking and crushing. All on-site soil should be processed, moisture-conditioned and placed to at least the minimum required compaction.

Structural Fill

Structural fill used for support of the buildings and pavement areas should consist of processed on-site granular soils, approved existing fill, or a relatively well-graded imported granular material with a liquid limit of 35 or less, a plasticity index of 10 or less, 5 to 25 percent material passing the No. 200 sieve, 60 percent or more passing the No. 4 sieve and no rocks larger than 6 inches. CDOT Class 1 structural backfill is acceptable as structural fill. Structural fill should be properly placed and compacted to reduce the risk of settlement and distress. Structural fills should be placed in accordance with the recommendations presented in the SITE GRADING section of this report.

Import Fill

The Geotechnical engineer should evaluate the suitability of any proposed import fill for its intended use.

Excavations

It is the responsibility of the Contractor to provide safe working conditions and to comply with the regulations in OSHA Standards, Excavations, 29CFS Part 1926. The onsite sand and gravel soil, and existing fill, will typically classify as "Type C" in accordance with OSHA regulations. The regulations allow slopes of 1½ horizontal to 1 vertical (1½:1) for **dry** temporary excavations less than 20 feet deep.

The presence of water, seepage, fissuring, vibrations or surcharge loads will require temporary excavation to have flatter slopes. **The excavation contractor's Competent Person should make decisions regarding cut slopes.** A qualified Geotechnical engineer should observe any questionable slopes or conditions. Temporary shoring may be necessary.

FOUNDATIONS

Considering the subsoil conditions encountered in the exploratory borings, review of the referenced 2005 report, and the nature of the proposed construction, we recommend the structures be founded with spread footings bearing on the undisturbed natural granular soils, or properly compacted structural fill less than 8 feet in depth.

The design and construction criteria presented below should be observed for a spread footing foundation system.

1) Footings placed on the undisturbed natural granular soils, or a limited depth of properly compacted structural fill, should be designed for an allowable soil bearing pressures of 3,000 to 5,500 pounds per square foot (psf). Based on experience, we expect movement of footings designed and constructed as discussed in this section will be about 1 inch or less.
2) The footings should have a minimum width of 18 inches for continuous walls and 2 feet for isolated pads.
3) Exterior footings and footings beneath unheated areas should be provided with adequate soil cover above their bearing elevation for frost protection. Placement of foundations at least 40 inches below exterior grade, or in accordance with local building code requirements, is recommended for foundations bearing on the native soils. Concrete should not be placed on frost, frozen soil, snow or ice.

4) Continuous foundation walls should be reinforced top and bottom to span local anomalies such as by assuming an unsupported length of at least 10 feet. Foundation walls acting as retaining structures should also be designed to resist lateral earth pressures as discussed in the "Foundation and Retaining Walls" section of this report.
5) Topsoil, undocumented, non-engineered existing fill (or the specified depth of existing fill), and any loose or disturbed soils should be removed, and the footing bearing level extended down to the relatively undisturbed soils. The exposed soils in footing areas should then be moistened to near optimum moisture, if necessary, and compacted. If water seepage is encountered, the footing areas should be dewatered before concrete placement and we shall be contacted for further evaluation.
6) Voids created by boulder removal in foundation areas should be backfilled with properly compacted structural fill, lean mix concrete or structural concrete to re-establish bearing elevations.
7) Structural fill used for support of the foundation should meet the requirements listed in the SITE GRADING section of this report.
8) **A representative of the geotechnical engineer should observe all footing excavations prior to forming footings and concrete placement to evaluate bearing conditions.**

FOUNDATION AND RETAINING WALLS

Foundation walls and retaining structures which are laterally supported and can be expected to undergo only a slight amount of deflection should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of at least 50 pounds per cubic foot (pcf) for backfill consisting of the on-site processed granular soils. Cantilevered retaining structures which are separate from the foundation and can be expected to deflect sufficiently to mobilize the full active earth pressure condition should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of at least 40 pcf for backfill consisting of the processed on-site granular soils. The backfill should not contain organics, deleterious material, and rock larger than about 6 inches in diameter.

The lateral resistance of foundation or retaining wall footings will be a combination of the sliding resistance of the footing on the foundation materials and passive earth pressure against the side of the footing. Resistance to sliding at the bottoms of the footings can be calculated based on a coefficient of friction of 0.45. Passive pressure of compacted backfill against the sides of the footings can be calculated using an equivalent fluid unit weight of 460 pcf. The coefficient of friction and passive pressure values recommended above assume ultimate soil strength. Suitable factors of safety should be included in the design to limit the strain which will occur at

the ultimate strength, particularly in the case of passive resistance. Fill placed against the sides of the footings to resist lateral loads should be an on-site soil material compacted to at least 95% of the maximum standard Proctor dry density at a moisture content near optimum.

All foundation and retaining structures should be designed for appropriate hydrostatic and surcharge pressures such as adjacent footings, traffic, construction materials and equipment. The pressures recommended above assume drained conditions behind the walls and a horizontal backfill surface. The buildup of water behind a wall or an upward sloping backfill surface will increase the lateral pressure imposed on a foundation wall or retaining structure. An underdrain should be provided to limit hydrostatic pressure buildup behind walls.

Backfill in patio, pavement, and walkway areas should be placed in uniform lifts and compacted to at least 95% of the maximum standard Proctor (ASTM D-698) dry density. Backfill placed in landscape areas should be compacted to at least 90% of the maximum standard Proctor dry density at a moisture content near optimum. Care should be taken not to over-compact the backfill or use large equipment near foundation and retaining walls, since this could cause excessive lateral pressure on the wall. Some settlement of deep foundation wall backfill should be expected, even if the material is placed correctly, and could result in distress to facilities constructed on the backfill.

FLOOR SLABS

The natural on-site granular soils, exclusive of topsoil, and properly compacted new structural fill, are suitable to support lightly loaded slab-on-grade construction. Undocumented, non-engineered existing fill should be removed from floor slab areas and replaced with properly compacted new structural fill to re-establish floor slab elevations. In areas of deeper fills, where complete removal of the fill may not be feasible, the existing fill soils should be observed by Kumar & Associates and appropriate recommendations for mitigation provided at the time of excavation.

To reduce the effects of some differential movement, floor slabs should be separated from all bearing walls and columns with expansion joints which allow unrestrained vertical movement. Floor slab control joints should be used to reduce damage due to shrinkage cracking. The requirements for joint spacing and slab reinforcement should be established by the designer based on experience and the intended slab use. A minimum 4-inch layer of free-draining gravel should be placed beneath basement level slabs to facilitate drainage. This material should consist of minus 2-inch aggregate with at least 50% retained on the No. 4 sieve and less than 2% passing the No. 200 sieve. All backfill under floor slabs should be placed in accordance

with the SITE GRADING section of this report. Proper drainage design to prevent wetting of the under-slab soils will be important in reducing the potential for slab movement.

We recommend vapor retarders conform to the minimum requirements of ASTM E1745 Class B material. Certain floor types are more sensitive to water vapor transmission than others. For floor slabs bearing on angular gravel or where flooring system sensitive to water vapor transmission are utilized, we recommend a vapor barrier be utilized conforming to the minimum requirements of ASTM E1745 Class A material. The vapor retarder should be installed in accordance with the manufacturers' recommendations.

Structural fill placed beneath slabs can consist of processed on-site soils, excluding topsoil and oversized rocks, or an imported well-graded granular material. Structural fill should be spread in thin horizontal lifts, adjusted to at or above optimum moisture content, and compacted to at least 95% of the maximum standard Proctor dry density. All vegetation, topsoil and loose or disturbed soil should be removed prior to fill placement.

EXTERIOR FLATWORK

Structural fill placed beneath exterior flatwork can consist of processed on-site granular soils excluding topsoil and oversized rocks, approved and processed existing fill, or an imported well-graded granular material. Structural fill should be spread in thin horizontal lifts, adjusted to at or above optimum moisture content, and compacted to at least 95% of the maximum standard Proctor dry density. All vegetation, topsoil and loose or disturbed soil should be removed prior to fill placement.

UNDERDRAIN SYSTEM AND DAMPPROOFING

Although groundwater was not encountered at assumed foundation bearing elevations in the current exploration, shallow groundwater was encountered in the referenced 2005 study, and it has been our experience in mountainous areas that the water level can rise and that local perched groundwater can develop during times of heavy precipitation or seasonal runoff. Frozen ground during spring runoff can create a perched condition. We recommend below-grade construction, such as retaining walls, crawlspace and basement areas, be protected from wetting and hydrostatic pressure buildup by an underdrain and wall drain system. **Slab-on-grade, at-grade construction, should not require a foundation drain.**

The underdrain should consist of drainpipe placed in the bottom of the wall backfill surrounded above the invert level with free-draining gravel. The drain should be placed at each level of excavation and at least 12-inches below lowest adjacent finish grade and sloped at a minimum

1% to a suitable gravity outlet, drywell or sump and pump system. Free-draining gravel used in the underdrain system should contain less than 2% passing the No. 200 sieve, less than 50% passing the No. 4 sieve and have a maximum size of 1-inch. The drain gravel backfill should be at least 1½ feet deep and protected by filter fabric. A typical drain detail is shown on Figure 8.

For exterior below grade foundation walls, we recommend, as a minimum, damp proofing consist of bituminous material, 3 lbs per square yard, extending from the top of the footing to above ground level. A wall drain system consisting of a geocomposite, MiraDrain 6000, or equivalent, should be placed adjacent to below grade construction walls, with 100 percent coverage on the foundation wall facing the uphill slope and a minimum of 50 percent coverage for the adjacent foundation walls. The wall drain system should connect into the underdrain and extend to within 1 to 2 feet of the ground surface.

SEISMIC DESIGN CRITERIA

A 100-foot-deep boring was outside the scope of this study, but using estimated shear wave velocities for the subgrade materials encountered, based on observations of the exploratory borings, review of the referenced 2005 report, and our professional experience in the project area, calculations indicate a design Site Class C per the 2018 International Building Code (IBC). Based on the subsurface profile and the anticipated ground conditions, liquefaction is not a design consideration.

SURFACE DRAINAGE

The following drainage precautions should be observed during construction and maintained at all times after the structures have been completed:

1) Inundation of the foundation excavations and underslab areas should be avoided during construction.
2) Backfill in pavement and slab areas should be compacted to at least 95% of the maximum standard Proctor dry density at a moisture content within 2% of optimum. Exterior backfill placed in landscape areas should be compacted to at least 90% of the maximum standard Proctor dry density at a moisture content near optimum.
3) The ground surface surrounding the exterior of the buildings should be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 6 inches in the first 10 feet in unpaved areas and a minimum slope of 2½ inches in the first 10 feet in paved areas.
4) Roof downspouts and drains should discharge well beyond the limits of all backfill.

5) Landscaping which requires regular heavy irrigation should be located at least 5 feet from foundation walls. The upper 2 feet of foundation wall backfill should consist of relatively impervious cover soil.

PAVEMENT SECTION DESIGN

Based on our understanding of the project, asphalt-paved access drives, roadways and parking areas will be constructed as part of project development. Traffic will generally consist of light automotive, bus traffic, and occasional heavy service vehicles. Traffic during construction will consist of heavier vehicles with higher wheel loads and precautions should be taken to prevent damage to the newly constructed pavement during construction.

The proposed development package, Fig. 2, indicates that a new roundabout is proposed at a future date on U.S. Highway 40 at the project entrance area. If the roundabout is constructed, a geotechnical engineering study for pavement section design should be performed for the roundabout prior to construction, in accordance with Colorado Department of Transportation (CDOT) guidelines, using current traffic data at the time of the study.

The proof-rolled, inorganic native granular soils and properly-compacted new structural fill will provide, in our opinion, adequate subgrade support for asphalt-paved drives, project roadways, and parking areas associated with the development. Existing undocumented, non-engineered existing fill should typically be removed from pavement areas and replaced with new, properly compacted structural fill to re-establish pavement section elevations. In areas of deeper existing fills, the fill should be evaluated by Kumar & Associates at the time of construction, and recommendations for a minimum depth of existing fill removal and replacement may be provided at that time, depending on the observed fill consistency and planned pavement structures.

Proper pavement section drainage, including site drainage to avoid ponding of water on, or adjacent to pavement areas, will be important in reducing the potential for pavement distress. Structural fill placed in paved areas should consist of processed on-site native soil, or approved existing fill, or imported sand and gravel meeting the requirements of the Site Grading section of this report. Fill should be placed in maximum 8-inch lifts, loose thickness, moisture-conditioned, and compacted to at least 95 percent of the standard Proctor density, ASTM D698.

A pavement section is a layered system designed to distribute concentrated traffic loads to the subgrade. Performance of the pavement structure is directly related to the physical properties of the subgrade soils and traffic loadings. Soils are represented for pavement design purposes by

means of a soil support value for flexible pavements and a modulus of subgrade reaction for rigid pavements. Both values are empirically related to strength.

Subgrade Soils

Subgrade soils consisting of natural, medium dense to very dense silty sand and gravel with cobbles and boulders, and existing fill of variable composition, are anticipated to be present at the pavement subgrade level. The natural soils typically classify as Groups A-1 and A-2, and in some cases A-4, in accordance with the American Association of State Highway and Transportation Officials (AASHTO). The soil types are considered excellent to good for pavement subgrade support. For design purposes, a seasonally adjusted effective resilient modulus of 5,000 psi was used to represent the subgrade strength for flexible pavements. Existing fill encountered in pavement subgrade areas, should be evaluated by Kumar & Associates at the time of excavation for suitability and appropriate recommendations provided at that time.

Traffic Estimates

Since anticipated traffic loading information was not available at the time of report preparation, Colorado Department of Transportation (CDOT) procedures were used to calculate an estimated 20-year Equivalent Single Axle Load (ESAL) value of 500,000 for project roadways. **The designer should verify anticipated traffic loads for the project. If higher 20-year ESAL values are anticipated, the pavement sections presented in this report will have to be re-evaluated.**

Asphaltic Concrete (AC) Pavement Design

Pavement section recommendations are presented for asphaltic concrete (AC) over aggregate base course (ABC) for the roadways, drive lanes and parking lot areas. We recommend that portland cement concrete (PCC) pavement be used in concrete aprons, garbage dumpster areas, entry areas, and other areas that will receive concentrated truck turning movements.

For flexible pavement design, a serviceability loss of 2.5 was selected. If other design parameters are preferred, we should be contacted in order to reevaluate the recommendations presented herein. A summary of the parameters used for the pavement section design is presented below.

20 Year ESAL's (roadways)	500,000
Design Serviceability Loss (Parking and Drive Lanes)	2.5
Drainage Coefficient	1.0
Effective Resilient Modulus (MR)	5,000 psi
Asphaltic Concrete Strength Coefficient	0.44
Aggregate Base Course Strength Coefficient	0.12

Based on the data presented above, an in-house spreadsheet utilizing AASHTO and CDOT methods was used to calculate a minimum structural number. Based on the structural number and the design parameters outlined above, the recommended pavement section thickness is presented in the following table:

Location	**Asphalt and Aggregate Base Course (AC + ABC)**	**Full Depth Asphalt Pavement (AC)**
Roadways (Excluding Highway 40)	*5 inches + 8 inches*	*7½ inches*
Access Drives & Auto-only Parking	*3 inches + 6 inches*	*5½ inches*
Bus Access Drives & Parking	4½ inches + 8 inches	7 inches

Asphalt should consist of a mixture of aggregate, filler and asphalt cement established by a qualified engineer. Aggregate Base Course (ABC) should conform to the requirements of AASHTO M147 and to Section 703.03 of the CDOT Standard Specifications for Road and Bridge Construction. The ABC should meet Class 6 grading and quality as defined by the CDOT specifications. The ABC should have a minimum R-value of 77 and a minimum dry unit weight of 120 pcf when placed at the required compaction. The ABC must also meet all other appropriate CDOT specifications.

Portland Cement Concrete Pavement Section

For concrete pavements, we recommend a minimum of 6-inches of Portland cement concrete (PCC) underlain by 4 inches of CDOT Class 6 ABC. Concrete pavement underlain by 4 inches Class 6 ABC is recommended 1) to create a uniform subbase/base, 2) to prevent pumping of fines from beneath the pavement, and 3) provide a working platform for construction.

All concrete should be based on a mix design established by a qualified engineer. A CDOT Class P or D mix would be acceptable. The design mix should consist of aggregate, Portland

cement, water, and additives which will meet the requirements contained in this section. The concrete should have a modulus of rupture of third point loading of 650 psi. Normally, concrete with a 28-day compressive strength of 4,200 psi will meet this requirement. Concrete should contain approximately 6 percent entrained air. Maximum allowable slump should not exceed 4 inches.

The concrete should contain joints not greater than 10 feet on centers. Joints should be sawed or formed by pre-molded filler. The joints should be at least 1/3 of the slab thickness. Joints should be reinforced with dowels to provide load transfer between slabs. Concrete pavement joints should meet the requirements of CDOT Standard Plan No. M 412-1 and CDOT Standard Specifications Section 412.13. Expansion joints should be provided at the end of each construction sequence and between the concrete slab and adjacent structures. Expansion joints, where required, should be filled with a ½-inch thick asphalt impregnated fiber. Concrete should be cured by protecting against loss of moisture, rapid temperature changes and mechanical injury for at least three days after placement. After sawing joints, the saw residue shall be removed and the joint sealed.

Subgrade Preparation

Prior to placing compacted fill, the exposed subgrade soils should be thoroughly scarified and well mixed to a depth of 12 inches, adjusted to a moisture content near optimum, and compacted to at least 95% of the standard Proctor (ASTMD 698) maximum dry density.

Proof Roll

Before placing aggregate base course for the pavement section, the subgrade should be proof rolled with a heavily loaded, pneumatic-tired vehicle. The vehicle should have gross vehicle weight of at least 50,000 pounds with a loaded single axle weight of 18,000 pounds and a tire pressure of 100 psi. Areas which deform excessively under heavy wheel loads are not stable and should be removed and replaced to achieve a stable subgrade prior to paving or placement of base course.

Drainage

The collection and diversion of surface drainage away from paved areas is extremely important for the satisfactory performance of pavement. Drainage design should provide for the removal of water from paved areas and prevent wetting of the subgrade soils.

Maintenance

Periodic maintenance of paved areas is critical to achieve the design pavement life. Crack sealing should be performed annually as new cracks appear. Joint seals in concrete should be replaced as they deteriorate. Chip seals, fog seals, or slurry seals applied at approximate intervals of 3 to 5 years are usually necessary for asphalt. As conditions warrant, it may be necessary to perform patching and structural overlays at approximate 10-year intervals. In temporary gravel roadways, periodic regrading should be expected on a yearly basis.

CONTINUING SERVICES

Three additional elements of geotechnical engineering service are important to the successful completion of this project.

1) Consultation with design professionals during the design phases. This is important to ensure that the intentions of our recommendations are properly incorporated in the design, and that any changes in the design concept properly consider geotechnical aspects.
2) Grading and Structural Plans Review. Project plans for specific structures were not available for our review at the time of this report. Project structural plans should be prepared by qualified, licensed designers, and a grading plan with finish floor elevations for the proposed construction should be prepared by a civil engineer licensed in the State of Colorado. Kumar and Associates, Inc. should be provided with project structural and grading plans once they are complete to confirm the recommendations contained in this report.
3) Observation and monitoring during construction. A representative of the Geotechnical engineer from our firm should observe the foundation excavation, earthwork, and foundation phases of the work for each structure and pavement area to determine that subsurface conditions are compatible with those used in the analysis and design and our recommendations have been properly implemented. Placement of backfill should be observed and tested to judge whether the proper placement conditions have been achieved. We recommend a representative of the geotechnical engineer observe the drain and dampproofing phases of the work, if constructed, to judge whether our recommendations have been properly implemented.

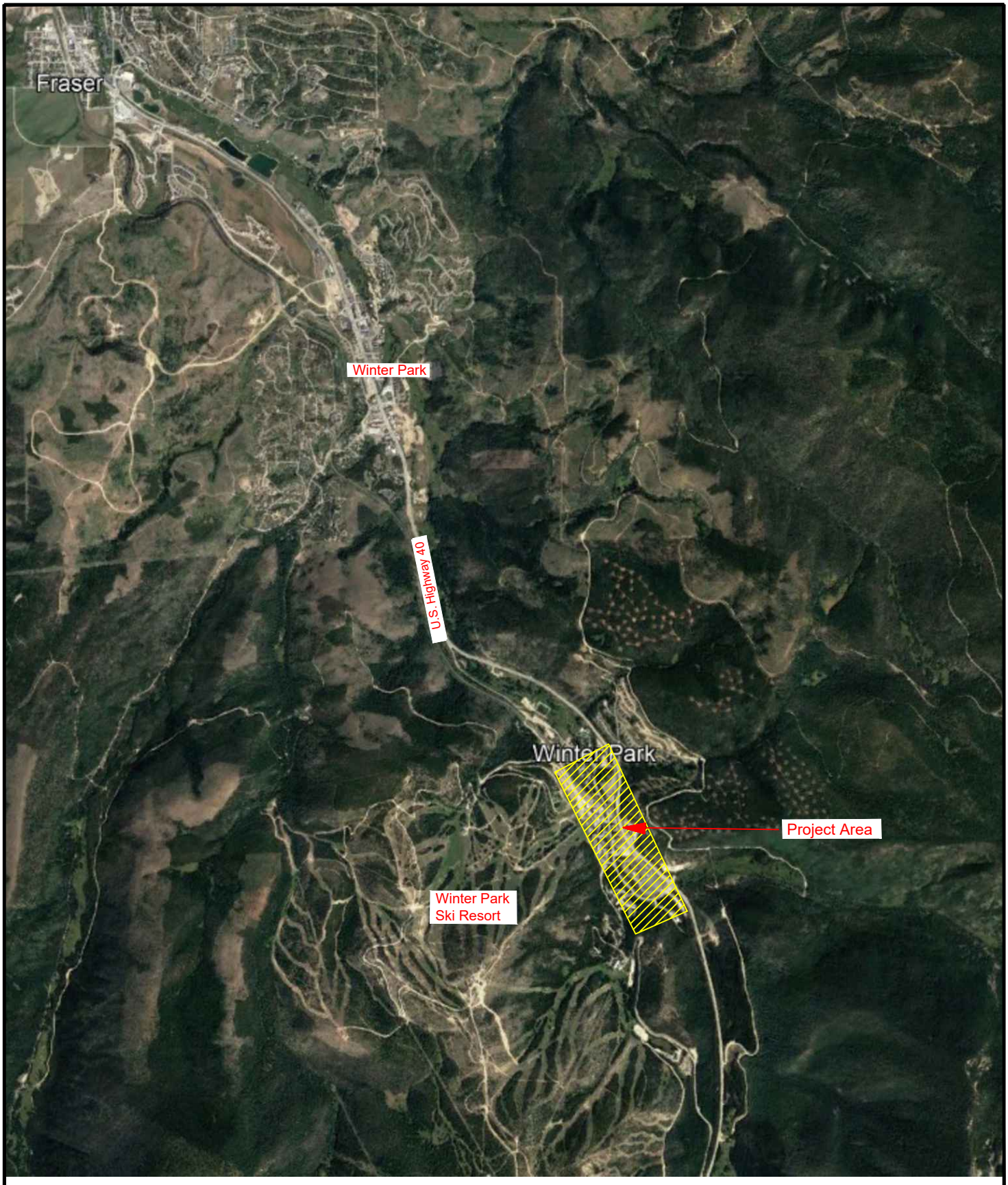
LIMITATIONS

This study has been conducted in accordance with generally accepted geotechnical engineering principles and practices in this area at this time. We make no warranty either express or implied. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory borings at the locations indicated on Fig. 2, review of the

referenced 2005 report, the proposed type of construction and our experience in the area. Our services do not include determining the presence, prevention or possibility of mold or other biological contaminants (MOBC) developing in the future. If the client is concerned about MOBC, then a professional in this special field of practice should be consulted. Our findings include interpolation and extrapolation of the subsurface conditions identified at the exploratory borings and variations in the subsurface conditions may not become evident until excavation is performed. If conditions encountered during construction appear different from those described in this report, we should be notified so that re-evaluation of the recommendations may be made.

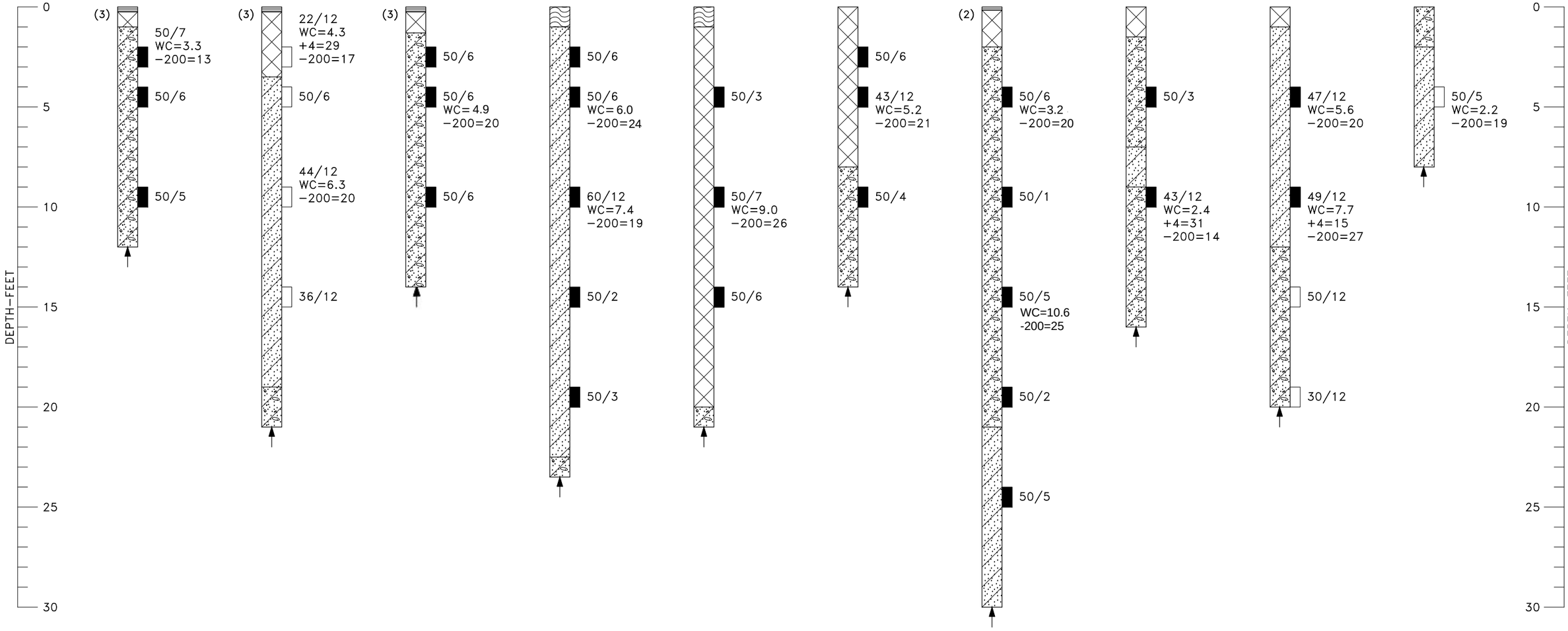
This report has been prepared for the exclusive use by our client for preliminary planning and design purposes. We are not responsible for technical interpretations by others of our information. As the project evolves, we should provide continued consultation and field services during construction to review and monitor the implementation of our recommendations, and to verify that the recommendations have been appropriately interpreted.

The recommendations contained in this report are contingent upon review of final building plans, as well as grading and excavation plans prepared by a civil engineer licensed in the State of Colorado. Review of project plans may alter our recommendations.



* No Scale

22–6–160.01	Kumar and Associates	VICINITY MAP	Fig. 1



22-6-160.01	Kumar & Associates	PROPOSED WINTER PARK MASTER PLAN PHASE I	LOGS OF EXPLORATORY BORINGS	Fig. 3

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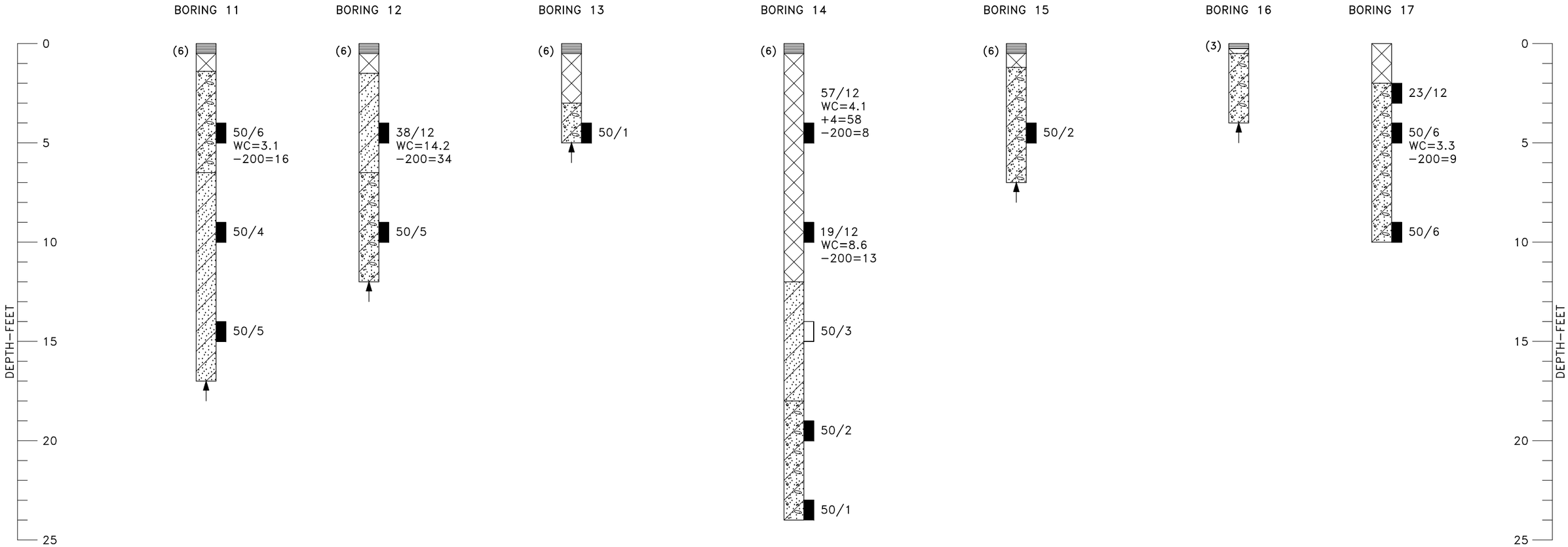

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22-6-160.01	Kumar & Associates	PROPOSED WINTER PARK MASTER PLAN PHASE I	LOGS OF EXPLORATORY BORINGS	Fig. 4

LEGEND

(3) ASPHALT, THICKNESS IN INCHES SHOWN IN PARENTHESES TO LEFT OF THE LOG.

TOPSOIL; SILTY SAND AND GRAVEL WITH ORGANICS, MOIST, DARK BROWN.

FILL: SILTY SAND, GRAVEL, AND COBBLES, WITH SCATTERED BOULDERS AND SCATTERED DEBRIS, TYPICALLY MEDIUM DENSE, MOIST, BROWN.

SILTY SAND (SM); WITH GRAVEL, COBBLES, AND SCATTERED BOULDERS, MEDIUM DENSE TO VERY DENSE, MOIST, BROWN.

SILTY GRAVEL (GM); WITH SAND, COBBLES, AND BOULDERS, MEDIUM DENSE TO VERY DENSE, MOIST, BROWN.

DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLE.

DRIVE SAMPLE, 1 3/8-INCH I.D. SPLIT SPOON STANDARD PENETRATION TEST.

50/7 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 50 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 7 INCHES.

PRACTICAL AUGER REFUSAL.

NOTES

1. THE EXPLORATORY BORINGS WERE DRILLED ON SEPTEMBER 28 AND 29 AND OCTOBER 24 AND 25, 2022 WITH A 4-INCH-DIAMETER CONTINUOUS-FLIGHT POWER AUGER.
2. THE LOCATIONS OF THE EXPLORATORY BORINGS WERE MEASURED APPROXIMATELY BY PACING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.
3. THE ELEVATIONS OF THE EXPLORATORY BORINGS WERE NOT MEASURED AND THE LOGS OF THE EXPLORATORY BORINGS ARE PLOTTED TO DEPTH.
4. THE EXPLORATORY BORING LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOGS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
6. GROUNDWATER WAS NOT ENCOUNTERED IN THE BORINGS AT THE TIME OF DRILLING.
7. LABORATORY TEST RESULTS:
   WC = WATER CONTENT (%) (ASTM D2216);
   +4 = PERCENTAGE RETAINED ON NO. 4 SIEVE (ASTM D6913);
   -200= PERCENTAGE PASSING NO. 200 SIEVE (ASTM D1140).

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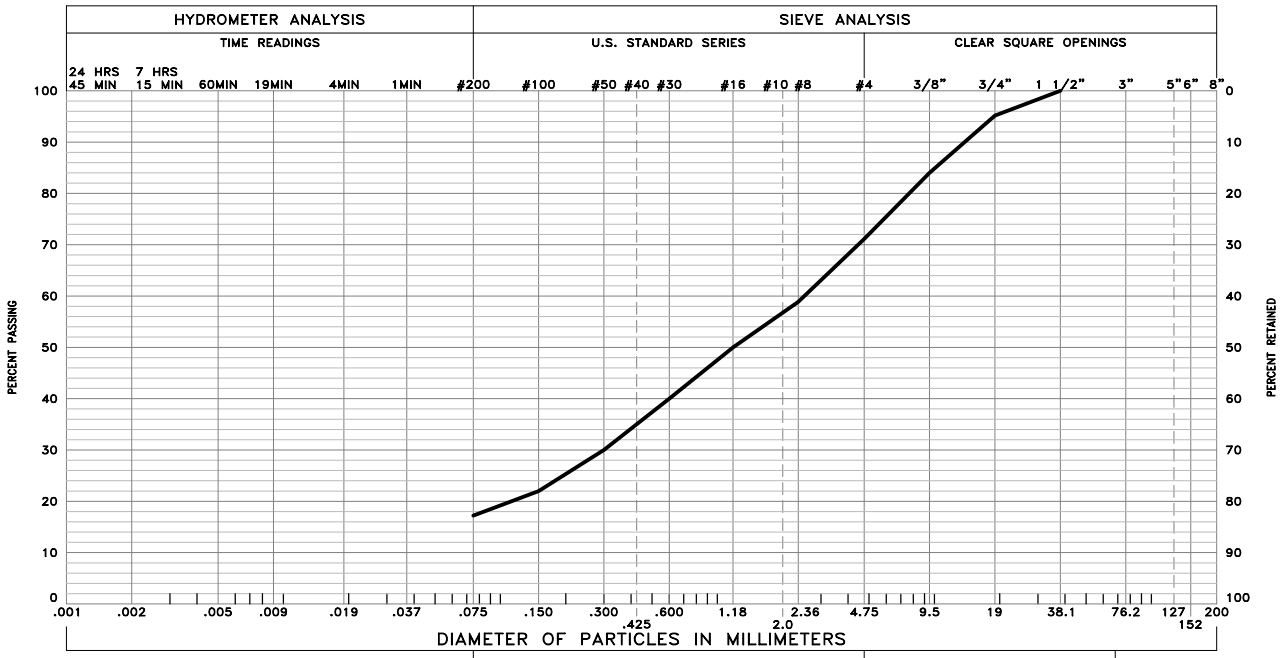
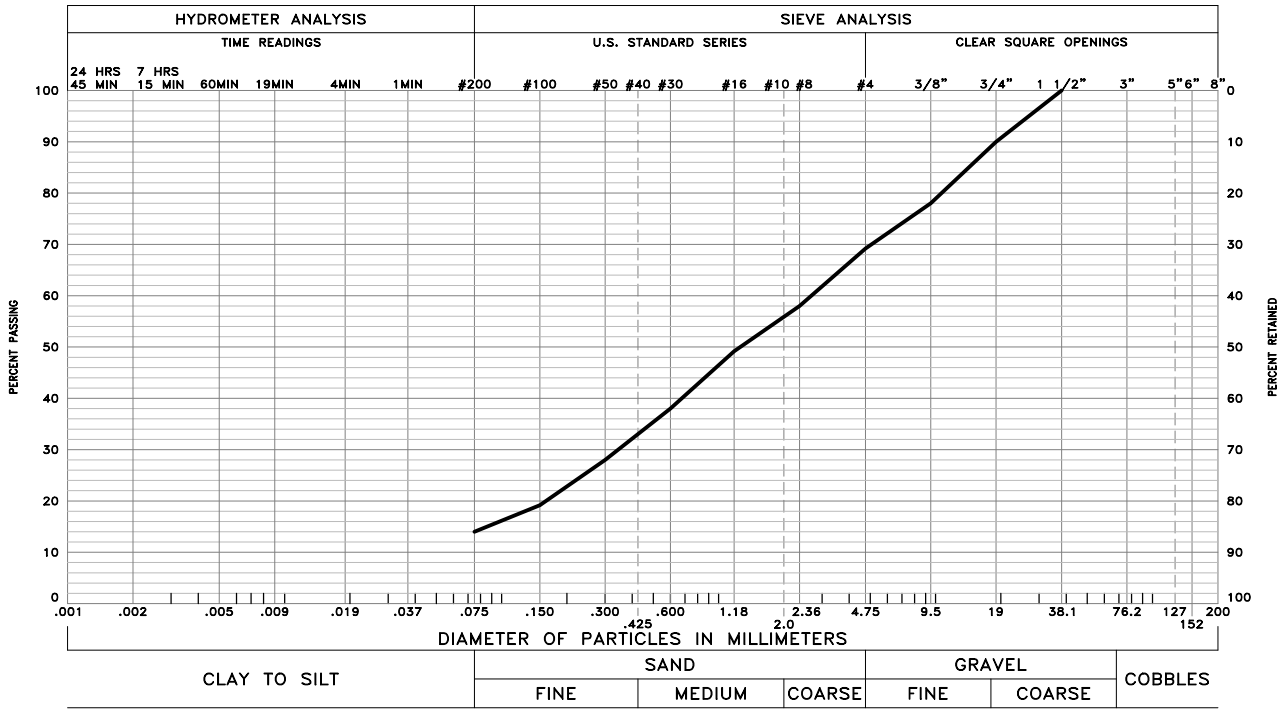


GRAVEL 29 % SAND 54 % SILT AND CLAY 17 %

SAMPLE OF: Silty Sand with Gravel FROM: Boring 2 @ 2'



GRAVEL 31 % SAND 55 % SILT AND CLAY 14 %

SAMPLE OF: Silty Sand with Gravel FROM: Boring 8 @ 9'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D6913, ASTM D7928, ASTM C136 and/or ASTM D1140.

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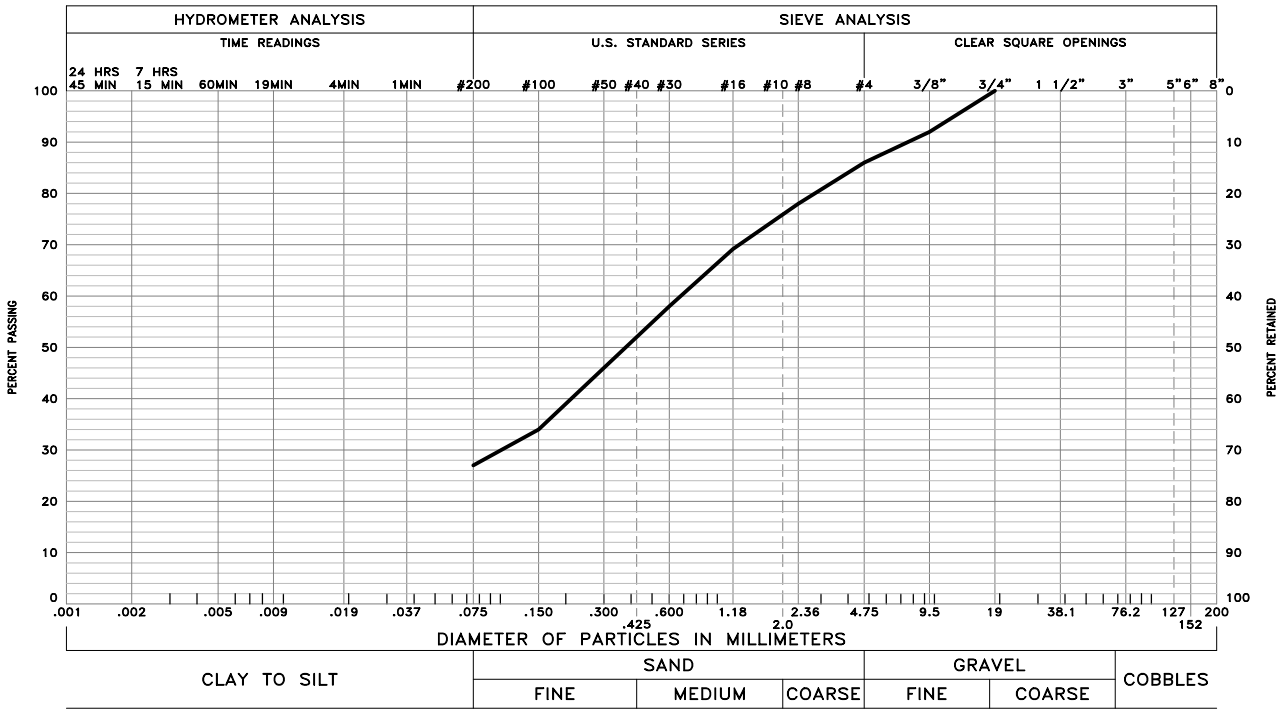
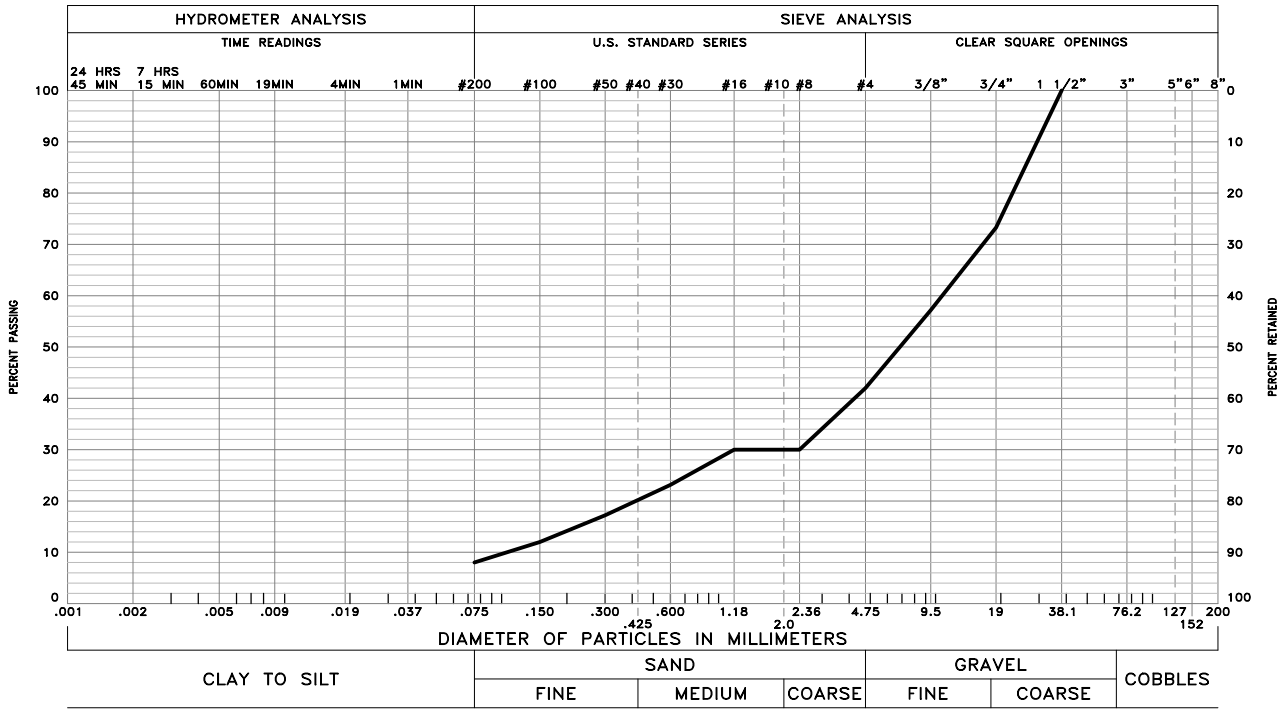


GRAVEL 15 % SAND 58 % SILT AND CLAY 27 %

LIQUID LIMIT

SAMPLE OF: Silty Sand with Gravel FROM: Boring 9 @ 9'



GRAVEL 58 % SAND 34 % SILT AND CLAY 8 %

SAMPLE OF: Fill: Well Graded Silty Gravel with Sand FROM: Boring 14 @ 4'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D6913, ASTM D7928, ASTM C136 and/or ASTM D1140.

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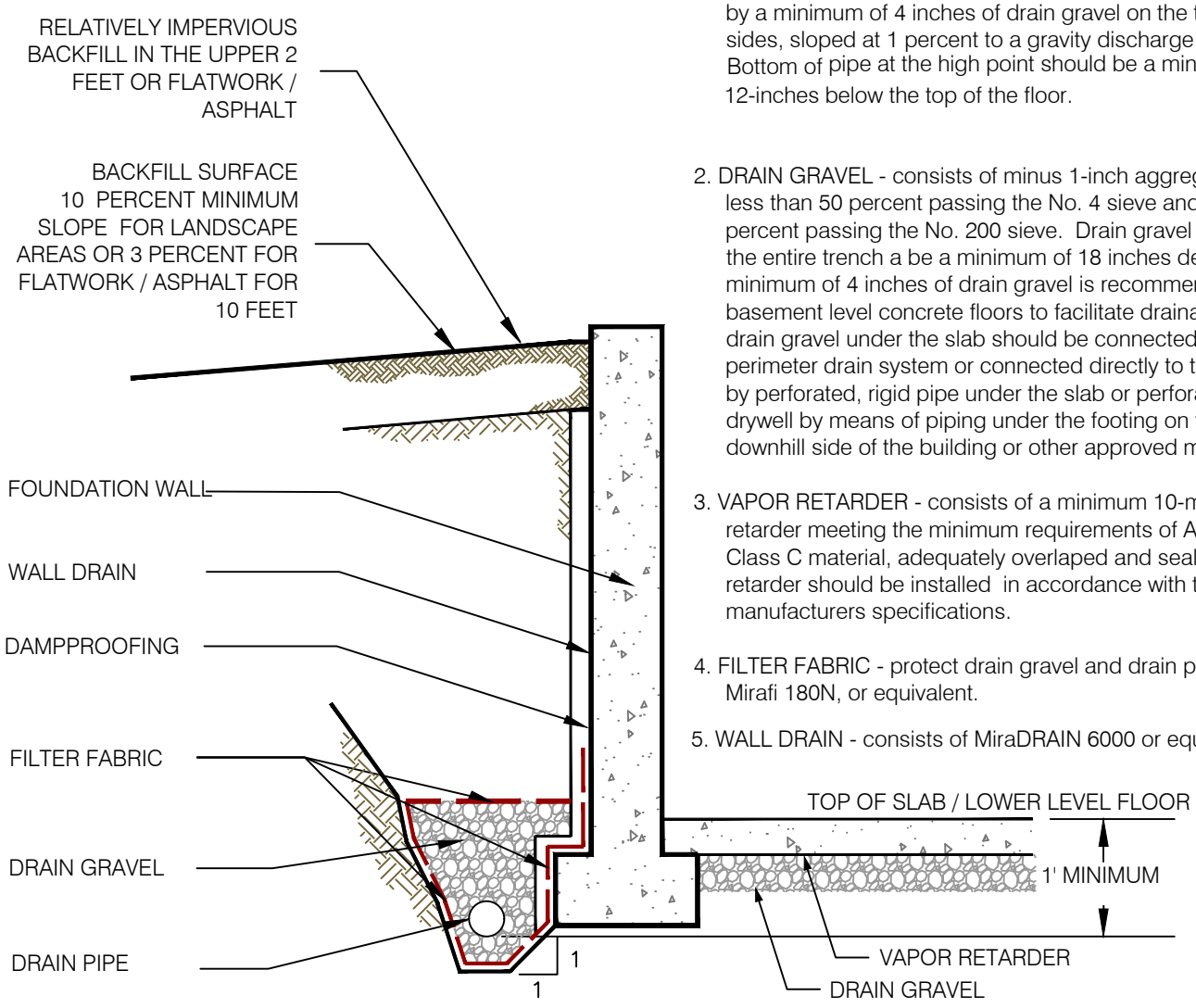
22-6-160.01	Kumar & Associates	GRADATION TEST RESULTS	Fig. 7



1. DRAIN PIPE - consists of 4-inch perforated PVC, surrounded by a minimum of 4 inches of drain gravel on the top and sides, sloped at 1 percent to a gravity discharge or drywell. Bottom of pipe at the high point should be a minimum of 12-inches below the top of the floor.

2. DRAIN GRAVEL - consists of minus 1-inch aggregate with less than 50 percent passing the No. 4 sieve and less than 2 percent passing the No. 200 sieve. Drain gravel should fill the entire trench a be a minimum of 18 inches deep. A minimum of 4 inches of drain gravel is recommended under basement level concrete floors to facilitate drainage. The drain gravel under the slab should be connected to the perimeter drain system or connected directly to the drywell by perforated, rigid pipe under the slab or perforation in the drywell by means of piping under the footing on the downhill side of the building or other approved method.

3. VAPOR RETARDER - consists of a minimum 10-mil vapor retarder meeting the minimum requirements of ASTM E1745 Class C material, adequately overlaped and sealed. Vapor retarder should be installed in accordance with the manufacturers specifications.

4. FILTER FABRIC - protect drain gravel and drain pipe with Mirafi 180N, or equivalent.

5. WALL DRAIN - consists of MiraDRAIN 6000 or equivalent.

NOT TO SCALE

22-6-160.01	Kumar & Associates	TYPICAL DRAIN DETAIL	FIG. 8

Kumar & Associates

JOB NO: 22-6-160.01
JOB NAME: PROPOSED WINTER PARK MASTER PLAN PHASE I

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

SAMPLE LOCATION		NATURAL MOISTURE CONTENT	NATURAL DRY UNIT WEIGHT	GRADATION			ATTERBERG LIMITS		SWELL-COMPRESSION		HVEEM STABILOMETER	WATER SOLUBLE SULFATES	pH	SOIL OR BEDROCK DESCRIPTION
BORING (#)	DEPTH (feet)	(%)	(pcf)	GRAVEL (%)	SAND (%)	SILT & CLAY (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SWELL (%)	SUR-CHARGE (psf)	(R-VALUE)	(%)	()	
1	2	3.3				13								SILTY GRAVEL WITH SAND
2	2	4.3		29	54	17								FILL: SILTY SAND WITH GRAVEL
	9	6.3				20								SILTY SAND WITH GRAVEL
3	4	4.9				20								SILTY GRAVEL WITH SAND
4	4	6.0				24								SILTY SAND WITH GRAVEL
	9	7.4				19								SILTY SAND WITH GRAVEL
5	9	9.0				26								FILL: SILTY GRAVEL WITH SAND
6	4	5.2				21								FILL: SILTY GRAVEL WITH SAND
7	4	3.2				20								SILTY GRAVEL WITH SAND
	14	10.6				25								SILTY GRAVEL WITH SAND
8	9	2.4		31	55	14								SILTY GRAVEL WITH SAND

Kumar & Associates

JOB NO: 22-6-160
JOB NAME: PROPOSED WINTER PARK CORE DEVELOPMENT TABLE 1 PAGE 2

SUMMARY OF LABORATORY TEST RESULTS

SAMPLE LOCATION		NATURAL MOISTURE CONTENT	NATURAL DRY UNIT WEIGHT	GRADATION			ATTERBERG LIMITS		SWELL-COMPRESSION		HVEEM STABILOMETER	WATER SOLUBLE SULFATES	pH	SOIL OR BEDROCK DESCRIPTION
BORING (#)	DEPTH (feet)	(%)	(pcf)	GRAVEL (%)	SAND (%)	SILT & CLAY (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SWELL (%)	SUR-CHARGE (psf)	(R-VALUE)	(%)	()	
9	4	5.6				20								SILTY SAND WITH GRAVEL
	9	7.7		15	58	27								SILTY SAND WITH GRAVEL
10	4	2.2				19								SILTY SAND WITH GRAVEL
11	4	3.1				16								SILTY GRAVEL WITH SAND
12	4	14.2				34								SILTY SAND WITH GRAVEL
14	4	4.1		58	34	8								FILL: WELL GRADED SILTY GRAVEL WITH SAND
	9	8.6				13								FILL: SILTY GRAVEL WITH SAND
17	4	3.3				9								WELL GRADED SILTY GRAVEL WITH SAND

APPENDIX A

WINTER PARK CORE GEOTECHNICAL ENGINEERING STUDY REPORT DATA

PROJECT NO. 05-1-390

DATED: OCTOBER 11, 2005

BORING 1
EL. 9132

BORING 2
EL. 9125

BUILDING 1

BORING 3
EL. 9129

BORING 4
EL. 9118

BORING 5
EL. 9130

BORING 6
EL. 9126

BORING 7
EL. 9121

BORING 8
EL. 9122

BORING 9
EL. 9105

VILLAGE CORE

ELEVATION–FEET

DEPTH–FEET

9135
9130
9125
9120
9115
9110
9105
9100
9095

0
5
10
15
20
25
30
35
40

APPROX. LOWER FLOOR LEVEL

50/2
WC=6.4
+4=53
−200=13
A–1–a (0)

18/12

5/12
WC=37.7
+4=16
−200=43
LL=50
PI=20
Org=8.3

17/12

19/12

17/12
WC=44.8
−200=57
WSS=0.02

BOUNCE

66/12
WC=8.4
+4=48
−200=11

48/12

56/12

50/6

11/12

11/12

7/12
+4=35
−200=10

4/12
WC=86.3
−200=37
LL=45
PI=14
Org=12.2

5/12

43/12

18/12

23/12

45/12

50/3

50/5

WC=46.9
−200=36
LL=59
PI=6
WSS=0.02
Org=11.0
A–4 (0)

WC=10.3
+4=4
−200=33
LL=24
PI=7
Org=2.6
RES=450
A–2–4 (0)

(4)

18/12

26/12
WC=9.5
+4=23
−200=22
LL=21
NP
WSS<0.02

50/3

50/6
WC=7.4
+4=49
−200=12
LL=19
PI=1

50/1

24/12

14/12
WC=9.9
+4=30
−200=18
NV
NP
A–1–b (0)

50/6

BOUNCE

11/12
WC=11.1
DD=122.7
+4=23
−200=23
A–1–b (0)

42/12
WC=6.4
DD=144.1
+4=51
−200=7

52/12
WC=12.0
+4=11
−200=23
WSS=0.02
A–1–b (0)

41/12

46/12
WC=8.0
DD=127.4
+4=60
−200=8

31/12

7/12
WC=9.2
+4=40
−200=16
A–1–b (0)

50/6

25/12
WC=9.6
+4=47
−200=10

57/12

Feb 22, 067 – 12:19pm
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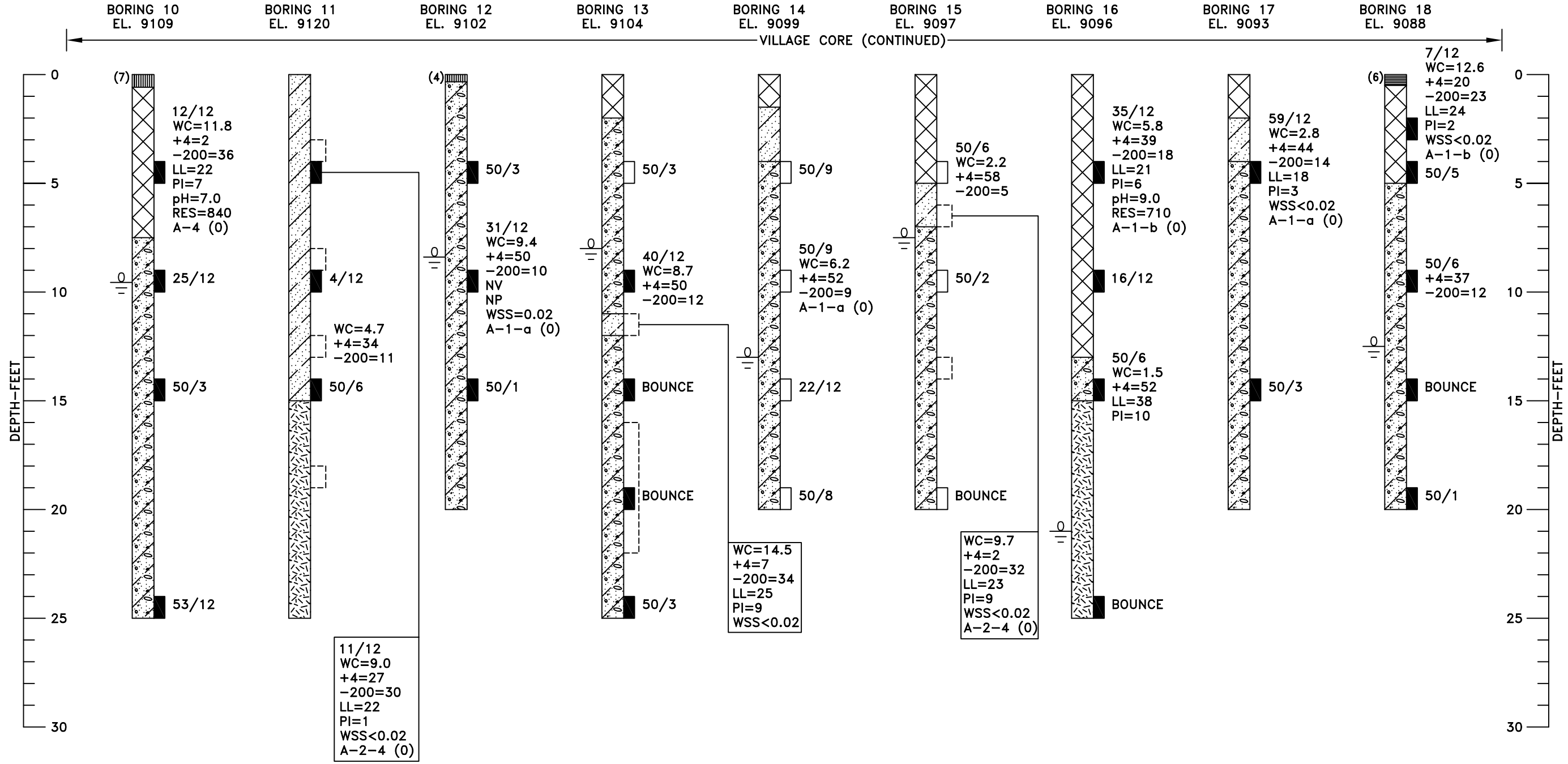
05–1–390	Kumar & Associates	WINTER PARK VILLAGE CORE AND FUTURE RESIDENTIAL DEVELOPMENT	LOGS OF EXPLORATORY BORING – VILLAGE CORE

Fig. 4



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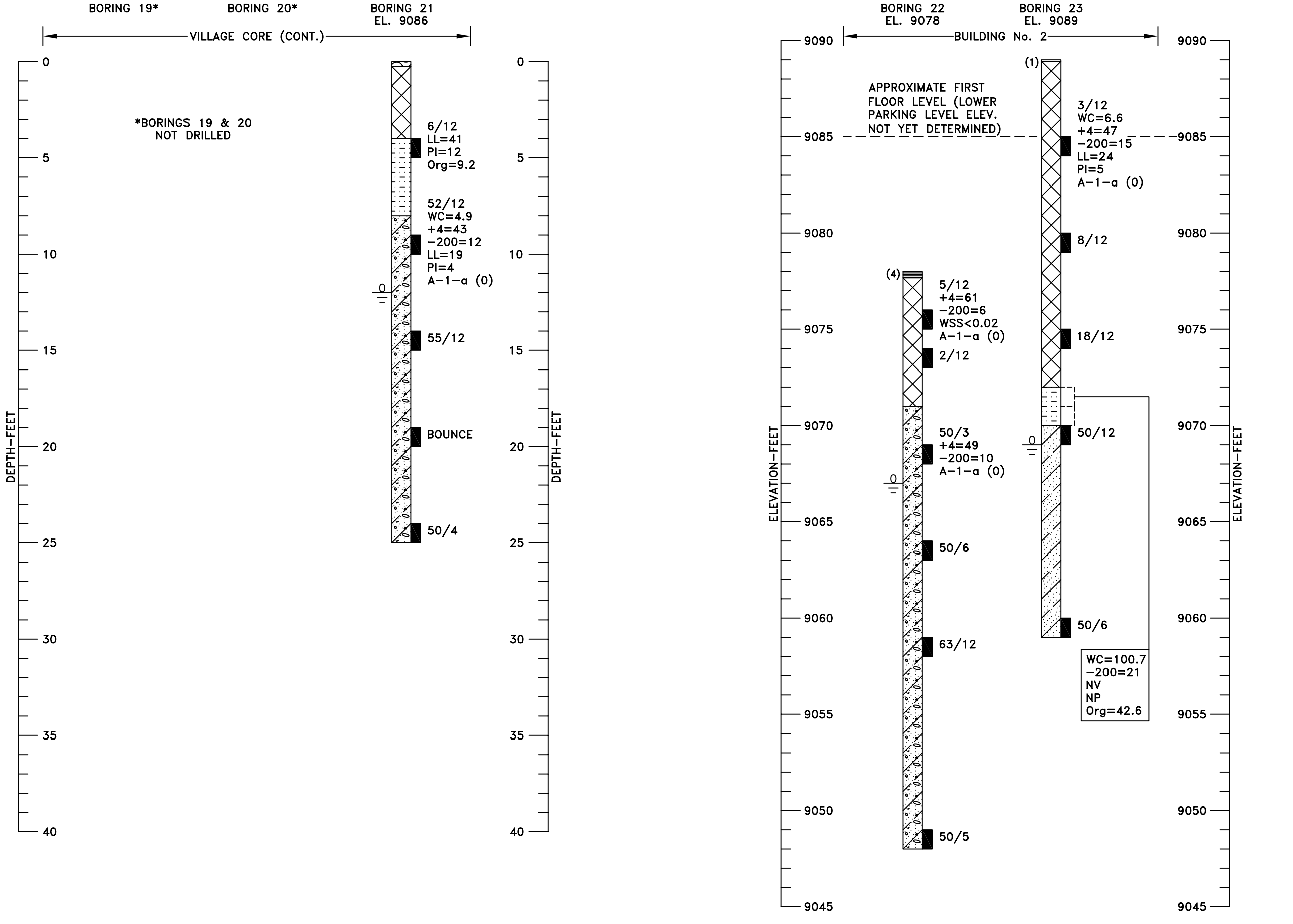
05−1−390	Kumar & Associates	WINTER PARK VILLAGE CORE AND FUTURE RESIDENTIAL DEVELOPMENT	LOGS OF EXPLORATORY BORINGS − VILLAGE CORE

Fig. 5



05−1−390	Kumar & Associates	WINTER PARK VILLAGE CORE AND FUTURE RESIDENTIAL DEVELOPMENT	LOGS OF EXPLORATORY BORINGS − VILLAGE CORE	Fig. 6

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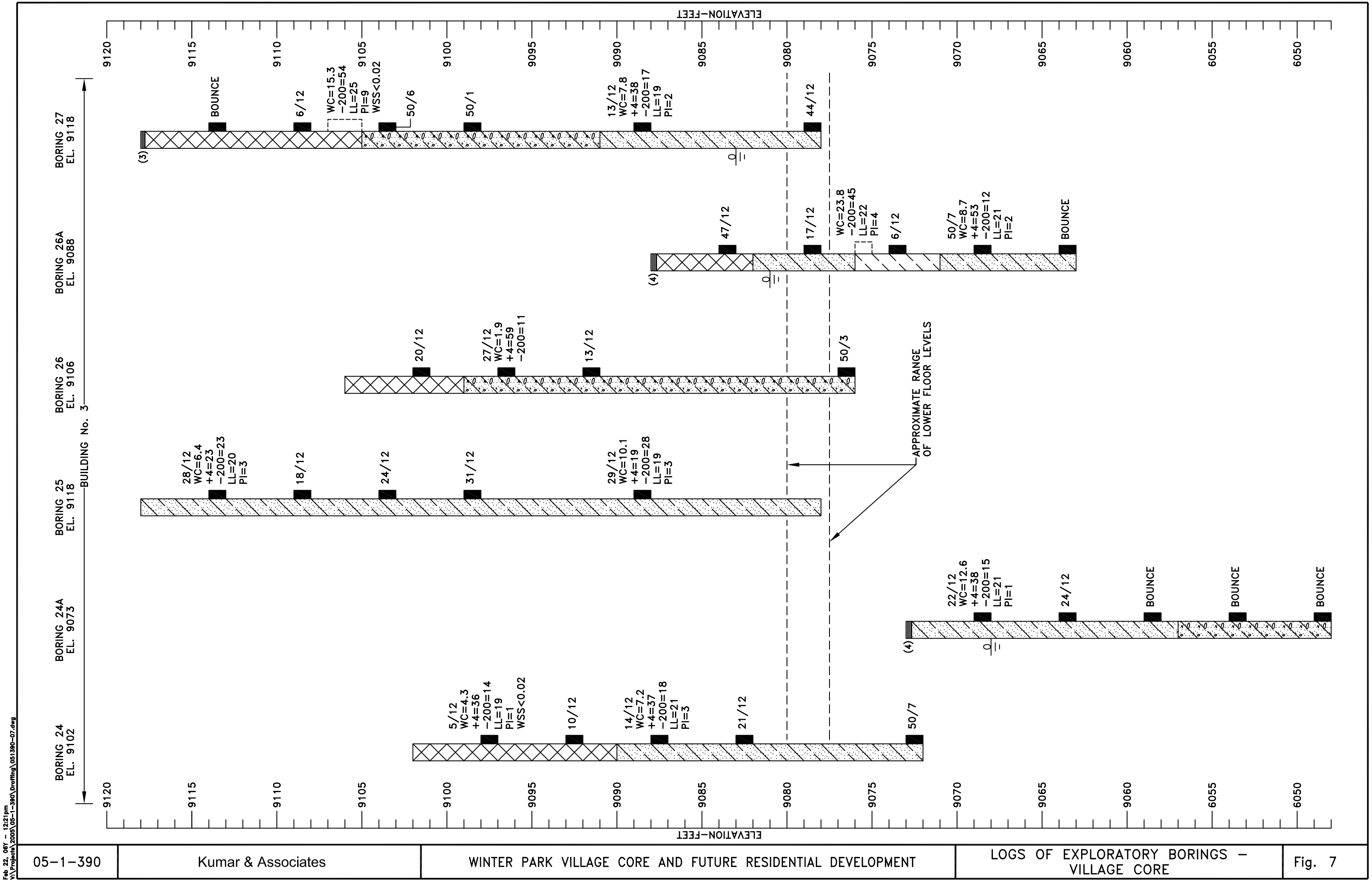

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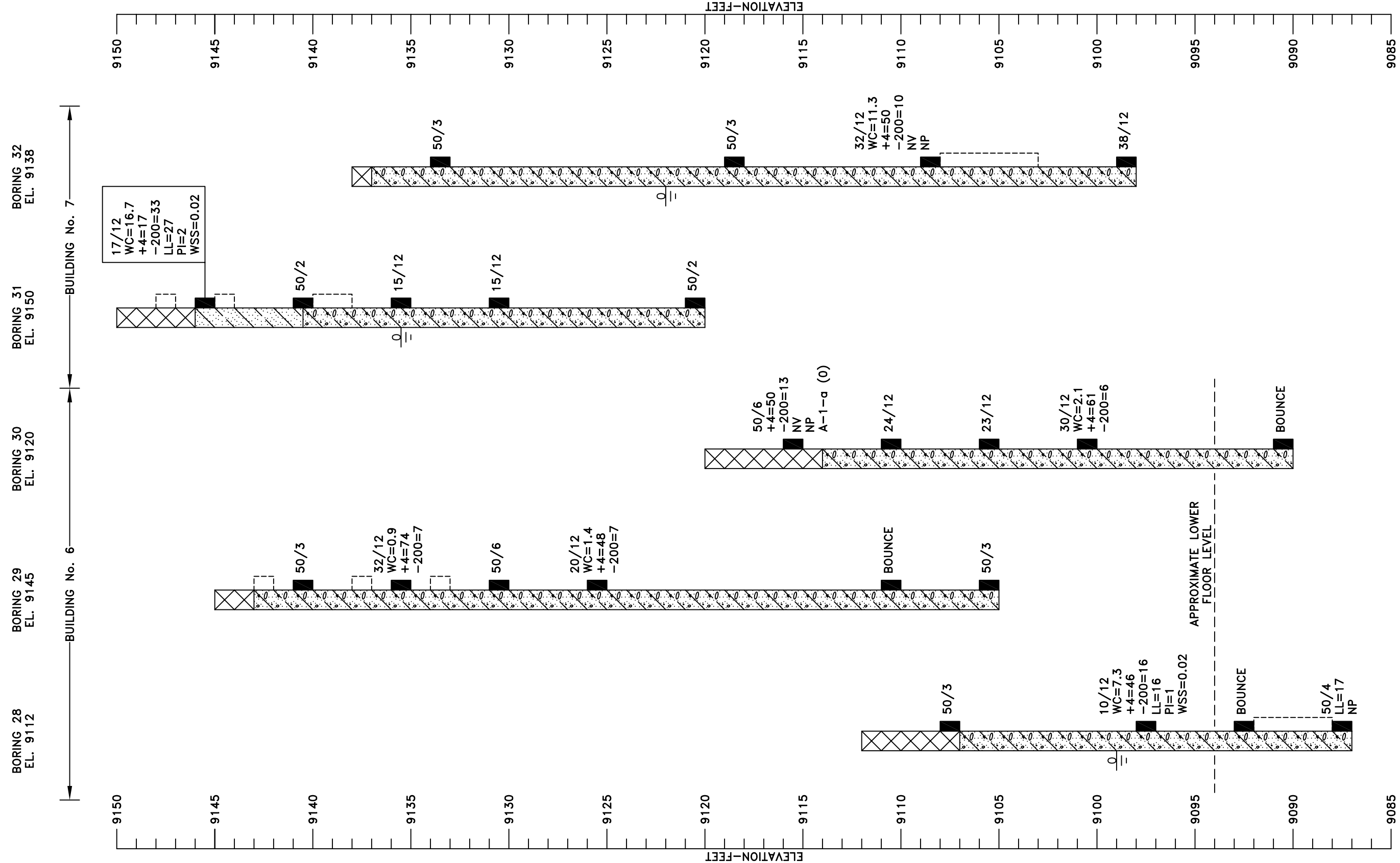
05-1-390	Kumar & Associates	WINTER PARK VILLAGE CORE AND FUTURE RESIDENTIAL DEVELOPMENT	LOGS OF EXPLORATORY BORINGS – VILLAGE CORE	Fig. 7



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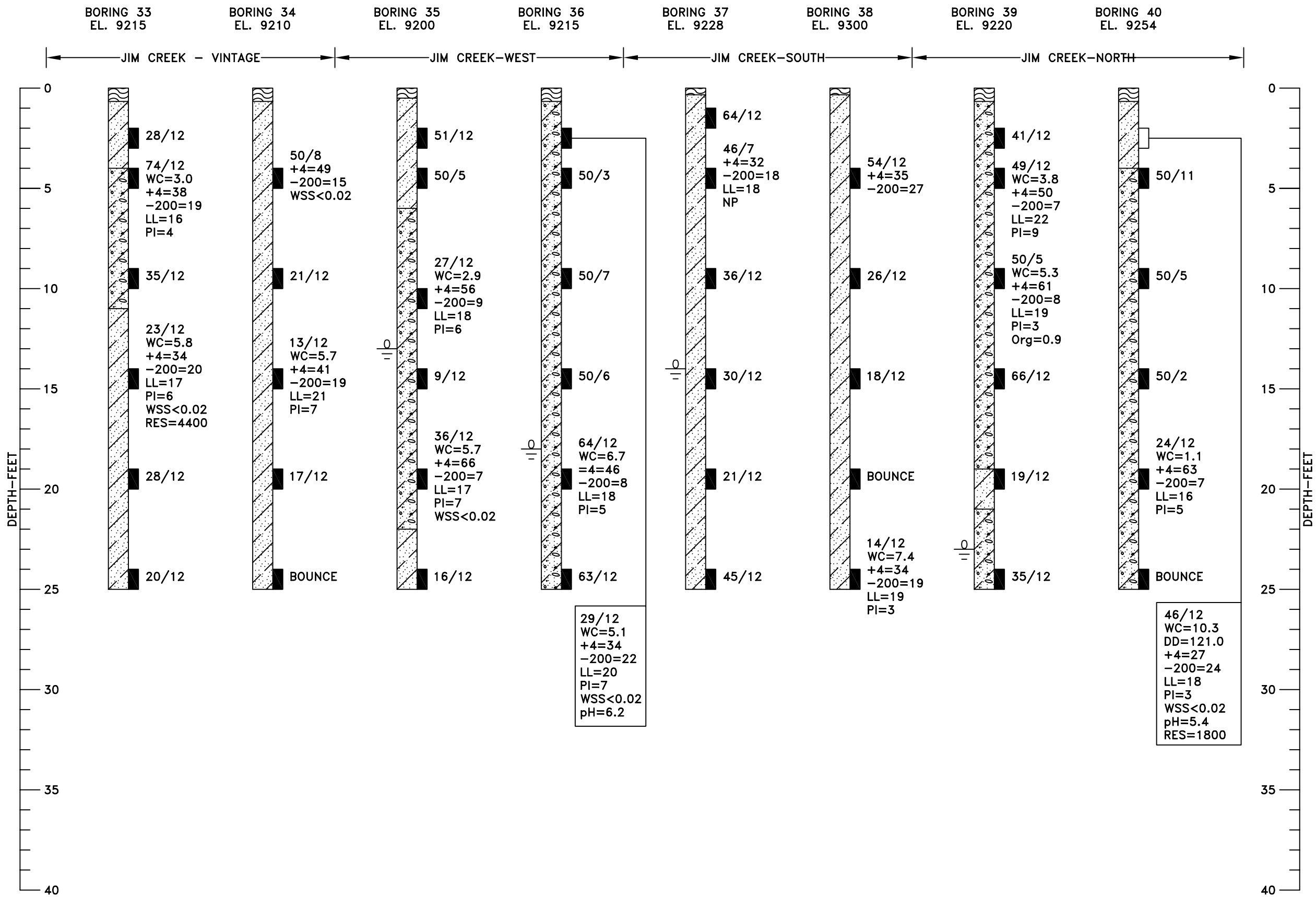
05-1-390	Kumar & Associates	WINTER PARK VILLAGE CORE AND FUTURE RESIDENTIAL DEVELOPMENT	LOGS OF EXPLORATORY BORINGS – VILLAGE CORE	Fig. 8



05–1–390	Kumar & Associates	WINTER PARK VILLAGE CORE AND FUTURE RESIDENTIAL DEVELOPMENT	LOGS OF EXPLORATORY BORINGS – FUTURE RESIDENTIAL DEVELOPMENT	Fig. 9

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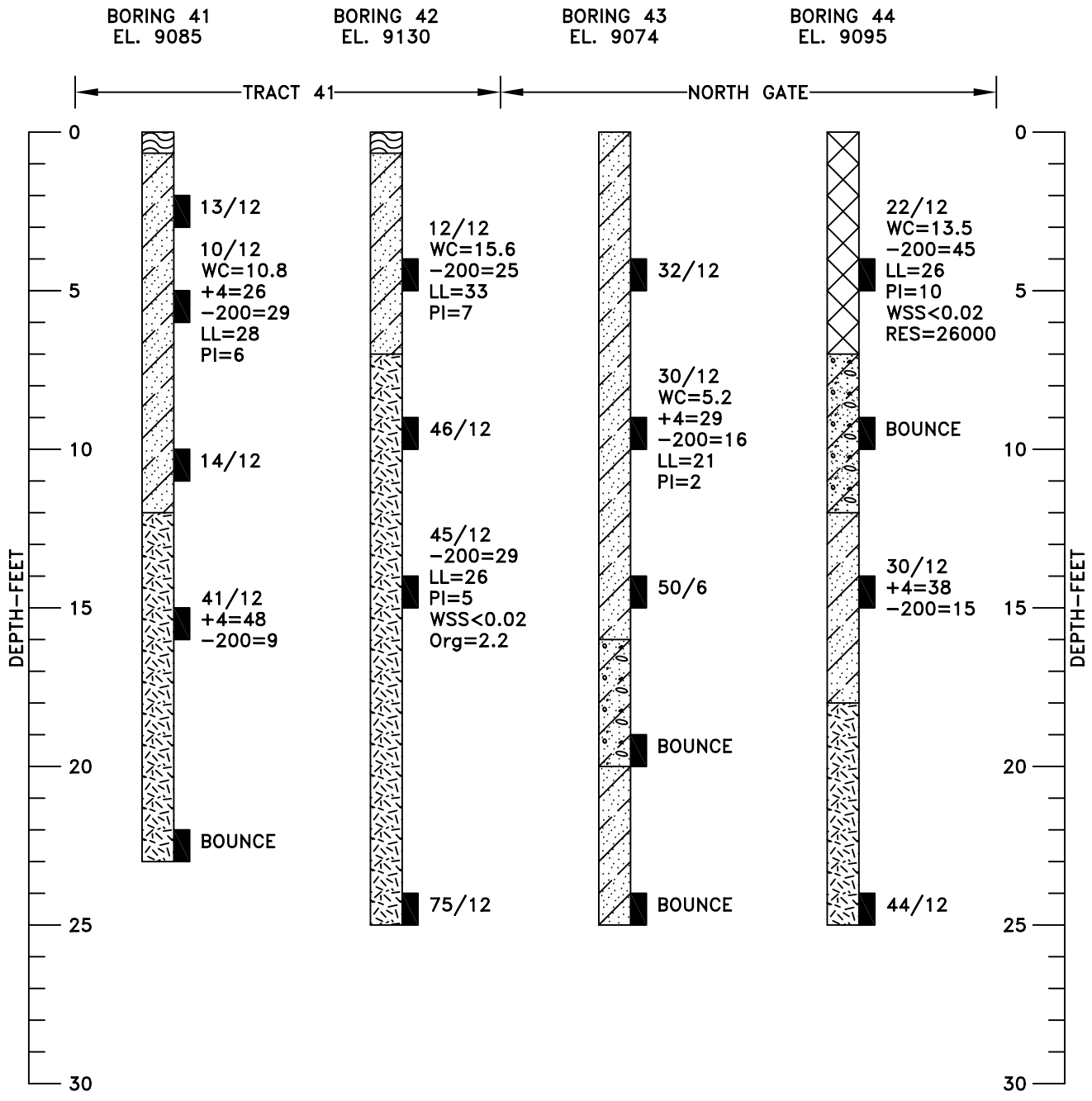

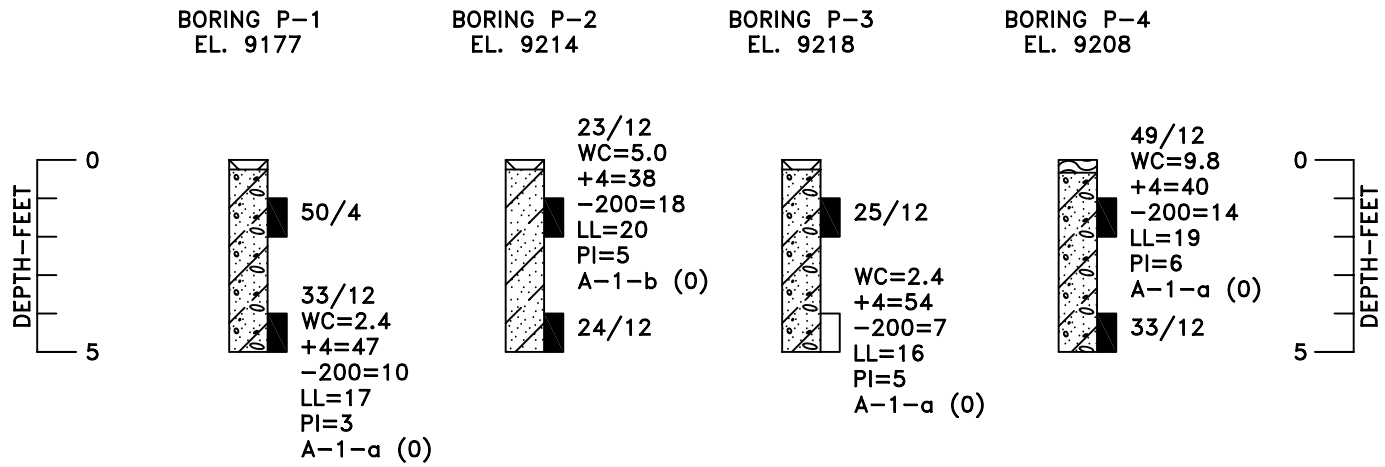

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05-1-390	Kumar & Associates	WINTER PARK VILLAGE CORE AND FUTURE RESIDENTIAL DEVELOPMENT	LOGS OF EXPLORATORY BORINGS – FUTURE RESIDENTIAL DEVELOPMENT	Fig. 10

LEGEND

(4) ASPHALT, THICKNESS IN INCHES SHOWN IN PARENTHESES TO LEFT OF THE LOG.

(7) CONCRETE, THICKNESS IN INCHES SHOWN IN PARENTHESES TO LEFT OF THE LOG.

FILL: CLAYEY/SILTY SAND AND GRAVEL, OCCASIONAL TO FREQUENT COBBLES AND BOULDERS, DRY TO WET, LIGHT-GRAY TO BROWN TO DARK GRAY, OCCASIONAL TIMBER AND OTHER CONSTRUCTION DEBRIS.

TOPSOIL: CLAYEY TO SILTY SAND AND GRAVEL WITH ORGANICS.

ORGANIC CLAY, SILT AND PEAT, MOIST TO VERY MOIST, DARK BROWN TO BROWNISH-BLACK, FIBROUS PEAT.

POORLY GRADED GRAVEL WITH SILT, CLAY AND SAND (GP-GC, GP-GM), CLAYEY GRAVEL WITH SAND (GC), AND SILTY GRAVEL WITH SAND (GM), OCCASIONAL TO FREQUENT COBBLES AND BOULDERS, MEDIUM DENSE TO VERY DENSE, DRY TO WET, LIGHT-GRAY TO BROWN TO DARK GRAY.

POORLY GRADED SAND WITH CLAY, SILT AND GRAVELS (SP-SC, SP-SM), CLAYEY SAND WITH GRAVEL (SC) AND SILTY SAND WITH GRAVEL (SM), OCCASIONALLY SILTY AND OCCASIONAL TO FREQUENT COBBLES AND BOULDERS, LOOSE TO VERY DENSE, DRY TO WET, LIGHT BROWN TO DARK BROWN TO DARK GRAY.

