PLANNING COMMISSION REGULAR MEETING
MONDAY, MARCH 2, 2026
AGENDA

Monday, March 2, 2026 **6:00 PM** **Hearing Room**

Disclaimer - This packet is provided for informational purposes only and is subject to change. Some documents may have been unavailable at the time this agenda was prepared. For additional information, contact the responsible staff person.

Instructions to access the video or audio of the meeting are available here: www.douglas.co.us/board-county-commissioners/boards-commissions/planning-commission/.
To submit written public comment and/or exhibits for a Planning Commission meeting, please send them, in advance, to planningcommission@douglas.co.us.

1. Call to Order

a. Pledge of Allegiance

b. Roll Call

c. Attorney Certification of the Agenda

d. Planning Commission Disclosures

2. Approval of Minutes

a. Unofficial Minutes from February 23, 2026. **4443**

Attachments: Unofficial Minutes from February 23, 2026

3. Land Use Hearing Items

a. Recommendation for Building Code Adoption. **4437**
Matthew Dziubanski, Chief Building Official — *Department of Community Development*

Attachments: Cover Page
Building Code Adoption 2026

b. 7440 North US Highway 85 - Range Metro District Infrastructure Project - Location and Extent - Project File: LE2025-027. **4441**
Trevor Bedford, AICP, Senior Planner — *Department of Community Development*

Attachments: Cover Page
Staff Report - LE2025-027
Supplemental Info
Update Memo - LE2025-027

c. Highlands Ranch Filing 159 - Minor Development Final Plat - Project File: SB2023-022. **4434**
Carolyn Washee-Freeland, AICP, Senior Planner — *Department of Community Development*

Attachments: Cover Page
Staff Report - SB2023-022

d. Driskill Subdivision - Minor Development Final Plat - Project File: SB2025-042. **4435**
Trevor Bedford, AICP, Senior Planner — *Department of Community Development*

Attachments: Cover Page
Staff Report - SB2025-042

e. Pinery Village Filing 2 - Minor Development Final Plat - Project File: SB2021-049. **4432**
Mike Pesicka, AICP, Principal Planner — *Department of Community Development*

Attachments: Cover Page
Staff Report - SB2021-049

4. Adjournment

The Next Regular Meeting Will be Held on Monday, March 16, 2026 @ 6:00 p.m.

MEETING DATE: March 2, 2026

DESCRIPTION: Unofficial Minutes from February 23, 2026.

ATTACHMENTS:

Unofficial Minutes from February 23 2026

PLANNING COMMISSION REGULAR MEETING
MONDAY, FEBRUARY 23, 2026
MINUTES

Monday, February 23, 2026 **6:00 PM** **Hearing Room**

1. Call to Order

Commissioner McKesson took over as Acting Chair and presented hearing instructions.

a. Pledge of Allegiance

b. Roll Call

PRESENT
Commissioner Len Abruzzo
Commissioner Mark Hampton
Commissioner Ed Kubly
Commissioner Michael McKesson, Acting Chair
Commissioner Ed Rhodes
Commissioner Jim Smallwood, Secretary
Alternate Mark Witkiewicz
EXCUSED
Commissioner Calvin Downs, Vice Chair

c. Attorney Certification of the Agenda

Arielle Dennis, Assistant County Attorney, stated that all items on today's agenda have been reviewed by the County Attorney's Office, they have been properly noticed, and the Commission has jurisdiction to hear them.

d. Planning Commission Disclosures

None.

2. Approval of Minutes

a. Unofficial Minutes from February 2, 2026.

Commissioner Jim Smallwood moved that the Commission approve the Minutes from February 2, 2026.

RESULT: APPROVED
MOVER: Jim Smallwood
SECONDER: Len Abruzzo

AYES: Len Abruzzo, Mark Hampton, Mike McKesson, Mark Witkiewicz
ABSTAIN: Ed Kubly, Ed Rhodes, Jim Smallwood

3. Land Use Hearing Items

a. Ramblewood Preliminary Plan – Project File: SB2025-040.

Trevor Bedford, AICP, Senior Planner - Department of Community Development – presented the proposed application.

The applicant's representative, Daniel Jennings, Denver, CO – provided additional information.

The applicant's representative, Dan Sheldon, Miller United Real Estate – provided additional information.

Commissioner McKesson opened public comment.

Lisa Frahm, Douglas County, CO – provided comment.

Scott Rehner, Douglas County, CO – provided comment.

Alandra Mothorpe, Parker, CO – provided comment.

Nicole Kembel, Douglas County, CO – provided comment.

James Whittlesey, Centennial, CO – provided comment.

Commissioner McKesson closed public comment.

Commissioner McKesson opened Planning Commission discussion.

Commissioner Jim Smallwood moved to recommend approval of the Ramblewood Preliminary Plan – Project File: SB2025-040, subject to the five conditions recommended by staff.

RESULT: APPROVED
MOVER: Jim Smallwood
SECONDER: Mark Witkiewicz
AYES: Len Abruzzo, Ed Kubly, Mike McKesson, Jim Smallwood, Mark Witkiewicz
NAYS: Mark Hampton, Ed Rhodes

b. Douglas County Zoning Resolution Amendments for Large Day-Care Homes – Project File: DR2025-007.

Melanie Estrada, SDA Planning Technician, Department of Community Development - presented the proposed application.

Commissioner McKesson opened public comment.

Alandra Mothorpe, Douglas County, CO – provided comment.

Commissioner McKesson closed public comment.

Commissioner McKesson opened Planning Commission discussion.

Commissioner Jim Smallwood moved to recommend approval of the Douglas County Zoning Resolution Amendments for Large Day-Care Homes – Project File: DR2025-007.

RESULT:	APPROVED
MOVER:	Jim Smallwood
SECONDER:	Len Abruzzo
AYES:	Len Abruzzo, Mark Hampton, Ed Kubly, Mike McKesson, Ed Rhodes, Jim Smallwood, Mark Witkiewicz

4. Adjournment

The meeting was adjourned at 7:21 p.m.

_____

Jim Smallwood, Secretary

_____

Samantha Hutchison, Recording Secretary

MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Matthew Dziubanski, Chief Building Official

DESCRIPTION: Recommendation for Building Code Adoption.

SUMMARY: The request is for the Planning Commission's recommendation for adoption of the 2024 International Codes, and the 2026 National Electrical Code, with amendments.

STAFF ASSESSMENT: The adoption of the 2024 International Codes and 2026 National Electrical Code along with the Colorado Model Electric Ready and Solar Ready Code and the Douglas County Wildfire Resiliency Code will help maintain consistency throughout Douglas County, coinciding with recent adoptions by other local jurisdictions. The newer codes provide a safer built environment for both residential and commercial structures, and accommodate new materials, design trends and construction methods. The timely adoption of building codes is also a direct positive factor in the community's rating by the Insurance Services Office.

REVIEW:

Steven E Koster	Approve	2/20/2026
Samantha Hutchison - FYI	Notified - FYI	2/20/2026

ATTACHMENTS:

Cover Page
Building Code Adoption 2026

MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Matthew Dziubanski, Chief Building Official

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ATTACHMENTS:

Building Code Adoption 2026

DOUGLAS COUNTY
COLORADO

2024 Building Code Adoption with Amendments Staff Report

DATE: FEBRUARY 19, 2026

TO: DOUGLAS COUNTY PLANNING COMMISSION

FROM: MATTHEW DZIUBANSKI, CHIEF BUILDING OFFICIAL
TIM PENDLETON, DEPUTY CHIEF BUILDING OFFICIAL

SUBJECT: ADOPTION OF THE 2024 INTERNATIONAL BUILDING CODES, 2026 NATIONAL ELECTRICAL CODE, AND COLORADO MODEL ELECTRIC READY AND SOLAR READY CODE WITH AMENDMENTS ALONG WITH THE DOUGLAS COUNTY WILDFIRE RESILIENCY CODE.

PLANNING COMMISSION HEARING:	**March 02, 2026 @ 6:00 PM**
BOARD OF COUNTY COMMISSIONERS HEARING:	**March 24, 2026 @ 2:30 PM**

I. EXECUTIVE SUMMARY

The Building Division is proposing an update to the County's adopted building codes to reflect the most current editions of the International Codes and applicable state-mandated requirements. Douglas County is currently enforcing the 2021 editions of the International Codes, the 2023 National Electrical Code, and the 2018 International Energy Conservation Code. To maintain consistency with industry standards, preserve the County's Insurance Services Office (ISO) rating, and align with neighboring jurisdictions, the Building Division is proposing adoption of the 2024 editions of the International Building Code, International Residential Code, International Plumbing Code, International Mechanical Code, International Fuel Gas Code, International Swimming Pool and Spa Code, and International Energy Conservation Code, (collectively the "2024 International Codes"), along with the 2026 National Electrical Code, with amendments.