LEAN CLAY WITH SAND TO SANDY LEAN CLAY (CL), MEDIUM STIFF TO STIFF, MOIST TO WET, BROWN, OCCASIONAL ORGANIC MATERIAL.

BEDROCK, GRANITIC TO GNEISSIC, WHITE TO DARK BROWN-GRAY.

DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLE.

DRIVE SAMPLE, 1 3/8-INCH I.D. SPLIT SPOON STANDARD PENETRATION TEST.

18/12 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 18 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.

DISTURBED BULK SAMPLE.

DEPTH TO WATER LEVEL ENCOUNTERED AT THE TIME OF DRILLING.

NOTES

1. THE EXPLORATORY BORINGS WERE DRILLED ON AUGUST 8, 2005 THROUGH AUGUST 29, 2005 WITH A 6-INCH DIAMETER TUBEX PERCUSSION DRILLING SYSTEM.
2. THE LOCATIONS OF THE EXPLORATORY BORINGS WERE STAKED IN THE FIELD BY MARTIN & MARTIN AT THE DIRECTION OF THE CLIENT.
3. THE ELEVATIONS OF THE EXPLORATORY BORINGS WERE INTERPOLATED FROM ELEVATIONS SHOWN ON THE CONTOUR PLAN PROVIDED BY THE CLIENT.
4. THE EXPLORATORY BORING LOCATIONS AND ELEVATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOGS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
6. GROUND WATER LEVELS SHOWN ON THE LOGS WERE MEASURED AT THE TIME AND UNDER CONDITIONS INDICATED. FLUCTUATIONS IN THE WATER LEVEL MAY OCCUR WITH TIME.
7. LABORATORY TEST RESULTS:
   WC = WATER CONTENT (%) (ASTM D 2216);
   DD = DRY DENSITY (pcf) (ASTM D 2216);
   +4 = PERCENTAGE RETAINED ON NO. 4 SIEVE (ASTM D 422);
   -200 = PERCENTAGE PASSING NO. 200 SIEVE (ASTM D 1140);
   LL = LIQUID LIMIT (ASTM D 4318);
   PI = PLASTICITY INDEX (ASTM D 4318);
   NP = NON-PLASTIC (ASTM D 4318);
   RES = MINIMUM LABORATORY RESISTIVITY (ohm-cm.) (AASHTO T 288);
   WSS = WATER SOLUBLE SULFATES (%) (HACH METHOD);
   pH = HYDROGEN ION CONCENTRATION (pH UNITS) (HACH METHOD);
   Org = ORGANIC CONTENT (%) (AASHTO T 267);
   A-1-a (0) = AASHTO CLASSIFICATION (GROUP INDEX).

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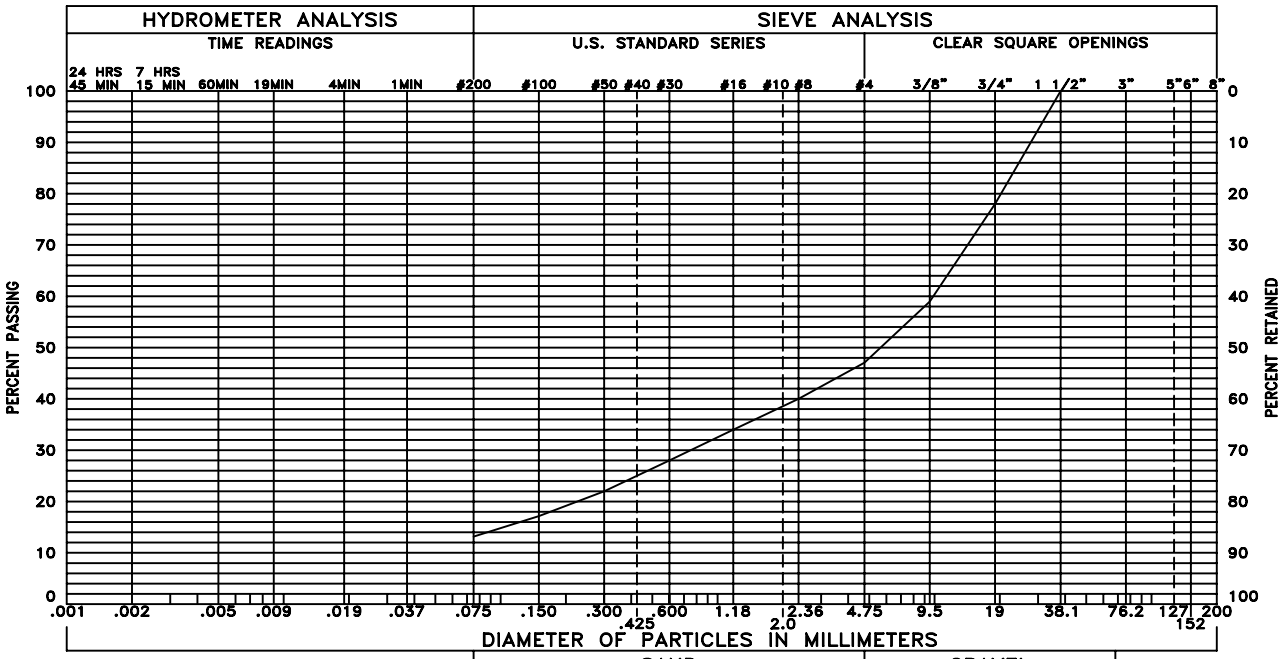
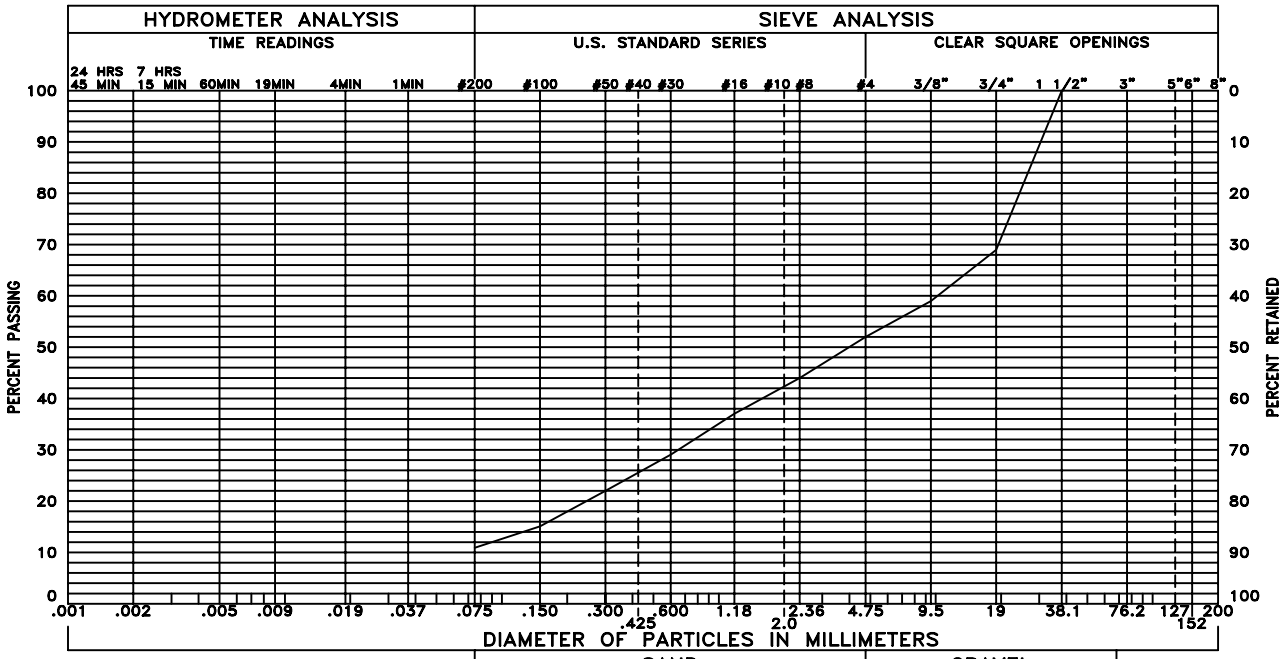


GRAVEL 53% SAND 34% SILT AND CLAY 13%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Silty Gravel wtih Sand (GM) FROM: Boring 1 @ 3'



GRAVEL 48% SAND 41% SILT AND CLAY 11%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 2 @ 14'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

05-1-390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 12

Feb 22, 06Y - 12:22pm
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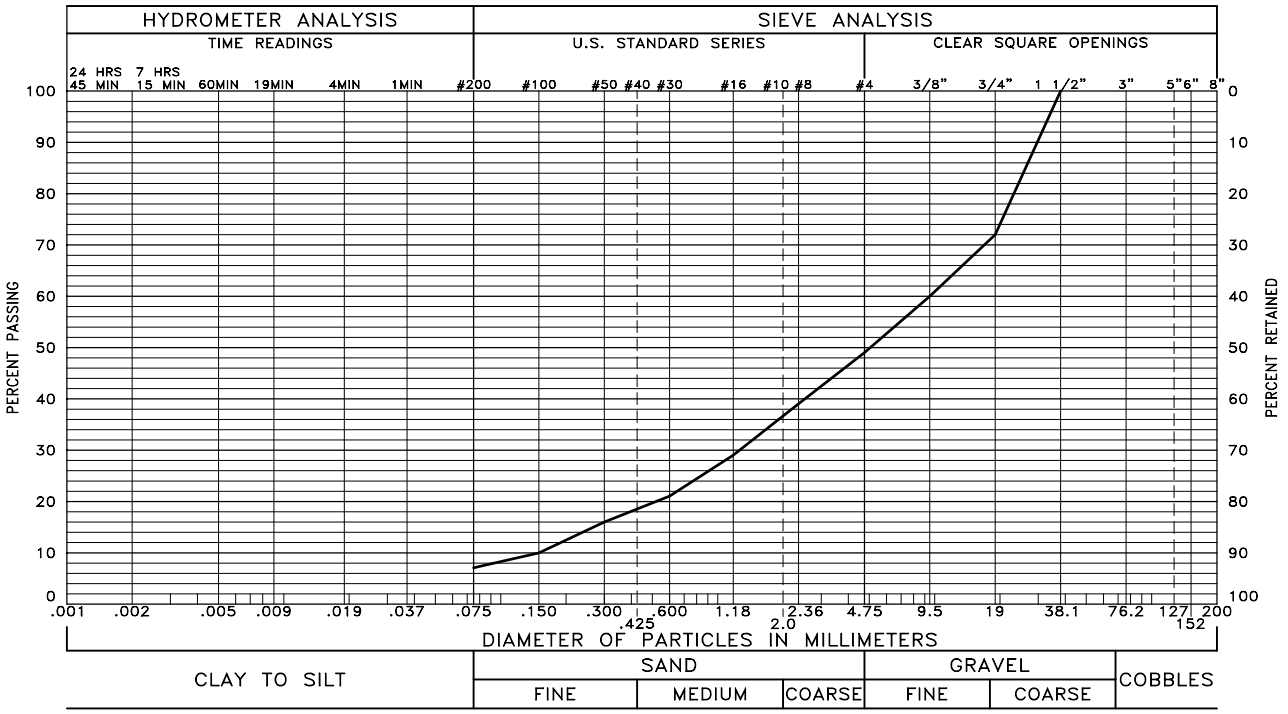
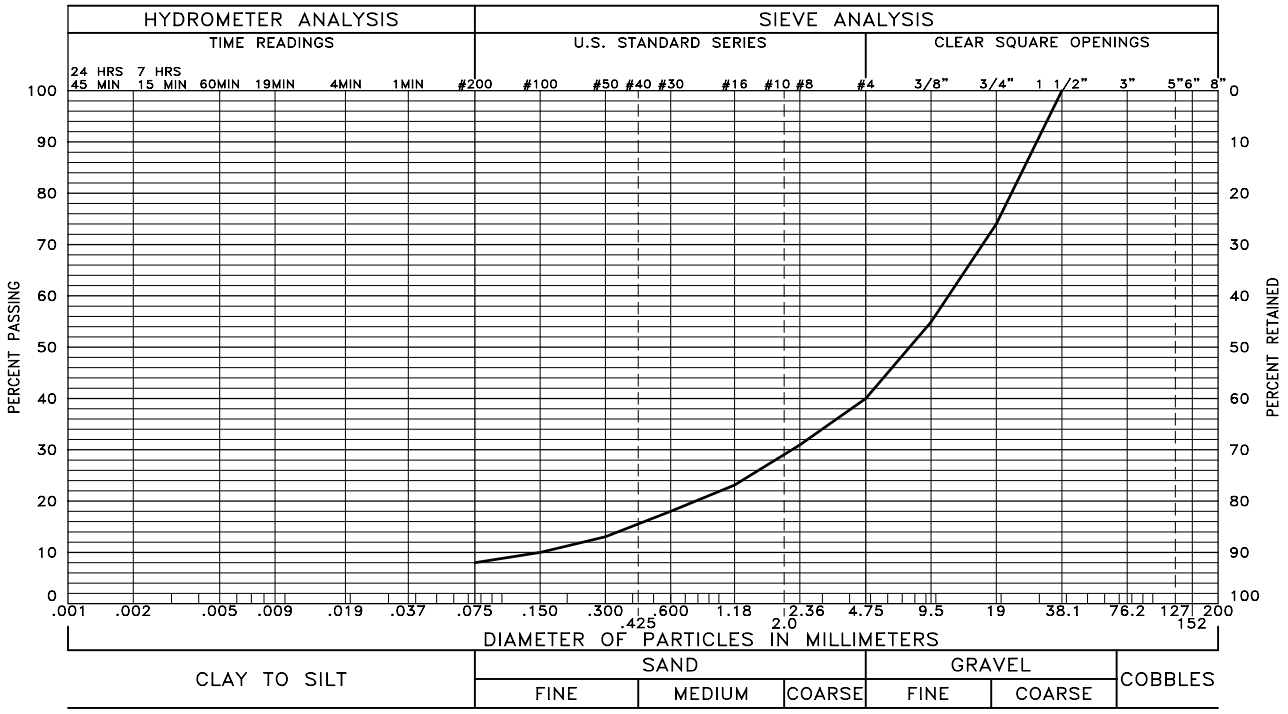


GRAVEL 51% SAND 42% SILT AND CLAY 7%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly–Graded Gravel with Silt and Sand (GP–GM) FROM: Boring 7 @ 14'



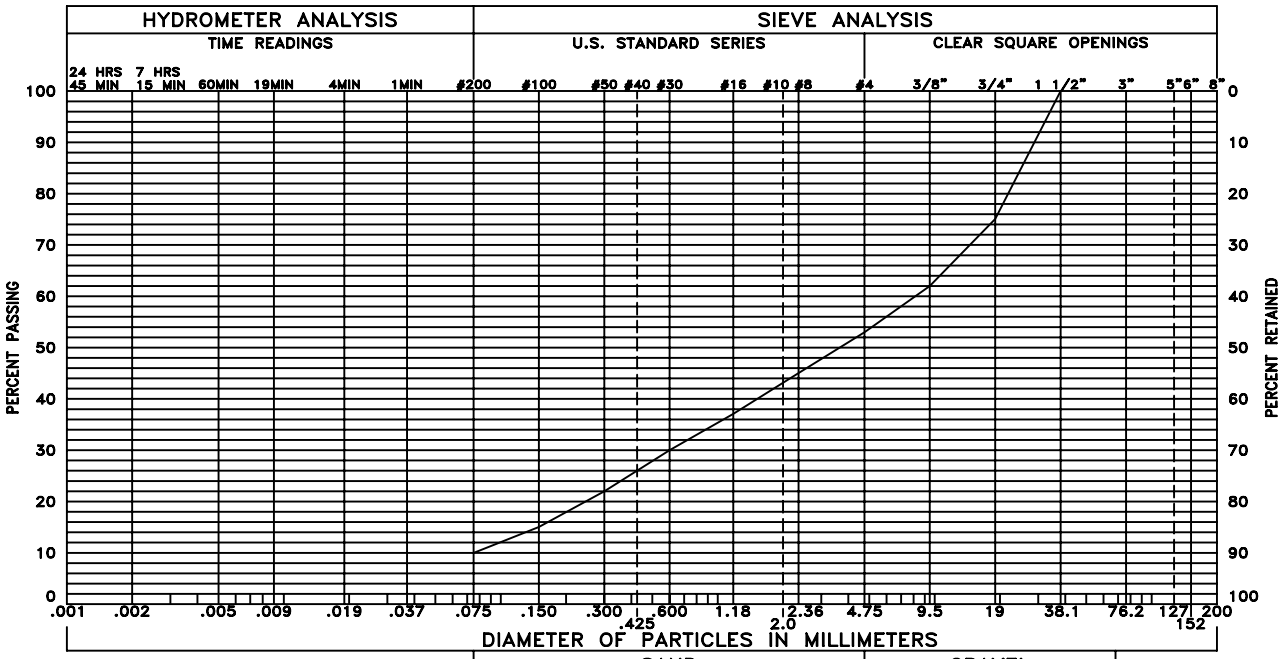
GRAVEL 60% SAND 32% SILT AND CLAY 8%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly–Graded Gravel wtih Silt and Sand (GP–GM) FROM: Boring 8 @ 14'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

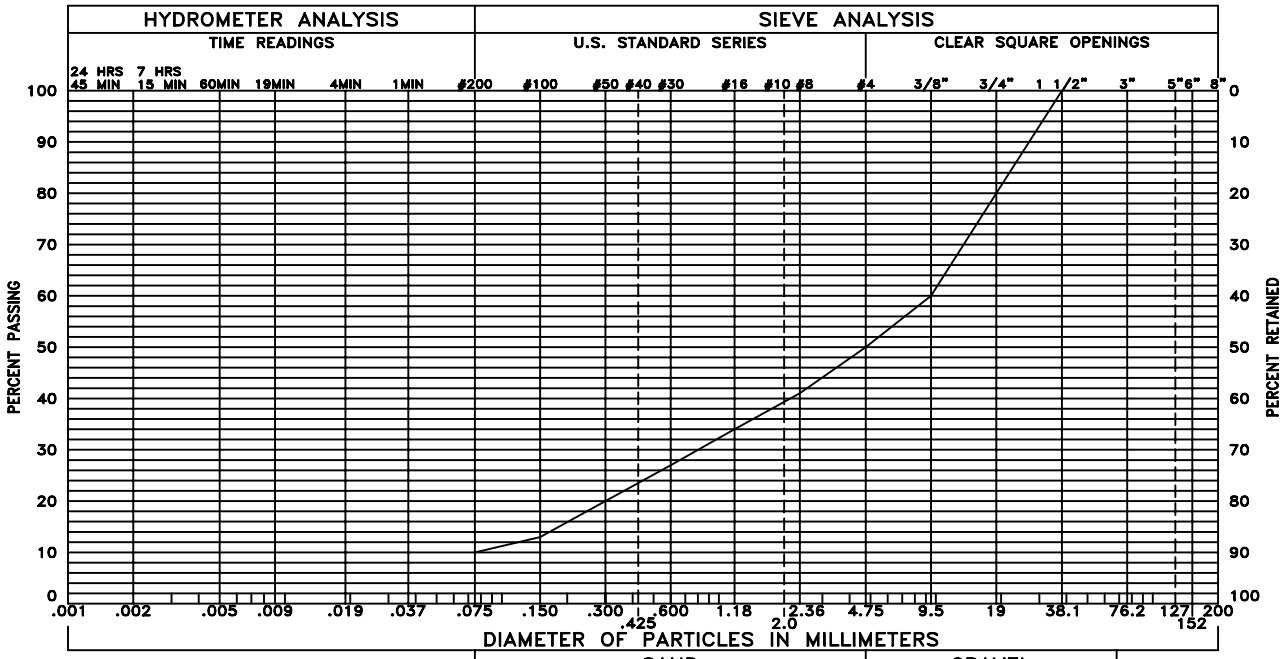
05–1–390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 13



GRAVEL 47% SAND 43% SILT AND CLAY 10%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 9 @ 19'

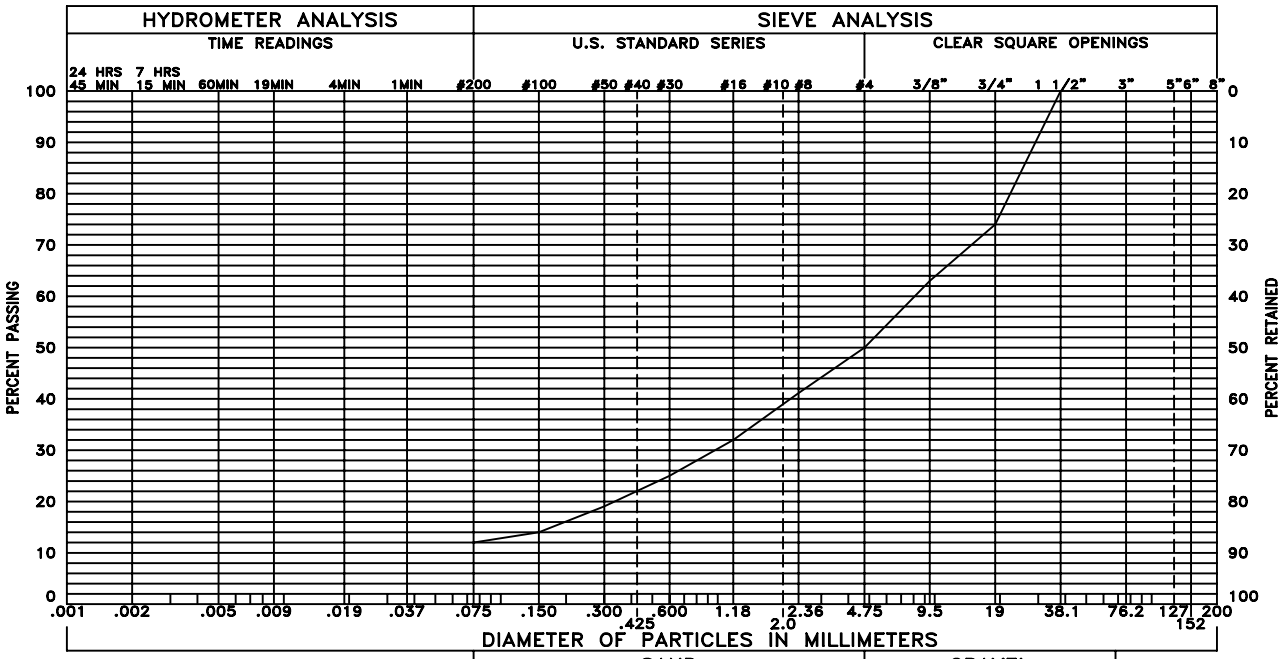


GRAVEL 50% SAND 40% SILT AND CLAY 10%

LIQUID LIMIT NV PLASTICITY INDEX NP

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 12 @ 9'

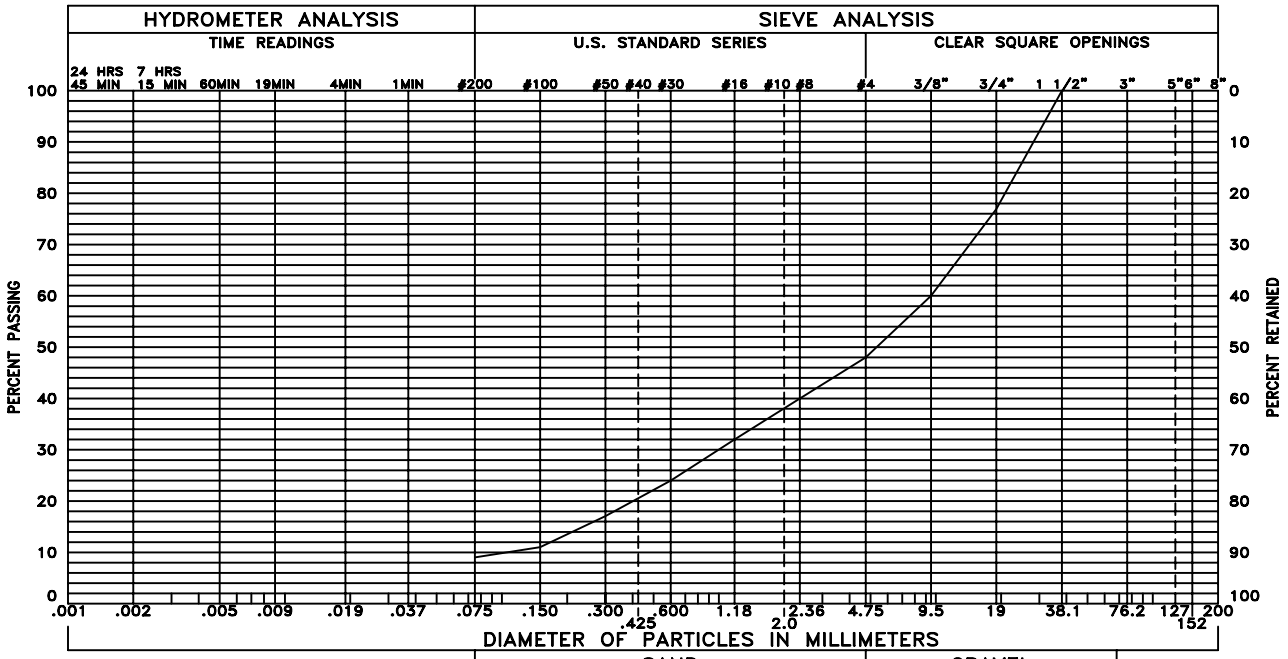
These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.



GRAVEL 50% SAND 38% SILT AND CLAY 12%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 13 @ 9'



GRAVEL 52% SAND 39% SILT AND CLAY 9%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel with Silt and Sand (gp-GM) FROM: Boring 14 @ 9'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

Feb 22, 08Y - 12:23pm
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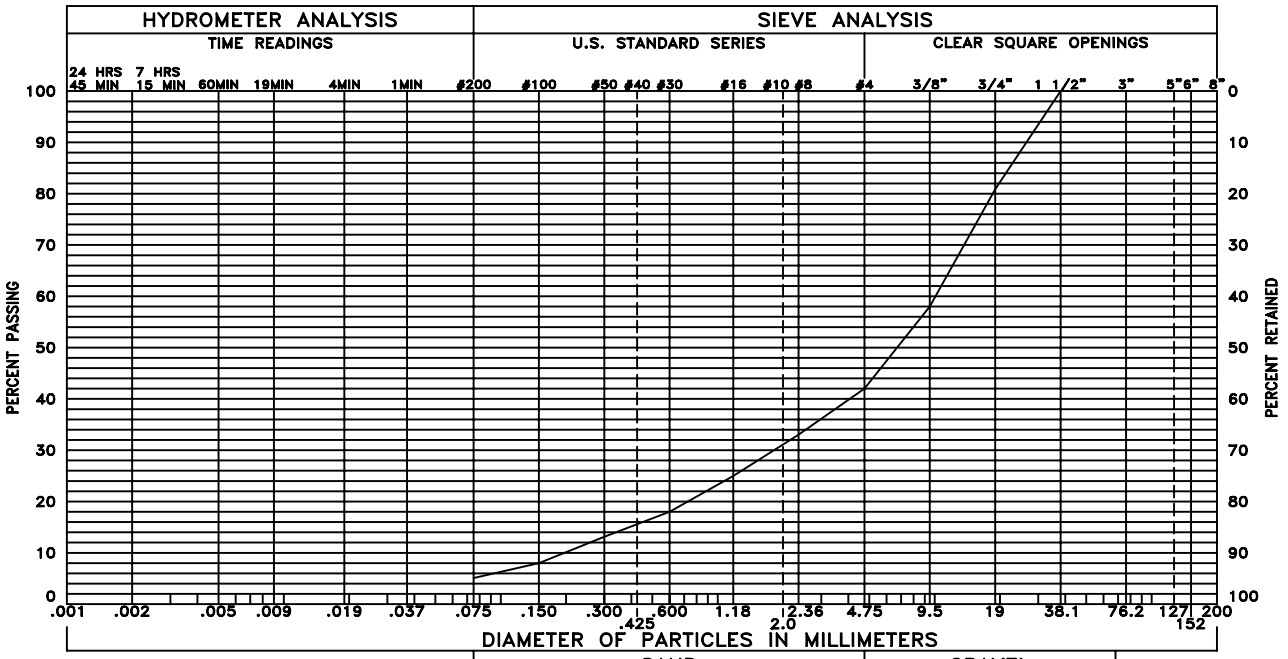
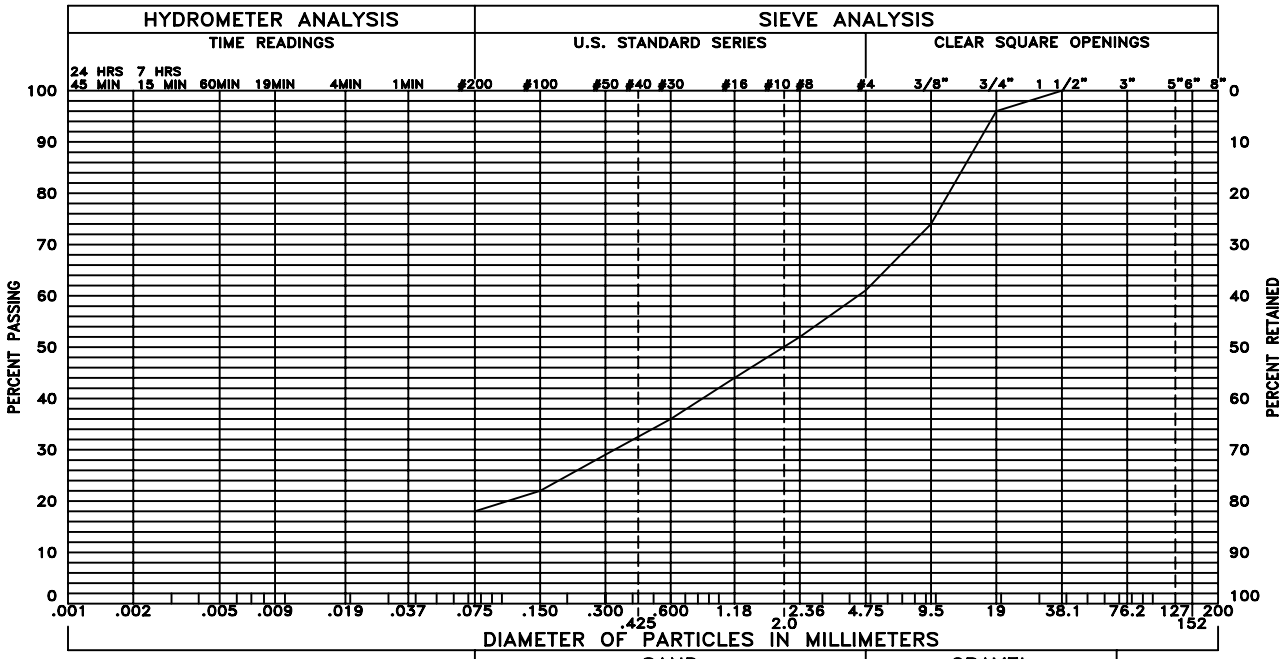
05-1-390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 15



GRAVEL 58% SAND 37% SILT AND CLAY 5%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 15 @ 4'



GRAVEL 39% SAND 43% SILT AND CLAY 18%

LIQUID LIMIT 21 PLASTICITY INDEX 6

SAMPLE OF: Silty, Clayey Sand with Gravel (SC-SM) FROM: Boring 16 @ 4'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

05-1-390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 16

Feb 22, 08Y - 12:24pm
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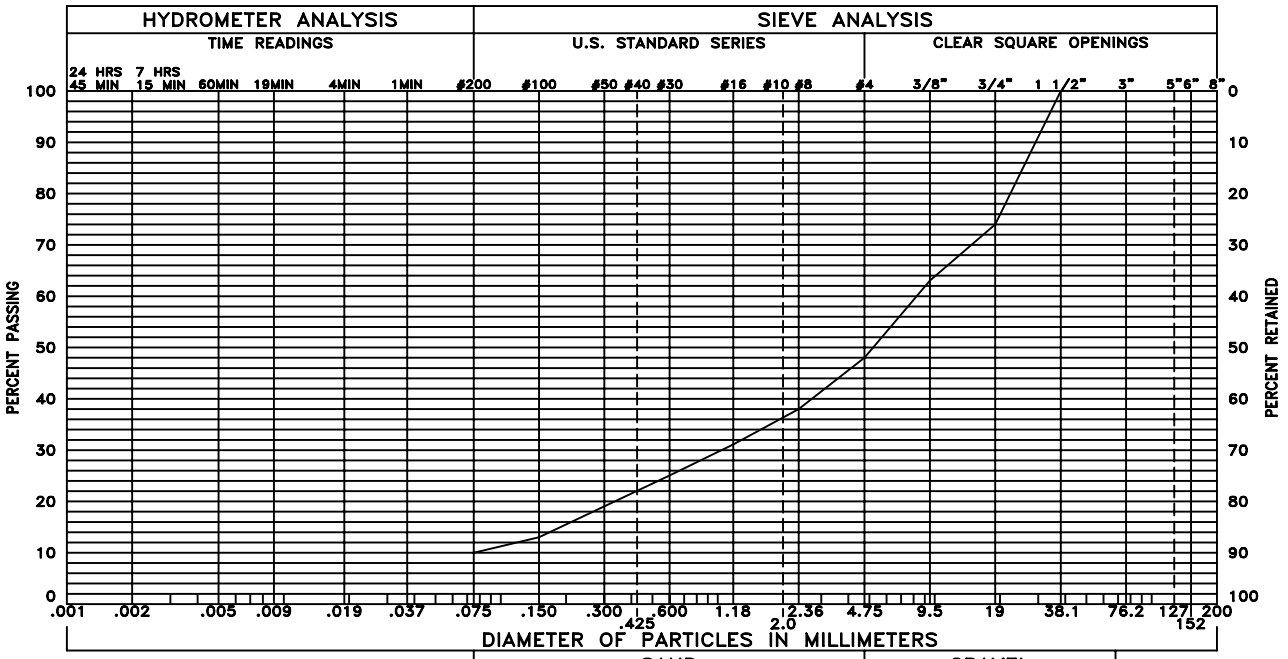
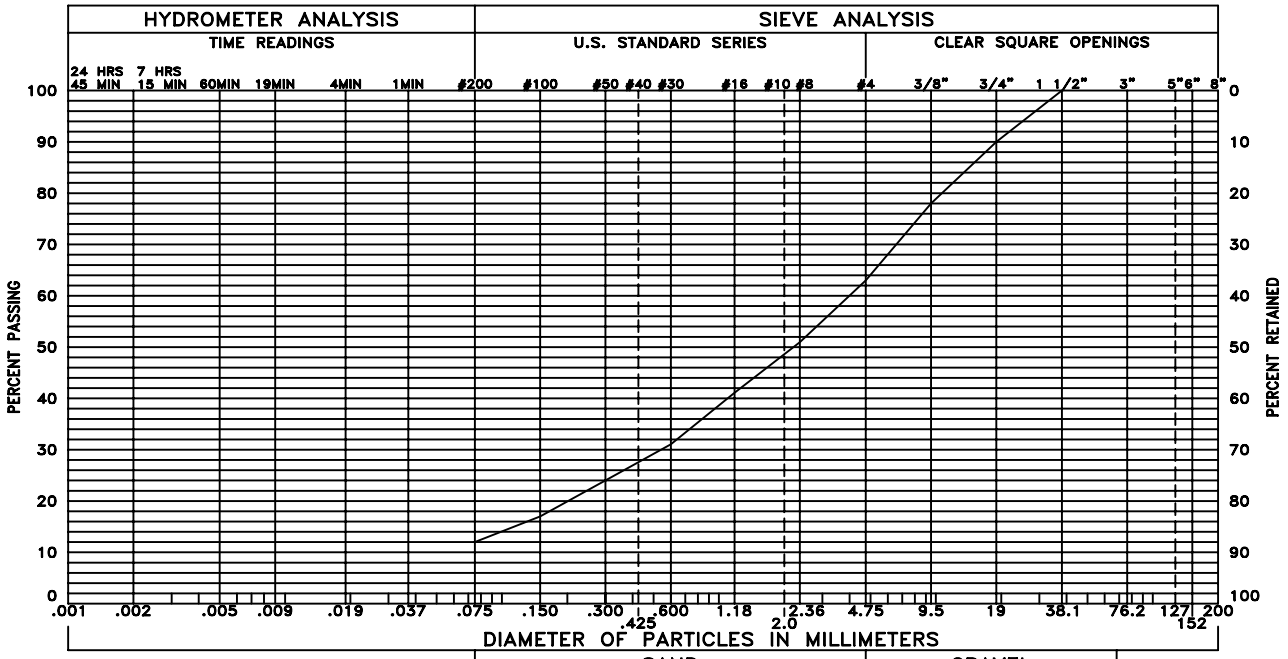


GRAVEL 52% SAND 38% SILT AND CLAY 10%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel with Silt and Sand (GP-GM) FROM: Boring 16 @ 14'



GRAVEL 37% SAND 51% SILT AND CLAY 12%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Sand wtih Silt and Gravel (SP-SM) FROM: Boring 18 @ 9'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

Feb 22, 08Y - 12:24pm
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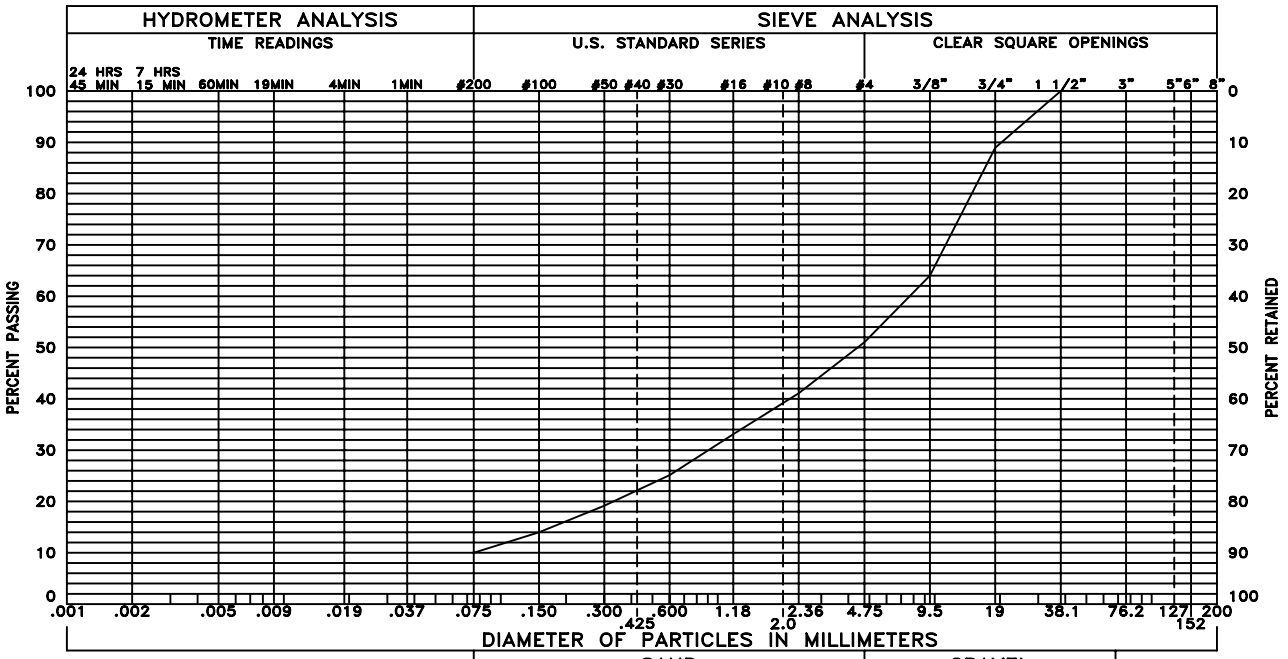
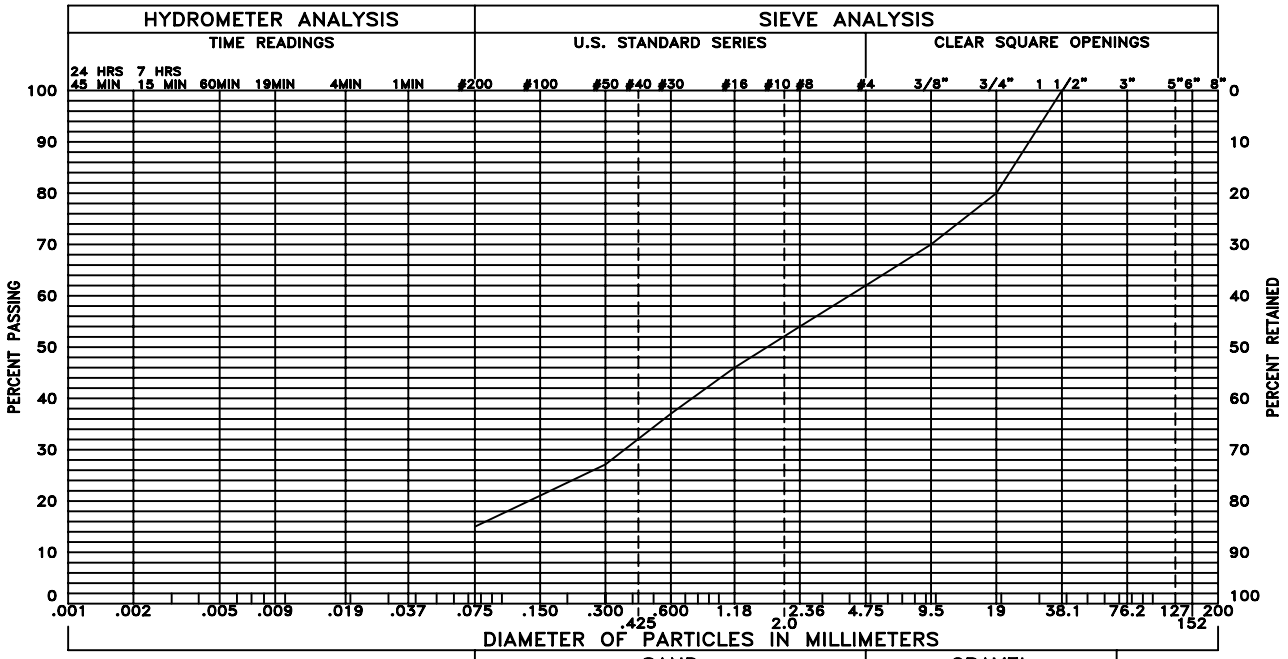
05-1-390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 17



GRAVEL 49% SAND 41% SILT AND CLAY 10%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 22 @ 9'



GRAVEL 38% SAND 47% SILT AND CLAY 15%

LIQUID LIMIT 21 PLASTICITY INDEX 1

SAMPLE OF: Silty Sand wtih Gravel (SM) FROM: Boring 24A @ 4'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

05-1-390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 18

Feb 22, 08Y - 12:24pm
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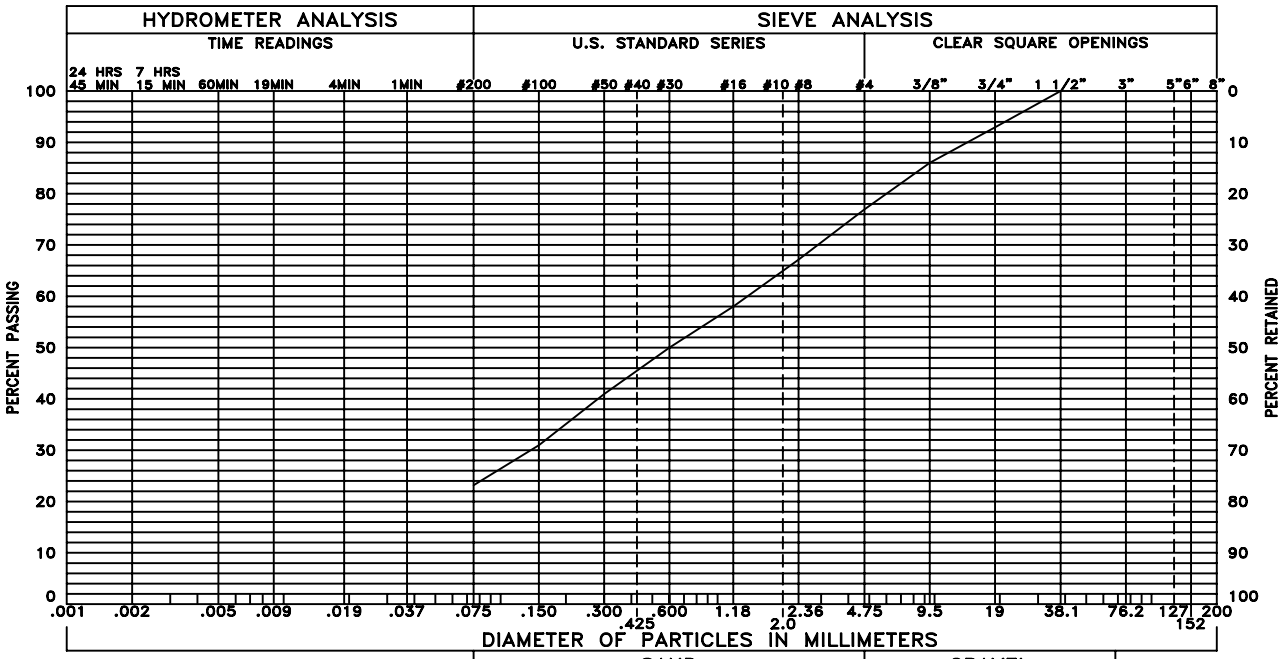
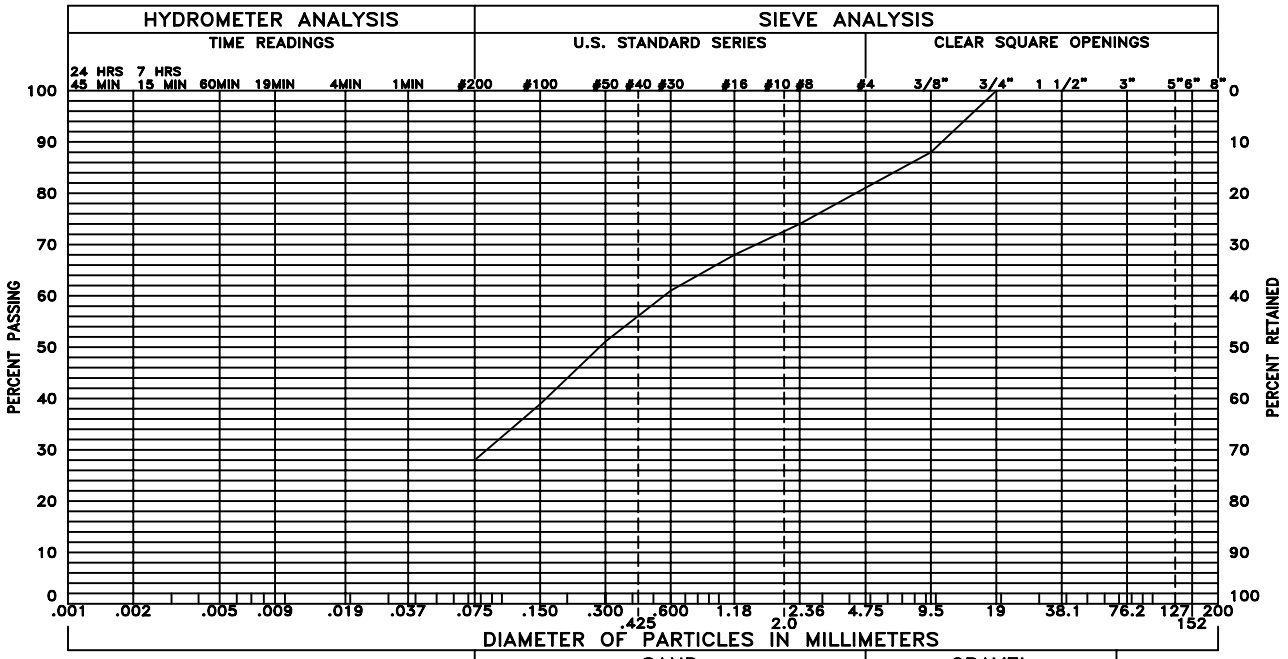


GRAVEL 23% SAND 54% SILT AND CLAY 23%

LIQUID LIMIT 20 PLASTICITY INDEX 3

SAMPLE OF: Silty Sand with Gravel FROM: Boring 25 @ 4'

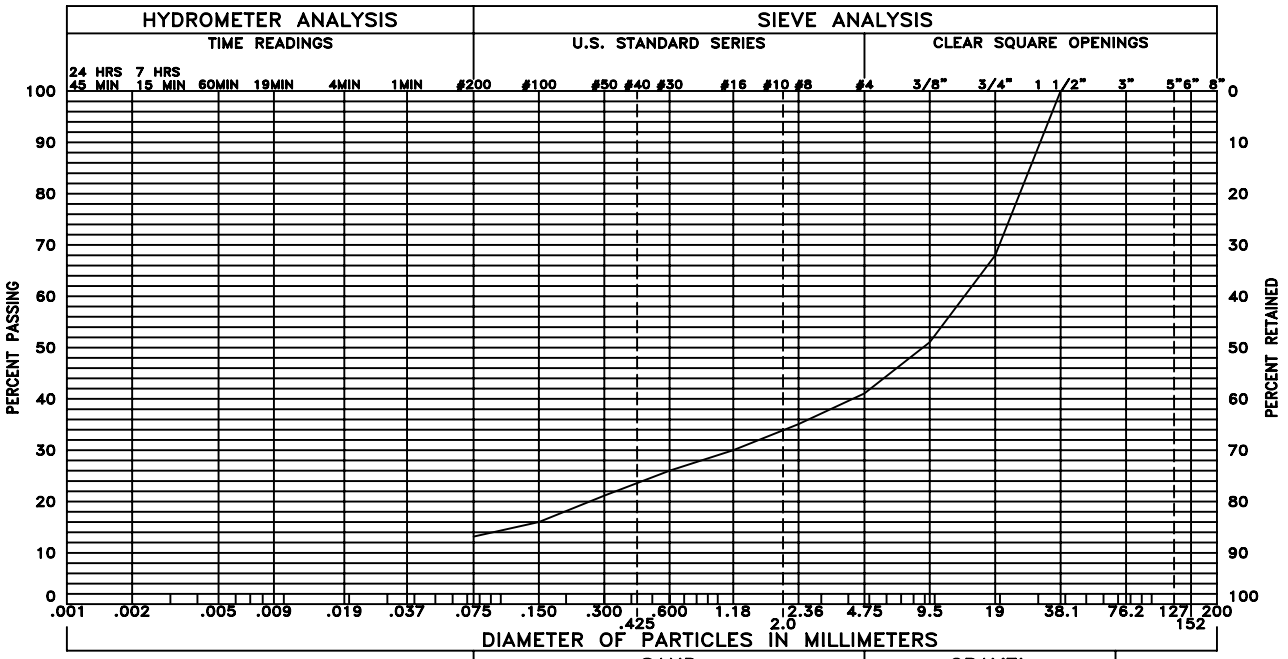


GRAVEL 19% SAND 53% SILT AND CLAY 28%

LIQUID LIMIT 19 PLASTICITY INDEX 3

SAMPLE OF: Silty Sand with Gravel FROM: Boring 25 @ 29'

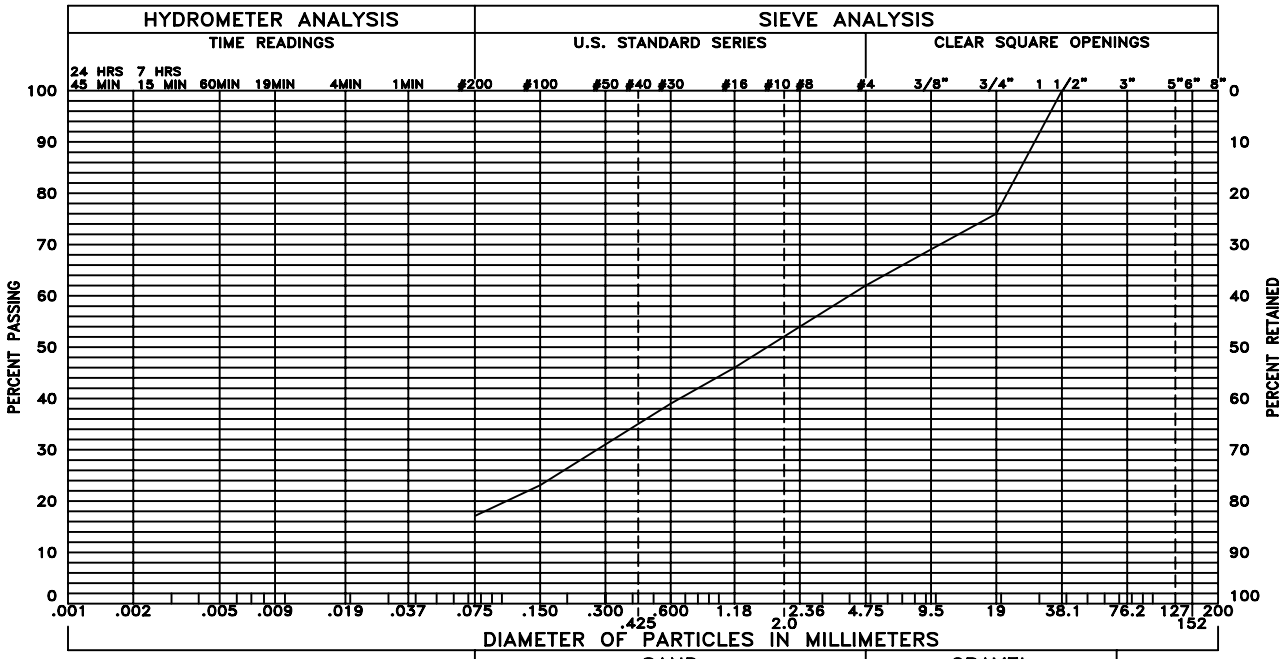
These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.



GRAVEL 59% SAND 30% SILT AND CLAY 11%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 26 @ 9'



GRAVEL 38% SAND 45% SILT AND CLAY 17%

LIQUID LIMIT 19 PLASTICITY INDEX 2

SAMPLE OF: Silty Sand with Gravel (SM) FROM: Boring 27 @ 29'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

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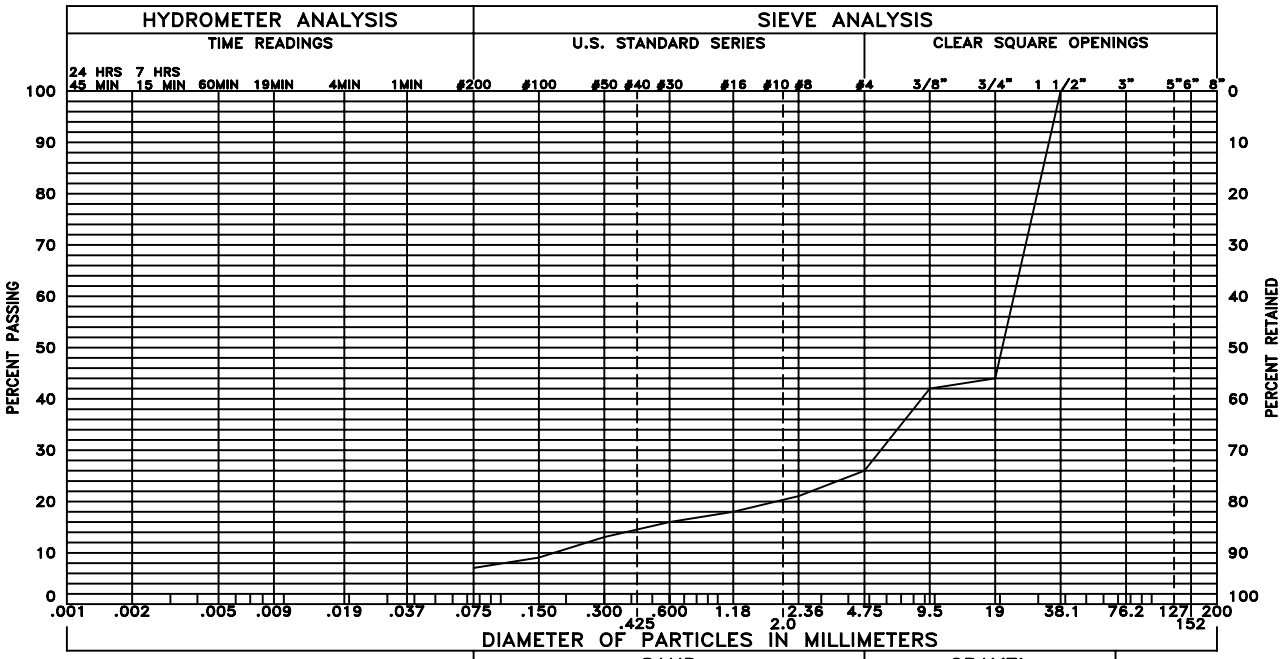
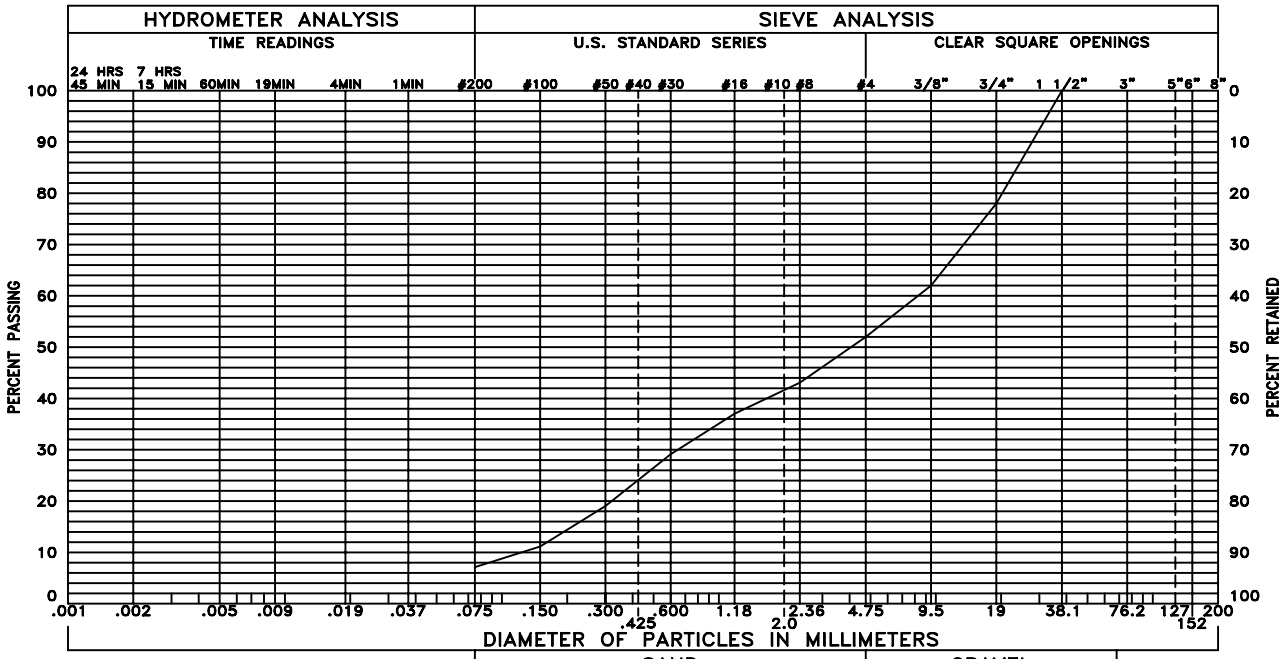
05-1-390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 20



GRAVEL 74% SAND 19% SILT AND CLAY 7%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and sand (GP-GM) FROM: Boring 29 @ 9'



GRAVEL 48% SAND 45% SILT AND CLAY 7%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 29 @ 19'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

05-1-390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 21

Feb 22, 06Y - 12:26pm
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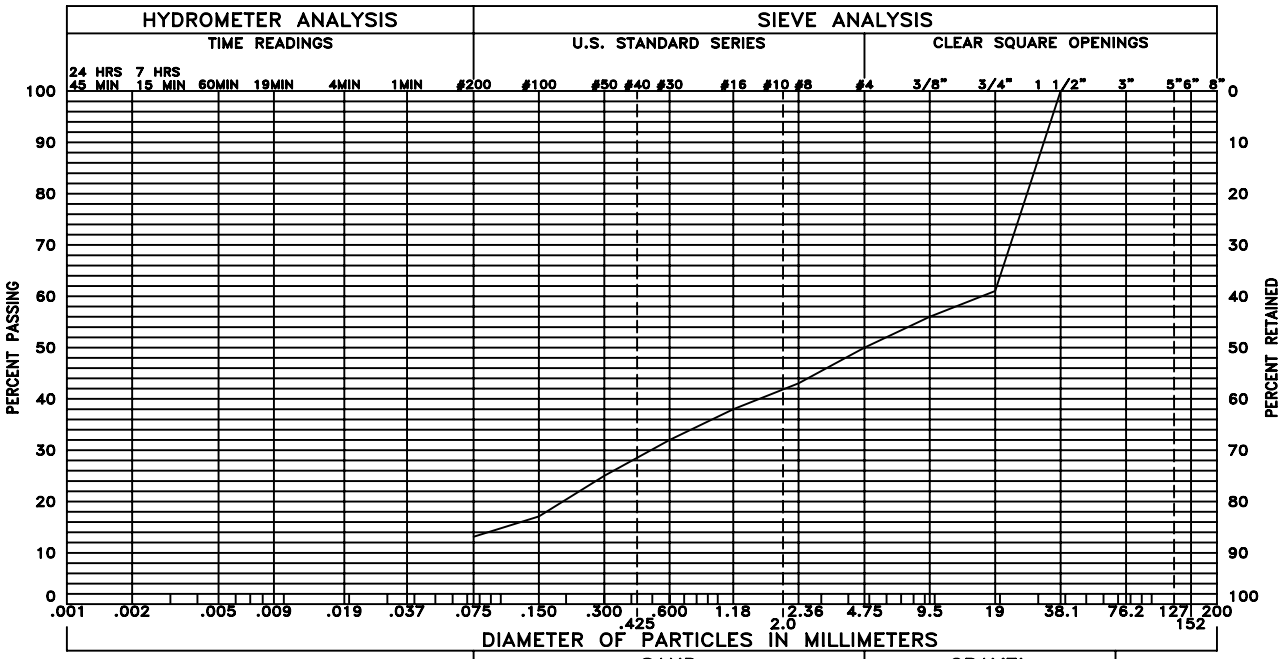
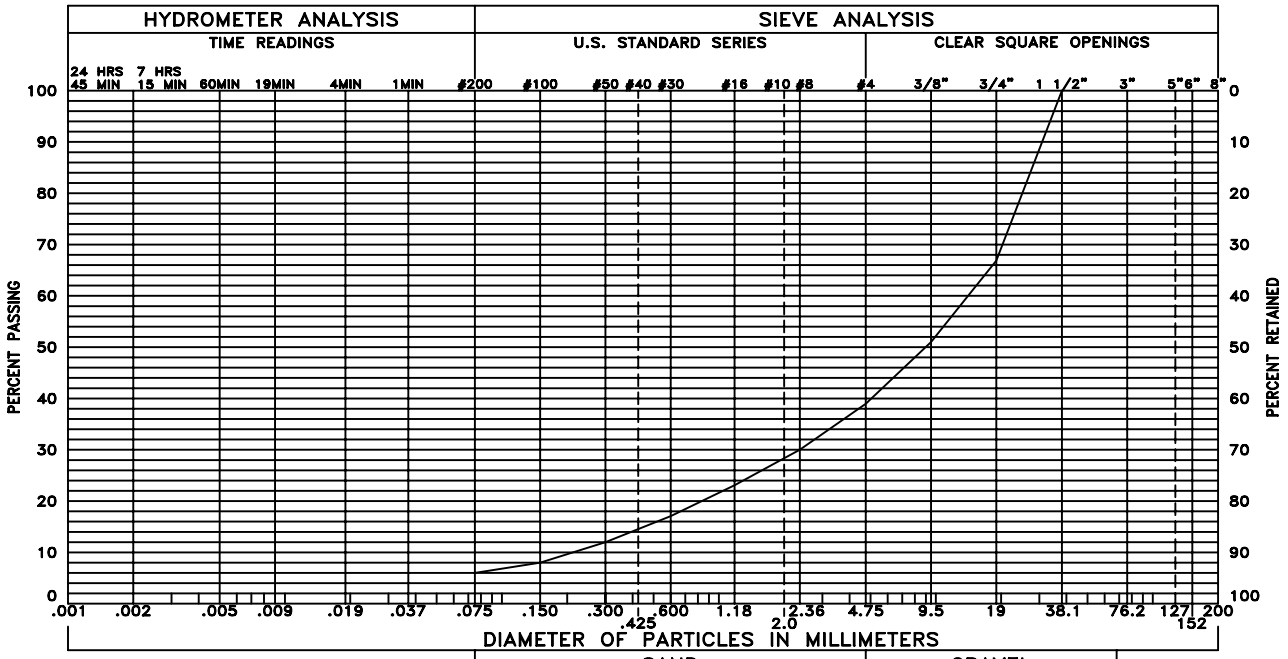


GRAVEL 50% SAND 37% SILT AND CLAY 13%

LIQUID LIMIT NV PLASTICITY INDEX NP

SAMPLE OF: Silty Gravel wtih Sand (GM) FROM: Boring 30 @ 4'



GRAVEL 61% SAND 33% SILT AND CLAY 6%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 30 @ 19'

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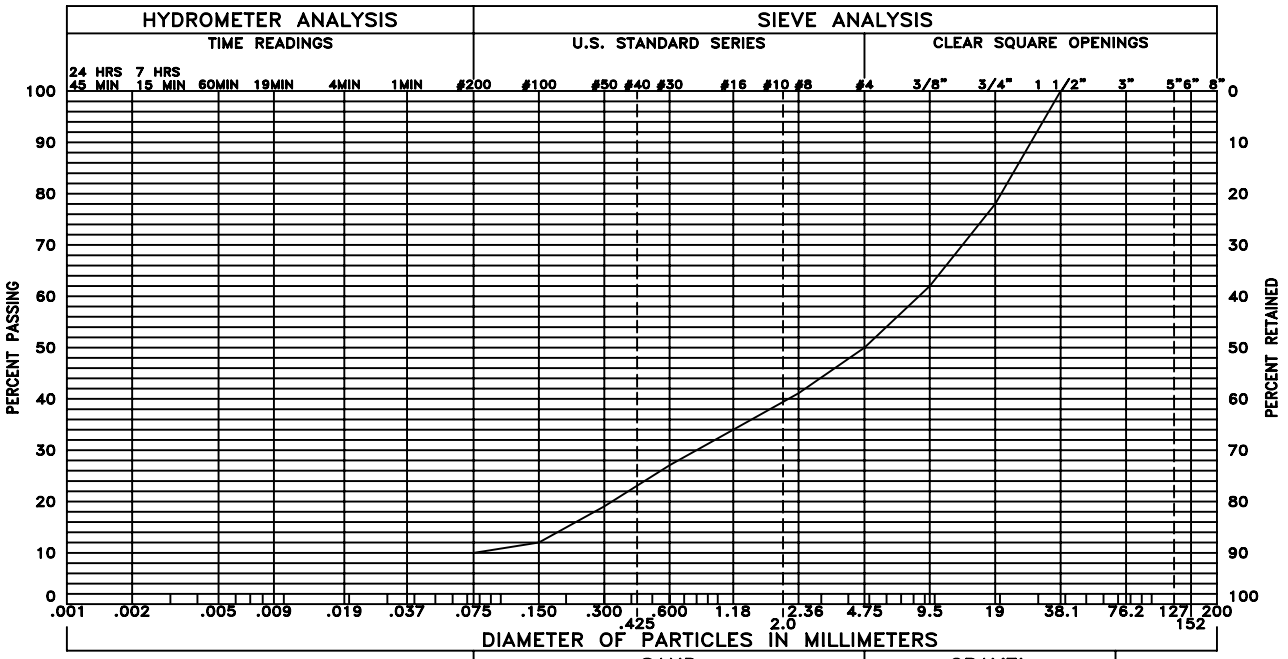
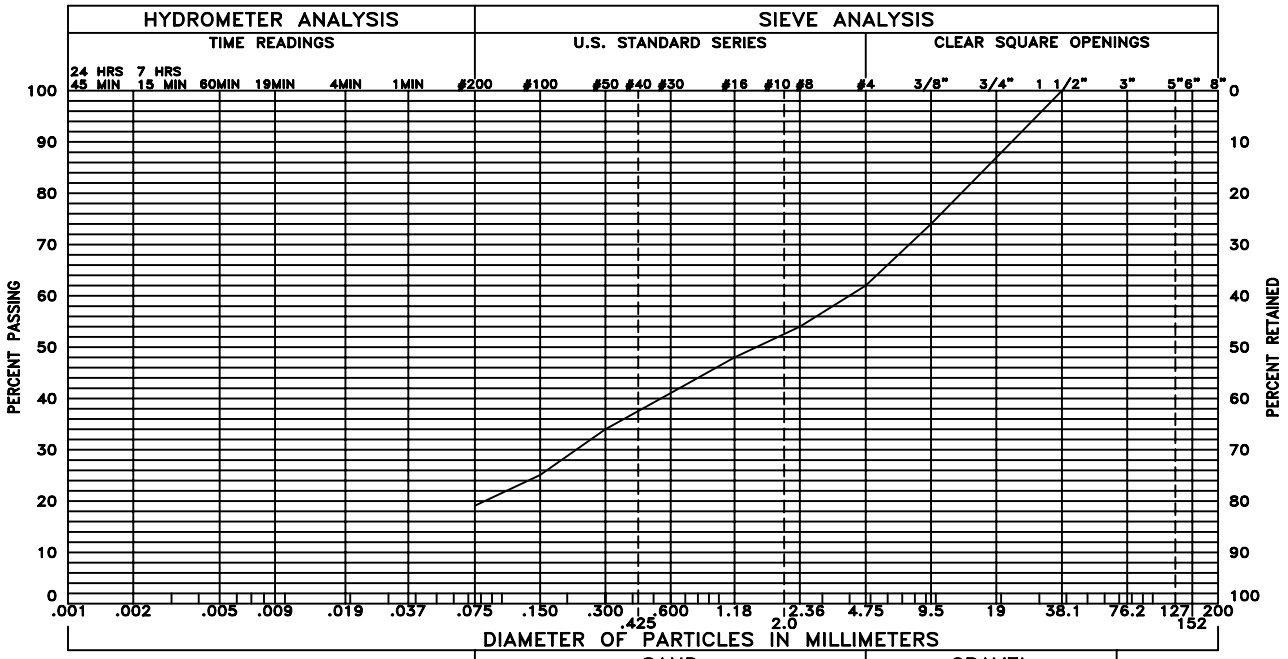


GRAVEL 50% SAND 40% SILT AND CLAY 10%

LIQUID LIMIT NV PLASTICITY INDEX NP

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 32 @ 29'

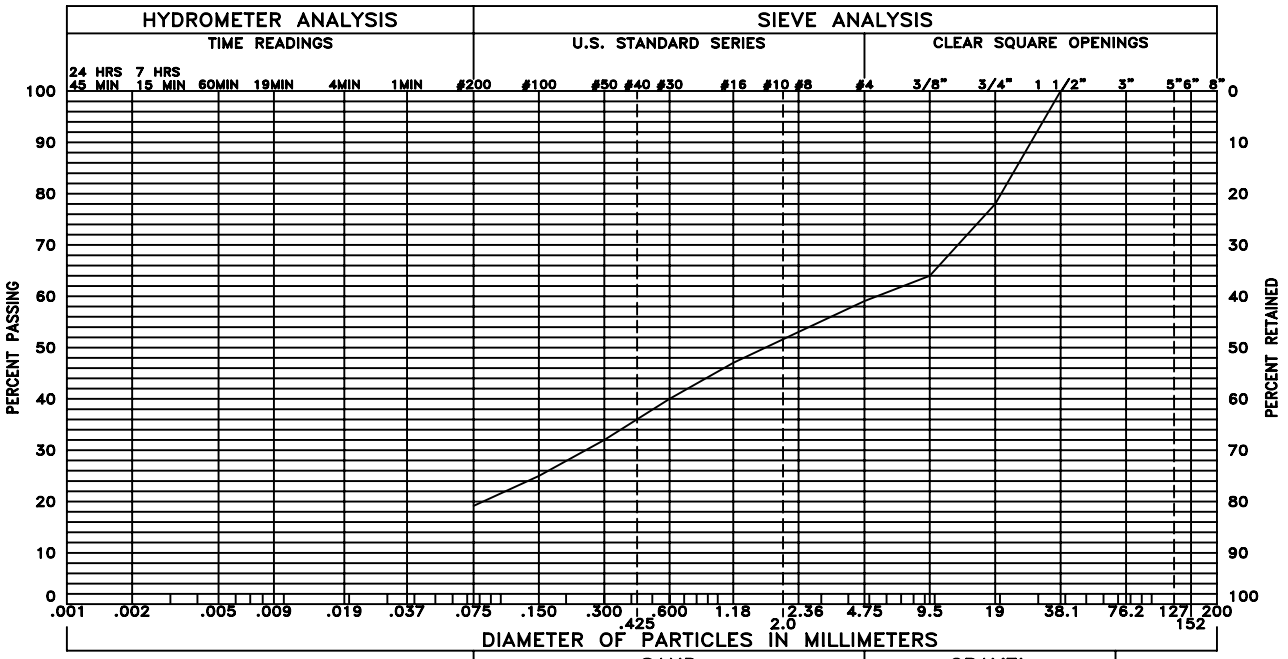


GRAVEL 38% SAND 43% SILT AND CLAY 19%

LIQUID LIMIT 16 PLASTICITY INDEX 4

SAMPLE OF: Silty, Clayey Sand wtih Gravel (SC-SM) FROM: Boring 33 @ 4'

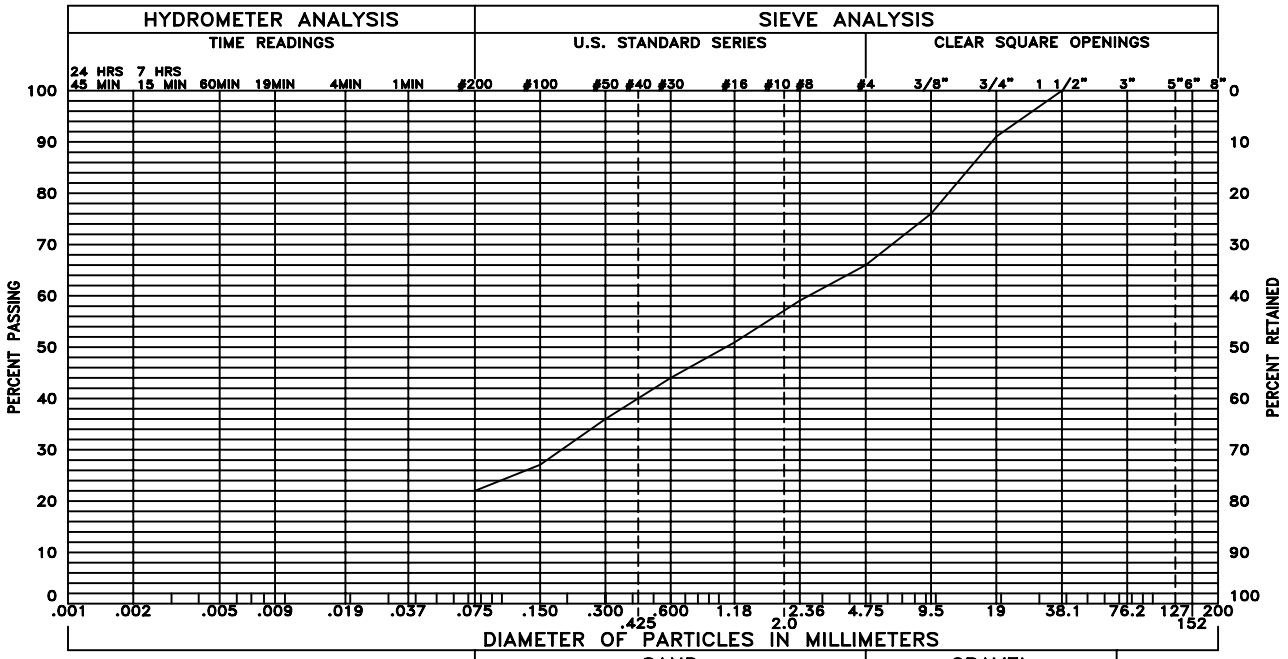
These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.



GRAVEL 41% SAND 40% SILT AND CLAY 19%

LIQUID LIMIT 21 PLASTICITY INDEX 7

SAMPLE OF: Silty, Clayey Gravel with Sand (GC–GM) FROM: Boring 34 @ 14'



GRAVEL 34% SAND 44% SILT AND CLAY 22%

LIQUID LIMIT 20 PLASTICITY INDEX 7

SAMPLE OF: Clayey Sand with Gravel (SC) FROM: Boring 36 @ 2'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.

05–1–390	Kumar & Associates	GRADATION TEST RESULTS	Fig. 24

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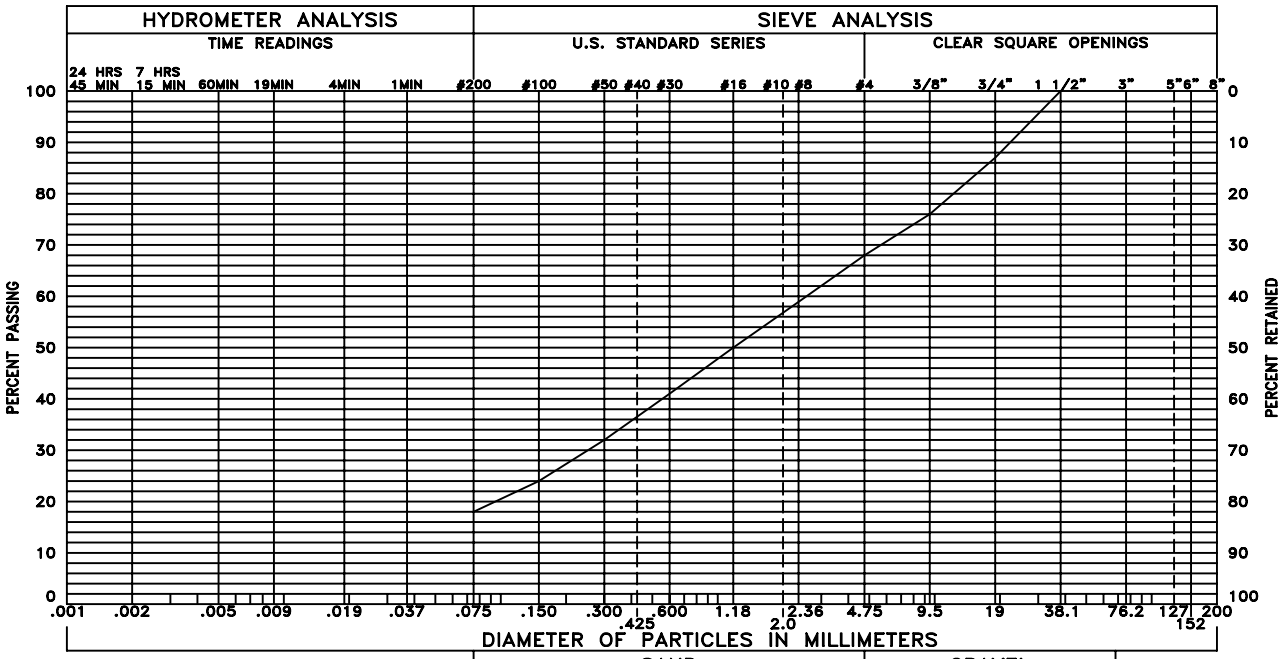
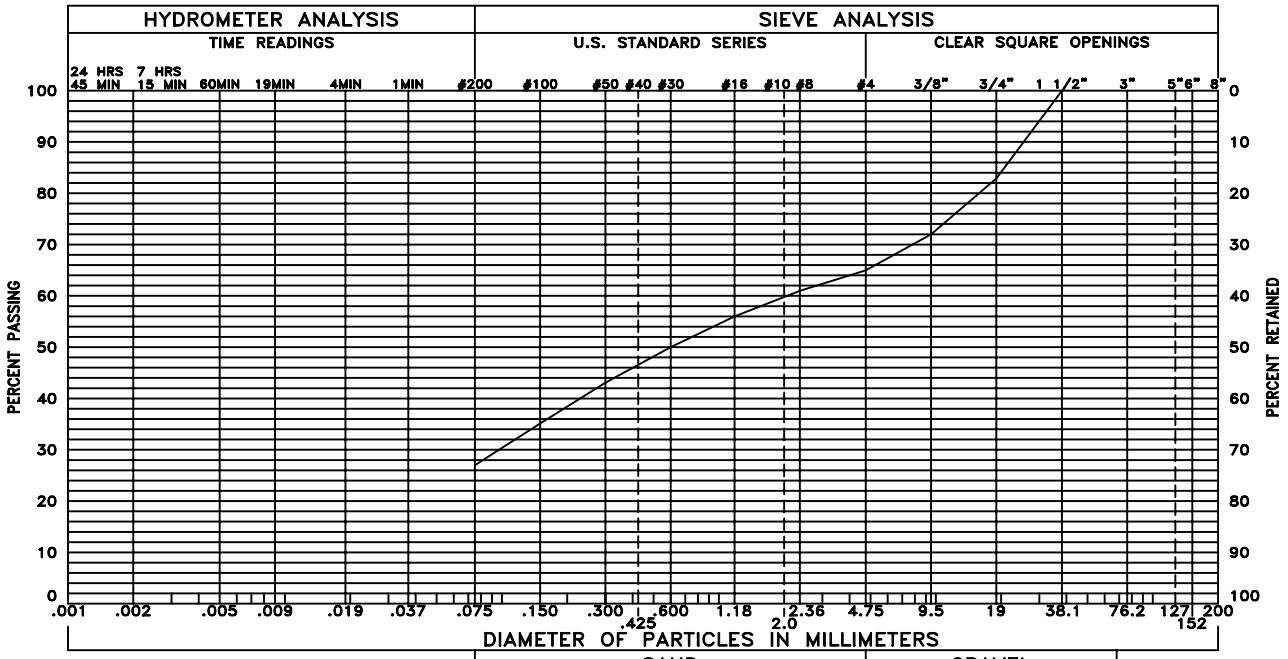


GRAVEL 32% SAND 50% SILT AND CLAY 18%

LIQUID LIMIT 18 PLASTICITY INDEX NP

SAMPLE OF: Silty Sand with Gravel (SM) FROM: Boring 37 @ 4'

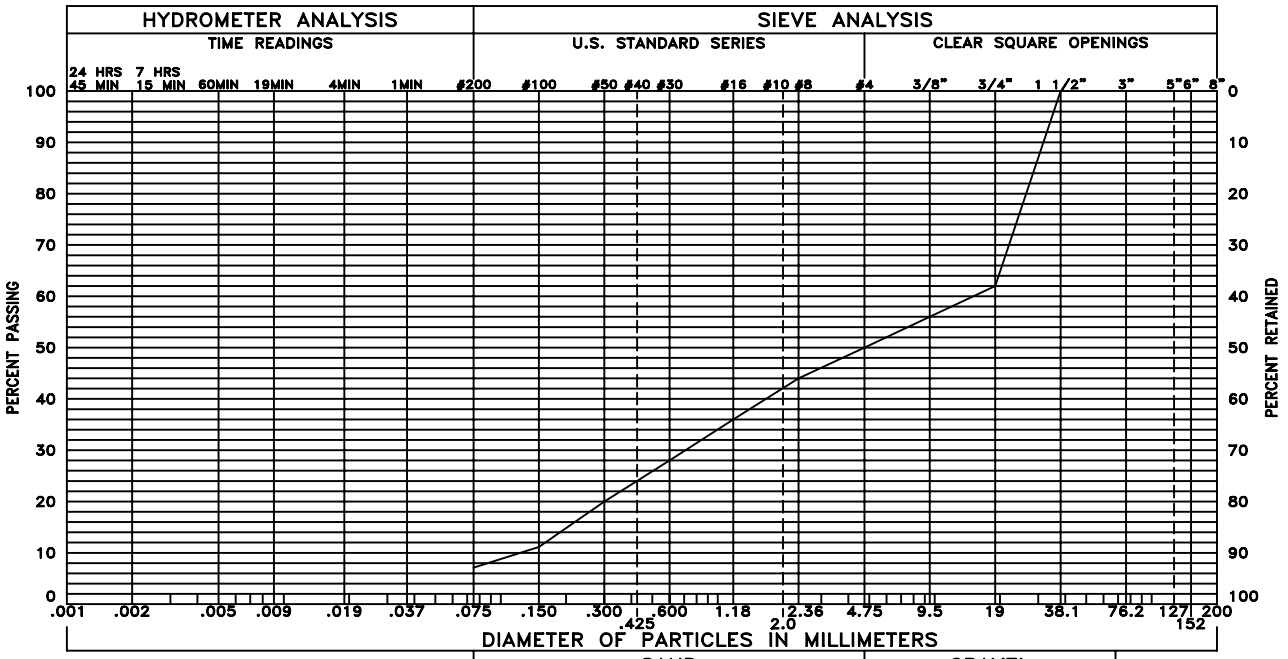


GRAVEL 35% SAND 38% SILT AND CLAY 27%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Silty Sand with Gravel (SM) FROM: Boring 38 @ 4'

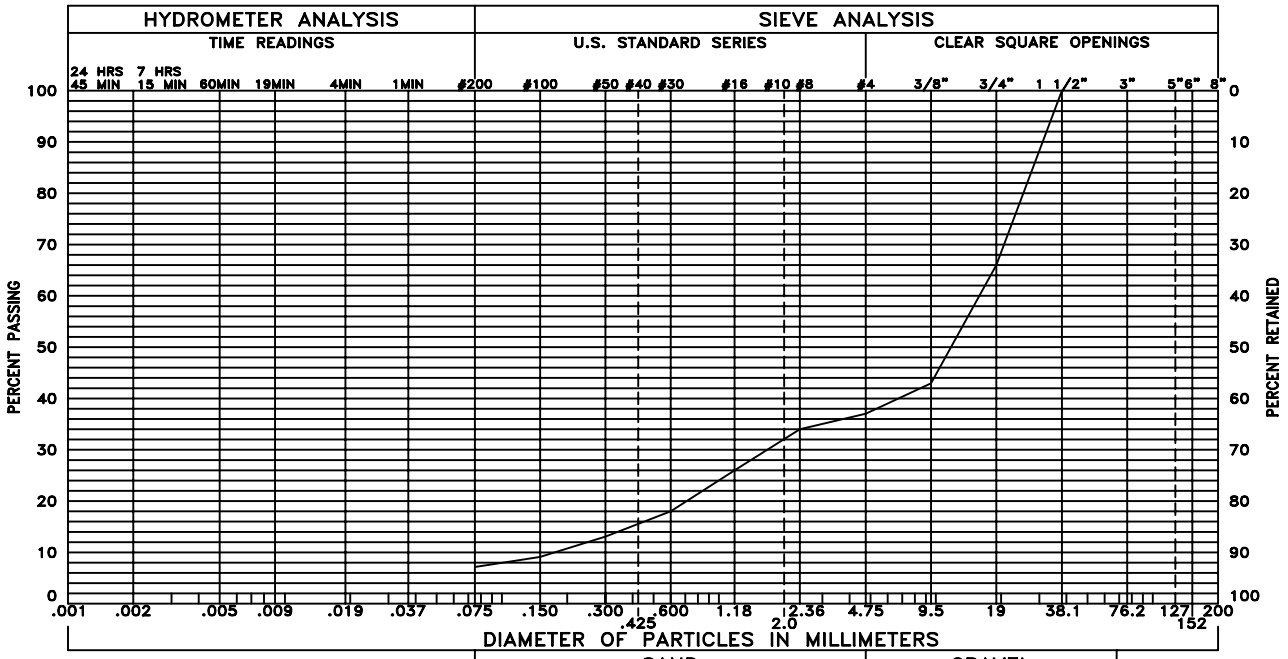
These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.