In addition, the County is required to adopt the Colorado Model Electric Ready and Solar Ready Code and a Wildfire Resiliency Code pursuant to state legislation. The Wildfire Resiliency Code will be applicable to areas of unincorporated Douglas County that are outside the boundaries of a fire protection district.

These codes and amendments maintain consistency with other local regulations and support the County's goal to improve the quality and safety of the built environment while minimizing economic impact on builders, costs that are ultimately shared by homeowners and building owners.

II. REQUEST

The Planning Commission's recommendation for adoption of the 2024 International Codes, and the 2026 National Electrical Code, with amendments. Along with the Colorado Model Electric Ready and Solar Ready Code, with amendments and Douglas County Wildfire Resiliency Code.

III. PUBLIC NOTICE

Notice of the hearing before the Planning Commission was published in the Douglas County News Press. Notice of hearing before the Board of County Commissioners is also published in the Douglas County News Press before and after it is heard by the Planning Commission.

IV. STAFF ASSESSMENT

The adoption of the 2024 International Codes and 2026 National Electrical Code along with the Colorado Model Electric Ready and Solar Ready Code and the Douglas County Wildfire Resiliency Code will help maintain consistency throughout Douglas County, coinciding with recent adoptions by other local jurisdictions. The newer codes provide a safer built environment for both residential and commercial structures, and accommodate new materials, design trends and construction methods. The timely adoption of building codes is also a direct positive factor in the community's rating by the (ISO).

ATTACHMENTS

- Attachment A – Amendments to the 2024 IBC, IRC, IPC, IMC, IFGC, ISPSC, and IECC; 2026 NEC; and the Exhibits A through F
- Attachment B - Douglas Couty Wildfire Resiliency Code

ATTACHEMENT A

CODE AMENDMENTS
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Exhibit A

AMENDMENTS COMMON TO ALL ADOPTED INTERNATIONAL CODES

Any references made to the below listed codes within the adopted codes are not valid in Douglas County except as noted above.

International Private Sewage Disposal Code	**Not adopted**
International Property Maintenance Code	**Not adopted**
ICC Electrical Code	**Not adopted**
International Zoning Code	**Not adopted**
International Wildland-Urban Interface Code	**Not adopted**
International Existing Building Code	**Not adopted**

The International Building Code, International Residential Code, International Plumbing Code, International Mechanical Code, International Fuel Gas Code, International Energy Conservation Code, and the International Swimming Pool and Spa Code are published by the International Code Council, Inc., 4051 W. Flossmoor Road, Country Club Hills, IL 60478.

10.0 FEES **Add new section and subsections**

10.1 Payment of fees
A permit shall not be valid until the fees, prescribed by law, have been paid, nor shall an amendment to a permit be issued until the additional fee, if any, has been paid.

10.1.1 Related fees
The payment of the fee for the construction, alteration, removal, or demolition for work done in connection to, or concurrently with the work authorized by a building permit, shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

10.2 Valuation of work
The determination of value or valuation shall be established by the Building Official utilizing building valuation data printed in the Building Safety Journal, published by the International Code Council, as a guide and using a modifier of one (1), or the applicant shall provide an estimated project valuation at the time of application. Permit valuations shall include the total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment, and permanent systems. If, in the opinion of the Building Official, the valuation is underestimated on the application, the permit shall be denied unless the applicant can provide detailed estimates to meet the approval of the Building Official. Final building permit valuation shall be set by the Building Official.

10.3 Schedule of permit fees
On new or altered structures, gas, mechanical, plumbing or roofing requiring a permit, a fee for each permit shall be paid in accordance with Table 10.3 (1997 edition of the Uniform Building Code, Table 1-A).

10.3.1 Plan review fee
The plan review fee shall be 65% of the permit fee. In cases of stock plans, the plan review fee shall be 10% of the permit fee.

10.3.2 Electrical permit fee
Fees for electrical only permits shall be assessed per Table 10.3.2

Table 10.3.2
ELECTRICAL PERMIT FEE SCHEDULE

If an electrical permit is not obtained prior to installation, the inspection fee may be twice the amount as prescribed by Colorado Revised Statute §12-115-121.3

Section A. RESIDENTIAL: In unincorporated Douglas County a single Residential Building Permit Fee covers all building, electrical, mechanical, and plumbing work included on the approved plans.

Section B. ALL OTHER FEES including some residential installations that are not based on square footage (not in a living area, i.e., garage, shop, and photovoltaic, etc.). Fees in this section are calculated from the total cost to customer, including electrical materials, components, and labor – whether provided by the contractor or the property owner. Use this formula for a service connection, a temporary meter, and all commercial installations. Such fees shall be computed as follows:

Valuation of Installation: (based on cost to customer of labor, materials, and components):

FEE

1) Not more than $2,000.....**$ 57**
2) $2,001 and above..... **$ 5 per thousand OR FRACTION thereof PLUS $ 57**

Example: The cost of the installation is $8,150 (round up to $9,000)
The base fee is calculated from section (2) above: 9 x $5= $45 *PLUS $*57 =$102

The total fee is: $102

C. Reinspection fee for all of the above…… **$ 47**
D. Add Fee for Extra inspections…….. **$ 50**
E. Add Fee for Residential Constr. Meter (for work under Sect. A) … **$ 45**

10.3.3 Wildfire mitigation assessment fee
A fee of $120.00 shall be assessed to new structures located in wildfire hazard areas as determined by the Wildfire Hazard Overlay Map that require an on-site assessment and final inspection.

10.3.4 Driveway permit fee *(Detached single-family residences only)*A permit fee of $40.00 shall be required for vehicular access to residential dwellings, or buildings accessory thereto, in rural areas generally not served by combination curb, gutter, and sidewalk.

10.3.5 Drainage, Erosion, and Sediment Control (DESC) permit fee
(Detached single-family residents only)
A DESC permit fee is required on all new single-family residential construction and new construction of accessory structures (e.g., additions, barns, arenas, detached garages, etc.) on existing single-family home sites. Fees for each DESC permit shall be determined in accordance with Table 10.3.5.

10.3.5.1 DESC plan review fee *(Detached single-family residences only)*
The DESC plan review fee shall be 65% of the DESC permit fee.

Table 10.3.5
DESC Permit Fee Schedule

Project Valuation	Permit Fee
$0 to $25,000.00	$25.00
$25,001.00 to $50,000.00	$35.00
$50,001.00 to $100,000.00	$50.00
$100,001.00 to $900,000.00	$50.00 for the first $100,000.00 plus $32.00 for each additional $100,000.00 of the valuation, or fraction thereof
$900,001.00 and up	$338.00

10.3.6 Zoning fee

10.3.6.1 One and two-family dwellings or townhouses as defined in the IRC
A review fee of $50.00 is required per single family/townhouse as each unit is permitted individually. Additionally, a fee of $30.00 will be assessed for permits for accessory structures.

10.3.6.2 Commercial and multi-family buildings as defined in the IBC
A review fee of $50.00 is required for each commercial structure as each unit is permitted individually. Apartment and condominium buildings will be assessed a $50.00 fee per building. Additionally, a fee of $30.00 will be assessed for permits for accessory structures.

10.3.7 Re-inspection fee
When an inspection has been requested for work that has not been completed, or for identified deviancies that have not been corrected, a re-inspection fee may be assessed.

Re-inspection fees may be assessed when: the inspection record card is not posted or otherwise available on the work site, the approved plans are not readily available to the inspector, for failure to provide access on the date for which the inspection is requested, or for deviating from approved plans.

When re-inspection fees have been assessed, no additional inspections will be performed until the required fees have been paid. Re-inspection fees shall be in accordance with Table 10.3.

10.3.8 Investigation fee
Investigation fees shall be determined in accordance with Table 10.3.

10.3.8.1 Work commencing before permit issuance
Investigation fees may be assessed for work regulated by this Resolution that commences prior to a valid permit being issued. An investigation fee may amount to two times the calculated permit fee.

10.3.9 Elevator/escalator inspection fee
A conveyance inspection fee in accordance with the Douglas County Administrative Fee Schedule shall be paid for each separate elevator/escalator installed in the county. These fees shall cover annual safety inspections and witness inspections as required by the State. Notice of the fee shall be given to each conveyance owner by the Building Division for the specific inspection service provided.

10.3.10 Use Tax A Use Tax on construction and building materials shall be collected at time of permit issuance for most types of permits, in accordance with Resolution R-994-147 and approval by registered electors at general election, and as modified by subsequent statutorily authorized public approval processes.

10.4 Refunds
The Building Official may authorize the refunding of fees for the following:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.

2. Not more than 80% of the permit fee paid when no work has been done under a permit issued in accordance with this code.

3. Not more than 80% of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.

The Building Official shall not authorize a refund of any fee paid, except upon written application filed by the original permittee, not later than 180 days after the date of fee payment.

Table 10.3

(1997 Uniform Building Code, Table 1-A)

Total Valuation	Building Permit Fee
$1.00 to $500.00	$23.50
$501.00 to $2,000.00	$23.50 for the first $500.00 plus $3.05 for each additional $100.00, or fraction thereof, to and including $2,000.00
$2,001.00 to $25,000.00	$69.25 for the first $2,000.00 plus $14.00 for each additional $1,000.00, or fraction thereof, to and including $25,000.00
$25,001.00 to $50,000.00	$391.25 for the first $25,000.00 plus $10.10 for each additional $1,000.00, or fraction thereof, to and including $50,000.00
$50,001.00 to $100,000.00	$643.75 for the first $50,000.00 plus $7.00 for each additional $1,000.00, or fraction thereof, to and including $100,000.00
$100,001.00 to $500,000.00	$993.75 for the first $100,000.00 plus $5.60 for each additional $1,000.00, or fraction thereof, to and including $500,000.00
$500,001.00 to $1,000,000.00	$3,233.75 for the first $500,000.00 plus $4.75 for each additional $1,000.00, or fraction thereof, to and including $1,000,000.00
$1,000,001.00 and up	$5,608.75 for the first $1,000,000.00 plus $3.65 for each additional $1,000.00, or fraction thereof

Other inspections and fees:

1. Inspections outside normal business hours……..... $47.00 per hour [A]
   (minimum charge of two hours)
2. Re-inspection fees……. $47.00 per hour [A]
   (minimum charge of one hour)
3. Inspections for which no fee is specifically indicated……..... $47.00 per hour [A]
   (minimum charge of one-half hour)
4. Additional plan review required by changes, additions or revisions to plans……... $47.00 per hour [A]
   (minimum charge of one-half hour)
5. For use of outside consultants for plan checking and inspections, or both…… Actual costs [B]
6. Investigation fees……..... $47.00 per hour [A]
   (minimum charge of two hours)

A. $47.00 per hour fee or the total hourly cost to the jurisdiction will be charged, whichever is greatest. The cost shall include supervision, overhead, equipment, hourly wages, and fringe benefits of the employees involved.

B. Actual costs include administrative and overhead costs.

20.0 CONTRACTOR REGISTRATION Add new section and subsections

20.1 General

No contractor shall hire, employ, contract with, or engage another person to perform any construction work unless the person so hired, employed, contracted with, or engaged to perform construction work is registered with Douglas County Building Division.

Exceptions:

1. A homeowner is not required to register and is exempt from this Section.
2. Construction trades other than mechanical, electrical, and plumbing performing work under a registered general contractor are not required to be registered.

A contractor shall be responsible for all work included under the scope of the contractors' registration regardless of whether such work is done by the contractor directly or by a sub-contractor which is exempt pursuant to this Section.

It shall be the duty of any applicant for electrical or plumbing registration to furnish copies of the State contractor's license, master's license and to send updates as new State licenses are issued, or if licensed tradespersons are replaced. No permits for electrical wiring or plumbing work may be issued to any applicant unless such State license is properly verified and registered.

Permits will only be issued to a registered contractor or their authorized representative.

20.2 Definitions

CONTRACTOR

A contractor is any person, firm, co-partnership, corporation, association, or other organization, or any combination thereof, who builds, constructs, alters, adds to, or repairs any building or structure either on its own property, or who supervises or advises on any such activity, or hires and pays subcontractors.

HOMEOWNER

The owner of the property who elects to act as an owner-builder for their residential dwelling or accessory structure, as defined in the International Residential Code (IRC). A homeowner may secure a permit on only one residential dwelling in a twelve (12) month period with the intent of occupying the structure upon completion. Any person who builds two or more residences in unincorporated Douglas County in any twelve (12) month period shall be deemed to be a contractor, who must then comply with Section 20.0.

20.3 Class of registration

It shall be unlawful to perform work which is not authorized under the scope or limits of work for which such registration was issued. Registration classifications are as follows:

20.3.1 Building contractor – CLASS "A"

This registration shall entitle the holder to contract for the construction, alteration, tenant finish, or repair of any type or size of structure permitted by the International Building Code (IBC) or International Residential Code (IRC).

20.3.2 Building contractor – CLASS "B"
This registration shall entitle the holder to contract for the construction, alteration, or repair of multi-family/townhouses with three or more units per structure as permitted by the IBC or IRC.

20.3.3 Building contractor – CLASS "C"
This registration shall entitle the holder to contract for the construction, alteration, or repair of single-family homes and duplexes as permitted by the IRC.

20.3.4 Building contractor – CLASS "D"
This registration shall entitle the holder to contract for the construction, alteration and repair of, but not limited to, garages, barns, basement finishes, alterations, decks, remodels, and low voltage wiring as permitted by the IRC.

20.3.5 Mechanical contractor – CLASS "MA"
This registration shall entitle the holder to perform work on heating, ventilation, air conditioning, and refrigerating systems.

20.3.6 Electrical contractor
Any person, firm, co-partnership, corporation, association, or combination thereof that undertakes or offers to undertake for another the planning, layout, supervision, installation or repair of wiring apparatus and equipment for electrical light, heat, and power. Pursuant to C.R.S. 12-23-105, electrical contractors are licensed by the State of Colorado and are only required to register with Douglas County. Electrical contractors are exempt from the fee requirements of this Section.

20.3.7 Plumbing contractor
Any person, firm, co-partnership, corporation, association, or combination thereof that undertakes or offers to undertake for another the planning, layout, supervision, installation, modification, or repair of plumbing systems. Pursuant to C.R.S. 12-58-105, plumbing contractors are licensed by the State of Colorado and as such are only required to register with Douglas County. Plumbing contractors are exempt from the fee requirements of this Section.

20.3.8 Roofing contractor
This registration shall entitle the holder to contract for the replacement and repairs of existing roofs as permitted by the IBC or IRC.

20.4 Contractor registration fee schedule

Contractor's registration fees shall be as follows:
Class "A" Contractor……..$250.00
Class "B" Contractor……..$200.00
Class "C" Contractor……..$150.00
Class "D" Contractor……..$150.00
Mechanical Contractor……... $150.00
Roofing Contractor…….....$150.00

Electric Contractor……..... Exempt
Plumbing Contractor…….. Exempt

Exception:

Fees for all types of registrations will be waived until further action by the Board of County Commissioners, effective July 1, 2013, per Douglas County Resolution (R-012-068).

20.5 Probationary registration

The Building Official may issue a probationary registration where the Building Official determines that qualifications must be established prior to issuance of a regular registration.

20.6 Expiration of registration and regulations

All registrations shall expire one (1) year from the date of issuance. Registrations with State issue licenses shall expire thirty (30) days after the State license expires, unless otherwise provided. No permits may be obtained, nor may work already under permit be continued, until the registration has been renewed. Applicants for registration renewals shall meet all current requirements for a new registration.

20.7 Insurance requirements

Prior to registration, the contractor shall file with the Building Official a Certificate of Liability insurance and Worker's Compensation insurance. The insurance certificate must be signed by an agent of an insurance company stating that the policy, or policies, required by this Section have been issued to the contractor. The policy, or policies, shall state the name of the company, effective date of such policies, and the expiration date of policy or policies. Each policy of insurance shall contain an endorsement to the effect that the insurance carrier shall notify the Douglas County Building Division of the effective date of a reduction or cancellation of the policy. The cancellation or reduction of insurance below the required amount of coverage shall be cause for automatic suspension of the contractor's registration until coverage is reinstated. All policies shall be kept in effect for the period of the registration.