GRAVEL 50% SAND 43% SILT AND CLAY 7%

LIQUID LIMIT 22 PLASTICITY INDEX 9

SAMPLE OF: Poorly-Graded Gravel wtih Clay and Sand (GP-GC) FROM: Boring 39 @ 4'

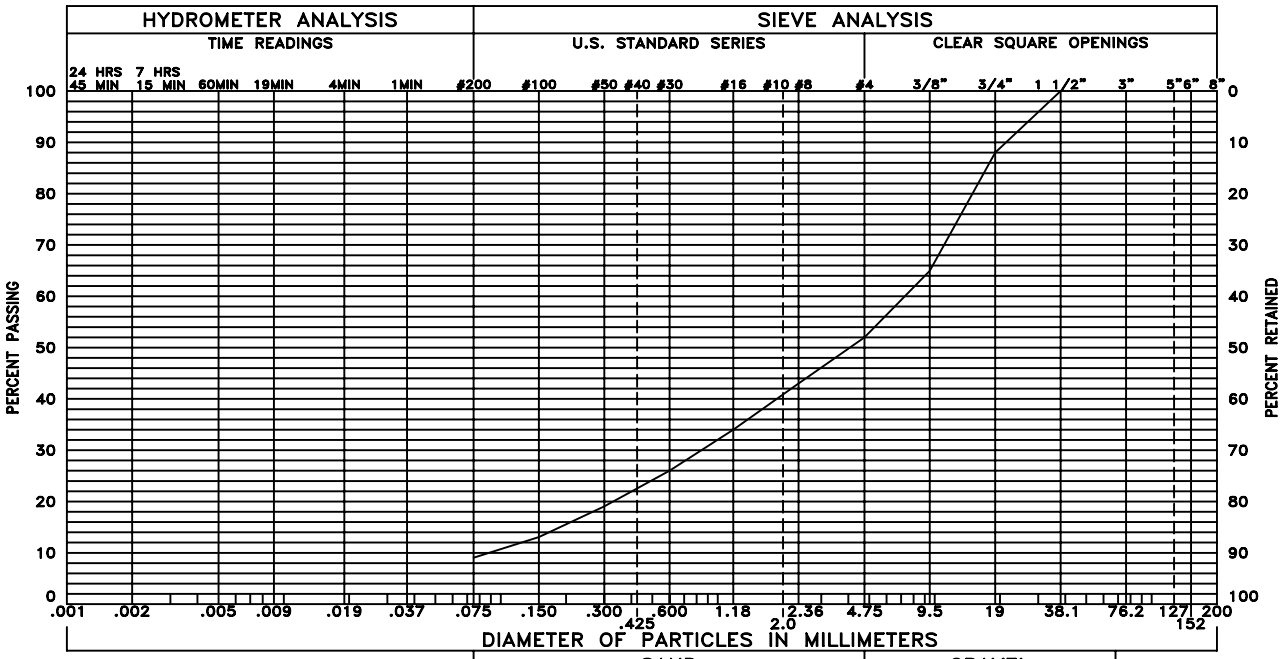


GRAVEL 63% SAND 30% SILT AND CLAY 7%

LIQUID LIMIT 16 PLASTICITY INDEX 5

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 40 @ 19'

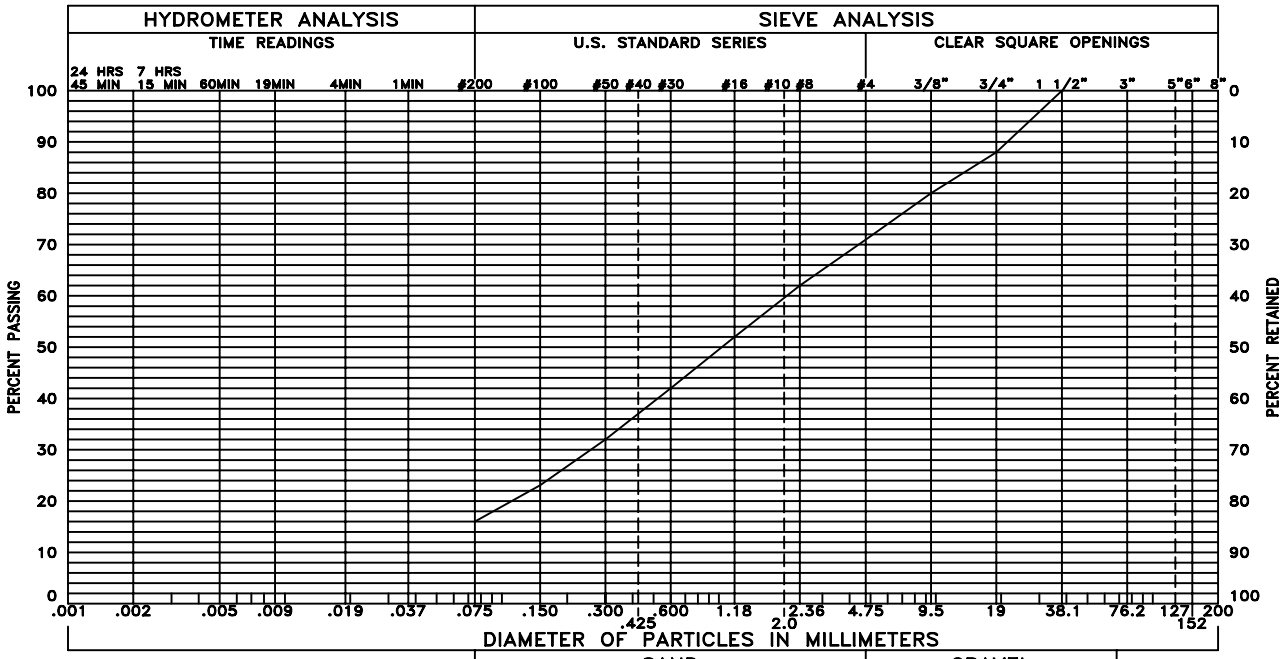
These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.



GRAVEL 48% SAND 43% SILT AND CLAY 9%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Poorly-Graded Gravel wtih Silt and Sand (GP-GM) FROM: Boring 41 @ 15'

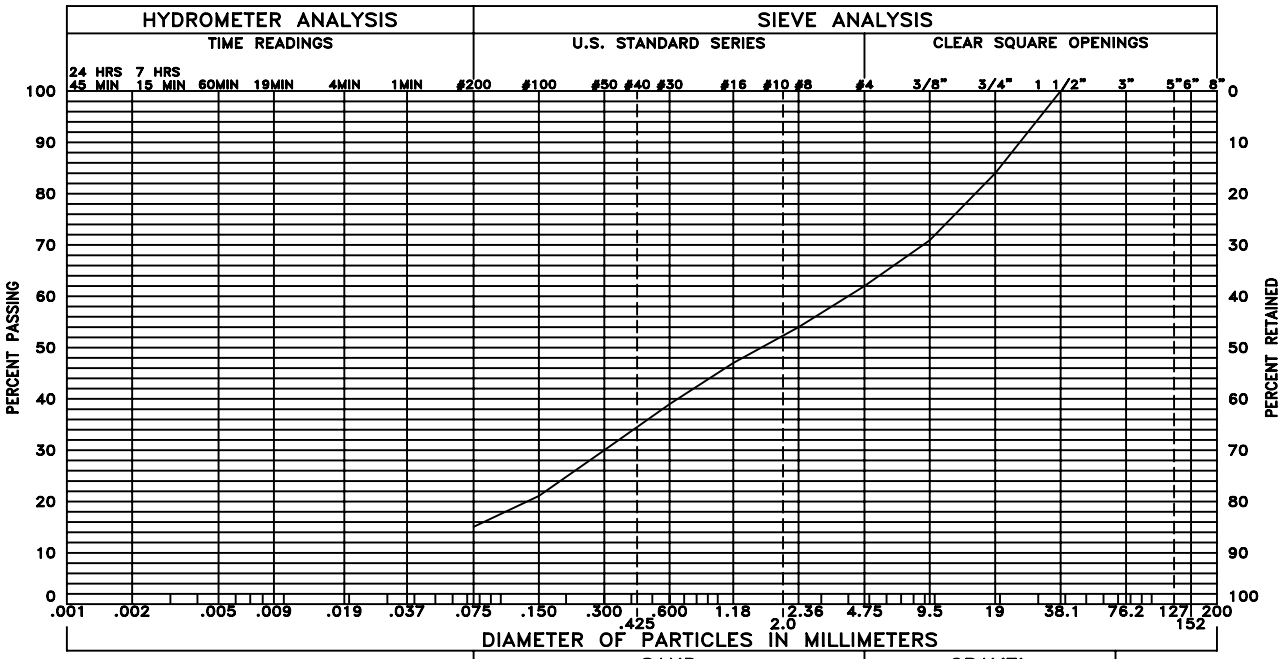


GRAVEL 29% SAND 55% SILT AND CLAY 16%

LIQUID LIMIT 21 PLASTICITY INDEX 2

SAMPLE OF: Silty Sand with Gravel (SM) FROM: Boring 43 @ 9'

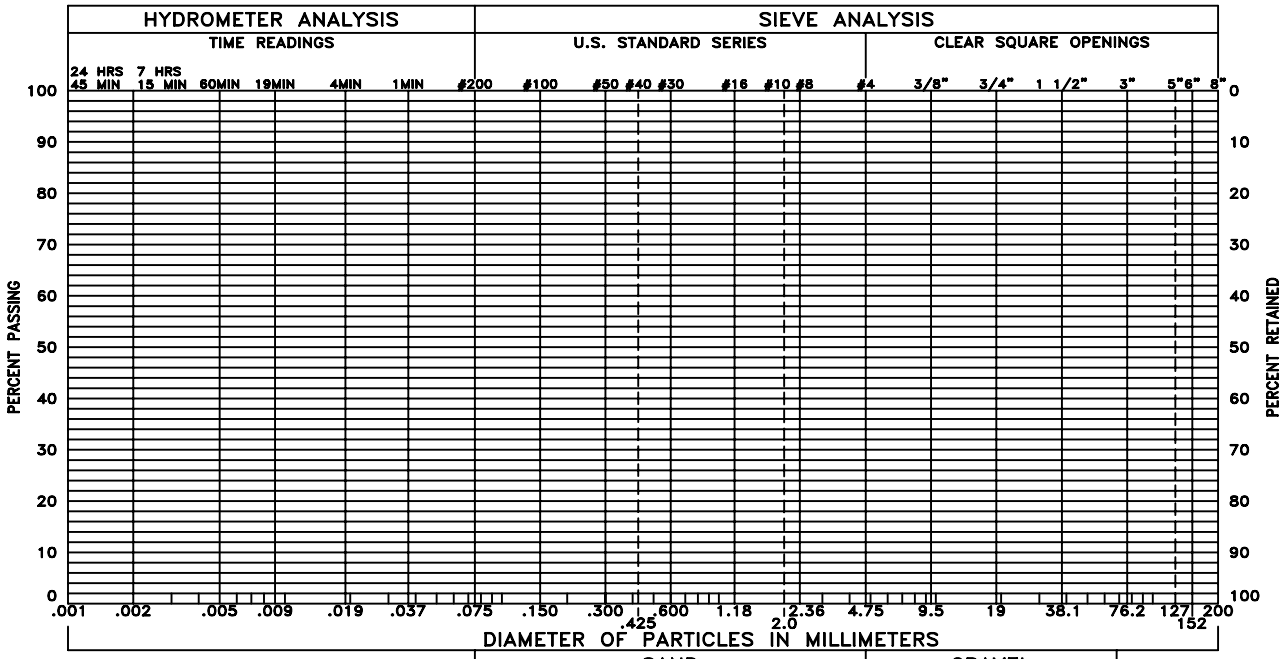
These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D422, ASTM C136 and/or ASTM D1140.



GRAVEL 38% SAND 47% SILT AND CLAY 15%

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: Silty Sand with Gravel (SM) FROM: Boring 44 @ 14'



GRAVEL % SAND % SILT AND CLAY %

LIQUID LIMIT PLASTICITY INDEX

SAMPLE OF: FROM:

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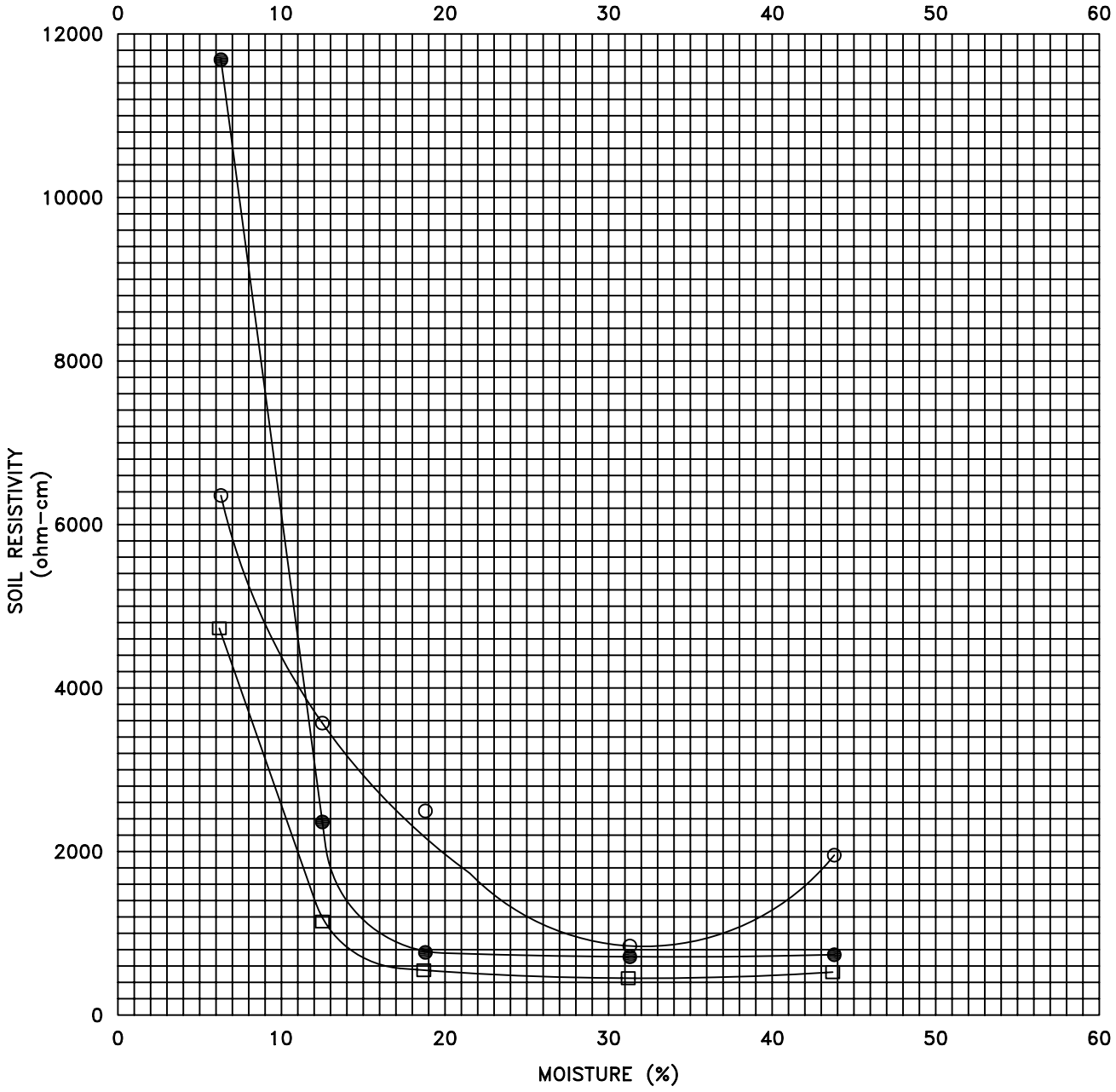

CURVE SYMBOL	SAMPLE IDENTIFICATION	SOIL OR BEDROCK TYPE	MINIMUM RESISTIVITY (ohm-cm)	RESISTIVITY AT IN SITU MOISTURE CONTENT (ohm-cm)
□	BORING 4 @ 6 FT.	Clayey Sand	450	2,400
○	BORING 10 @ 4 FT.	Clayey Sand	840	3,800
●	BORING 16 @ 4 FT.	Silty Clayey Sand with Gravel	710	>12,000

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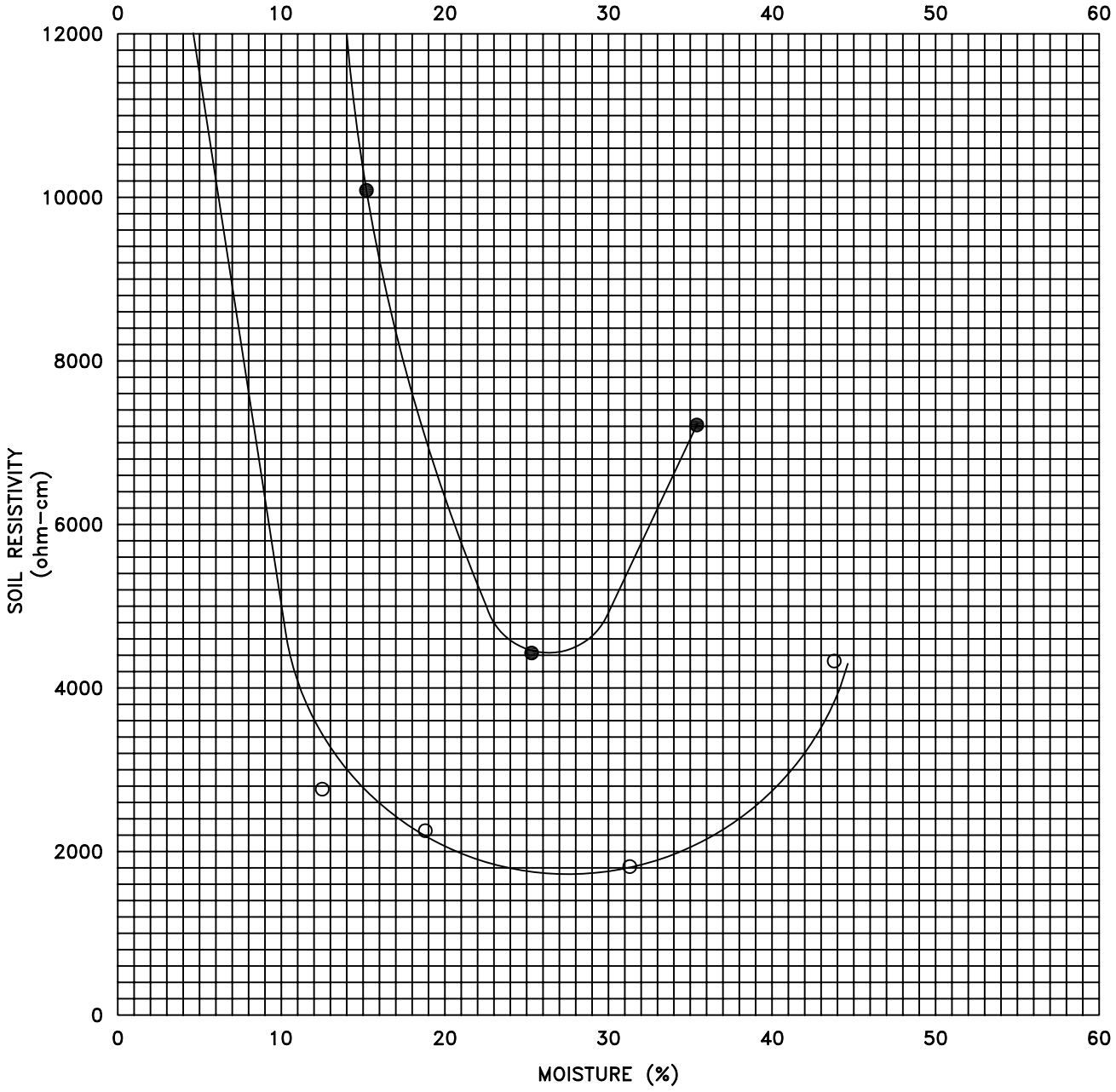
05-1-390	Kumar & Associates	LABORATORY RESISTIVITY RESULTS	Fig. 29



CURVE SYMBOL	SAMPLE IDENTIFICATION	SOIL OR BEDROCK TYPE	MINIMUM RESISTIVITY (ohm-cm)	RESISTIVITY AT IN SITU MOISTURE CONTENT (ohm-cm)
●	BORING 33 @ 14 FT.	Silty to Clayey Sand with Gravel	4,400	>12,000
○	BORING 40 @ 2 FT.	Poorly Graded Gravel with Silt and Sand	1,800	>12,000
NOT SHOWN	BORING 44 @ 2 FT.	Silty Sand with Gravel	26,000	>26,000

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05-1-390	Kumar & Associates	LABORATORY RESISTIVITY RESULTS	Fig. 30

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

PROJECT NO.: 05-1-390
PROJECT NAME: WINTER PARK
DATE SAMPLED: 8/8/05 TO 8/29/05
DATE RECEIVED: 8/16/05, 8/26/05 AND 9/2/05

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	ORGANIC CONTENT (%)	pH	MIN. ELECTRICAL RESISTIVITY (ohm-cm)	AASHTO CLASSIFICATION (group index)	SOIL OR BEDROCK TYPE
BORING	DEPTH (feet)				GRAVEL (%)	SAND (%)		LIQUID LIMIT (%)	PLASTICITY INDEX (%)						
1	3	8/23/05	6.4		53	34	13							A-1-a (0)	Silty Gravel with Sand (GM)
1	18	8/26/05	37.7		16	41	43	50	20		8.3				Silty Sand with Gravel (SM)
2	7	8/24/05	44.8				57			0.02					Sandy Lean Clay (CL)
2	14	8/24/05	8.4		48	41	11								Poorly-Graded Gravel with Silt and Sand (GP-GM)
3	11	8/26/05	46.9				36	59	6	0.02	11.0			A-4 (0)	Silty Sand with Gravel (SM)
3	18	8/22/05			35	55	10								Poorly Graded Sand with Silt and Gravel (SP-SM)
3	23	8/22/05	86.3				37	45	14		12.2				Silty Sand (SM)
4	6	9/2/05	10.3		4	63	33	24	7		2.6		450	A-2-4 (0)	Clayey Sand (SC)
5	9	9/2/05	9.5		23	55	22	21	NP	<0.02					Silty Sand with Gravel (SM)
5	19	9/2/05	7.4		49	39	12	19	1						Poorly-Graded Gravel with Silt and Sand (GP-GM)
6	9	8/22/05	9.9		30	52	18	NV	NP					A-1-b (0)	Silty Sand with Gravel (SM)
7	4	8/24/05	11.1	122.7	23	54	23							A-1-b (0)	Silty Sand with Gravel (SM)
7	14	8/24/05	6.4	144.1	51	42	7								Poorly-Graded Gravel with Silt and Sand (GP-GM)
8	4	8/24/05	12.0		11	66	23			0.02				A-1-b (0)	Silty Sand (SM)
8	14	8/24/05	8.0	127.4	60	32	8								Poorly-Graded Gravel with Silt and Sand (GP-GM)
9	4	8/23/05	9.2		40	44	16							A-1-b (0)	Silty Sand with Gravel (SM)
9	19	8/23/05	9.6		47	43	10								Poorly-Graded Gravel with Silt and Sand (GP-GM)
10	4	9/2/05	11.8		2	62	36	22	7			7.0	840	A-4 (0)	Clayey Sand (SC)

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

PROJECT NO.: 05-1-390
PROJECT NAME: WINTER PARK
DATE SAMPLED: 8/8/05 TO 8/29/05
DATE RECEIVED: 8/16/05, 8/26/05 AND 9/2/05

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	ORGANIC CONTENT (%)	pH	MIN. ELECTRICAL RESISTIVITY (ohm-cm)	AASHTO CLASSIFICATION (group index)	SOIL OR BEDROCK TYPE
BORING	DEPTH (feet)				GRAVEL (%)	SAND (%)		LIQUID LIMIT (%)	PLASTICITY INDEX (%)						
11	4	8/22/05	9.0		27	43	30	22	1	<0.02				A-2-4 (0)	Silty Sand with Gravel (SM)
11	12	8/24/05	4.7		34	55	11								Poorly-Graded Sand with Silt and Gravel (SP-SM)
12	9	9/2/05	9.4		50	40	10	NV	NP	0.02				A-1-a (0)	Poorly-Graded Gravel with Silt and Sand (GP-GM)
13	9	8/23/05	8.7		50	38	12								Poorly-Graded Gravel with Silt and Sand (GP-GM)
13	11	8/22/05	14.5		7	59	34	25	9	<0.02					Clayey Sand (SC)
14	9	8/23/05	6.2		52	39	9							A-1-a (0)	Poorly-Graded Gravel with Silt and Sand (GP-GM)
15	4	8/23/05	2.2		58	37	5								Poorly-Graded Gravel with Silt and Sand (GP-GM)
15	6	8/23/05	9.7		2	66	32	23	9	<0.02				A-2-4 (0)	Clayey Sand (SC)
16	4	9/9/05	5.8		39	43	18	21	6			9.0	710	A-1-b (0)	Silty, Clayey Sand with Gravel (SC-SM)
16	14	9/2/05	1.5		52	38	10								Poorly-Graded Gravel with Silt and Sand (GP-GM)
17	4	9/9/05	2.8		44	42	14	18	3	<0.02				A-1-a (0)	Silty Gravel with Sand (GM)
18	2	9/6/05	12.6		20	57	23	24	2	<0.02				A-1-b (0)	Silty Sand with Gravel (SM)
18	9	9/6/05			37	51	12								Poorly-Graded Sand with Silt and Gravel (SP-SM)
21	4	9/6/05						41	12		9.2				Silty Sand with Gravel (SM)
21	9	9/6/05	4.9		43	45	12	19	4					A-1-a (0)	Poorly-Graded Sand with Silt and Gravel (SP-SM)

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

PROJECT NO.: 05-1-390
PROJECT NAME: WINTER PARK
DATE SAMPLED: 8/8/05 TO 8/29/05
DATE RECEIVED: 8/16/05, 8/26/05 AND 9/2/05

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	ORGANIC CONTENT (%)	pH	MIN. ELECTRICAL RESISTIVITY (ohm-cm)	AASHTO CLASSIFICATION (group index)	SOIL OR BEDROCK TYPE
BORING	DEPTH (feet)				GRAVEL (%)	SAND (%)		LIQUID LIMIT (%)	PLASTICITY INDEX (%)						
22	2	9/6/05			61	33	6			<0.02				A-1-a (0)	Poorly-Graded Gravel with Silt & Sand (GP-GM)
22	9	9/6/05			49	41	10							A-1-a (0)	Poorly-Graded Gravel with Silt & Sand (GP-GM)
23	4	9/6/05	6.6		47	38	15	24	5					A-1-a (0)	Silty, Clayey Gravel (GC-GM)
23	17	9/6/05	100.7				21	NV	NP		42.6				Peat (Pt)
24	4	9/6/05	4.3		36	50	14	19	1	<0.02					Silty Sand with Gravel (SM)
24	14	9/6/05	7.2		37	45	18	21	3						Silty Sand with Gravel (SM)
24A	4	9/6/05	12.6		38	47	15	21	1						Silty Sand with Gravel (SM)
25	4	9/6/05	6.4		23	54	23	20	3						Silty Sand with Gravel (SM)
25	29	9/6/05	10.1		19	53	28	19	3						Silty Sand with Gravel (SM)
26	9	9/6/05	1.9		59	30	11								Poorly-Graded Gravel with Silt & Sand (GP-GM)
26A	12	9/6/05	23.8				45	22	4						Silty Gravel with Sand (GM)
26A	19	9/6/05	8.7		53	35	12	21	2						Poorly-Graded Gravel with Silt & Sand (GP-GM)
27	11	9/6/05	15.3				54	25	9	<0.02					Sandy Lean Clay (CL)
27	29	9/6/05	7.8		38	45	17	19	2						Silty Sand with Gravel (SM)
28	14	8/18/05	7.3		46	38	16	16	1	0.02					Silty Gravel with Sand (GM)
28	24	8/18/05						17	NP						Silty Sand with Gravel (SM)
29	9	8/18/05	0.9		74	19	7								Poorly-Graded Gravel with Silt and Sand (GP-GM)
29	19	8/18/05	1.4		48	45	7								Poorly-Graded Gravel with Silt and Sand (GP-GM)

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

PROJECT NO.: 05-1-390
PROJECT NAME: WINTER PARK
DATE SAMPLED: 8/8/05 TO 8/29/05
DATE RECEIVED: 8/16/05, 8/26/05 AND 9/2/05

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	ORGANIC CONTENT (%)	pH	MIN. ELECTRICAL RESISTIVITY (ohm-cm)	AASHTO CLASSIFICATION (group index)	SOIL OR BEDROCK TYPE
BORING	DEPTH (feet)				GRAVEL (%)	SAND (%)		LIQUID LIMIT (%)	PLASTICITY INDEX (%)						
30	4	8/18/05			50	37	13	NV	NP					A-1-a (0)	Silty Gravel with Sand (GM)
30	19	8/18/05	2.1		61	33	6								Poorly-Graded Gravel with Silt and Sand (GP-GM)
31	4	8/18/05	16.7		17	50	33	27	2	0.02					Silty Sand with Gravel (SM)
32	29	8/18/05	11.3		50	40	10	NV	NP						Poorly-Graded Gravel with Silt and Sand (GP-GM)
33	4	9/2/05	3.0		38	43	19	16	4						Silty, Clayey Sand with Gravel (SC-SM)
33	14	9/2/05	5.8		34	46	20	17	6	<0.02			4400		Silty, Clayey Sand with Gravel (SC-SM)
34	4	9/6/05			49	36	15			<0.02					Silty Gravel with Sand (GM)
34	14	9/6/05	5.7		41	40	19	21	7						Silty, Clayey Gravel with Sand (GC-GM)
35	10	9/9/05	2.9		56	35	9	18	6						Poorly-Graded Gravel with Silt and Sand (GP-GM)
35	19	9/2/05	5.7		66	27	7	17	7	<0.02					Poorly-Graded Gravel with Clay and Sand (GP-GC)
36	2	9/9/05	5.1		34	44	22	20	7	<0.02		6.2			Clayey Sand with Gravel (SC)
36	19	9/9/05	6.7		46	46	8	18	5						Poorly-Graded Gravel with Silt and Sand (GP-GM)
37	4	9/6/05			32	50	18	18	NP						Silty Sand with Gravel (SM)
38	4	9/6/05			35	38	27								Silty Sand with Gravel (SM)
38	24	9/6/05	7.4		34	47	19	19	3						Silty Sand with Gravel (SM)
39	4	9/9/05	3.8		50	43	7	22	9						Poorly-Graded Gravel with Clay and Sand (GP-GC)

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

PROJECT NO.: 05-1-390
PROJECT NAME: WINTER PARK
DATE SAMPLED: 8/8/05 TO 8/29/05
DATE RECEIVED: 8/16/05, 8/26/05 AND 9/2/05

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	ORGANIC CONTENT (%)	pH	MIN. ELECTRICAL RESISTIVITY (ohm-cm)	AASHTO CLASSIFICATION (group index)	SOIL OR BEDROCK TYPE
BORING	DEPTH (feet)				GRAVEL (%)	SAND (%)		LIQUID LIMIT (%)	PLASTICITY INDEX (%)						
39	9	9/9/05	5.3		61	31	8	19	3		0.9				Poorly-Graded Gravel with Silt and Sand (GP-GM)
40	2	9/9/05	10.3	121.0	27	49	24	18	3	<0.02		5.4	1800		Silty Sand with Gravel (SM)
40	19	9/9/05	1.1		63	30	7	16	5						Poorly-Graded Gravel with Silt and Sand (GP-GM)
41	5	9/6/05	10.8		26	45	29	28	6						Silty, Clayey Sand with Gravel (SC-SM)
41	15	9/6/05			48	43	9								Poorly-Graded Gravel with Silt and Sand (GP-GM)
42	4	9/6/05	15.6				25	33	7						Clayey Sand (SC)
42	14	9/6/05					29	26	5	<0.02	2.2				Silty Sand with Gravel (SM)
43	9	9/6/05	5.2		29	55	16	21	2						Silty Sand with Gravel (SM)
44	2	9/9/05	5.3		34	44	22	20	7	<0.02		6.2	26000		Silty to Clayey Sand with Gravel (SC-SM)
44	4	9/6/05	13.5				45	26	10	<0.02					Clayey Sand (SC)
44	14	9/6/05			38	47	15								Silty Sand with Gravel (SM)
P-1	4	9/2/05	2.4		47	43	10	17	3					A-1-a (0)	Poorly-Graded Gravel with Silt and Sand (GP-GM)
P-2	1	9/2/05	5.0		38	44	18	20	5					A-1-b (0)	Silty, Clayey Sand with Gravel (SC-SM)
P-3	4	9/2/05	2.4		54	39	7	16	5					A-1-a (0)	Poorly-Graded Gravel with Silt and Sand (GP-GM)
P-4	1	9/2/05	9.8		40	46	14	19	6					A-1-a (0)	Silty, Clayey Sand with Gravel (SC-SM)

Table 2 - SUMMARY OF GENERALIZED SUBSURFACE CONDITIONS

DEVELOPMENT	EXPLORATORY BORINGS/ PITS	GENERALIZED SUBSURFACE CONDITIONS	GROUND WATER DEPTHS (ft)
	B-1, B-2, B-3, B-4 KA92-26	Existing fill from the surface to depths ranging from 3.5 ft of 13 ft, underlain by nil to 3 feet of stiff organic-rich clay and peat. The fill and peat were in turn underlain by medium dense to very dense poorly graded sand with clay and gravel, clayey sand with gravel and clayey gravel with sand containing frequent cobbles and boulders, which extended to explored depths ranging from 11.5 to 40 ft.	Encountered in Borings B-1, B-2 and B-3 at the time of drilling at depths ranging from 12 to 22 ft. Encountered in Boring KA92-26 at a depth of 8 ft at the time of drilling, and at the surface in that boring when measured an unspecified number of days after drilling.
	B-22, B-23, KA92-1 to KA92-10	Existing fill from the surface to depths ranging from 7 ft of 23 ft, underlain by nil to 3 feet of stiff organic-rich clay and peat. Fill and peat in turn underlain by medium dense to very dense poorly graded sand with clay and gravel, clayey sand with gravel, and clayey to silty gravel with sand containing frequent cobbles and boulders, which extended to the explored depths ranging from 14 to 45 ft.	Encountered at 10.5 to 26 ft at the time of drilling.
	B-24, B-24A, B-25, B-26, B-26A, B-27, KA92-27	Existing fill encountered in Borings B-24, B-25, B-26, B-27 and KA92-27, located within the existing parking lot embankment, from the surface to depths ranging from 6 to 13 feet. Material encountered below the fill in these borings, and in Borings B-24A and B26-A at the toe of the embankment, consisted of medium dense to very dense clayey sand with gravel and poorly graded gravel with sand and clay, which extended to explored depths ranging from 20 to 40 ft.	Encountered in Borings 24A and 26A, located at the embankment toe, at depths ranging from 5 to 7 ft, and in Boring 27, within the existing parking lot, at a depth of 35 ft at the time of drilling.
	B-28, B-29, B-30, KA-94-5	Existing fill encountered from the surface to depths ranging from 2 to 6 feet. This material was underlain by medium dense to very dense clayey gravel with sand and poorly graded gravel with sand and clay, containing occasional to frequent cobbles and boulders, to explored depths ranging from 25 to 40 feet.	Encountered only in Boring B-28, at a depth of 13 feet at the time of drilling.
	B-31, B-32, MW-D, KA94-3, KA94-4, KA92-30	Nil to 11 ft of existing fill underlain by medium dense to very dense silty to clayey gravel with sand and silty to clayey sand with gravel, containing frequent cobbles and boulders, to explored depths ranging from 25 to 55 ft.	Encountered in Borings B-31, B-32 and MW-D at depth ranging from 14.5 to 16 ft at the time of drilling. Measured in Borings KA94-3 and KA94-4 at depths ranging from 14.5 to 15 ft two to three days after drilling.

Table 2 - SUMMARY OF GENERALIZED SUBSURFACE CONDITIONS

DEVELOPMENT	EXPLORATORY BORINGS/ PITS	GENERALIZED SUBSURFACE CONDITIONS	GROUND WATER DEPTHS (ft)
	B-21, KA92-16	Existing fill encountered from the surface to a depth of 4 feet, underlain by 2 to 4 feet of organic clay and peat material, to depths ranging from 6 to 8 feet. This material was underlain by medium dense to very dense silty to clayey gravel with sand containing cobbles and possible boulders, to the explored depth of 25 feet.	Encountered at depths ranging from 9 to 12 during drilling, and in Boring KA92-16 at a depth of 7 feet when measured 6 days after drilling.
	B-18, KA92-20	Encountered existing fill from the surface to depths ranging from 5 to 8 feet, which was underlain by very dense, poorly graded gravel with silt and sand to explored depths ranging from 16 to 20 ft.	Encountered at depths ranging from 7 to 12.5 during drilling, and in Boring KA92-20 at a depth of 11 ft when measured 6 days after drilling.
	B-17, KA92-21	Encountered existing fill from the surface to a depth of 2 ft, underlain by nil to 1 ft of sandy organic clay. This material was in turn underlain by very dense clayey sand with gravel and poorly graded gravel with sand containing cobbles and possible boulders to explored depths ranging from 4.5 to 20 ft.	Ground water was not encountered in Boring B-17 and Pit KA92-21 at the time of exploration.
	B-12, B-15	Encountered nil to 6 ft existing fill, underlain by dense to very dense, poorly graded gravel with sand and silt, and clayey gravel with sand to an explored depth of 20 ft.	Encountered at depths ranging from 7.5 to 8.5 ft at the time of drilling.
	B-12, B-13, KA92-24	Nil to 2 ft existing fill underlain by dense to very dense poorly graded gravel with sand, silt and clay to explored depths ranging from 17 to 25 ft.	Encountered at depths ranging from 8 to 8.5 during drilling, and in Boring KA92-24 at a depth of 15 ft when measured 6 days after drilling.
	B-9, B-13	Nil to 2 ft topsoil or fill underlain by loose to very dense clayey sand with gravel and clayey gravel with sand containing cobbles and boulders to an explored depth of 25 ft.	Encountered at depths ranging from 6 to 8 ft at the time of drilling.
	B-7, B-8, MW-C	Nil to 1.5 ft existing fill underlain by medium dense to very dense clayey sand with gravel and clayey gravel with sand containing cobbles and boulders to a depth of 13.5 ft in Boring B-7, and to explored depths ranging from 11 to 16 ft in Borings B-8 and MW-C. In Boring B-7, the overburden soils were underlain by granitic, gneissic bedrock to the explored depth of 25 ft.	Encountered at depths ranging from 6 to 9 during drilling, and in Boring MW-C at a depths ranging from 7 to 8.5 ft based on frequent measurements taken after well completion.
	B-12, KA92-23, KA92-24	Encountered nil to 2 ft existing fill underlain by dense to very dense silty sand with gravel, and silty to clayey gravel with sand containing cobbles and boulders, to explored depths ranging from 17 to 25 ft.	Encountered at depths ranging from 7.5 to 9 ft during drilling, in Borings KA92-23 at a depth of 5 ft when measured an unspecified time after drilling, and in KA92-24 at a depth of 15 ft when measured 6 days after drilling.

Table 2 - SUMMARY OF GENERALIZED SUBSURFACE CONDITIONS

DEVELOPMENT	EXPLORATORY BORINGS/ PITS	GENERALIZED SUBSURFACE CONDITIONS	GROUND WATER DEPTHS (ft)
	B-12, B-14, B-16	Encountered nil to 13 ft existing fill underlain by dense to very dense poorly graded gravel with sand and clay, which extended to an explored depth of 20 ft in Borings B-12 and B-14, and to a depth of 15 ft in Boring B-16. In Boring B-16, the overburden soil was underlain by granitic to gneissic bedrock, which extended to the explored depth of 25 ft.	Encountered at depths ranging from 8.5 to 21 ft at the time of drilling.
	B-16, KA92-19, KA92-21	Encountered 2 to 13 ft existing fill underlain by nil to 1 ft of organic sandy clay. The fill and organic clay were underlain by very dense poorly graded gravel with sand, silt and clay to explored depths ranging from 5 to 7 ft in Pits KA92-19 and KA92-21, and to a depth of 15 ft in Boring B-16. In Boring B-16, the overburden soil was underlain by granitic to gneissic bedrock, which extended to the explored depth of 25 ft.	Encountered only in Boring B-16 at a depth of 21 ft at the time of drilling.
	KA92-17, KA92-18, KA92-19	Encountered 2 to 5 ft existing fill underlain by nil to 1 ft of organic sandy clay. The fill and organic clay were underlain by dense to very dense poorly graded gravel with sand, silt and clay to explored depths ranging from 7 to 25 ft.	Encountered only in Boring KA92-17 and KA92-18, at depths ranging from 8.5 to 10 ft at the time of drilling, in Boring KA92-17 at a depth of 7.5 ft when measured 6 days after drilling, and in Boring KA92-18 at a depth of 5 ft when measured an unspecified number of days after drilling.
	B-4, B-5	Encountered 6 to 7.5 ft existing fill underlain by medium dense to very dense, poorly graded gravel with sand and silt containing cobbles and possible boulders to an explored depth of 25 ft.	Encountered at depths ranging from 12 to 12.5 ft at the time of drilling.
	B-9, B-10	Encountered nil to 7.5 ft existing fill beneath the pavement or topsoil, which was underlain by medium dense to very dense , poorly graded gravel with sand and clay, and clayey gravel with sand, containing cobbles and possible boulders, to the explored depth of 25 ft.	Encountered at depths ranging from 6 to 9.5 ft at the time of drilling.
	B-28, KA92-22	Encountered 1 to 5 ft existing fill underlain by medium dense to very dense silty sand with gravel and poorly graded gravel with sand and silt containing cobbles and possible boulders to explored depths ranging from 10 to 25 ft..	Encountered water in Boring B-28 at the time of drilling, and in Boring KA92-22 at a depth of 8 ft when measured six days after drilling .
	P-1, P-2, P-3, P-4	Encountered medium dense to very dense poorly graded gravel with sand and silt, silty gravel with sand, and silty sand with gravel, below less than 6 inches of topsoil to the explored depth of 5 ft.	Ground water not encountered.

Table 2 - SUMMARY OF GENERALIZED SUBSURFACE CONDITIONS

DEVELOPMENT	EXPLORATORY BORINGS/ PITS	GENERALIZED SUBSURFACE CONDITIONS	GROUND WATER DEPTHS (ft)
	B-33, B-34	Encountered approximately 8 inches of topsoil underlain by medium dense to dense, sandy gravels and gravelly sands, with clay, silt, cobbles, and boulders to the explored depth of 25 feet.	Not encountered at the time of drilling.
	B-35, B-36	Encountered approximately 6 to 8 inches of topsoil underlain by medium dense to very dense, sandy gravels and gravelly sands, with clay, silt, cobbles, and occasional boulders to the explored depths of 25 feet.	Encountered at depths ranging from 13 to 18 feet at the time of drilling.
	B-37, B-38	Encountered approximately 4 inches of topsoil underlain by medium dense to very dense, gravelly sand with clay, silt, cobbles, and boulders to the explored depths of 25 feet.	Encountered only in Boring B-37 at a depth of 14 ft at the time of drilling.
	B-39, B-40	Encountered approximately 8 inches of topsoil underlain by medium dense to very dense, sandy gravels with clay, silts, cobbles, and occasional boulders to the explored depths of approximately 25 ft.	Encountered only in Boring B-39 at a depth of 23 feet at the time of drilling.
	B-41, B-42	Encountered approximately 8 inches of topsoil underlain by loose to medium dense, gravelly sand with clay and silt to depths ranging from 7.5 to 12 ft. This material was in turn underlain by granitic to gneissic bedrocks to the explored depths of 22 and 25 ft.	Not encountered at the time of drilling.
	B-43, B-44	Encountered nil to 7 feet of existing fill consisting of gravelly sand with silt and clay, which was underlain by medium dense to dense, gravelly sands and sandy gravels, with clay, silt, and occasional cobbles and boulders, to the explored depth of 25 in Boring B-43, and to a depth of 18 ft in Boring B-44. In Boring B-44, the overburden material was underlain by relatively weathered granitic to gneissic bedrock to the explored depth of 25 ft.	Not encountered at the time of drilling.

APPENDIX-E
WETLAND REPORT

Owl Ridge Natural Resource Consultants, Inc.

Aquatic Resource Delineation and Assessment Report

Alterra Mountain Company Base Area

Winter Park, Colorado

November 8, 2024

Aquatic Resource Delineation and Assessment Report

Alterra Mountain Company Base Area, Winter Park, Colorado

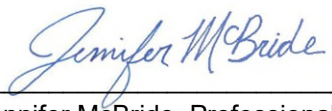
November 8, 2024

Prepared By:
Arcadis U.S., Inc.
630 Plaza Drive, Suite 200
Highlands Ranch, CO 80129
United States
Phone: 720 344 3500
Fax: 720 344 3535

Prepared For:
Owl Ridge Natural Resource Consultants, Inc.
4060 B Street, Suite 200
Anchorage
Alaska 99503
Phone: 907 344 3448

Alterra Mountain Company
3501 Wazee Street #400
Denver
Colorado 80216
Phone: 303 749 8200

Our Ref:
30229006



Jennifer McBride, Professional Wetland Scientist
Project Ecologist

George Meyer
Environmental Scientist

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Acronyms and Abbreviations

2023 Conforming Rule	"Revised Definition of Waters of the United States; Conforming" Rule
2023 Rule	Final "Revised Definition of Waters of the United States" Rule
AA	Assessment Area
AOI	Area of Interest
APT	Antecedent Precipitation Tool
Arcadis	Arcadis U.S., Inc.
CDPHE	Colorado Department of Health and Environment
CDOT	Colorado Department of Transportation
Cowardin Classification	Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979)
CWA	Clean Water Act
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FACWet	Functional Assessment of Colorado Wetlands Method
FCI	Functional Capacity Index
GIS	geographic information system
GPS	global positioning system
HUC	Hydrologic Unit Code
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
Owl Ridge	Owl Ridge Natural Resource Consultants Inc.
PDSI	Palmer Drought Survey Index
Report	Aquatic Resource Delineation and Assessment Report
RHA	Rivers and Harbors Act
Survey Area	Survey Areas A1, A8, and A16
TNW	traditional navigable water
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBD	Watershed Boundary Dataset

1 Introduction

On behalf of Owl Ridge Natural Resource Consultants, Inc. (Owl Ridge), Arcadis U.S., Inc. (Arcadis) has prepared this Aquatic Resource Delineation and Assessment Report (Report), which documents and describes the findings of an aquatic resource delineation and wetland functional assessment completed for the Alterra Mountain Company base area on July 12, 2024 in Winter Park, Grand County, Colorado. The aquatic resource delineation and assessment were conducted to support future site development and improvement in three locations, designated as Survey Areas A1, A8, and A16 (collectively referred to as the Survey Area). The Survey Area is shown on **Figure 1** and summarized in **Table 1**.

Table 1. Survey Area Summary

Survey Area	Size (acres)	Approximate Location (latitude, longitude)	Section, Township, Range
A1	1.64	39.881564°, -105.754390°	14, 2 South, 75 West
A8	8.99	39.881605°, -105.761152°	15, 2 South, 75 West
A16	4.96	39.890026°, -105.762012°	10, 2 South, 75 West
Total	**15.59**		

2 Aquatic Resources

This section summarizes the regulatory framework and the results of a desktop assessment and field investigation conducted to delineate and assess aquatic resources within the Survey Area.

2.1 Regulatory Framework

This section summarizes the regulatory framework for defining waters of the U.S., waters of the state, and Sackett Gap Waters.

2.1.1 Waters of the United States

Under the authority of Section 404 of the Clean Water Act (CWA; 33 United States Code [USC] 1344), the U.S. Army Corps of Engineers (USACE) shares regulatory authority with the United States Environmental Protection Agency (USEPA) over waters of the U.S. The USACE also has regulatory authority for navigable waters as defined by Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 USC Section 403). Specifically, the discharge of dredged and fill material into all waters of the U.S., including wetlands and navigable waterways, is regulated.

The regulatory framework that defines waters of the U.S. subject to jurisdiction under Section 404 of the CWA has undergone and continues to be subject to revision. The final “Revised Definition of Waters of the United States” Rule (2023 Rule) was published in the Federal Register on January 18, 2023 (USACE and USEPA 2023a) and took effect on March 20, 2023. Following the U.S. Supreme Court’s decision in the case of Sackett v. Environmental Protection Agency on May 26, 2023, the USACE and USEPA developed a rule that amends the 2023 Rule to conform to the Sackett decision. The USACE and USEPA issued a final revised rule (Revised Definition of Waters of the United States; Conforming [2023 Conforming Rule]) on August 29, 2023, which became effective on September 8, 2023 (USACE and USEPA 2023b). The 2023 Conforming Rule eliminates

certain provisions of the 2023 Rule inconsistent with the U.S. Supreme Court's May 25, 2023 decision in Sackett v. Environmental Protection Agency.

As a result of ongoing litigation on the 2023 Rule, the agencies are only implementing the 2023 Conforming Rule in certain states. In the remaining states, the 2023 Conforming Rule is currently not in effect, and the pre-2015 regulatory definition of waters of the U.S. and the Sackett decision are being implemented instead. As of the date of this Report, the operative definition of waters of the U.S. in Colorado is consistent with the 2023 Conforming Rule (USEPA 2024a).

2.1.2 Waters of the State

Waters of the State of Colorado are defined as any and all surface and subsurface waters that are contained in or that flow in or through the state, including wetlands, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed (Colorado Revised Statute 25-8-103 [19]).

2.1.3 Sackett Gap Waters

Sackett Gap Waters are defined as waters of the state that were under the jurisdiction of the CWA Section 404 permitting program as waters of the U.S. pursuant to the pre-2015 federal regulations and *the Rapanos v. United States* and *Carabell v. United States* decision (2008 Guidance) but that are no longer considered waters of the U.S. because of the change in the scope of federal jurisdiction resulting from the *Sackett v. Environmental Protection Agency* decision. Sackett Gap Waters do not include the subset of state waters that were outside the scope of federal jurisdiction under the pre-2015 federal regulations and the 2008 Guidance (Colorado Department of Public Health and Environment [CDPHE] 2023).

2.2 Methodology

This section describes the methodology used to conduct the aquatic resources desktop assessment and field survey.

2.2.1 Desktop Review

Before performing the aquatic resource delineation and assessment, Arcadis conducted an environmental desktop review for preliminary identification of wetlands, streams, and other sensitive resources within the Survey Area using the Environmental Systems Research Institute's (ESRI's) ArcMap geographic information system (GIS) software and available federal, state, and county digital datasets.

Arcadis reviewed the following information before conducting the aquatic resource field survey:

- Aerial imagery (ESRI 2024);
- Federal Emergency Management Agency (FEMA) National Flood Hazard Layer Dataset (FEMA 2024);
- Natural Resources Conservation Service (NRCS) Web Soil Survey for Grand County (NRCS 2024);
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS 2024);
- U.S. Geological Survey (USGS) 7.5 Minute Topographic Map, Fraser Quadrangle (USGS 2022);
- USGS National Hydrography Dataset (NHD) Flowlines and Waterbodies (USGS 2024); and

- USGS Watershed Boundary Dataset (WBD) Hydrologic Unit Code 8 (HUC-8) Sub-basins and HUC-12 Subwatersheds (USGS 2024).

The desktop review allowed for preliminary identification of potential aquatic resources within the Survey Area and provided an understanding of the ecology, land use, and general physiography of the surrounding region. Digital formats of the preliminary desktop delineation results were migrated to field global positioning system (GPS) units using the ArcGIS Field Maps digital data collection application to facilitate field delineation and verification of aquatic resources.

2.2.2 Antecedent Precipitation Tool

The USACE has developed the Antecedent Precipitation Tool (APT; USACE 2020) to assist in determining the conditions of a typical year for a given location and date. The 2020 Navigable Waters Protection Rule defined the typical year as the period of time during which precipitation and other climatic variables are within the normal periodic range for a geographic area based on a rolling 30-year period (USACE and USEPA 2020). Although the 2020 Navigable Waters Protection Rule is no longer in effect, the APT remains a useful tool to identify the conditions during which a survey is conducted. For example, the results of the APT can assist in determining if "normal conditions" were present during the survey or if the geographic area was experiencing higher or lower than normal precipitation. Other resources, such as gage data, can also be used to define the conditions or provide context of a typical year for aquatic features. The APT draws on multiple publicly available resources and provides summarized outputs to use in determining the climatic conditions of the typical year.

A summary of the APT output for the HUC-12 subbasin is provided in **Section 2.3.1.6**. The APT output is included in **Appendix A**.

2.2.3 Wetlands

Field personnel collected data to evaluate the presence of wetlands in locations that visually exhibited surface indicators of potential wetland characteristics (e.g., presence of potentially hydrophytic vegetation indicative of wetlands, hydrology indicators present at the surface, or depressional areas exhibiting characteristics different from those of the surrounding uplands) and/or were included as an aquatic feature on NWI maps. Wetland areas were delineated using the multi-parameter approach (hydrophytic vegetation, hydric soils, and wetland hydrology) procedures described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the 2010 USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0; Environmental Laboratory 2010). Paired wetland and upland data points were evaluated to delineate wetland boundaries. Region-specific Wetland Determination Data Forms, completed at wetland and upland data point locations, are included in **Appendix B.**

Where potential wetlands were identified, sites were evaluated for representative vegetative, hydrologic, and soil characteristics. Each feature was classified using Classification of Wetlands and Deepwater Habitats of the United States (Cowardin Classification; Cowardin et al.1979). The 2022 Western Mountains, Valleys, and Coast Region Wetland Plant List (USACE 2023) was used to determine the wetland indicator status for plant species. A list of plant species identified within the Survey Area, including wetland indicator status for each species, is included in **Appendix C.**

Wetland boundaries and data points were mapped in the field within the Survey Area using Trimble TDC650 and Juniper Geode GPS units capable of submeter accuracy and paired with the ArcGIS Field Maps application. Geo-referenced photographs were also collected and stored with the GPS-mapped features in the ArcGIS application.

2.2.4 Non-Wetland Waters

The ordinary high water mark (OHWM) is used to delineate non-tidal waters that are not wetlands (e.g., streams). The OHWM may be indicated by the presence of a defined streambed with bank shelving, flow lines, sediment deposition or scour, mineral staining, salt deposits, deep or surficial cracking, or other indicators as outlined in guidance documents. Non-wetland waters were delineated in accordance with the OHWM Regulatory Guidance Letter No. 05-05 (USACE 2005) and A Guide to OHWM Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States (Mersel and Lichvar 2014). Field personnel collected data to delineate the OHWM in channelized areas that exhibited one or more OHWM indicators as observed during the field survey. OHWM indicators were mapped in the field within the Survey Area using Trimble TDC650 and Juniper Geode GPS units capable of submeter accuracy and paired with the ArcGIS Field Maps application. Geo-referenced photographs were also collected and stored with the GPS-mapped features in the ArcGIS application. Where the active channel width was less than 6 feet, the centerline of the stream was mapped, and the average OHWM was documented. OHWM Data Sheets are included as **Appendix D**.

Arcadis classified stream flow duration as perennial, intermittent, or ephemeral for each feature using field observations and indicators described in the User Manual for the Streamflow Duration Assessment Methods for the Arid West and Western Mountains of the United States (USEPA 2024c). Non-wetland waters were classified as upland swales or erosional if they lacked OHWM indicators or a defined bed and bank, or otherwise did not exhibit indicators of at least an ephemeral flow regime.

The following parameters were used to classify stream flow duration:

- Perennial streams – contain flowing water continuously during a year of normal rainfall, often with the streambed located below the water table for most of the year. Groundwater typically supplies the baseflow for perennial reaches, but the baseflow may also be supplemented by stormwater runoff and/or snowmelt.
- Intermittent streams – contain sustained flowing water for only part of the year, typically during the wet season, where the streambed may be below the water table and/or where the snowmelt from surrounding uplands provides sustained flow. Flow may vary greatly with stormwater runoff.
- Ephemeral streams – flow only in direct response to precipitation. Water typically flows only during and/or shortly after large precipitation events, the streambed is always above the water table, and stormwater runoff is the primary water source.

Aerial imagery, digital topographic maps, field observations, and other desktop resources were used to establish channelized surface connections outside of the Survey Area and to determine connectivity of delineated wetlands and non-wetland waters to other potentially jurisdictional waters. A preliminary jurisdictional review for potential waters of the U.S. and waters of the state, including Sackett gap waters, was completed for all delineated aquatic features within the Survey Area based on current federal and state regulations and legal interpretations.

2.2.5 Wetland Functional Assessment

Wetland functional condition was assessed for the delineated wetlands within the Survey Area using the Colorado Department of Transportation's (CDOT) Functional Assessment of Colorado Wetlands (FACWet) Method (CDOT 2014). The FACWet Method is a rapid assessment method for rating the condition of wetlands relative to their natural potential by identifying ecological stressors that may alter a wetland's ability to perform ecological functions and processes. The FACWet Method involves comparing the wetland feature, or Assessment Area (AA), under review to an undisturbed natural wetland to determine mitigation needs accurately. Three primary variables are considered for the scoring process: Buffer and Landscape Context, Hydrology, and Abiotic and Biotic Habitat. Aerial imagery, digital topographic maps, field observations, and other desktop resources were

used to score the Functional Capacity Indices (FCIs) of each Survey Area (A1, A8, and A16). A final FCI score is calculated using a pre-determined formula, and a functional category is generated based on the final score. The final score, ranging from <0.6 to 1.0, falls into one of five functional categories: Non-Functioning, Functioning Impaired, Functioning, Highly Functioning, and Reference Standard. An overview of FACWet results is discussed in **Section 2.3.3,** and FACWet Score Cards are included in **Appendix E**.

2.3 Results

This section presents the results of the desktop review, field delineation, and wetland functional assessment for the Survey Area. Results of the desktop review and field survey, including the aquatic features identified in the Survey Area, are shown on **Figures 2** through **4**.

2.3.1 Desktop Review

The results of the desktop review are discussed in the following sections.

2.3.1.1 Landscape Setting

The Survey Area ranges in elevation from approximately 9,100 to 9,200 feet above mean sea level. Aerial imagery indicates that the surrounding land cover and use in the vicinity of the Survey Area generally include forested land, existing roads, paved and unpaved parking lots associated with Winter Park Resort, and residential and commercial development.

The Survey Area is located within the Southern Rockies Level III Ecoregion, characterized by high-elevation, steep, rugged mountains (USEPA 2024b). Although coniferous forests cover much of the region, vegetation, soil, and land use follow a pattern of elevational banding. The lowest elevations are generally grass- or shrub-covered and heavily grazed. Low to middle elevations are also grazed and covered by a variety of vegetation types including Douglas-fir, ponderosa pine, aspen, and juniper-oak woodlands. Middle to high elevations are largely covered by coniferous forests and generally support little grazing activity.

More specifically, the Survey Area is located within the Crystalline Subalpine Forests and Crystalline Mid-Elevation Forests Level IV Ecoregions (USEPA 2024b). The Crystalline Subalpine Forests ecoregion occupies a narrow elevational band on the steep, forested slopes of the mountains, becoming more extensive on the north-facing slopes. The dense forests are dominated by Englemann spruce. Subalpine fir, aspen, and pockets of lodgepole pine locally dominate some areas. Subalpine meadows also occur. Forest blowdown, insect outbreaks, fire, and avalanches affect the vegetation mosaic. Soils are weathered from a variety of crystalline and metamorphic materials, such as gneiss, schist, and granite, as well as some areas of igneous intrusive rocks. Recreation, logging, mining, and wildlife habitat are the major land uses within the ecoregion. Grazing is limited by climatic conditions, lack of forage, and lingering snowpack.

The Crystalline Mid-Elevation Forests ecoregion is typically found from 7,000 to 9,000 feet in elevation on crystalline and metamorphic substrates. Natural vegetation includes aspen, ponderosa pine, Douglas-fir, and areas of lodgepole pine and limber pine. A diverse understory of shrubs, grasses, and wildflowers occurs. The variety of food sources supports a diversity of bird and mammal species. Forest stands have become denser in many areas due to decades of fire suppression. Land use within the ecoregion includes wildlife habitat, livestock grazing, logging, mineral extraction, and recreation with increasing residential subdivisions.

2.3.1.2 Aquatic Features

The NWI and NHD identified multiple stream and wetland features within the Survey Area (USFWS 2024, USGS 2024). The mapped aquatic features include Jim Creek, Fraser River, and Buck Creek and associated wetlands. The NWI- and NHD-mapped aquatic features are shown on **Figure 2**.

2.3.1.3 Flood Zones

According to the FEMA National Flood Hazard Layer, a portion of Survey Area A8 along the Fraser River is mapped within a Special Flood Hazard Area with 1 percent annual chance of flooding, designated as Zone AE (FEMA 2024). A portion of Survey Area A1 is mapped within a Special Flood Hazard Area with 1 percent annual chance of flooding, designated as Zone A. Survey Area A16 and the remainder of Survey Area A1 are mapped within an Area of Minimal Flood Hazard, designated as Zone X. The FEMA flood zones are shown on **Figure 2**.

2.3.1.4 Watersheds

The USGS WBD defines the areal extent of surface water drainage to a discharge point formed by the terrain and other landscape characteristics. The Survey Area is located within the Colorado Headwaters (HUC-8 14010001) sub-basin and the Upper Fraser River (HUC-12 140100010202) sub-watershed (USGS 2024).

2.3.1.5 Soils

According to the NRCS Web Soil Survey for Grand County, the Survey Area consists of four soil map units (NRCS 2024). Descriptions of the soil map units are provided in **Table 2**, and the distribution of mapped soil units is shown on **Figure 3**.

Table 2. Soil Map Unit Description within the Survey Area

Map Unit Symbol	Map Unit Name	Hydric Rating
Survey Area A1		
7103A	Cryaquolls-Leighcan family, till substratum complex, 0 to 15 percent slopes	Partially hydric
ML	Dams and mine dumps, 5 to 75 percent slopes	Non-hydric
Survey Area A8		
7202B	Leighcan family, till substratum-Cryaquolls complex, 5 to 40 percent slopes	Predominantly non-hydric
7700C	Leighcan family, 40 to 75 percent slopes	Non-hydric
ML	Dams and mine dumps, 5 to 75 percent slopes	Non-hydric
Survey Area A16		
ML	Dams and mine dumps, 5 to 75 percent slopes	Non-hydric

2.3.1.6 Antecedent Precipitation Tool Output

The APT was queried for the HUC-12 sub-watershed that encompasses the Survey Area for the field survey on July 12, 2024 (USACE 2020) and is summarized in **Table 3**. The APT output is included in **Appendix A**.

Table 3. Antecedent Precipitation Tool Summary for the Survey Area

HUC-12 Subwatershed	Survey Date	Average Antecedent Precipitation Score	Preliminary Determination	Antecedent Precipitation Condition	WebWMP H_2O Balance	Drought Index (PDSI)
140100010202 (Upper Fraser River)	7-12-2024	10.25	Normal Conditions	Normal Conditions	Dry Season	Mild Drought

Note: PDSI = Palmer Drought Severity Index
Source: USACE 2020

2.3.2 Aquatic Resource Delineation

Arcadis' ecologists performed an aquatic resource delineation within the Survey Area on July 12, 2024. In total, Arcadis delineated 19 wetland features (Wetland-1A through Wetland-9D), three perennial stream features (Jim Creek, Fraser River, and Buck Creek), and five intermittent stream features (Stream-1 through Stream-5). **Tables 4 and 5** summarize each wetland and non-wetland water feature identified within the Survey Area, respectively.

The following sections describe the aquatic resources identified within the Survey Area in more detail.

2.3.2.1 Wetlands

In total, 19 wetlands totaling 3.00 acres were identified within the Survey Area (**Figures 4A** through **4C**). Each of the wetland features identified within the Survey Area is summarized in **Table 4**. Where individual wetland features exhibited similar characteristics and were close to other similar features, those features were assigned the same aquatic feature name (e.g., Wetland-1) with unique Feature IDs (e.g., Wetland-1A, Wetland-1B). The delineated wetland features exhibited indicators of wetland hydrology, hydrophytic vegetation, and hydric soils.

Wetland determination data forms for the wetland and upland data points are included in **Appendix B**. Representative photographs of each feature are included in **Appendix F.** A review of potential jurisdictional status of the wetland features delineated within the Survey Area is included in **Section 2.3.4**.

Table 4. Summary of Wetlands Delineated Within Survey Area

Aquatic Feature	Cowardin Classification [a]	Comments	Location (Latitude/Longitude)	Area (acres) [b]
Wetland-1A	PSS	Slope palustrine scrub-shrub wetlands abutting Jim Creek. Wetlands exhibited saturated sandy soils, and dominant vegetation consisted of Pacific willow (*Salix lasiandra*), Richardson's geranium (*Geranium richardsonii*), water sedge (*Carex aquatilis*), arrowleaf ragwort (*Senecio triangularis*), white bog orchid (*Platanthera dilatata*), and meadow horsetail (*Equisetum pratense*).	39.881296, -105.754253	0.01
Wetland-1B	PSS		39.881459, -105.754201	0.01
Wetland-1C	PSS/PEM	Depressional palustrine emergent/scrub-shrub wetland abutting Jim Creek via a concave linear drainage. Wetland exhibited saturated sandy soils. Dominant vegetation consisted of Pacific willow, white bog orchid, water sedge, and Richardson's geranium.	39.881519, -105.754334	0.004
Wetland-2	PSS	Depressional palustrine scrub-shrub wetland with continuous surface connection to Jim Creek exhibiting saturated loamy soils. Shallow surface water present in topographic low areas. Dominant vegetation consisted of Geyer's willow (*Salix geyeriana*), Pacific willow, water sedge, and Nebraska sedge (*Carex nebrascensis*).	39.881744, -105.754594	0.48
Wetland-3	PSS/PEM	Sloped palustrine emergent/scrub-shrub wetland abutting the Fraser River with a shallow layer of organic peat over loamy/clayey soils and a high groundwater table. Dominant vegetation included Pacific willow, speckled alder (*Alnus incana*), water sedge, meadow horsetail, and arrowleaf ragwort.	39.880797, -105.759529	0.03
Wetland-4	PEM	Sloped palustrine emergent wetland abutting the Fraser River and exhibiting a shallow, saturated layer of organic peat over loamy soil. Dominated by water sedge, meadow horsetail, arrowleaf ragwort, and tall fringed bluebells (*Mertensia ciliata*).	39.881155, -105.760114	0.14
Wetland-5A	PSS/PEM	Palustrine emergent/scrub-shrub wetland complex abutting the Fraser River and exhibiting a shallow, saturated layer of organic peat over loamy soil. Dominated by Pacific willow, water sedge, claspleaf twistedstalk (*Streptopus amplexifolius*), and arrowleaf ragwort.	39.881799, -105.761047	1.87
Wetland-5B	PEM	Isolated depressional wetland exhibiting soil saturation to the ground surface. Receives surface water from Stream-3. Dominated by Richardson's geranium, cow parsnip (*Heracleum maximum*), water sedge, and arrowleaf ragwort.	39.881686, -105.761870	0.01
Wetland-6	PEM	Isolated depressional wetland exhibiting surface water and soil saturation. Loamy soils with a mix of gravel. Dominant vegetation includes meadow horsetail, arrowleaf ragwort, timothy grass (*Phleum pratense*), and water sedge.	39.880543, -105.761447	0.01

Aquatic Feature	Cowardin Classification [a]	Comments	Location (Latitude/Longitude)	Area (acres) [b]
Wetland-7	PEM	Palustrine emergent wetland abutting Buck Creek and exhibiting a shallow, saturated layer of organic peat over loamy soil. Dominant vegetation included Pacific willow, water sedge, arrowleaf ragwort, and meadow horsetail.	39.890425, -105.761147	0.07
Wetland-8A	PEM	Wetlands 8A through 8D are a series of depressional wetland features situated between the toe of an upland berm and an upland, forested area. Appears to capture runoff from a nearby parking lot to the east. Wetlands are connected by a continuous swale, and when inundated, flow to Buck Creek. Wetland-8E is separated from other Wetland-8 features by upland berm and is surrounded by uplands. Saturated loamy soils are overlain by a shallow layer of organic peat. Surface water present in areas of low topography. Dominant vegetation included broadleaf cattail (*Typha latifolia*), water sedge, and common spikerush (*Eleocharis palustris*).	39.890207, -105.761067	0.01
Wetland-8B	PEM		39.890007, -105.761166	0.02
Wetland-8C	PEM		39.889777, -105.761525	0.03
Wetland-8D	PEM		39.889551, -105.761732	0.03
Wetland-8E	PEM		39.889876, -105.761630	0.01
Wetland-9A	PEM	Complex of isolated depressional palustrine emergent/scrub-shrub wetlands exhibiting a saturated, shallow layer of organic peat over loamy soil. Wetlands within the complex generally exhibit a high groundwater table. Dominant vegetation included speckled alder, Pacific willow, water sedge, Richardson's geranium, and arrowleaf ragwort.	39.889845, -105.761981	0.12
Wetland-9B	PSS		39.890147, -105.761799	0.03
Wetland-9C	PEM		39.890075, -105.762167	0.03
Wetland-9D	PEM		39.890133, -105.762566	0.07

Notes:

[a] Cowardin Classification Codes (Cowardin et al. 1979)
PEM = Palustrine, emergent
PSS = Palustrine, scrub-shrub

[b] Feature areas rounded to the nearest 0.01 acre (if less than 0.01 acre, the area is rounded to nearest 0.001 acre).

2.3.2.2 Non-Wetland Waters

Eight stream features totaling 2,324 linear feet were identified within the Survey Area. Named stream features delineated within the Survey Area include Buck Creek, Fraser River, and Jim Creek. Each of the non-wetland waters identified within the Survey Area is summarized in **Table 5**.

Figures 4A through **4C** depict the alignment, extent, and flow regime of each stream identified within the Survey Area. OHWM data sheets are included in **Appendix D**. Representative photographs of each stream are included in **Appendix F**. A review of the potential jurisdictional status of the non-wetland waters is included in **Section 2.3.4**.

2.3.3 Wetland Functional Assessment

Arcadis' ecologists conducted a functional assessment of mapped wetland and riparian habitat within the Survey Area in accordance with CDOT's FACWet Method (CDOT 2014). The boundaries of Survey Areas A1, A8, and A16 were used as the Area of Interest (AOI), and AA boundaries were established based on mapped wetland and riparian habitat identified during the field survey. Land use surrounding the Survey Area includes highways and roadways, bike paths, residential and commercial development, and parking lots, all of which can negatively impact the FCI scoring. Hydrologic and geomorphic impacts due to upgradient and on-site modifications resulted in both positive and negative impacts on the overall FCI score. The composite FCI score for each AA is listed below, and FACWet Score Cards are included in **Appendix E**.

- Survey Area A1: FCI is 0.85 (Highly Functioning);
- Survey Area A8: FCI is 0.79 (Functioning); and
- Survey Area A16: FCI is 0.69 (Functioning Impaired).

Table 5. Summary of Non-Wetland Waters Delineated within Survey Area

Aquatic Feature	Cowardin Classification [a]	Comments	Location (Latitude/Longitude)	Length (linear feet) [b]
Buck Creek	R5UBH	Perennial stream with adjacent wetlands exhibiting OHWM indicators (break in slope, change in substrate, and incision). OHWM averages 3 feet wide and 8 inches high. Top of bank averages 3.5 feet wide, 14 inches high. Flowing surface water at the time of survey.	39.890250, -105.761829	552
Fraser River	R2UBH	Perennial stream with adjacent wetlands exhibiting OHWM indicators (break in slope, change in substrate, scour line, and drift deposits). OHWM averages 22 feet wide and 14 inches high. Top of bank averages 29 feet wide and 2 feet high. Flowing surface water present at the time of the survey.	39.881741, -105.760508	1068
Jim Creek	R5UBH	Perennial stream with adjacent wetlands exhibiting OHWM indicators (break in slope, change in substrate, and bank undercutting). OHWM averages 8 feet wide and 8 inches high. Top of bank averages 11 feet wide and 14 inches high. Flowing surface water was present at the time of the survey.	39.881317, -105.754289	204
Stream-1	R4SB	Intermittent stream exhibiting OHWM indicators (break in slope, change in substrate, substrate sorting, bank undercutting, and drift lines). Tributary of Jim Creek. OHWM averages 4 feet wide and 4 inches high. Top of bank averages 6.5 feet wide and 1 foot high. No flowing water present at the time of the survey upgradient of the confluence with Stream-2.	39.881649, -105.754117	66
Stream-2	R4SB	Intermittent stream exhibiting OHWM indicators (break in slope, change in substrate, change in vegetation cover). Tributary of Stream-1. OHWM averages 2.5 feet wide and 6 inches high. Top of bank averages 4 feet wide and 10 inches high. Flowing water was present at the time of the survey.	39.881660, -105.754063	34
Stream-3	R4SB	Intermittent stream exhibiting OHWM indicators (break in slope, change in substrate, change in vegetation cover). Stream diffuses at Wetland-5B. OHWM averages 18 inches wide and 4 inches high. Top of bank averages 2 feet wide and 8 inches high. Flowing water was present at the time of the survey.	39.881519, -105.761960	140
Stream-4	R4SB	Intermittent stream exhibiting OHWM indicators (break in slope, change in substrate, and change in vegetation cover). Tributary of the Fraser River. OHWM averages 2 feet wide and 4 inches high. Top of bank averages 4 feet wide and 8 inches high. Flowing water was present at the time of the survey.	39.882506, -105.761607	226
Stream-5	R4SB	Intermittent stream exhibiting OHWM indicators (break in slope, change in substrate, bank incision). Seep-fed tributary of Buck Creek. OHWM averages 3.5 feet wide and 8 inches high. Top of bank averages 5 feet wide and 1.5 feet high. Flowing water was present at the time of the survey.	39.890307, -105.761314	33

Notes:

[a] Cowardin Classification Codes (Cowardin et al. 1979)
R2UBH = Riverine, lower perennial, unconsolidated bottom, permanently flooded
R5UBH = Riverine, unknown perennial, unconsolidated bottom, permanently flooded
R4SB = Riverine, intermittent, streambed

[b] Feature lengths rounded to the nearest linear foot.

2.3.4 Preliminary Jurisdictional Status Review

Arcadis reviewed the potential jurisdictional status of each aquatic feature identified within the Survey Areas based on current regulations and legal interpretations. The results of this review are summarized in **Table 6**.

Based on Arcadis' preliminary jurisdictional review, 19 of the 27 delineated wetland and stream features within the Survey Area are likely considered jurisdictional waters of the U.S. under the 2023 Conforming Rule. This determination is based on the relatively permanent flow durations of the stream features and the continuous surface connection of the wetlands and streams to a traditional navigable water (TNW). Buck Creek and Jim Creek are tributaries to the Fraser River, which in turn flows to the Colorado River. Therefore, the relatively permanent direct and indirect tributaries and the wetlands exhibiting a continuous surface connection to these features are likely considered waters of the U.S. The features that lack a continuous surface connection to downgradient jurisdictional waterbodies are not likely considered waters of the U.S. under the 2023 Conforming Rule.

All of the aquatic features delineated within the Survey Area meet the definition of a water of the state under current Colorado law. Of these, seven features may meet the definition of a Sackett Gap Water. In addition, none of the aquatic features within the Survey Area are considered a navigable water under Section 10 of the RHA.

The preliminary jurisdictional status of the aquatic features identified within the Survey Area was evaluated based on the current regulations and legal interpretations. The USACE and USEPA, under the authority of the CWA and RHA, have the authority to determine the locations and extents of jurisdictional waters of the U.S. The jurisdictional status of the features discussed in this Report should be considered preliminary until concurrence from a regulatory agency is obtained. Furthermore, the identification of waters of the state and Sackett Gap Waters should be considered preliminary until concurrence from the state is obtained.