Single occurrence liability insurance shall have the following minimum coverage amount:

Class "A" Contractor…… $1,000,000.00
Class "B" Contractor…… $1,000,000.00
Class "C" Contractor…… $500,000.00
Class "D" Contractor……..... $300,000.00
Electrical Contractor……. $300,000.00
Plumbing Contractor……. $300,000.00
Mechanical Contractor……. $300,000.00
Roofing Contractor…… $300,000.00

20.8 Registration suspension and revocation

The Building Official may suspend or revoke the registration of any registered contractor for good cause, as described in this Section. Upon suspension or revocation, the Building Official shall provide written notice to the registered contractor by delivery to the business

mailing address provided by the contractor at time of registration. The notice of suspension or revocation shall include information regarding the appeals process for the suspension or revocation, including the right of the contractor to appear before the Board of Appeals and show cause why the registration should not be suspended or revoked. At the hearing before the Board of Appeals, the contractor shall have the right to present their case by oral and documentary evidence, to submit rebuttal evidence, as may be required for a full and true disclosure of the facts.

Suspension or revocation of a contractor's registration shall not be construed to release the contractor from liabilities and obligations of completing his contract. During the period prior to the hearing before the Board of Appeals, the contractor shall not be allowed to submit an application for any other projects.

The Board of Appeals, after review of the evidence presented, shall have the power to suspend, revoke or reinstate a contractor's registration for good cause shown. Good cause includes, but is not limited, to the following:

1. Violating any provisions of the Douglas County Building Code including any codes which are adopted by reference.

2. Failure to comply with any lawful order of the Building Official or any other authorized representative of the Building Division pertaining to the administration of the building code and those codes adopted by reference.

3. Using a contractor's registration to obtain a permit required under this code for any other person, corporation, or legal entity.

4. Failure to reveal any material fact in the application for a contractor's registration or permit, or the supplying of information which is untrue or misleading as to any material fact in the application, for a contractor's registration or permit.

5. Failure to obtain a proper permit for any work for which a permit is required.

The Board of Appeals (BOA) may reinstate a registration for any contractor whose registration has been revoked, provided a majority of the BOA votes in favor of such reinstatement for such reason as the BOA may deem sufficient. In such case where the contractor's registration has been revoked and the contractor is petitioning the BOA for reinstatement, the petitioner shall follow the established policies for requesting such hearing and pay all applicable fees.

30.0 BOARD OF REVIEW **Add new section and subsections**

30.1 General

In order to hear and decide appeals of orders, decisions, or determinations made by the Building Official relative to the application and interpretation of this code, there shall be and is hereby created a Board of Review (BOR). The Building Official shall be an ex-

officio member of, and shall act as secretary to said BOR, but shall have no vote on any matter before the BOR. The BOR shall operate as and perform the duties of the Board of Review, pursuant to Section 30-28-206, C.R.S. the BOR shall be appointed by the Douglas County Board of County Commissioners and any member of the BOR may be removed for cause by the Douglas County Board of County Commissioners. The BOR shall consist of no less than three members nor more than five members. The member's terms shall be of such length and such arrangement that the term of at least one member shall expire each year. Vacancies shall be filled for an unexpired term in the same manner as in the case of original appointments. The Douglas County Board of County Commissioners shall provide for general rules to cover the organization, procedure, and jurisdiction of the BOR. The BOR may adopt supplemental rules of procedure not inconsistent with Article 28, Title 30, C.R.S. or such general rules. The BOR shall render all decisions and finding, in writing, to the appellant. A duplicate copy shall be sent to the Building Official.

30.2 Limitations on authority
Pursuant to Section 30-28-206, C.R.S., the BOR, in appropriate cases and subject to a determination as to the suitability of alternate materials and methods of construction, may make special exceptions to the terms of the Building Code in harmony with its purpose and intent. The BOR shall have no authority to waive requirements of this Code or provide product approvals.

30.3 Qualifications
The BOR shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

30.4 Code amendments
Pursuant to Section 30-28-206(2), C.R.S., the BOR is authorized to formulate suggested amendments to the Douglas County Building Code for consideration by the Douglas County Board of County Commissioners.

30.5 Administration
The Building Official shall take immediate action in accordance with the decision of the BOR.

30.6 Fees
The fee for a hearing before the Board of Review shall be $250.00. The fee is non-refundable.

40.0 NOISE MITIGATION **Add new section and subsections**

40.1 Interior Noise Level
All new structures, and the alteration or repair of existing structures, that are located in the Centennial Airport Review Area (CARA) as defined in Section 19 of the Douglas County Zoning Resolution and as amended, requiring noise mitigation, shall comply with this following.

An acoustical engineer, registered with the State of Colorado, shall certify that construction practices and/or materials of the structure will achieve an interior noise level below DNL 45 dBA. The acoustical professional shall submit documentation of the proposed measures to the Building Official before permitting.

Field testing to show compliance with the following Outdoor-Indoor Transmission Class (OITC) ratings shall be formed in accordance with the current ASTM standard.
OITC ratings of wall, floor, roof, window, and door assemblies shall be a value of 32 or greater.

40.2 Penetrations
All membrane or through penetrations in the construction assemblies for piping, electrical devices, recessed cabinets, bathtubs, soffits, heating, combustion, ventilation, or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings.

50.0 SITE SANITATION **Add new section and subsections**

50.1 Sanitation facilities required
Every building site during construction, remodeling, or demolition activities, shall be furnished with approved sanitation facilities for workers in accordance with Section 311 of the International Plumbing Code and an appropriate enclosure or other means approved by Douglas County to contain trash and debris.

50.2 Location
Sanitary facilities and approved trash enclosures shall be located within 300 feet of the building site. Sanitary facilities and trash enclosures shall not be located within the public right-of-way. Failure to comply with this section may cause suspension of inspections until compliance is achieved.

AMENDMENTS TO THE 2024 INTERNATIONAL RESIDENTIAL CODE (IRC)

Note: Refer to the section "Amendments common to all adopted International Codes" for more information.

Appendix BD Home Day Care Occupancy **Adopt Appendix**

Wildfire Mitigation Standards **Adopt as an appendix**
Attached hereto, as Exhibit "B"

Water Supply Standard for Rural Firefighting **Adopt as an appendix**
Attached hereto, as Exhibit "C"

Installation Standard IS-22-98 **Adopt as an appendix**
Installation standards for potable water storage tanks and cisterns for domestic use
Attached hereto, as Exhibit "D"

R101.1 Title [NAME OF JURISDICTION] **Replace**
Douglas County Building Division **Insert**

R105.2(5) Work exempt from permit (Building) Delete words "and driveways"

R105.2(11-14) Work exempt from permit (Building) Add new exceptions

11. Manufactured metal shipping containers used as tool and storage sheds with a floor area not larger than 200 square feet and are:
    11.1. Not used for storage of hazardous materials, or
    11.2. Not modified, connected, or stacked on top of each other.

12. Shade structures such as fabric shade sails or fabric covered awnings; and detached, free standing pergolas that do not exceed 200 square feet and are not subject to a uniformly distributed snow load; and detached ornamental garden structures and greenhouses accessory to a dwelling that do not exceed 200 square feet.

13. Replacement windows and doors where no structural modification of the rough opening is required, and the replacement window is of the same operating style as the existing window or a style that provides for an equal or greater window opening area than the existing window. This exemption shall not apply within areas subject to the Douglas County Wildfire Resiliency Code.

14. The replacement or repair of roofing less than one square (100 square feet).

All work exempted by this Section R105.2 must comply with applicable zoning requirements and the regulations of other agencies having authority.

Work exempted from permit under Section R105.2 shall comply with the Douglas County Wildfire Resiliency Code when applicable.

R105.3 Application for permit (8) and (9) Add new subsection requirements

8. Proof of ownership of the property shall be submitted with the building permit application. When access is not from a public road, proof of legal and physical access shall be submitted with the application. If legal access is in question, the Building Official may confer with the County Attorney to determine the legality of the proposed access. If physical access is in question, referral comments may be sought from the Douglas County Department of Public Works and the Fire Protection District serving the property. The Building Official shall then determine whether legal access is available and whether physical access is safe, reasonable, and adequate. If the Building Official determines that the physical access is not safe, reasonable, or adequate, he may recommend whatever improvements would be necessary to provide safe and reasonable access.

9. A soils test of the building site prepared by a professional engineer registered by the State of Colorado shall be submitted with the application for a building permit. A professional engineer registered by the State of Colorado shall design the foundation in accordance with the soils report. Concrete foundations shall comply with ACI 318. When the building site is located in a hillside area, or in the opinion of the Building Official, is located in an area subject to geological hazards or steep slopes, the Building

Official may require an engineering geologist, working within their field of expertise, to submit specific recommendations regarding the building site and the proposed location and design.

R108 Fees **Delete section in its entirety**

R109.1.1 Foundation inspection **Addition to the end of the subsection**

Inspections shall be performed by a Colorado licensed professional engineer or architect that is registered in the State of Colorado. A sealed written report shall be provided to the Building Official of the results for these inspections by a Colorado licensed professional engineer or architect that is registered in the State of Colorado.

R112 Means of Appeals **Delete section in its entirety**

R202 Definitions

Accessory Structure **Amend to read as follows**

Accessory Structure. A structure that is not over two stories in height, the use of which is customarily accessory to and incidental to that of the dwelling(s), or other allowed use, and that is located on the same lot.

Table R301.2(1) Climatic and geographic design criteria **Delete chart and substitute**

TABLE R301.2(1)

Climatic & Geographic Design Criteria

Topo effects	Seismic category	Subject to damage from: Weathering	Frost line depth	Termites	Ice barrier underlay	Flood hazards	Wind-borne debris
Exposure C	B	Severe	36"	Slight to moderate	Yes above 7,000'	per FEMA	No

Manual J Design Criteria

Elevation	Altitude correction factor	Coincident wet bulb	Indoor winter dry bulb temp	Air freezing index	Outdoor winter dry bulb temp	Design temp cooling	Heating temp difference
Varies	Varies	59°	70°	867	-3°	75°	73°
Latitude	**Daily range**	**Indoor summer rel. humidity**	**Indoor winter rel. humidity**	**Indoor summer dry bulb temp**	**Outdoor summer dry bulb temp**	**Mean annual temp**	**Cooling temp difference**
39.5° N	H	30%	50%	75°	90°	48°	15°

TABLE R301.2(2)
Wind and Snow Load Design Criteria

USGS Elevation Ranges (feet)*	Snow load (psf)	Wind Speed
5152-5999	30	115 Ultimate Wind Speed Exposure C
6000-6499	35	
6500-6999	40	
7000-7499	45	130 Ultimate Wind Speed Exposure C
7500-7999	50	
8000-8499	55	
8500-8999	60	
9000-9499	65	
Ground Snow Load = Roof Snow Load	**Reductions for Snow Loads are Not Allowed**	

*At top of foundation

R302.13 Fire protection of floors. **Delete section in its entirety**

R310.1 Emergency escape and rescue openings required **Delete exception (2)**

R309.1 Townhouse automatic fire sprinkler systems **Delete in its entirety and substitute**

An automatic residential fire sprinkler system *may* be installed in townhouses in accordance with Section P2904 or NFPA 13D.

R309.2 One and two-family dwellings automatic fire sprinkler systems **Delete section in its entirety and add**

Owner occupied lodging houses, bed and breakfast with five or fewer guest rooms and 10 or fewer total occupants permitted to be constructed in accordance with the International Residential Code shall be equipped with an automatic residential fire sprinkler system designed and installed in accordance with Section P2904 or NFPA 13D.

R311.2.2 Alterations, repairs and additions **Delete exception 2 and 3**

R311.3 Location **Delete in its entirety and substitute**

Carbon monoxide alarms in dwelling units shall be installed outside each separate sleeping area within 15 feet of each bedroom's entrance. Where a fuel-burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom.

R319.4.1 Minimum size **Add exception (2)**

Exception 2. In basements of existing R-3 (one- or two-family dwellings) occupancies, where existing egress window wells are retained, window wells may have a minimum horizontal projection of 24 inches (610mm) and must be the full width of the window. If a ladder is required in the window well, the ladder must be installed such that it does not interfere with or is in front of the operable side of the window.

R401.2 Requirements **Addition to the end of the subsection**

Based on soils reports for lots within the Dipping Bedrock Overlay District, as identified by the Colorado Geological Survey, the Building Official may require additional testing to determine the proper foundation design. Such additional testing may include, but are not limited to, testing for initial water content, initial dry density, grain size distribution, Atterberg Limits (liquid limit and plasticity index), percent swell and test load surcharge, swell pressure, penetration resistance (blow counts), and unconfined compressive strength.

R401.3 Drainage **Delete in its entirety and substitute**

Single-family detached dwelling units and accessory structures thereto, shall comply with the Douglas County Drainage, Erosion and Sediment Control (DESC) manual.

R402.1 Wood foundations **Delete in its entirety**

R403.3 Frost-protected shallow foundations **Delete in its entirety**

R905.7 Wood shingles. **Delete in its entirety**

R905.8 Wood Shakes. **Delete in its entirety**

R908.7 Drip edge flashing for asphalt shingle roof **Add New Subsection**

Drip edge flashing shall be provided at eaves and rake edges of shingle roofs. Adjacent segments of drip edge shall be overlapped a minimum of 2 inches. Drip edges for eaves shall extend a minimum of 1.5 inches below the roof sheathing and extend up the roof deck a minimum of 4 inches. Drip edges for gables shall extend a minimum of .25 inches below the roof sheathing and extend up the roof deck a minimum of 2 inches. Drip edges shall be mechanically fastened to the roof deck at a maximum of 12 inches on center with fasteners as specified in Section R905.2.5. Underlayment shall be installed over the drip edge along eaves and under the drip edge on rakes/gables. Unless specified differently by the shingle manufacturer, shingles are permitted to be flush with the drip edge.

R908.1 General **Addition to the end of the subsection**

Roof drainage shall comply with the requirements of Section R801.3.

R908.4 Roof recover **Addition to exception (2)**

Exception 2. Where the existing roof covering is asphalt shingle, slate, clay, cement, or asbestos-cement tile.

Chapter 11 Energy efficiency **Delete Chapter in its entirety and substitute**

IRC Sections N1101 through N1113 (R505) in Chapter 11 are deleted in their entirety and replaced with a new section N1101 to read as follows:

SECTION 1101
GENERAL REQUIREMENTS

N1101.1 Scope. This chapter regulates the energy efficiency for the design and construction of buildings regulated by this code.

N1101.2 Criteria. Buildings shall be designed and constructed in accordance with the 2024 International Energy Conservation Code (IECC) as amended and adopted by Douglas County. The climate zone for unincorporated Douglas County is established as Zone 5B.

G2406.2(303.3) (3) and (4) Prohibited locations **Delete in their entirety**

G2417.4.1 (406.4.1) Test pressure **Delete section in its entirety and substitute**

Test pressure and duration Low pressure gas piping systems not exceeding six (6) inches of water column shall be tested at ten (10) pounds per square inch on a thirty (30) pounds per square inch gauge using air, CO2, or Nitrogen for not less than fifteen (15) minutes with no perceptible drop in pressure. For welded piping, and for piping carrying gas at pressures in excess of fourteen (14) inches (356 mm) water column pressure, the test pressure shall not be less than sixty (60) pounds per square inch (413.4 kPa) and shall be continued for not less than thirty (30) minutes with no perceptible drop in pressure.

G2417.4.2 (406.4.2) Test duration **Delete in its entirety**

G2425.8 (501.8) (7) Appliances not required to be vented **Delete in its entirety**

G2433.1 (603.1) General **Delete in its entirety and substitute**
Log lighters are prohibited.

G2445 (621) Unvented room heaters **Delete section in its entirety and substitute**
Unvented room heaters and unvented fireplaces are prohibited within a dwelling.

Clarification: IRC Sections G2425.8, G2445 and IFGC Sections 501.8(8), and 621 are deleted in their entirety and amended to prohibit the use of unvented room heaters and specifically unvented or ventless fireplaces. These are defined as appliances that have no flue collar or flue pipe associated with them and are designed to discharge all products of combustion through the front or face of the appliance and into the room or space being heated. It is the intent of the Building Official to prohibit the installation of these appliances inside dwellings or to provide heat to habitable spaces. However, these appliances may be installed in accordance with their listings and manufacturers specifications, outside or on patios with or without covers, with at least one open side that communicates directly with the atmosphere.

Chapters 34 through 43. **Delete Chapters in their entirety and substitute** Chapters 34 through 43 are deleted in their entirety and replaced by a new Chapter 34, General Requirements, which shall read as follows:

CHAPTER 34
GENERAL REQUIREMENTS

E3401.1 Scope. This chapter governs all electrical components, equipment and systems used in buildings and structures regulated by this code.

E3401.2 Criteria. All electrical components, equipment and systems shall be designed and constructed in accordance with the provisions of NFPA 70 (National Electric Code, NEC), as amended and adopted by Douglas County.

AMENDMENTS TO THE 2024 INTERNATIONAL BUILDING CODE (IBC)

Note: Refer to the section "Amendments common to all adopted International Codes" for more information.