Table 6. Potential Jurisdictional Status Review Summary

Feature ID	Potential Water of the U.S.?	Potential Water of the State?	Potential Sackett Gap Water?
Wetland-1A	Yes, exhibits continuous surface connection to Jim Creek and meets the definition of an adjacent wetland.	Yes	N/A
Wetland-1B	Yes, exhibits continuous surface connection to Jim Creek and meets the definition of an adjacent wetland.	Yes	N/A
Wetland-1C	Yes, exhibits continuous surface connection to Jim Creek and meets the definition of an adjacent wetland.	Yes	N/A
Wetland-2	Yes, exhibits continuous surface connection to Jim Creek and meets the definition of an adjacent wetland.	Yes	N/A
Wetland-3	Yes, exhibits continuous surface connection to the Fraser River and meets the definition of an adjacent wetland.	Yes	N/A
Wetland-4	Yes, exhibits continuous surface connection to the Fraser River and meets the definition of an adjacent wetland.	Yes	N/A
Wetland-5A	Yes, exhibits continuous surface connection to the Fraser River and meets the definition of an adjacent wetland.	Yes	N/A
Wetland-5B	No, isolated feature surrounded by uplands and lacking continuous surface connection to downgradient jurisdictional waterbodies.	Yes	Yes
Wetland-6	No, isolated feature surrounded by uplands and lacking continuous surface connection to downgradient jurisdictional waterbodies.	Yes	No
Wetland-7	Yes, exhibits continuous surface connection to Buck Creek and meets the definition of an adjacent wetland.	Yes	N/A
Wetland-8A	Yes, meets the continuous surface connection requirement based on connection to Buck Creek via a discrete feature (i.e., non-jurisdictional swale).	Yes	N/A
Wetland-8B	Yes, meets the continuous surface connection requirement based on connection to Buck Creek via a discrete feature (i.e., non-jurisdictional swale).	Yes	N/A
Wetland-8C	Yes, meets the continuous surface connection requirement based on connection to Buck Creek via a discrete feature (i.e., non-jurisdictional swale).	Yes	N/A
Wetland-8D	Yes, meets the continuous surface connection requirement based on connection to Buck Creek via a discrete feature (i.e., non-jurisdictional swale).	Yes	N/A
Wetland-8E	No, isolated feature surrounded by uplands and an upland berm. Lacks continuous surface connection to downgradient jurisdictional waterbodies.	Yes	Yes
Wetland-9A	No, isolated feature surrounded by uplands and lacking continuous surface connection to downgradient jurisdictional waterbodies.	Yes	Yes
Wetland-9B	No, isolated feature surrounded by uplands and lacking continuous surface connection to downgradient jurisdictional waterbodies.	Yes	Yes

Feature ID	Potential Water of the U.S.?	Potential Water of the State?	Potential Sackett Gap Water?
Wetland-9C	No, isolated feature surrounded by uplands and lacking continuous surface connection to downgradient jurisdictional waterbodies.	Yes	Yes
Wetland-9D	No, isolated feature surrounded by uplands and lacking continuous surface connection to downgradient jurisdictional waterbodies.	Yes	Yes
Buck Creek	Yes, relatively permanent tributary to the Fraser River and indirect tributary to a TNW.	Yes	N/A
Fraser River	Yes, relatively permanent direct tributary to the Colorado River.	Yes	N/A
Jim Creek	Yes, relatively permanent tributary to the Fraser River and indirect tributary to a TNW.	Yes	N/A
Stream-1	Yes, relatively permanent tributary of Jim Creek and indirect tributary to a TNW.	Yes	N/A
Stream-2	Yes, relatively permanent tributary of Jim Creek and indirect tributary to a TNW.	Yes	N/A
Stream-3	No, isolated feature lacking continuous surface connection to downgradient jurisdictional waterbodies.	Yes	Yes
Stream-4	Yes, relatively permanent tributary to the Fraser River and indirect tributary to a TNW.	Yes	N/A
Stream-5	Yes, relatively permanent tributary to Buck Creek and indirect tributary to a TNW.	Yes	N/A

3 Summary and Recommendations

In total, 19 wetlands (3.00 acres in total) and eight streams (2,324 linear feet in total) were identified within the Survey Area during the aquatic resource field delineation conducted by Arcadis in July 2024. Of the 27 delineated wetland and stream features, 19 features are likely considered waters of the U.S. as defined by the current 2023 Conforming Rule. All wetland and stream features are likely considered waters of the state. Of these, seven features may be considered Sackett Gap Waters. None of the aquatic features identified within the Survey Area are considered navigable under Section 10 of the RHA. The jurisdictional status of the features discussed in this Report should be considered preliminary until concurrence from a regulatory agency is obtained. If jurisdictional features will be impacted by future development, the applicable permits should be obtained, and the FACWet Method results should be used to inform mitigation requirements for permanent impacts to those features.

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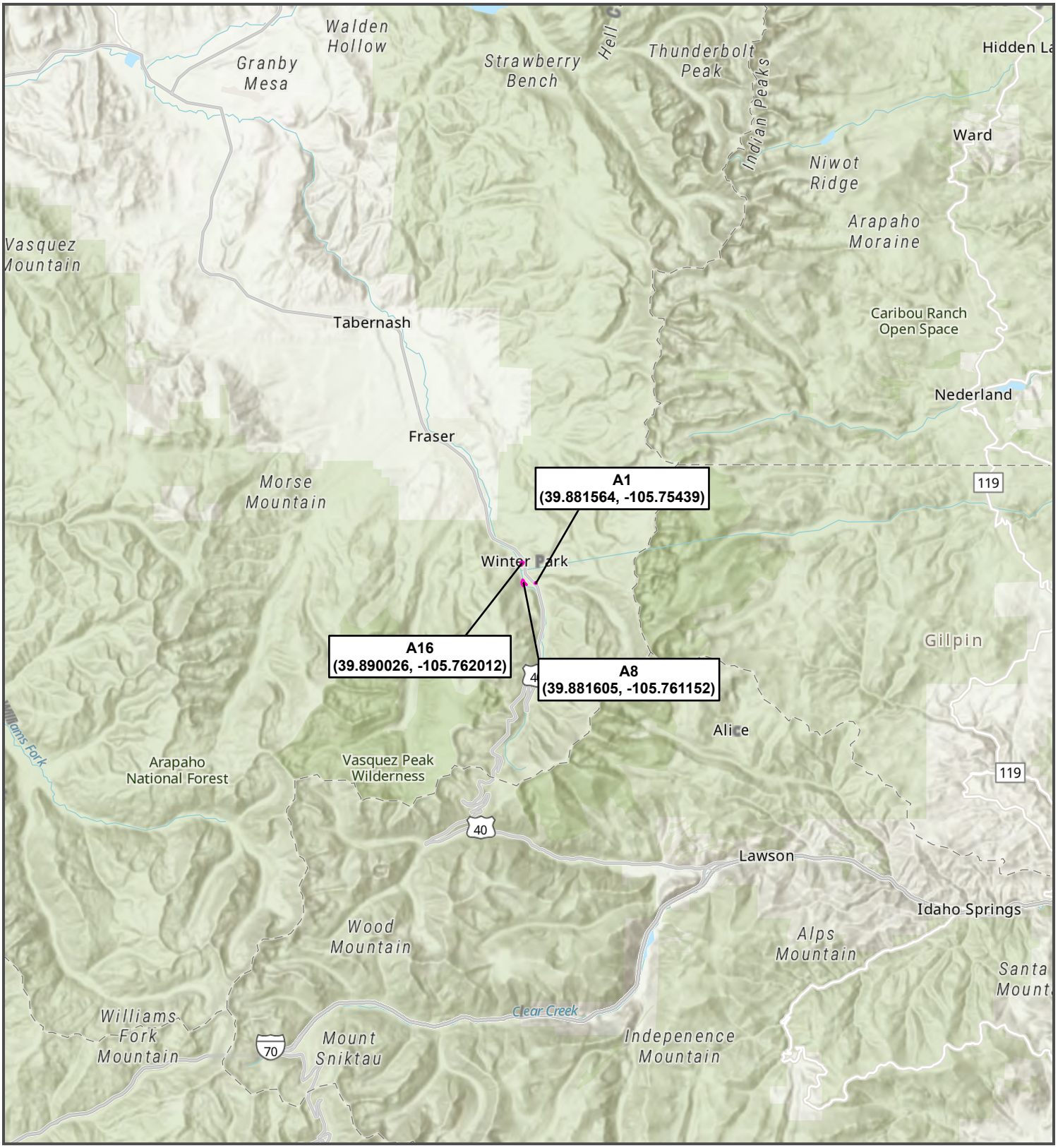
Figures

Figure 1 – Project Location

Figure 2 – NHD/NWI/FEMA

Figure 3 – NRCS Soils

Figures 4A-4C – Delineated Features



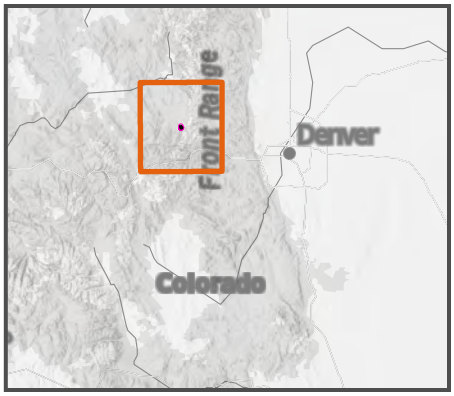


FIGURE 1
PROJECT LOCATION
Aquatic Resource Delineation
Alterra Mountain Company Base Area
Winter Park, Grand County, Colorado

Legend
Survey Area (15.59 ac)

Notes:
1. Basemap obtained from ESRI, 2024.
2. Aquatic resource delineation conducted July 2024 by Arcadis U.S., Inc.

0 2 4 mi
0 3 6 km

ARCADIS

Creator: NJones Last Saved: 11/5/2024 2:18 PM
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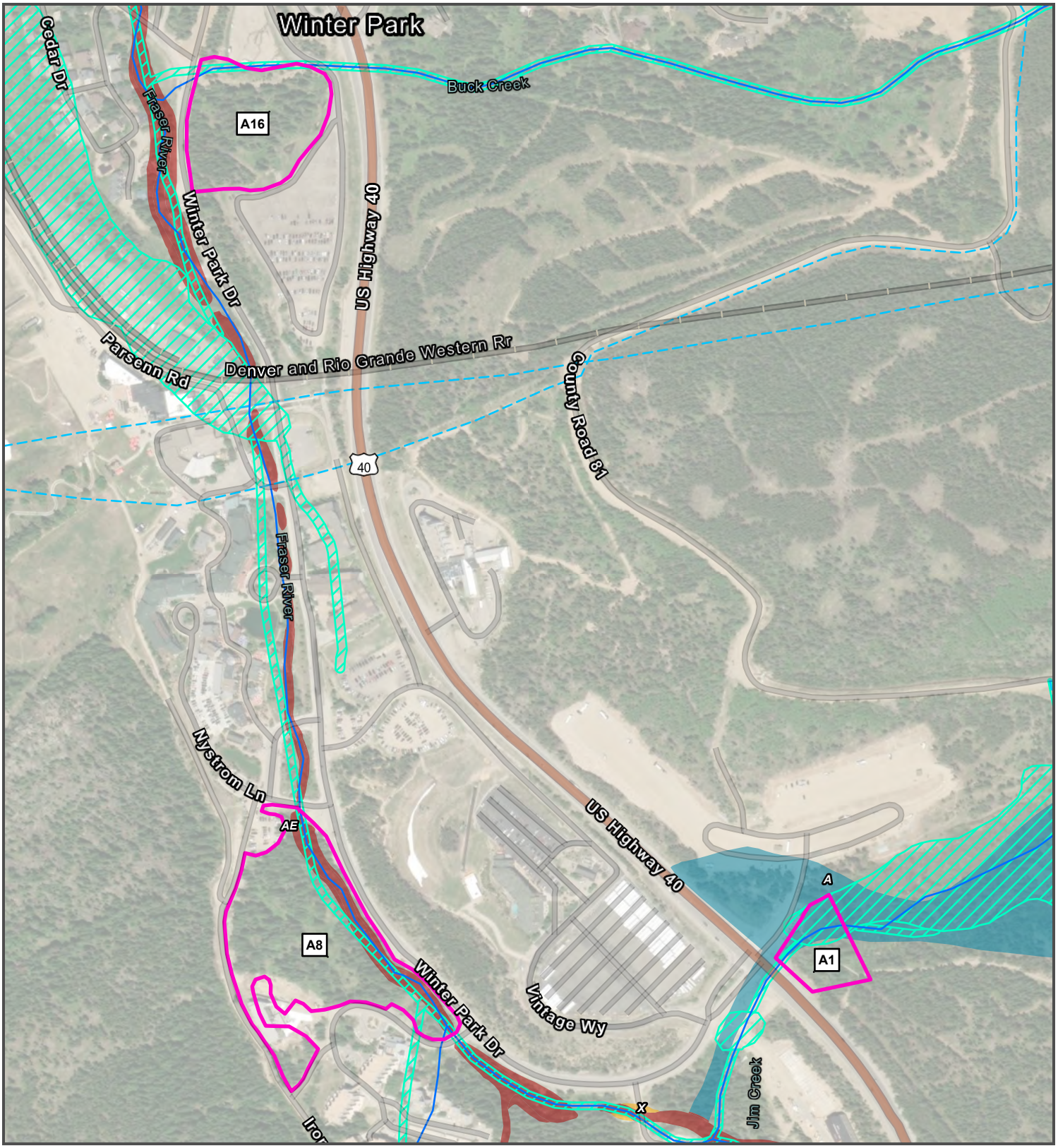
Location: T:_EPP\Owl_Ridge\Winter_Park_Resort\MXD_Pro\WPR_Working.aprx\Aquatic Resources - Alterra - Figure 1 - Project Location
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



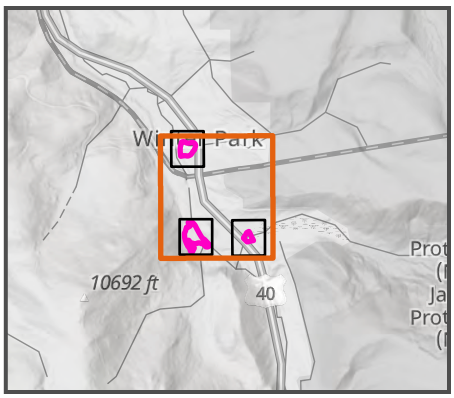


FIGURE 2

NHD/NWI/FEMA

Aquatic Resource Delineation
Alterra Mountain Company Base Area
Winter Park, Grand County, Colorado

Notes:
1. Basemap, NHD, NWI, and FEMA obtained from ESRI, 2024.
2. Aquatic resource delineation conducted July 2024 by Arcadis U.S., Inc.
3. Unshaded areas mapped in an Area of Minimal Flood Hazard (Zone X) (FEMA 2024)

0 250 500 f
0 75 150 m

Legend

- Survey Area (15.59 ac)
- Canal/Ditch/Pipeline
- Stream (Perennial)
- NHD Waterbodies
- NWI Wetlands

FEMA Flood Zone

- A
- AE
- X (0.2 Percent Chance Annual Flood Hazard)

ARCADIS

Creator: N.Jones Last Saved: 11/5/2024 8:48 AM
Coordinate System: NAD 1983 StatePlane Colorado North FIPS 0501 Feet
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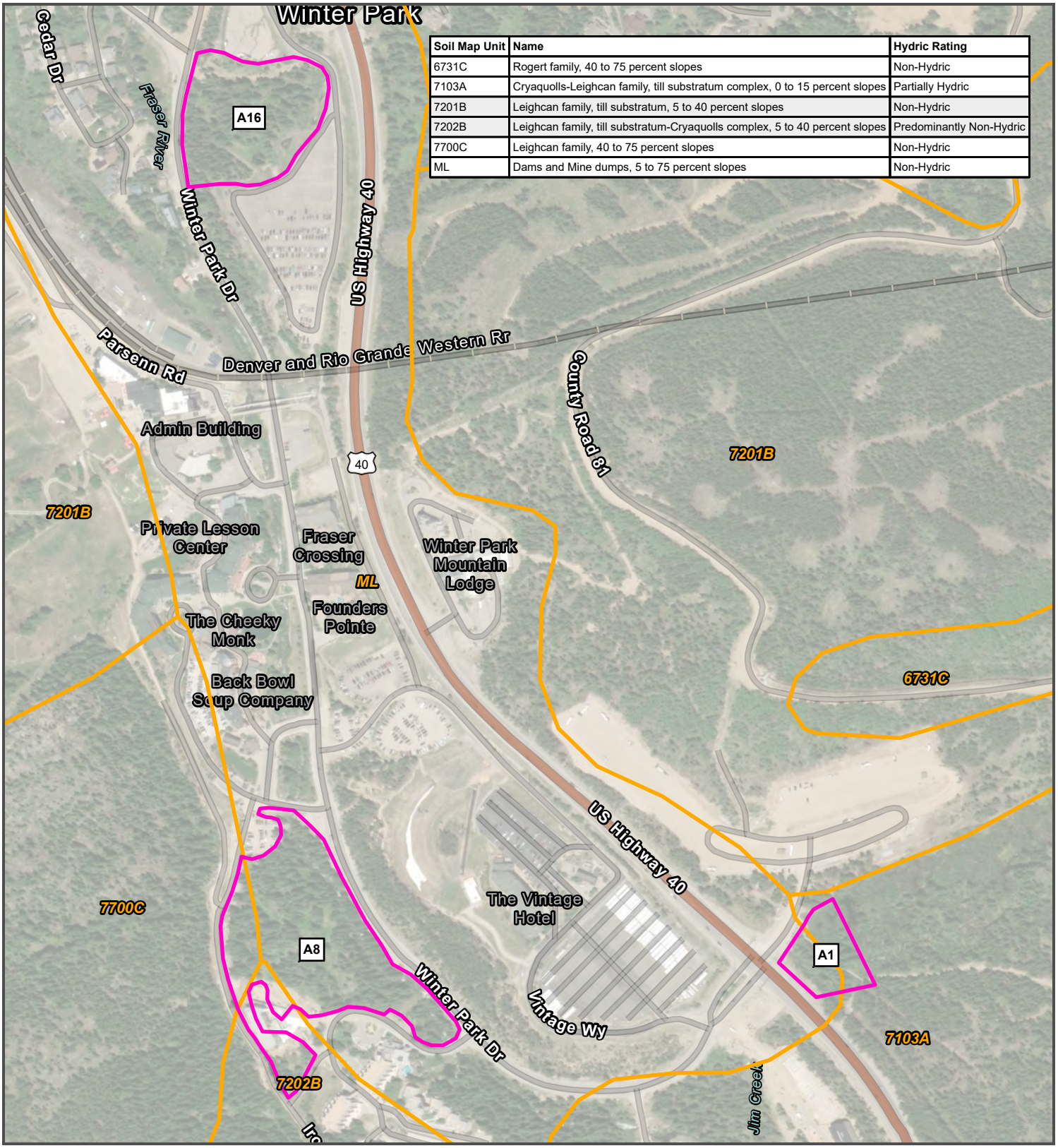
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



Soil Map Unit	Name	Hydric Rating
6731C	Rogert family, 40 to 75 percent slopes	Non-Hydric
7103A	Cryaquolls-Leighcan family, till substratum complex, 0 to 15 percent slopes	Partially Hydric
7201B	Leighcan family, till substratum, 5 to 40 percent slopes	Non-Hydric
7202B	Leighcan family, till substratum-Cryaquolls complex, 5 to 40 percent slopes	Predominantly Non-Hydric
7700C	Leighcan family, 40 to 75 percent slopes	Non-Hydric
ML	Dams and Mine dumps, 5 to 75 percent slopes	Non-Hydric

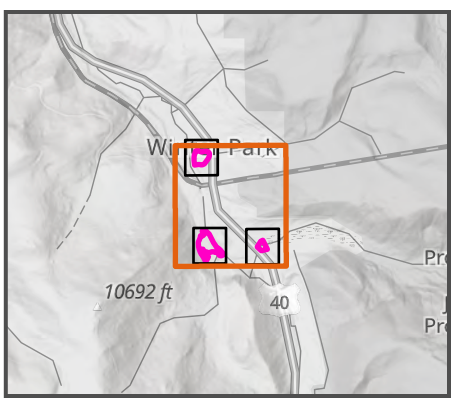


FIGURE 3
NRCS SOILS
Aquatic Resource Delineation
Alterra Mountain Company Base Area
Winter Park, Grand County, Colorado

Legend
- Survey Area (15.59 ac)
- NRCS Soil Map Unit

Notes:
1. Basemap obtained from ESRI, 2024.
2. Soils obtained from NRCS, 2024.
3. Aquatic resource delineation conducted July 2024 by Arcadis U.S., Inc.

0 250 500 f
0 75 150 m

ARCADIS

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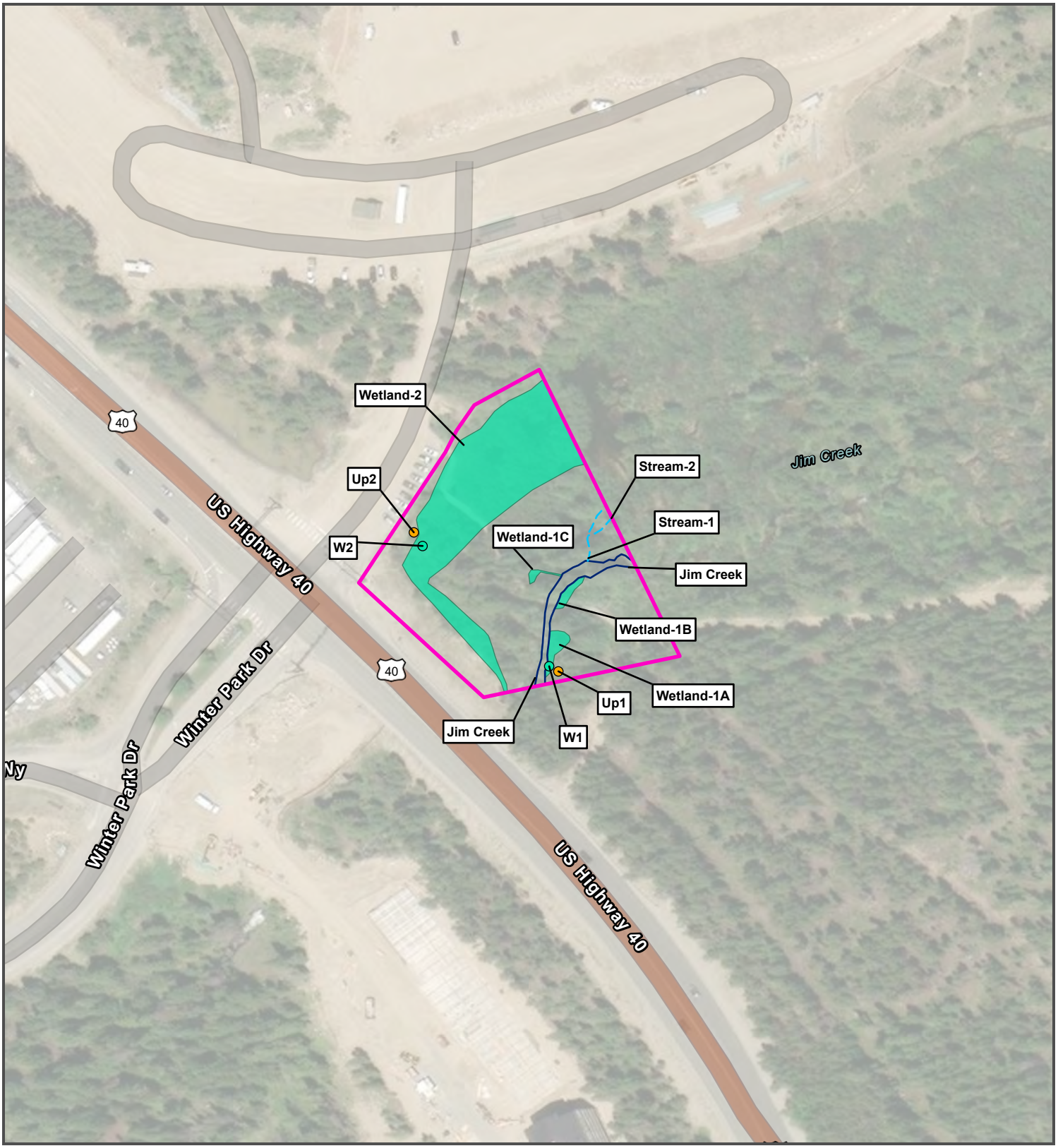
Location: T:_EPP\Owl_Ridge\Winter_Park_Resort\MXD_Pro\WPR_Working.aprx\Aquatic Resources - Alterra - Figure 3 - Soils
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



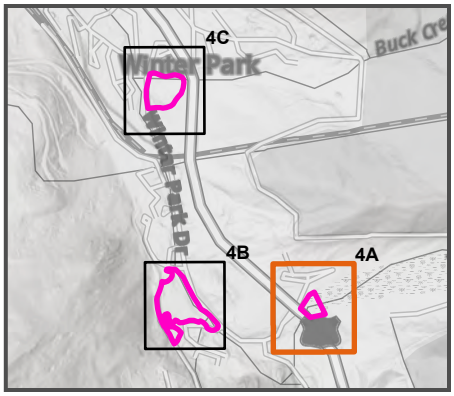


FIGURE 4A
A1 DELINEATED FEATURES

Aquatic Resource Delineation
Alterra Mountain Company Base Area
Winter Park, Grand County, Colorado

Legend

- Survey Area (15.59 ac)
- Upland Data Point
- Wetland Data Point
- Intermittent Stream Centerline
- Perennial Stream OHWM
- Wetland

Notes:
1. Basemap obtained from ESRI, 2024.
2. Aquatic resource delineation conducted July 2024 by Arcadis U.S., Inc.

0 75 150 ft
0 25 50 m

ARCADIS

Creator: NJones Last Saved: 11/5/2024 2:27 PM
Coordinate System: NAD 1983 StatePlane Colorado North FIPS 0501 Feet
Location: T:_EPP\Owl_RidgeWinter_Park_Resort\MXD_Pro\WPR_Working.aprx\Aquatic Resources - Alterra - Figure 4 - Delineated Features
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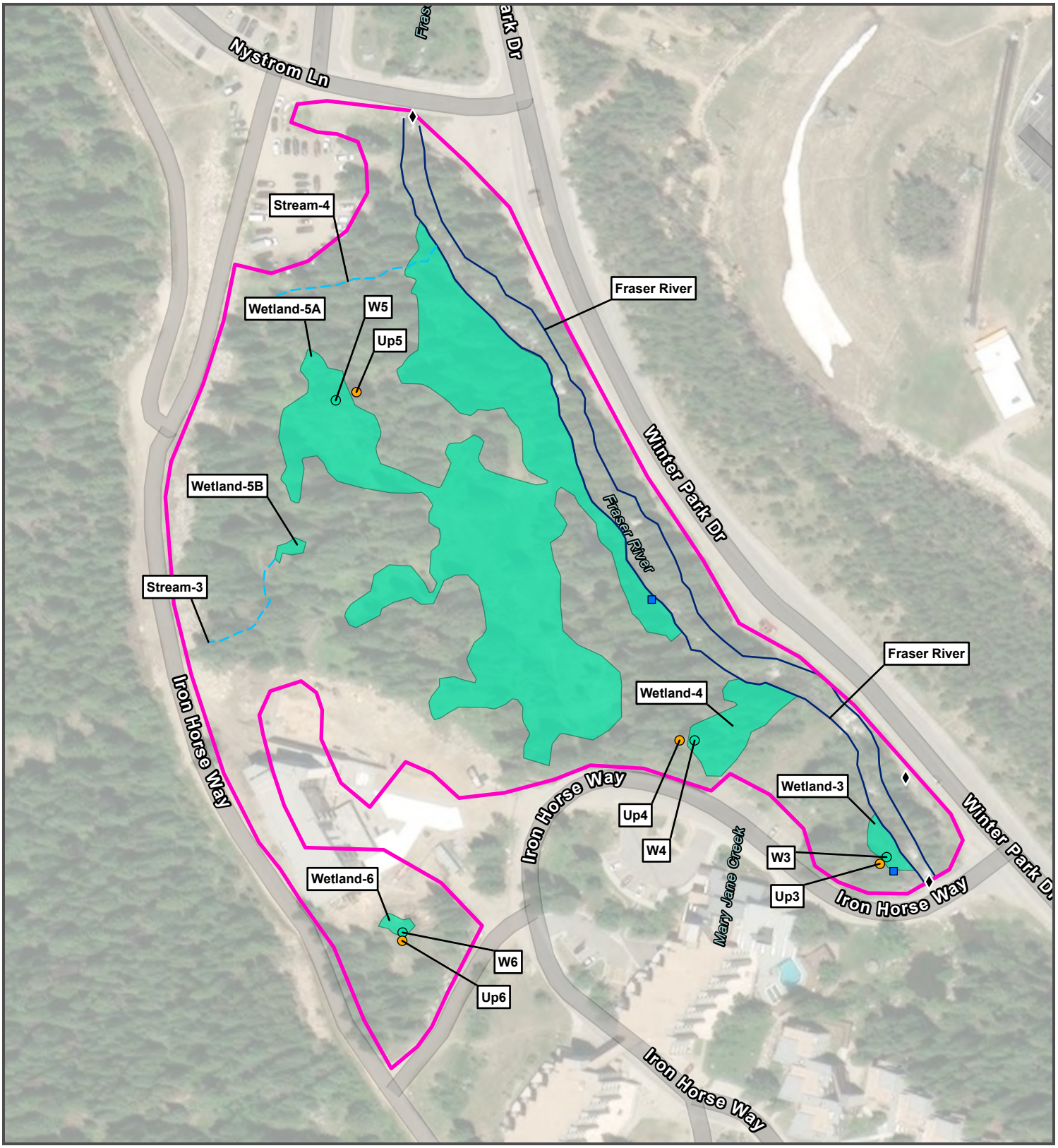

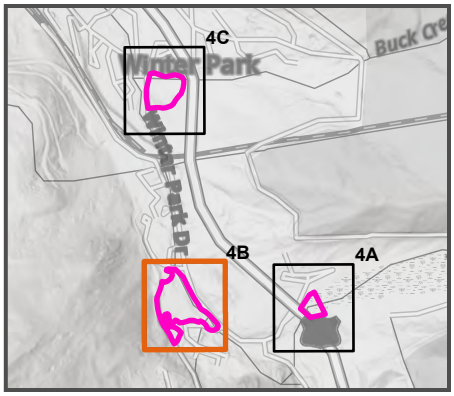

FIGURE 4B
A8 DELINEATED FEATURES

Aquatic Resource Delineation
Alterra Mountain Company Base Area
Winter Park, Grand County, Colorado

Legend

- Survey Area (15.59 ac)
- Culvert
- Spring/Seep
- Upland Data Point
- Wetland Data Point
- Intermittent Stream Centerline
- Perennial Stream OHWM
- Wetland

Notes:
1. Basemap obtained from ESRI, 2024.
2. Aquatic resource delineation conducted July 2024 by Arcadis U.S., Inc.

0 75 150 ft
0 25 50 m

ARCADIS

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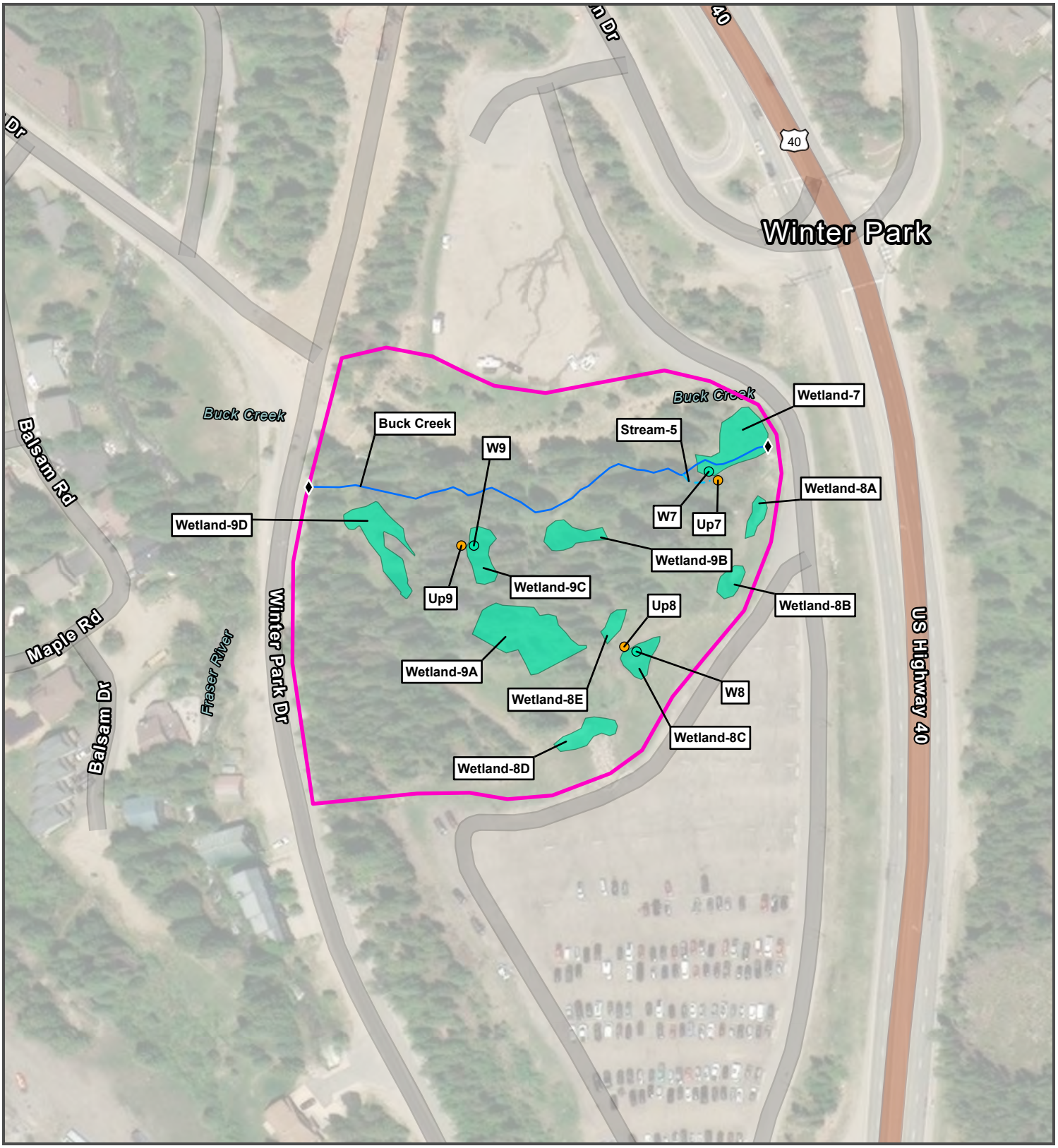
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.



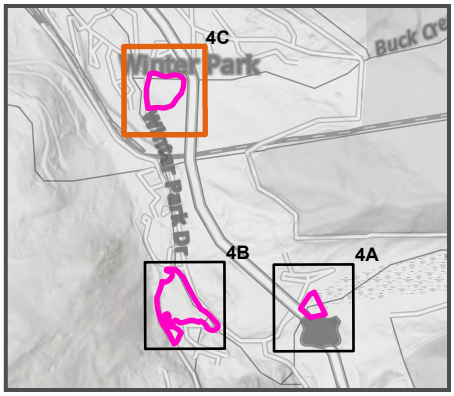


FIGURE 4C
A16 DELINEATED FEATURES
Aquatic Resource Delineation
Alterra Mountain Company Base Area
Winter Park, Grand County, Colorado

Legend

- Survey Area (15.59 ac)
- Culvert
- Upland Data Point
- Wetland Data Point
- Intermittent Stream Centerline
- Perennial Stream Centerline
- Wetland

Notes:
1. Basemap obtained from ESRI, 2024.
2. Aquatic resource delineation conducted July 2024 by Arcadis U.S., Inc.

0 75 150 ft
0 25 50 m

ARCADIS

Creator: NJones Last Saved: 11/5/2024 2:27 PM
Coordinate System: NAD 1983 StatePlane Colorado North FIPS 0501 Feet
Location: T:_EPP\Owl_RidgeWinter_Park_Resort\MXD_Pro\WPR_Working.aprx\Aquatic Resources - Alterra - Figure 4 - Delineated Features
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

Appendix A

APT Output

Antecedent Precipitation Tool v1.0 - Watershed Sampling Summary

Generated on 2024-11-05

User Inputs

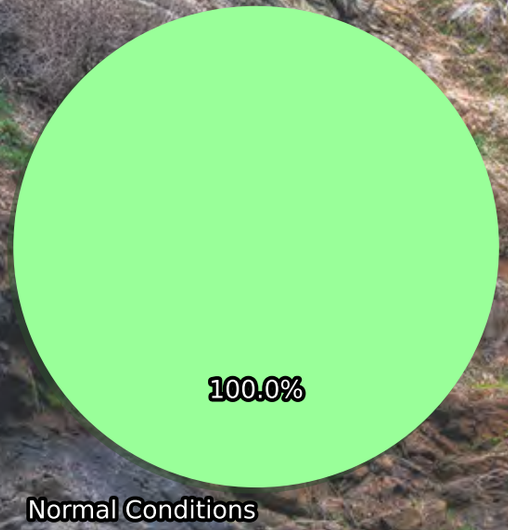
Coordinates	39.890026, -105.762012
Date	2024-07-12
Geographic Scope	HUC12

Intermediate Data

Hydrologic Unit Code	140100010202
Watershed Size	30.3 mi^2
# Random Sampling Points	4

Preliminary Result

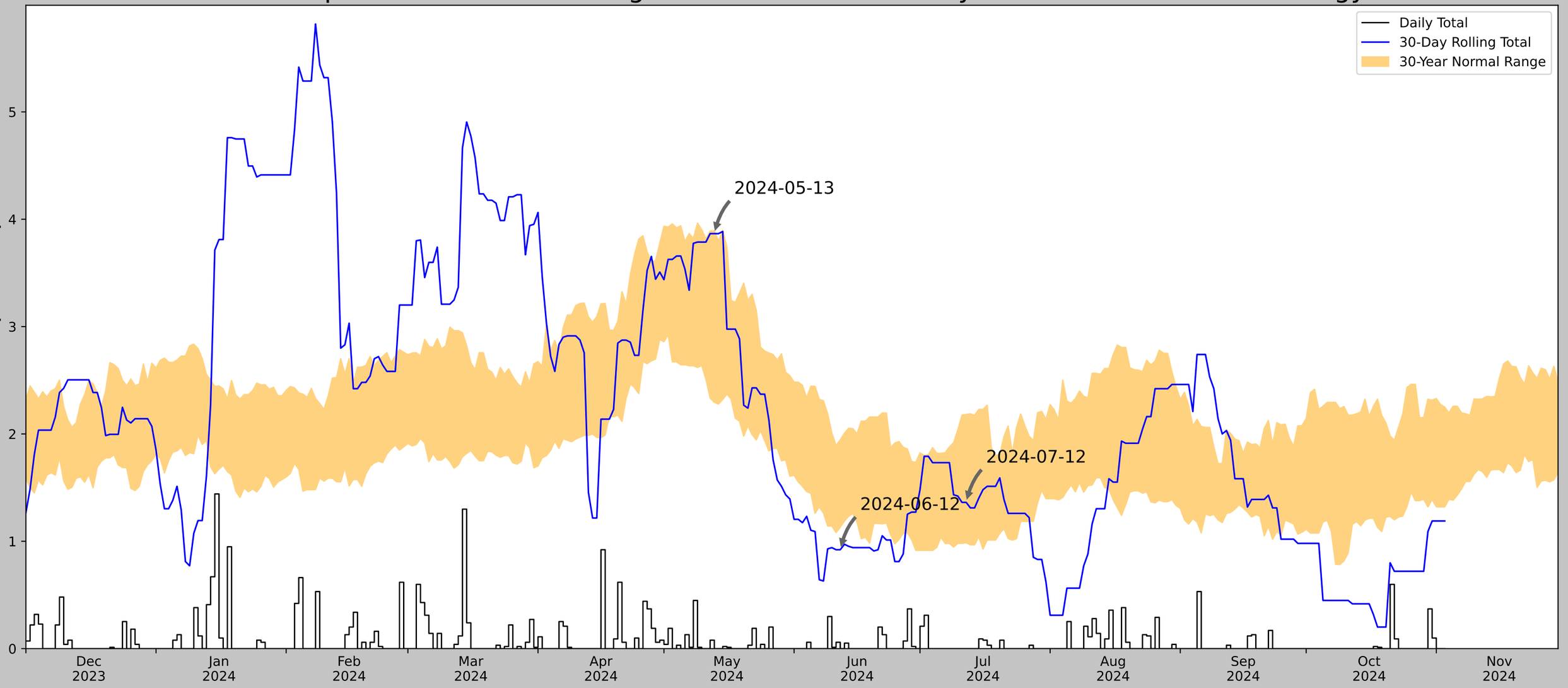
Average Antecedent Precipitation Score	10.25
Preliminary Determination	Normal Conditions



Sampling Point Breakdown

Antecedent Precipitation Score	Antecedent Precipitation Condition	WebWIMP H_2O Balance	Drought Index (PDSI)	# of Points
11	Normal Conditions	Dry Season	Mild drought	1
10	Normal Conditions	Dry Season	Mild drought	3

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.890026, -105.762012
Observation Date	2024-07-12
Elevation (ft)	9072.511
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Dry Season

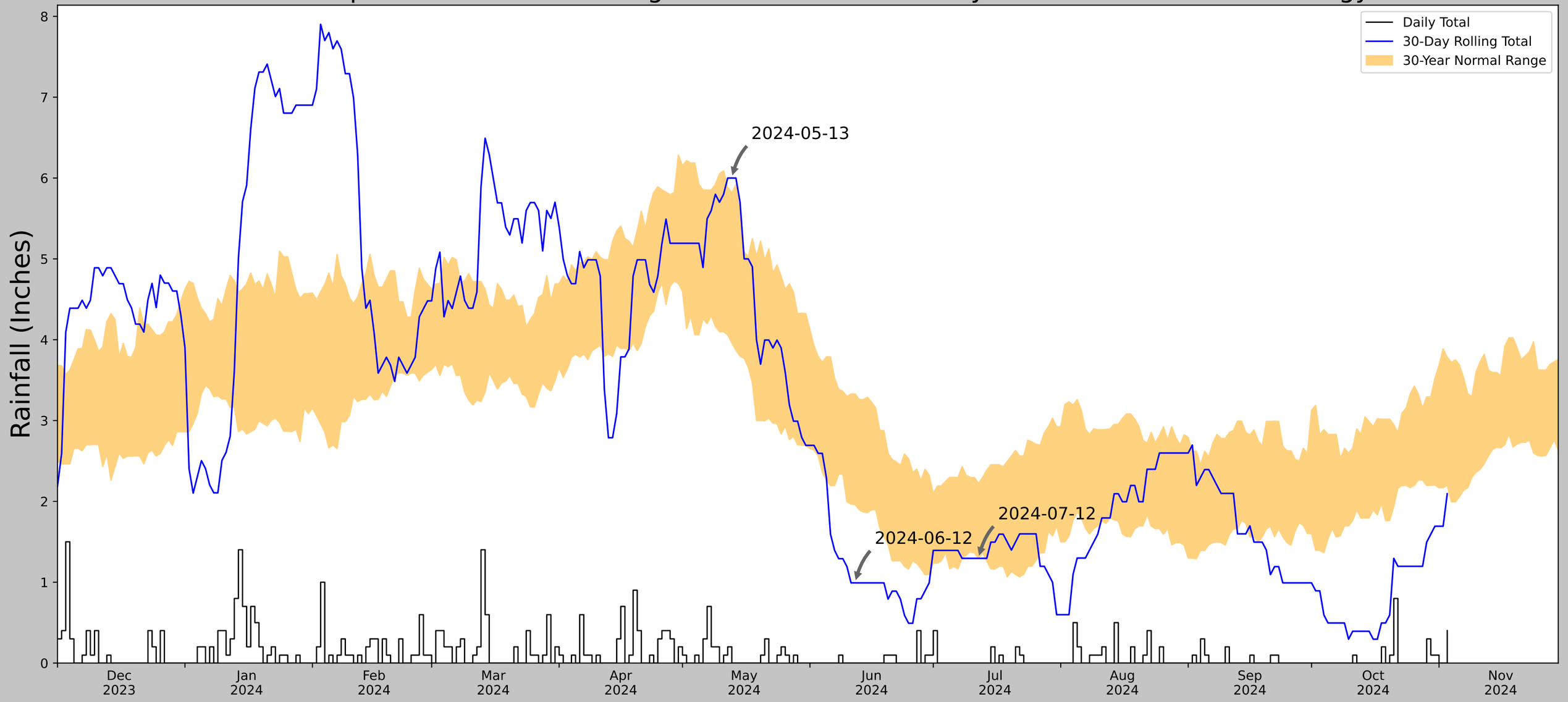
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-07-12	0.986221	2.181496	1.362205	Normal	2	3	6
2024-06-12	1.129921	1.944095	0.92126	Dry	1	2	2
2024-05-13	2.293701	3.892914	3.866142	Normal	2	1	2
Result							Normal Conditions - 10

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WINTER PARK	39.8878, -105.7614	9123.032	0.157	50.521	0.079	11122	90
FRASER 1.4 E	39.948, -105.7895	8826.116	4.418	296.916	3.3	5	0
FRASER 5.2 WSW	39.9047, -105.884	9005.906	6.603	117.126	3.745	15	0
FRASER	39.9456, -105.8139	8562.992	4.867	560.04	4.916	171	0
FRASER 1.8 NNE	39.9693, -105.8033	8727.034	6.053	395.998	5.121	20	0
IDAHO SPRINGS 4.9 NW	39.7948, -105.573	9249.016	11.882	125.984	6.844	12	0
TABERNASH 2.5 ENE	40.0063, -105.7988	8658.137	8.424	464.895	7.707	2	0
Lake Eldora	39.94, -105.59	9700.132	9.773	577.1	10.038	5	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.808103, -105.7864
Observation Date	2024-07-12
Elevation (ft)	9072.511
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Dry Season

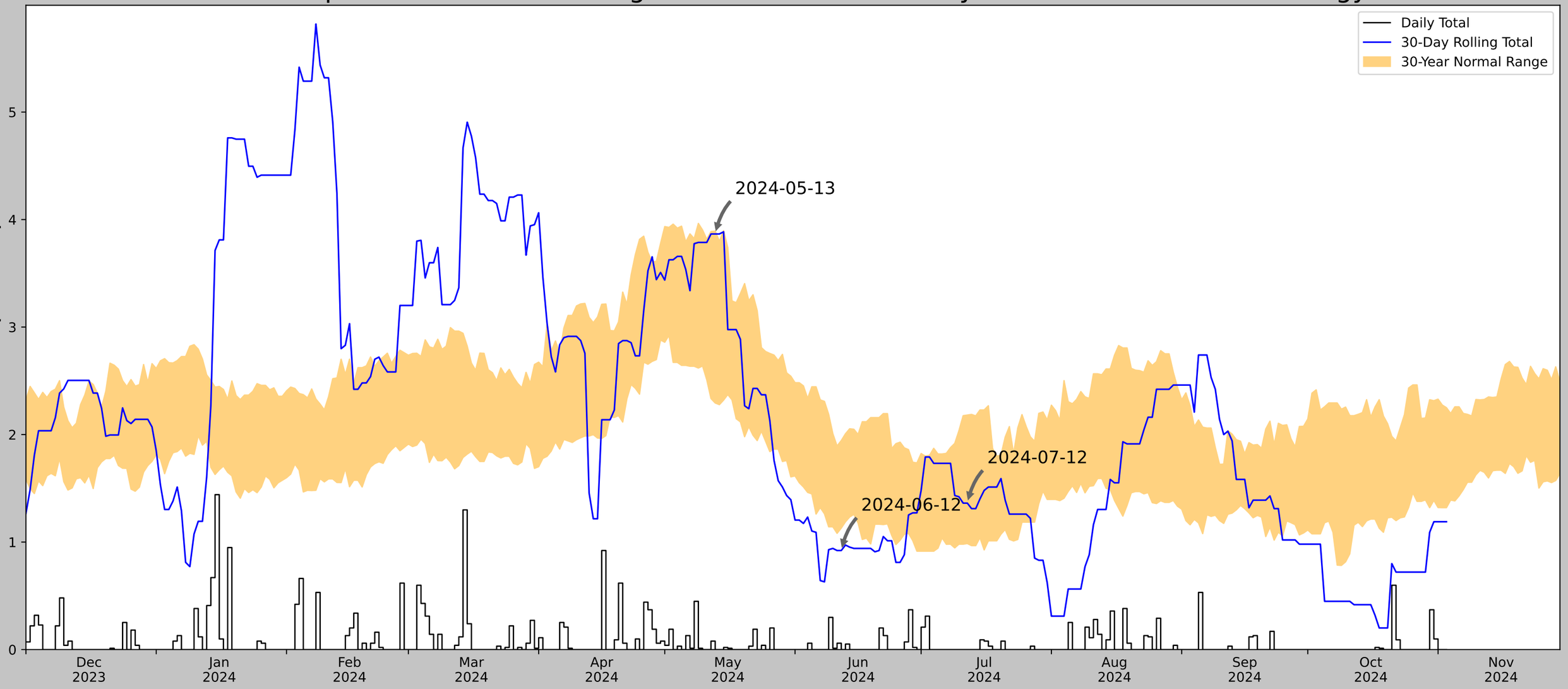
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-07-12	1.294095	2.223622	1.295276	Normal	2	3	6
2024-06-12	1.961024	3.329134	0.992126	Dry	1	2	2
2024-05-13	3.961024	5.815355	6.0	Wet	3	1	3
Result							Normal Conditions - 11

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
Berthoud Summit	39.8, -105.78	11299.869	0.655	2227.358	1.754	11351	90
Fool Creek	39.87, -105.87	11149.935	6.797	149.934	4.078	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.906419, -105.781372
Observation Date	2024-07-12
Elevation (ft)	8964.106328
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Dry Season

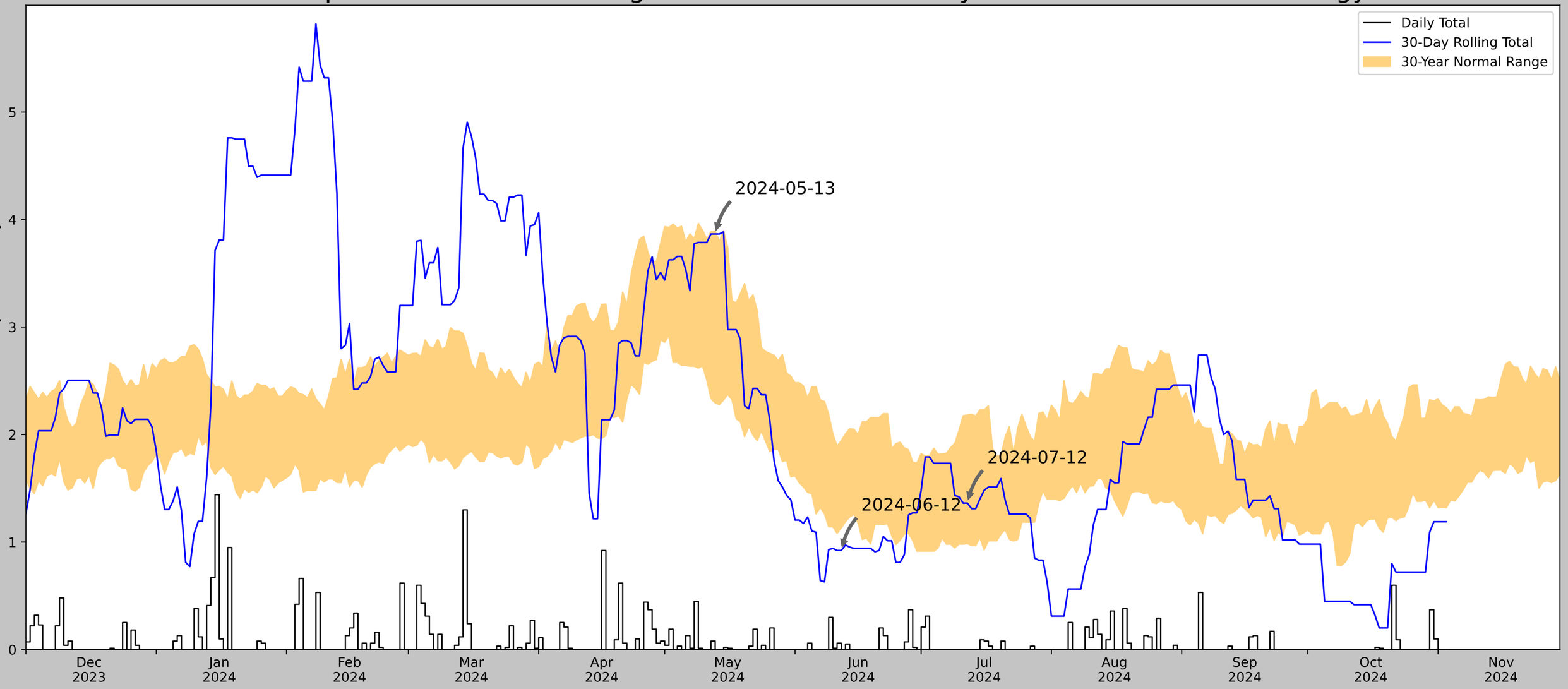
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-07-12	0.986221	2.181496	1.362205	Normal	2	3	6
2024-06-12	1.129921	1.944095	0.92126	Dry	1	2	2
2024-05-13	2.293701	3.892914	3.866142	Normal	2	1	2
Result							Normal Conditions - 10

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WINTER PARK	39.8878, -105.7614	9123.032	1.666	158.926	1.014	11122	90
FRASER 1.4 E	39.948, -105.7895	8826.116	4.418	296.916	3.3	5	0
FRASER 5.2 WSW	39.9047, -105.884	9005.906	6.603	117.126	3.745	15	0
FRASER	39.9456, -105.8139	8562.992	4.867	560.04	4.916	171	0
FRASER 1.8 NNE	39.9693, -105.8033	8727.034	6.053	395.998	5.121	20	0
IDAHO SPRINGS 4.9 NW	39.7948, -105.573	9249.016	11.882	125.984	6.844	12	0
TABERNASH 2.5 ENE	40.0063, -105.7988	8658.137	8.424	464.895	7.707	2	0
Lake Eldora	39.94, -105.59	9700.132	9.773	577.1	10.038	5	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.870364, -105.710992
Observation Date	2024-07-12
Elevation (ft)	10201.107161
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-07-12	0.986221	2.181496	1.362205	Normal	2	3	6
2024-06-12	1.129921	1.944095	0.92126	Dry	1	2	2
2024-05-13	2.293701	3.892914	3.866142	Normal	2	1	2
Result							Normal Conditions - 10

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WINTER PARK	39.8878, -105.7614	9123.032	2.932	1078.075	4.48	11122	90
FRASER 1.4 E	39.948, -105.7895	8826.116	4.418	296.916	3.3	5	0
FRASER 5.2 WSW	39.9047, -105.884	9005.906	6.603	117.126	3.745	15	0
FRASER	39.9456, -105.8139	8562.992	4.867	560.04	4.916	171	0
FRASER 1.8 NNE	39.9693, -105.8033	8727.034	6.053	395.998	5.121	20	0
IDAHO SPRINGS 4.9 NW	39.7948, -105.573	9249.016	11.882	125.984	6.844	12	0
TABERNASH 2.5 ENE	40.0063, -105.7988	8658.137	8.424	464.895	7.707	2	0
Lake Eldora	39.94, -105.59	9700.132	9.773	577.1	10.038	5	0

Appendix B

Wetland Determination Data Forms

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W1

Investigator(s): J. McBride, B. Meyer | Section, Township, Range: S14 T2S R75W

Landform (hillside, terrace, etc.): Bank slope/floodplain | Local relief (concave, convex, none): None | Slope (%): 5

Subregion (LRR/MLRA): LRR E | Lat: 39.881238°N | Long: 105.754272°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75% slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Wetland data point associated with Wetland-1; PSS wetland associated with Jim Creek

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Alnus incana*	10	No	FACW
2. *Salix lasiandra*	50	Yes	FACW
3.			
4.			
5.			
	60	=Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Heracleum maximum*	10	Yes	FAC
2. *Platanthera dilatata*	10	Yes	FAC
3. *Senecio triangularis*	10	Yes	FACW
4. *Geranium richardsonii*	20	Yes	FAC
5. *Chamaenerion angustifolium*	10	Yes	FACU
6. *Carex aquatilis*	20	Yes	OBL
7. *Equisetum pratense*	10	Yes	FACW
8.			
9.			
10.			
11.			
	90	=Total Cover	
Woody Vine Stratum (Plot size: 5 ft)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	80	x 2 =	160
FAC species	40	x 3 =	120
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	150 (A)		340 (B)

Prevalence Index = B/A = 2.27

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ 5 - Wetland Non-Vascular Plants[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100					Sandy	Saturated to surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (saturated soils)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up1

Investigator(s): J. McBride, B. Meyer | Section, Township, Range: S14 T2S R75W

Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): None | Slope (%): 10

Subregion (LRR/MLRA): LRR E | Lat: 39.881223°N | Long: 105.754236°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75% slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point associated with Wetland-1

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea engelmannii*	40	Yes	FAC
2. *Pseudotsuga menziesii*	20	Yes	FACU
3.			
4.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Picea engelmannii*	5	Yes	FAC
2. *Pinus contorta*	5	Yes	FAC
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Chamaenerion angustifolium*	20	Yes	FACU
2. *Vaccinium scoparium*	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 5 ft)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	110 (A)		390 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

SOIL

Sampling Point: Up1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/2	100					Sandy	Dry, with gravel and cobble

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 8

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W2

Investigator(s): J. McBride, B. Meyer | Section, Township, Range: S14 T2S R75W

Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRR/MLRA): LRR E | Lat: 39.881602°N | Long: 105.754774°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75% slopes | NWI classification: PSS1C/R5UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland data point associated with Wetland-2; PSS wetland associated with Jim Creek

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Salix geyeriana*	30	Yes	FACW
2. *Salix wolfii*	30	Yes	OBL
3.			
4.			
5.			
	60	=Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Carex nebrascensis*	20	Yes	OBL
2. *Potentilla gracilis*	10	No	FAC
3. *Carex aquatilis*	50	Yes	OBL
4. *Geranium richardsonii*	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
Woody Vine Stratum (Plot size: 5 ft)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	100	x 1 =	100
FACW species	30	x 2 =	60
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		220 (B)

Prevalence Index = B/A = 1.47

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					Loamy/Clayey	Saturated to surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (saturated soils)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 2		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up2

Investigator(s): J. McBride, B. Meyer | Section, Township, Range: S14 T2S R75W

Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): None | Slope (%): 10

Subregion (LRR/MLRA): LRR E | Lat: 39.881643°N | Long: 105.754810°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75% slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point associated with Wetland-2; disturbance to natural vegetation due to adjacent parking lot

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Salix lasiandra*	30	Yes	FACW
2.			
3.			
4.			
5.			
	30 =Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Bromus inermis*	30	Yes	UPL
2. *Dactylis glomerata*	30	Yes	FACU
3. *Juncus balticus*	10	No	FACW
4. *Geranium richardsonii*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75 =Total Cover		
Woody Vine Stratum (Plot size: 5 ft)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 25

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	5	x 3 =	15
FACU species	30	x 4 =	120
UPL species	30	x 5 =	150
Column Totals:	105 (A)		365 (B)

Prevalence Index = B/A = 3.48

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

SOIL

Sampling Point: Up2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/2	100					Loamy/Clayey	Dry
2-6	10YR 3/2	100					Loamy/Clayey	Dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 6

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W3

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S15 T2S R75W

Landform (hillside, terrace, etc.): Bank slope | Local relief (concave, convex, none): Concave | Slope (%): 5

Subregion (LRR/MLRA): LRR E | Lat: 39.8807543°N | Long: 105.7595188°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps 5 to 75 percent slopes | NWI classification: R5UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland data point associated with Wetland-3, PEM/PSS wetland adjacent to the Fraser River.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Salix lasiandra*	20	Yes	FACW
2. *Alnus incana*	20	Yes	FACW
3.			
4.			
5.			
	40 =Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Carex aquatilis*	30	Yes	OBL
2. *Chamaenerion angustifolium*	10	No	FACU
3. *Senecio triangularis*	30	Yes	FACW
4. *Equisetum pratense*	30	Yes	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	140 (A)		270 (B)

Prevalence Index = B/A = 1.93

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100					Peat	Saturated
2-12	10YR 3/2	100					Loamy/Clayey	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (saturation, high water table)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 4		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up3

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S15 T2S R75W

Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): None | Slope (%): 5

Subregion (LRR/MLRA): LRR E | Lat: 39.8807332°N | Long: 105.7595443°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps 5 to 75 percent slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point associated with Wetland-3

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea engelmannii*	10	Yes	FAC
2. *Abies lasiocarpa*	12	Yes	FACU
3.			
4.			
	22	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Picea engelmannii*	5	Yes	FAC
2. *Abies lasiocarpa*	10	Yes	FACU
3.			
4.			
5.			
	15	=Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Heracleum maximum*	10	No	FAC
2. *Equisetum pratense*	85	Yes	FACW
3. *Chamaenerion angustifolium*	5	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	85	x 2 =	170
FAC species	25	x 3 =	75
FACU species	27	x 4 =	108
UPL species	0	x 5 =	0
Column Totals:	137 (A)		353 (B)
Prevalence Index = B/A =			2.58

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: Up3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/2	100					Loamy/Clayey	Dry to moist, some surficial organics

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W4

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S15 T2S R75W

Landform (hillside, terrace, etc.): Slope | Local relief (concave, convex, none): Concave | Slope (%): 10

Subregion (LRR/MLRA): LRR E | Lat: 39.8811073°N | Long: 105.7602752°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps 5 to 75 percent slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland data point associated with Wetland-4, PEM wetland adjacent to the Fraser River.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Carex aquatilis*	20	Yes	OBL
2. *Chamaenerion angustifolium*	10	No	FACU
3. *Senecio triangularis*	20	Yes	FACW
4. *Equisetum pratense*	30	Yes	FACW
5. *Mertensia ciliata*	15	No	FACW
6. *Streptopus amplexifolius*	5	No	FAC
7.			
8.			
9.			
10.			
11.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	65	x 2 =	130
FAC species	5	x 3 =	15
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		205 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/2	100					Peat	Saturated
1-16	10YR 3/2	100					Loamy/Clayey	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (saturation)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up4

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S15 T2S R75W

Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): None | Slope (%): 15

Subregion (LRR/MLRA): LRR E | Lat: 39.8811073°N | Long: 105.7603356°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps 5 to 75 percent slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes ____ No X

Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:
Upland data point associated with Wetland-4

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea engelmannii*	15	Yes	FAC
2. *Abies lasiocarpa*	15	Yes	FACU
3.			
4.			
	30	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Picea engelmannii*	2	No	FAC
2. *Abies lasiocarpa*	2	No	FACU
3.			
4.			
5.			
	4	=Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Heracleum maximum*	20	Yes	FAC
2. *Equisetum pratense*	20	Yes	FACW
3. *Chamaenerion angustifolium*	5	No	FACU
4. *Potentilla gracilis*	10	No	FAC
5. *Phleum pratense*	10	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	65	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 35

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	57	x 3 =	171
FACU species	22	x 4 =	88
UPL species	0	x 5 =	0
Column Totals:	99 (A)		299 (B)
Prevalence Index = B/A =			3.02

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ 5 - Wetland Non-Vascular Plants[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: Up4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/2	100					Loamy/Clayey	Dry to moist, some surficial organics

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W5

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S15 T2S R75W

Landform (hillside, terrace, etc.): Valley floor, depression | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRR/MLRA): LRR E | Lat: 39.882136°N | Long: 105.761695°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps 5 to 75 percent slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Wetland data point associated with Wetland-5, PEM/PSS wetland adjacent to the Fraser River.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea engelmannii*	10	Yes	FAC
2. *Abies lasiocarpa*	10	Yes	FACU
3.			
4.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Salix lasiandra*	10	Yes	FACW
2.			
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Heracleum maximum*	5	No	FAC
2. *Carex aquatilis*	40	Yes	OBL
3. *Senecio triangularis*	20	No	FACW
4. *Geranium richardsonii*	5	No	FAC
5. *Streptopus amplexifolius*	25	Yes	FAC
6. *Equisetum pratense*	5	No	FACW
7. *Platanthera dilatata*	2	No	FAC
8. *Juncus balticus*	5	No	FACW
9. *Micranthes odontoloma*	10	No	FACW
10.			
11.			
	117	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	50	x 2 =	100
FAC species	47	x 3 =	141
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	147 (A)		321 (B)

Prevalence Index = B/A = 2.18

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ 5 - Wetland Non-Vascular Plants[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					Peat	Saturated
2-12	10YR 2/1	100					Loamy/Clayey	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (saturation, high water table)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 8		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up5

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S15 T2S R75W

Landform (hillside, terrace, etc.): Terrace | Local relief (concave, convex, none): None | Slope (%): 2

Subregion (LRR/MLRA): LRR E | Lat: 39.882165°N | Long: 105.761618°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps 5 to 75 percent slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point associated with Wetland-5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea engelmannii*	90	Yes	FAC
2.			
3.			
4.			
	90	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Salix lasiandra*	2	No	FACW
2.			
3.			
4.			
5.			
	2	=Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Heracleum maximum*	5	No	FAC
2. *Vaccinium scoparium*	40	Yes	FACU
3. *Cornus canadensis*	10	No	FAC
4. *Streptopus amplexifolius*	5	No	FAC
5. *Equisetum pratense*	15	No	FACW
6. *Mertensia ciliata*	2	No	FACW
7. *Bistorta bistortoides*	2	No	FACW
8.			
9.			
10.			
11.			
	79	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	21	x 2 =	42
FAC species	110	x 3 =	330
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	171 (A)		532 (B)
Prevalence Index = B/A =			3.11

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

SOIL

Sampling Point: Up5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100					Peat	Dry, organic material
2-8	10YR 2/2	100					Loamy/Clayey	Dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Tree roots

Depth (inches): 8

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W6

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S15 T2S R75W

Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRR/MLRA): LRR E | Lat: 39.8805212°N | Long: 105.7614272°W | Datum: WGS84

Soil Map Unit Name: Leighcan family, till substratum-Cryaquolls complex 5-40 percent slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Wetland data point associated with Wetland-6, isolated PEM wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Carex aquatilis*	10	No	OBL
2. *Chamaenerion angustifolium*	5	No	FACU
3. *Senecio triangularis*	15	No	FACW
4. *Equisetum pratense*	25	Yes	FACW
5. *Mertensia ciliata*	10	No	FACW
6. *Phleum pratense*	20	Yes	FAC
7.			
8.			
9.			
10.			
11.			
	85	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	50	x 2 =	100
FAC species	20	x 3 =	60
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	85 (A)		190 (B)

Prevalence Index = B/A = 2.24

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ 5 - Wetland Non-Vascular Plants[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100					Loamy/Clayey	Saturated, with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (saturation, surface water)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 1		
Water Table Present?	Yes X	No ___	Depth (inches): 0		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up6

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S15 T2S R75W

Landform (hillside, terrace, etc.): Terrace | Local relief (concave, convex, none): None | Slope (%): 0

Subregion (LRR/MLRA): LRR E | Lat: 39.8804954°N | Long: 105.7614276°W | Datum: WGS84

Soil Map Unit Name: Leighcan family, till substratum-Cryaquolls complex 5 to 40% slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point associated with Wetland-6

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea engelmannii*	5	Yes	FAC
2. *Abies lasiocarpa*	5	Yes	FACU
3.			
4.			
	10	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Phleum pratense*	20	Yes	FAC
2. *Equisetum pratense*	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 70

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	25	x 3 =	75
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	40 (A)		115 (B)

Prevalence Index = B/A = 2.88

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: Up6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					Loamy/Clayey	Dry, gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W7

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S10 T2S R75W

Landform (hillside, terrace, etc.): Bank Slope | Local relief (concave, convex, none): None | Slope (%): 5

Subregion (LRR/MLRA): LRR E | Lat: 39.8903413°N | Long: 105.7612606°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75 % slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland data point associated with Wetland-7, PEM wetland located adjacent to Buck Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Salix lasiandra*	10	Yes	FACW
2.			
3.			
4.			
5.			
	10 =Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Senecio triangularis*	20	Yes	FACW
2. *Carex aquatilis*	50	Yes	OBL
3. *Equisetum pratense*	20	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 =Total Cover		
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	50	x 2 =	100
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		150 (B)

Prevalence Index = B/A = 1.50

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/2	100					Peat	Saturated
1-15	10YR 3/2	100					Loamy/Clayey	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (e.g. saturation)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up7

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S10 T2S R75W

Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): None | Slope (%): 10

Subregion (LRR/MLRA): LRR E | Lat: 39.8903145°N | Long: 105.7612231°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75 % slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point associated with Wetland-7, PEM wetland located adjacent to Buck Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Abies lasiocarpa*	10	Yes	FACU
2. *Pinus contorta*	10	Yes	FAC
3. *Picea engelmannii*	5	Yes	FAC
4.			
	25	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Abies lasiocarpa*	5	Yes	FACU
2. *Pinus contorta*	5	Yes	FAC
3. *Picea engelmannii*	2	No	FAC
4.			
5.			
	12	=Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Heracleum maximum*	10	No	FAC
2. *Phleum pratense*	25	Yes	FAC
3. *Equisetum pratense*	15	Yes	FACW
4. *Chamaenerion angustifolium*	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	55	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	57	x 3 =	171
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	92 (A)		281 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: Up7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	100					Loamy/Clayey	Dry, gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W8

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S10 T2S R75W

Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRR/MLRA): LRR E | Lat: 39.889795°N | Long: 105.761541°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75 % slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland data point associated with Wetland-8, depressional PEM wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Typha latifolia*	40	Yes	OBL
2. *Carex aquatilis*	40	Yes	OBL
3. *Eleocharis palustris*	15	No	OBL
4. *Phleum pratense*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	95	x 1 =	95
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		110 (B)
Prevalence Index = B/A =			1.10

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100					Peat	Saturated
2-12	10YR 3/2	100					Loamy/Clayey	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (e.g. saturation, surface water)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 1		
Water Table Present?	Yes X	No ___	Depth (inches): 0		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up8

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S10 T2S R75W

Landform (hillside, terrace, etc.): Upland berm | Local relief (concave, convex, none): Convex | Slope (%): 5

Subregion (LRR/MLRA): LRR E | Lat: 39.889809°N | Long: 105.761591°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75 % slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point associated with Wetland-8, located on apparent manmade berm

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea engelmannii*	10	Yes	FAC
2.			
3.			
4.			
	10	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Abies lasiocarpa*	5	Yes	FACU
2. *Pinus contorta*	5	Yes	FAC
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Dactylis glomerata*	40	Yes	FACU
2. *Phleum pratense*	30	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	90 (A)		315 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: Up8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					Loamy/Clayey	Dry, gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: W9

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S10 T2S R75W

Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRR/MLRA): LRR E | Lat: 39.8901136°N | Long: 105.7621856°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75 % slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland data point associated with Wetland-9, depressional PEM wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Alnus incana*	10	Yes	FACW
2. *Picea engelmannii*	2	No	FAC
3.			
4.			
5.			
	12 =Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Senecio triangularis*	30	Yes	FACW
2. *Carex aquatilis*	40	Yes	OBL
3. *Geranium richardsonii*	20	Yes	FAC
4. *Equisetum arvense*	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	40	x 2 =	80
FAC species	32	x 3 =	96
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	112 (A)		216 (B)

Prevalence Index = B/A = 1.93

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: W9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100					Peat	Saturated
2-14	10YR 3/2	100					Loamy/Clayey	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydric soils assumed based on indicators of sustained hydrology (e.g. saturation, high water table)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 4		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers

WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region

See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Alterra Mountain Company Base Area | City/County: Winter Park/Grand | Sampling Date: 7/12/2024

Applicant/Owner: Alterra Mountain Company | State: CO | Sampling Point: Up9

Investigator(s): J. McBride/B. Meyer | Section, Township, Range: S10 T2S R75W

Landform (hillside, terrace, etc.): Upland terrace | Local relief (concave, convex, none): None | Slope (%): 2

Subregion (LRR/MLRA): LRR E | Lat: 39.8901147°N | Long: 105.7622359°W | Datum: WGS84

Soil Map Unit Name: Dams and mine dumps, 5 to 75 % slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point associated with Wetland-9

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea engelmannii*	20	Yes	FAC
2.			
3.			
4.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Picea engelmannii*	10	Yes	FAC
2. *Alnus incana*	5	Yes	FACW
3.			
4.			
5.			
	15	=Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Dactylis glomerata*	40	Yes	FACU
2. *Phleum pratense*	30	Yes	FAC
3. *Senecio triangularis*	10	No	FACW
4. *Equisetum pratense*	10	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
Woody Vine Stratum (Plot size: 5 feet)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	60	x 3 =	180
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	125 (A)		390 (B)

Prevalence Index = B/A = 3.12

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: Up9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					Loamy/Clayey	Dry, gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ 1 cm Muck (A9) **(LRR D, G)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR A, E)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix C

Plant List

Appendix C - Plant List
Alterra Mountain Company Base Area
Aquatic Resource Delineation and Assessment
Winter Park, Grand County, Colorado

Scientific Name	Common Name	Wetland Indicator Status
Trees		
Abies lasiocarpa	subalpine fir	FACU
Picea engelmannii	Engelmann spruce	FAC
Pseudotsuga menziesii	Douglas-fir	FACU
Shrubs, Saplings, and Woody Vines		
Abies lasiocarpa	subalpine fir	FACU
Alnus incana	speckled alder	FACW
Cornus canadensis	bunchberry dogwood	FAC
Picea engelmannii	Engelmann spruce	FAC
Pinus contorta	lodgepole pine	FAC
Salix geyeriana	Geyer's willow	FACW
Salix lasiandra	Pacific willow	FACW
Salix wolfii	Idaho willow	OBL
Herbaceous		
Bistorta bistortoides	American bistort	FACW
Bromus inermis	smooth brome	UPL
Carex aquatilis	water sedge	OBL
Carex nebrascensis	Nebraska sedge	OBL
Chamaenerion angustifolium	fireweed	FACU
Dactylis glomerata	orchard grass	FACU
Eleocharis palustris	common spikerush	OBL
Equisetum pratense	meadow horsetail	FACW
Geranium richardsonii	Richardson's geranium	FAC
Heracleum maximum	American cow parsnip	FAC
Juncus balticus	Baltic rush	FACW
Mertensia ciliata	tall fringed bluebells	FACW
Phleum pratense	common timothy grass	FAC
Platanthera dilatata	white bog orchid	FAC
Potentilla gracilis	slender cinquefoil	FAC
Saxifraga odontoloma	brook saxifrage	FACW
Senecio triangularis	arrowleaf ragwort	FACW
Streptopus amplexifolius	claspleaf twistedstalk	FAC
Typha latifolia	broadleaf cattail	OBL
Vaccinium scoparium	grouse whortleberry	FACU

Notes:
Wetland Indicator Status
FAC = Facultative
FACU = Facultative Upland
FACW = Facultative Wetland
OBL = Obligate
UPL = Upland

Source: USACE. 2023. National Wetland Plant List - Western Mountains, Valleys, and Coast Region. [Web page]. Located at: https://nwpl.sec.usace.army.mil/static/reports/NWPL%20Cover%20Page%20WMVC_v3.pdf. Accessed: November 7, 2024.

Appendix D

OHWM Data Sheets

OHWM Delineation Cover Sheet

Project: Alterra Mountain Company Base Area ARDR **Date:** 7/12/2024

Location: Buck Creek (39.890259, -105.762040) **Investigator(s):** B. Meyer, J. McBride

Project Description:

Aquatic resource delineation to support proposed improvements for Alterra Mountain Company

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Perennial stream with a well-defined bed, bank, and channel.

Off-site Information

Remotely sensed image(s) acquired? ☒ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

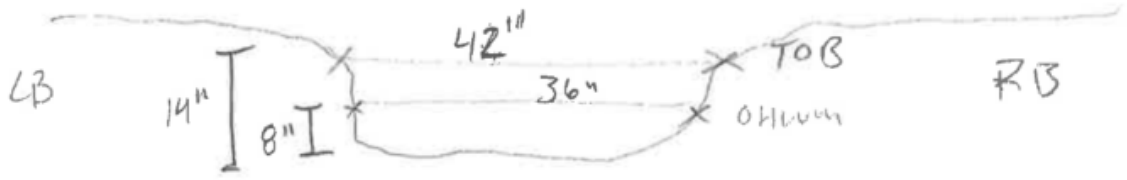
Hydrologic/hydraulic information acquired? ☒ **Yes** ☐ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

National Wetland Inventory - Cowardin Classification R5UBH
National Hydrography Dataset - perennial stream designated as Buck Creek
USACE Antecedent Precipitation Tool - "Normal" climate conditions during dry season

List and describe any other supporting information received/acquired:

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☐ Sharp (> 60°) | ☒ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	0	60	20	10	10	
Below OHWM	0	0	10	50	40	

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	100	0	95	5
Below OHWM	100	0	10	90

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

OHWM evidenced by break in slope, change in substrate, substrate sorting, and incision.

OHWM Delineation Cover Sheet

Project: Alterra Mountain Company Base Area ARDR **Date:** 7/12/2024

Location: Fraser River (39.882261, -105.760841) **Investigator(s):** B. Meyer, J. McBride

Project Description:

Aquatic resource delineation to support proposed improvements for Alterra Mountain Company

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Perennial river with a well-defined bed, bank, and channel.

Off-site Information

Remotely sensed image(s) acquired? ☒ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

Hydrologic/hydraulic information acquired? ☒ **Yes** ☐ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

National Wetland Inventory - Cowardin Classification R2UBH
National Hydrography Dataset - perennial stream designated as Fraser River
USACE Antecedent Precipitation Tool - "Normal" climate conditions during dry season

List and describe any other supporting information received/acquired:

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)

Break in Slope at OHWM: ☐ Sharp (> 60°) | ☐ Moderate (30–60°) | ☒ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	0	70	20	5	5	
Below OHWM	0	5	5	5	85	

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	90	10	75	10
Below OHWM	10	5	5	80

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

OHWM evidenced by break in slope, change in substrate, substrate sorting, scour line, and drift deposits.

OHWM Delineation Cover Sheet

Project: Alterra Mountain Company Base Area ARDR **Date:** 7/12/2024

Location: Jim Creek (39.8813177, -105.7542899) **Investigator(s):** B. Meyer, J. McBride

Project Description:

Aquatic resource delineation to support proposed improvements for Alterra Mountain Company

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Perennial stream with a defined bed, bank, and channel. An existing boardwalk supported by piles spans the stream.

Off-site Information

Remotely sensed image(s) acquired? ☒ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

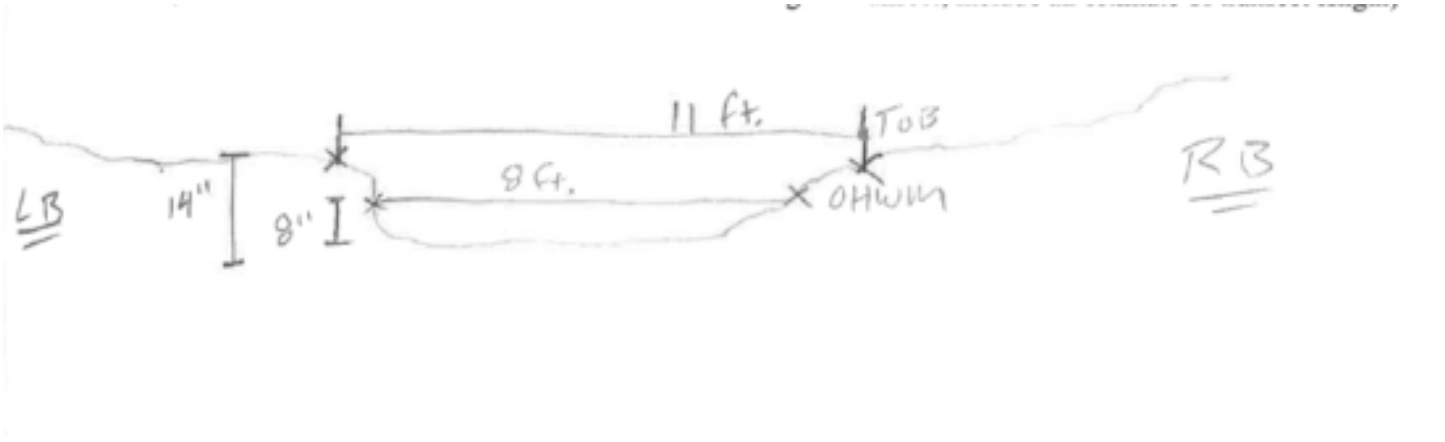
Hydrologic/hydraulic information acquired? ☒ **Yes** ☐ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

National Wetland Inventory - Cowardin Classification R5UBH
National Hydrography Dataset - Perennial stream designated as Jim Creek
USACE Antecedent Precipitation Tool - "Normal" climate conditions during dry season

List and describe any other supporting information received/acquired:

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☐ Sharp (> 60°) | ☒ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	0	90	10	0	0	
Below OHWM	0	5	15	40	40	

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	75	50	70	10
Below OHWM	70	40	10	10

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

OHWM evidenced by break in slope, change in substrate, undercut bank, and change in vegetation cover.

OHWM Delineation Cover Sheet

Project: Alterra Mountain Company Base Area ARDR **Date:** 7/12/2024

Location: Stream-1 (39.881317, -105.754289) **Investigator(s):** B. Meyer, J. McBride

Project Description:

Aquatic resource delineation to support proposed improvements for Alterra Mountain Company

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Intermittent tributary to Jim Creek with a defined bed, bank, and channel.

Off-site Information

Remotely sensed image(s) acquired? ☒ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

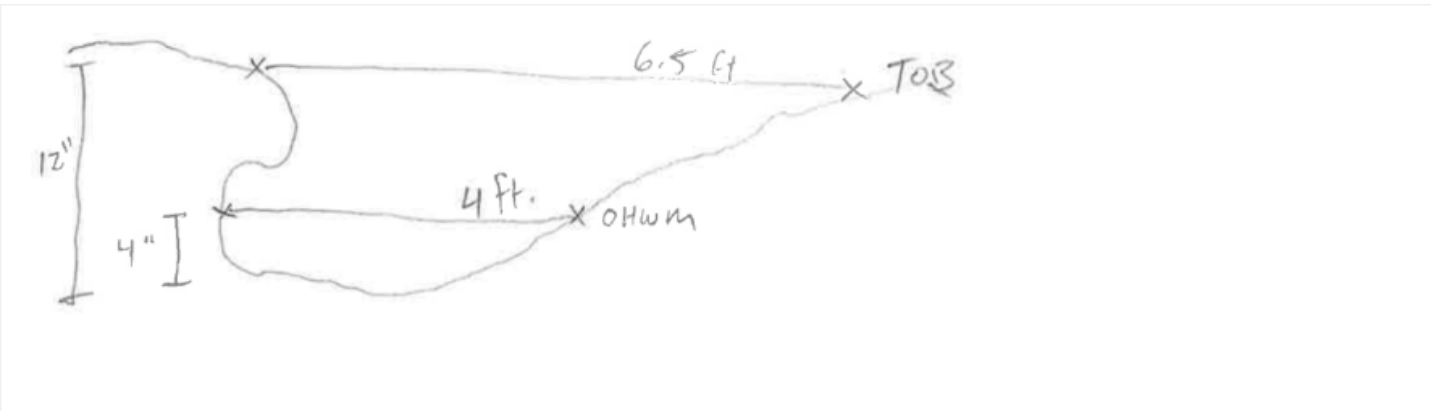
Hydrologic/hydraulic information acquired? ☒ **Yes** ☐ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

National Wetland Inventory - Not listed
National Hydrography Dataset - Not listed
USACE Antecedent Precipitation Tool - "Normal" climate conditions during dry season

List and describe any other supporting information received/acquired:

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☒ Sharp (> 60°) | ☐ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	0	80	10	10	0	
Below OHWM	0	5	20	45	30	

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	10	5	90	10
Below OHWM	0	5	70	30

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

OHWM evidenced by break in slope, change in substrate, substrate sorting, undercut bank, and drift lines.

OHWM Delineation Cover Sheet

Project: Alterra Mountain Company Base Area ARDR **Date:** 7/12/2024

Location: Stream-2 (39.881660, -105.754063) **Investigator(s):** B. Meyer, J. McBride

Project Description:

Aquatic resource delineation to support proposed improvements for Alterra Mountain Company

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Intermittent stream with a defined bed, bank, and channel.