Appendix C - Group U Agricultural Buildings **Adopt Appendix**

Wildfire Mitigation Standards **Adopt as an appendix**
Attached hereto, as "Exhibit B"

Water Supply Standard for Rural Firefighting **Adopt as an appendix**
Attached hereto, as "Exhibit C"

Appendix Q– Solar Photovoltaic Power Systems **Adopt as a new appendix**
Attached hereto, as "Exhibit E"

101.1 Title [NAME OF JURISDICTION] **Replace**
Douglas County Building Division **Insert**

101.4.4 Property Maintenance **Delete in its entirety**

105.2(2) Work exempt from permit (Building) **Delete item 2 and substitute**

2. Fences, other than swimming pool barriers, not over 7 feet high, unless electrically energized. All electrified fences shall require permitting and compliance with this code, the adopted National Electrical Code and International Fire Code as amended and adopted by Douglas County.

Work exempted from permit under Section 105.2 shall comply with the Douglas County Wildfire Resiliency Code when applicable.

105.3(8) Application for permit **Add a new section**

Soils testing shall be performed, and a Soils Report of the building site prepared by a professional engineer registered by the State of Colorado shall be submitted with the

application for a building permit. A professional engineer registered by the State of Colorado shall design the foundation in accordance with the Soils Report. When the building site is located in a hillside area or, in the opinion of the Building Official, is located in an area subject to geological hazards or steep slopes, the Building Official may require an engineering geologist, working within their field of expertise, to submit specific recommendations regarding the building site and the proposed location and design. Such recommendations shall include, but are not limited to, the relationships of site grading, structural integrity, site vegetation characteristics (or potential), location of septic drain fields, and protection of adjacent property.

109 Fees — **Delete section and all subsections to fees in their entirety**

110.3.1 Footing and foundation inspection — **Add to end of subsection**

Inspections shall be performed by a Colorado registered professional engineer. A sealed written report shall be provided to the Building Official of the results for these inspections by a Colorado registered professional engineer.

111.1 Change of occupancy — **Add new exception**

2. Certificates of occupancy are not required for buildings and structures permitted under Section 312 Utility and Miscellaneous Group U.

113 Means of Appeals — **Delete this section in its entirety**

310.4.2 Lodging Houses. — **Delete in its entirety and substitute**

Owner-occupied lodging houses with five or fewer guest rooms and 10 or fewer total occupants shall be permitted to be constructed in accordance with the International Residential Code, provided an automatic sprinkler system is installed in accordance with IRC Section P2904 or that meets the requirements of NFPA 13D.

1608.2 Ground snow loads — **Delete in its entirety and substitute**

Snow loads for portions of Douglas County outside of the Pike National Forest boundary shall be 30 pounds per square foot for an elevation up to 6,000 feet and shall increase 5 pounds per square foot for every 500-foot increment above 6,000 feet. Snow loads for all elevations above 8,000 feet shall be determined based on the Snow Load Design Data for Colorado recommendations prepared by the Structural Engineer's Association of Colorado. No reduction for ground snow load to flat roof snow load ($p_g = p_f$).

1609.3 Basic design wind speed — **Delete in its entirety and substitute**

Risk Category II - Figure 1609.3(1) equals 115 miles per hour
Risk Category III - Figure 1609.3(2) equals 120 miles per hour
Risk Category IV - Figure 1609.3(3) equals 120 miles per hour
Risk Category I - Figure 1609.3(4) equals 105 miles per hour

1609.4.3 Exposure categories **Delete in its entirety and substitute**

The design wind exposure category for unincorporated Douglas County shall be Exposure C.

1612.3 Establishment of flood hazard areas **Delete in its entirety and substitute**

All flood hazard areas in unincorporated Douglas County shall be defined and governed by the Douglas County Zoning Resolution, Section 18, Floodplain – Overlay District.

1803.2.1 Investigations required **Add new subsection**

Based on soils reports for lots within the Dipping Bedrock Overlay District, as identified by the Colorado Geological Survey, the Building Official may require additional testing to determine the proper foundation design. Such additional testing may include, but is not limited to, testing for initial water content, initial dry density, grain size distribution, Atterberg Limits (liquid limit and plasticity index), percent swell and test load surcharge, swell pressure, penetration resistance (blow counts), and unconfined compressive strength.

1809.5 Frost protection **Addition as first sentence**

Frost depth for all areas of Douglas County shall be a minimum of 36 inches.

3111.1 General **Delete in its entirety and substitute**

Solar photovoltaic panels/modules shall comply with the requirements of this code, the 2026 National Electrical Code (or a subsequently adopted electrical code), and IBC Appendix Q (added herein).

AMENDMENTS TO THE 2024 INTERNATIONAL PLUMBING CODE (IPC)

Note: Refer to the section "Amendments common to all adopted International Codes" for more information.

Appendix E Sizing of Water Piping Systems **Appendix E hereby adopted**

101.1 Title [NAME OF JURISDICTION] **Replace**
Douglas County Building Division **Insert**

112 Means of Appeals **Delete in its entirety**

113 Board of Appeals **Delete in its entirety**

114.4 Violation penalties **Delete in its entirety**

115.4 Failure to comply **Delete section and substitute**

Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

305.4.1 Sewer depth **Delete in its entirety**

308.7.2 Hanger rods **Add a new subsection**

308.7.2 Hanger Rods
Hanger rods shall be sized per Table 308.7.2(1)

Table 308.7.2(1)
Minimum Hanger Rod Size

Pipe and Tube Size (inches)	Rod Size (inches)
1/2 - 4	3/8
5 - 8	1/2
10 - 12	5/8

903.1.1 Roof extension unprotected **Delete in its entirety and substitute**
All open vent pipes that extend through a roof shall be terminated at least twelve (12) inches above the roof.

1003.2.1 Municipalities or special districts **Add a new subsection**
Regulations by the municipalities or special districts for wastewater into which the grease trap or interceptor effluent is transported and/or treated may supersede the requirements of Section 1003.

AMENDMENTS TO THE 2024 INTERNATIONAL MECHANICAL CODE (IMC)

Note: Refer to the section "Amendments common to all adopted International Codes" for more information.

101.1 Title [NAME OF JURISDICTION] **Replace**
Douglas County Building Division **Insert**

112 Means of Appeals **Delete in its entirety**

113 Board of Appeals **Delete in its entirety**

114.4 Violation penalties **Delete in its entirety**

115.4 Failure to comply **Delete section and substitute**
Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

AMENDMENTS TO THE 2024 INTERNATIONAL FUEL GAS CODE (IFGC)

Note: Refer to the section "Amendments common to all adopted International Codes" for more information.

101.1 Title [NAME OF JURISDICTION] **Replace**
Douglas County Building Division **Insert**

103.1 [INSERT NAME OF DEPT] **Replace**
Douglas County Building Division **Insert**

112 Means of Appeals **Delete in its entirety**

113.4 Violation penalties **Delete in its entirety**

114.4 Failure to comply **Delete section and substitute**
Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

303.3(3) and (4) Prohibited locations **Delete in their entirety**

404.12 Minimum burial depth **Delete and substitute**
Underground piping systems shall be installed at a minimum depth of eighteen (18) inches (457 mm) below grade.

404.12.1 Individual outdoor appliances **Delete in its entirety**

406.4.1 Test pressure **Delete and substitute**

406.4.1 Test pressure and duration
Low pressure gas piping systems not exceeding six (6) inches of water column shall be tested at ten (10) pounds per square inch on a thirty (30) pounds per square inch gauge using air, CO2, or Nitrogen for not less than fifteen (15) minutes with no perceptible drop in pressure. For welded piping, and for piping carrying gas at pressures in excess of fourteen (14) inches (356 mm) water column pressure, the test pressure shall not be less than sixty (60) pounds per square inch (413.4 kPa) and shall be continued for not less than thirty (30) minutes with no perceptible drop in pressure.

406.4.2 Test duration **Delete in its entirety**

501.8 (8) Appliances not required to be vented **Delete in its entirety**

603.1 General **Delete in its entirety and substitute**
Log lighters are prohibited.

621 Unvented room heaters **Delete section in its entirety and substitute**
Unvented room heaters and unvented fireplaces are prohibited within dwellings. (See clarification in the IRC amendments).

AMENDMENTS TO THE 2024 INTERNATIONAL SWIMMING POOL AND SPA CODE (ISPSC)

Note: Refer to the section "Amendments common to all adopted International Codes" for more information.

101.1 Title [NAME OF JURISDICTION] Douglas County Building Division — **Replace / Insert**

109 Fees — **Delete section and all subsections to fees in their entirety**

112 Means of Appeals — **Delete section in its entirety**

114.4 Failure to comply — **Delete section and substitute**

Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

AMENDMENTS TO THE 2024 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

Note: Refer to the section "Amendments common to all adopted International Codes" for more information.

101.1 Title [NAME OF JURISDICTION] Douglas County Building Division — **Replace / Insert**

106 Fees — **Delete section and all subsections to fees in their entirety**

109 Means of Appeals — **Delete section in its entirety**

110.4 Failure to comply — **Delete section and substitute**

Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

C103.6.3 Systems operation control — **Delete subsection in its entirety**

R202 Definitions — **Delete in their entirety and substitute**

RESIDENTIAL BUILDING

For this code, includes single-family as defined in the IRC, R-3 buildings, as well as R-2 and R-4, buildings three stories or less in height above grade.

EQUIPMENT ROOM
A space that contains either electrical equipment, mechanical equipment, machinery, water pumps, or hydraulic pumps that are a function of the buildings' services.

R401.3 Certificate **Delete the first two sentences and substitute**

A permanent certificate shall be completed by the builder or permit holder and be posted on the return air plenum of the furnace where it is readily accessible. Where a return air plenum is not available, the certificate shall be posted in the area housing the mechanical equipment.

AMENDMENTS TO THE 2026 NATIONAL ELECTRICAL CODE (NEC)

The National Electrical Code is published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts, 02169

Article 210.23 (B) - 15- and 20-amp branch circuits; Addition to the end of the subsection: In dwelling units, the general-purpose branch circuits for receptacles and lighting shall be limited to no more than (10) openings on a 15-amp circuit and no more than (12) openings on a 20-amp circuit. Branch circuits for lighting only shall not exceed 80% of the branch circuit rating. The calculated load shall be determined on the maximum allowable wattage of the fixtures.

Article 210.52 (B) 3- Kitchen Receptacles Requirements; Modify the first sentence to read: Receptacles installed in a kitchen to serve countertop surfaces shall be supplied by not fewer than two small appliance circuits, **these circuits shall have no more than four openings,** either or both of which shall also be permitted to supply receptacle outlets in the same kitchen or other rooms specified in 210.52 (B) (1).

Article 215.4(A) 2 Informational Note #2 – Delete and substitute

Article 215.4(A) 2 Service Conductors and Feeder Conductors, as defined in Article 100, shall be sized to prevent a voltage drop exceeding 3 percent at the furthest termination and will provide reasonable efficiency of operation.

Exhibit B

WILDFIRE MITIGATION STANDARDS

General

(a). Purpose. The provisions of this standard are intended to promote public safety and welfare by reducing the risk of fire-induced damages to property and the environment.

(b). Scope. This standard applies to all property, buildings and structures located within wildfire hazard areas as determined by the Wildfire Overlay District Map, site-specific analysis, and wildfire hazard assessment. Buildings or conditions in existence at the time of the adoption of this standard are allowed to have their use or occupancy continued, if such condition, use, or occupancy was legal at the time of the adoption of this standard.

(c). Design and Construction. The design and construction of buildings and structures located within the boundaries of a Wildfire Hazard Area shall be in accordance with the standard set forth below.

Chapter 1 Introduction

1-1 **Scope.** This standard presents minimum planning criteria for the protection of life and property from wildfire. It includes information on safe procedures and best practices at the wildland-urban interface or intermix.

1-2 **Purpose**. The purpose of this standard is to provide criteria for fire agencies, land use planners, architects, developers, forestry consultants and local government for development in areas that may be threatened by wildfire.

1-3 **Definitions**. For the purpose of this standard, the following terms have the meanings shown below:

Access Routes. Principal vehicular ingress and egress to a structure or through a development, crossing more than one parcel, including public and private roads, streets, and lanes, that extend to and intersect with a publicly maintained road, street, or lane.

Accessory Building or Structure. Any building or structure used incidentally to another building or structure or other allowed use, and which is located on the same lot or parcel.

Aerial Fuels. Standing and supported live and dead combustibles not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, cones, bark, and vines.

Approved. Acceptable to the "authority having jurisdiction."

Aspect. Direction towards which the slope faces.

Authority Having Jurisdiction. The "authority having jurisdiction" shall be the Building Official and the Douglas County Office of Emergency Management. When matters of joint interest are involved, the Building Official or the Douglas County Office of Emergency Management may request referral comments from other organizations, offices, or individuals.

Brush. Shrubs and scrub vegetation or other vegetative growth heavier than grass but not full tree size.

Building. Any structure used or intended for supporting any use or occupancy.

Classified Roof. A roof constructed with a roof covering that is listed as meeting the requirements for Class A, B, or C roof covering materials (see NFPA 256, Standard Methods of Fire Tests of Roof Coverings).

Combustible. Any material that, in the form in which it is used and under the condition anticipated, will ignite and burn.

Defensible Space. An area either natural or man-made, where material capable of allowing a fire to spread unchecked has been treated, cleared, or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression operations to occur.

Development. Any human made change to improved or unimproved real estate, including but not limited to buildings, structures, grading, excavation or any alteration to land, buildings or structures which falls under the purview of Douglas County's adopted regulations.

Dwelling Unit. Any building or structure or portion thereof that contains living facilities with provisions for sleeping, eating, cooking, and sanitation for not more than one family.

Fire Hydrant. A valved connection on a piped water supply system having one or more outlets and that is used to supply hose and fire department pumpers with water.

Fuel Break. An area, usually a long strip strategically located, wherein vegetative fuels are reduced in volume and maintained to cause a reduction of fire intensity if ignited by a wildland fire.

Fuel Loading. The volume of fuel in a given area, generally expressed in tons per acre.

Fuel Modification. The removal of fuels, increased spacing of individual plants, or reduction of fuel loading.

Fuels. All combustible materials within the wildland-urban Interface or wildland-urban intermix, including, but not limited to, vegetation and structures.

Ground Fuels. Any native or landscape vegetation not considered a tree and generally in contact with the ground, including, but not limited to, duff layer and loose surface litter.

Home Ignition Zone. The structure itself and everything around it up to a minimum of 100 feet unless limited by property boundaries.

Listed. Equipment or materials included in a list published by an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

Noncombustible. A material that, in the form in which it is used and under the conditions anticipated, will not aid combustion, or add appreciable heat to an ambient fire. Materials tested in accordance with Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750º C (1382º F), ASTM E 136, and conforming to the criteria contained in Section 7 of the referenced standard shall be considered non-combustible.

Occupancy. The purpose for which a building, or part thereof, is used or intended to be used.

Residential Driveway. A vehicular access for private use that serves one lot or parcel connecting a house, garage, or other allowed use, to the public or private road.

Residential Shared Driveway. A vehicular access for private use that may serve no more than three lots or parcels for the purpose(s) of ingress and egress to buildings, structures, or other allowed use.

Roadway. Any surface improved, designed, or ordinarily used for vehicular travel other than a private residential driveway or residential shared driveway as defined in this Standard.

Slope. Upward or downward incline or slant, usually calculated as a percent of slope [rise or fall per 100 feet of horizontal distance].

Standard. This Exhibit B, Douglas County Wildfire Mitigation Standards.

Structure. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

Traveled Way. The portion of a roadway that provides for vehicular travel in all permitted directions.

Turnaround. A portion of a roadway or driveway unobstructed by parking, that allows for a safe reversal of direction for emergency equipment.

Turnouts. A widening in a roadway or driveway of sufficient length and width to allow vehicles to pass one another.

Wildland/Urban Interface. An area where development and wildland fuels meet at a well-defined boundary.

Wildland-Urban Intermix. An area where development and wildland fuels meet with no clearly defined boundary.

Wildfire. An unplanned and unwanted fire requiring suppression action; an uncontrolled fire, usually spreading through vegetative fuels but often threatening structures.

Chapter 2 Wildland-Urban Interface and Wildland-Urban Intermix Analysis

2-1 General. The analysis of the wildland-urban interface or wildland-urban intermix will help identify and document local problem areas and guide the application of standards and establishment of priorities relative to fire danger.

2-1.1 Scope. The provisions of this chapter establish general requirements for wildfire hazard assessment, inspection, and analysis for development, new and existing buildings, structures, and premises located within the wildfire hazard area, as determined by the Wildfire Hazard Overlay District Map.