Off-site Information

Remotely sensed image(s) acquired? ☒ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

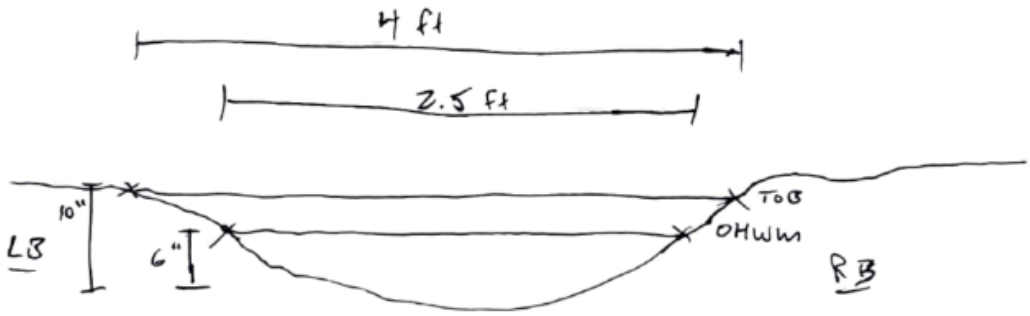
Hydrologic/hydraulic information acquired? ☒ **Yes** ☐ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

National Wetland Inventory - Not classified
National Hydrography Dataset - Not classified
USACE Antecedent Precipitation Tool - "Normal" climate conditions during dry season

List and describe any other supporting information received/acquired:

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☐ Sharp (> 60°) | ☐ Moderate (30–60°) | ☒ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	0	30	50	15	5	
Below OHWM	0	10	10	30	50	

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	40	10	60	40
Below OHWM	40	0	10	90

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

OHWM evidenced by break in slope, change in substrate, and substrate sorting.

OHWM Delineation Cover Sheet

Project: Alterra Mountain Company Base Area ARDR **Date:** 7/12/2024

Location: Stream-3 (39.881519, -105.761960) **Investigator(s):** B. Meyer, J. McBride

Project Description:

Aquatic resource delineation to support proposed improvements for Alterra Mountain Company

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Intermittent stream with a defined bed, bank, and channel.

Off-site Information

Remotely sensed image(s) acquired? ☒ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

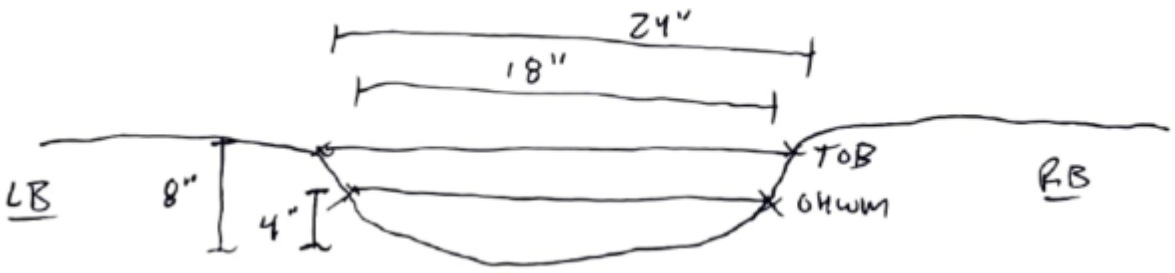
Hydrologic/hydraulic information acquired? ☒ **Yes** ☐ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

National Wetland Inventory - Not classified
National Hydrography Dataset - Not classified
USACE Antecedent Precipitation Tool - "Normal" climate conditions during dry season

List and describe any other supporting information received/acquired:

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☐ Sharp (> 60°) | ☒ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	70	20	10	0	0	
Below OHWM	20	60	20	0	0	

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	80	0	20	80
Below OHWM	80	0	5	95

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

OHWM evidenced by break in slope, change in substrate, and substrate sorting.

OHWM Delineation Cover Sheet

Project: Alterra Mountain Company Base Area ARDR **Date:** 7/12/2024

Location: Stream-4 (39.882506, -105.761607) **Investigator(s):** B. Meyer, J. McBride

Project Description:

Aquatic resource delineation to support proposed improvements for Alterra Mountain Company

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Intermittent stream with a defined bed, bank, and channel.

Off-site Information

Remotely sensed image(s) acquired? ☒ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

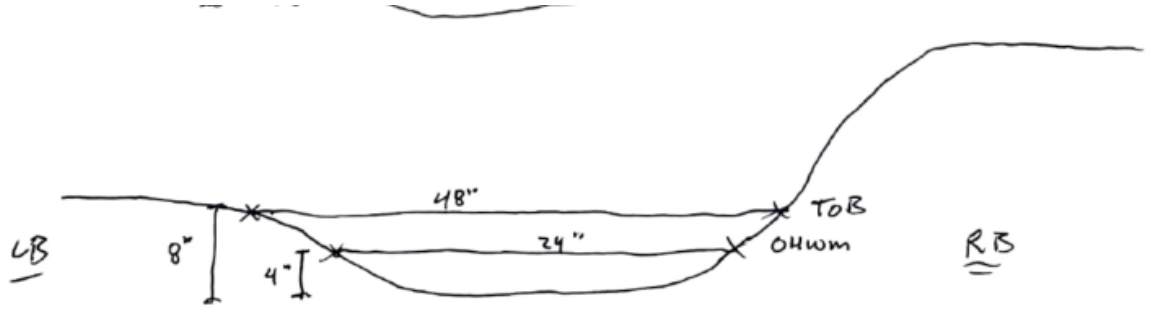
Hydrologic/hydraulic information acquired? ☒ **Yes** ☐ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

National Wetland Inventory - Not classified
National Hydrography Dataset - Not classified
USACE Antecedent Precipitation Tool - "Normal" climate conditions during dry season

List and describe any other supporting information received/acquired:

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☐ Sharp (> 60°) | ☒ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	5	40	25	30	0	
Below OHWM	0	30	30	40	0	

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	5	10	60	40
Below OHWM	0	5	20	80

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

OHWM evidenced by break in slope, change in substrate, and substrate sorting.

OHWM Delineation Cover Sheet

Project: Alterra Mountain Company Base Area ARDR **Date:** 7/12/2024

Location: Stream-5 (39.890341, -105.761259) **Investigator(s):** B. Meyer, J. McBride

Project Description:

Aquatic resource delineation to support proposed improvements for Alterra Mountain Company

Describe the river or stream's condition (disturbances, in-stream structures, etc.):

Intermittent tributary to Buck Creek with a defined bed, bank, and channel. The stream feature originates from a groundwater seep/spring.

Off-site Information

Remotely sensed image(s) acquired? ☒ **Yes** ☐ **No** [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

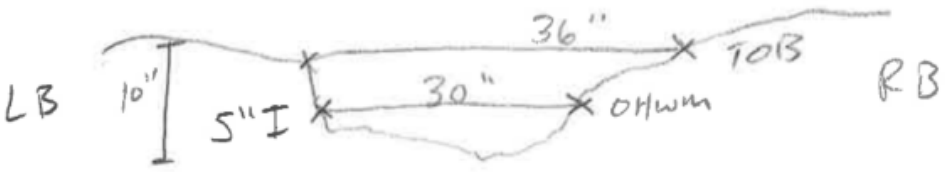
Hydrologic/hydraulic information acquired? ☒ **Yes** ☐ **No** [If yes, attach information to datasheet(s) and describe below.] Description:

National Wetland Inventory - Not classified
National Hydrography Dataset - Not Classified
USACE Antecedent Precipitation Tool - "Normal" climate conditions during dry season

List and describe any other supporting information received/acquired:

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

Transect (cross-section) drawing: (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



Break in Slope at OHWM: ☐ Sharp (> 60°) | ☒ Moderate (30–60°) | ☐ Gentle (< 30°) | ☐ None

Notes/Description:

Sediment Texture: Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	0	20	30	30	20	
Below OHWM	0	0	20	40	40	

Notes/Description:

Vegetation: Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	100	0	25	75
Below OHWM	100	0	10	90

Notes/Description:

Other Evidence: List/describe any additional field evidence and/or lines of reasoning used to support your delineation

OHWM evidenced by break in slope, change in substrate, change in vegetation, and scour lines.

Appendix E

FACWet Score Cards

FACWet Score Card

Alterra Mountain Company Base Area Project - Parcel A1

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	**Variable 1:**	**Habitat Connectivity (Connect)**	0.80
	Variable 2:	**Contributing Area (CA)**	0.70
Hydrology	**Variable 3:**	**Water Source (Source)**	0.95
	Variable 4:	**Water Distribution (Dist)**	0.90
	Variable 5:	**Water Outflow (Outflow)**	0.8
Abiotic and Biotic Habitat	**Variable 6:**	**Geomorphology (Geom)**	0.9
	Variable 7:	**Chemical Environment (Chem)**	0.9
	Variable 8:	**Vegetation Structure and Complexity (Veg)**	0.85

Functional Capacity Indices

Function 1 -- Support of Characteristic Wildlife Habitat

$V1_{connect}$	+ $V2_{CA}$	+ (2 x $V8_{veg}$)				=	Total Functional Points	÷ 4	= FCI
0.80	+ 0.70	+ 1.70	+	+	+	=	3.20	÷ 4	= 0.80

Function 2 -- Support of Characteristic Fish/aquatic Habitat

(3 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$					
2.85	+ 1.80	+ 1.6	+ 0.9	+ 0.90	+	=	8.05	÷ 9	= 0.89

Function 3 -- Flood Attenuation

$V2_{CA}$	+ (2 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V8_{veg}$			
0.70	+ 1.90	+ 1.80	+ 1.60	+ 0.90	+ 0.85	=	7.75	÷ 9	= 0.86

Function 4 -- Short- and Long-term Water Storage

$V3_{source}$	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	$V6_{geom}$					
0.95	+ 1.80	+ 1.60	+ 0.90	+	+	=	5.25	÷ 6	= 0.88

Function 5 -- Nutrient/Toxicant Removal

(2 x $V2_{CA}$)	+ (2 x $V4_{dist}$)	+ $V6_{geom}$	$V7_{chem}$					
1.40	+ 1.80	+ 0.90	+ 0.90	+	+	=	5.00	÷ 6	= 0.83

Function 6 -- Sediment Retention/Shoreline Stabilization

$V2_{CA}$	+ (2 x $V6_{geom}$)	+ (2 x $V8_{veg}$)						
0.70	+ 1.80	+ 1.70	+	+	+	=	4.20	÷ 5	= 0.84

Function 7 -- Production Export/Food Chain Support

$V1_{connect}$	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$	+ (2 x $V8_{veg}$)					
0.80	+ 1.6	+ 0.9	+ 0.9	+ 1.70	+	=	5.90	÷ 7	= 0.84

Sum of Individual FCI Scores 5.94

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score 0.85

FACWet Score Card

Alterra Mountain Group Base Area Project - Parcel A8

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	**Variable 1:**	**Habitat Connectivity (Connect)**	0.70
	Variable 2:	**Contributing Area (CA)**	0.63
Hydrology	**Variable 3:**	**Water Source (Source)**	0.75
	Variable 4:	**Water Distribution (Dist)**	0.85
	Variable 5:	**Water Outflow (Outflow)**	0.85
Abiotic and Biotic Habitat	**Variable 6:**	**Geomorphology (Geom)**	0.85
	Variable 7:	**Chemical Environment (Chem)**	0.80
	Variable 8:	**Vegetation Structure and Complexity (Veg)**	0.80

Functional Capacity Indices

Function 1 -- Support of Characteristic Wildlife Habitat

$V1_{connect}$	+ $V2_{CA}$	+ (2 x $V8_{veg}$)					Total Functional Points		FCI
0.70	+ 0.63	+ 1.60	+	+	+	=	2.93	÷ **4** =	0.73

Function 2 -- Support of Characteristic Fish/aquatic Habitat

(3 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$				
2.25	+ 1.70	+ 1.70	+ 0.85	+ 0.80	+	=	7.30	÷ **9** = 0.81

Function 3 -- Flood Attenuation

$V2_{CA}$	+ (2 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V8_{veg}$			
0.63	+ 1.50	+ 1.70	+ 1.70	+ 0.85	+ 0.80	=	7.18	÷ **9** = 0.80

Function 4 -- Short- and Long-term Water Storage

$V3_{source}$	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	$V6_{geom}$					
0.75	+ 1.7	+ 1.7	+ 0.85	+	+	=	5.00	÷ **6** = 0.83

Function 5 -- Nutrient/Toxicant Removal

(2 x $V2_{CA}$)	+ (2 x $V4_{dist}$)	+ $V6_{geom}$	$V7_{chem}$					
1.26	+ 1.70	+ 0.85	+ 0.80	+	+	=	4.61	÷ **6** = 0.77

Function 6 -- Sediment Retention/Shoreline Stabilization

$V2_{CA}$	+ (2 x $V6_{geom}$)	+ (2 x $V8_{veg}$)						
0.63	+ 1.70	+ 1.60	+	+	+	=	3.93	÷ **5** = 0.79

Function 7 -- Production Export/Food Chain Support

$V1_{connect}$	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$	+ (2 x $V8_{veg}$)				
0.70	+ 1.70	+ 0.85	+ 0.80	+ 1.60	+	=	5.65	÷ **7** = 0.81

Sum of Individual FCI Scores 5.54

Divide by the Number of Functions Scored **÷ 7**

Composite FCI Score 0.79

FACWet Score Card

Alterra Mountain Company Base Area - Parcel A16

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	**Variable 1:**	**Habitat Connectivity (Connect)**	0.55
	Variable 2:	**Contributing Area (CA)**	0.45
Hydrology	**Variable 3:**	**Water Source (Source)**	0.70
	Variable 4:	**Water Distribution (Dist)**	0.70
	Variable 5:	**Water Outflow (Outflow)**	0.70
Abiotic and Biotic Habitat	**Variable 6:**	**Geomorphology (Geom)**	0.65
	Variable 7:	**Chemical Environment (Chem)**	0.80
	Variable 8:	**Vegetation Structure and Complexity (Veg)**	0.80

Functional Capacity Indices

Function 1 -- Support of Characteristic Wildlife Habitat

$V1_{connect}$	+ $V2_{CA}$	+ (2 x $V8_{veg}$)				=	Total Functional Points	÷ 4	= FCI
0.55	+ 0.45	+ 1.60	+	+	+	=	2.6	÷ 4	= 0.65

Function 2 -- Support of Characteristic Fish/aquatic Habitat

(3 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$					
2.10	+ 1.40	+ 1.40	+ 0.65	+ 0.80	+	=	6.35	÷ 9	= 0.71

Function 3 -- Flood Attenuation

$V2_{CA}$	+ (2 x $V3_{source}$)	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V8_{veg}$			
0.45	+ 1.40	+ 1.40	+ 1.40	+ 1.30	+ 0.80	=	6.75	÷ 9	= 0.75

Function 4 -- Short- and Long-term Water Storage

$V3_{source}$	+ (2 x $V4_{dist}$)	+ (2 x $V5_{outflow}$)	$V6_{geom}$					
0.70	+ 1.40	+ 1.40	+ 0.65	+	+	=	4.15	÷ 6	= 0.69

Function 5 -- Nutrient/Toxicant Removal

(2 x $V2_{CA}$)	+ (2 x $V4_{dist}$)	+ $V6_{geom}$	$V7_{chem}$					
0.90	+ 1.40	+ 0.65	+ 0.80	+	+	=	3.75	÷ 6	= 0.63

Function 6 -- Sediment Retention/Shoreline Stabilization

$V2_{CA}$	+ (2 x $V6_{geom}$)	+ (2 x $V8_{veg}$)						
0.45	+ 1.3	+ 1.6	+	+	+	=	3.35	÷ 5	= 0.67

Function 7 -- Production Export/Food Chain Support

$V1_{connect}$	+ (2 x $V5_{outflow}$)	+ $V6_{geom}$	+ $V7_{chem}$	+ (2 x $V8_{veg}$)					
0.55	+ 1.4	+ 0.65	+ 0.80	+ 1.6	+	=	5.00	÷ 7	= 0.71

Sum of Individual FCI Scores 4.81

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score 0.69

Appendix F

Photograph Log

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 1

Description:
Jim Creek

Date: 7/12/2024

Photograph: 2

Description:
Stream-1, tributary to Jim Creek

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 3

Description:
Stream-2, tributary to Stream-1

Date: 7/12/2024

Photograph: 4

Description:
Fraser River

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 5

Description:
Stream-3

Date: 7/12/2024

Photograph: 6

Description:
Stream-4, tributary to Fraser River

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 7

Description:
Buck Creek

Date: 7/12/2024

Photograph: 8

Description:
Stream-5, tributary to Buck Creek

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 9

Description:
Wetland-1A

Date: 7/12/2024

Photograph: 10

Description:
Wetland-1B

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 11

Description:
Wetland-1C

Date: 7/12/2024

Photograph: 12

Description:
Wetland-2

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 13

Description:
Wetland-3

Date: 7/12/2024

Photograph: 14

Description:
Wetland-4

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 15

Description:
Wetland-5A

Date: 7/12/2024

Photograph: 16

Description:
Wetland-5B

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 17

Description:
Wetland-6

Date: 7/12/2024

Photograph: 18

Description:
Wetland-7

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 19

Description:
Wetland-8A

Date: 7/12/2024

Photograph: 20

Description:
Wetland-8B

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 21

Description:
Wetland-8C

Date: 7/12/2024

Photograph: 22

Description:
Wetland-8D

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 23

Description:
Wetland-8E

Date: 7/12/2024

Photograph: 24

Description:
Wetland-9A

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 25

Description:
Wetland-9B

Date: 7/12/2024

Photograph: 26

Description:
Wetland-9C

Date: 7/12/2024

Photograph Log

Alterra Mountain Company Base Area
July 2024 Aquatic Resource Delineation and Assessment

Photograph: 27

Description:
Wetland-9D

Date: 7/12/2024

Arcadis U.S., Inc.
630 Plaza Drive, Suite 200
Highlands Ranch, CO 80129
United States
Phone: 720 344 3500
Fax: 720 344 3535
www.arcadis.com

APPENDIX-F
MOBILITY STUDY

Winter Park Mobility Study DRAFT

Prepared for:
Alterra Mountain Company

February 2025

DN21-0694.01

FEHR PEERS

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Executive Summary

Project Description

The Winter Park Master Plan envisions a revamped base area for Winter Park Resort that redevelops existing properties and constructs new condominiums, vacation homes, workforce housing, hotels, shopping, and other base area amenities that establishes the resort as a year-round attraction. The concept aims to create a resort that is highly accessible to residents and visitors by train, bus, gondola, or bike, and that allows drivers to park once and easily walk to all destinations.

Study Results

The Winter Park Mobility Study evaluates the potential transportation impacts associated with the proposed Winter Park Master Plan.

The study assessed both existing and future traffic conditions. To be conservative, this analysis focuses on the season, time of day, development density, and skier capacity that could result in the most traffic congestion at the site. The analysis is focused on the winter season during the Saturday PM peak hour (3:45-4:45) because that was found to be the busiest travel time. It should be noted that during a typical winter ski day, it is anticipated that the intersections will operate acceptably.

Findings indicate that, without mitigation, increasing visitation and development will result in significant congestion and reduced mobility at key intersections, particularly during peak hours. With the proposed mitigations presented in this study, the intersections should function without significant delay. It should be noted that no Transportation Demand Management (TDM) strategies were included in the analysis. If implemented, they would result in further improved LOS at all intersections because the total number of trips would be less.

LOS Summary

The study projects traffic conditions for future years of the development (2029, 2031, 2033, 2037, and 2050) under both background and build scenarios. Full Build traffic volumes will cause several key intersections to operate below acceptable Level of Service (LOS) thresholds. Specifically, the intersections of US-40 & Old Town Drive, US-40 & Mountain Lodge Access, US-40 & Mary Jane Road, and Old Town Drive & Garage Access will experience congestion issues without mitigation measures. **Table 1** shows the existing and background LOS results and **Table 2** shows the Build LOS results.

Table 1: Existing and Background LOS Results

Int #	Intersection Name	Control Type[1]	Existing			2029			2031			2033			2037			2050		
			Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	6	A		7	A		6	A		6	A		6	A		7	A	
3	US-40 & Old Town Drive	Signal	24	C		25	C		25	C		26	C		27	C		33	C	
4	US-40 & Mountain Lodge Access	SSSC	32	D	WB	34	D	WB	36	E	WB	37	E	WB	39	E	WB	**54**	**F**	**WB**
5	US-40 & Winter Park Drive (south)	Signal	23	C		23	C		23	D		23	C		23	C		49	D	
6	US-40 & Mary Jane Road	SSSC	**270**	**F**	**EB**	**303**	**F**	**EB**	**317**	**F**	**EB**	**333**	**F**	**EB**	**368**	**F**	**EB**	**493**	**F**	**EB**

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

Source: HCM 2016, Fehr & Peers

Table 2: Build LOS Results

Int #	Intersection Name	Control Type[1]	Phase 1 2029			Phase 2 2031			Phase 3 2033			Full Build 2037			Full Build 2050		
			Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	9	A	-	14	B	-	20	C	-	34	C	-	45	D	-
3	US-40 & Old Town Drive	Roundabout	**131**	**F**	**-**	**177**	**F**	**-**	**211**	**F**	**-**	**193**	**F**	**-**	**205**	**F**	**-**
4	US-40 & Mountain Lodge Access	SSSC	36	E	WB	46	E	WB	**58**	**F**	**WB**	49	E	WB	**69**	**F**	**WB**
5	US-40 & Winter Park Drive (south)	Roundabout	8	A	-	13	B	-	16	B	-	27	D	-	28	D	-
6	US-40 & Mary Jane Road	SSSC	**2151**	**F**	**EB**	**3007**	**F**	**EB**	**3880**	**F**	**EB**	**5213**	**F**	**EB**	**6376**	**F**	**EB**
7	Old Town Drive & Garage Access	SSSC	**166**	**F**	**EB**	**256**	**F**	**EB**	**306**	**F**	**EB**	**234**	**F**	**EB**	**234**	**F**	**EB**
8	Winter Park Drive & Old Town Drive	AWSC	7	A	-	8	A	-	8	A	-	8	A	-	8	A	-
9	Winter Park Drive & Timberhouse Road	SSSC	0	A	EB	0	A	EB	0	A	EB	10	A	EB	10	A	EB
10	Winter Park Drive & Access	SSSC	9	A	EB	10	B	EB	10	B	EB	11	B	EB	11	B	EB
11	Winter Park Drive & Road 2	SSSC	9	A	EB	10	A	WB	10	A	EB	10	A	WB	10	A	WB
12	Winter Park Drive & Nystrom Lane	SSSC	9	A	EB	9	A	EB	9	A	EB	9	A	EB	9	A	EB
13	Winter Park Drive & Access	SSSC	0	A	-	9	A	NB	9	A	NB	9	A	NB	9	A	NB
14	Winter Park Drive & Road 4	SSSC	10	A	SB	11	B	SB	13	B	SB	47	E	SB	47	E	SB
15	Road 4 & Road 2	AWSC	7	A	-	7	A	-	8	A	-	8	A	-	8	A	-
16	Winter Park Drive & Timberhouse Road	SSSC	0	A	-	0	A	-	0	A	-	0	A	-	0	A	-
17	Winter Park Drive & Road 5	SSSC	0	A	-	0	A	-	0	A	-	10	A	NB	10	A	NB

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

Source: HCM 2016, Fehr & Peers

Proposed Mitigations

To address anticipated congestion, the study proposes both infrastructure and Transportation Demand Management (TDM) mitigations:

1. Infrastructure Improvements:
    a. Signalize US-40 & Mary Jane Road to improve traffic flow and reduce long queues.
    b. Restrict movements at US-40 & Mountain Lodge Access to allow only westbound right turns, minimizing conflicting movements.
    c. Construct internal roundabouts at parking garage access points (#7 and #14) to streamline vehicle circulation out of the parking garages and reduce delays.
2. TDM Measures:
    a. Implementation of a parking management system, including real-time space availability updates and incentive-based pricing to optimize parking utilization.
    b. Expansion of bicycle storage and parking facilities to encourage active transportation options for visitors and employees.
    c. Introduction of an electric bike-share program to facilitate last-mile connectivity between transit hubs and the resort base.
    d. Establishment of a Winter Park Transportation Coordinator and incentive program to encourage alternative travel modes, including transit use and carpooling.
    e. Extension of transit service coverage, hours, or frequency to better serve resort visitors and employees, particularly during peak demand periods.
    f. Development of pedestrian-friendly infrastructure, including enhanced crosswalks, lighting, and wayfinding to improve safety and accessibility.

It should be noted that no TDM measures were included in the analysis. If implemented, they would result in further improved LOS at all intersections because the total number of trips would be less.

The infrastructure improvements will reduce delay and mitigate the failing LOS at the intersections of US-40 & Mary Jane, US-40 & Mountain Lodge Access, and the garage entrances. It should be noted that the intersection of US-40 & Old Town Drive will operate at a LOS of F in all build scenarios. A variety of mitigation measures were explored for this intersection such as adding lanes on US-40, adding lanes on Old Town Drive, and changing the roundabout geometry, but it was determined that the option presented in this study (single lanes on Old Town Drive and double lanes on US-40) results in the least amount of delay on US-40. As can be seen in **Appendix B: HCM Reports** the delay on US-40 is relatively minimal for the 2050 full build scenario at 129 seconds.

Conclusion

The transportation network will be able to accommodate projected growth while maintaining acceptable service levels at critical intersections if the proposed mitigations are implemented. By prioritizing multimodal access and sustainable transportation options, the Winter Park Master Plan aims to enhance mobility, reduce congestion, and create a seamless and enjoyable visitor experience.

It is recommended that the phased implementation of these strategies be closely monitored and adjusted as needed to ensure continued effectiveness. Future developments should integrate smart transportation technologies, such as adaptive traffic signal control and data-driven transit optimization, to further enhance efficiency. Additionally, continued collaboration with local and regional transportation agencies will be essential to aligning mobility improvements with broader infrastructure planning efforts.

Introduction

This mobility study documents the potential transportation-related impacts to the surrounding multimodal network from the proposed Winter Park Master Plan project. The project location is shown in **Figure 1**.

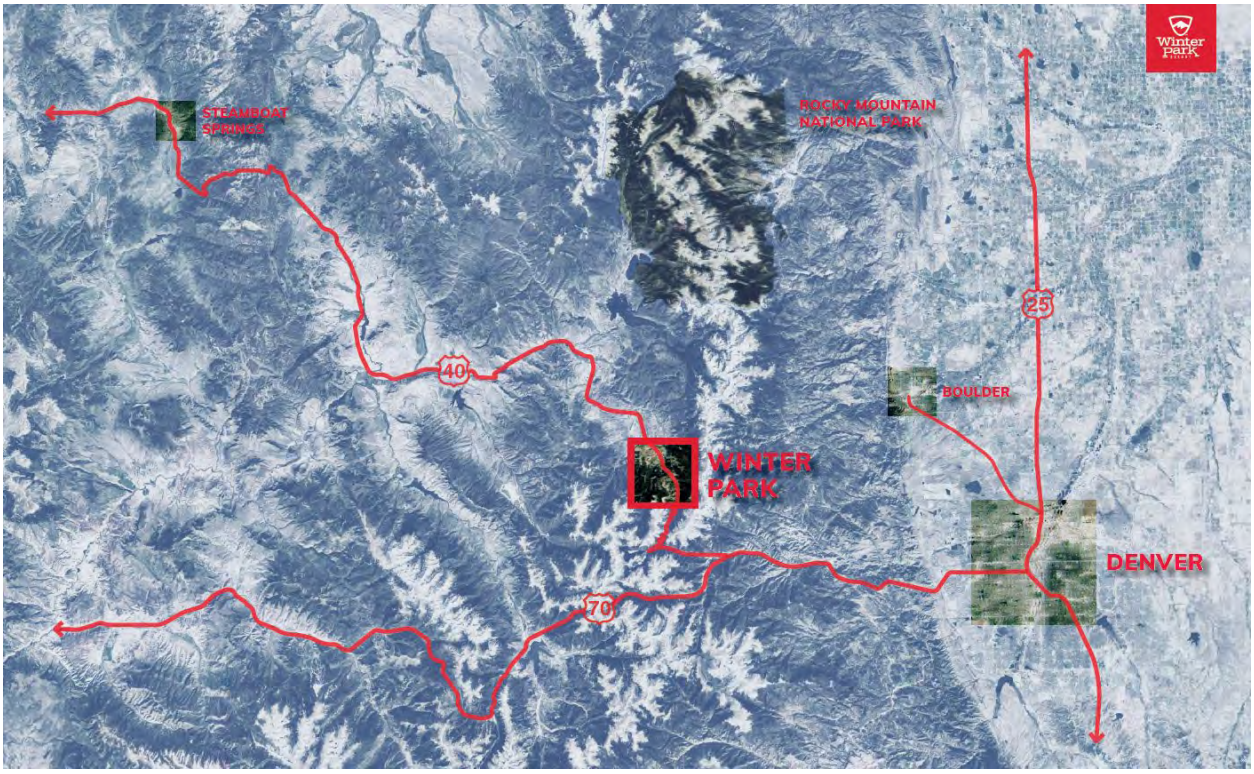


Figure 1: Project Location

Project Description

The Winter Park Master Plan envisions a revamped base area for Winter Park Resort that redevelops existing properties and constructs new condominiums, vacation homes, workforce housing, hotels, shopping, and other base area amenities that establishes the resort as a year-round attraction. The concept aims to create a resort that is highly accessible to residents and visitors by train, bus, gondola, or bike, and that allows drivers to park once and easily walk to all destinations. The 140-acre site plan is shown in **Figure 2**.

Figure 2: Site Plan

Mobility Study Scope

The scope of this study, as determined in collaboration with the Colorado Department of Transportation (CDOT), analyzes the transportation network for the following scenarios during the Saturday PM peak hour (3:45pm to 4:45pm):

- Existing Conditions (2024)
- Future Background Conditions by Phase
  - 2029
  - 2031
  - 2033
  - 2037
  - 2050
- Build Conditions (background with project) by Phase
  - Phase 1 + Day Skier Trips - 2029
  - Phase 1 + 2 + Day Skier Trips - 2031
  - Phase 1 + 2 + 3 + Day Skier Trips - 2033
  - Phase 1 + 2 + 3 + 4 + Day Skier Trips - 2037
  - Phase 1 + 2 + 3 + 4 + Day Skier Trips - 2050

Intersection operations at key intersections, identified below and shown in **Figure 3** were analyzed under the scenarios listed above during Saturday PM peak travel period (3:45pm – 4:45pm). Given the nature of ski areas operating as recreational destinations, Saturdays during the PM peak hour consistently experience the highest traffic volumes and focusing on this time period for the transportation analysis presents the most conservative results.

Traffic counts were collected during the period of Friday, March 11 through Sunday, March 13, 2022, at intersections 2-5 to establish an understanding of peak winter ski season traffic patterns. The counts showed that the Saturday PM peak hour is the busiest, so this study will use the traffic counts from Saturday, March 12. The 2022 traffic counts were grown to 2024 using a 0.91% annual growth rate.

Since the completion of the first study, additional traffic counts were collected at US-40 & Vasquez Road on Saturday, September 14, 2024, and US-40 & Mary Jane Road on Saturday, April 20, 2024. The traffic counts at US-40 & Vasquez were adjusted using a seasonal factor to be more representative of counts collected during the ski season.

The traffic counts are provided in **Appendix A**.

This mobility study analyzed the potential transportation impacts of the project at the following intersections:

1. US-40 & Vasquez Road
2. US-40 & Winter Park Drive North*
3. US-40 & Old Town Drive
4. US-40 & Winter Park Mtn Lodge Access
5. US-40 and Winter Park Drive – Lot G
6. US-40 & Mary Jane Road
7. Old Town Drive & Garage Access
8. Winter Park Drive & Old Town Drive
9. Winter Park Drive & Timberhouse Road (south)
10. Winter Park Drive & Access
11. Winter Park Drive & Road 2
12. Winter Park Drive & Nystrom Lane
13. Winter Park Drive & Access
14. Winter Park Drive & Road 4
15. Road 4 & Road 2
16. Winter Park Drive & Timberhouse Road (north)
17. Winter Park Drive & Road 5

**Intersection not analyzed due to no traffic control at the intersection*

Figure 3: Study Intersections

Level of Service (LOS) Analysis

The transportation operations analysis addressed signalized and unsignalized intersection operations using the procedures and methodologies contained in the Highway Capacity Manual (HCM) (2016, Transportation Research Board) for the Saturday PM peak hour traffic operations. Study intersection operations were evaluated using level of service (LOS) calculations as analyzed in the Synchro software. The proposed roundabout intersections were analyzed with the SIDRA analysis software.

Level of Service Criteria

To measure and describe the operational status of the local roadway network and corresponding intersections, transportation engineers and planners commonly use a grading system called level of service (LOS) put forth by the Transportation Research Board's Highway Capacity Manual (HCM) 2016. LOS characterizes the operational conditions of an intersection's traffic flow, ranging from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions where traffic flows exceed the design capacity, resulting in long queues and delays). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. Traffic conditions with LOS E or F are generally considered unacceptable and represent significant travel delay, increased accident potential, and inefficient motor vehicle operation. The LOS is determined differently depending on the type of control at the intersection.

At signalized intersections, the operation analysis uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the intersection's volume-to-capacity (v/c) ratio. For signalized intersections, the HCM defines the intersection LOS as the average delay per vehicle for the overall intersection, which includes all approaches.

At unsignalized intersections, the operation analysis uses various intersection characteristics (such as traffic volumes, lane geometry, and stop-controlled approaches) to estimate the intersection's volume-to-capacity (v/c) ratio. For unsignalized intersections the HCM defines the intersection LOS as either the average delay per vehicle for the worst approach or the whole intersection for side-street stop and all-way stop intersections, respectively. **Table 3** summarizes the relationship between delay and LOS for signalized intersections and **Table 4** summarizes the relationship between delay and LOS for unsignalized intersections.

Table 3: Signalized Intersection Level of Service Definitions Using Average Control Vehicular Delay

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	>10 to 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	>20 to 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	>35 to 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	>55 to 80
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80

Source: Highway *Capacity Manual (Transportation Research Board, 2016.*

Table 4: Unsignalized Intersection Level of Service Definitions Using Average Control Vehicular Delay

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	<10
B	Short traffic delay.	>10 to 15
C	Average traffic delays.	>15 to 25
D	Long traffic delays.	>25 to 35
E	Very long traffic delays.	>35 to 50
F	Extreme traffic delays with intersection capacity exceeded.	>50

Source: Highway *Capacity Manual (Transportation Research Board, 2016).*

Existing Conditions

The Existing Conditions analysis examines the study intersections during the Saturday PM Peak hour. Existing traffic volumes and geometric conditions were utilized. The existing conditions analyses were performed using traffic data collected in 2022 and 2024.

Existing Transportation Network

Roadway

US-40 is a Colorado Department of Transportation (CDOT) facility and is classified in the study area as an R-B Rural Highway. For most of the study area, there are two northbound lanes and two southbound lanes with auxiliary turn lanes at primary intersections. Near US-40 & Mary Jane Road, US-40 has a single lane in either direction. The posted speed limit is between 40 MPH and 55 MPH for most of the study area, near the intersection of US-40 & Vasquez, the speed limit is 35 MPH. The intersections of US-40 & Vasquez, US-40 & Old Town Drive, and US-40 & Winter Park Drive (south) are signalized intersections. In diagrams included in this report, US-40 is oriented north-south.

Winter Park Drive is the primary roadway that serves the interior of the base area. The southern intersection with US-40 is signalized and is the primary site entrance. Winter Park Drive has not been developed on the east side of this intersection, other than to serve the G Lot, which offers additional site parking across US-40. Winter Park Drive intersects US-40 on the north side of the Winter Park resort but only serves southbound vehicles that turn right off the highway to enter a one-way drive into the base area.

Old Town Drive/Arrow Trail is a secondary signalized site entrance on US-40. Arrow Trail serves neighborhoods east of the resort, and Old Town Drive merges into Winter Park Drive.

Winter Park Mountain Lodge Access is a stop-controlled intersection that serves the Winter Park Mountain Lodge on the east side of US-40. The stop control is on the westbound leg.

Transit

The Lift is the existing transit provider for the Town of Winter Park serving the Town, the Winter Park Resort, Fraser, and Granby. As seen in the Winter 2024-2025 route map in **Figure 4** there are three main transit centers where key routes make stops: the Winter Park Resort stop, the Cooper Creek Transit Center, and the Fraser Valley Center. The frequency of The Lift's routes in the winter season are depicted in **Table 5**. Most routes in winter are scheduled to operate on an hourly frequency on off-peak days and on a 30-minute frequency on peak days. Despite hourly frequencies, route schedules allow for an average of six minutes between all buses departing from the Winter Park Resort stop. Buses depart every four minutes or less on winter peak days.

Figure 4: The Lift Winter 2024-2025 Route Map

Table 5: Scheduled Frequency of Each Lift Route

Route	Winter Off-Peak Frequency	Winter Peak Frequency
Orange	60 minutes	30 minutes
Blue	60 minutes	30 minutes
Red	60 minutes	30 minutes
Purple	60 minutes	30 minutes
Black	30 minutes	15 minutes
Teal	7 daily runs	X
Emerald	60 minutes	30 minutes
Yellow	60 minutes	30 minutes
Green	25 minutes	25 minutes
Brown	60 minutes	30 minutes

Source: The Lift, December 2024

Routes Serving Study Area

Within the study area, most routes only make a stop at the Winter Park Resort stop. Only the Green, Red, and Teal Routes make additional stops; the Red Route also stops hourly on weekdays at the Old Town Winter Park stop, and the Teal Route also stops five times each day at the Lower Circle stop. The Green Route, however, is the only route to provide base area circulation, making stops at the Iron Horse Resort, Winter Park Mountain Lodge, Lakota Trail, Arrow Trail, Lakota Park Drive, Old Town Winter Park, Lower Circle, and the Winter Park Resort within a counterclockwise, 25-minute loop. All other routes of The Lift are specifically designed to connect riders between Winter Park Resort and the Town of Winter Park and beyond, and do not provide efficient base area circulation.

As mentioned above, the Green Route operates as the only base-area circulator, running only in a counterclockwise direction every 25 minutes. Unfortunately, this means that a person who needs to connect from the Iron Horse Resort to the Winter Park Resort (total distance of 0.4 miles) must either ride the entire route until it gets back to the Winter Park Resort, or risk walking the distance on a road with no pedestrian infrastructure. In addition to improvements to the pedestrian infrastructure, frequency and directional improvements to the Green Route could increase connectivity within the base area.

Ski Train

The Winter Park Express, also known as the Ski Train, is a seasonal train connecting Denver's Union Station with the Winter Park Resort in two hours. The train is a partnership between Amtrak, CDOT, and the Winter Park Resort. It runs five days a week (Thursday, Friday, Saturday, Sunday, and Monday) between January 9 – March 31. It leaves Denver Union Station at 7:00 AM and leaves Winter Park at 4:30 PM. This year, there will also be holiday service that is three days a week (Friday, Saturday, and Sunday) from December 20 – December 29. The fares have also been lowered to $19 per trip this year for adults.

Bicycle & Pedestrian

The main base area and Winter Park Drive host much of the resort's existing pedestrian walkways. However, sidewalks are currently incomplete or missing in several areas. Bicycle infrastructure is currently non-existent in the main base area. However, the Fraser River Trail connects the Town of Fraser to the Town of Winter Park via a five-mile multiuse path. Improvements to the pedestrian and bicycle infrastructure throughout the base area are proposed as part of the base area redevelopment plan.

Existing Traffic Volumes

To understand the existing operating conditions of current intersections as a baseline for future modifications, peak hour traffic volume data was collected for the following intersections:

1. US 40 & Vasquez Road
2. US 40 & Winter Park Drive (north)
3. US 40 & Old Town Drive
4. US 40 & Winter Park Mountain Lodge Access
5. US 40 and Winter Park Drive (south)
6. US 40 & Mary Jane Road

Traffic counts were collected during the period of Friday, March 11 through Sunday, March 13, 2022, at intersections 2-5 to establish an understanding of peak winter ski season traffic patterns. The counts showed that the Saturday PM peak hour is the busiest, so this study will use the traffic counts from Saturday, March 12. The 2022 traffic counts were grown to 2024 using a 0.91% annual growth rate.

Since the completion of the first study, additional traffic counts were collected at US-40 & Vasquez Road on Saturday, September 14, 2024, and US-40 & Mary Jane Road on Saturday, April 20, 2024. The traffic counts at US-40 & Vasquez were adjusted using a seasonal factor to be more representative of counts collected during the ski season.

Traffic counts during the peak hour of 3:45 PM to 4:45 PM were used as a baseline to study existing conditions **(Figure 5)**. The traffic counts are provided in **Appendix A**.

Figure 5: Existing Saturday PM Peak Hour Volumes

Existing Level of Service

During the existing Saturday PM peak hour, all intersections are operating acceptably (LOS A-E) except for US-40 & Mary Jane Road which operates at LOS F **(Table 6).**

Table 6: Existing Saturday LOS

Intersection #	Intersection Name	Control Type[1]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	6	A	
3	US-40 & Old Town Drive	Signal	24	C	
4	US-40 & Mountain Lodge Access	SSSC	32	D	WB
5	US-40 & Winter Park Drive (south)	Signal	23	C	
6	US-40 & Mary Jane Road	SSSC	**270**	**F**	**EB**

Source: HCM 2016, Fehr & Peers
Notes:
Bold text indicates intersections operating below the acceptable LOS threshold.

6. SSSC = Side-Street Stop Control
7. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
8. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
9. The worst movement is only reported for unsignalized intersections.
10. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

Regional Travel Analysis

For the analysis initially prepared in 2021, Fehr & Peers used StreetLight data to analyze travel behavior. StreetLight is a Big Data provider that estimates vehicle origin, destination, and routing travel patterns based on anonymous smartphone data from global positioning system (GPS) enabled mobile applications. StreetLight Data can provide insight into the relative impacts of Winter Park and other destinations in and around Winter Park, as well as a stronger understanding of where travelers are arriving from and traveling to across the region. StreetLight's platform allows us to reach back in time to pre-COVID conditions and evaluate traffic patterns during peak visitation periods, such as winter weekends and holidays. Fehr & Peers has used StreetLight data to help clients understand recreational travel flows for entities including the National Park Service; West Yellowstone, MT; and Snow Park.

The traffic count data from StreetLight was compared with observed counts at the study area intersections to ensure the data was close to observed counts. StreetLight data was collected for four periods to represent pre-pandemic conditions: Winter 2019 weekdays (M-Th) and weekends (F-Su), and Summer 2019 weekdays (M-Th) and weekends (F-Su).

Winter Travel Patterns

During winter weekdays **(Figure 6 and Figure 7)**, most visitors of Winter Park Resort (74%) come from the Fraser Valley, including the Towns of Granby, Tabernash, Fraser, and Winter Park. Just over a quarter of visitors (26%) come from the Denver metropolitan area, including Boulder. More visitors from both the Fraser Valley and Denver metropolitan area enter the resort from the Mary Jane base area during the winter than the summer. However, the main base area still receives most visitors from the Fraser Valley (88%) and the Denver metropolitan area (63%).

In the afternoon, slightly fewer visitors return directly to the Denver metropolitan area, with 19% of visitors travelling there directly. This suggests that some visitors stay at the resort or visit nearby towns before travelling home. This could reflect visitors going to dinner in the area before returning.

During winter weekends **(Figure 8 and Figure 9)**, most visitors of Winter Park Resort (73%) come from the Fraser Valley, including the Towns of Granby, Tabernash, Fraser, and Winter Park. Just over a quarter of visitors (27%) come from the Denver metropolitan area, including Boulder. More visitors from both the Fraser Valley and Denver metropolitan area enter the resort from the Mary Jane base area during the winter than the summer. However, the main base area still receives most visitors from the Fraser Valley (86%) and the Denver metropolitan area (68%).

In the afternoon, roughly the same share of visitors return directly to the Denver metropolitan area, with 30% of visitors travelling there directly. This could reflect visitors returning more quickly to "beat the traffic." This time period also includes Sunday afternoons, a period during which many city visitors who stay for the weekend travel home. On the weekend, a greater share of the Denver metro area visitors are coming up for only the day compared to weekday visitors who are more likely to be staying locally.

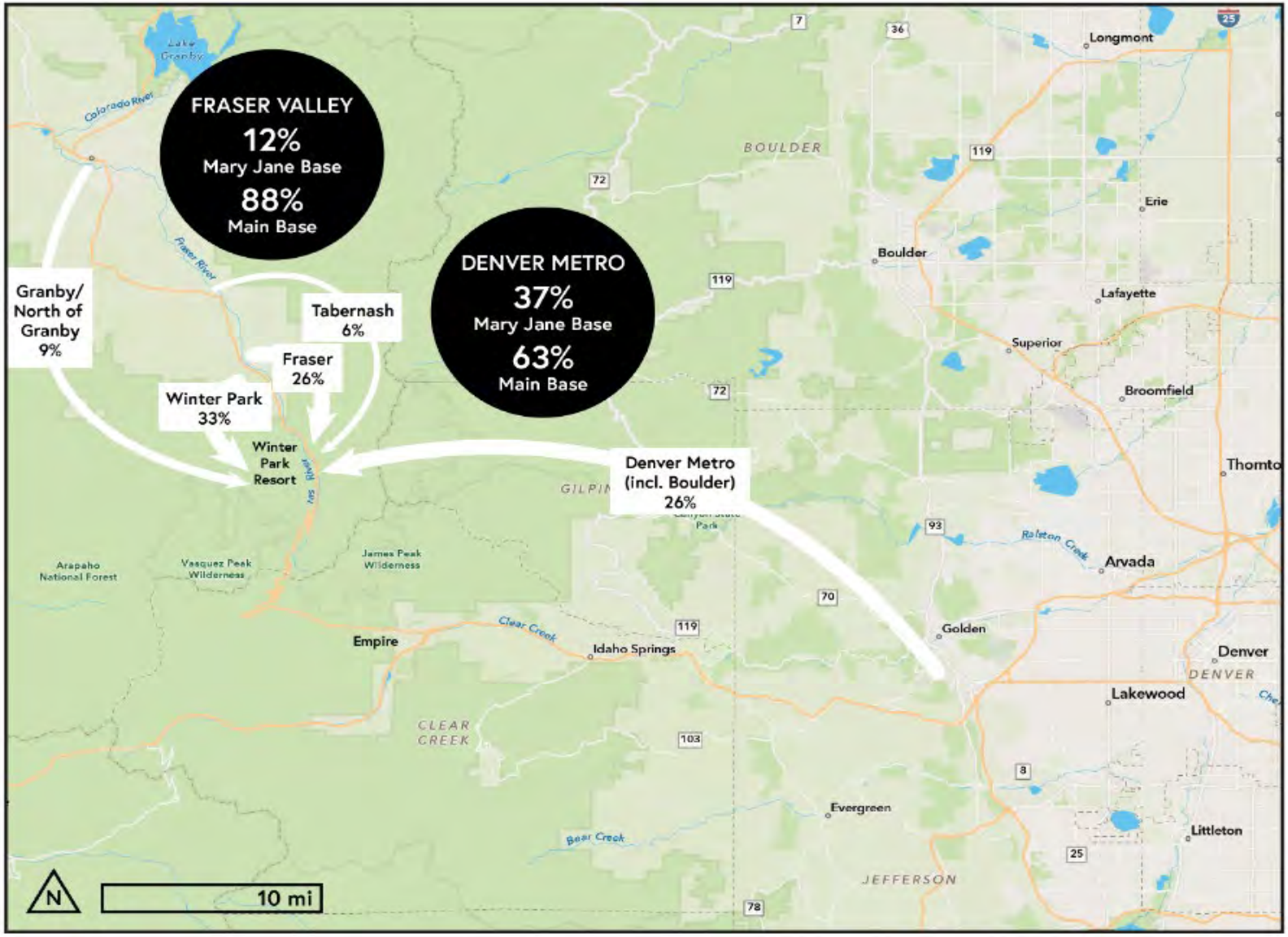


Figure 6: Winter Park Winter Weekday AM Incoming Trends

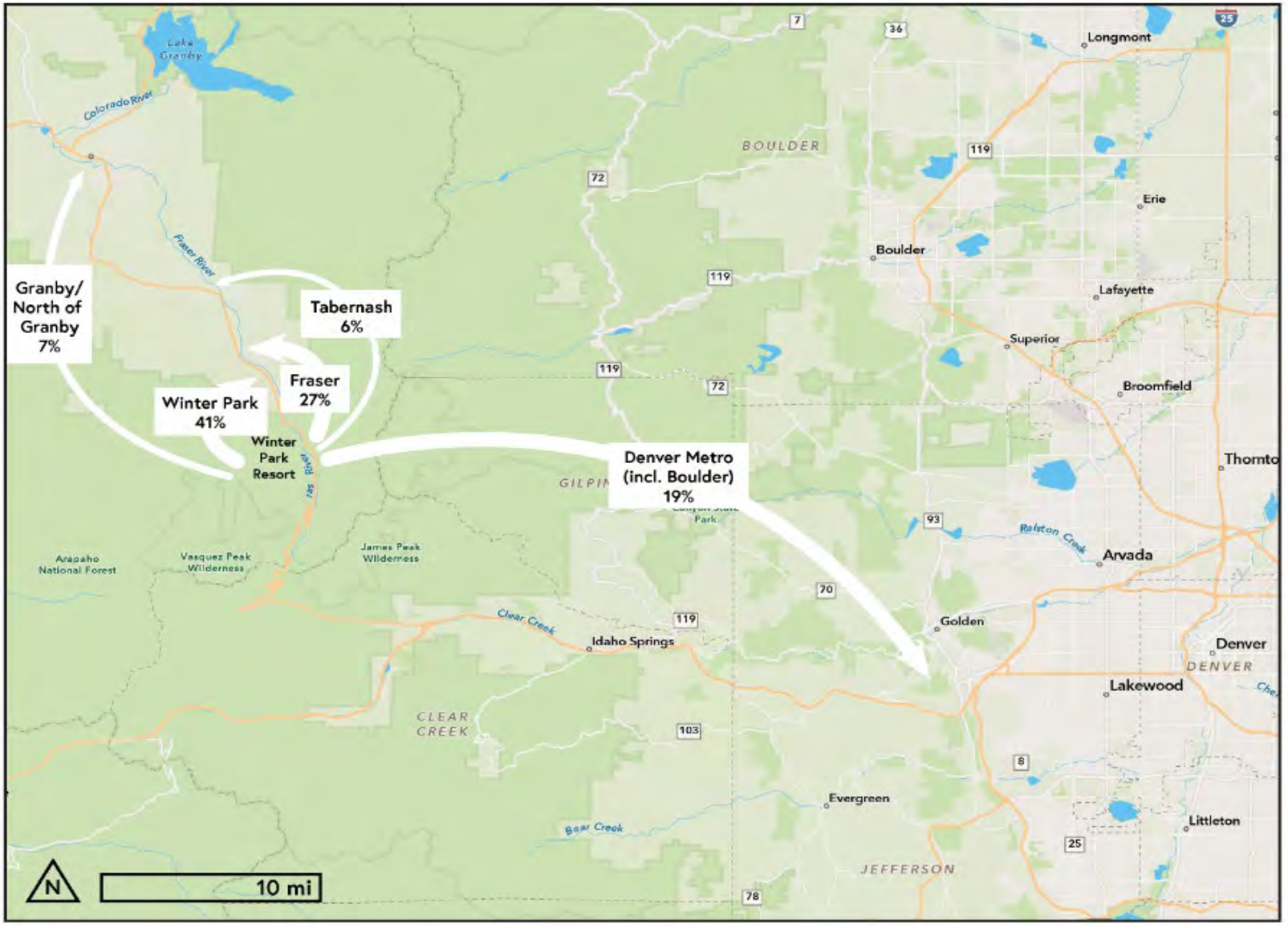


Figure 7: Winter Park Winter Weekday PM Outgoing Trends

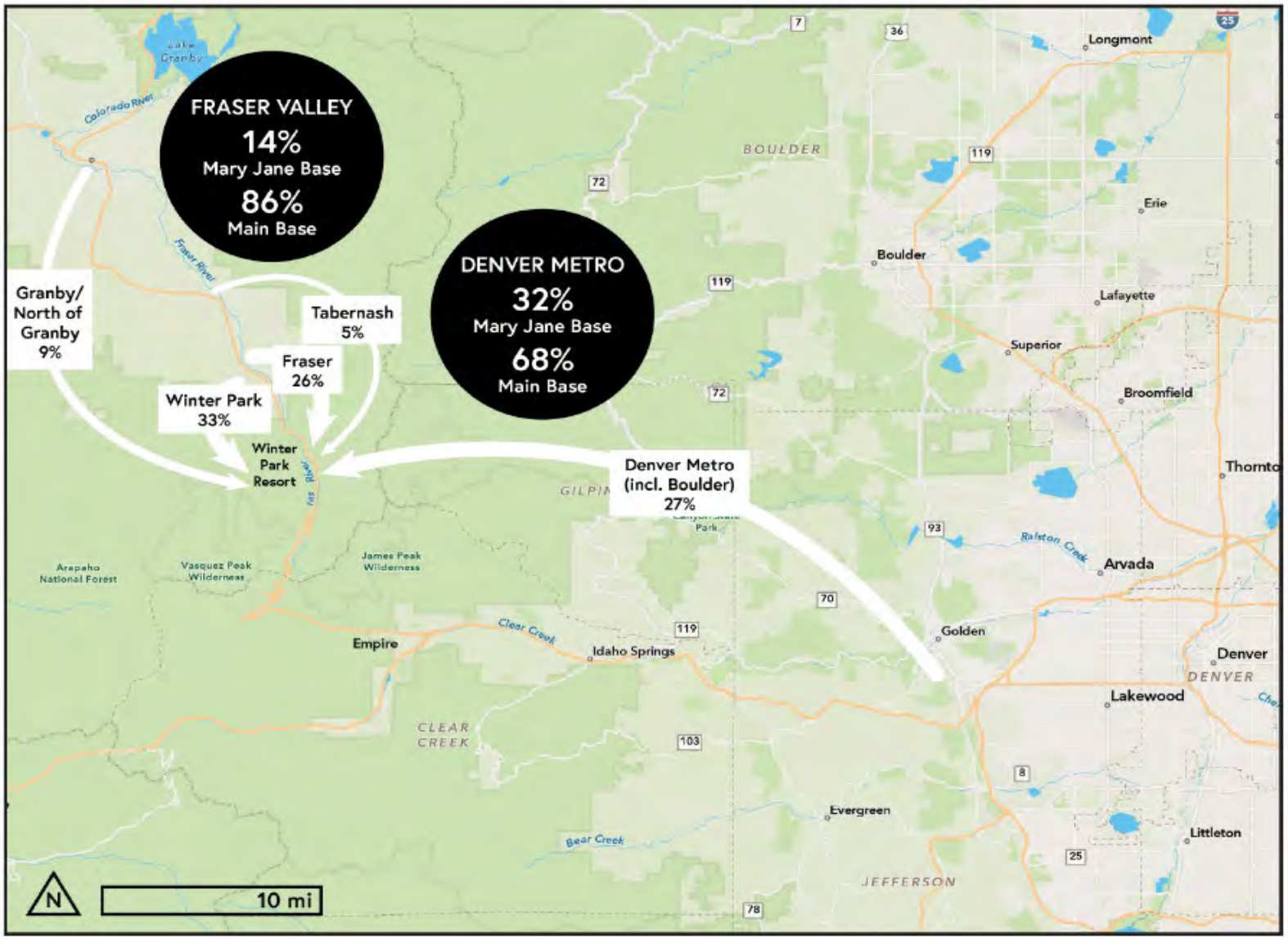


Figure 8: Winter Park Winter Weekend AM Incoming Trends

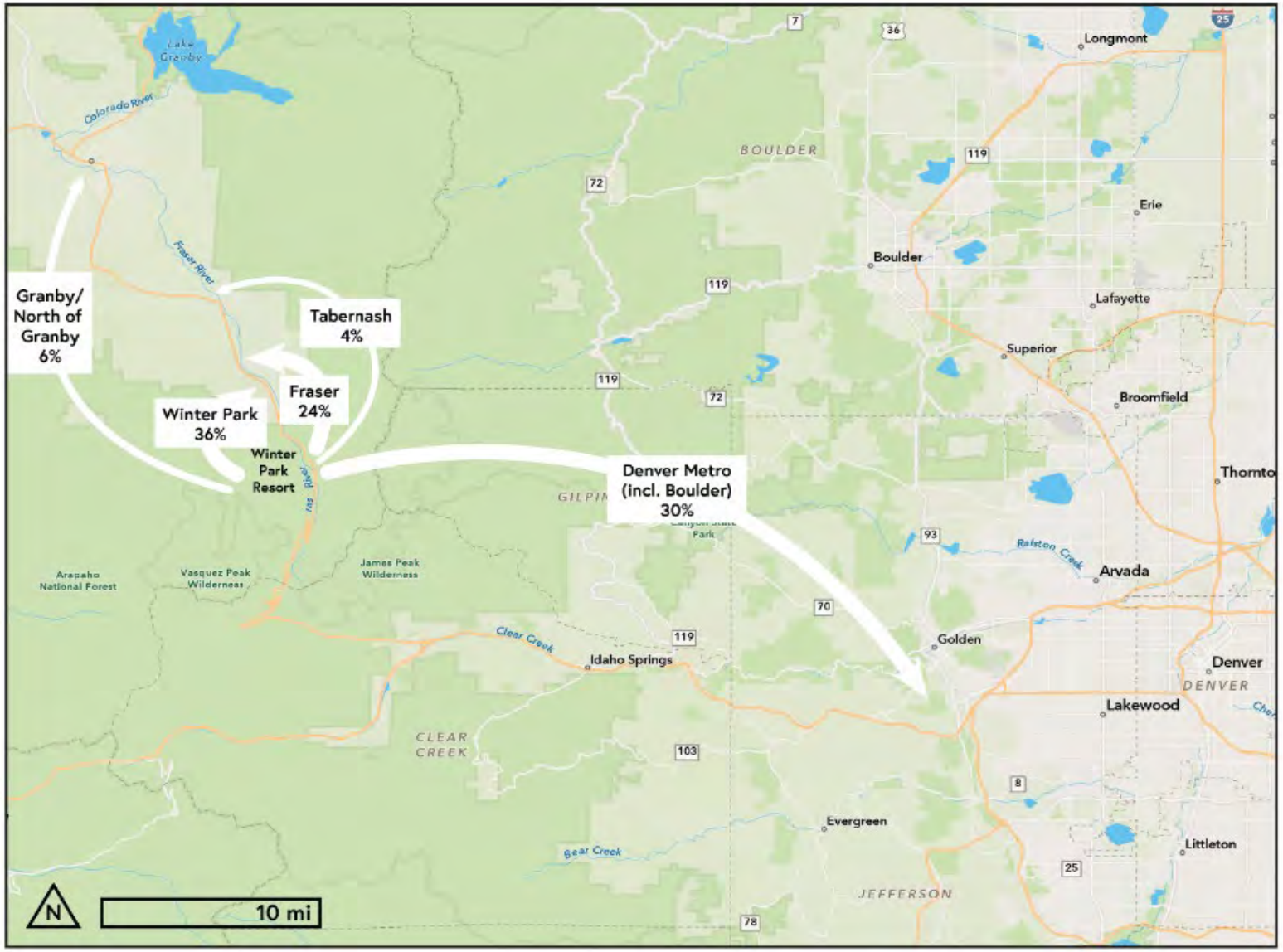


Figure 9: Winter Park Winter Weekend PM Outgoing Trends

Future Background Traffic Volumes

Development of Background Growth Rate

Fehr & Peers documented and analyzed the future background traffic conditions using a compound annual growth rate. Fehr & Peers determined the background traffic for this analysis in collaboration with CDOT, and by examining annual growth rates from CDOT's Online Transportation Information System (OTIS) for five sections of US-40, State Demographer growth forecasts, the *2045 Northwest Regional Transportation Plan*, and the *ROAM Transportation Impact Study*, using a similar methodology as CDOT's *US 40 Fraser Feasibility Study*. Based on each of these data points, this study uses an annual growth rate of 0.91% as shown in **Table 7.**

Table 7: Annual Growth Rates Considered

Source	Annual Growth Rate
CDOT OTIS (Station 101874)	0.60%
CDOT OTIS (Station 101876)	0.51%
CDOT OTIS (Station 101877)	0.56%
CDOT OTIS (Station 101878)	0.51%
CDOT OTIS (Station 101879)	0.38%
State Demographers Office (20 Year)	1.52%
State Demographers Office (30 Year)	1.57%
2045 Northwest RTP	2.08%
ROAM TIS	0.43%
Average	**0.91%**

Background Conditions

Background volumes for the Saturday PM peak period were developed for the future years of 2029, 2031, 2033, 2037, and 2050 using the existing traffic counts and the 0.91% annual growth rate. It should be noted that none of the volumes entering or exiting Winter Park Resort were grown in the background conditions because it was assumed that the number of skiers would remain the same without further development.

Fehr & Peers then evaluated how the existing roadway network would perform with future background volumes for the Saturday PM peak period in 2029, 2031, 2033, 2037, and 2050. The model was programmed using a default peak hour factor of 0.92 and existing signal timing and phasing.

Background 2029

Figure 10 shows the 2029 background volumes and **Table 8** shows the LOS results.

Figure 10: 2029 Background Volumes

Table 8: Background 2029 Saturday PM LOS

Intersection #	Intersection Name	Control Type[1]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	6	A	
3	US-40 & Old Town Drive	Signal	24	C	
4	US-40 & Mountain Lodge Access	SSSC	32	D	WB
5	US-40 & Winter Park Drive (south)	Signal	23	C	
6	US-40 & Mary Jane Road	SSSC	**270**	**F**	**EB**

Source: HCM 2016, Fehr & Peers

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

In 2029, it is projected that all the intersections will operate acceptably, except for US-40 & Mary Jane Road during the Saturday PM peak. Signalizing US-40 & Mary Jane Road will resolve the delay. The mitigations are described in more detail in the **Proposed Mitigations** section.

Background 2031

Figure 11 shows the 2031 background volumes and **Table 9** shows the LOS results.

Figure 11: 2031 Background Volumes

Table 9: Background 2031 Saturday LOS

Intersection #	Intersection Name	Control Type[1]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	6	A	
3	US-40 & Old Town Drive	Signal	25	C	
4	US-40 & Mountain Lodge Access	SSSC	36	E	WB
5	US-40 & Winter Park Drive (south)	Signal	23	C	
6	US-40 & Mary Jane Road	**SSSC**	**317**	**F**	**EB**

Source: HCM 2016, Fehr & Peers

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

In 2031, it is projected that all the intersections will operate acceptably, except for US-40 & Mary Jane Road during the Saturday PM peak. Signalizing US-40 & Mary Jane Road will resolve the delay. The mitigations are described in more detail in the **Proposed Mitigations** section.

Background 2033

Figure 12 shows the 2033 background volumes and **Table 10** shows the LOS results.

Figure 12: 2033 Background Volumes

Table 10: Background 2033 Saturday LOS

Intersection #	Intersection Name	Control Type[1]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	6	A	
3	US-40 & Old Town Drive	Signal	26	C	
4	US-40 & Mountain Lodge Access	SSSC	37	E	WB
5	US-40 & Winter Park Drive (south)	Signal	23	C	
6	US-40 & Mary Jane Road	SSSC	**333**	**F**	**EB**

Source: HCM 2016, Fehr & Peers

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

In 2033, it is projected that all the intersections will operate acceptably, except for US-40 & Mary Jane Road during the Saturday PM peak. Signalizing US-40 & Mary Jane Road will resolve the delay. The mitigations are described in more detail in the **Proposed Mitigations** section.

Background 2037

Figure 13 shows the background 2037 volumes and **Table 11** shows the LOS results.

Figure 13: 2037 Background Volumes

Table 11: Background 2037 Saturday LOS

Intersection #	Intersection Name	Control Type[1]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	6	A	
3	US-40 & Old Town Drive	Signal	27	C	
4	US-40 & Mountain Lodge Access	SSSC	39	E	WB
5	US-40 & Winter Park Drive (south)	Signal	23	C	
6	US-40 & Mary Jane Road	SSSC	**368**	**F**	**EB**

Source: HCM 2016, Fehr & Peers

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

In 2037, it is projected that all the intersections will operate acceptably, except for US-40 & Mary Jane Road during the Saturday PM peak. Signalizing US-40 & Mary Jane Road will resolve the delay. The mitigations are described in more detail in the **Proposed Mitigations** section.

Background 2050

Figure 14 shows the 2050 background volumes and **Table 12** shows the LOS results.

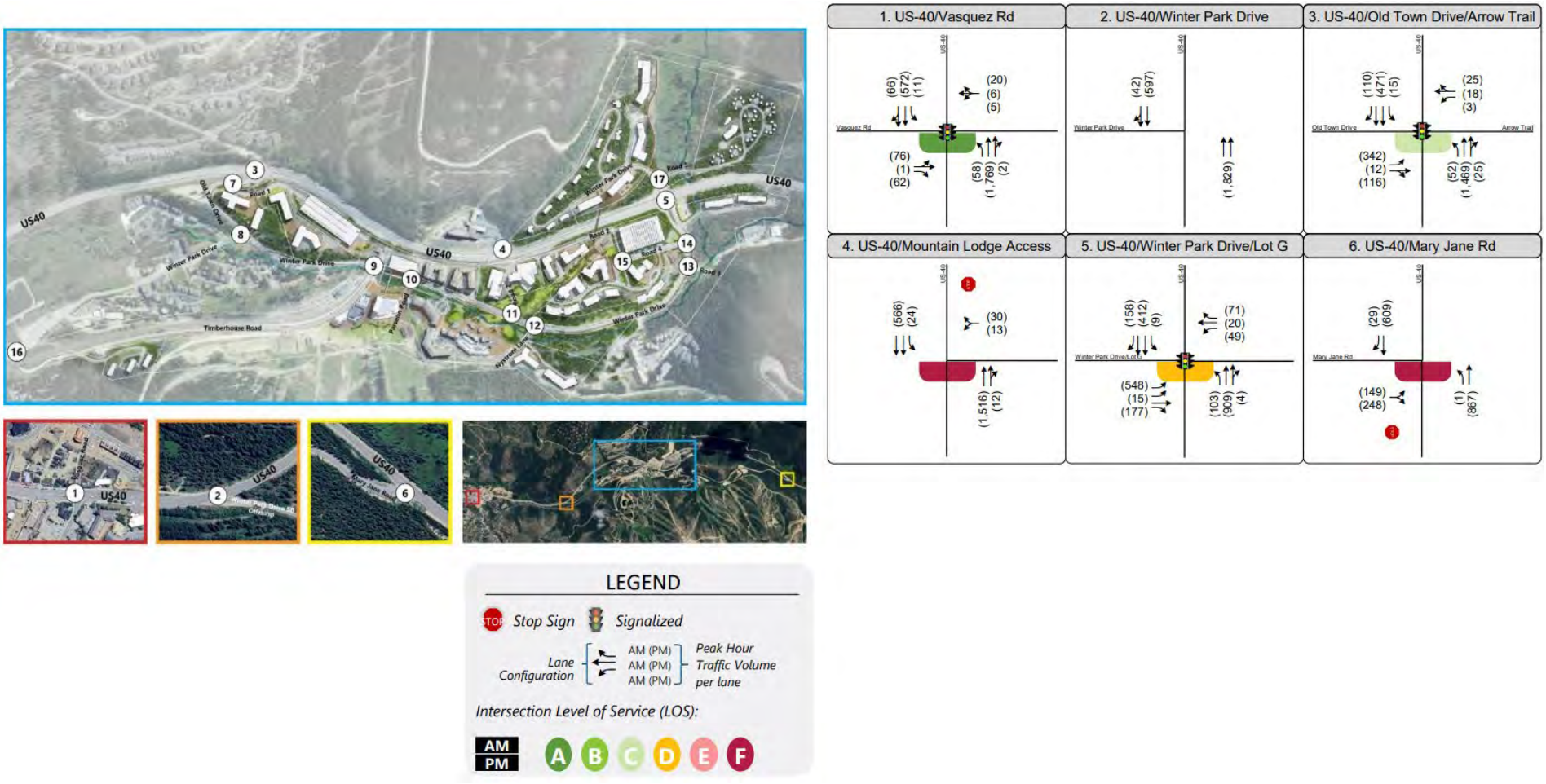


Figure 14: 2050 Background Volumes

Table 12: Background 2050 Saturday LOS

Intersection #	Intersection Name	Control Type[1]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	7	A	
3	US-40 & Old Town Drive	Signal	33	C	
4	US-40 & Mountain Lodge Access	SSSC	**54**	**F**	**WB**
5	US-40 & Winter Park Drive (south)	Signal	49	D	
6	US-40 & Mary Jane Road	SSSC	**493**	**F**	**EB**

Source: HCM 2016, Fehr & Peers

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

In 2050, it is projected that all the intersections will operate acceptably, except for US-40 & Mary Jane Road and US-40 & Mountain Lodge Access during the Saturday PM peak. Restricting the westbound movements to be right-out only at US-40 & Mountain Lodge Access will resolve the delay. Signalizing US-40 & Mary Jane Road will resolve the delay. The mitigations are described in more detail in the **Proposed Mitigations** section.

Existing and Background LOS Comparison

Table 13 highlights the intersection performance over time, showing that the cause of LOS F at Mountain Lodge Access is westbound left movement at the side-street stop control. This is common for side streets on major corridors, where it is challenging for vehicles to find gaps in the mainline traffic. The proposed mitigation to restrict movements at this access point will help minimize congestion and improve safety. Additionally, the LOS F at Mary Jane Road necessitates signalization to improve traffic flow and reduce delays, ensuring a more efficient and safer experience for all users.

Table 13: Background Saturday LOS

Int #	Intersection Name	Control Type[1]	Existing			2029			2031			2033			2037			2050		
			Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	6	A		7	A		6	A		6	A		6	A		7	A	
3	US-40 & Old Town Drive	Signal	24	C		25	C		25	C		26	C		27	C		33	C	
4	US-40 & Mountain Lodge Access	SSSC	32	D	WB	34	D	WB	36	E	WB	37	E	WB	39	E	WB	**54**	**F**	**WB**
5	US-40 & Winter Park Drive (south)	Signal	23	C		23	C		23	D		23	C		23	C		49	D	
6	US-40 & Mary Jane Road	SSSC	**270**	**F**	**EB**	**303**	**F**	**EB**	**317**	**F**	**EB**	**333**	**F**	**EB**	**368**	**F**	**EB**	**493**	**F**	**EB**

Source: HCM 2016, Fehr & Peers

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

Project Conditions

The Project conditions analysis evaluates the type and intensity of the proposed development. Build volumes are the sum of the estimated background traffic and the project site generated traffic. This analysis will determine the impact of the proposed development on the study intersections and project access points. Improvements will be presented in the **Proposed Mitigations** section.

Trip Generation

Trip generation for Winter Park Resort was estimated in two parts: one for the proposed development and one for the proposed increase in skier capacity. The development trip generation is show in the **Winter Park Resort Development** section and the skier trip generation is shown in the **Skier Trip Generation** section.

Winter Park Resort Development

The development is proposed to include the following land uses from the 06/04/2024 Winter Park Yield Study to be built over four phases from 2029-2037:

- 775 hotel rooms
- 1,621 multifamily housing units/condominiums
- 252 workforce housing units
- 8,000 square feet of resort office space
- 34,000 square feet of commercial/retail space

Table 14 shows the proposed land use by phase, density, and general location.

Table 14: Proposed Land Uses

Parcel ID	Land Use	Size	Unit	Zone
Phase 1 2029				
23	Public Parking Garage Retail wrap	10,000	GSF	Old Town
15	Hotel	110	Rooms	Resort Village
15a	Condos	96	Dwelling Units	Resort Village
16	Hotel	105	Rooms	Resort Village
16a	Condos	50	Dwelling Units	Resort Village
17	Retail Pavilions	7,000	GSF	Resort Village
18	Condos	160	Dwelling Units	Resort Village
	Lodge Retail	14,000	GSF	Resort Village
	Lodge Resort Operations	8,000	GSF	Resort Village
22	Condos	217	Dwelling Units	Old Town
Phase 2 2031				
8	Hotel	150	Rooms	Welcome Village
9	Hotel	130	Rooms	Welcome Village
WV-WF	Workforce Housing	252	Dwelling Units	Welcome Village
Phase 3 2033				
10	Hotel (Replacement for current Vintage Hotel)	140	Rooms	Welcome Village
11	Condos	144	Dwelling Units	Welcome Village
12	Condos	117	Dwelling Units	Welcome Village
Phase 4 2037				
2	Cottages / Condos	64	Dwelling Units	Retreat
3	Hotel	140	Rooms	Retreat
4	Condos	123	Dwelling Units	Retreat
5	Cottages / Condos	51	Dwelling Units	Retreat
6	Condos	139	Dwelling Units	Retreat
13	Condos	121	Dwelling Units	Welcome Village
14	Condos	58	Dwelling Units	Welcome Village
20	Condos	59	Dwelling Units	Old Town
21	Condos	222	Dwelling Units	Old Town
7	Public Parking Garage Retail wrap	10,000	GSF	Welcome Village

The internal capture, and walk, bike, and transit trip percentages for the Winter Park Resort development were estimated using the Fehr & Peers tool, MXD+. The methodology is described in detail below.

MXD+

Much research and case studies have been performed to better understand the transportation benefits of mixed-use development and transit-oriented development (TOD) over the past decade. "D" factors affect the way mixed-use developments generate trips. The "D" factors include:

1. Density *(dwellings, jobs per acre)*
2. Diversity *(mix of housing, jobs, retail)*
3. Design *(connectivity, walkability)*
4. Destinations *(regional accessibility)*
5. Distance to Transit *(rail and bus proximity)*
6. Development Scale *(population, jobs)*
7. Demographics *(household size, income)*

Because of the "D" factors, mixed-use developments and TOD have a much higher distribution of mode split (split between walk, bike, transit, and vehicle) and generally result in lower single-occupant vehicle trips and parking demand. Research has shown that mixed-use developments and TOD generate one-third to two-thirds fewer trips than typical state-of-the-practice trip generation methodologies.

Trip generation for the proposed Winter Park plan was obtained from the *Institute of Transportation Engineers – 11th Edition Trip Generation Manual* (ITE Manual) and Fehr & Peers' mixed-use development (MXD+) methodology via MainStreet, a Fehr & Peers web application that captures the traffic benefits of developments by looking at interactions among the mixture of land uses and patron usage of alternative modes (i.e. transit, bicycling, and/or walking).

The MXD+ trip generation methodology more accurately captures the trip-reducing benefits of mixed-use development projects and is used throughout the United States to help developers, agencies, and the public to quantify these trip reductions. The MXD+ trip generation model is promoted by the United States Environmental Protection Agency (EPA) and has been adopted by the American Society of Civil Engineers (ASCE), American Planning Association (APA), and many others as a recommended resource for trip generation of smart-growth developments. The MXD+ model uses ITE trip generation rates and applies additional variables to those trip generation rates. Some of the additional variables include:

1. Employment
2. (Population + Employment) per square mile
3. Land area
4. Total jobs / population diversity
5. Number of intersections per square mile
6. Employment within a mile; within
7. Employment within a 30-minute trip by transit
8. Average household size
9. Vehicles owned per capita

Trip generation for the project was computed using trip generation rates published in the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, with trip reductions based on Fehr & Peers' MXD+ methodology to account for the project's many complementary land uses and availability of transit.

The development is proposed to support the current Winter Park Resort. The trip generation tables present the weekday daily, weekday AM peak-hour, weekday PM peak-hour, and Saturday peak-hour trip generation estimates by phase for the proposed Winter Park resort project.

Assumed Mode Shift

The trip generation estimates in this study consider walk, bike, and transit mode shift reductions derived from the MXD methodology. The mode shift reductions are applied to all proposed land uses. The estimate may be conservative, given efforts in this project to create a walkable pedestrian environment. The development proposes pedestrian centric zones that are dense, highly walkable areas with bicycle dismounts and no vehicle access, a new Main Street style pedestrian promenade, a pedestrian bridge to connect neighborhoods across US-40 to the main resort base area, and new multimodal paths that connect with the Fraser River Trail to downtown Winter Park. Potential mode shift to transit for those traveling to and from the Town of Winter Park may also be higher with potential future improvements.

Internal Capture & Non-Driving Share

The trip generation estimates in this study consider internal capture reductions derived from the MXD methodology. In a mixed-use development, some users will travel from one onsite land use to another without using the external road network. The development concept for this project is for the visitor to "park once," then enter a pedestrian dominant environment, or to arrive by transit or other means. Applying an internal capture percentage to the trips generated ensures that these types of trips are not "double-counted" in the analysis. It should be noted that the internal capture reductions are applied to all land uses except for retail because the retail uses are expected to almost exclusively serve guests already at Winter Park Resort rather than guests traveling to Winter Park Resort explicitly for those services. The retail internal capture reduction methodology is presented in the next section.

Trip Internalization Derived from Palisades Tahoe

While the residential and hotel uses are expected to be destinations unto themselves that will generate a measurable number of peak-hour vehicle trips, the food service and retail uses (shown in the trip generation as "Strip Retail Plaza") are not expected to generate trips from people traveling to the resort exclusively for those services.

To support this assumption, trip generation estimates for the retail uses in this study rely on trip internalization estimates derived from an origin-destination survey conducted at the Palisades Tahoe California resort in 2011. Surveys conducted showed that 95-97% of customers at dining and retail uses in a similar context (ski resort base village) were already at the village for other purposes, and did not travel solely for the dining/retail use. Reductions based on the data from Palisades Tahoe are presented under the row "% Resort Int. Capt." and are applied only to the retail uses. We assume that employees for these

uses will almost exclusively arrive and depart during off-peak periods, resulting in lower reductions for daily trips generated by the retail uses.

Development Phases

The trip generation is broken up by phase. The following tables show the cumulative trip generation of development by phase:

- **Table 15** – Phase 1 trip generation
- **Table 16** – Phase 2 trip generation
- **Table 17** – Phase 3 trip generation
- **Table 18** – Phase 4 trip generation

Table 15: Phase 1 Trip Generation 2029

Parcel ID	WP Land Use[1]	Land Use Group[2]	ITE Code[2]	ITE Land Use[2]	Size	Unit	Daily Weekday Trips	Saturday Daily Trips	AM Peak Hour			PM Peak Hour			Saturday Peak			Zone
									In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips	
Phase 1 2029																		
23	Public Parking Garage Retail wrap	Retail	822	Strip Retail Plaza (<40k)	10,000	GSF	545	1,162	14	10	24	33	33	66	34	32	66	Old Town
15	Hotel	Hotel	330	Resort Hotel	110	Rooms	690	n/a	25	10	35	19	26	45	33	44	77	Resort Village
15a	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	96	Dwelling Units	436	439	8	28	36	23	14	37	19	18	37	Resort Village
16	Hotel	Hotel	330	Resort Hotel	105	Rooms	658	n/a	24	10	34	18	25	43	32	42	74	Resort Village
16a	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	50	Dwelling Units	227	229	4	15	19	12	8	20	10	10	20	Resort Village
17	Retail Pavilions	Retail	822	Strip Retail Plaza (<40k)	7,000	GSF	381	813	10	7	17	23	23	46	23	23	46	Resort Village
	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	160	Dwelling Units	726	731	14	45	59	38	24	62	32	31	62	Resort Village
18	Lodge Retail	Retail	822	Strip Retail Plaza (<40k)	14,000	GSF	762	1,626	20	13	33	46	46	92	47	45	92	Resort Village
	Lodge Resort Operations	Office	710	General Office Building	8,000	GSF	87	18	11	1	12	2	10	12	2	2	4	Resort Village
22	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	217	Dwelling Units	985	992	18	62	80	52	33	85	43	41	85	Old Town
						ITE Subtotal	**5,497**	**n/a**	**148**	**201**	**349**	**266**	**242**	**508**	**275**	**287**	**562**	
			Daily	AM	PM													
		Internal Capture Reduction[3]	7%	10%	11%		268	n/a	10	17	27	19	16	35	20	21	41	
		% Walk/Bike/Transit[4]	2%	2%	2%		97	n/a	3	5	8	5	4	9	5	5	10	
		Resort Iternal Capture[5]	96%	96%	96%		1,624	n/a	42	29	71	98	98	196	100	96	196	
PHASE 1 Trips After application of mixed use internal capture, resort retail capture, walk, bike transit reductions							**3,508**	**n/a**	**92**	**151**	**243**	**144**	**124**	**268**	**151**	**165**	**316**	

Source: Fehr & Peers 2025

Notes:

1. WP Land Use is how the land use is described/named in the 06/04/2024 Winter Park Yield Study.
2. Indicates the ITE Land Use Code, Group, and Name from the Institute of Transportation Engineers – 11th Edition Trip Generation Manual (ITE Manual), 2021
3. The internal capture reduction percentage calculated by MXD+. The internal capture is applied to all land uses except for retail.
4. The walk/bike/transit reduction percentage calculated by MXD+. Applied to all land uses.
5. The resort internal capture calculated from the Palisades Tahoe study. Applied only to retail land uses.

Table 16: Phase 2 Trip Generation 2031

Parcel ID	WP Land Use[1]	Land Use Group[2]	ITE Code[2]	ITE Land Use[2]	Size	Unit	Daily Weekday Trips	Saturday Daily Trips	AM Peak Hour			PM Peak Hour			Saturday Peak			Zone
									In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips	
Phase 1 2029																		
23	Public Parking Garage Retail wrap	Retail	822	Strip Retail Plaza (<40k)	10,000	GSF	545	1,162	14	10	24	33	33	66	34	32	66	Old Town
15	Hotel	Hotel	330	Resort Hotel	110	Rooms	690	n/a	25	10	35	19	26	45	33	44	77	Resort Village
15a	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	96	Dwelling Units	436	439	8	28	36	23	14	37	19	18	37	Resort Village
16	Hotel	Hotel	330	Resort Hotel	105	Rooms	658	n/a	24	10	34	18	25	43	32	42	74	Resort Village
16a	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	50	Dwelling Units	227	229	4	15	19	12	8	20	10	10	20	Resort Village
17	Retail Pavilions	Retail	822	Strip Retail Plaza (<40k)	7,000	GSF	381	813	10	7	17	23	23	46	23	23	46	Resort Village
	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	160	Dwelling Units	726	731	14	45	59	38	24	62	32	31	62	Resort Village
18	Lodge Retail	Retail	822	Strip Retail Plaza (<40k)	14,000	GSF	762	1,626	20	13	33	46	46	92	47	45	92	Resort Village
	Lodge Resort Operations	Office	710	General Office Building	8,000	GSF	87	18	11	1	12	2	10	12	2	2	4	Resort Village
22	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	217	Dwelling Units	985	992	18	62	80	52	33	85	43	41	85	Old Town
Phase 2 2031																		
8	Hotel	Hotel	330	Resort Hotel	150	Rooms	941	n/a	35	13	48	26	35	61	45	60	105	Welcome Village
9	Hotel	Hotel	330	Resort Hotel	130	Rooms	815	n/a	30	12	42	23	30	53	39	52	91	Welcome Village
WV-WF	Workforce Housing	Affordable Housing	223	Affordable Housing - Income Limits	252	Dwelling Units	1,212	5,830	26	65	91	68	48	116	68	48	116	Welcome Village
						ITE Subtotal	**8,465**	**11,838**	**239**	**291**	**530**	**383**	**355**	**738**	**427**	**447**	**874**	
			Daily	AM	PM													
		Internal Capture Reduction[3]	7%	10%	9%		490	n/a	20	27	46	25	23	48	29	31	60	
		% Walk/Bike/Transit[4]	2%	2%	2%		153	n/a	5	7	12	7	7	14	8	8	17	
		Resort Iternal Capture[5]	96%	96%	96%		1,624	n/a	42	29	71	98	98	196	100	96	196	
		PHASE 1&2 Trips After application of mixed use internal capture, resort retail capture, walk, bike transit reductions					**6,197**	**n/a**	**171**	**229**	**400**	**252**	**228**	**480**	**290**	**312**	**602**	

Source: Fehr & Peers 2025

Notes:

1. WP Land Use is how the land use is described/named in the 06/04/2024 Winter Park Yield Study.
2. Indicates the ITE Land Use Code, Group, and Name from the Institute of Transportation Engineers – 11th Edition Trip Generation Manual (ITE Manual), 2021
3. The internal capture reduction percentage calculated by MXD+. The internal capture is applied to all land uses except for retail.
4. The walk/bike/transit reduction percentage calculated by MXD+. Applied to all land uses.
5. The resort internal capture calculated from the Palisades Tahoe study. Applied only to retail land uses.

Table 17: Phase 3 Trip Generation 2033

Parcel ID	WP Land Use[1]	Land Use Group[2]	ITE Code[2]	ITE Land Use[2]	Size	Unit	Daily Weekday Trips	Saturday Daily Trips	AM Peak Hour			PM Peak Hour			Saturday Peak			Zone
									In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips	
Phase 1 2029																		
23	Public Parking Garage Retail wrap	Retail	822	Strip Retail Plaza (<40k)	10,000	GSF	545	1,162	14	10	24	33	33	66	34	32	66	Old Town
15	Hotel	Hotel	330	Resort Hotel	110	Rooms	690	n/a	25	10	35	19	26	45	33	44	77	Resort Village
15a	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	96	Dwelling Units	436	439	8	28	36	23	14	37	19	18	37	Resort Village
16	Hotel	Hotel	330	Resort Hotel	105	Rooms	658	n/a	24	10	34	18	25	43	32	42	74	Resort Village
16a	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	50	Dwelling Units	227	229	4	15	19	12	8	20	10	10	20	Resort Village
17	Retail Pavilions	Retail	822	Strip Retail Plaza (<40k)	7,000	GSF	381	813	10	7	17	23	23	46	23	23	46	Resort Village
	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	160	Dwelling Units	726	731	14	45	59	38	24	62	32	31	62	Resort Village
18	Lodge Retail	Retail	822	Strip Retail Plaza (<40k)	14,000	GSF	762	1,626	20	13	33	46	46	92	47	45	92	Resort Village
	Lodge Resort Operations	Office	710	General Office Building	8,000	GSF	87	18	11	1	12	2	10	12	2	2	4	Resort Village
22	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	217	Dwelling Units	985	992	18	62	80	52	33	85	43	41	85	Old Town
Phase 2 2031																		
8	Hotel	Hotel	330	Resort Hotel	150	Rooms	941	n/a	35	13	48	26	35	61	45	60	105	Welcome Village
9	Hotel	Hotel	330	Resort Hotel	130	Rooms	815	n/a	30	12	42	23	30	53	39	52	91	Welcome Village
WV-WF	Workforce Housing	Affordable Housing	223	Affordable Housing - Income Limits	252	Dwelling Units	1,212	5,830	26	65	91	68	48	116	68	48	116	Welcome Village
Phase 3 2033																		
10	Hotel (Replacement for current Vintage Hotel)	Hotel	330	Resort Hotel	140	Rooms	878	n/a	32	13	45	25	32	57	42	56	98	Welcome Village
11	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	144	Dwelling Units	654	658	12	41	53	34	22	56	29	28	56	Welcome Village
12	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	117	Dwelling Units	531	535	10	33	43	28	18	46	23	22	46	Welcome Village
						ITE Subtotal	**10,527**	**n/a**	**293**	**378**	**671**	**470**	**427**	**897**	**521**	**553**	**1,074**	
			Daily	AM	PM													
		Internal Capture Reduction[3]	7%	10%	8%		651	n/a	26	36	62	31	28	59	35	38	74	
		% Walk/Bike/Transit[4]	2%	2%	2%		199	n/a	7	9	16	9	8	17	10	10	20	
		Resort Iternal Capture[5]	96%	96%	96%		1,624	n/a	42	29	71	98	98	196	100	96	196	
PHASE 1,2&3 Trips After application of mixed use internal capture, resort retail capture, walk, bike transit reductions							**8,053**	**n/a**	**218**	**304**	**522**	**332**	**293**	**625**	**376**	**408**	**784**	

Source: Fehr & Peers 2025

Notes:

1. WP Land Use is how the land use is described/named in the 06/04/2024 Winter Park Yield Study.
2. Indicates the ITE Land Use Code, Group, and Name from the Institute of Transportation Engineers – 11th Edition Trip Generation Manual (ITE Manual), 2021
3. The internal capture reduction percentage calculated by MXD+. The internal capture is applied to all land uses except for retail.
4. The walk/bike/transit reduction percentage calculated by MXD+. Applied to all land uses.
5. The resort internal capture calculated from the Palisades Tahoe study. Applied only to retail land uses.

Table 18: Phase 4 (Full Buildout) Trip Generation 2037

Parcel ID	WP Land Use[1]	Land Use Group[2]	ITE Code[2]	ITE Land Use[2]	Size	Unit	Daily Weekday Trips	Saturday Daily Trips	AM In Trips	AM Out Trips	AM Total Trips	PM In Trips	PM Out Trips	PM Total Trips	Satu In Trips	Satu Out Trips	Satu Total Trips	Zone
Phase 1 2029																		
23	Public Parking Garage Retail wrap	Retail	822	Strip Retail Plaza (<40k)	10,000	GSF	545	1,162	14	10	24	33	33	66	34	32	66	Old Town
15	Hotel	Hotel	330	Resort Hotel	110	Rooms	690	n/a	25	10	35	19	26	45	33	44	77	Resort Village
15a	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	96	Dwelling Units	436	439	8	28	36	23	14	37	19	18	37	Resort Village
16	Hotel	Hotel	330	Resort Hotel	105	Rooms	658	n/a	24	10	34	18	25	43	32	42	74	Resort Village
16a	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	50	Dwelling Units	227	229	4	15	19	12	8	20	10	10	20	Resort Village
17	Retail Pavilions	Retail	822	Strip Retail Plaza (<40k)	7,000	GSF	381	813	10	7	17	23	23	46	23	23	46	Resort Village
18	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	160	Dwelling Units	726	731	14	45	59	38	24	62	32	31	62	Resort Village
	Lodge Retail	Retail	822	Strip Retail Plaza (<40k)	14,000	GSF	762	1,626	20	13	33	46	46	92	47	45	92	Resort Village
	Lodge Resort Operations	Office	710	General Office Building	8,000	GSF	87	18	11	1	12	2	10	12	2	2	4	Resort Village
22	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	217	Dwelling Units	985	992	18	62	80	52	33	85	43	41	85	Old Town
Phase 2 2031																		
8	Hotel	Hotel	330	Resort Hotel	150	Rooms	941	n/a	35	13	48	26	35	61	45	60	105	Welcome Village
9	Hotel	Hotel	330	Resort Hotel	130	Rooms	815	n/a	30	12	42	23	30	53	39	52	91	Welcome Village
WV-WF	Workforce Housing	Affordable Housing	223	Affordable Housing - Income Limits	252	Dwelling Units	1,212	5,830	26	65	91	68	48	116	68	48	116	Welcome Village
Phase 3 2033																		
10	Hotel (Replacement for current Vintage Hotel)	Hotel	330	Resort Hotel	140	Rooms	878	n/a	32	13	45	25	32	57	42	56	98	Welcome Village
11	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	144	Dwelling Units	654	658	12	41	53	34	22	56	29	28	56	Welcome Village
12	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	117	Dwelling Units	531	535	10	33	43	28	18	46	23	22	46	Welcome Village
Phase 4 2037																		
2	Cottages / Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	64	Dwelling Units	291	292	6	18	24	15	10	25	13	12	25	Retreat
3	Hotel	Hotel	330	Resort Hotel	140	Keys	878	n/a	32	13	45	25	32	57	42	56	98	Retreat
4	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	123	Dwelling Units	558	562	11	35	46	29	19	48	24	24	48	Retreat
5	Cottages / Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	51	Dwelling Units	232	233	4	15	19	12	8	20	10	10	20	Retreat
6	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	139	Dwelling Units	631	635	12	39	51	33	21	54	28	27	54	Retreat
13	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	121	Dwelling Units	549	553	10	35	45	29	18	47	24	23	47	Welcome Village
14	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	58	Dwelling Units	263	265	5	16	21	14	9	23	12	11	23	Welcome Village
20	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	59	Dwelling Units	268	270	5	17	22	14	9	23	12	11	23	Old Town
21	Condos	Residential	221	Multifamily Housing (Mid-Rise) not close to rail transi	222	Dwelling Units	1,008	1,015	19	63	82	53	34	87	44	42	87	Old Town
7	Public Parking Garage Retail wrap	Retail	822	Strip Retail Plaza (<40k)	10,000	GSF	545	1,162	14	10	24	33	33	66	34	32	66	Welcome Village
					ITE Subtotal		**15,750**	**n/a**	**411**	**639**	**1,050**	**727**	**620**	**1,347**	**763**	**801**	**1,564**	
			Daily	AM	PM													
		Internal Capture Reduction[3]	7%	10%	8%		931	n/a	34	57	91	46	37	83	48	52	100	
		% Walk/Bike/Transit[4]	2%	3%	2%		325	n/a	11	16	27	15	13	28	16	17	33	
		Resort Iternal Capture[5]	96%	96%	96%		2,148	n/a	56	38	94	130	130	260	132	127	259	
PHASE 4 Trips After application of mixed use internal capture, resort retail capture, walk, bike transit							**12,346**	**n/a**	**311**	**527**	**838**	**536**	**440**	**976**	**567**	**606**	**1,173**	

Source: Fehr & Peers 2025

Notes:

1. WP Land Use is how the land use is described/named in the 06/04/2024 Winter Park Yield Study.
2. Indicates the ITE Land Use Code, Group, and Name from the Institute of Transportation Engineers – 11th Edition Trip Generation Manual (ITE Manual), 2021
3. The internal capture reduction percentage calculated by MXD+. The internal capture is applied to all land uses except for retail.
4. The walk/bike/transit reduction percentage calculated by MXD+. Applied to all land uses.
5. The resort internal capture calculated from the Palisades Tahoe study. Applied only to retail land uses.

Skier Trip Generation

For the build conditions, the study removed all existing skier traffic entering or exiting Winter Park Resort from the network. The skier trips were calculated using the maximum capacity of the Resort during each phase of the development. This method provides the most conservative analysis of the skier traffic because it is unlikely that the Resort will regularly reach maximum capacity.

The maximum capacity was turned into vehicles by dividing the maximum capacity by the average vehicle occupancy (AVO.) An AVO of about 2.5 was estimated from previous reports and peer sites and confirmed by the Alterra team. The Saturday PM peak hour trips were calculated using the count data collected on Saturday, March 12, 2022.

Table 19 shows the skier trip generation to and from Winter Park Resort and Mary Jane both for day skier traffic as well as reduced traffic due to increased extended stay skiers.

Skier Growth

In existing conditions, approximately 18,000 skiers visit Winter Park Resort on peak days (holiday weekends.) Alterra is planning for skier capacity to grow as following for each phase:

- **Phase 1 maximum capacity**: 19,500 skiers
- **Phase 2 maximum capacity**: 21,000 skiers
- **Phase 3 maximum capacity**: 22,500 skiers
- **Phase 4 maximum capacity**: 24,000 skiers

Resort Base Lodging Reductions

The proposed redevelopment of the Winter Park Resort with hotels and condominiums aims to capture more extended stay skiers that results in a reduction in trips taken by day skiers. Alterra provided the estimations for the average winter season occupancy, average people per room, guest-to-skier conversion, and overnight stays converted to ski days. It is assumed that most skiers who lodge at the base will arrive and depart outside of the current peak travel times. For example, extended stay skiers will most likely arrive on a Thursday or Friday afternoon or evening and depart early Sunday morning or Sunday afternoon rather on Saturday morning and Saturday afternoon (the current travel patterns of most day skiers.)

Therefore, the current number of day skiers traveling to Winter Park Resort were reduced by the number of hotel rooms and condominium units available during each phase. The following sections show how the number of hotel rooms and condominium units were converted to extended stay skiers.

Day-skier reduction due to on-site Hotels

The day skier reduction percentage is calculated by dividing the number of day skiers reduced in each phase by the maximum capacity of the phase. The number of day skiers reduced in each phase is calculated by multiplying the number of hotel rooms available in the phase by the average winter season

occupancy, average number of people per room, the guest-to-skier conversion, and the nights stayed converted to ski days. Below is the information provided by Alterra regarding hotel estimates:

- **Average winter season occupancy**: 70%
- **Average people per room**: 2.5
- **Guest-to-skier conversion**: 80%
- **Nights converted to ski days**: 80%

An example of the calculation is as follows:

> In Phase 1, there are 215 hotel rooms. Following the assumptions described above, those hotel rooms convert to 241 extended stay skiers. The capacity of the resort in Phase 1 is 19,500, meaning 1.2% of total skiers will not drive to the resort during peak hours due to delivery of new hotel rooms in Phase 1.

215	X	70%	X	2.5	X	80%	X	80%	=	**241**
Hotel rooms		Average winter occupancy		Average guests/room		Guest-to-skier conversion		Nights-to-ski-days		**Total skiers**

Calculation for Phase 1 Hotel Extended Stay Skier Trip Reduction

Day-skier reduction due to on-site Condominiums

The condominium reduction percentage is calculated by dividing the number of skiers reduced in each phase by the maximum capacity of the phase. The number of skiers reduced in each phase is calculated by multiplying the number of condominium units available in the phase by the average winter season occupancy, average number of people per room, the guest to skier conversion, and the nights stayed converted to ski days. Below is the information provided by Alterra regarding condominium estimates:

- **Average winter season occupancy**: 50%
- **Average people per room**: 3.5
- **Guest-to-skier conversion**: 80%
- **Nights converted to ski days**: 80%

An example of the calculation is as follows:

> In Phase 1, there are 523 condominium units. Following the assumptions described above, those condominiums convert to 586 extended stay skiers. The capacity of the resort in Phase 1 is 19,500, meaning 3% of total skiers will not drive to the resort during peak hours due to delivery of new condos in Phase 1.

523	X	50%	X	3.5	X	80%	X	80%	=	**523**
Condos		Average winter occupancy		Average guests/room		Guest-to-skier conversion		Nights-to-ski-days		**Total skiers**

Calculation for Phase 1 Condominium Extended Stay Skier Trip Reduction

Linger Longer Reduction

The nature of the planned development encourages visitors to "linger longer" at the Winter Park Resort. An estimated 4,000 additional restaurant and bar seats are proposed on the site by the end of Phase 4. These additional seats will allow visitors to dine on-site after skiing and avoid traveling during the PM peak hour. To calculate how many skiers would not be traveling during the PM peak hour, the "linger longer" reduction percentage was conservatively estimated to be 7% at full build out. As the phasing plan presents varying additions of food and beverage seats per phase, the "linger longer" reduction percentage grows proportionally based on the estimated number of new food and beverage seats available.

In Phase 4, it is expected that about 530 skiers or 215 vehicles will not travel during the Saturday PM peak hour.

Ski Train Reduction

The Winter Park ski train will have an increased number of trains traveling to Winter Park Resort in the future. This study assumes that only one train will impact the number of skier vehicles traveling during Saturday PM peak hour. The Winter Park ski train that departs during the PM peak hour has a capacity of 400 people. The current occupancy of the train is about 70%, by the time the first phase is complete, Alterra expects the occupancy to grow to about 80%. This means that about 320 skiers will not be driving to the resort and leaving during the PM peak hour, which translates to about 128 vehicles. Proposals to increase daily service between the Denver Metropolitan Area and Winter Park Resort could be assumed to further reduce vehicle trips beyond what was included in this analysis.

Table 19: Skier Trip Generation

	Maximum Capacity	Saturday Daily Trips	Saturday Peak Trips		
			In	Out	Total Trips
			Trips	Trips	
Phase 1 Skiers 2029					
Raw Ski Trips	**19,500**	**7,800**	**549**	**1,947**	**2,496**
% Linger Longer	3.3%		18	65	83
% Staying at the Resort (Hotel)	1.2%		7	24	31
% Staying at the Resort (Condo)	3.0%		16	58	75
Taking Train during Peak Hour			0	128	128
		Total Reductions	42	275	317
		PHASE 1 Ski Trips After Reductions	**508**	**1,672**	**2,179**
Phase 2 Skiers 2031					
Raw Ski Trips	**21,000**	**8,400**	**591**	**2,097**	**2,688**
% Linger Longer	4.0%		24	84	108
% Staying at the Resort (Hotel)	2.6%		16	55	71
% Staying at the Resort (Condo)	2.8%		16	58	75
Taking Train during Peak Hour			0	128	128
		Total Reductions	56	326	382
		PHASE 2 Ski Trips After Reductions	**535**	**1,770**	**2,306**
Phase 3 Skiers 2033					
Raw Ski Trips	**22,500**	**9,000**	**634**	**2,246**	**2,880**
% Linger Longer	5.1%		32	114	146
% Staying at the Resort (Hotel)	3.2%		20	71	91
% Staying at the Resort (Condo)	3.9%		25	88	112
Taking Train during Peak Hour			0	128	128
		Total Reductions	77	401	478
		PHASE 3 Ski Trips After Reductions	**557**	**1,846**	**2,402**
Phase 4 Skiers 2037					
Raw Ski Trips	**24,000**	**9,600**	**676**	**2,396**	**3,072**
% Linger Longer	7.0%		47	168	215
% Staying at the Resort (Hotel)	3.6%		24	87	111
% Staying at the Resort (Condo)	7.6%		51	181	232
Taking Train during Peak Hour			0	128	128
		Total Reductions	123	564	687
		PHASE 4 Ski Trips After Reductions	**553**	**1,833**	**2,385**

Trip Distribution

Fehr & Peers examined existing traffic counts and StreetLight data to determine the share of inbound and outbound trips entering and exiting the site in the PM peak. **Figure 15** shows the share of inbound trips entering the site at each access and the share of outbound trips exiting the site at each access. Dark blue percentages of inbound trips sum to 100% and pink percentages of outbound trips sum to 100%.

Project traffic was assigned to the roadway network based on the proximity to major streets and freeways, population densities, and local and regional attractions. Existing travel patterns revealed traffic count data, and the Streetlight data also provided helpful guidance to establish these distribution percentages, especially close to the site.

During the PM peak, most outbound trips travel northbound on US 40 toward the Fraser Valley (75%), which reflects patterns observed in the regional travel analysis. Inbound trips enter primarily from the north of the site (55%).

Figure 15: Saturday PM Site-Generated Directional Distribution

Trip Assignment

The project trips from the development trip generation and skier trip generation were distributed per **Figure 15** and assigned to the study intersections. This analysis assumes that the Old Town parking garage is going to be built first, meaning most of the ski trips are directed to that garage. Because the Winter Park parking lot and the overflow lot will still be open, a small percentage of ski traffic was directed to those locations. Once the Welcome Village parking garage is built in the Full Build scenario, the ski traffic is split evenly between the two locations.

Figure 16 and **Figure 17** show Phase 1+Ski trip assignment, **Figure 18** and **Figure 19** show Phase 1+2+Ski trip assignment, **Figure 20** and **Figure 21** show Phase 1+2+3+Ski trip assignment, and **Figure 22** and **Figure 23** show Full Build+Ski trip assignment.

Phase 1+Ski Trip Assignment

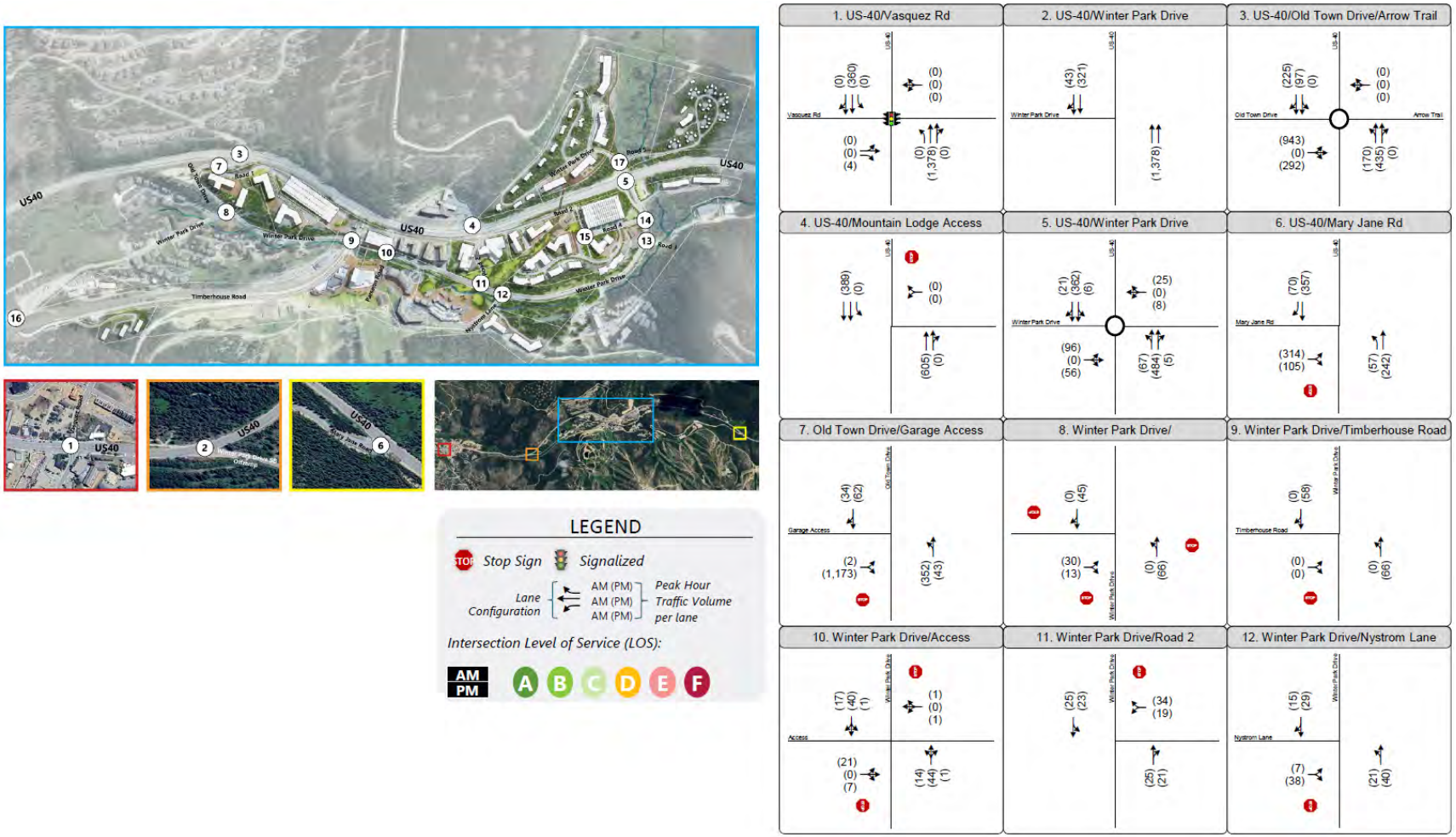


Figure 16: Phase 1+Ski Assigned Trip Volumes – Intersections #1-#12

Figure 17: Phase 1+Ski Assigned Trip Volumes – Intersections #13-#17

Phase 1+2+Ski Trip Assignment

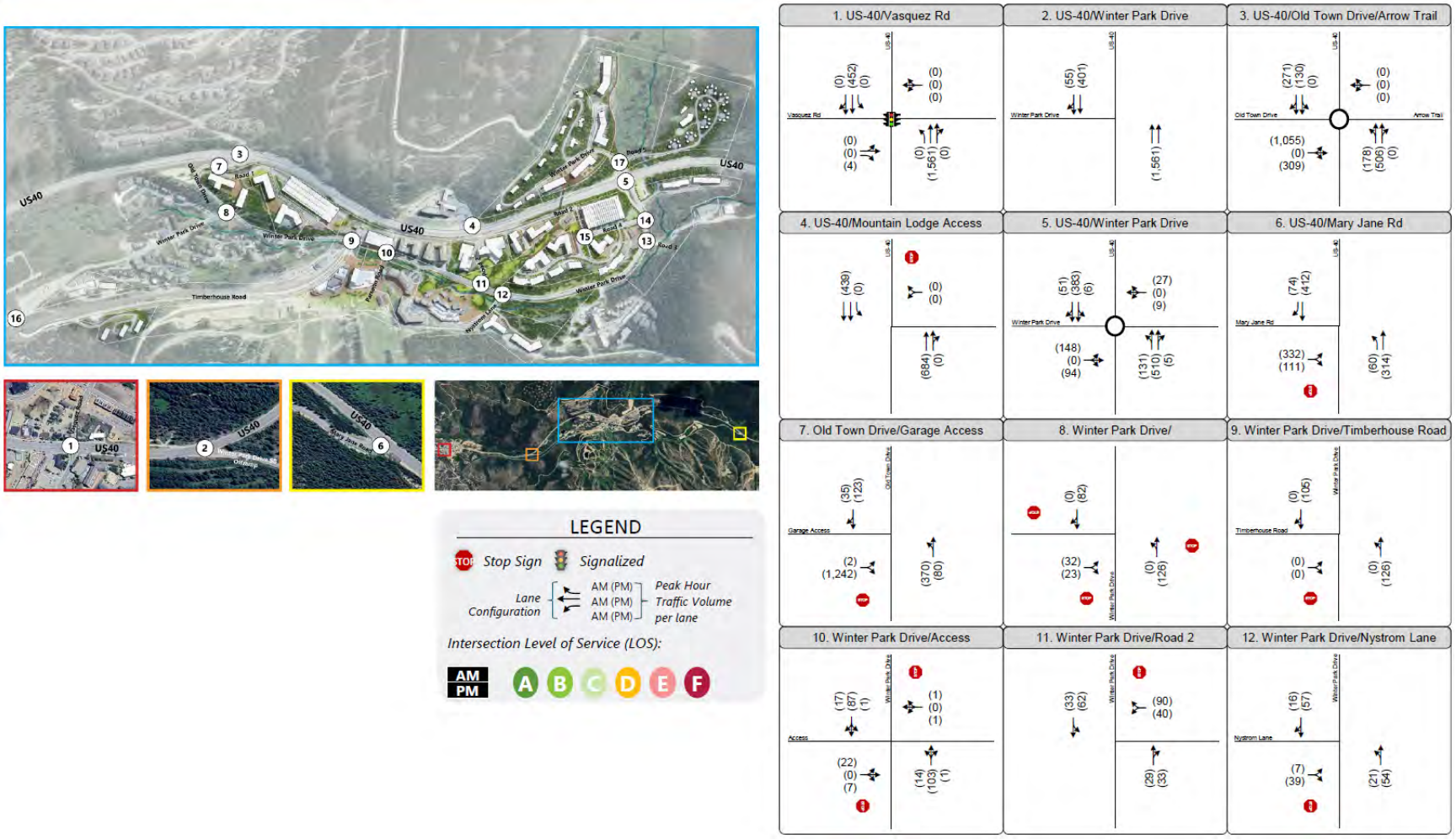


Figure 18: Phase 1+2+Ski Assigned Trip Volumes - Intersections #1-#12

Figure 19: Phase 1+2+Ski Assigned Trip Volumes - Intersections #13-#17

Phase 1+2+3+Ski Trip Assignment

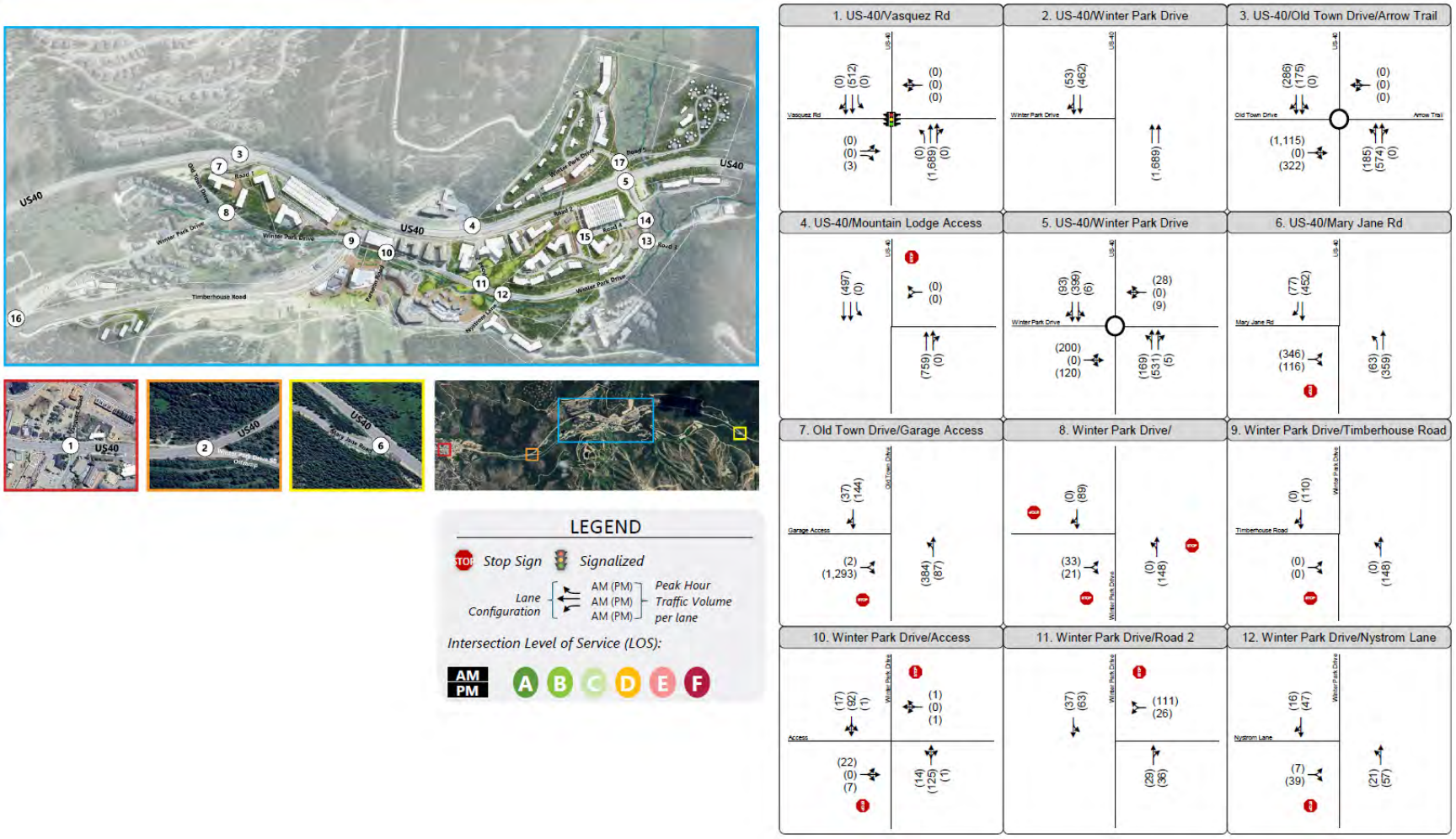


Figure 20: Phase 1+2+3+Ski Assigned Trip Volumes - Intersections #1-#12

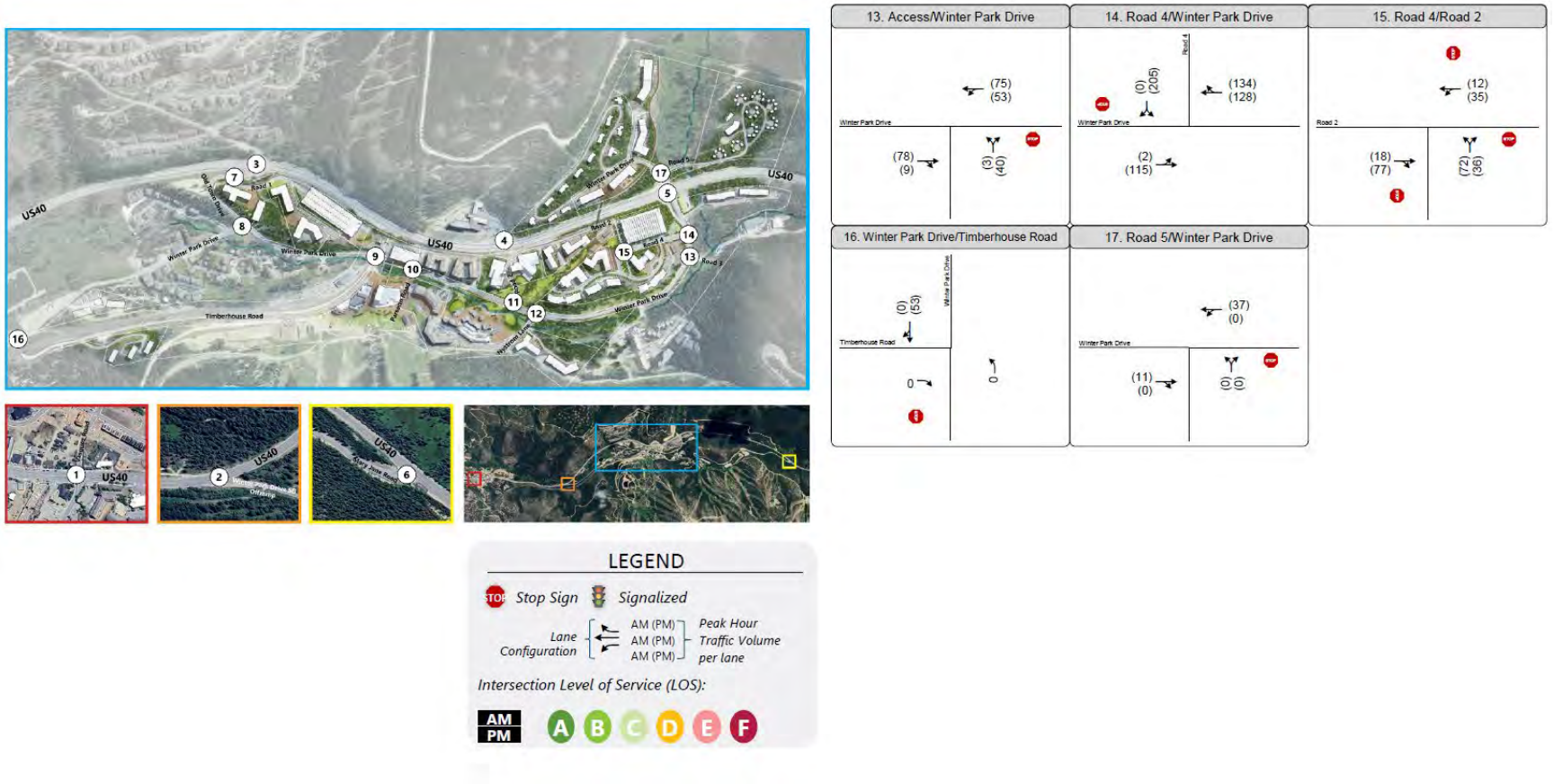


Figure 21: Phase 1+2+3+Ski Assigned Trip Volumes - Intersections #3-#17

Full Build+Ski Trip Assignment

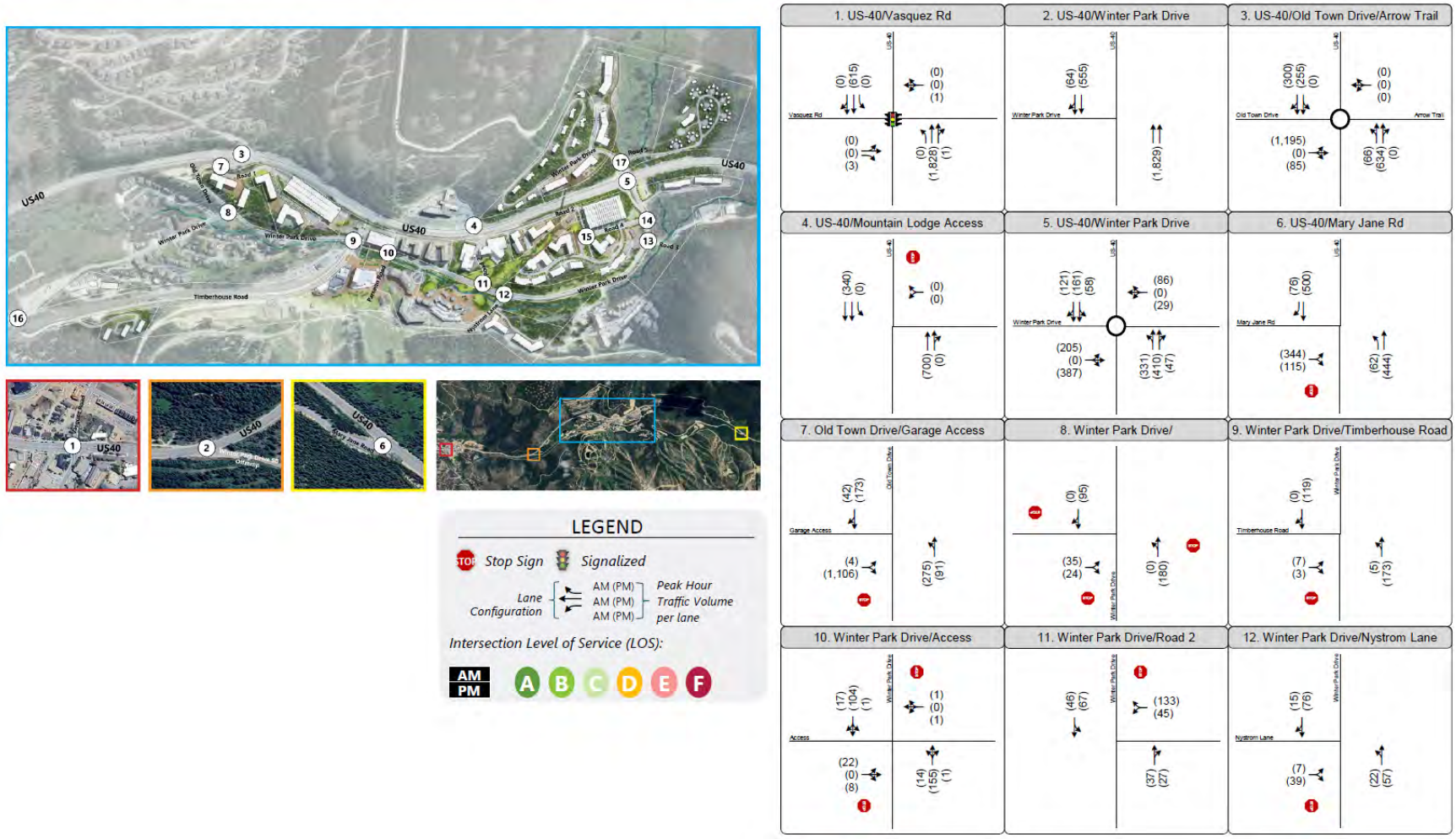


Figure 22: Full Build+Ski Assigned Trip Volumes – Intersections #1-#12

Figure 23: Full Build+Ski Assigned Trip Volumes - Intersections #13-#17

Project Build Volumes and LOS Analysis

The project trips and background traffic (with existing skiers removed from the background traffic) for each phase were added together to create the build volumes. The build conditions were then analyzed as described in the **Level of Service (LOS) Analysis** section.

Phase 1+Ski 2029

Figure 24 and **Figure 25** show Phase 1 2029 build volumes and **Table 20** shows the LOS results.

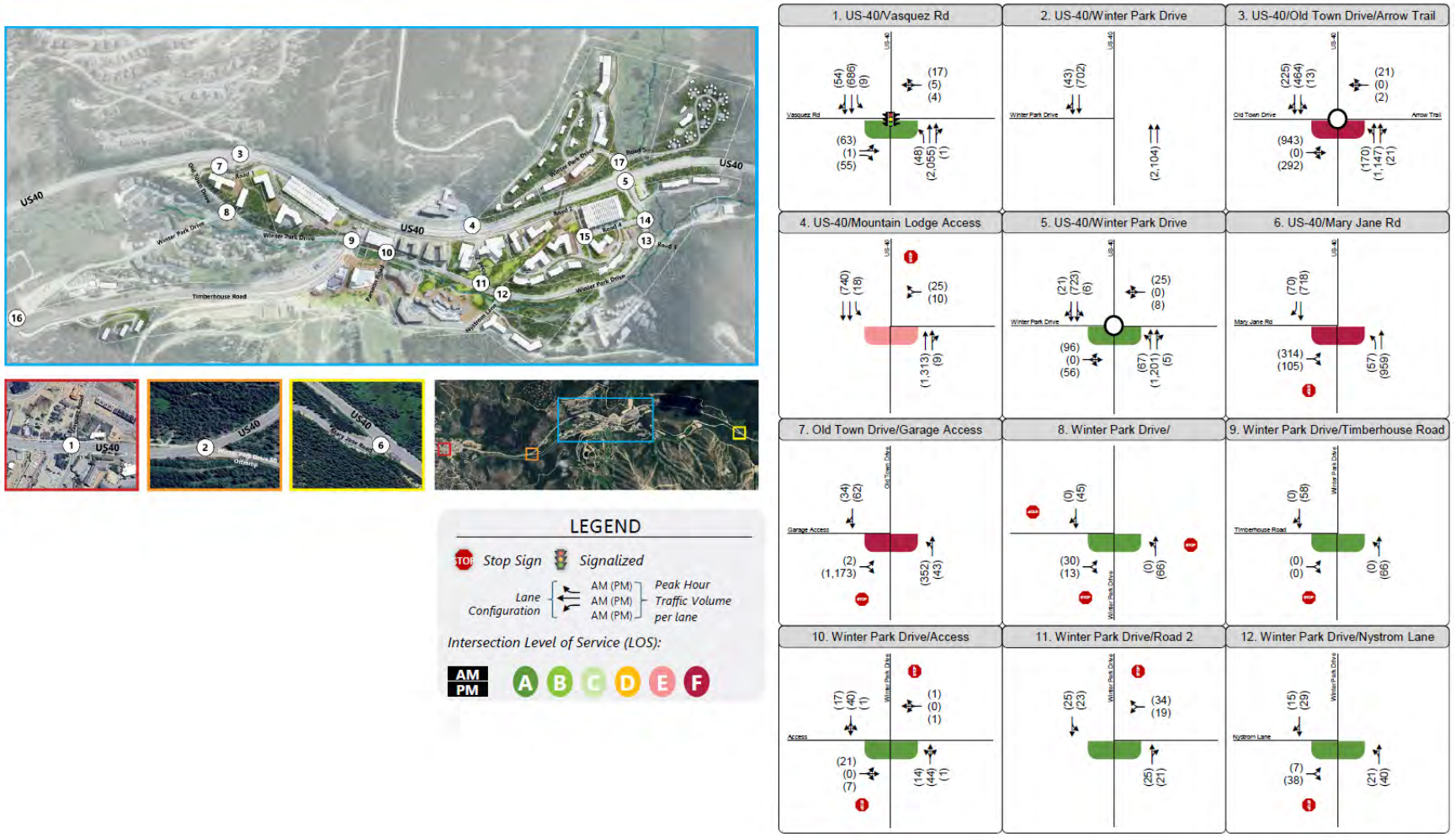


Figure 24: Phase 1+Ski 2029 Build Volumes – Intersections #1-#12

Figure 25: Phase 1+Ski 2029 Build Volumes – Intersections #13-#17

Table 20: Phase 1 Build 2029 Saturday PM LOS Results

Intersection #	Intersection Name	Control Type	Delay[2]	LOS[2]	Worst Movement[3]
1	US-40 & Vasquez Road	Signal	9	A	-
3	US-40 & Old Town Drive	Roundabout	**131**	**F**	-
4	US-40 & Mountain Lodge Access	SSSC	36	E	WB
5	US-40 & Winter Park Drive (south)	Roundabout	8	A	-
6	US-40 & Mary Jane Road	SSSC	**2151**	**F**	**EB**
7	Old Town Drive & Garage Access	SSSC	**166**	**F**	**EB**
8	Winter Park Drive & Old Town Drive	AWSC	7	A	-
9	Winter Park Drive & Timberhouse Road	SSSC	0	A	EB
10	Winter Park Drive & Access	SSSC	9	A	EB
11	Winter Park Drive & Road 2	SSSC	9	A	EB
12	Winter Park Drive & Nystrom Lane	SSSC	9	A	EB
13	Winter Park Drive & Access	SSSC	0	A	-
14	Winter Park Drive & Road 4	SSSC	10	A	SB
15	Road 4 & Road 2	AWSC	7	A	-
16	Winter Park Drive & Timberhouse Road	SSSC	0	A	-
17	Winter Park Drive & Road 5	SSSC	0	A	-

Source: HCM 2016, Fehr & Peers
Notes:
Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

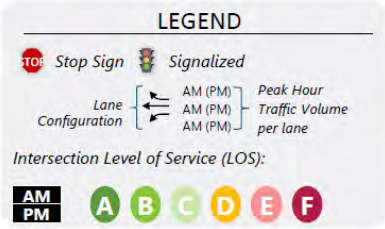
When Phase 1 is completed in 2029, most of the study intersections are projected to operate acceptably. However, the following intersections are anticipated to perform at a LOS F:

- #3: US-40 & Old Town Drive
- #6: US-40 & Mary Jane Road
- #7: Old Town Drive & Garage Access

The proposed mitigations for these intersections include signalizing US-40 & Mary Jane Road and constructing a roundabout at Old Town Drive & Garage Access. While the intersection of US-40 & Old Town Drive is projected to operate at LOS F, it should be noted that the highest delay on US 40 is only 61 seconds. Again, this is during the highest volume period, so during normal operations, the intersection will operate acceptably.

Phase 1+2+Ski 2031

Figure 26 and **Figure 27** show Phase 1+2+Ski build volumes and **Table 21** shows the LOS results.



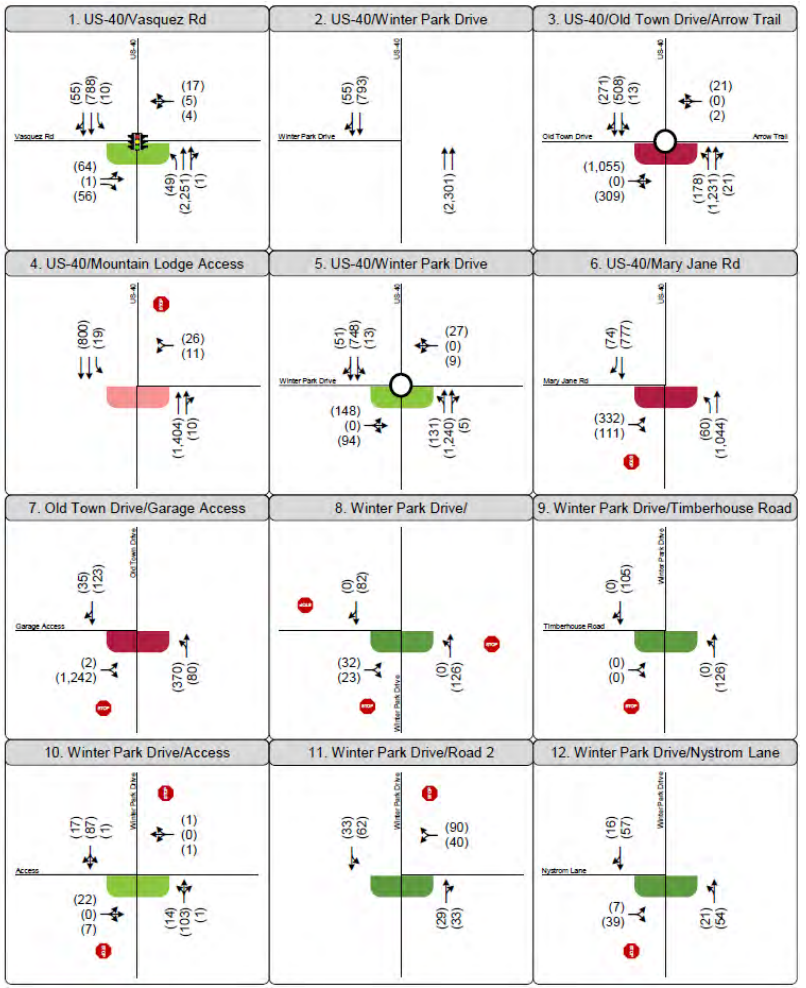


Figure 26: Phase 1+2+Ski 2031 Build Volumes - Intersections #1-#12

Figure 27: Phase 1+2+Ski 2031 Build Volumes - Intersections #13-#17

Table 21: Phase 2 Build 2031 Saturday PM LOS Results

Intersection #	Intersection Name	Control Type	Delay[2]	LOS[2]	Worst Movement[3]
1	US-40 & Vasquez Road	Signal	14	B	-
3	US-40 & Old Town Drive	Roundabout	**177**	**F**	-
4	US-40 & Mountain Lodge Access	SSSC	46	E	WB
5	US-40 & Winter Park Drive (south)	Roundabout	13	B	-
6	US-40 & Mary Jane Road	SSSC	**3007**	**F**	**EB**
7	Old Town Drive & Garage Access	SSSC	**256**	**F**	**EB**
8	Winter Park Drive & Old Town Drive	AWSC	8	A	-
9	Winter Park Drive & Timberhouse Road	SSSC	0	A	EB
10	Winter Park Drive & Access	SSSC	10	B	EB
11	Winter Park Drive & Road 2	SSSC	10	A	WB
12	Winter Park Drive & Nystrom Lane	SSSC	9	A	EB
13	Winter Park Drive & Access	SSSC	9	A	NB
14	Winter Park Drive & Road 4	SSSC	11	B	SB
15	Road 4 & Road 2	AWSC	7	A	-
16	Winter Park Drive & Timberhouse Road	SSSC	0	A	-
17	Winter Park Drive & Road 5	SSSC	0	A	-

Source: HCM 2016, Fehr & Peers
Notes:
Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

When Phase 2 is complete in 2031, most of the intersections are projected to operate acceptably. However, the following intersections are anticipated to perform at an LOS F:

- #3: US-40 & Old Town Drive
- #6: US-40 & Mary Jane Road
- #7: Old Town Drive & Garage Access

The proposed mitigations for these intersections include signalizing US-40 & Mary Jane Road and constructing a roundabout at Old Town Drive & Garage Access. While the intersection of US-40 & Old Town Drive is projected to operate at LOS F, it should be noted that the highest delay on US 40 is only 72 seconds. Again, this is during the highest volume period, so during normal operations, the intersection will operate acceptably.

Phase 1+2+3+Ski 2033

Figure 28 and **Figure 29** show the Phase 1+2+3+Ski build volumes and **Table 22** shows the LOS results.

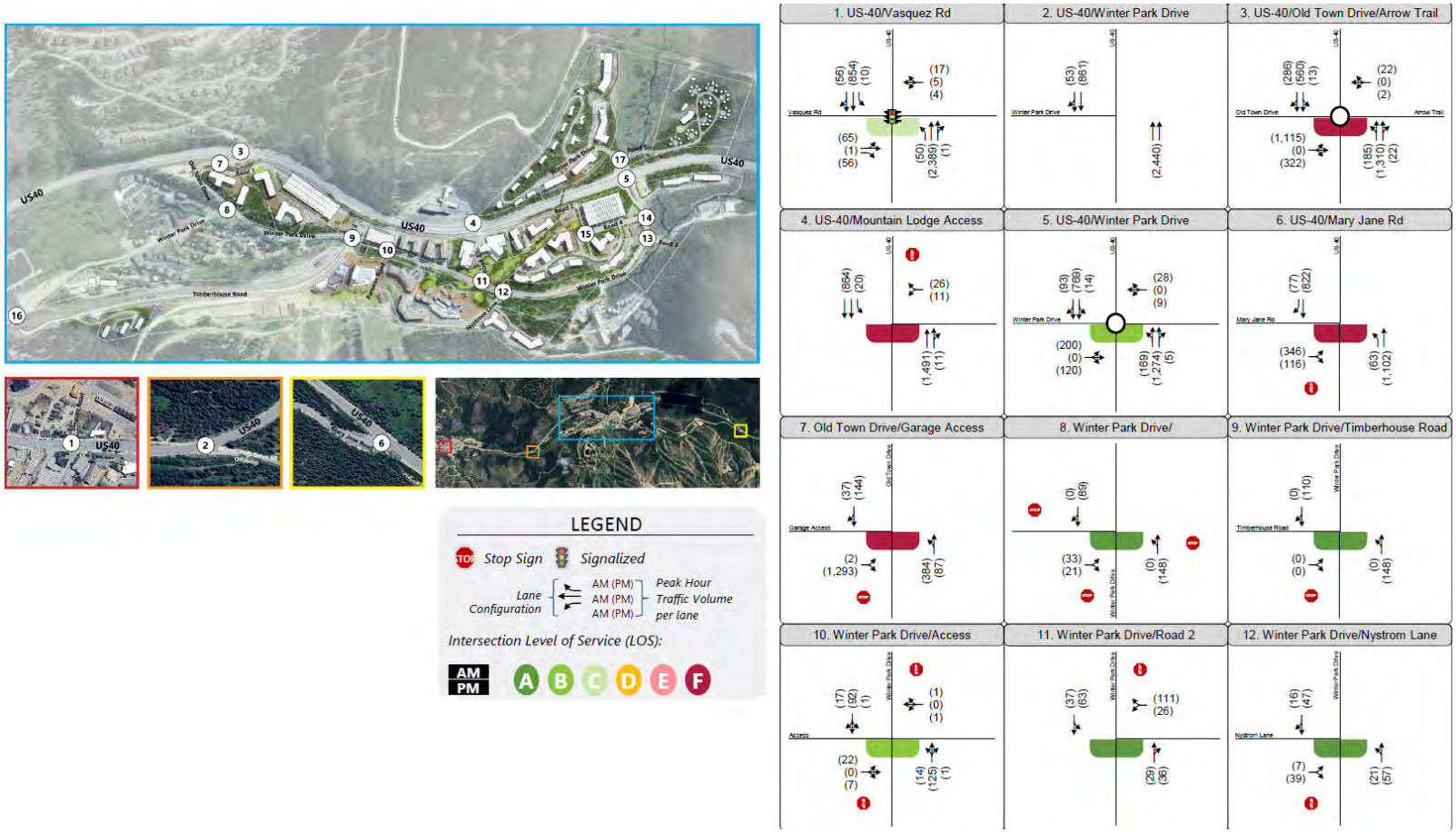


Figure 28: Phase 1+2+3+Ski 2033 Build Volumes – Intersections #1-#12

Figure 29: Phase 1+2+3+Ski 2033 Build Volumes – Intersections #13-#17

Table 22: Phase 3 Build 2033 Saturday PM LOS Results

Intersection #	Intersection Name	Control Type	Delay[2]	LOS[2]	Worst Movement[3]
1	US-40 & Vasquez Road	Signal	20	C	-
3	US-40 & Old Town Drive	Roundabout	**211**	**F**	**-**
4	US-40 & Mountain Lodge Access	SSSC	**58**	**F**	**WB**
5	US-40 & Winter Park Drive (south)	Roundabout	16	B	-
6	US-40 & Mary Jane Road	SSSC	**3880**	**F**	**EB**
7	Old Town Drive & Garage Access	SSSC	**306**	**F**	**EB**
8	Winter Park Drive & Old Town Drive	AWSC	8	A	-
9	Winter Park Drive & Timberhouse Road	SSSC	0	A	EB
10	Winter Park Drive & Access	SSSC	10	B	EB
11	Winter Park Drive & Road 2	SSSC	10	A	EB
12	Winter Park Drive & Nystrom Lane	SSSC	9	A	EB
13	Winter Park Drive & Access	SSSC	9	A	NB
14	Winter Park Drive & Road 4	SSSC	13	B	SB
15	Road 4 & Road 2	AWSC	8	A	-
16	Winter Park Drive & Timberhouse Road	SSSC	0	A	-
17	Winter Park Drive & Road 5	SSSC	0	A	-

Source: HCM 2016, Fehr & Peers
Notes:
Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

When Phase 3 is complete in 2033, most of the intersections are projected to operate acceptably. However, the following intersections are anticipated to perform at an LOS F:

- #3: US-40 & Old Town Drive
- #4: US-40 & Mountain Lodge Access
- #6: US-40 & Mary Jane Road
- #7: Old Town Drive & Garage Access

The proposed mitigations for these intersections include signalizing US-40 & Mary Jane Road and constructing a roundabout at Old Town Drive and Garage Access. Restricting the westbound movement at US-40 & Mountain Lodge Access to be right-out only will resolve the delay. While the intersection of US-40 & Old Town Drive is projected to operate at LOS F, it should be noted that the highest delay on US 40 is only 77 seconds. Again, this is during the highest volume period, so during normal operations, the intersection will operate acceptably.

Full Build+Ski 2037

Figure 30 and **Figure 31** show the full build 2037 volumes and **Table 23** shows the LOS results.

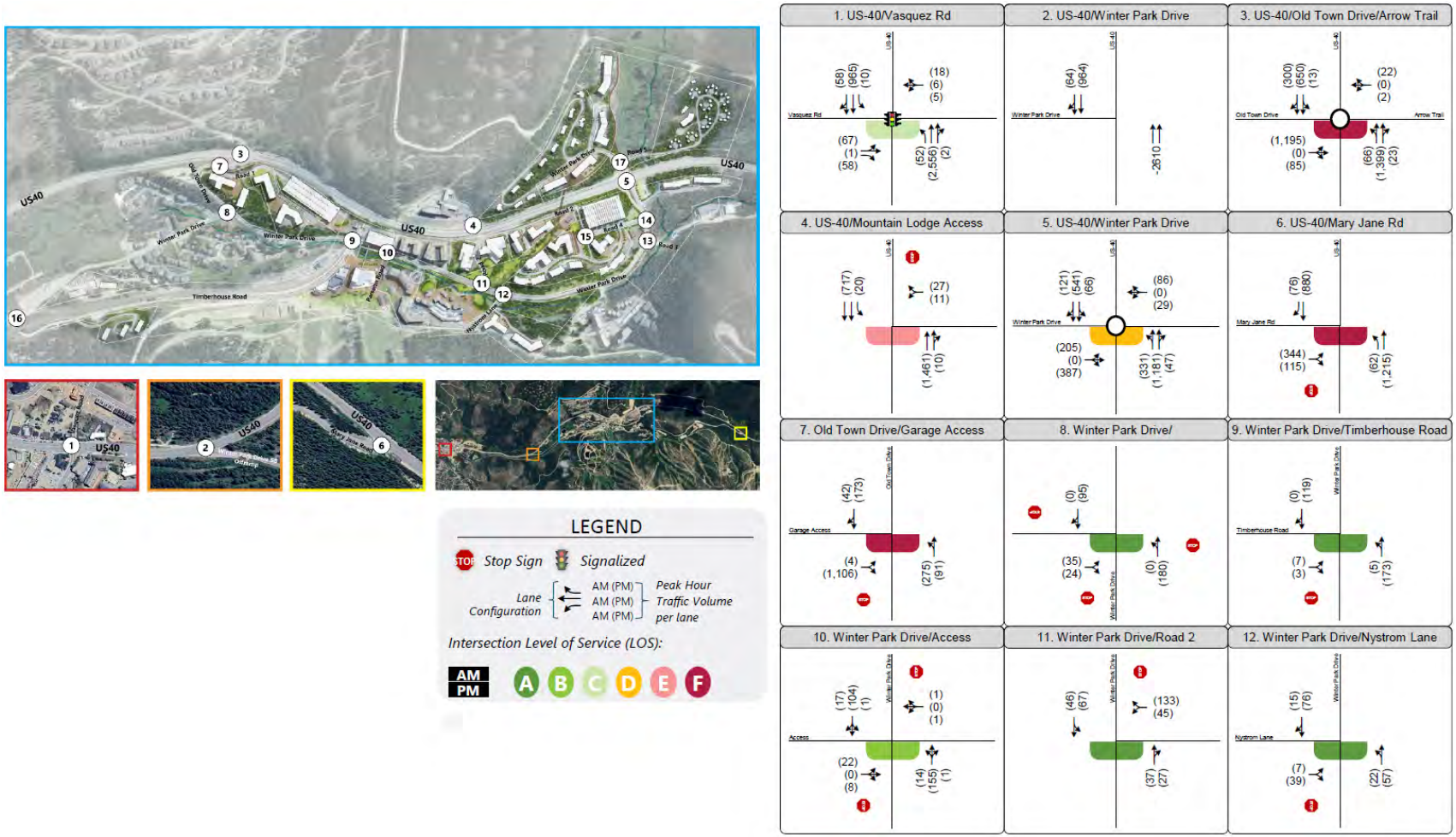


Figure 30: Full Build 2037 Volumes – Intersections #1-#12

Figure 31: Full Build 2037 Volumes – Intersections #13-#17

Table 23: Full Build 2037 Saturday PM LOS Results

Intersection #	Intersection Name	Control Type	Delay[2]	LOS[2]	Worst Movement[3]
1	US-40 & Vasquez Road	Signal	34	C	-
3	US-40 & Old Town Drive	Roundabout	**193**	**F**	**-**
4	US-40 & Mountain Lodge Access	SSSC	49	E	WB
5	US-40 & Winter Park Drive (south)	Roundabout	27	D	-
6	US-40 & Mary Jane Road	SSSC	**5213**	**F**	**EB**
7	Old Town Drive & Garage Access	SSSC	**234**	**F**	**EB**
8	Winter Park Drive & Old Town Drive	AWSC	8	A	-
9	Winter Park Drive & Timberhouse Road	SSSC	10	A	EB
10	Winter Park Drive & Access	SSSC	11	B	EB
11	Winter Park Drive & Road 2	SSSC	10	A	WB
12	Winter Park Drive & Nystrom Lane	SSSC	9	A	EB
13	Winter Park Drive & Access	SSSC	9	A	NB
14	Winter Park Drive & Road 4	SSSC	47	E	SB
15	Road 4 & Road 2	AWSC	8	A	-
16	Winter Park Drive & Timberhouse Road	SSSC	0	A	-
17	Winter Park Drive & Road 5	SSSC	10	A	NB

Source: HCM 2016, Fehr & Peers
Notes:
Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

When Phase 4 is completed in 2037, the following intersections are anticipated to perform at an LOS F:

- #3: US-40 & Old Town Drive
- #6: US-40 & Mary Jane Road
- #7: Old Town Drive & Garage Access

The intersection of US-40 & Mountain Lodge Access improves from the previous scenario because the second garage will be open, and less traffic will be going through the intersection. The proposed mitigations for these intersections include signalizing US-40 & Mary Jane Road and constructing a roundabout at Old Town Drive & Garage Access. While the intersection of US-40 & Old Town Drive is projected to operate at LOS F, it should be noted that the highest delay on US 40 is 122 seconds. Again, this is during the highest volume period, so during normal operations, the intersection will operate acceptably.

Full Build+Ski Build Volumes (2050)

Figure 32 and **Figure 33** shows the full build 2050 volumes and **Table 24** shows the LOS results.

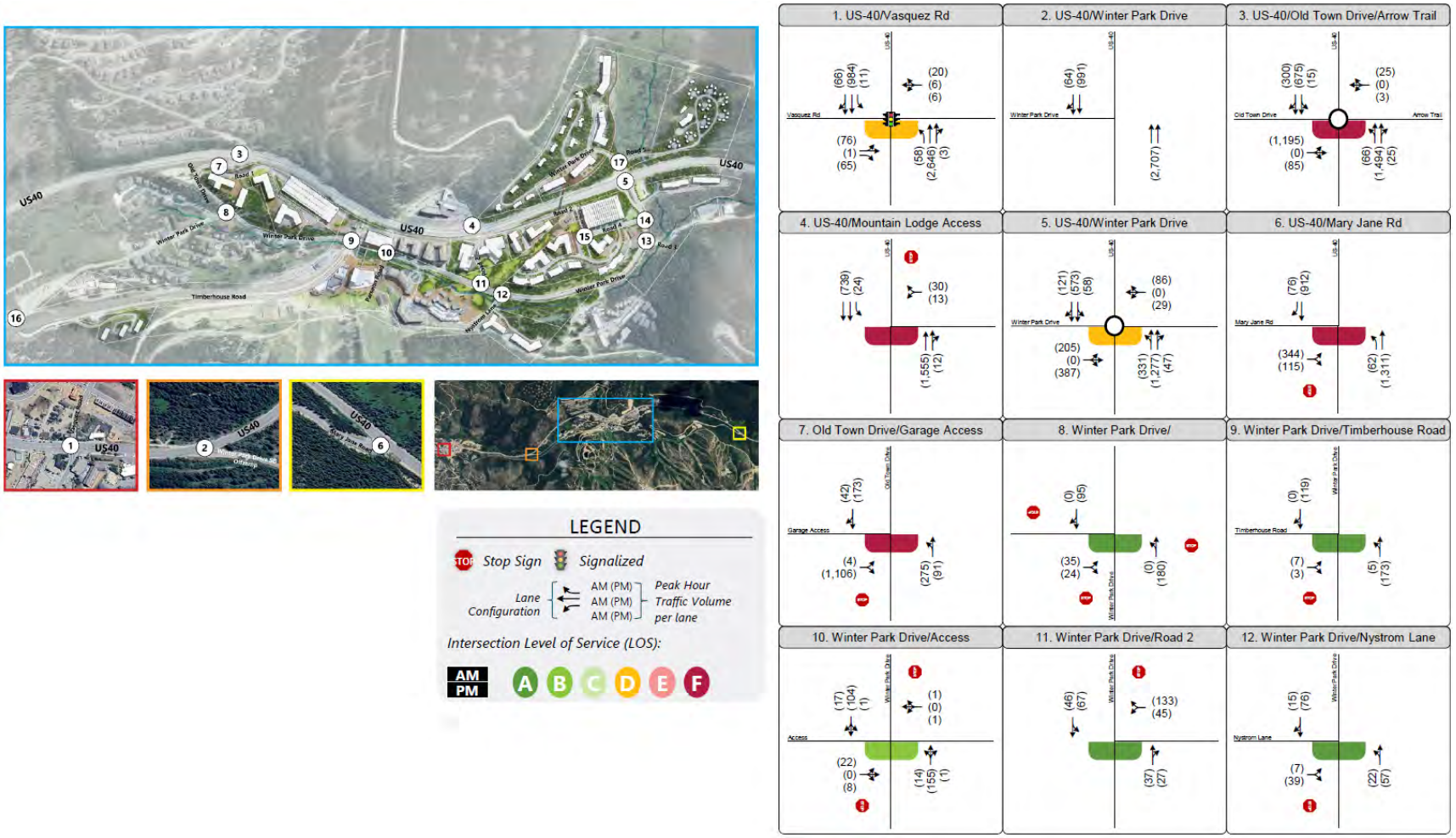


Figure 32: Full Build 2050 Volumes – Intersections #1-#12

Figure 33: Full Build 2050 Volumes – Intersections #13-#17

Table 24: Full Build 2050 Saturday PM LOS Results

Intersection #	Intersection Name	Control Type	Delay[2]	LOS[2]	Worst Movement[3]
1	US-40 & Vasquez Road	Signal	45	D	-
3	US-40 & Old Town Drive	Roundabout	**205**	**F**	**-**
4	US-40 & Mountain Lodge Access	SSSC	**69**	**F**	**WB**
5	US-40 & Winter Park Drive (south)	Roundabout	28	D	-
6	US-40 & Mary Jane Road	SSSC	**6376**	**F**	**EB**
7	Old Town Drive & Garage Access	SSSC	**234**	**F**	**EB**
8	Winter Park Drive & Old Town Drive	AWSC	8	A	-
9	Winter Park Drive & Timberhouse Road	SSSC	10	A	EB
10	Winter Park Drive & Access	SSSC	11	B	EB
11	Winter Park Drive & Road 2	SSSC	10	A	WB
12	Winter Park Drive & Nystrom Lane	SSSC	9	A	EB
13	Winter Park Drive & Access	SSSC	9	A	NB
14	Winter Park Drive & Road 4	SSSC	47	E	SB
15	Road 4 & Road 2	AWSC	8	A	-
16	Winter Park Drive & Timberhouse Road	SSSC	0	A	-
17	Winter Park Drive & Road 5	SSSC	10	A	NB

Source: HCM 2016, Fehr & Peers
Notes:
Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

In 2050, the following intersections are anticipated to perform at an LOS F:

- #3: US-40 & Old Town Drive
- #4: US-40 & Mountain Lodge Access
- #6: US-40 & Mary Jane Road
- #7: Old Town Drive & Garage Access

The proposed mitigations for these intersections include signalizing US-40 & Mary Jane Road, constructing a roundabout at Old Town Drive & Garage Access and restricting the westbound movement at US-40 & Mountain Lodge Access to be right-out only. While the intersection of US-40 & Old Town Drive is projected to operate at LOS F, it should be noted that the highest delay on US 40 is 129 seconds. Again, this is during the highest volume period, so during normal operations, the intersection will operate acceptably.

Build Conditions LOS Comparison

Table 25 shows the LOS from Phase 1 in 2029 to Full Build in 2050.

Table 25: Build Conditions LOS Comparison

Int #	Intersection Name	Control Type[1]	Phase 1 2029			Phase 2 2031			Phase 3 2033			Full Build 2037			Full Build 2050		
			Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]	Delay[2]	LOS[3]	Worst Movement[4,5]
1	US-40 & Vasquez Road	Signal	9	A	-	14	B	-	20	C	-	34	C	-	45	D	-
3	US-40 & Old Town Drive	Roundabout	**131**	**F**	-	**177**	**F**	-	**211**	**F**	-	**193**	**F**	-	**205**	**F**	**-**
4	US-40 & Mountain Lodge Access	SSSC	36	E	WB	46	E	WB	**58**	**F**	**WB**	49	E	WB	**69**	**F**	**WB**
5	US-40 & Winter Park Drive (south)	Roundabout	8	A	-	13	B	-	16	B	-	27	D	-	28	D	-
6	US-40 & Mary Jane Road	SSSC	**2151**	**F**	**EB**	**3007**	**F**	**EB**	**3880**	**F**	**EB**	**5213**	**F**	**EB**	**6376**	**F**	**EB**
7	Old Town Drive & Garage Access	SSSC	**166**	**F**	**EB**	**256**	**F**	**EB**	**306**	**F**	**EB**	**234**	**F**	**EB**	**234**	**F**	**EB**
8	Winter Park Drive & Old Town Drive	AWSC	7	A	-	8	A	-	8	A	-	8	A	-	8	A	-
9	Winter Park Drive & Timberhouse Road	SSSC	0	A	EB	0	A	EB	0	A	EB	10	A	EB	10	A	EB
10	Winter Park Drive & Access	SSSC	9	A	EB	10	B	EB	10	B	EB	11	B	EB	11	B	EB
11	Winter Park Drive & Road 2	SSSC	9	A	EB	10	A	WB	10	A	EB	10	A	WB	10	A	WB
12	Winter Park Drive & Nystrom Lane	SSSC	9	A	EB	9	A	EB	9	A	EB	9	A	EB	9	A	EB
13	Winter Park Drive & Access	SSSC	0	A	-	9	A	NB	9	A	NB	9	A	NB	9	A	NB
14	Winter Park Drive & Road 4	SSSC	10	A	SB	11	B	SB	13	B	SB	47	E	SB	47	E	SB
15	Road 4 & Road 2	AWSC	7	A	-	7	A	-	8	A	-	8	A	-	8	A	-
16	Winter Park Drive & Timberhouse Road	SSSC	0	A	-	0	A	-	0	A	-	0	A	-	0	A	-
17	Winter Park Drive & Road 5	SSSC	0	A	-	0	A	-	0	A	-	10	A	NB	10	A	NB

Source: HCM 2016, Fehr & Peers

Notes:

Bold text indicates intersections operating below the acceptable LOS threshold.

1. SSSC = Side-Street Stop Control
2. Represents the overall intersection delay (seconds/vehicle) for signalized intersections and roundabouts, and the worst approach delay (seconds/vehicle) for unsignalized intersections.
3. Represents the overall LOS for signalized intersections and roundabouts, and the worst movement LOS for unsignalized intersections.
4. The worst movement is only reported for unsignalized intersections.
5. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

Proposed Mitigations

The sections below outline possible mitigation measures that can be taken to improve vehicle circulation around the site.

Signal at US-40 & Mary Jane Road – Intersection #6

In the existing conditions, the intersection of US-40 & Mary Jane Road operates at a LOS F during the Saturday PM peak hour. As Winter Park Resort develops and more skiers can ski on the mountain, the delay gets significantly worse. To mitigate the delay at this intersection, it is recommended to install a traffic signal. When a traffic signal is installed, the LOS and delay go from LOS F (6,376 seconds) to LOS D (46 seconds) in the Full Build 2050 scenario. **Appendix C: Mitigation HCM Reports** contains the HCM report for the intersection with a signal.

Right Out Only at US-40 & Mountain Lodge Access – Intersection #4

The intersection of US-40 & Mountain Lodge Access is anticipated to have a LOS F in the 2050 background traffic. Adding in any development traffic and additional skiers make the LOS and delay worse. To mitigate the delay at this intersection, it is recommended to allow only westbound right turns from the Mountain Lodge Access during peak travel hours. Vehicles that want to turn left at this intersection would instead turn right and use the US-40 & Old Town Drive roundabout to turn around and travel southbound on US-40. Implementing this mitigation and removing left turns would decrease the LOS from F (69 seconds) to LOS C (19 seconds) in the Full Build 2050 scenario. **Appendix C: Mitigation HCM Reports** contains the HCM report for the mitigated intersection.

Internal Roundabouts

The high volume of skiers leaving the Resort during the PM peak hour cause significant delays at the intersections with the parking garages. It is recommended that small roundabouts be implemented at these intersections to allow for more free flowing traffic out of the parking garages and onto US-40. **Appendix C: Mitigation HCM Reports** contains the HCM report for the mitigated intersection.

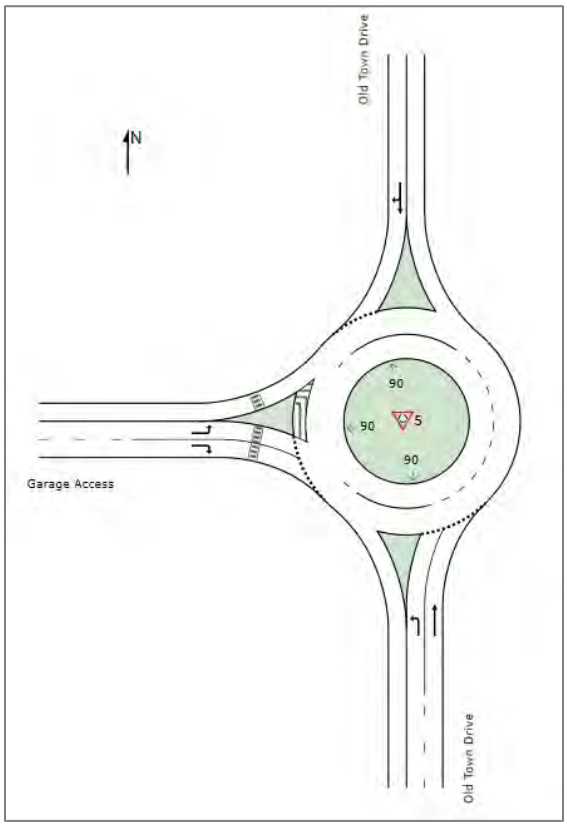


Figure 34: Intersection #7 Roundabout

Old Town Drive & Garage Access – Intersection #7

Implementing a roundabout at the intersection of Old Town Drive & Garage Access would decrease the LOS from F (234 seconds) to LOS C (18 seconds) in the Full Build 2050 scenario. **Figure 34** shows the lane configuration of the small roundabout.

Winter Park Drive & Road 4 (Garage Access) – Intersection #14

Implementing a roundabout at the intersection of Winter Park Drive & Garage Access would decrease the LOS from E (47 seconds) to LOS A (5 seconds) in the Full Build 2050 scenario. Below is a graphic of the small roundabout. **Figure 35** shows the lane configuration of the small roundabout.

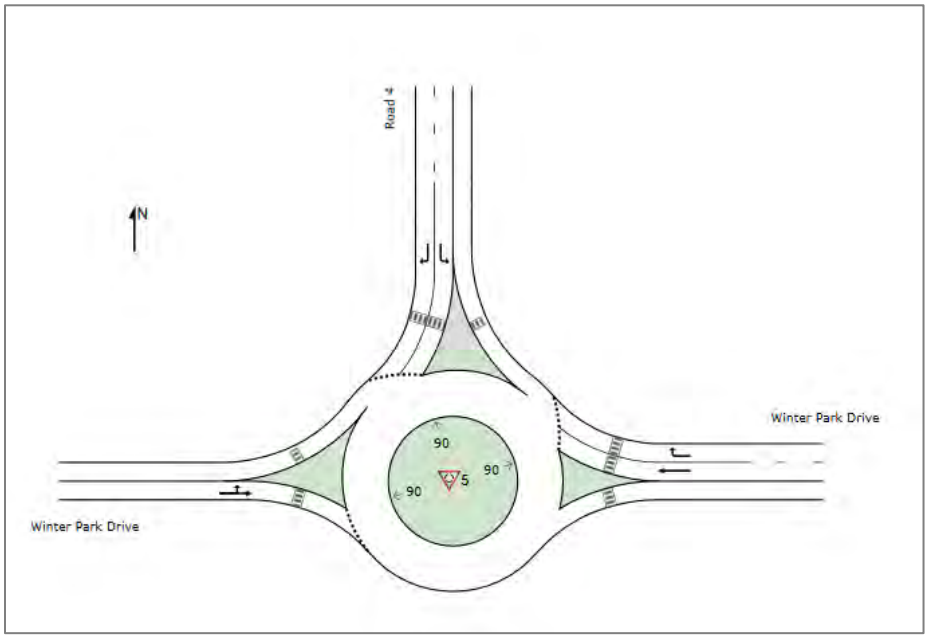


Figure 35: Intersection #14 Roundabout

Implement TDM Strategies

Trip reduction from design, transit, transportation modes beyond the single occupant vehicle, and trails will be a key component of the development strategy. The strategy for reducing vehicle trips is based on the destination resort concept of the visitor "parking once," and leaving the vehicle behind, or arriving by transit or other means, to enter a pedestrian dominant environment. Each proposed strategy has the potential to reduce vehicular traffic, or vehicle miles traveled (VMT.) It is recommended that Winter Park Resort employ some or all the following transportation demand management (TDM) strategies.

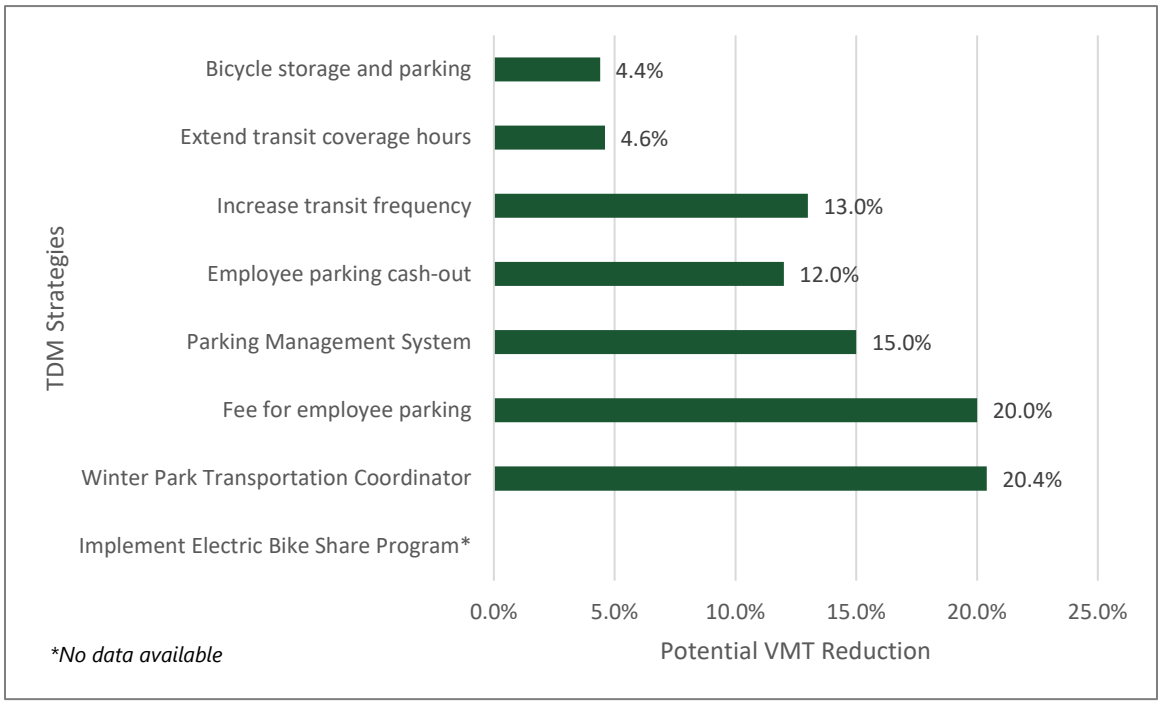


Figure 36. Potential VMT Reduction of Proposed TDM Strategies

Parking Management System

A fundamental aspect of the Winter Park proposal is the implementation of a constrained, structured parking supply that will require parkers to pay a daily fee. This strategy is seen as a key disincentive to traveling by single-occupant vehicle. Reductions of up to 17% in daily parking demand due to paid parking in similar contexts have been determined using methods derived from *The Price Elasticity of Parking: a Meta-Analysis* (Lehner, Peer; 2018), which evaluates price sensitivities to the implementation of paid parking from 50 separate studies. To present a more conservative reduction and resulting parking supply, a 15% reduction could be realized.

Bicycle Storage and Parking

Figure 37. Grid Bike Rack (not preferred) (Source: Amazon.com)

Alongside bike lanes and trails, a key component of the bicycle network is secure bicycle storage and parking. Without ample and safe bike parking, people may be more reluctant to choose to bike. Installing and maintaining end-of-trip facilities such as secure bike parking and storage, showers, and personal lockers encourages commuting by bicycle by making it more convenient. This action has been shown to reduce site VMT by up to 4.4%. The resort should prioritize installation of bike parking and secure bike storage in key destinations near major transit hubs, parks, residential areas, and shopping areas.

Figure 38. U-Bike Rack (preferred) (Source: Handi-hut.com)

Bike parking could take the form of bike racks, micromobility corrals, bike lockers, and bike shelters. Implementation of these facilities should consider not just traditional bikes but cargo, e-bikes and adaptive devices. Grid bike racks (shown in Figure 37**,)** loop bike racks, and other similar bike racks that do not allow the user to easily lock the frame and wheel of the bike to a post should be avoided. These racks are typically inefficiently used, harder to secure one's bike, and less compatible with larger e-bikes and cargo bikes. The inverted U or other similar bike racks are preferred, as shown in Figure 38. The resort may refer to the Association of Professional Bicycle Professionals (APBP) resource, Essentials of Bike Parking, which outlines design and installation guidelines for short-term and long-term bike parking.

It must be noted that bicycle storage and parking will not influence VMT during winter peak periods.

Implement Electric Bike Share Program

The resort could consider implementing an electric bike share program in partnership with the Town of Winter Park. Responsibility for capital costs, maintenance, and marketing of the e-bike program could be jointly shared between the resort and town. This would create a likely docked system of e-bikes available on-demand to rent to users at the resort and in the Town of Winter Park. This encourages mode shift from vehicles to e-bikes, by offering an affordable and convenient alternative. E-bikes are particularly useful in a mountainous community like Winter Park.

Figure 39. E-bike Share in Aspen, CO (Source: WE-Cycle)

Winter Park Transportation Coordinator & Incentive Program

As a major employer in the Winter Park community, the resort could encourage and influence employee travel behaviors. The resort should consider hiring a transportation coordinator for all mountain employees to help organize employee shuttle and ride matching/carpools/vanpools, employee education and marketing about transportation options, manage parking cashout, track commute share, etc.

The incentive program would support employees who walk, bike, or take transit to work. Incentives can include e-bike rebates, bike-themed events, swag such as bike lights and helmets, and gift certificates for those who bike to events. Guaranteed Ride Home provides commuters who did not drive to work with alternative means home in case of an emergency.

The transportation coordinator could also help organize employee vanpools, matching employees who live close to each other in Winter Park, Fraser, Granby, and other nearby towns and facilitating shared rides to work. This measure can be extremely effective for reducing long-distance single occupancy vehicle trips, reducing employee VMT up to 20.4%.

The resort can also influence travel behavior by pricing workplace and workforce housing parking or implementing employee parking cash-out. Because free employee parking is a common benefit, charging employees to park onsite increases the cost of choosing to drive to work. This has been shown to reduce employee VMT by up to 20%, depending on prices. Parking cash-out works in a similar way, but rather than pricing parking, employees who choose to forgo their free parking receive a cash payment for the value of a parking space. This has been shown to reduce employee VMT by up to 12%.

Marketing of this program would involve the transportation coordinator sharing information and educating employees about these travel options, while promoting non single-occupancy vehicle choices. Effective commute trip reduction marketing has been shown to reduce employee VMT by up to 4%.

Extend Transit Network Coverage or Hours and/or Transit Service Frequency

These measures expand the local transit network by either adding or modifying existing transit service, extending the operational hours to enhance service near the project site, and/or increasing transit frequency on one or more transit lines serving the site. Starting services earlier in the morning and/or extending services to late-night hours can accommodate alternate commuting hours and social activities. Extending coverage and/or hours have been shown to reduce VMT by up to 4.6%. Increasing transit frequency reduces wait times and overall travel times, making it feasible for more people to choose transit. This is one of the most effective strategies, reducing VMT up to 11.3%. Each of these strategies is explored in greater detail in the following section on transit.

Conclusion

The findings of the Winter Park Mobility Study Update highlight the need for improvements to support the continued growth and success of Winter Park Resort. Without intervention, increasing visitor volumes will result in significant congestion, reducing mobility. The proposed mitigations, including intersection upgrades, Transportation Demand Management strategies, and expanded multimodal infrastructure, will help ensure a more efficient and sustainable transportation network.

Summary of Proposed Mitigation Benefits:

- **Signalize US-40 & Mary Jane Road:** Reduces congestion and enhances traffic flow.
- **Restrict Movements at US-40 & Mountain Lodge Access:** Improves safety by minimizing conflicting traffic movements.
- **Roundabouts at Parking Garage Access Points:** Enhances circulation, reduces queue times, and improves pedestrian safety.
- **TDM Strategies:** Promote a reduction in VMT by enhancing access and convenience to non-vehicular travel.

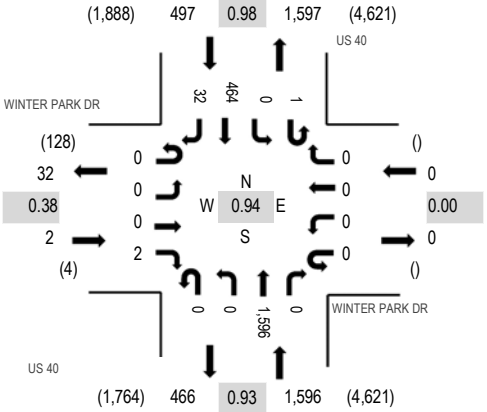
Continuous monitoring and data collection should guide future adjustments to the mitigation strategies, ensuring they remain effective in addressing evolving mobility challenges.

Appendix A: Traffic Counts

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

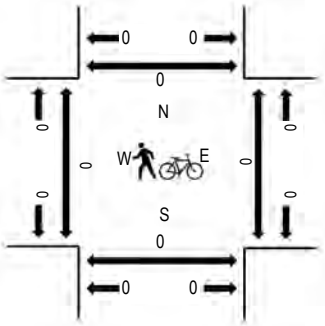
Location: 1 US 40 & WINTER PARK DR PM
Date: Saturday, March 12, 2022
Peak Hour: 03:45 PM - 04:45 PM
Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



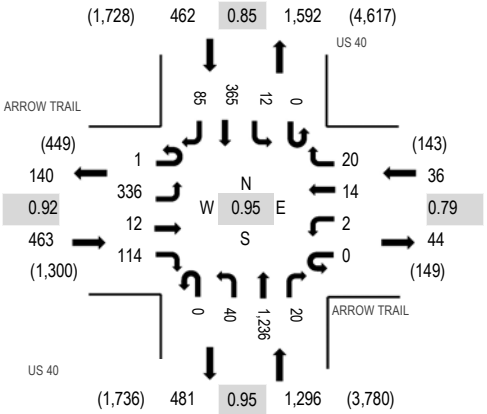
Traffic Counts

Interval Start Time	WINTER PARK DR Eastbound				WINTER PARK DR Westbound				US 40 Northbound				US 40 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
2:00 PM	0	0	0	0	0	0	0	0	0	0	213	0	0	0	122	6	341	1,387	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	1	0	172	0	0	0	114	13	300	1,442	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	265	0	0	0	118	9	392	1,529	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	221	0	0	0	126	7	354	1,558	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	264	0	0	0	128	4	396	1,718	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	261	0	0	0	119	7	387	1,878	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	309	0	0	0	104	8	421	2,034	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	366	0	0	0	140	8	514	2,095	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	427	0	1	0	122	6	556	2,056	0	0	0	0
4:15 PM	0	0	0	2	0	0	0	0	0	0	432	0	0	0	100	9	543	1,901	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	371	0	0	0	102	9	482	1,728	0	0	0	0
4:45 PM	0	0	0	1	0	0	0	0	0	0	377	0	0	0	86	11	475	1,560	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	307	0	0	0	85	9	401	1,352	0	0	0	0
5:15 PM	0	0	0	1	0	0	0	0	0	0	251	0	0	0	110	8	370		0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	206	0	0	0	102	6	314		0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	178	0	0	0	81	8	267		0	0	0	0
Count Total	0	0	0	4	0	0	0	0	1	0	4,620	0	1	0	1,759	128	6,513		0	0	0	0
Peak Hour	0	0	0	2	0	0	0	0	0	0	1,596	0	1	0	464	32	2,095		0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

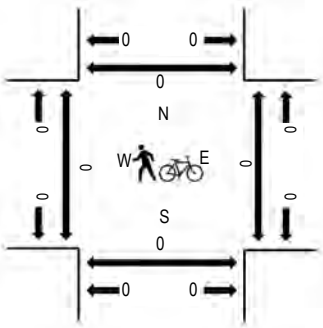
Location: 2 US 40 & ARROW TRAIL PM
Date: Saturday, March 12, 2022
Peak Hour: 03:45 PM - 04:45 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



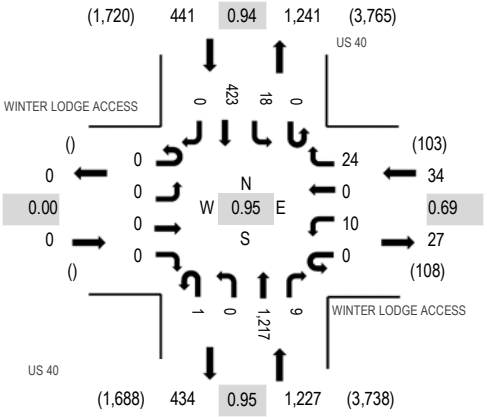
Traffic Counts

Interval Start Time	ARROW TRAIL Eastbound				ARROW TRAIL Westbound				US 40 Northbound				US 40 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
2:00 PM	0	17	0	12	0	2	0	3	0	3	174	2	0	2	97	28	340	1,495	0	0	0	0
2:15 PM	0	29	2	31	0	2	2	5	0	10	161	4	0	2	85	19	352	1,596	0	0	0	0
2:30 PM	0	28	2	23	0	3	4	3	0	4	226	5	0	3	89	19	409	1,671	0	0	0	0
2:45 PM	0	24	2	21	0	5	0	5	0	5	211	4	0	2	94	21	394	1,728	0	0	0	0
3:00 PM	0	43	2	27	0	5	2	4	0	12	219	4	0	4	98	21	441	1,907	0	0	0	0
3:15 PM	0	63	4	22	0	1	1	6	0	8	204	5	0	5	90	18	427	2,048	0	1	0	4
3:30 PM	0	63	3	19	0	1	0	8	0	10	246	2	0	4	91	19	466	2,213	0	2	0	0
3:45 PM	0	83	5	24	0	0	7	6	0	14	284	4	0	5	114	27	573	2,257	0	0	0	0
4:00 PM	0	90	4	30	0	2	1	5	0	5	325	6	0	4	81	29	582	2,173	0	0	0	0
4:15 PM	1	88	2	38	0	0	4	6	0	11	327	4	0	2	93	16	592	2,008	0	0	0	0
4:30 PM	0	75	1	22	0	0	2	3	0	10	300	6	0	1	77	13	510	1,795	0	0	0	0
4:45 PM	0	106	2	14	0	0	0	8	0	12	248	6	0	5	78	10	489	1,607	1	0	0	1
5:00 PM	0	71	2	16	0	1	1	6	0	8	223	5	0	3	74	7	417	1,376	0	0	0	0
5:15 PM	0	49	0	14	0	2	3	7	0	2	190	4	0	5	81	22	379		0	0	0	1
5:30 PM	0	51	1	8	0	3	3	4	0	8	148	2	0	2	76	16	322		0	0	0	0
5:45 PM	0	59	1	6	0	1	1	5	0	0	108	1	0	3	63	10	258		0	0	0	0
Count Total	1	939	33	327	0	28	31	84	0	122	3,594	64	0	52	1,381	295	6,951		1	3	0	6
Peak Hour	1	336	12	114	0	2	14	20	0	40	1,236	20	0	12	365	85	2,257		0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

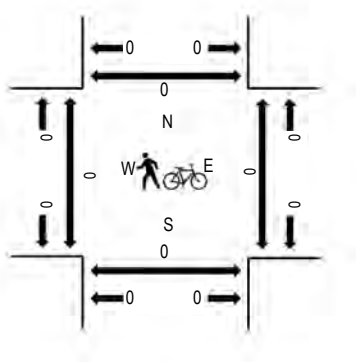
Location: 3 US 40 & WINTER LODGE ACCESS PM
Date: Saturday, March 12, 2022
Peak Hour: 03:45 PM - 04:45 PM
Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



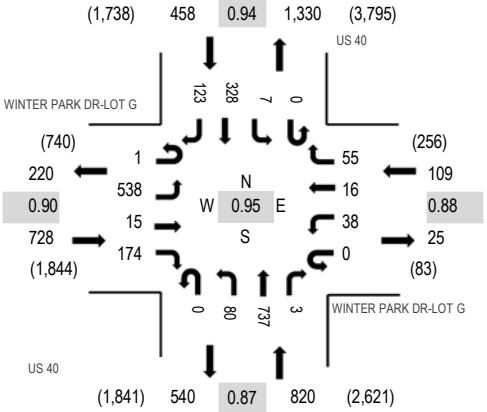
Traffic Counts

Interval Start Time	WINTER LODGE ACCESS Eastbound				WINTER LODGE ACCESS Westbound				US 40 Northbound				US 40 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
2:00 PM	0	0	0	0	0	1	0	5	0	0	176	1	0	5	119	0	307	1,337	0	0	0	0
2:15 PM	0	0	0	0	0	3	0	1	0	0	180	2	0	2	113	0	301	1,390	0	0	0	0
2:30 PM	0	0	0	0	0	1	0	1	1	0	230	5	0	2	113	0	353	1,444	0	0	0	0
2:45 PM	0	0	0	0	0	4	0	2	0	0	239	7	0	2	122	0	376	1,431	0	0	0	0
3:00 PM	0	0	0	0	0	1	0	7	0	0	221	2	0	3	126	0	360	1,475	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	1	0	0	233	3	0	0	118	0	355	1,564	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	1	0	0	227	2	0	3	107	0	340	1,655	0	0	0	0
3:45 PM	0	0	0	0	0	1	0	5	0	0	297	3	0	5	109	0	420	1,702	0	0	0	0
4:00 PM	0	0	0	0	0	4	0	9	1	0	319	2	0	5	109	0	449	1,645	0	0	0	0
4:15 PM	0	0	0	0	0	4	0	6	0	0	312	2	0	4	118	0	446	1,540	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	4	0	0	289	2	0	4	87	0	387	1,404	0	0	0	0
4:45 PM	0	0	0	0	0	1	0	4	0	0	270	6	0	1	81	0	363	1,287	0	0	0	0
5:00 PM	0	0	0	0	0	4	0	9	0	0	237	1	0	5	88	0	344	1,104	0	0	0	0
5:15 PM	0	0	0	0	0	2	0	7	0	0	201	1	0	11	88	0	310		0	0	0	0
5:30 PM	0	0	0	0	0	2	0	7	0	0	159	3	0	6	93	0	270		0	0	0	0
5:45 PM	0	0	0	0	0	0	0	5	0	0	101	3	0	5	66	0	180		0	0	0	0
Count Total	0	0	0	0	0	29	0	74	2	0	3,691	45	0	63	1,657	0	5,561		0	0	0	0
Peak Hour	0	0	0	0	0	10	0	24	1	0	1,217	9	0	18	423	0	1,702		0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

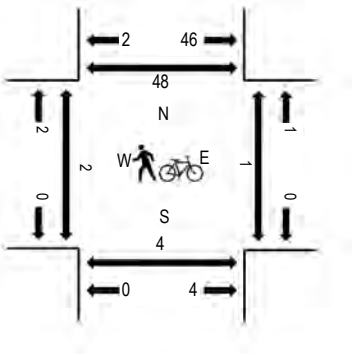
Location: 4 US 40 & WINTER PARK DR-LOT G PM
Date: Saturday, March 12, 2022
Peak Hour: 03:45 PM - 04:45 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

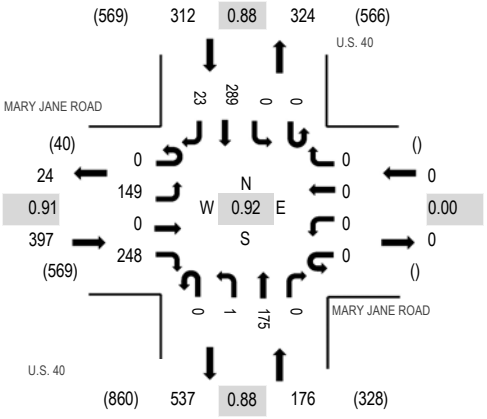
Interval Start Time	WINTER PARK DR-LOT G Eastbound				WINTER PARK DR-LOT G Westbound				US 40 Northbound				US 40 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
2:00 PM	0	31	3	23	0	1	2	5	0	8	129	1	0	0	76	31	310	1,488	0	0	0	4
2:15 PM	0	46	2	25	0	4	2	4	0	22	149	0	0	1	84	38	377	1,557	0	6	0	6
2:30 PM	0	50	3	36	3	1	2	7	0	16	159	1	0	1	57	46	382	1,617	0	0	0	6
2:45 PM	0	52	1	37	0	2	1	5	0	13	174	0	0	1	97	36	419	1,693	0	3	0	20
3:00 PM	0	66	4	27	0	8	1	5	0	11	139	1	0	0	84	33	379	1,796	0	3	3	0
3:15 PM	0	81	2	46	0	6	3	1	0	17	162	0	0	0	81	38	437	1,971	0	2	0	12
3:30 PM	0	114	2	55	0	3	3	8	0	13	127	0	0	0	103	30	458	2,092	0	0	0	20
3:45 PM	1	158	3	44	0	15	5	9	0	18	140	0	0	0	93	36	522	2,115	0	0	0	0
4:00 PM	0	134	4	41	0	9	3	19	0	21	221	1	0	0	80	21	554	2,004	0	0	4	29
4:15 PM	0	129	3	55	0	10	3	12	0	15	195	0	0	4	97	35	558	1,823	2	0	0	11
4:30 PM	0	117	5	34	0	4	5	15	0	26	181	2	0	3	58	31	481	1,595	0	1	0	8
4:45 PM	0	92	4	29	0	10	3	14	0	19	161	3	0	2	49	25	411	1,382	0	0	0	9
5:00 PM	0	76	2	18	0	8	2	6	0	11	147	2	0	0	79	22	373	1,171	0	0	0	0
5:15 PM	0	90	1	16	0	1	2	2	0	6	112	2	0	1	78	19	330		0	0	0	6
5:30 PM	0	33	3	13	0	0	1	11	0	10	97	3	0	4	78	15	268		0	0	0	0
5:45 PM	0	27	0	6	0	6	1	3	0	4	80	2	0	3	54	14	200		0	0	0	0
Count Total	1	1,296	42	505	3	88	39	126	0	230	2,373	18	0	20	1,248	470	6,459		2	15	7	131
Peak Hour	1	538	15	174	0	38	16	55	0	80	737	3	0	7	328	123	2,115		2	1	4	48

ALL TRAFFIC DATA SERVICES

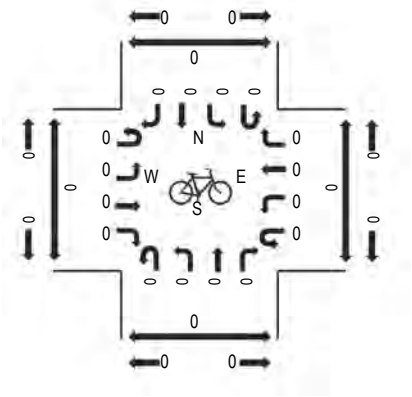
(303) 216-2439
www.alltrafficdata.net

Location: 1 U.S. 40 & MARY JANE ROAD PM
Date: Saturday, April 20, 2024
Peak Hour: 03:30 PM - 04:30 PM
Peak 15-Minutes: 03:30 PM - 03:45 PM

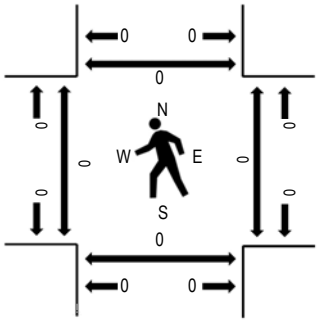
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MARY JANE ROAD Eastbound				MARY JANE ROAD Westbound				U.S. 40 Northbound				U.S. 40 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
3:30 PM	0	46	0	63	0	0	0	0	0	1	49	0	0	0	77	4	240	885	0	0	0	0
3:45 PM	0	39	0	58	0	0	0	0	0	0	47	0	0	0	65	7	216	851	0	0	0	0
4:00 PM	0	32	0	62	0	0	0	0	0	0	32	0	0	0	81	8	215	802	0	0	0	0
4:15 PM	0	32	0	65	0	0	0	0	0	0	47	0	0	0	66	4	214	715	0	0	0	0
4:30 PM	0	33	0	42	0	0	0	0	0	0	40	0	0	0	85	6	206	581	0	0	0	0
4:45 PM	0	36	0	18	0	0	0	0	0	0	43	0	0	0	68	2	167		0	0	0	0
5:00 PM	0	16	0	13	0	0	0	0	0	0	33	0	0	0	63	3	128		0	0	0	0
5:15 PM	0	8	0	6	0	0	0	0	0	3	33	0	0	0	28	2	80		0	0	0	0
Count Total	0	242	0	327	0	0	0	0	0	4	324	0	0	0	533	36	1,466		0	0	0	0
Peak Hour	0	149	0	248	0	0	0	0	0	1	175	0	0	0	289	23	885		0	0	0	0

Ridgeview Data Collection

Winter Park, CO
Winter Park Counts
Sat PM Peak
SH 40 and Vasquez Rd

File Name : SH 40 and Vasquez Rd Sat PM
Site Code : F&P
Start Date : 9/14/2024
Page No : 1

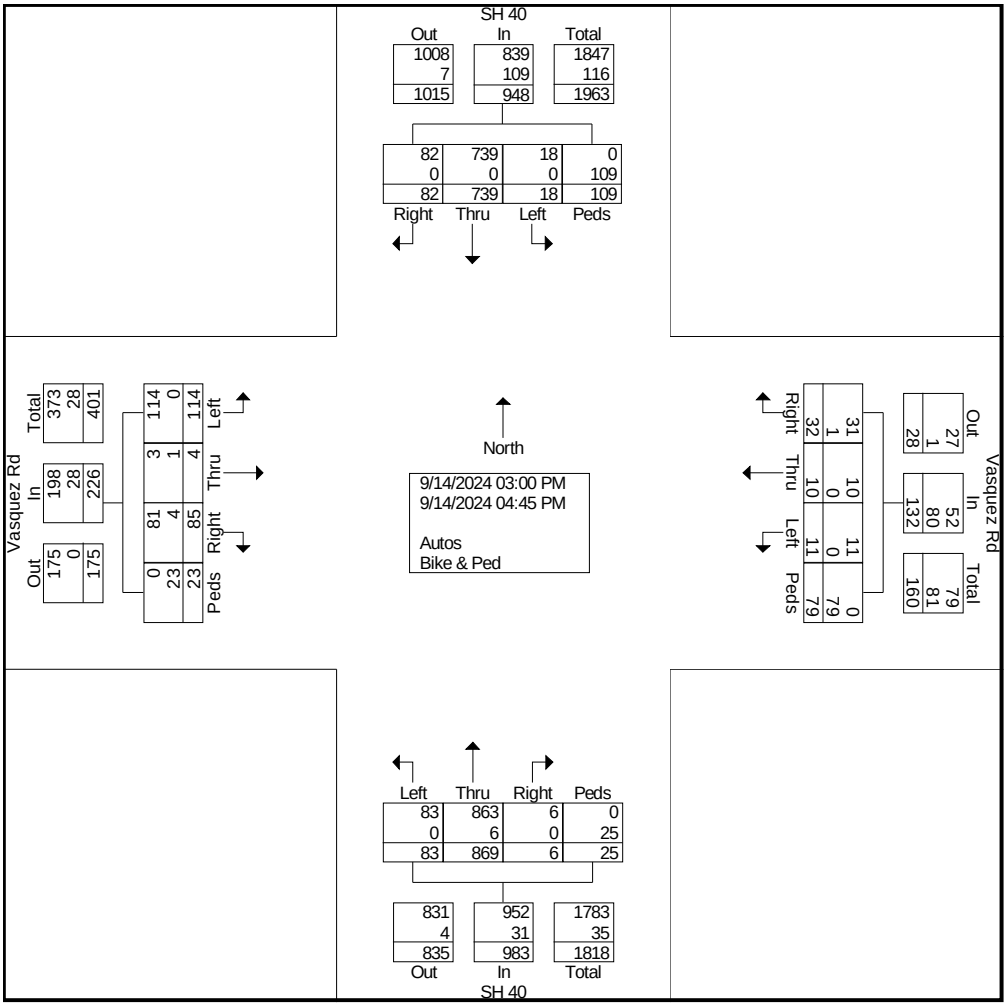
Groups Printed- Autos - Bike & Ped

	Vasquez Rd Eastbound					Vasquez Rd Westbound					SH 40 Northbound					SH 40 Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	8	1	7	3	19	1	3	4	9	17	8	100	3	5	116	3	110	8	8	129	281
03:15 PM	9	0	9	8	26	2	2	7	17	28	8	133	0	9	150	1	80	11	15	107	311
03:30 PM	17	0	10	5	32	0	0	2	5	7	11	128	0	2	141	4	99	15	15	133	313
03:45 PM	9	0	13	1	23	2	3	3	9	17	13	93	1	0	107	4	96	13	8	121	268
Total	43	1	39	17	100	5	8	16	40	69	40	454	4	16	514	12	385	47	46	490	1173
04:00 PM	23	1	15	3	42	0	0	3	14	17	12	105	0	0	117	0	86	11	17	114	290
04:15 PM	21	2	13	0	36	0	1	2	3	6	13	100	0	0	113	2	95	5	20	122	277
04:30 PM	13	0	9	0	22	3	1	6	9	19	12	117	0	2	131	1	92	9	10	112	284
04:45 PM	14	0	9	3	26	3	0	5	13	21	6	93	2	7	108	3	81	10	16	110	265
Total	71	3	46	6	126	6	2	16	39	63	43	415	2	9	469	6	354	35	63	458	1116
Grand Total	114	4	85	23	226	11	10	32	79	132	83	869	6	25	983	18	739	82	109	948	2289
Apprch %	50.4	1.8	37.6	10.2		8.3	7.6	24.2	59.8		8.4	88.4	0.6	2.5		1.9	78	8.6	11.5		
Total %	5	0.2	3.7	1	9.9	0.5	0.4	1.4	3.5	5.8	3.6	38	0.3	1.1	42.9	0.8	32.3	3.6	4.8	41.4	
Autos	114	3	81	0	198	11	10	31	0	52	83	863	6	0	952	18	739	82	0	839	2041
% Autos	100	75	95.3	0	87.6	100	100	96.9	0	39.4	100	99.3	100	0	96.8	100	100	100	0	88.5	89.2
Bike & Ped	0	1	4	23	28	0	0	1	79	80	0	6	0	25	31	0	0	0	109	109	248
% Bike & Ped	0	25	4.7	100	12.4	0	0	3.1	100	60.6	0	0.7	0	100	3.2	0	0	0	100	11.5	10.8

Ridgeview Data Collection

Winter Park, CO
Winter Park Counts
Sat PM Peak
SH 40 and Vasquez Rd

File Name : SH 40 and Vasquez Rd Sat PM
Site Code : F&P
Start Date : 9/14/2024
Page No : 2

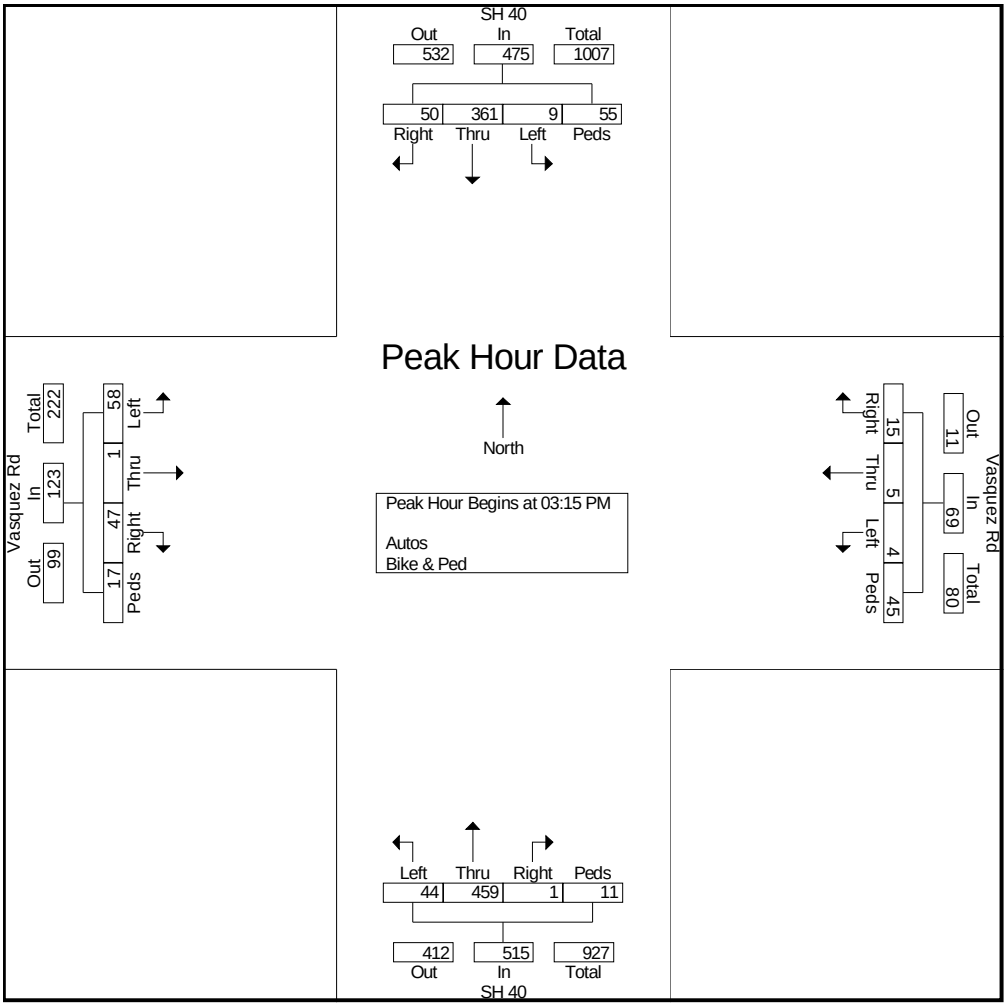


Ridgeview Data Collection

Winter Park, CO
Winter Park Counts
Sat PM Peak
SH 40 and Vasquez Rd

File Name : SH 40 and Vasquez Rd Sat PM
Site Code : F&P
Start Date : 9/14/2024
Page No : 3

	Vasquez Rd Eastbound					Vasquez Rd Westbound					SH 40 Northbound					SH 40 Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	9	0	9	**8**	26	**2**	2	**7**	**17**	**28**	8	**133**	0	**9**	**150**	1	80	11	15	107	311
03:30 PM	17	0	10	5	32	0	0	2	5	7	11	128	0	2	141	**4**	**99**	**15**	15	**133**	**313**
03:45 PM	9	0	13	1	23	2	**3**	3	9	17	**13**	93	**1**	0	107	4	96	13	8	121	268
04:00 PM	**23**	**1**	**15**	3	**42**	0	0	3	14	17	12	105	0	0	117	0	86	11	**17**	114	290
Total Volume	58	1	47	17	123	4	5	15	45	69	44	459	1	11	515	9	361	50	55	475	1182
% App. Total	47.2	0.8	38.2	13.8		5.8	7.2	21.7	65.2		8.5	89.1	0.2	2.1		1.9	76	10.5	11.6		
PHF	.630	.250	.783	.531	.732	.500	.417	.536	.662	.616	.846	.863	.250	.306	.858	.563	.912	.833	.809	.893	.944



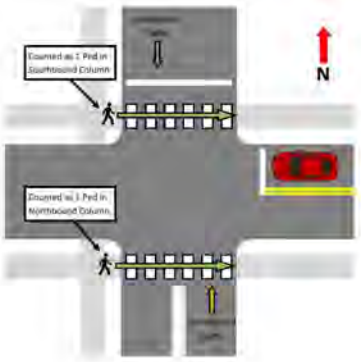
Ridgeview Data Collection

Winter Park, CO
Winter Park Counts
Sat PM Peak
SH 40 and Vasquez Rd

File Name : SH 40 and Vasquez Rd Sat PM
Site Code : F&P
Start Date : 9/14/2024

Image 1

The number of pedestrians shown on this report is representative of the crossing on the approaching leg, i.e. pedestrians crossing the north side of the intersection are counted as pedestrians in the southbound crosswalk, as that is the approaching leg that they are crossing (see figure below). Diagonal crossings are counted on the two legs that will get the pedestrian to the same end point. Diagonals can be counted separately if discussed prior to count.

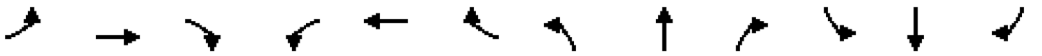


Appendix B: HCM Reports

Existing Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

10/18/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	1	49	4	5	16	46	1617	1	9	452	52
Future Volume (veh/h)	60	1	49	4	5	16	46	1617	1	9	452	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	1	0	4	5	17	50	1758	1	10	491	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	267	2		105	30	83	740	2647	2	287	2331	270
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1448	22	1585	184	401	1104	859	3645	2	272	3209	371
Grp Volume(v), veh/h	66	0	0	26	0	0	50	857	902	10	271	277
Grp Sat Flow(s),veh/h/ln	1470	0	1585	1689	0	0	859	1777	1870	272	1777	1804
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.0	0.9	11.6	11.6	0.9	2.2	2.3
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.7	0.0	0.0	3.2	11.6	11.6	12.5	2.2	2.3
Prop In Lane	0.98		1.00	0.15		0.65	1.00		0.00	1.00		0.21
Lane Grp Cap(c), veh/h	268	0		219	0	0	740	1291	1358	287	1291	1310
V/C Ratio(X)	0.25	0.00		0.12	0.00	0.00	0.07	0.66	0.66	0.03	0.21	0.21
Avail Cap(c_a), veh/h	716	0		733	0	0	740	1291	1358	287	1291	1310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	0.0	19.7	0.0	0.0	2.5	3.3	3.3	6.6	2.0	2.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.0	0.2	2.7	2.6	0.2	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	0.2	0.0	0.0	0.1	1.9	2.0	0.1	0.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.7	0.0	0.0	20.0	0.0	0.0	2.7	6.0	5.9	6.8	2.4	2.4
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		66			26			1809			558	
Approach Delay, s/veh		20.7			20.0			5.8			2.5	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		7.9		37.5		7.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		13.6		3.9		14.5		2.7				
Green Ext Time (p_c), s		13.3		0.2		3.4		0.1				

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	5.6
HCM 6th LOS	A

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	12	116	2	14	20	41	1308	20	12	372	87
Future Volume (veh/h)	342	12	116	2	14	20	41	1308	20	12	372	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	372	13	126	2	15	22	45	1422	22	13	404	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	510	47	454	412	213	313	542	1675	26	176	1568	
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.04	0.46	0.46	0.02	0.43	0.00
Sat Flow, veh/h	1393	153	1481	1270	696	1021	1810	3639	56	1810	3610	1610
Grp Volume(v), veh/h	372	0	139	2	0	37	45	705	739	13	404	0
Grp Sat Flow(s),veh/h/ln	1393	0	1633	1270	0	1716	1810	1805	1890	1810	1805	1610
Q Serve(g_s), s	17.8	0.0	4.5	0.1	0.0	1.1	0.9	23.9	23.9	0.3	4.9	0.0
Cycle Q Clear(g_c), s	18.9	0.0	4.5	4.5	0.0	1.1	0.9	23.9	23.9	0.3	4.9	0.0
Prop In Lane	1.00		0.91	1.00		0.59	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	510	0	501	412	0	526	542	831	870	176	1568	
V/C Ratio(X)	0.73	0.00	0.28	0.00	0.00	0.07	0.08	0.85	0.85	0.07	0.26	
Avail Cap(c_a), veh/h	527	0	520	427	0	547	859	831	870	540	1568	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.7	0.0	18.1	19.9	0.0	17.0	9.9	16.5	16.5	14.2	12.4	0.0
Incr Delay (d2), s/veh	4.9	0.0	0.3	0.0	0.0	0.1	0.0	10.5	10.2	0.1	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	0.0	1.7	0.0	0.0	0.4	0.3	10.3	10.7	0.1	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.6	0.0	18.4	19.9	0.0	17.1	9.9	27.0	26.7	14.3	12.8	0.0
LnGrp LOS	C		B	B		B	A	C	C	B	B	
Approach Vol, veh/h		511			39			1489			417	
Approach Delay, s/veh		25.8			17.2			26.3			12.9	
Approach LOS		C			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	38.8		25.2	6.9	37.0		25.2
Change Period (Y+Rc), s	4.0	7.0		4.0	4.0	7.0		4.0
Max Green Setting (Gmax), s	15.0	30.0		22.0	15.0	30.0		22.0
Max Q Clear Time (g_c+I1), s	2.3	25.9		20.9	2.9	6.9		6.5
Green Ext Time (p_c), s	0.0	3.3		0.3	0.0	3.3		0.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	23.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

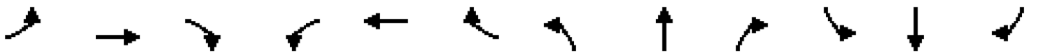
Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	24	1345	9	18	472
Future Vol, veh/h	10	24	1345	9	18	472
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	26	1462	10	20	513

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1764	736	0	0	1472	0
Stage 1	1467	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	77	366	-	-	464	-
Stage 1	182	-	-	-	-	-
Stage 2	734	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	74	366	-	-	464	-
Mov Cap-2 Maneuver	74	-	-	-	-	-
Stage 1	182	-	-	-	-	-
Stage 2	702	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	32.2	0	0.5
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	169	464	-
HCM Lane V/C Ratio	-	-	0.219	0.042	-
HCM Control Delay (s/veh)	-	-	32.2	13.1	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q (veh)	-	-	0.8	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	548	15	177	39	16	56	81	750	3	7	350	125
Future Volume (veh/h)	548	15	177	39	16	56	81	750	3	7	350	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	596	16	192	42	17	61	88	815	3	8	380	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	684	474	402	70	177	150	493	1645	6	312	1445	629
Arrive On Green	0.20	0.25	0.25	0.04	0.09	0.09	0.06	0.45	0.45	0.01	0.41	0.41
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	1781	3631	13	1781	3554	1546
Grp Volume(v), veh/h	596	16	192	42	17	61	88	399	419	8	380	136
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	1781	1777	1868	1781	1777	1546
Q Serve(g_s), s	12.3	0.5	7.6	1.7	0.6	2.7	2.0	11.7	11.7	0.2	5.2	4.2
Cycle Q Clear(g_c), s	12.3	0.5	7.6	1.7	0.6	2.7	2.0	11.7	11.7	0.2	5.2	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	684	474	402	70	177	150	493	805	846	312	1445	629
V/C Ratio(X)	0.87	0.03	0.48	0.60	0.10	0.41	0.18	0.50	0.50	0.03	0.26	0.22
Avail Cap(c_a), veh/h	703	685	580	362	685	580	754	805	846	656	1445	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	20.7	23.4	34.9	30.5	31.4	10.7	14.2	14.2	13.1	14.5	14.2
Incr Delay (d2), s/veh	11.8	0.0	1.3	11.3	0.3	2.5	0.2	0.5	0.5	0.0	0.4	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.2	2.9	1.0	0.3	1.1	0.7	4.0	4.2	0.1	1.9	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.4	20.8	24.6	46.2	30.8	33.9	10.9	14.7	14.7	13.1	15.0	15.0
LnGrp LOS	D	C	C	D	C	C	B	B	B	B	B	B
Approach Vol, veh/h		804			120			906			524	
Approach Delay, s/veh		36.3			37.8			14.3			15.0	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	39.4	6.9	22.7	8.2	36.0	18.6	11.0
Change Period (Y+Rc), s	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	30.0	15.0	27.0	15.0	30.0	15.0	27.0
Max Q Clear Time (g_c+I1), s	2.2	13.7	3.7	9.6	4.0	7.2	14.3	4.7
Green Ext Time (p_c), s	0.0	4.2	0.1	1.0	0.1	2.7	0.3	0.3

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	23.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	65

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	149	248	1	685	543	23
Future Vol, veh/h	149	248	1	685	543	23
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	-	470	-	-	-
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	162	270	1	745	590	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1337	590	615	0	-	0
Stage 1	590	-	-	-	-	-
Stage 2	747	-	-	-	-	-
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	169	508	965	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	169	508	965	-	-	-
Mov Cap-2 Maneuver	169	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	468	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	269.9	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	965	-	290	-	-
HCM Lane V/C Ratio	0.001	-	1.488	-	-
HCM Control Delay (s/veh)	8.7	-	269.9	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q (veh)	0	-	24.3	-	-

Background 2029 Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

10/22/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	1	51	4	5	17	48	1644	1	9	473	54
Future Volume (veh/h)	63	1	51	4	5	17	48	1644	1	9	473	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	1	0	4	5	18	52	1787	1	10	514	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	2		104	30	87	723	2643	1	280	2330	267
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1449	21	1585	174	389	1126	839	3645	2	265	3213	368
Grp Volume(v), veh/h	69	0	0	27	0	0	52	871	917	10	283	290
Grp Sat Flow(s),veh/h/ln	1470	0	1585	1688	0	0	839	1777	1870	265	1777	1804
Q Serve(g_s), s	1.3	0.0	0.0	0.0	0.0	0.0	1.0	12.0	12.0	1.0	2.4	2.4
Cycle Q Clear(g_c), s	2.0	0.0	0.0	0.7	0.0	0.0	3.4	12.0	12.0	13.0	2.4	2.4
Prop In Lane	0.99		1.00	0.15		0.67	1.00		0.00	1.00		0.20
Lane Grp Cap(c), veh/h	271	0		221	0	0	723	1288	1356	280	1288	1308
V/C Ratio(X)	0.26	0.00		0.12	0.00	0.00	0.07	0.68	0.68	0.04	0.22	0.22
Avail Cap(c_a), veh/h	714	0		731	0	0	723	1288	1356	280	1288	1308
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	0.0	19.7	0.0	0.0	2.6	3.4	3.4	6.9	2.0	2.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.0	0.2	2.9	2.7	0.2	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.3	0.0	0.0	0.1	2.1	2.1	0.1	0.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.7	0.0	0.0	19.9	0.0	0.0	2.8	6.2	6.1	7.1	2.4	2.4
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		69			27			1840			583	
Approach Delay, s/veh		20.7			19.9			6.1			2.5	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.0		37.5		8.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.0		4.0		15.0		2.7				
Green Ext Time (p_c), s		13.3		0.2		3.6		0.1				

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	5.8	
HCM 6th LOS	A	

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	12	116	2	15	21	43	1337	21	13	389	91
Future Volume (veh/h)	342	12	116	2	15	21	43	1337	21	13	389	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	372	13	126	2	16	23	47	1453	23	14	423	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	509	47	455	412	217	311	532	1670	26	171	1564	
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.04	0.46	0.46	0.02	0.43	0.00
Sat Flow, veh/h	1390	153	1481	1270	705	1013	1810	3637	58	1810	3610	1610
Grp Volume(v), veh/h	372	0	139	2	0	39	47	721	755	14	423	0
Grp Sat Flow(s),veh/h/ln	1390	0	1633	1270	0	1718	1810	1805	1890	1810	1805	1610
Q Serve(g_s), s	17.9	0.0	4.5	0.1	0.0	1.1	1.0	24.9	25.0	0.3	5.2	0.0
Cycle Q Clear(g_c), s	19.1	0.0	4.5	4.5	0.0	1.1	1.0	24.9	25.0	0.3	5.2	0.0
Prop In Lane	1.00		0.91	1.00		0.59	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	509	0	502	412	0	528	532	829	867	171	1564	
V/C Ratio(X)	0.73	0.00	0.28	0.00	0.00	0.07	0.09	0.87	0.87	0.08	0.27	
Avail Cap(c_a), veh/h	523	0	519	425	0	546	846	829	867	532	1564	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.8	0.0	18.2	19.9	0.0	17.0	10.0	16.9	16.9	14.6	12.6	0.0
Incr Delay (d2), s/veh	5.0	0.0	0.3	0.0	0.0	0.1	0.0	12.0	11.7	0.1	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	1.7	0.0	0.0	0.4	0.3	11.0	11.4	0.1	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.8	0.0	18.5	19.9	0.0	17.1	10.0	28.9	28.5	14.7	13.0	0.0
LnGrp LOS	C		B	B		B	A	C	C	B	B	
Approach Vol, veh/h		511			41			1523			437	
Approach Delay, s/veh		26.0			17.2			28.1			13.1	
Approach LOS		C			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.2	38.8		25.3	7.0	37.0		25.3
Change Period (Y+Rc), s	4.0	7.0		4.0	4.0	7.0		4.0
Max Green Setting (Gmax), s	15.0	30.0		22.0	15.0	30.0		22.0
Max Q Clear Time (g_c+I1), s	12.3	27.0		21.1	3.0	7.2		6.5
Green Ext Time (p_c), s	0.0	2.6		0.2	0.0	3.5		0.2

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		24.9
HCM 6th LOS		C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

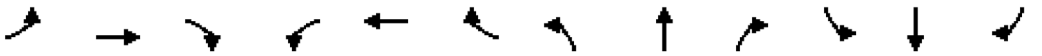
Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	25	1376	9	18	489
Future Vol, veh/h	10	25	1376	9	18	489
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	27	1496	10	20	532

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1807	753	0	0	1506	0
Stage 1	1501	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	72	357	-	-	450	-
Stage 1	174	-	-	-	-	-
Stage 2	726	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	69	357	-	-	450	-
Mov Cap-2 Maneuver	69	-	-	-	-	-
Stage 1	174	-	-	-	-	-
Stage 2	694	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	33.7	0	0.5
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	163	450	-
HCM Lane V/C Ratio	-	-	0.233	0.043	-
HCM Control Delay (s/veh)	-	-	33.7	13.4	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q (veh)	-	-	0.9	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	548	15	177	41	17	59	85	778	3	7	361	131
Future Volume (veh/h)	548	15	177	41	17	59	85	778	3	7	361	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	596	16	192	45	18	64	92	846	3	8	392	142
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	683	471	399	73	177	150	487	1647	6	301	1444	628
Arrive On Green	0.20	0.25	0.25	0.04	0.09	0.09	0.06	0.45	0.45	0.01	0.41	0.41
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	1781	3632	13	1781	3554	1546
Grp Volume(v), veh/h	596	16	192	45	18	64	92	414	435	8	392	142
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	1781	1777	1868	1781	1777	1546
Q Serve(g_s), s	12.3	0.5	7.6	1.8	0.6	2.8	2.1	12.3	12.3	0.2	5.4	4.4
Cycle Q Clear(g_c), s	12.3	0.5	7.6	1.8	0.6	2.8	2.1	12.3	12.3	0.2	5.4	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	683	471	399	73	177	150	487	806	847	301	1444	628
V/C Ratio(X)	0.87	0.03	0.48	0.62	0.10	0.43	0.19	0.51	0.51	0.03	0.27	0.23
Avail Cap(c_a), veh/h	702	684	580	362	684	580	747	806	847	645	1444	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	20.9	23.5	34.8	30.5	31.5	10.7	14.4	14.4	13.2	14.6	14.3
Incr Delay (d2), s/veh	11.8	0.0	1.3	11.6	0.4	2.7	0.2	0.6	0.5	0.0	0.5	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.2	2.9	1.0	0.3	1.2	0.7	4.2	4.5	0.1	2.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.5	20.9	24.8	46.4	30.9	34.2	10.9	14.9	14.9	13.2	15.1	15.2
LnGrp LOS	D	C	C	D	C	C	B	B	B	B	B	B
Approach Vol, veh/h		804			127			941			542	
Approach Delay, s/veh		36.4			38.1			14.5			15.1	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	39.5	7.0	22.6	8.2	36.0	18.6	11.0
Change Period (Y+Rc), s	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	30.0	15.0	27.0	15.0	30.0	15.0	27.0
Max Q Clear Time (g_c+I1), s	2.2	14.3	3.8	9.6	4.1	7.4	14.3	4.8
Green Ext Time (p_c), s	0.0	4.3	0.1	1.0	0.1	2.8	0.3	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	23.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	71.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	149	248	1	717	555	24
Future Vol, veh/h	149	248	1	717	555	24
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	-	470	-	-	-
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	162	270	1	779	603	26

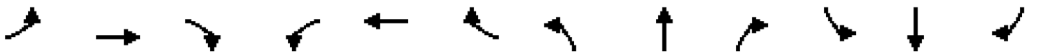
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1384	603	629	0	-	0
Stage 1	603	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 158	499	953	-	-	-
Stage 1	546	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 158	499	953	-	-	-
Mov Cap-2 Maneuver	~ 158	-	-	-	-	-
Stage 1	545	-	-	-	-	-
Stage 2	451	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 303.7	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	953	-	276	-	-
HCM Lane V/C Ratio	0.001	-	1.563	-	-
HCM Control Delay (s/veh)	8.8	-	$ 303.7	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q (veh)	0	-	25.7	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Background 2031 Saturday PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	1	52	4	5	17	49	1655	1	10	482	55
Future Volume (veh/h)	64	1	52	4	5	17	49	1655	1	10	482	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	1	0	4	5	18	53	1799	1	11	524	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	2		104	30	88	715	2640	1	277	2329	266
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1448	21	1585	173	391	1127	831	3645	2	262	3214	367
Grp Volume(v), veh/h	71	0	0	27	0	0	53	877	923	11	289	295
Grp Sat Flow(s),veh/h/ln	1469	0	1585	1690	0	0	831	1777	1870	262	1777	1804
Q Serve(g_s), s	1.4	0.0	0.0	0.0	0.0	0.0	1.0	12.2	12.2	1.1	2.4	2.5
Cycle Q Clear(g_c), s	2.1	0.0	0.0	0.7	0.0	0.0	3.5	12.2	12.2	13.3	2.4	2.5
Prop In Lane	0.99		1.00	0.15		0.67	1.00		0.00	1.00		0.20
Lane Grp Cap(c), veh/h	272	0		223	0	0	715	1287	1355	277	1287	1307
V/C Ratio(X)	0.26	0.00		0.12	0.00	0.00	0.07	0.68	0.68	0.04	0.22	0.23
Avail Cap(c_a), veh/h	713	0		731	0	0	715	1287	1355	277	1287	1307
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	0.0	19.7	0.0	0.0	2.6	3.4	3.4	7.0	2.1	2.1
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.0	0.2	2.9	2.8	0.3	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.3	0.0	0.0	0.1	2.1	2.2	0.1	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.8	0.0	0.0	19.9	0.0	0.0	2.8	6.3	6.2	7.3	2.5	2.5
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		71			27			1853			595	
Approach Delay, s/veh		20.8			19.9			6.2			2.6	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.1		37.5		8.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.2		4.1		15.3		2.7				
Green Ext Time (p_c), s		13.3		0.2		3.6		0.1				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			5.9									
HCM 6th LOS			A									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	12	116	2	15	21	44	1348	21	13	396	93
Future Volume (veh/h)	342	12	116	2	15	21	44	1348	21	13	396	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	372	13	126	2	16	23	48	1465	23	14	430	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	509	47	455	412	217	311	529	1671	26	169	1562	
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.04	0.46	0.46	0.02	0.43	0.00
Sat Flow, veh/h	1390	153	1481	1270	705	1013	1810	3638	57	1810	3610	1610
Grp Volume(v), veh/h	372	0	139	2	0	39	48	726	762	14	430	0
Grp Sat Flow(s),veh/h/ln	1390	0	1633	1270	0	1718	1810	1805	1890	1810	1805	1610
Q Serve(g_s), s	18.0	0.0	4.5	0.1	0.0	1.1	1.0	25.2	25.3	0.3	5.3	0.0
Cycle Q Clear(g_c), s	19.1	0.0	4.5	4.5	0.0	1.1	1.0	25.2	25.3	0.3	5.3	0.0
Prop In Lane	1.00		0.91	1.00		0.59	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	509	0	502	412	0	528	529	829	868	169	1562	
V/C Ratio(X)	0.73	0.00	0.28	0.00	0.00	0.07	0.09	0.88	0.88	0.08	0.28	
Avail Cap(c_a), veh/h	523	0	518	425	0	545	842	829	868	529	1562	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.8	0.0	18.2	19.9	0.0	17.0	10.0	17.0	17.0	14.7	12.7	0.0
Incr Delay (d2), s/veh	5.1	0.0	0.3	0.0	0.0	0.1	0.0	12.6	12.2	0.1	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	1.7	0.0	0.0	0.4	0.3	11.2	11.7	0.1	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.8	0.0	18.5	19.9	0.0	17.1	10.0	29.5	29.2	14.8	13.1	0.0
LnGrp LOS	C		B	B		B	B	C	C	B	B	
Approach Vol, veh/h		511			41			1536			444	
Approach Delay, s/veh		26.0			17.2			28.7			13.1	
Approach LOS		C			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.2	38.8		25.3	7.0	37.0		25.3
Change Period (Y+Rc), s	4.0	7.0		4.0	4.0	7.0		4.0
Max Green Setting (Gmax), s	15.0	30.0		22.0	15.0	30.0		22.0
Max Q Clear Time (g_c+I1), s	12.3	27.3		21.1	3.0	7.3		6.5
Green Ext Time (p_c), s	0.0	2.3		0.2	0.0	3.6		0.2

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		25.3
HCM 6th LOS		C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

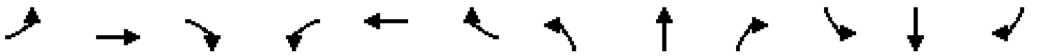
Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	26	1387	10	19	495
Future Vol, veh/h	11	26	1387	10	19	495
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	28	1508	11	21	538

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1825	760	0	0	1519	0
Stage 1	1514	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	70	353	-	-	445	-
Stage 1	171	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	67	353	-	-	445	-
Mov Cap-2 Maneuver	67	-	-	-	-	-
Stage 1	171	-	-	-	-	-
Stage 2	688	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	35.9	0	0.5
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	156	445	-
HCM Lane V/C Ratio	-	-	0.258	0.046	-
HCM Control Delay (s/veh)	-	-	35.9	13.5	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q (veh)	-	-	1	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	548	15	177	42	17	60	86	789	4	7	365	134
Future Volume (veh/h)	548	15	177	42	17	60	86	789	4	7	365	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	596	16	192	46	18	65	93	858	4	8	397	146
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	683	470	398	74	177	150	484	1645	8	297	1444	628
Arrive On Green	0.20	0.25	0.25	0.04	0.09	0.09	0.06	0.45	0.45	0.01	0.41	0.41
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	1781	3627	17	1781	3554	1546
Grp Volume(v), veh/h	596	16	192	46	18	65	93	420	442	8	397	146
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	1781	1777	1867	1781	1777	1546
Q Serve(g_s), s	12.3	0.5	7.6	1.9	0.6	2.9	2.1	12.5	12.5	0.2	5.5	4.6
Cycle Q Clear(g_c), s	12.3	0.5	7.6	1.9	0.6	2.9	2.1	12.5	12.5	0.2	5.5	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	683	470	398	74	177	150	484	806	847	297	1444	628
V/C Ratio(X)	0.87	0.03	0.48	0.62	0.10	0.43	0.19	0.52	0.52	0.03	0.28	0.23
Avail Cap(c_a), veh/h	702	684	579	362	684	579	743	806	847	641	1444	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	20.9	23.6	34.8	30.6	31.6	10.7	14.4	14.4	13.2	14.7	14.4
Incr Delay (d2), s/veh	11.8	0.0	1.3	11.7	0.4	2.8	0.2	0.6	0.6	0.0	0.5	0.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.2	2.9	1.0	0.3	1.2	0.7	4.3	4.6	0.1	2.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.5	20.9	24.9	46.5	30.9	34.3	10.9	15.0	15.0	13.2	15.1	15.2
LnGrp LOS	D	C	C	D	C	C	B	B	B	B	B	B
Approach Vol, veh/h		804			129			955			551	
Approach Delay, s/veh		36.4			38.2			14.6			15.1	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	39.5	7.1	22.5	8.3	36.0	18.6	11.0
Change Period (Y+Rc), s	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	30.0	15.0	27.0	15.0	30.0	15.0	27.0
Max Q Clear Time (g_c+I1), s	2.2	14.5	3.9	9.6	4.1	7.5	14.3	4.9
Green Ext Time (p_c), s	0.0	4.4	0.1	1.0	0.1	2.8	0.3	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	23.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	73.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	149	248	1	730	559	25
Future Vol, veh/h	149	248	1	730	559	25
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	-	470	-	-	-
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	162	270	1	793	608	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1403	608	635	0	-	0
Stage 1	608	-	-	-	-	-
Stage 2	795	-	-	-	-	-
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	~ 154	496	948	-	-	-
Stage 1	543	-	-	-	-	-
Stage 2	445	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 154	496	948	-	-	-
Mov Cap-2 Maneuver	~ 154	-	-	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	445	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 316.7	0	0
HCM LOS	F		

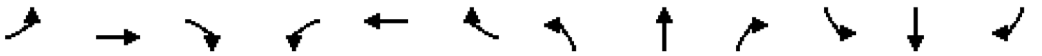
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	948	-	271	-	-
HCM Lane V/C Ratio	0.001	-	1.592	-	-
HCM Control Delay (s/veh)	8.8	-	$ 316.7	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q (veh)	0	-	26.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Background 2033 Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

10/22/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1	53	4	5	17	50	1665	1	10	490	56
Future Volume (veh/h)	65	1	53	4	5	17	50	1665	1	10	490	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	1	0	4	5	18	54	1810	1	11	533	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	2		104	31	88	709	2639	1	275	2328	266
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1448	20	1585	172	392	1128	823	3645	2	259	3214	367
Grp Volume(v), veh/h	72	0	0	27	0	0	54	882	929	11	294	300
Grp Sat Flow(s),veh/h/ln	1469	0	1585	1692	0	0	823	1777	1870	259	1777	1804
Q Serve(g_s), s	1.4	0.0	0.0	0.0	0.0	0.0	1.1	12.4	12.4	1.1	2.5	2.5
Cycle Q Clear(g_c), s	2.1	0.0	0.0	0.7	0.0	0.0	3.6	12.4	12.4	13.5	2.5	2.5
Prop In Lane	0.99		1.00	0.15		0.67	1.00		0.00	1.00		0.20
Lane Grp Cap(c), veh/h	272	0		223	0	0	709	1287	1354	275	1287	1307
V/C Ratio(X)	0.26	0.00		0.12	0.00	0.00	0.08	0.69	0.69	0.04	0.23	0.23
Avail Cap(c_a), veh/h	713	0		730	0	0	709	1287	1354	275	1287	1307
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	0.0	19.7	0.0	0.0	2.7	3.4	3.4	7.1	2.1	2.1
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.0	0.2	3.0	2.8	0.3	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.3	0.0	0.0	0.1	2.1	2.2	0.1	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.8	0.0	0.0	19.9	0.0	0.0	2.9	6.4	6.3	7.4	2.5	2.5
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		72			27			1865			605	
Approach Delay, s/veh		20.8			19.9			6.3			2.6	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.1		37.5		8.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.4		4.1		15.5		2.7				
Green Ext Time (p_c), s		13.3		0.2		3.7		0.1				

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	5.9	
HCM 6th LOS	A	

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	12	116	2	15	22	44	1359	22	13	404	94
Future Volume (veh/h)	342	12	116	2	15	22	44	1359	22	13	404	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	372	13	126	2	16	24	48	1477	24	14	439	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	508	47	456	413	211	317	524	1668	27	166	1561	
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.04	0.46	0.46	0.02	0.43	0.00
Sat Flow, veh/h	1389	153	1481	1270	686	1029	1810	3635	59	1810	3610	1610
Grp Volume(v), veh/h	372	0	139	2	0	40	48	733	768	14	439	0
Grp Sat Flow(s),veh/h/ln	1389	0	1633	1270	0	1715	1810	1805	1889	1810	1805	1610
Q Serve(g_s), s	18.0	0.0	4.5	0.1	0.0	1.1	1.0	25.7	25.7	0.3	5.5	0.0
Cycle Q Clear(g_c), s	19.1	0.0	4.5	4.5	0.0	1.1	1.0	25.7	25.7	0.3	5.5	0.0
Prop In Lane	1.00		0.91	1.00		0.60	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	508	0	503	413	0	528	524	828	867	166	1561	
V/C Ratio(X)	0.73	0.00	0.28	0.00	0.00	0.08	0.09	0.88	0.89	0.08	0.28	
Avail Cap(c_a), veh/h	521	0	518	425	0	544	837	828	867	526	1561	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.8	0.0	18.2	19.9	0.0	17.0	10.0	17.1	17.1	14.9	12.7	0.0
Incr Delay (d2), s/veh	5.1	0.0	0.3	0.0	0.0	0.1	0.0	13.3	12.9	0.1	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	1.7	0.0	0.0	0.5	0.3	11.5	12.0	0.1	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.9	0.0	18.5	19.9	0.0	17.1	10.0	30.4	30.0	15.0	13.2	0.0
LnGrp LOS	C		B	B		B	B	C	C	B	B	
Approach Vol, veh/h		511			42			1549			453	
Approach Delay, s/veh		26.1			17.2			29.6			13.2	
Approach LOS		C			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	38.8		25.4	7.0	37.0		25.4
Change Period (Y+Rc), s	4.0	7.0		4.0	4.0	7.0		4.0
Max Green Setting (Gmax), s	15.0	30.0		22.0	15.0	30.0		22.0
Max Q Clear Time (g_c+I1), s	2.3	27.7		21.1	3.0	7.5		6.5
Green Ext Time (p_c), s	0.0	2.0		0.2	0.0	3.6		0.2

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		25.8
HCM 6th LOS		C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

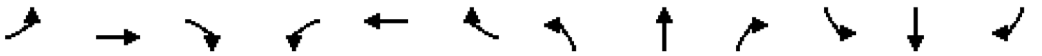
Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	26	1399	11	20	502
Future Vol, veh/h	11	26	1399	11	20	502
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	28	1521	12	22	546

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1844	767	0	0	1533	0
Stage 1	1527	-	-	-	-	-
Stage 2	317	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	68	349	-	-	440	-
Stage 1	169	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	65	349	-	-	440	-
Mov Cap-2 Maneuver	65	-	-	-	-	-
Stage 1	169	-	-	-	-	-
Stage 2	681	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	37	0	0.5
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	152	440	-
HCM Lane V/C Ratio	-	-	0.265	0.049	-
HCM Control Delay (s/veh)	-	-	37	13.6	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q (veh)	-	-	1	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	548	15	177	42	17	61	88	801	3	8	370	135
Future Volume (veh/h)	548	15	177	42	17	61	88	801	3	8	370	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	596	16	192	46	18	66	96	871	3	9	402	147
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	683	469	398	74	177	150	482	1644	6	295	1443	628
Arrive On Green	0.20	0.25	0.25	0.04	0.09	0.09	0.06	0.45	0.45	0.01	0.41	0.41
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	1781	3632	13	1781	3554	1546
Grp Volume(v), veh/h	596	16	192	46	18	66	96	426	448	9	402	147
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	1781	1777	1868	1781	1777	1546
Q Serve(g_s), s	12.4	0.5	7.6	1.9	0.7	2.9	2.2	12.8	12.8	0.2	5.6	4.6
Cycle Q Clear(g_c), s	12.4	0.5	7.6	1.9	0.7	2.9	2.2	12.8	12.8	0.2	5.6	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	683	469	398	74	177	150	482	804	846	295	1443	628
V/C Ratio(X)	0.87	0.03	0.48	0.62	0.10	0.44	0.20	0.53	0.53	0.03	0.28	0.23
Avail Cap(c_a), veh/h	701	683	579	362	683	579	740	804	846	636	1443	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	20.9	23.6	34.9	30.6	31.6	10.8	14.6	14.6	13.2	14.7	14.4
Incr Delay (d2), s/veh	11.8	0.0	1.3	11.7	0.4	2.9	0.2	0.7	0.6	0.0	0.5	0.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.2	2.9	1.0	0.3	1.2	0.7	4.4	4.7	0.1	2.1	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.6	21.0	24.9	46.6	30.9	34.5	11.0	15.2	15.2	13.2	15.2	15.3
LnGrp LOS	D	C	C	D	C	C	B	B	B	B	B	B
Approach Vol, veh/h		804			130			970			558	
Approach Delay, s/veh		36.5			38.3			14.8			15.2	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	39.5	7.1	22.5	8.3	36.0	18.6	11.0
Change Period (Y+Rc), s	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	30.0	15.0	27.0	15.0	30.0	15.0	27.0
Max Q Clear Time (g_c+I1), s	2.2	14.8	3.9	9.6	4.2	7.6	14.4	4.9
Green Ext Time (p_c), s	0.0	4.4	0.1	1.0	0.1	2.8	0.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	23.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	76.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	149	248	1	743	564	25
Future Vol, veh/h	149	248	1	743	564	25
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	-	470	-	-	-
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	162	270	1	808	613	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1423	613	640	0	-	0
Stage 1	613	-	-	-	-	-
Stage 2	810	-	-	-	-	-
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	~ 150	492	944	-	-	-
Stage 1	541	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 150	492	944	-	-	-
Mov Cap-2 Maneuver	~ 150	-	-	-	-	-
Stage 1	540	-	-	-	-	-
Stage 2	438	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v$	333	0	0
HCM LOS	F		

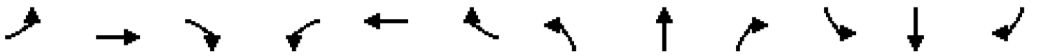
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	944	-	265	-	-
HCM Lane V/C Ratio	0.001	-	1.628	-	-
HCM Control Delay (s/veh)	8.8	-	$ 333	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q (veh)	0	-	26.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Background 2037 Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

10/22/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	1	55	4	6	18	52	1689	1	10	508	58
Future Volume (veh/h)	67	1	55	4	6	18	52	1689	1	10	508	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	73	1	0	4	7	20	57	1836	1	11	552	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	274	2		101	37	88	694	2633	1	269	2323	264
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1453	20	1585	147	455	1094	807	3645	2	252	3215	366
Grp Volume(v), veh/h	74	0	0	31	0	0	57	895	942	11	304	311
Grp Sat Flow(s),veh/h/ln	1473	0	1585	1695	0	0	807	1777	1870	252	1777	1804
Q Serve(g_s), s	1.3	0.0	0.0	0.0	0.0	0.0	1.2	12.9	12.9	1.2	2.6	2.6
Cycle Q Clear(g_c), s	2.1	0.0	0.0	0.8	0.0	0.0	3.8	12.9	12.9	14.0	2.6	2.6
Prop In Lane	0.99		1.00	0.13		0.65	1.00		0.00	1.00		0.20
Lane Grp Cap(c), veh/h	275	0		226	0	0	694	1284	1351	269	1284	1304
V/C Ratio(X)	0.27	0.00		0.14	0.00	0.00	0.08	0.70	0.70	0.04	0.24	0.24
Avail Cap(c_a), veh/h	710	0		732	0	0	694	1284	1351	269	1284	1304
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	0.0	19.7	0.0	0.0	2.8	3.5	3.5	7.5	2.1	2.1
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.0	0.2	3.2	3.0	0.3	0.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.3	0.0	0.0	0.1	2.3	2.3	0.1	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.7	0.0	0.0	19.9	0.0	0.0	3.0	6.7	6.6	7.8	2.6	2.6
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		74			31			1894			626	
Approach Delay, s/veh		20.7			19.9			6.5			2.6	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.2		37.5		8.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.9		4.1		16.0		2.8				
Green Ext Time (p_c), s		13.3		0.2		3.8		0.1				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			6.2									
HCM 6th LOS			A									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	12	116	2	16	22	46	1384	23	13	419	98
Future Volume (veh/h)	342	12	116	2	16	22	46	1384	23	13	419	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	372	13	126	2	17	24	50	1504	25	14	455	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	508	47	456	413	220	310	517	1668	28	161	1558	
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.04	0.46	0.46	0.02	0.43	0.00
Sat Flow, veh/h	1388	153	1481	1270	713	1006	1810	3634	60	1810	3610	1610
Grp Volume(v), veh/h	372	0	139	2	0	41	50	746	783	14	455	0
Grp Sat Flow(s),veh/h/ln	1388	0	1633	1270	0	1719	1810	1805	1889	1810	1805	1610
Q Serve(g_s), s	18.0	0.0	4.5	0.1	0.0	1.2	1.0	26.5	26.6	0.3	5.7	0.0
Cycle Q Clear(g_c), s	19.2	0.0	4.5	4.6	0.0	1.2	1.0	26.5	26.6	0.3	5.7	0.0
Prop In Lane	1.00		0.91	1.00		0.59	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	508	0	503	413	0	530	517	829	867	161	1558	
V/C Ratio(X)	0.73	0.00	0.28	0.00	0.00	0.08	0.10	0.90	0.90	0.09	0.29	
Avail Cap(c_a), veh/h	519	0	517	424	0	544	826	829	867	520	1558	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.9	0.0	18.2	19.9	0.0	17.0	10.1	17.3	17.4	15.2	12.9	0.0
Incr Delay (d2), s/veh	5.2	0.0	0.3	0.0	0.0	0.1	0.0	14.8	14.5	0.1	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	1.7	0.0	0.0	0.5	0.3	12.2	12.7	0.1	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.0	0.0	18.5	19.9	0.0	17.1	10.1	32.2	31.8	15.3	13.3	0.0
LnGrp LOS	C		B	B		B	B	C	C	B	B	
Approach Vol, veh/h		511			43			1579			469	
Approach Delay, s/veh		26.2			17.3			31.3			13.4	
Approach LOS		C			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	38.9		25.4	7.1	37.0		25.4
Change Period (Y+Rc), s	4.0	7.0		4.0	4.0	7.0		4.0
Max Green Setting (Gmax), s	15.0	30.0		22.0	15.0	30.0		22.0
Max Q Clear Time (g_c+I1), s	2.3	28.6		21.2	3.0	7.7		6.6
Green Ext Time (p_c), s	0.0	1.2		0.2	0.0	3.8		0.2

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		26.8
HCM 6th LOS		C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

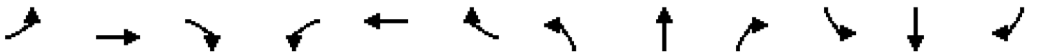
Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	27	1426	10	20	517
Future Vol, veh/h	11	27	1426	10	20	517
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	29	1550	11	22	562

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1881	781	0	0	1561	0
Stage 1	1556	-	-	-	-	-
Stage 2	325	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	64	342	-	-	429	-
Stage 1	163	-	-	-	-	-
Stage 2	711	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	61	342	-	-	429	-
Mov Cap-2 Maneuver	61	-	-	-	-	-
Stage 1	163	-	-	-	-	-
Stage 2	675	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	38.8	0	0.5
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	147	429	-
HCM Lane V/C Ratio	-	-	0.281	0.051	-
HCM Control Delay (s/veh)	-	-	38.8	13.8	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q (veh)	-	-	1.1	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	548	15	177	44	18	63	91	825	4	8	380	140
Future Volume (veh/h)	548	15	177	44	18	63	91	825	4	8	380	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	596	16	192	48	20	68	99	897	4	9	413	152
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	683	467	396	76	177	150	477	1643	7	286	1442	627
Arrive On Green	0.20	0.25	0.25	0.04	0.09	0.09	0.06	0.45	0.45	0.01	0.41	0.41
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	1781	3628	16	1781	3554	1546
Grp Volume(v), veh/h	596	16	192	48	20	68	99	439	462	9	413	152
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	1781	1777	1867	1781	1777	1546
Q Serve(g_s), s	12.4	0.5	7.6	2.0	0.7	3.0	2.2	13.3	13.3	0.2	5.8	4.8
Cycle Q Clear(g_c), s	12.4	0.5	7.6	2.0	0.7	3.0	2.2	13.3	13.3	0.2	5.8	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	683	467	396	76	177	150	477	805	846	286	1442	627
V/C Ratio(X)	0.87	0.03	0.48	0.64	0.11	0.45	0.21	0.55	0.55	0.03	0.29	0.24
Avail Cap(c_a), veh/h	701	683	579	361	683	579	733	805	846	627	1442	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	21.0	23.7	34.8	30.6	31.7	10.8	14.7	14.7	13.3	14.8	14.5
Incr Delay (d2), s/veh	11.9	0.0	1.3	11.9	0.4	3.0	0.2	0.8	0.7	0.0	0.5	0.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.2	2.9	1.1	0.3	1.3	0.8	4.6	4.9	0.1	2.1	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.6	21.0	25.0	46.8	31.0	34.7	11.0	15.5	15.4	13.3	15.3	15.4
LnGrp LOS	D	C	C	D	C	C	B	B	B	B	B	B
Approach Vol, veh/h		804			136			1000			574	
Approach Delay, s/veh		36.5			38.4			15.0			15.3	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	39.5	7.1	22.5	8.3	36.0	18.6	11.0
Change Period (Y+Rc), s	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	30.0	15.0	27.0	15.0	30.0	15.0	27.0
Max Q Clear Time (g_c+I1), s	2.2	15.3	4.0	9.6	4.2	7.8	14.4	5.0
Green Ext Time (p_c), s	0.0	4.5	0.1	1.0	0.1	2.9	0.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	23.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	82.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	149	248	1	771	575	26
Future Vol, veh/h	149	248	1	771	575	26
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	-	470	-	-	-
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	162	270	1	838	625	28

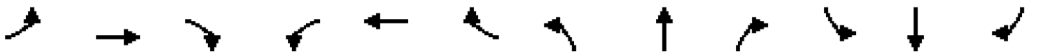
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1465	625	653	0	-	0
Stage 1	625	-	-	-	-	-
Stage 2	840	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 141	485	934	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 141	485	934	-	-	-
Mov Cap-2 Maneuver	~ 141	-	-	-	-	-
Stage 1	533	-	-	-	-	-
Stage 2	424	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	$ 368.1	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	934	-	253	-	-
HCM Lane V/C Ratio	0.001	-	1.706	-	-
HCM Control Delay (s/veh)	8.9	-	$ 368.1	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q (veh)	0	-	28.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Background 2050 Saturday PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	1	62	5	6	20	58	1769	2	11	572	66
Future Volume (veh/h)	76	1	62	5	6	20	58	1769	2	11	572	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	83	1	0	5	7	22	63	1923	2	12	622	72
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	1		104	37	93	646	2620	3	251	2308	267
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1456	18	1585	165	435	1101	750	3643	4	232	3210	371
Grp Volume(v), veh/h	84	0	0	34	0	0	63	938	987	12	344	350
Grp Sat Flow(s),veh/h/ln	1474	0	1585	1702	0	0	750	1777	1870	232	1777	1804
Q Serve(g_s), s	1.6	0.0	0.0	0.0	0.0	0.0	1.5	14.4	14.4	1.5	3.1	3.1
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.9	0.0	0.0	4.6	14.4	14.4	15.9	3.1	3.1
Prop In Lane	0.99		1.00	0.15		0.65	1.00		0.00	1.00		0.21
Lane Grp Cap(c), veh/h	281	0		234	0	0	646	1278	1345	251	1278	1297
V/C Ratio(X)	0.30	0.00		0.15	0.00	0.00	0.10	0.73	0.73	0.05	0.27	0.27
Avail Cap(c_a), veh/h	707	0		728	0	0	646	1278	1345	251	1278	1297
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	0.0	19.6	0.0	0.0	3.0	3.8	3.8	8.6	2.2	2.2
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.3	0.0	0.0	0.3	3.8	3.6	0.4	0.5	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.3	0.0	0.0	0.2	2.7	2.8	0.1	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.9	0.0	0.0	19.9	0.0	0.0	3.3	7.6	7.4	8.9	2.8	2.8
LnGrp LOS	C			B			A	A	A	A	A	A
Approach Vol, veh/h		84			34			1988			706	
Approach Delay, s/veh		20.9			19.9			7.4			2.9	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.4		37.5		8.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		16.4		4.4		17.9		2.9				
Green Ext Time (p_c), s		13.0		0.3		4.2		0.1				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			6.8									
HCM 6th LOS			A									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	12	116	3	18	25	52	1469	25	15	471	110
Future Volume (veh/h)	342	12	116	3	18	25	52	1469	25	15	471	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	372	13	126	3	20	27	57	1597	27	16	512	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	505	47	460	416	228	307	490	1658	28	146	1544	
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.05	0.46	0.46	0.02	0.43	0.00
Sat Flow, veh/h	1380	153	1481	1270	733	989	1810	3633	61	1810	3610	1610
Grp Volume(v), veh/h	372	0	139	3	0	47	57	792	832	16	512	0
Grp Sat Flow(s),veh/h/ln	1380	0	1633	1270	0	1722	1810	1805	1889	1810	1805	1610
Q Serve(g_s), s	18.3	0.0	4.5	0.1	0.0	1.4	1.2	29.8	30.0	0.3	6.6	0.0
Cycle Q Clear(g_c), s	19.7	0.0	4.5	4.6	0.0	1.4	1.2	29.8	30.0	0.3	6.6	0.0
Prop In Lane	1.00		0.91	1.00		0.57	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	505	0	507	416	0	535	490	824	862	146	1544	
V/C Ratio(X)	0.74	0.00	0.27	0.01	0.00	0.09	0.12	0.96	0.96	0.11	0.33	
Avail Cap(c_a), veh/h	509	0	512	420	0	540	790	824	862	499	1544	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.1	0.0	18.2	20.0	0.0	17.1	10.3	18.5	18.5	16.7	13.4	0.0
Incr Delay (d2), s/veh	5.5	0.0	0.3	0.0	0.0	0.1	0.0	23.3	23.1	0.1	0.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	1.7	0.0	0.0	0.5	0.4	15.3	16.0	0.1	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.6	0.0	18.5	20.0	0.0	17.2	10.3	41.8	41.6	16.8	14.0	0.0
LnGrp LOS	C		B	B		B	B	D	D	B	B	
Approach Vol, veh/h		511			50			1681			528	
Approach Delay, s/veh		26.6			17.4			40.6			14.0	
Approach LOS		C			B			D			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.3	39.0		25.8	7.4	37.0		25.8
Change Period (Y+Rc), s	4.0	7.0		4.0	4.0	7.0		4.0
Max Green Setting (Gmax), s	15.0	30.0		22.0	15.0	30.0		22.0
Max Q Clear Time (g_c+I1), s	12.3	32.0		21.7	3.2	8.6		6.6
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	4.3		0.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	32.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

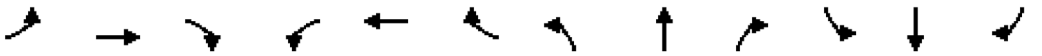
Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	30	1516	12	24	566
Future Vol, veh/h	13	30	1516	12	24	566
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	14	33	1648	13	26	615

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2015	831	0	0	1661	0
Stage 1	1655	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	52	317	-	-	393	-
Stage 1	144	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	49	317	-	-	393	-
Mov Cap-2 Maneuver	49	-	-	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	638	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	53.6	0	0.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	119	393	-
HCM Lane V/C Ratio	-	-	0.393	0.066	-
HCM Control Delay (s/veh)	-	-	53.6	14.8	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q (veh)	-	-	1.6	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	548	15	177	49	20	71	103	909	4	9	412	158
Future Volume (veh/h)	548	15	177	49	20	71	103	909	4	9	412	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	596	16	192	53	22	77	112	988	4	10	448	172
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	494	327	277	69	132	112	556	2189	9	348	2023	886
Arrive On Green	0.14	0.17	0.17	0.04	0.07	0.07	0.05	0.60	0.60	0.01	0.57	0.57
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	1781	3630	15	1781	3554	1557
Grp Volume(v), veh/h	596	16	192	53	22	77	112	484	508	10	448	172
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	1781	1777	1867	1781	1777	1557
Q Serve(g_s), s	15.0	0.7	11.9	3.1	1.2	5.0	2.6	15.6	15.6	0.2	6.5	5.6
Cycle Q Clear(g_c), s	15.0	0.7	11.9	3.1	1.2	5.0	2.6	15.6	15.6	0.2	6.5	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	494	327	277	69	132	112	556	1071	1126	348	2023	886
V/C Ratio(X)	1.21	0.05	0.69	0.77	0.17	0.69	0.20	0.45	0.45	0.03	0.22	0.19
Avail Cap(c_a), veh/h	494	481	408	254	481	408	729	1071	1126	581	2023	886
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	36.1	40.7	50.0	45.9	47.7	8.0	11.4	11.4	10.0	11.1	11.0
Incr Delay (d2), s/veh	111.1	0.1	4.4	21.7	0.8	10.2	0.2	1.4	1.3	0.0	0.3	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	0.4	5.0	1.8	0.6	2.3	0.9	5.7	6.0	0.1	2.4	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	156.1	36.2	45.1	71.7	46.7	57.8	8.2	12.7	12.7	10.0	11.4	11.4
LnGrp LOS	F	D	D	E	D	E	A	B	B	A	B	B
Approach Vol, veh/h		804			152			1104			630	
Approach Delay, s/veh		127.2			61.0			12.3			11.4	
Approach LOS		F			E			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.3	69.3	8.1	22.3	8.8	65.8	19.0	11.4
Change Period (Y+Rc), s	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	30.0	15.0	27.0	15.0	30.0	15.0	27.0
Max Q Clear Time (g_c+I1), s	2.2	17.6	5.1	13.9	4.6	8.5	17.0	7.0
Green Ext Time (p_c), s	0.0	4.6	0.1	0.9	0.2	3.2	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	49.2
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	102.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	149	248	1	867	609	29
Future Vol, veh/h	149	248	1	867	609	29
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	-	470	-	-	-
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	162	270	1	942	662	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1606	662	694	0	-	0
Stage 1	662	-	-	-	-	-
Stage 2	944	-	-	-	-	-
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	~ 116	462	901	-	-	-
Stage 1	513	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 116	462	901	-	-	-
Mov Cap-2 Maneuver	~ 116	-	-	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	378	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	$493.4	0	0
HCM LOS	F		

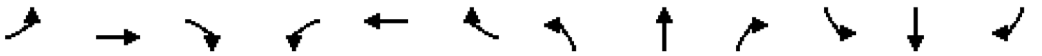
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	901	-	218	-	-
HCM Lane V/C Ratio	0.001	-	1.979	-	-
HCM Control Delay (s/veh)	9	-	$ 493.4	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q (veh)	0	-	31.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Phase 1 2029 Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

01/14/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	1	55	4	5	17	48	2055	1	9	686	54
Future Volume (veh/h)	63	1	55	4	5	17	48	2055	1	9	686	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	1	0	4	5	18	52	2234	1	10	746	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	2		104	30	87	595	2643	1	208	2419	191
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1449	21	1585	174	389	1126	677	3645	2	171	3336	264
Grp Volume(v), veh/h	69	0	0	27	0	0	52	1089	1146	10	397	408
Grp Sat Flow(s),veh/h/ln	1470	0	1585	1688	0	0	677	1777	1870	171	1777	1823
Q Serve(g_s), s	1.3	0.0	0.0	0.0	0.0	0.0	1.3	19.8	19.8	2.0	3.6	3.6
Cycle Q Clear(g_c), s	2.0	0.0	0.0	0.7	0.0	0.0	4.9	19.8	19.8	21.8	3.6	3.6
Prop In Lane	0.99		1.00	0.15		0.67	1.00		0.00	1.00		0.14
Lane Grp Cap(c), veh/h	271	0		221	0	0	595	1288	1356	208	1288	1322
V/C Ratio(X)	0.26	0.00		0.12	0.00	0.00	0.09	0.85	0.85	0.05	0.31	0.31
Avail Cap(c_a), veh/h	714	0		731	0	0	595	1288	1356	208	1288	1322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	0.0	19.7	0.0	0.0	3.1	4.4	4.4	12.2	2.2	2.2
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.0	0.3	6.9	6.6	0.4	0.6	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.3	0.0	0.0	0.1	4.2	4.3	0.1	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.7	0.0	0.0	19.9	0.0	0.0	3.4	11.4	11.1	12.6	2.8	2.8
LnGrp LOS	C			B			A	B	B	B	A	A
Approach Vol, veh/h		69			27			2287			815	
Approach Delay, s/veh		20.7			19.9			11.0			3.0	
Approach LOS		C			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.0		37.5		8.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		21.8		4.0		23.8		2.7				
Green Ext Time (p_c), s		10.1		0.2		3.7		0.1				

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	9.3
HCM 6th LOS	A

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

MOVEMENT SUMMARY

Site: #3 - US-40 & Old Town Drive/Arrow Trail

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2029 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	185	5.0	185	5.0	1.024	65.5	LOS F	29.4	765.0	1.00	2.28	3.19	14.5
8x	T1	All MCs	1247	5.0	1247	5.0	1.024	60.1	LOS F	36.4	945.7	1.00	2.36	3.22	15.1
18x	R2	All MCs	23	5.0	23	5.0	1.024	57.2	LOS F	36.4	945.7	1.00	2.41	3.24	15.4
Approach			1454	5.0	1454	5.0	1.024	60.8	LOS F	36.4	945.7	1.00	2.35	3.22	15.0
East: Arrow Trail															
1x	L2	All MCs	2	5.0	2	5.0	1.000	1450.5	LOS F	4.7	121.1	1.00	1.23	1.79	4.8
6x	T1	All MCs	2	5.0	2	5.0	1.000	1450.5	LOS F	4.7	121.1	1.00	1.23	1.79	4.8
16x	R2	All MCs	23	5.0	23	5.0	1.000	270.3	LOS F	4.7	121.1	1.00	1.23	1.79	4.8
Approach			27	5.0	27	5.0	1.000	374.1	LOS F	4.7	121.1	1.00	1.23	1.79	4.8
North: US-40															
7x	L2	All MCs	14	5.0	14	5.0	0.312	6.2	LOS A	2.2	56.5	0.50	0.28	0.50	23.3
4x	T1	All MCs	504	5.0	504	5.0	0.312	5.9	LOS A	2.3	59.3	0.49	0.27	0.49	23.4
14x	R2	All MCs	245	5.0	245	5.0	0.312	5.4	LOS A	2.3	59.3	0.48	0.25	0.48	23.4
Approach			763	5.0	763	5.0	0.312	5.8	LOS A	2.3	59.3	0.49	0.26	0.49	23.4
West: Old Town Drive															
5x	L2	All MCs	1025	5.0	1025	5.0	1.565	271.2	LOS F	166.6	4332.6	1.00	6.86	10.43	6.3
2x	T1	All MCs	2	5.0	2	5.0	1.565	271.2	LOS F	166.6	4332.6	1.00	6.86	10.43	6.3
12x	R2	All MCs	317	5.0	317	5.0	1.565	271.2	LOS F	166.6	4332.6	1.00	6.86	10.43	6.3
Approach			1345	5.0	1345	5.0	1.565	271.2	LOS F	166.6	4332.6	1.00	6.86	10.43	6.3
All Vehicles			3589	5.0	3589	5.0	1.565	130.9	LOS F	166.6	4332.6	0.89	3.59	5.33	10.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	25	1313	9	18	740
Future Vol, veh/h	10	25	1313	9	18	740
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	27	1427	10	20	804

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1874	719	0	0	1437	0
Stage 1	1432	-	-	-	-	-
Stage 2	442	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	65	375	-	-	479	-
Stage 1	190	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	62	375	-	-	479	-
Mov Cap-2 Maneuver	62	-	-	-	-	-
Stage 1	190	-	-	-	-	-
Stage 2	595	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	35.9	0	0.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	154	479	-
HCM Lane V/C Ratio	-	-	0.247	0.041	-
HCM Control Delay (s/veh)	-	-	35.9	12.8	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q (veh)	-	-	0.9	0.1	-

MOVEMENT SUMMARY

Site: #5 US-40 & Winter Park Drive

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2029 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	73	5.0	73	5.0	0.531	8.8	LOS A	4.6	119.2	0.52	0.27	0.52	22.6
8x	T1	All MCs	1305	5.0	1305	5.0	0.531	8.2	LOS A	4.7	122.8	0.50	0.25	0.50	22.9
18x	R2	All MCs	5	5.0	5	5.0	0.531	7.9	LOS A	4.7	122.8	0.49	0.24	0.49	23.0
Approach			1384	5.0	1384	5.0	0.531	8.3	LOS A	4.7	122.8	0.50	0.25	0.50	22.9
East: Winter Park Drive															
1x	L2	All MCs	9	5.0	9	5.0	0.227	28.5	LOS D	1.2	32.0	0.96	0.92	0.96	18.7
6x	T1	All MCs	2	5.0	2	5.0	0.227	28.5	LOS D	1.2	32.0	0.96	0.92	0.96	18.8
16x	R2	All MCs	27	5.0	27	5.0	0.227	28.5	LOS D	1.2	32.0	0.96	0.92	0.96	18.8
Approach			38	5.0	38	5.0	0.227	28.5	LOS D	1.2	32.0	0.96	0.92	0.96	18.8
North: US-40															
7x	L2	All MCs	23	5.0	23	5.0	0.298	5.4	LOS A	1.9	49.4	0.30	0.13	0.30	23.4
4x	T1	All MCs	786	5.0	786	5.0	0.298	5.1	LOS A	1.9	50.5	0.29	0.12	0.29	23.6
14x	R2	All MCs	7	5.0	7	5.0	0.298	4.9	LOS A	1.9	50.5	0.29	0.12	0.29	23.7
Approach			815	5.0	815	5.0	0.298	5.1	LOS A	1.9	50.5	0.29	0.12	0.29	23.6
West: Winter Park Drive															
5x	L2	All MCs	104	5.0	104	5.0	0.248	8.3	LOS A	1.5	40.2	0.80	0.63	0.80	22.1
2x	T1	All MCs	2	5.0	2	5.0	0.248	8.3	LOS A	1.5	40.2	0.80	0.63	0.80	22.2
12x	R2	All MCs	61	5.0	61	5.0	0.248	8.3	LOS A	1.5	40.2	0.80	0.63	0.80	22.2
Approach			167	5.0	167	5.0	0.248	8.3	LOS A	1.5	40.2	0.80	0.63	0.80	22.1
All Vehicles			2404	5.0	2404	5.0	0.531	7.5	LOS A	4.7	122.8	0.46	0.25	0.46	23.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection	
Int Delay, s/veh	405.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	314	105	57	959	718	70
Future Vol, veh/h	314	105	57	959	718	70
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	-	470	-	-	-
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	341	114	62	1042	780	76

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1946	780	856	0	-	0
Stage 1	780	-	-	-	-	-
Stage 2	1166	-	-	-	-	-
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	~ 71	395	784	-	-	-
Stage 1	452	-	-	-	-	-
Stage 2	~ 296	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 65	395	784	-	-	-
Mov Cap-2 Maneuver	~ 65	-	-	-	-	-
Stage 1	416	-	-	-	-	-
Stage 2	~ 296	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	$ 2150.5	0.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	784	-	82	-	-
HCM Lane V/C Ratio	0.079	-	5.554	-	-
HCM Control Delay (s/veh)	10	-	$ 2150.5	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q (veh)	0.3	-	50.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	119.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	1173	352	43	62	34
Future Vol, veh/h	2	1173	352	43	62	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	2	1275	383	47	67	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	899	86	104	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	813	-	-	-	-	-
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	309	~ 973	1488	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	436	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	227	~ 973	1488	-	-	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	690	-	-	-	-	-
Stage 2	436	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	166.4	7.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1488	-	968	-	-
HCM Lane V/C Ratio	0.257	-	1.319	-	-
HCM Control Delay (s/veh)	8.3	0	166.4	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q (veh)	1	-	48.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	13	0	66	45	0
Future Vol, veh/h	30	13	0	66	45	0
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	33	14	0	72	49	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	7.4	7.4	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	0%	70%	0%
Vol Thru, %	100%	0%	100%
Vol Right, %	0%	30%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	66	43	45
LT Vol	0	30	0
Through Vol	66	0	45
RT Vol	0	13	0
Lane Flow Rate	72	47	49
Geometry Grp	1	1	1
Degree of Util (X)	0.081	0.053	0.055
Departure Headway (Hd)	4.053	4.099	4.071
Convergence, Y/N	Yes	Yes	Yes
Cap	882	867	877
Service Time	2.086	2.155	2.108
HCM Lane V/C Ratio	0.082	0.054	0.056
HCM Control Delay, s/veh	7.4	7.4	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	0.2	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	66	58	0
Future Vol, veh/h	0	0	0	66	58	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
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	0	0	72	63	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	135	63	63	0	-	0
Stage 1	63	-	-	-	-	-
Stage 2	72	-	-	-	-	-
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	859	1002	1540	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	859	1002	1540	-	-	-
Mov Cap-2 Maneuver	859	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1540	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q (veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	21	0	7	1	0	1	14	44	1	1	40	17
Future Vol, veh/h	21	0	7	1	0	1	14	44	1	1	40	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	23	0	8	1	0	1	15	48	1	1	43	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	133	133	52	137	142	49	61	0	0	49	0	0
Stage 1	54	54	-	79	79	-	-	-	-	-	-	-
Stage 2	79	79	-	58	63	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	839	758	1016	834	749	1020	1542	-	-	1558	-	-
Stage 1	958	850	-	930	829	-	-	-	-	-	-	-
Stage 2	930	829	-	954	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	831	750	1016	821	741	1020	1542	-	-	1558	-	-
Mov Cap-2 Maneuver	831	750	-	821	741	-	-	-	-	-	-	-
Stage 1	948	849	-	921	821	-	-	-	-	-	-	-
Stage 2	920	821	-	946	841	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	9.3	9	1.7	0.1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1542	-	-	871	910	1558	-	-
HCM Lane V/C Ratio	0.01	-	-	0.035	0.002	0.001	-	-
HCM Control Delay (s/veh)	7.4	0	-	9.3	9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	34	25	21	23	25
Future Vol, veh/h	19	34	25	21	23	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	21	37	27	23	25	27

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	116	39	0	0	50	0
Stage 1	39	-	-	-	-	-
Stage 2	77	-	-	-	-	-
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	880	1033	-	-	1557	-
Stage 1	983	-	-	-	-	-
Stage 2	946	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	866	1033	-	-	1557	-
Mov Cap-2 Maneuver	866	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	931	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	9	0	3.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	966	1557	-
HCM Lane V/C Ratio	-	-	0.06	0.016	-
HCM Control Delay (s/veh)	-	-	9	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q (veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	38	21	40	29	15
Future Vol, veh/h	7	38	21	40	29	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	-	-	-	-	-	-
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	8	41	23	43	32	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	129	40	48	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	89	-	-	-	-	-
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	865	1031	1559	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	934	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	852	1031	1559	-	-	-
Mov Cap-2 Maneuver	852	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	934	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	8.8	2.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1559	-	998	-	-
HCM Lane V/C Ratio	0.015	-	0.049	-	-
HCM Control Delay (s/veh)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q (veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	67	0	0	61	0	0
Future Vol, veh/h	67	0	0	61	0	0
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	73	0	0	66	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	73	0	139	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	66	-
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	-	-	1527	-	854	989
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	957	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1527	-	854	989
Mov Cap-2 Maneuver	-	-	-	-	854	-
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1527	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	67	61	28	85	0
Future Vol, veh/h	0	67	61	28	85	0
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	0	73	66	30	92	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	96	0	-	0	154	81
Stage 1	-	-	-	-	81	-
Stage 2	-	-	-	-	73	-
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	1498	-	-	-	838	979
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	950	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1498	-	-	-	838	979
Mov Cap-2 Maneuver	-	-	-	-	838	-
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	950	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1498	-	-	-	838
HCM Lane V/C Ratio	-	-	-	-	0.11
HCM Control Delay (s/veh)	0	-	-	-	9.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	6.6
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	1	0	0	2
Future Vol, veh/h	0	0	1	0	0	2
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	0	0	1	0	0	2
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	0	7.1	6.3
HCM LOS	-	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	0%	0%	100%
Vol Thru, %	0%	100%	0%
Vol Right, %	100%	0%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	2	0	1
LT Vol	0	0	1
Through Vol	0	0	0
RT Vol	2	0	0
Lane Flow Rate	2	0	1
Geometry Grp	1	1	1
Degree of Util (X)	0.002	0	0.001
Departure Headway (Hd)	3.336	3.939	4.138
Convergence, Y/N	Yes	Yes	Yes
Cap	1079	0	870
Service Time	1.336	1.939	2.138
HCM Lane V/C Ratio	0.002	0	0.001
HCM Control Delay, s/veh	6.3	6.9	7.1
HCM Lane LOS	A	N	A
HCM 95th-tile Q	0	0	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	43	0
Future Vol, veh/h	0	0	0	0	43	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Yield	Yield	Free	Free
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	0	0	0	0	47	0

Major/Minor	Minor2			Major2	
Conflicting Flow All	-	47		-	0
Stage 1	-	-		-	-
Stage 2	-	-		-	-
Critical Hdwy	-	6.22		-	-
Critical Hdwy Stg 1	-	-		-	-
Critical Hdwy Stg 2	-	-		-	-
Follow-up Hdwy	-	3.318		-	-
Pot Cap-1 Maneuver	0	1022		-	-
Stage 1	0	-		-	-
Stage 2	0	-		-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	1022		-	-
Mov Cap-2 Maneuver	-	-		-	-
Stage 1	-	-		-	-
Stage 2	-	-		-	-

Approach	EB	SB
HCM Control Delay, s/v	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s/veh)	0	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q (veh)	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	33	0	0
Future Vol, veh/h	10	0	0	33	0	0
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	11	0	0	36	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	11	0	47	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	36	-
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	-	-	1608	-	963	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	986	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1608	-	963	1070
Mov Cap-2 Maneuver	-	-	-	-	963	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	986	-

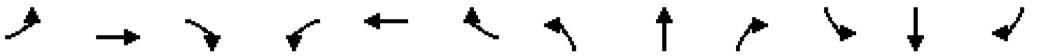
Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1608	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	-	-	-	0	-

Phase 2 2031 Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

01/14/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	1	56	4	5	17	49	2251	1	10	788	55
Future Volume (veh/h)	64	1	56	4	5	17	49	2251	1	10	788	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	1	0	4	5	18	53	2447	1	11	857	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	2		104	30	88	542	2641	1	180	2441	171
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1448	21	1585	173	391	1127	609	3645	1	138	3369	236
Grp Volume(v), veh/h	71	0	0	27	0	0	53	1193	1255	11	452	465
Grp Sat Flow(s),veh/h/ln	1469	0	1585	1690	0	0	609	1777	1870	138	1777	1828
Q Serve(g_s), s	1.4	0.0	0.0	0.0	0.0	0.0	1.6	25.6	25.6	3.3	4.3	4.3
Cycle Q Clear(g_c), s	2.1	0.0	0.0	0.7	0.0	0.0	5.9	25.6	25.6	28.9	4.3	4.3
Prop In Lane	0.99		1.00	0.15		0.67	1.00		0.00	1.00		0.13
Lane Grp Cap(c), veh/h	272	0		223	0	0	542	1287	1355	180	1287	1324
V/C Ratio(X)	0.26	0.00		0.12	0.00	0.00	0.10	0.93	0.93	0.06	0.35	0.35
Avail Cap(c_a), veh/h	713	0		731	0	0	542	1287	1355	180	1287	1324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	0.0	19.7	0.0	0.0	3.4	5.3	5.3	17.4	2.3	2.3
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.0	0.4	12.7	12.2	0.6	0.8	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.3	0.0	0.0	0.2	6.7	6.9	0.1	0.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.8	0.0	0.0	19.9	0.0	0.0	3.8	18.0	17.5	18.0	3.1	3.1
LnGrp LOS	C			B			A	B	B	B	A	A
Approach Vol, veh/h		71			27			2501			928	
Approach Delay, s/veh		20.8			19.9			17.4			3.2	
Approach LOS		C			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.1		37.5		8.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		27.6		4.1		30.9		2.7				
Green Ext Time (p_c), s		5.2		0.2		1.2		0.1				

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	13.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

MOVEMENT SUMMARY

Site: #3 US-40 & Old Town Drive/Arrow Trail

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2031 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	193	5.0	193	5.0	1.064	76.0	LOS F	35.4	919.5	1.00	2.57	3.67	13.6
8x	T1	All MCs	1338	5.0	1338	5.0	1.064	70.9	LOS F	44.1	1146.9	1.00	2.69	3.73	14.1
18x	R2	All MCs	23	5.0	23	5.0	1.064	68.1	LOS F	44.1	1146.9	1.00	2.75	3.76	14.3
Approach			1554	5.0	1554	5.0	1.064	71.5	LOS F	44.1	1146.9	1.00	2.67	3.72	14.0
East: Arrow Trail															
1x	L2	All MCs	2	5.0	2	5.0	1.000	1466.7	LOS F	4.7	121.5	1.00	1.22	1.79	4.8
6x	T1	All MCs	2	5.0	2	5.0	1.000	1466.7	LOS F	4.7	121.5	1.00	1.22	1.79	4.8
16x	R2	All MCs	23	5.0	23	5.0	1.000	270.0	LOS F	4.7	121.5	1.00	1.22	1.79	4.8
Approach			27	5.0	27	5.0	1.000	374.8	LOS F	4.7	121.5	1.00	1.22	1.79	4.8
North: US-40															
7x	L2	All MCs	14	5.0	14	5.0	0.352	6.6	LOS A	2.5	66.3	0.52	0.29	0.52	23.2
4x	T1	All MCs	552	5.0	552	5.0	0.352	6.4	LOS A	2.7	69.5	0.51	0.28	0.51	23.3
14x	R2	All MCs	295	5.0	295	5.0	0.352	5.9	LOS A	2.7	69.5	0.50	0.27	0.50	23.3
Approach			861	5.0	861	5.0	0.352	6.2	LOS A	2.7	69.5	0.51	0.28	0.51	23.3
West: Old Town Drive															
5x	L2	All MCs	1147	5.0	1147	5.0	1.809	380.1	LOS F	220.0	5718.7	1.00	8.05	12.60	4.9
2x	T1	All MCs	2	5.0	2	5.0	1.809	380.1	LOS F	220.0	5718.7	1.00	8.05	12.60	4.9
12x	R2	All MCs	336	5.0	336	5.0	1.809	380.1	LOS F	220.0	5718.7	1.00	8.05	12.60	4.9
Approach			1485	5.0	1485	5.0	1.809	380.1	LOS F	220.0	5718.7	1.00	8.05	12.60	4.9
All Vehicles			3927	5.0	3927	5.0	1.809	176.6	LOS F	220.0	5718.7	0.89	4.17	6.36	8.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	26	1404	10	19	800
Future Vol, veh/h	11	26	1404	10	19	800
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	28	1526	11	21	870

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2009	769	0	0	1537	0
Stage 1	1532	-	-	-	-	-
Stage 2	477	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	53	348	-	-	438	-
Stage 1	168	-	-	-	-	-
Stage 2	596	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	50	348	-	-	438	-
Mov Cap-2 Maneuver	50	-	-	-	-	-
Stage 1	168	-	-	-	-	-
Stage 2	567	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	46.4	0	0.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	126	438	-
HCM Lane V/C Ratio	-	-	0.319	0.047	-
HCM Control Delay (s/veh)	-	-	46.4	13.6	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q (veh)	-	-	1.3	0.1	-

MOVEMENT SUMMARY

Site: #5 US-40 & Winter Park Drive

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2031 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	142	5.0	142	5.0	0.602	10.6	LOS B	5.7	147.1	0.66	0.38	0.66	22.1
8x	T1	All MCs	1348	5.0	1348	5.0	0.602	9.9	LOS A	5.9	153.3	0.64	0.36	0.64	22.5
18x	R2	All MCs	5	5.0	5	5.0	0.602	9.4	LOS A	5.9	153.3	0.62	0.35	0.62	22.7
Approach			1496	5.0	1496	5.0	0.602	9.9	LOS A	5.9	153.3	0.64	0.36	0.64	22.5
East: Winter Park Drive															
1x	L2	All MCs	10	5.0	10	5.0	1.000	291.6	LOS F	5.3	138.7	1.00	1.31	1.97	6.2
6x	T1	All MCs	2	5.0	2	5.0	1.000	685.7	LOS F	5.3	138.7	1.00	1.31	1.97	6.3
16x	R2	All MCs	29	5.0	29	5.0	1.000	244.5	LOS F	5.3	138.7	1.00	1.31	1.97	6.3
Approach			41	5.0	41	5.0	1.000	270.1	LOS F	5.3	138.7	1.00	1.31	1.97	6.3
North: US-40															
7x	L2	All MCs	14	5.0	14	5.0	0.345	6.3	LOS A	2.3	60.6	0.45	0.23	0.45	23.2
4x	T1	All MCs	813	5.0	813	5.0	0.345	5.9	LOS A	2.4	62.7	0.43	0.22	0.43	23.4
14x	R2	All MCs	55	5.0	55	5.0	0.345	5.6	LOS A	2.4	62.7	0.42	0.21	0.42	23.5
Approach			883	5.0	883	5.0	0.345	5.9	LOS A	2.4	62.7	0.43	0.22	0.43	23.4
West: Winter Park Drive															
5x	L2	All MCs	161	5.0	161	5.0	0.412	11.4	LOS B	3.0	77.7	0.88	0.75	0.95	21.5
2x	T1	All MCs	2	5.0	2	5.0	0.412	11.4	LOS B	3.0	77.7	0.88	0.75	0.95	21.6
12x	R2	All MCs	102	5.0	102	5.0	0.412	11.4	LOS B	3.0	77.7	0.88	0.75	0.95	21.6
Approach			265	5.0	265	5.0	0.412	11.4	LOS B	3.0	77.7	0.88	0.75	0.95	21.5
All Vehicles			2685	5.0	2685	5.0	1.000	12.9	LOS B	5.9	153.3	0.60	0.37	0.62	21.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	555.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	332	111	60	1044	777	74
Future Vol, veh/h	332	111	60	1044	777	74
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	-	470	-	-	-
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	361	121	65	1135	845	80

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2110	845	925	0	-	0
Stage 1	845	-	-	-	-	-
Stage 2	1265	-	-	-	-	-
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	~ 56	363	739	-	-	-
Stage 1	421	-	-	-	-	-
Stage 2	~ 265	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 51	363	739	-	-	-
Mov Cap-2 Maneuver	~ 51	-	-	-	-	-
Stage 1	384	-	-	-	-	-
Stage 2	~ 265	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	$ 3006.7	0.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	739	-	65	-	-
HCM Lane V/C Ratio	0.088	-	7.408	-	-
HCM Control Delay (s/veh)	10.3	-	$ 3006.7	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q (veh)	0.3	-	55.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	173.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	1242	370	80	123	35
Future Vol, veh/h	2	1242	370	80	123	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	2	1350	402	87	134	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1044	153	172	0	-	0
Stage 1	153	-	-	-	-	-
Stage 2	891	-	-	-	-	-
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	254	~ 893	1405	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	401	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	178	~ 893	1405	-	-	-
Mov Cap-2 Maneuver	178	-	-	-	-	-
Stage 1	612	-	-	-	-	-
Stage 2	401	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	256.3	7.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1405	-	887	-	-
HCM Lane V/C Ratio	0.286	-	1.524	-	-
HCM Control Delay (s/veh)	8.6	0	256.3	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q (veh)	1.2	-	65.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	23	0	126	82	0
Future Vol, veh/h	32	23	0	126	82	0
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	35	25	0	137	89	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	7.6	7.9	7.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	0%	58%	0%
Vol Thru, %	100%	0%	100%
Vol Right, %	0%	42%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	126	55	82
LT Vol	0	32	0
Through Vol	126	0	82
RT Vol	0	23	0
Lane Flow Rate	137	60	89
Geometry Grp	1	1	1
Degree of Util (X)	0.156	0.071	0.103
Departure Headway (Hd)	4.106	4.294	4.143
Convergence, Y/N	Yes	Yes	Yes
Cap	867	839	857
Service Time	2.163	2.294	2.209
HCM Lane V/C Ratio	0.158	0.072	0.104
HCM Control Delay, s/veh	7.9	7.6	7.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.2	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	126	105	0
Future Vol, veh/h	0	0	0	126	105	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
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	0	0	137	114	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	251	114	114	0	-	0
Stage 1	114	-	-	-	-	-
Stage 2	137	-	-	-	-	-
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	738	939	1475	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	738	939	1475	-	-	-
Mov Cap-2 Maneuver	738	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	890	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1475	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q (veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	0	7	1	0	1	14	103	1	1	87	17
Future Vol, veh/h	22	0	7	1	0	1	14	103	1	1	87	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	24	0	8	1	0	1	15	112	1	1	95	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	249	249	104	253	258	113	113	0	0	113	0	0
Stage 1	106	106	-	143	143	-	-	-	-	-	-	-
Stage 2	143	143	-	110	115	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	705	654	951	700	646	940	1476	-	-	1476	-	-
Stage 1	900	807	-	860	779	-	-	-	-	-	-	-
Stage 2	860	779	-	895	800	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	698	646	951	688	638	940	1476	-	-	1476	-	-
Mov Cap-2 Maneuver	698	646	-	688	638	-	-	-	-	-	-	-
Stage 1	890	806	-	851	770	-	-	-	-	-	-	-
Stage 2	850	770	-	887	799	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	10	9.5	0.9	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1476	-	-	746	794	1476	-	-
HCM Lane V/C Ratio	0.01	-	-	0.042	0.003	0.001	-	-
HCM Control Delay (s/veh)	7.5	0	-	10	9.5	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	90	29	33	62	33
Future Vol, veh/h	40	90	29	33	62	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	43	98	32	36	67	36

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	220	50	0	0	68	0
Stage 1	50	-	-	-	-	-
Stage 2	170	-	-	-	-	-
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	768	1018	-	-	1533	-
Stage 1	972	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	733	1018	-	-	1533	-
Mov Cap-2 Maneuver	733	-	-	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	821	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	9.7	0	4.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	909	1533	-
HCM Lane V/C Ratio	-	-	0.155	0.044	-
HCM Control Delay (s/veh)	-	-	9.7	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q (veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	39	21	54	57	16
Future Vol, veh/h	7	39	21	54	57	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	8	42	23	59	62	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	176	71	79	0	-	0
Stage 1	71	-	-	-	-	-
Stage 2	105	-	-	-	-	-
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	814	991	1519	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	801	991	1519	-	-	-
Mov Cap-2 Maneuver	801	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9	2.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1519	-	956	-	-
HCM Lane V/C Ratio	0.015	-	0.052	-	-
HCM Control Delay (s/veh)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q (veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	89	7	54	72	3	40
Future Vol, veh/h	89	7	54	72	3	40
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	97	8	59	78	3	43

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	105	0	297	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	196	-
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	-	-	1486	-	694	954
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	837	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1486	-	665	954
Mov Cap-2 Maneuver	-	-	-	-	665	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	802	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	3.2	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	926	-	-	1486	-
HCM Lane V/C Ratio	0.05	-	-	0.039	-
HCM Control Delay (s/veh)	9.1	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	129	126	55	113	0
Future Vol, veh/h	0	129	126	55	113	0
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	0	140	137	60	123	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	197	0	-	0	307	167
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	140	-
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	1376	-	-	-	685	877
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	887	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1376	-	-	-	685	877
Mov Cap-2 Maneuver	-	-	-	-	685	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	887	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1376	-	-	-	685
HCM Lane V/C Ratio	-	-	-	-	0.179
HCM Control Delay (s/veh)	0	-	-	-	11.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.6

Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	24	0	0	28
Future Vol, veh/h	0	0	24	0	0	28
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	0	0	26	0	0	30
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	0	7.3	6.5
HCM LOS	-	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	0%	0%	100%
Vol Thru, %	0%	100%	0%
Vol Right, %	100%	0%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	28	0	24
LT Vol	0	0	24
Through Vol	0	0	0
RT Vol	28	0	0
Lane Flow Rate	30	0	26
Geometry Grp	1	1	1
Degree of Util (X)	0.029	0	0.03
Departure Headway (Hd)	3.379	4.007	4.187
Convergence, Y/N	Yes	Yes	Yes
Cap	1062	0	859
Service Time	1.393	2.017	2.191
HCM Lane V/C Ratio	0.028	0	0.03
HCM Control Delay, s/veh	6.5	7	7.3
HCM Lane LOS	A	N	A
HCM 95th-tile Q	0.1	0	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	55	0
Future Vol, veh/h	0	0	0	0	55	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Yield	Yield	Free	Free
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	0	0	0	0	60	0

Major/Minor	Minor2			Major2	
Conflicting Flow All	-	60		-	0
Stage 1	-	-		-	-
Stage 2	-	-		-	-
Critical Hdwy	-	6.22		-	-
Critical Hdwy Stg 1	-	-		-	-
Critical Hdwy Stg 2	-	-		-	-
Follow-up Hdwy	-	3.318		-	-
Pot Cap-1 Maneuver	0	1005		-	-
Stage 1	0	-		-	-
Stage 2	0	-		-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	1005		-	-
Mov Cap-2 Maneuver	-	-		-	-
Stage 1	-	-		-	-
Stage 2	-	-		-	-

Approach	EB	SB
HCM Control Delay, s/v	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s/veh)	0	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q (veh)	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	0	0	35	0	0
Future Vol, veh/h	11	0	0	35	0	0
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	12	0	0	38	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	12	0	50	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	38	-
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	-	-	1607	-	959	1069
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	984	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1607	-	959	1069
Mov Cap-2 Maneuver	-	-	-	-	959	-
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	984	-

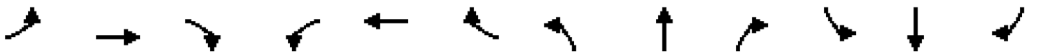
Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1607	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	-	-	-	0	-

Phase 3 2033 Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

01/14/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1	56	4	5	17	50	2389	1	10	854	56
Future Volume (veh/h)	65	1	56	4	5	17	50	2389	1	10	854	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	1	0	4	5	18	54	2597	1	11	928	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	2		104	31	88	511	2640	1	163	2451	161
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1448	20	1585	172	392	1128	569	3646	1	119	3385	222
Grp Volume(v), veh/h	72	0	0	27	0	0	54	1266	1332	11	487	502
Grp Sat Flow(s),veh/h/ln	1469	0	1585	1692	0	0	569	1777	1870	119	1777	1830
Q Serve(g_s), s	1.4	0.0	0.0	0.0	0.0	0.0	1.8	31.1	31.1	1.9	4.7	4.7
Cycle Q Clear(g_c), s	2.1	0.0	0.0	0.7	0.0	0.0	6.6	31.1	31.1	33.0	4.7	4.7
Prop In Lane	0.99		1.00	0.15		0.67	1.00		0.00	1.00		0.12
Lane Grp Cap(c), veh/h	272	0		223	0	0	511	1287	1354	163	1287	1325
V/C Ratio(X)	0.26	0.00		0.12	0.00	0.00	0.11	0.98	0.98	0.07	0.38	0.38
Avail Cap(c_a), veh/h	713	0		730	0	0	511	1287	1354	163	1287	1325
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	0.0	19.7	0.0	0.0	3.6	6.0	6.0	22.4	2.4	2.4
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.0	0.4	21.5	20.9	0.8	0.8	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.3	0.0	0.0	0.2	10.4	10.7	0.1	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.8	0.0	0.0	19.9	0.0	0.0	4.1	27.5	26.9	23.2	3.2	3.2
LnGrp LOS	C			B			A	C	C	C	A	A
Approach Vol, veh/h		72			27			2652			1000	
Approach Delay, s/veh		20.8			19.9			26.7			3.4	
Approach LOS		C			B			C			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.1		37.5		8.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		33.1		4.1		35.0		2.7				
Green Ext Time (p_c), s		0.0		0.2		0.0		0.1				

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	20.4	
HCM 6th LOS	C	

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

MOVEMENT SUMMARY

Site: #3 US-40 & Old Town Drive/Arrow Trail

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2033 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	201	5.0	201	5.0	1.084	80.7	LOS F	39.7	1031.7	1.00	2.75	3.94	13.2
8x	T1	All MCs	1424	5.0	1424	5.0	1.084	76.0	LOS F	49.5	1286.4	1.00	2.89	4.02	13.7
18x	R2	All MCs	24	5.0	24	5.0	1.084	73.4	LOS F	49.5	1286.4	1.00	2.96	4.06	13.9
Approach			1649	5.0	1649	5.0	1.084	76.5	LOS F	49.5	1286.4	1.00	2.87	4.01	13.6
East: Arrow Trail															
1x	L2	All MCs	2	5.0	2	5.0	0.995	1541.9	LOS F	4.7	122.4	1.00	1.23	1.80	4.9
6x	T1	All MCs	2	5.0	2	5.0	0.995	1541.9	LOS F	4.7	122.4	1.00	1.23	1.80	4.9
16x	R2	All MCs	24	5.0	24	5.0	0.995	260.4	LOS F	4.7	122.4	1.00	1.23	1.80	4.9
Approach			28	5.0	28	5.0	0.995	364.2	LOS F	4.7	122.4	1.00	1.23	1.80	4.9
North: US-40															
7x	L2	All MCs	14	5.0	14	5.0	0.383	7.0	LOS A	2.9	74.2	0.54	0.30	0.54	23.1
4x	T1	All MCs	609	5.0	609	5.0	0.383	6.8	LOS A	3.0	77.9	0.53	0.30	0.53	23.2
14x	R2	All MCs	311	5.0	311	5.0	0.383	6.2	LOS A	3.0	77.9	0.52	0.28	0.52	23.2
Approach			934	5.0	934	5.0	0.383	6.6	LOS A	3.0	77.9	0.53	0.29	0.53	23.2
West: Old Town Drive															
5x	L2	All MCs	1212	5.0	1212	5.0	2.012	471.4	LOS F	256.8	6675.9	1.00	8.71	13.94	4.1
2x	T1	All MCs	2	5.0	2	5.0	2.012	471.4	LOS F	256.8	6675.9	1.00	8.71	13.94	4.1
12x	R2	All MCs	350	5.0	350	5.0	2.012	471.4	LOS F	256.8	6675.9	1.00	8.71	13.94	4.1
Approach			1564	5.0	1564	5.0	2.012	471.4	LOS F	256.8	6675.9	1.00	8.71	13.94	4.1
All Vehicles			4175	5.0	4175	5.0	2.012	211.4	LOS F	256.8	6675.9	0.89	4.47	6.94	7.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	26	1491	11	20	864
Future Vol, veh/h	11	26	1491	11	20	864
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	28	1621	12	22	939

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2141	817	0	0	1633	0
Stage 1	1627	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	43	324	-	-	403	-
Stage 1	149	-	-	-	-	-
Stage 2	571	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	41	324	-	-	403	-
Mov Cap-2 Maneuver	41	-	-	-	-	-
Stage 1	149	-	-	-	-	-
Stage 2	540	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	58.4	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	106	403	-
HCM Lane V/C Ratio	-	-	0.379	0.054	-
HCM Control Delay (s/veh)	-	-	58.4	14.4	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q (veh)	-	-	1.5	0.2	-

MOVEMENT SUMMARY

Site: #5 US-40 & Winter Park Drive

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2033 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	184	5.0	184	5.0	0.672	13.0	LOS B	9.0	234.3	0.79	0.63	0.95	21.6
8x	T1	All MCs	1385	5.0	1385	5.0	0.672	12.0	LOS B	9.0	234.3	0.77	0.56	0.87	22.0
18x	R2	All MCs	5	5.0	5	5.0	0.672	11.4	LOS B	8.1	209.6	0.76	0.52	0.82	22.2
Approach			1574	5.0	1574	5.0	0.672	12.1	LOS B	9.0	234.3	0.77	0.57	0.88	22.0
East: Winter Park Drive															
1x	L2	All MCs	10	5.0	10	5.0	1.000	790.7	LOS F	6.9	180.2	1.00	1.28	1.97	5.9
6x	T1	All MCs	2	5.0	2	5.0	1.000	1463.8	LOS F	6.9	180.2	1.00	1.28	1.97	5.9
16x	R2	All MCs	30	5.0	30	5.0	1.000	165.9	LOS F	6.9	180.2	1.00	1.28	1.97	5.9
Approach			42	5.0	42	5.0	1.000	292.9	LOS F	6.9	180.2	1.00	1.28	1.97	5.9
North: US-40															
7x	L2	All MCs	15	5.0	15	5.0	0.389	7.1	LOS A	2.8	72.2	0.53	0.30	0.53	23.0
4x	T1	All MCs	836	5.0	836	5.0	0.389	6.7	LOS A	2.9	75.4	0.52	0.29	0.52	23.3
14x	R2	All MCs	101	5.0	101	5.0	0.389	6.3	LOS A	2.9	75.4	0.51	0.28	0.51	23.3
Approach			952	5.0	952	5.0	0.389	6.7	LOS A	2.9	75.4	0.52	0.29	0.52	23.3
West: Winter Park Drive															
5x	L2	All MCs	217	5.0	217	5.0	0.568	15.8	LOS C	5.3	138.4	0.95	0.96	1.27	20.6
2x	T1	All MCs	2	5.0	2	5.0	0.568	15.8	LOS C	5.3	138.4	0.95	0.96	1.27	20.7
12x	R2	All MCs	130	5.0	130	5.0	0.568	15.8	LOS C	5.3	138.4	0.95	0.96	1.27	20.7
Approach			350	5.0	350	5.0	0.568	15.8	LOS C	5.3	138.4	0.95	0.96	1.27	20.7
All Vehicles			2918	5.0	2918	5.0	1.000	16.1	LOS C	9.0	234.3	0.72	0.54	0.82	21.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	709.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	346	116	63	1102	822	77
Future Vol, veh/h	346	116	63	1102	822	77
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	-	470	-	-	-
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	376	126	68	1198	893	84

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2227	893	977	0	-	0
Stage 1	893	-	-	-	-	-
Stage 2	1334	-	-	-	-	-
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	~ 47	340	706	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	~ 246	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 42	340	706	-	-	-
Mov Cap-2 Maneuver	~ 42	-	-	-	-	-
Stage 1	~ 362	-	-	-	-	-
Stage 2	~ 246	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	$ 3879.7	0.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	706	-	54	-	-
HCM Lane V/C Ratio	0.097	-	9.3	-	-
HCM Control Delay (s/veh)	10.6	-	$ 3879.7	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q (veh)	0.3	-	59.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	205.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	1293	384	87	144	37
Future Vol, veh/h	2	1293	384	87	144	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	2	1405	417	95	157	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1106	177	197	0	-	0
Stage 1	177	-	-	-	-	-
Stage 2	929	-	-	-	-	-
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	233	~ 866	1376	-	-	-
Stage 1	854	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	158	~ 866	1376	-	-	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	385	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 306.1	7.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1376	-	860	-	-
HCM Lane V/C Ratio	0.303	-	1.637	-	-
HCM Control Delay (s/veh)	8.8	0	$ 306.1	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q (veh)	1.3	-	75.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	33	21	0	148	89	0
Future Vol, veh/h	33	21	0	148	89	0
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	36	23	0	161	97	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	7.7	8.1	7.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	0%	61%	0%
Vol Thru, %	100%	0%	100%
Vol Right, %	0%	39%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	148	54	89
LT Vol	0	33	0
Through Vol	148	0	89
RT Vol	0	21	0
Lane Flow Rate	161	59	97
Geometry Grp	1	1	1
Degree of Util (X)	0.184	0.072	0.112
Departure Headway (Hd)	4.11	4.387	4.159
Convergence, Y/N	Yes	Yes	Yes
Cap	865	822	851
Service Time	2.173	2.387	2.235
HCM Lane V/C Ratio	0.186	0.072	0.114
HCM Control Delay, s/veh	8.1	7.7	7.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.2	0.4

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	148	110	0
Future Vol, veh/h	0	0	0	148	110	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
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	0	0	161	120	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	281	120	120	0	-	0
Stage 1	120	-	-	-	-	-
Stage 2	161	-	-	-	-	-
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	709	931	1468	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	868	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	709	931	1468	-	-	-
Mov Cap-2 Maneuver	709	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	868	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1468	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q (veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	0	7	1	0	1	14	125	1	1	92	17
Future Vol, veh/h	22	0	7	1	0	1	14	125	1	1	92	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	24	0	8	1	0	1	15	136	1	1	100	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	278	278	109	282	287	137	118	0	0	137	0	0
Stage 1	111	111	-	167	167	-	-	-	-	-	-	-
Stage 2	167	167	-	115	120	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	674	630	945	670	623	911	1470	-	-	1447	-	-
Stage 1	894	804	-	835	760	-	-	-	-	-	-	-
Stage 2	835	760	-	890	796	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	667	622	945	659	616	911	1470	-	-	1447	-	-
Mov Cap-2 Maneuver	667	622	-	659	616	-	-	-	-	-	-	-
Stage 1	884	803	-	826	752	-	-	-	-	-	-	-
Stage 2	825	752	-	882	795	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	10.2	9.7	0.7	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1470	-	-	718	765	1447	-	-
HCM Lane V/C Ratio	0.01	-	-	0.044	0.003	0.001	-	-
HCM Control Delay (s/veh)	7.5	0	-	10.2	9.7	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	111	29	36	63	37
Future Vol, veh/h	26	111	29	36	63	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	28	121	32	39	68	40

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	228	52	0	0	71	0
Stage 1	52	-	-	-	-	-
Stage 2	176	-	-	-	-	-
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	760	1016	-	-	1529	-
Stage 1	970	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	726	1016	-	-	1529	-
Mov Cap-2 Maneuver	726	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	9.5	0	4.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	944	1529	-
HCM Lane V/C Ratio	-	-	0.158	0.045	-
HCM Control Delay (s/veh)	-	-	9.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q (veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	39	21	57	47	16
Future Vol, veh/h	7	39	21	57	47	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	8	42	23	62	51	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	168	60	68	0	-	0
Stage 1	60	-	-	-	-	-
Stage 2	108	-	-	-	-	-
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	822	1005	1533	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	809	1005	1533	-	-	-
Mov Cap-2 Maneuver	809	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	916	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	8.9	2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1533	-	969	-	-
HCM Lane V/C Ratio	0.015	-	0.052	-	-
HCM Control Delay (s/veh)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q (veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	78	9	53	75	3	40
Future Vol, veh/h	78	9	53	75	3	40
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	85	10	58	82	3	43

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	95	0	288	90
Stage 1	-	-	-	-	90	-
Stage 2	-	-	-	-	198	-
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	-	-	1499	-	702	968
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	835	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1499	-	673	968
Mov Cap-2 Maneuver	-	-	-	-	673	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	801	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	3.1	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	939	-	-	1499	-
HCM Lane V/C Ratio	0.05	-	-	0.038	-
HCM Control Delay (s/veh)	9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	115	128	134	205	0
Future Vol, veh/h	2	115	128	134	205	0
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	2	125	139	146	223	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	285	0	-	0	341	212
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	129	-
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	1277	-	-	-	655	828
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	897	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1277	-	-	-	654	828
Mov Cap-2 Maneuver	-	-	-	-	654	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	897	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.1	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1277	-	-	-	654
HCM Lane V/C Ratio	0.002	-	-	-	0.341
HCM Control Delay (s/veh)	7.8	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	1.5

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	18	77	35	12	72	36
Future Vol, veh/h	18	77	35	12	72	36
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	20	84	38	13	78	39
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	7.2	7.7	7.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	67%	0%	74%
Vol Thru, %	0%	19%	26%
Vol Right, %	33%	81%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	108	95	47
LT Vol	72	0	35
Through Vol	0	18	12
RT Vol	36	77	0
Lane Flow Rate	117	103	51
Geometry Grp	1	1	1
Degree of Util (X)	0.135	0.106	0.062
Departure Headway (Hd)	4.132	3.691	4.369
Convergence, Y/N	Yes	Yes	Yes
Cap	860	957	811
Service Time	2.191	1.768	2.444
HCM Lane V/C Ratio	0.136	0.108	0.063
HCM Control Delay, s/veh	7.8	7.2	7.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.5	0.4	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	53	0
Future Vol, veh/h	0	0	0	0	53	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Yield	Yield	Free	Free
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	0	0	0	0	58	0

Major/Minor	Minor2			Major2	
Conflicting Flow All	-	58		-	0
Stage 1	-	-		-	-
Stage 2	-	-		-	-
Critical Hdwy	-	6.22		-	-
Critical Hdwy Stg 1	-	-		-	-
Critical Hdwy Stg 2	-	-		-	-
Follow-up Hdwy	-	3.318		-	-
Pot Cap-1 Maneuver	0	1008		-	-
Stage 1	0	-		-	-
Stage 2	0	-		-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	1008		-	-
Mov Cap-2 Maneuver	-	-		-	-
Stage 1	-	-		-	-
Stage 2	-	-		-	-

Approach	EB	SB
HCM Control Delay, s/v	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s/veh)	0	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q (veh)	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	0	0	37	0	0
Future Vol, veh/h	11	0	0	37	0	0
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	12	0	0	40	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	12	0	52	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	40	-
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	-	-	1607	-	957	1069
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	982	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1607	-	957	1069
Mov Cap-2 Maneuver	-	-	-	-	957	-
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	982	-

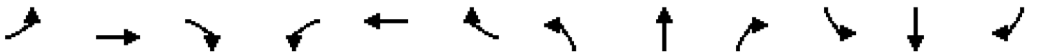
Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1607	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	-	-	-	0	-

Full Build 2037 Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

01/14/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	1	58	5	6	18	52	2556	2	10	965	58
Future Volume (veh/h)	67	1	58	5	6	18	52	2556	2	10	965	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	73	1	0	5	7	20	57	2778	2	11	1049	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	274	2		106	37	86	461	2632	2	158	2459	148
Arrive On Green	0.08	0.08	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1455	20	1585	181	454	1059	507	3644	3	99	3406	205
Grp Volume(v), veh/h	74	0	0	32	0	0	57	1354	1426	11	547	565
Grp Sat Flow(s),veh/h/ln	1475	0	1585	1695	0	0	507	1777	1870	99	1777	1834
Q Serve(g_s), s	1.3	0.0	0.0	0.0	0.0	0.0	2.3	33.0	33.0	0.0	5.7	5.7
Cycle Q Clear(g_c), s	2.1	0.0	0.0	0.8	0.0	0.0	8.0	33.0	33.0	33.0	5.7	5.7
Prop In Lane	0.99		1.00	0.16		0.62	1.00		0.00	1.00		0.11
Lane Grp Cap(c), veh/h	276	0		228	0	0	461	1283	1350	158	1283	1324
V/C Ratio(X)	0.27	0.00		0.14	0.00	0.00	0.12	1.06	1.06	0.07	0.43	0.43
Avail Cap(c_a), veh/h	710	0		732	0	0	461	1283	1350	158	1283	1324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	0.0	19.7	0.0	0.0	4.2	6.3	6.3	22.8	2.5	2.5
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.0	0.6	41.2	40.7	0.9	1.0	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.3	0.0	0.0	0.2	17.6	18.3	0.1	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.7	0.0	0.0	20.0	0.0	0.0	4.7	47.5	47.0	23.7	3.6	3.6
LnGrp LOS	C			B			A	F	F	C	A	A
Approach Vol, veh/h		74			32			2837			1123	
Approach Delay, s/veh		20.7			20.0			46.4			3.8	
Approach LOS		C			B			D			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.2		37.5		8.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		35.0		4.1		35.0		2.8				
Green Ext Time (p_c), s		0.0		0.2		0.0		0.1				

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	34.0	
HCM 6th LOS	C	

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

MOVEMENT SUMMARY

Site: #3 US-40 & Old Town Drive/Arrow Trail

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2037 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	72	5.0	72	5.0	1.177	115.9	LOS F	49.6	1289.1	1.00	3.25	4.89	11.0
8x	T1	All MCs	1521	5.0	1521	5.0	1.177	111.5	LOS F	63.9	1662.3	1.00	3.47	5.07	11.3
18x	R2	All MCs	25	5.0	25	5.0	1.177	108.5	LOS F	63.9	1662.3	1.00	3.62	5.19	11.5
Approach			1617	5.0	1617	5.0	1.177	111.6	LOS F	63.9	1662.3	1.00	3.47	5.06	11.3
East: Arrow Trail															
1x	L2	All MCs	2	5.0	2	5.0	0.991	1481.0	LOS F	4.6	120.7	1.00	1.23	1.81	5.0
6x	T1	All MCs	2	5.0	2	5.0	0.991	1481.0	LOS F	4.6	120.7	1.00	1.23	1.81	5.0
16x	R2	All MCs	24	5.0	24	5.0	0.991	259.9	LOS F	4.6	120.7	1.00	1.23	1.81	5.0
Approach			28	5.0	28	5.0	0.991	360.4	LOS F	4.6	120.7	1.00	1.23	1.81	5.0
North: US-40															
7x	L2	All MCs	14	5.0	14	5.0	0.381	6.2	LOS A	3.0	79.1	0.33	0.13	0.33	23.3
4x	T1	All MCs	707	5.0	707	5.0	0.381	6.0	LOS A	3.1	81.7	0.33	0.13	0.33	23.4
14x	R2	All MCs	326	5.0	326	5.0	0.381	5.6	LOS A	3.1	81.7	0.32	0.12	0.32	23.4
Approach			1047	5.0	1047	5.0	0.381	5.9	LOS A	3.1	81.7	0.32	0.12	0.32	23.4
West: Old Town Drive															
5x	L2	All MCs	1299	5.0	1299	5.0	1.900	421.9	LOS F	217.1	5645.5	1.00	8.19	13.44	4.5
2x	T1	All MCs	2	5.0	2	5.0	1.900	421.9	LOS F	217.1	5645.5	1.00	8.19	13.44	4.5
12x	R2	All MCs	92	5.0	92	5.0	1.900	421.9	LOS F	217.1	5645.5	1.00	8.19	13.44	4.5
Approach			1393	5.0	1393	5.0	1.900	421.9	LOS F	217.1	5645.5	1.00	8.19	13.44	4.5
All Vehicles			4086	5.0	4086	5.0	1.900	192.7	LOS F	217.1	5645.5	0.83	4.21	6.69	8.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	27	1461	10	20	717
Future Vol, veh/h	11	27	1461	10	20	717
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	29	1588	11	22	779

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2028	800	0	0	1599	0
Stage 1	1594	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	51	332	-	-	415	-
Stage 1	155	-	-	-	-	-
Stage 2	627	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	48	332	-	-	415	-
Mov Cap-2 Maneuver	48	-	-	-	-	-
Stage 1	155	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	48.9	0	0.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	122	415	-
HCM Lane V/C Ratio	-	-	0.339	0.052	-
HCM Control Delay (s/veh)	-	-	48.9	14.2	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q (veh)	-	-	1.4	0.2	-

MOVEMENT SUMMARY

Site: #5 US-40 & Winter Park Drive

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2037 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	360	5.0	360	5.0	0.757	17.0	LOS C	14.2	368.4	0.91	0.98	1.39	20.6
8x	T1	All MCs	1284	5.0	1284	5.0	0.757	15.4	LOS C	14.4	374.4	0.89	0.92	1.30	21.3
18x	R2	All MCs	51	5.0	51	5.0	0.757	14.7	LOS B	14.4	374.4	0.88	0.89	1.25	21.5
Approach			1695	5.0	1695	5.0	0.757	15.7	LOS C	14.4	374.4	0.90	0.93	1.32	21.1
East: Winter Park Drive															
1x	L2	All MCs	32	5.0	32	5.0	1.000	291.0	LOS F	9.2	239.3	1.00	1.51	2.78	9.1
6x	T1	All MCs	2	5.0	2	5.0	1.000	4760.6	LOS F	9.2	239.3	1.00	1.51	2.78	9.1
16x	R2	All MCs	93	5.0	93	5.0	1.000	110.3	LOS F	9.2	239.3	1.00	1.51	2.78	9.1
Approach			127	5.0	127	5.0	1.000	156.0	LOS F	9.2	239.3	1.00	1.51	2.78	9.1
North: US-40															
7x	L2	All MCs	72	5.0	72	5.0	0.388	8.4	LOS A	2.7	70.8	0.71	0.49	0.71	22.6
4x	T1	All MCs	588	5.0	588	5.0	0.388	7.7	LOS A	2.9	76.7	0.70	0.48	0.70	22.9
14x	R2	All MCs	132	5.0	132	5.0	0.388	7.1	LOS A	2.9	76.7	0.70	0.46	0.70	23.1
Approach			791	5.0	791	5.0	0.388	7.6	LOS A	2.9	76.7	0.70	0.47	0.70	22.9
West: Winter Park Drive															
5x	L2	All MCs	223	5.0	223	5.0	0.909	37.3	LOS E	19.8	515.2	1.00	1.75	2.41	17.4
2x	T1	All MCs	2	5.0	2	5.0	0.909	37.3	LOS E	19.8	515.2	1.00	1.75	2.41	17.4
12x	R2	All MCs	421	5.0	421	5.0	0.909	37.3	LOS E	19.8	515.2	1.00	1.75	2.41	17.4
Approach			646	5.0	646	5.0	0.909	37.3	LOS E	19.8	515.2	1.00	1.75	2.41	17.4
All Vehicles			3259	5.0	3259	5.0	1.000	26.6	LOS D	19.8	515.2	0.87	1.00	1.44	19.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	889

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	344	115	62	1215	880	76
Future Vol, veh/h	344	115	62	1215	880	76
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	-	470	-	-	-
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	374	125	67	1321	957	83

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2412	957	1040	0	-	0
Stage 1	957	-	-	-	-	-
Stage 2	1455	-	-	-	-	-
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	~ 36	313	669	-	-	-
Stage 1	~ 373	-	-	-	-	-
Stage 2	~ 214	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 32	313	669	-	-	-
Mov Cap-2 Maneuver	~ 32	-	-	-	-	-
Stage 1	~ 336	-	-	-	-	-
Stage 2	~ 214	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	$ 5212.6	0.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	669	-	41	-	-
HCM Lane V/C Ratio	0.101	-	12.169	-	-
HCM Control Delay (s/veh)	11	-	$ 5212.6	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q (veh)	0.3	-	60.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	154.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	1106	275	91	173	42
Future Vol, veh/h	4	1106	275	91	173	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	1202	299	99	188	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	908	211	234	0	-	0
Stage 1	211	-	-	-	-	-
Stage 2	697	-	-	-	-	-
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	306	~ 829	1333	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	233	~ 829	1333	-	-	-
Mov Cap-2 Maneuver	233	-	-	-	-	-
Stage 1	629	-	-	-	-	-
Stage 2	494	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	233.6	6.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1333	-	821	-	-
HCM Lane V/C Ratio	0.224	-	1.47	-	-
HCM Control Delay (s/veh)	8.5	0	233.6	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q (veh)	0.9	-	56.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	24	0	180	95	0
Future Vol, veh/h	35	24	0	180	95	0
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	38	26	0	196	103	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	7.8	8.4	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	0%	59%	0%
Vol Thru, %	100%	0%	100%
Vol Right, %	0%	41%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	180	59	95
LT Vol	0	35	0
Through Vol	180	0	95
RT Vol	0	24	0
Lane Flow Rate	196	64	103
Geometry Grp	1	1	1
Degree of Util (X)	0.224	0.079	0.12
Departure Headway (Hd)	4.125	4.462	4.196
Convergence, Y/N	Yes	Yes	Yes
Cap	861	808	842
Service Time	2.194	2.462	2.284
HCM Lane V/C Ratio	0.228	0.079	0.122
HCM Control Delay, s/veh	8.4	7.8	7.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.9	0.3	0.4

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	3	5	173	119	0
Future Vol, veh/h	7	3	5	173	119	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
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	8	3	5	188	129	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	327	129	129	0	-	0
Stage 1	129	-	-	-	-	-
Stage 2	198	-	-	-	-	-
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	667	921	1457	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	664	921	1457	-	-	-
Mov Cap-2 Maneuver	664	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	835	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	10	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1457	-	725	-	-
HCM Lane V/C Ratio	0.004	-	0.015	-	-
HCM Control Delay (s/veh)	7.5	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q (veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	0	8	1	0	1	14	155	1	1	104	17
Future Vol, veh/h	22	0	8	1	0	1	14	155	1	1	104	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	24	0	9	1	0	1	15	168	1	1	113	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	323	323	122	328	332	169	131	0	0	169	0	0
Stage 1	124	124	-	199	199	-	-	-	-	-	-	-
Stage 2	199	199	-	129	133	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	630	595	929	625	588	875	1454	-	-	1409	-	-
Stage 1	880	793	-	803	736	-	-	-	-	-	-	-
Stage 2	803	736	-	875	786	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	624	588	929	614	581	875	1454	-	-	1409	-	-
Mov Cap-2 Maneuver	624	588	-	614	581	-	-	-	-	-	-	-
Stage 1	870	792	-	794	728	-	-	-	-	-	-	-
Stage 2	793	728	-	866	785	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	10.5	10	0.6	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1454	-	-	684	722	1409	-	-
HCM Lane V/C Ratio	0.01	-	-	0.048	0.003	0.001	-	-
HCM Control Delay (s/veh)	7.5	0	-	10.5	10	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.2	0	0	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	133	37	27	67	46
Future Vol, veh/h	45	133	37	27	67	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	49	145	40	29	73	50

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	251	55	0	0	69	0
Stage 1	55	-	-	-	-	-
Stage 2	196	-	-	-	-	-
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	738	1012	-	-	1532	-
Stage 1	968	-	-	-	-	-
Stage 2	837	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	702	1012	-	-	1532	-
Mov Cap-2 Maneuver	702	-	-	-	-	-
Stage 1	968	-	-	-	-	-
Stage 2	796	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	10	0	4.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	910	1532	-
HCM Lane V/C Ratio	-	-	0.213	0.048	-
HCM Control Delay (s/veh)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q (veh)	-	-	0.8	0.2	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	39	22	57	76	15
Future Vol, veh/h	7	39	22	57	76	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	-	-	-	-	-	-
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	8	42	24	62	83	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	201	91	99	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	110	-	-	-	-	-
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	788	967	1494	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	775	967	1494	-	-	-
Mov Cap-2 Maneuver	775	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.1	2.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	932	-	-
HCM Lane V/C Ratio	0.016	-	0.054	-	-
HCM Control Delay (s/veh)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q (veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	106	9	53	76	3	40
Future Vol, veh/h	106	9	53	76	3	40
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	115	10	58	83	3	43

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	125	0	319	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	199	-
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	-	-	1462	-	674	931
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	835	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1462	-	646	931
Mov Cap-2 Maneuver	-	-	-	-	646	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	800	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	3.1	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	903	-	-	1462	-
HCM Lane V/C Ratio	0.052	-	-	0.039	-
HCM Control Delay (s/veh)	9.2	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	20.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	140	128	323	452	0
Future Vol, veh/h	6	140	128	323	452	0
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	7	152	139	351	491	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	490	0	-	0	481	315
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	166	-
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	1073	-	-	-	544	725
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	863	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1073	-	-	-	540	725
Mov Cap-2 Maneuver	-	-	-	-	540	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	863	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.3	0	47.4
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1073	-	-	-	540
HCM Lane V/C Ratio	0.006	-	-	-	0.91
HCM Control Delay (s/veh)	8.4	0	-	-	47.4
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q (veh)	0	-	-	-	10.9

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	49	77	29	13	104	44
Future Vol, veh/h	49	77	29	13	104	44
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	53	84	32	14	113	48
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	7.7	7.9	8.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	70%	0%	69%
Vol Thru, %	0%	39%	31%
Vol Right, %	30%	61%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	148	126	42
LT Vol	104	0	29
Through Vol	0	49	13
RT Vol	44	77	0
Lane Flow Rate	161	137	46
Geometry Grp	1	1	1
Degree of Util (X)	0.188	0.152	0.058
Departure Headway (Hd)	4.211	3.989	4.579
Convergence, Y/N	Yes	Yes	Yes
Cap	840	904	787
Service Time	2.3	1.99	2.582
HCM Lane V/C Ratio	0.192	0.152	0.058
HCM Control Delay, s/veh	8.3	7.7	7.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.5	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	58	6
Future Vol, veh/h	0	0	0	0	58	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Yield	Yield	Free	Free
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	0	0	0	0	63	7

Major/Minor	Minor2			Major2	
Conflicting Flow All	-	67		-	0
Stage 1	-	-		-	-
Stage 2	-	-		-	-
Critical Hdwy	-	6.22		-	-
Critical Hdwy Stg 1	-	-		-	-
Critical Hdwy Stg 2	-	-		-	-
Follow-up Hdwy	-	3.318		-	-
Pot Cap-1 Maneuver	0	997		-	-
Stage 1	0	-		-	-
Stage 2	0	-		-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	997		-	-
Mov Cap-2 Maneuver	-	-		-	-
Stage 1	-	-		-	-
Stage 2	-	-		-	-

Approach	EB	SB
HCM Control Delay, s/v	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s/veh)	0	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q (veh)	-	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	19	0	104	11	0
Future Vol, veh/h	94	19	0	104	11	0
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	102	21	0	113	12	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	123	0	226	113
Stage 1	-	-	-	-	113	-
Stage 2	-	-	-	-	113	-
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	-	-	1464	-	762	940
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	912	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1464	-	762	940
Mov Cap-2 Maneuver	-	-	-	-	762	-
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	912	-

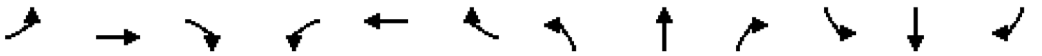
Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	762	-	-	1464	-
HCM Lane V/C Ratio	0.016	-	-	-	-
HCM Control Delay (s/veh)	9.8	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Full Build 2050 Saturday PM

HCM 6th Signalized Intersection Summary
1: US-40 & Vasquez Rd

01/14/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	1	65	6	6	20	58	2646	3	11	984	66
Future Volume (veh/h)	76	1	65	6	6	20	58	2646	3	11	984	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	83	1	0	7	7	22	63	2876	3	12	1070	72
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	280	2		113	37	89	447	2618	3	157	2428	163
Arrive On Green	0.09	0.09	0.00	0.09	0.09	0.09	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1461	18	1585	227	435	1040	493	3643	4	90	3379	227
Grp Volume(v), veh/h	84	0	0	36	0	0	63	1403	1476	12	562	580
Grp Sat Flow(s),veh/h/ln	1478	0	1585	1702	0	0	493	1777	1870	90	1777	1829
Q Serve(g_s), s	1.5	0.0	0.0	0.0	0.0	0.0	2.8	33.0	33.0	0.0	6.0	6.0
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.9	0.0	0.0	8.8	33.0	33.0	33.0	6.0	6.0
Prop In Lane	0.99		1.00	0.19		0.61	1.00		0.00	1.00		0.12
Lane Grp Cap(c), veh/h	282	0		239	0	0	447	1277	1344	157	1277	1315
V/C Ratio(X)	0.30	0.00		0.15	0.00	0.00	0.14	1.10	1.10	0.08	0.44	0.44
Avail Cap(c_a), veh/h	707	0		728	0	0	447	1277	1344	157	1277	1315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	0.0	19.6	0.0	0.0	4.5	6.5	6.5	23.0	2.7	2.7
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.3	0.0	0.0	0.7	56.6	56.2	0.9	1.1	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.3	0.0	0.0	0.3	23.3	24.4	0.2	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.8	0.0	0.0	19.9	0.0	0.0	5.1	63.0	62.7	23.9	3.8	3.7
LnGrp LOS	C			B			A	F	F	C	A	A
Approach Vol, veh/h		84			36			2942			1154	
Approach Delay, s/veh		20.8			19.9			61.6			4.0	
Approach LOS		C			B			E			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		8.4		37.5		8.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		35.0		4.4		35.0		2.9				
Green Ext Time (p_c), s		0.0		0.3		0.0		0.1				

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	44.7	
HCM 6th LOS	D	

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

MOVEMENT SUMMARY

Site: #3 US-40 & Old Town Drive/Arrow Trail

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2050 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	72	5.0	72	5.0	1.222	132.5	LOS F	58.2	1514.3	1.00	3.61	5.49	10.2
8x	T1	All MCs	1624	5.0	1624	5.0	1.222	128.5	LOS F	75.4	1959.2	1.00	3.87	5.71	10.4
18x	R2	All MCs	27	5.0	27	5.0	1.222	125.7	LOS F	75.4	1959.2	1.00	4.05	5.86	10.6
Approach			1723	5.0	1723	5.0	1.222	128.6	LOS F	75.4	1959.2	1.00	3.86	5.70	10.4
East: Arrow Trail															
1x	L2	All MCs	3	5.0	3	5.0	0.990	1313.2	LOS F	5.2	135.6	1.00	1.24	1.85	5.3
6x	T1	All MCs	2	5.0	2	5.0	0.990	1587.6	LOS F	5.2	135.6	1.00	1.24	1.85	5.4
16x	R2	All MCs	27	5.0	27	5.0	0.990	225.1	LOS F	5.2	135.6	1.00	1.24	1.85	5.4
Approach			33	5.0	33	5.0	0.990	328.9	LOS F	5.2	135.6	1.00	1.24	1.85	5.4
North: US-40															
7x	L2	All MCs	16	5.0	16	5.0	0.391	6.3	LOS A	3.2	81.9	0.33	0.13	0.33	23.2
4x	T1	All MCs	734	5.0	734	5.0	0.391	6.1	LOS A	3.3	84.6	0.33	0.12	0.33	23.4
14x	R2	All MCs	326	5.0	326	5.0	0.391	5.7	LOS A	3.3	84.6	0.31	0.12	0.31	23.4
Approach			1076	5.0	1076	5.0	0.391	6.0	LOS A	3.3	84.6	0.32	0.12	0.32	23.4
West: Old Town Drive															
5x	L2	All MCs	1299	5.0	1299	5.0	1.956	446.9	LOS F	223.2	5803.6	1.00	8.28	13.70	4.3
2x	T1	All MCs	2	5.0	2	5.0	1.956	446.9	LOS F	223.2	5803.6	1.00	8.28	13.70	4.3
12x	R2	All MCs	92	5.0	92	5.0	1.956	446.9	LOS F	223.2	5803.6	1.00	8.28	13.70	4.3
Approach			1393	5.0	1393	5.0	1.956	446.9	LOS F	223.2	5803.6	1.00	8.28	13.70	4.3
All Vehicles			4225	5.0	4225	5.0	1.956	204.6	LOS F	223.2	5803.6	0.83	4.35	6.94	7.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	30	1555	12	24	739
Future Vol, veh/h	13	30	1555	12	24	739
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	14	33	1690	13	26	803

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2151	852	0	0	1703	0
Stage 1	1697	-	-	-	-	-
Stage 2	454	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	42	307	-	-	379	-
Stage 1	136	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	39	307	-	-	379	-
Mov Cap-2 Maneuver	39	-	-	-	-	-
Stage 1	136	-	-	-	-	-
Stage 2	570	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	69.3	0	0.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	100	379	-
HCM Lane V/C Ratio	-	-	0.467	0.069	-
HCM Control Delay (s/veh)	-	-	69.3	15.2	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q (veh)	-	-	2	0.2	-

MOVEMENT SUMMARY

Site: #5 US-40 & Winter Park Drive

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2050 PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: US-40															
3x	L2	All MCs	360	5.0	360	5.0	0.775	17.8	LOS C	15.6	404.4	0.93	1.02	1.45	20.5
8x	T1	All MCs	1334	5.0	1334	5.0	0.775	16.2	LOS C	15.8	411.7	0.91	0.96	1.35	21.1
18x	R2	All MCs	51	5.0	51	5.0	0.775	15.4	LOS C	15.8	411.7	0.90	0.93	1.31	21.4
Approach			1745	5.0	1745	5.0	0.775	16.5	LOS C	15.8	411.7	0.92	0.97	1.37	21.0
East: Winter Park Drive															
1x	L2	All MCs	32	5.0	32	5.0	1.000	290.8	LOS F	9.2	238.8	1.00	1.50	2.76	9.1
6x	T1	All MCs	2	5.0	2	5.0	1.000	4905.3	LOS F	9.2	238.8	1.00	1.50	2.76	9.1
16x	R2	All MCs	93	5.0	93	5.0	1.000	110.6	LOS F	9.2	238.8	1.00	1.50	2.76	9.1
Approach			127	5.0	127	5.0	1.000	156.5	LOS F	9.2	238.8	1.00	1.50	2.76	9.1
North: US-40															
7x	L2	All MCs	63	5.0	63	5.0	0.402	8.6	LOS A	2.9	74.2	0.72	0.50	0.72	22.6
4x	T1	All MCs	623	5.0	623	5.0	0.402	7.9	LOS A	3.1	80.5	0.71	0.48	0.71	22.9
14x	R2	All MCs	132	5.0	132	5.0	0.402	7.3	LOS A	3.1	80.5	0.71	0.47	0.71	23.1
Approach			817	5.0	817	5.0	0.402	7.8	LOS A	3.1	80.5	0.71	0.48	0.71	22.9
West: Winter Park Drive															
5x	L2	All MCs	223	5.0	223	5.0	0.936	42.4	LOS E	21.8	567.7	1.00	1.88	2.61	16.7
2x	T1	All MCs	2	5.0	2	5.0	0.936	42.4	LOS E	21.8	567.7	1.00	1.88	2.61	16.8
12x	R2	All MCs	421	5.0	421	5.0	0.936	42.4	LOS E	21.8	567.7	1.00	1.88	2.61	16.8
Approach			646	5.0	646	5.0	0.936	42.4	LOS E	21.8	567.7	1.00	1.88	2.61	16.8
All Vehicles			3335	5.0	3335	5.0	1.000	27.8	LOS D	21.8	567.7	0.89	1.05	1.50	19.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	1038

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	344	115	62	1311	912	76
Future Vol, veh/h	344	115	62	1311	912	76
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	-	470	-	-	-
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	374	125	67	1425	991	83

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2550	991	1074	0	-	0
Stage 1	991	-	-	-	-	-
Stage 2	1559	-	-	-	-	-
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	~ 29	299	649	-	-	-
Stage 1	~ 359	-	-	-	-	-
Stage 2	~ 191	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 26	299	649	-	-	-
Mov Cap-2 Maneuver	~ 26	-	-	-	-	-
Stage 1	~ 322	-	-	-	-	-
Stage 2	~ 191	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	$ 6375.7	0.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	649	-	34	-	-
HCM Lane V/C Ratio	0.104	-	14.674	-	-
HCM Control Delay (s/veh)	11.2	-	$ 6375.7	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q (veh)	0.3	-	61.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	154.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	1106	275	91	173	42
Future Vol, veh/h	4	1106	275	91	173	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	1202	299	99	188	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	908	211	234	0	-	0
Stage 1	211	-	-	-	-	-
Stage 2	697	-	-	-	-	-
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	306	~ 829	1333	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	233	~ 829	1333	-	-	-
Mov Cap-2 Maneuver	233	-	-	-	-	-
Stage 1	629	-	-	-	-	-
Stage 2	494	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	233.6	6.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1333	-	821	-	-
HCM Lane V/C Ratio	0.224	-	1.47	-	-
HCM Control Delay (s/veh)	8.5	0	233.6	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q (veh)	0.9	-	56.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	24	0	180	95	0
Future Vol, veh/h	35	24	0	180	95	0
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	38	26	0	196	103	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	7.8	8.4	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	0%	59%	0%
Vol Thru, %	100%	0%	100%
Vol Right, %	0%	41%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	180	59	95
LT Vol	0	35	0
Through Vol	180	0	95
RT Vol	0	24	0
Lane Flow Rate	196	64	103
Geometry Grp	1	1	1
Degree of Util (X)	0.224	0.079	0.12
Departure Headway (Hd)	4.125	4.462	4.196
Convergence, Y/N	Yes	Yes	Yes
Cap	861	808	842
Service Time	2.194	2.462	2.284
HCM Lane V/C Ratio	0.228	0.079	0.122
HCM Control Delay, s/veh	8.4	7.8	7.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.9	0.3	0.4

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	3	5	173	119	0
Future Vol, veh/h	7	3	5	173	119	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
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	8	3	5	188	129	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	327	129	129	0	-	0
Stage 1	129	-	-	-	-	-
Stage 2	198	-	-	-	-	-
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	667	921	1457	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	664	921	1457	-	-	-
Mov Cap-2 Maneuver	664	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	835	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	10	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1457	-	725	-	-
HCM Lane V/C Ratio	0.004	-	0.015	-	-
HCM Control Delay (s/veh)	7.5	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q (veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	0	8	1	0	1	14	155	1	1	104	17
Future Vol, veh/h	22	0	8	1	0	1	14	155	1	1	104	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	24	0	9	1	0	1	15	168	1	1	113	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	323	323	122	328	332	169	131	0	0	169	0	0
Stage 1	124	124	-	199	199	-	-	-	-	-	-	-
Stage 2	199	199	-	129	133	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	630	595	929	625	588	875	1454	-	-	1409	-	-
Stage 1	880	793	-	803	736	-	-	-	-	-	-	-
Stage 2	803	736	-	875	786	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	624	588	929	614	581	875	1454	-	-	1409	-	-
Mov Cap-2 Maneuver	624	588	-	614	581	-	-	-	-	-	-	-
Stage 1	870	792	-	794	728	-	-	-	-	-	-	-
Stage 2	793	728	-	866	785	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	10.5	10	0.6	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1454	-	-	684	722	1409	-	-
HCM Lane V/C Ratio	0.01	-	-	0.048	0.003	0.001	-	-
HCM Control Delay (s/veh)	7.5	0	-	10.5	10	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.2	0	0	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	133	37	27	67	46
Future Vol, veh/h	45	133	37	27	67	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	49	145	40	29	73	50

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	251	55	0	0	69	0
Stage 1	55	-	-	-	-	-
Stage 2	196	-	-	-	-	-
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	738	1012	-	-	1532	-
Stage 1	968	-	-	-	-	-
Stage 2	837	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	702	1012	-	-	1532	-
Mov Cap-2 Maneuver	702	-	-	-	-	-
Stage 1	968	-	-	-	-	-
Stage 2	796	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	10	0	4.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	910	1532	-
HCM Lane V/C Ratio	-	-	0.213	0.048	-
HCM Control Delay (s/veh)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q (veh)	-	-	0.8	0.2	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	39	22	57	76	15
Future Vol, veh/h	7	39	22	57	76	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	-	-	-	-	-	-
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	8	42	24	62	83	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	201	91	99	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	110	-	-	-	-	-
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	788	967	1494	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	775	967	1494	-	-	-
Mov Cap-2 Maneuver	775	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.1	2.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	932	-	-
HCM Lane V/C Ratio	0.016	-	0.054	-	-
HCM Control Delay (s/veh)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q (veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	106	9	53	76	3	40
Future Vol, veh/h	106	9	53	76	3	40
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	115	10	58	83	3	43

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	125	0	319	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	199	-
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	-	-	1462	-	674	931
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	835	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1462	-	646	931
Mov Cap-2 Maneuver	-	-	-	-	646	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	800	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	3.1	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	903	-	-	1462	-
HCM Lane V/C Ratio	0.052	-	-	0.039	-
HCM Control Delay (s/veh)	9.2	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	20.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	140	128	323	452	0
Future Vol, veh/h	6	140	128	323	452	0
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	7	152	139	351	491	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	490	0	-	0	481	315
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	166	-
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	1073	-	-	-	544	725
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	863	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1073	-	-	-	540	725
Mov Cap-2 Maneuver	-	-	-	-	540	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	863	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.3	0	47.4
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1073	-	-	-	540
HCM Lane V/C Ratio	0.006	-	-	-	0.91
HCM Control Delay (s/veh)	8.4	0	-	-	47.4
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q (veh)	0	-	-	-	10.9

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	49	77	29	13	104	44
Future Vol, veh/h	49	77	29	13	104	44
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	53	84	32	14	113	48
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	7.7	7.9	8.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	70%	0%	69%
Vol Thru, %	0%	39%	31%
Vol Right, %	30%	61%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	148	126	42
LT Vol	104	0	29
Through Vol	0	49	13
RT Vol	44	77	0
Lane Flow Rate	161	137	46
Geometry Grp	1	1	1
Degree of Util (X)	0.188	0.152	0.058
Departure Headway (Hd)	4.211	3.989	4.579
Convergence, Y/N	Yes	Yes	Yes
Cap	840	904	787
Service Time	2.3	1.99	2.582
HCM Lane V/C Ratio	0.192	0.152	0.058
HCM Control Delay, s/veh	8.3	7.7	7.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.5	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	58	6
Future Vol, veh/h	0	0	0	0	58	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Yield	Yield	Free	Free
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	0	0	0	0	63	7

Major/Minor	Minor2			Major2	
Conflicting Flow All	-	67		-	0
Stage 1	-	-		-	-
Stage 2	-	-		-	-
Critical Hdwy	-	6.22		-	-
Critical Hdwy Stg 1	-	-		-	-
Critical Hdwy Stg 2	-	-		-	-
Follow-up Hdwy	-	3.318		-	-
Pot Cap-1 Maneuver	0	997		-	-
Stage 1	0	-		-	-
Stage 2	0	-		-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	997		-	-
Mov Cap-2 Maneuver	-	-		-	-
Stage 1	-	-		-	-
Stage 2	-	-		-	-

Approach	EB	SB
HCM Control Delay, s/v	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s/veh)	0	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q (veh)	-	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	11	0	104	11	0
Future Vol, veh/h	94	11	0	104	11	0
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	102	12	0	113	12	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	114	0	221	108
Stage 1	-	-	-	-	108	-
Stage 2	-	-	-	-	113	-
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	-	-	1475	-	767	946
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	912	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1475	-	767	946
Mov Cap-2 Maneuver	-	-	-	-	767	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	912	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	767	-	-	1475	-
HCM Lane V/C Ratio	0.016	-	-	-	-
HCM Control Delay (s/veh)	9.8	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q (veh)	0	-	-	0	-

Appendix C: Mitigation HCM Reports

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	43	1555	12	24	763
Future Vol, veh/h	0	43	1555	12	24	763
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	-	-	-	450	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	47	1690	13	26	829

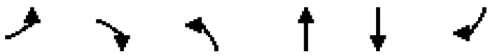
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	852	0	0	1703	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	4.1	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	0	307	-	-	379	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	307	-	-	379	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	18.8	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	307	379	-
HCM Lane V/C Ratio	-	-	0.152	0.069	-
HCM Control Delay (s/veh)	-	-	18.8	15.2	-
HCM Lane LOS	-	-	C	C	-
HCM 95th %tile Q (veh)	-	-	0.5	0.2	-

HCM 6th Signalized Intersection Summary
6: US-40 & Mary Jane Rd

02/04/2025



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	344	115	62	1311	912	76
Future Volume (veh/h)	344	115	62	1311	912	76
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	374	125	67	1425	991	83
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	362	322	279	1378	1378	1168
Arrive On Green	0.20	0.20	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1781	1585	525	1870	1870	1585
Grp Volume(v), veh/h	374	125	67	1425	991	83
Grp Sat Flow(s),veh/h/ln	1781	1585	525	1870	1870	1585
Q Serve(g_s), s	30.5	10.2	12.3	110.5	44.5	2.2
Cycle Q Clear(g_c), s	30.5	10.2	56.8	110.5	44.5	2.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	362	322	279	1378	1378	1168
V/C Ratio(X)	1.03	0.39	0.24	1.03	0.72	0.07
Avail Cap(c_a), veh/h	362	322	279	1378	1378	1168
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.8	51.7	27.0	19.7	11.1	5.5
Incr Delay (d2), s/veh	55.9	0.8	0.4	33.5	1.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.4	4.2	1.6	51.6	16.3	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	115.7	52.4	27.4	53.3	12.9	5.5
LnGrp LOS	F	D	C	F	B	A
Approach Vol, veh/h	499			1492	1074	
Approach Delay, s/veh	99.8			52.1	12.3	
Approach LOS	F			D	B	

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	115.0			115.0	35.0
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	110.5			110.5	30.5
Max Q Clear Time (g_c+I1), s	112.5			46.5	32.5
Green Ext Time (p_c), s	0.0			10.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	46.0
HCM 6th LOS	D

MOVEMENT SUMMARY

Site: #7 Old Town Drive & Garage Access

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2050 Mitigation
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Old Town Drive															
3	L2	All MCs	299	3.0	299	3.0	0.244	4.3	LOS A	1.3	33.1	0.05	0.01	0.05	31.1
8	T1	All MCs	99	3.0	99	3.0	0.110	4.6	LOS A	0.5	12.6	0.05	0.01	0.05	33.9
Approach			398	3.0	398	3.0	0.244	4.4	LOS A	1.3	33.1	0.05	0.01	0.05	31.8
North: Old Town Drive															
4	T1	All MCs	188	3.0	188	3.0	0.287	7.5	LOS A	1.4	35.0	0.48	0.34	0.48	32.5
14	R2	All MCs	46	3.0	46	3.0	0.287	7.5	LOS A	1.4	35.0	0.48	0.34	0.48	32.3
Approach			234	3.0	234	3.0	0.287	7.5	LOS A	1.4	35.0	0.48	0.34	0.48	32.5
West: Garage Access															
5	L2	All MCs	4	3.0	4	3.0	0.005	4.1	LOS A	0.0	0.6	0.39	0.18	0.39	31.2
12	R2	All MCs	1202	3.0	1202	3.0	0.911	24.3	LOS C	34.6	885.1	1.00	1.06	1.64	25.8
Approach			1207	3.0	1207	3.0	0.911	24.2	LOS C	34.6	885.1	1.00	1.05	1.64	25.9
All Vehicles			1838	3.0	1838	3.0	0.911	17.8	LOS C	34.6	885.1	0.73	0.74	1.15	27.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: #14 Winter Park Drive & Road 4

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: 2050 Mitigation
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
East: Winter Park Drive															
6x	T1	All MCs	139	5.0	139	5.0	0.118	3.7	LOS A	0.7	17.3	0.07	0.01	0.07	23.9
16x	R2	All MCs	351	5.0	351	5.0	0.236	3.8	LOS A	1.6	40.6	0.07	0.01	0.07	23.6
Approach			490	5.0	490	5.0	0.236	3.8	LOS A	1.6	40.6	0.07	0.01	0.07	23.7
North: Road 4															
7x	L2	All MCs	491	5.0	491	5.0	0.364	5.9	LOS A	2.2	58.3	0.36	0.18	0.36	22.2
14x	R2	All MCs	11	5.0	11	5.0	0.012	4.0	LOS A	0.1	1.3	0.31	0.14	0.31	23.5
Approach			502	5.0	502	5.0	0.364	5.9	LOS A	2.2	58.3	0.36	0.18	0.36	22.2
West: Winter Park Drive															
5x	L2	All MCs	7	5.0	7	5.0	0.189	6.2	LOS A	1.1	28.3	0.64	0.46	0.64	23.1
2x	T1	All MCs	152	5.0	152	5.0	0.189	6.2	LOS A	1.1	28.3	0.64	0.46	0.64	23.2
Approach			159	5.0	159	5.0	0.189	6.2	LOS A	1.1	28.3	0.64	0.46	0.64	23.2
All Vehicles			1151	5.0	1151	5.0	0.364	5.0	LOS A	2.2	58.3	0.28	0.15	0.28	22.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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