2-1.2 Objective. The objective of this chapter is to establish minimum requirements to reduce the likelihood of life and property loss due to wildland fire, reduce exposures from adjacent structures and to prevent structure fires from spreading to wildland fuels. The wildfire hazard assessment, inspection and analysis shall assess all applicable wildfire hazards and risks as they relate to the natural and built environments. Results of the assessment will establish minimum requirements for project development as it relates to land use applications, including 35 acre and larger developments and building permits.

2-2 Analysis. The authority having jurisdiction shall perform a wildland fire hazard assessment of all developments, existing or planned, to determine the amount of wildfire mitigation necessary. The analysis developed under the authority of this section shall be the basis for the implementation of fire conscious design and construction criteria. The analysis shall be based on a project-specific wildfire hazard assessment that includes considerations of location, topography, aspect, and vegetative fuel loading, as well as any existing developments.

2-3 Analysis Components. The analysis shall consider the following components:

(a) Wildland-urban interface or wildland-urban intermix boundaries

(b) Slope & Aspect

(c) Climatic Conditions

(d) Structure Building Materials

(e) Vegetative Fuels

(f) Neighborhood Scale Hazard Potential

2-4 Assessing Fuel Hazards. For purposes of this sub-paragraph, "fuel" means any combustible material, including petroleum-based products, cultivated landscape plants, grasses, weeds, and wildland vegetation. The amount of fuel modification necessary shall consider the flammability of the structure as affected by building material, building standards, location, and types of vegetation. Fuels shall be maintained and spaced in a condition so that a wildfire burning under average weather conditions would be unlikely to ignite the structure. Fuels modification will be supported by available science, risk models and best practices, and shall be at the discretion of the Authority Having Jurisdiction.

2-4.1 Assessment Relating to the Land-Use Process. Development determined to be subject to the provisions of the Wildfire Hazard Overlay District and identified by wildfire mitigation staff as a significant wildfire hazard, must provide a Wildfire Mitigation or Forest Management Plan to be submitted by a professional forester, reviewed, and approved by Douglas County staff, and executed prior to the issuance of building permits within the development.

2-4.2 Assessment Relating to the Building Permitting Process. Each construction project permitted through the Building Division is subject to review under the adopted regulations. Any property undergoing development within the wildfire hazard area, as identified by the boundaries of the Wildfire Hazard Overlay District Map, whether new construction or modification to existing development, will require a wildfire hazard assessment from the Douglas County Office of Emergency Management. The assessment will examine the area within the first 100 feet from the edge of the built environment or to the property line, whichever comes first. The intensity of fuels management may vary within the 100-foot perimeter of the structure, with more intense fuel reductions being utilized between 5 and 30 feet around the structure, and an ember-resistant zone being required within 5 feet of the structure.

Chapter 3 Fuel Modification Planning

3-1 General. This chapter will provide guidance in the mitigation measures associated with fuel hazards and special hazard conditions. Fuel modifications shall be the primary mitigation measure. New subdivisions or developments shall complete the hazardous fuel reduction and mitigation work outlined in the Douglas County approved forest management or wildfire mitigation plan submitted by the applicant, if required, prior to the issuance of building permits for structures within the development. The Douglas County Office of Emergency Management shall determine whether a wildfire mitigation or forest management plan is required based on current forest conditions

3-2 Evaluation Factors. As prescribed in Chapter 2 of this standard, a comprehensive assessment of the fuel hazard shall be made. Factors that shall be considered in the assessment include:

(a) Fuel-type identification

(b) Fuel loading (volume)

(c) Size of fuel bed (acres)

(d) Slope and aspect

3-2.1 Fuel-type Identification. All fuel, natural vegetation, as well as other flammable materials existing within the area shall be identified and rated as its potential to increase the hazard. The ease of ignition and ability to assist in the spread of fire are important factors.

3-2.2 Fuel Loading. The volume of fuels, both presently existing and likely to be present under expected development, shall be estimated and included on maps.

3-2.3 Slope. Percent of slope and aspect shall be determined and indicated during the assessment process.

3-2.4 Fuel Modification. The purpose of the fuel modification effort shall be to reduce the volume of vegetative fuel to protect structures from approaching wildfire as well as to reduce the potential for a structure fire from spreading to the wildland. The fuel modification shall be initially provided by the developer prior to building permit issuance for buildings or structures, through the implementation of a Douglas County approved wildfire mitigation or forest management plan and shall be maintained by the property owner. Additional fuel modification may be required when buildings or structures are proposed through the building permit process to create defensible space management zones around buildings or structures. The permit process will require the applicant to create and maintain defensible space of 100 feet from each side and from the front and rear of the structure or to the property line, whichever comes first.

3-2.5 Maintenance of Defensible Space.

Responsibility. Persons owning, leasing, controlling, operating, or maintaining buildings or structures are responsible for maintenance of defensible space. Fuels shall be maintained and spaced in a condition so that a wildfire burning under average weather conditions would be unlikely to ignite the structure including, but not limited to removing non-fire resistive vegetation and keeping leaves, needles and other dead vegetative material regularly removed from roofs of buildings and the area immediately adjacent to structures.

Trees. Prune tree branches extending to within 10 feet of any structure to maintain a minimum horizontal clearance of 10 feet. Prune tree branches within the defensible space to remove limbs located less than 10 feet above the ground surface adjacent to trees. Prune portions of tree branches that extend within 10 feet of the outlet of a chimney to maintain a minimum horizontal clearance of 10 feet.

3-3 Defensible Space Management Zones.

Zone 1 is the area of maximum modification and treatment. It consists of an area of 5 feet around the structure in which all flammable native vegetation is removed. These 5 feet are generally measured from the outside edge of the building or structure's eaves and any attached structures, such as decks.

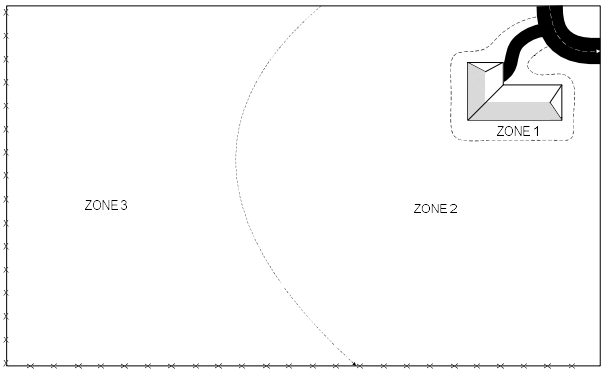

Figure 3-3: Forested property showing the three fire-defensible zones around a home or other structure.

Zone 2 is an area of fuel reduction. It is a transitional area between zones 1 and 3. The defensible zone, or home ignition zone (HIZ) consisting of the home or structure itself, zone 1 and zone 2, shall extend at least 100 feet from the structure unless limited by property boundaries. Within this zone, the continuity and arrangement of vegetation is modified. The intensity of fuels management may vary within the 100-foot perimeter of the structure, with more intense fuel reductions being utilized between 5 and 30 feet around the structure. Examples of fuel modifications include but are not limited to removal of stressed, diseased, dead, or dying trees and shrubs; thinning and pruning the remaining larger trees and shrubs; extending thinning along either side of the driveway all the way to the main access road. These actions help eliminate the continuous fuel surrounding a structure while enhancing safety and the aesthetics of the property.

Zone 3 is an area of traditional forest management and is of no particular size. It extends from the edge of the defensible space zone to the property boundaries.

3-3.1 Modification of Fuel Types. Where consistent with ecological factors, less fire-prone, native vegetation shall be encouraged.

3-3.2 Reduction of Fuel Loading. Trees and brush shall be cleared away from structures for a distance that is in accordance with section 3-3 to prevent ignition of either the structure or the vegetation, should the other burn. Vegetation existing away from the immediate area of the structure shall be thinned and pruned to prevent a fire from being carried toward or away from the structure. Annual grasses shall be mowed to 6 inches or less in accordance with Figure 6. Ground litter shall be removed annually. Over-mature, dead, and dying trees shall be evaluated as to their potential to ignite and to carry fire. All trees determined to contain such potential shall be removed.

3-3.3 Mitigation of Slope and Aspect Impact. Slope and aspect greatly affect the potential for carrying fire, and very little opportunity exists to modify them directly. Where the degree of slope or aspect is determined to affect the hazards, fuels will require a greater degree of modification or fuel breaks shall be required.

3-3.4 Building Envelope Siting. Building envelope siting shall comply with Chapter 3 of this standard. If proper building envelope siting cannot be or is not met as required by Chapter 3, the Building Official, in his or her sole discretion, may approve alternative mitigation methods to include, but not be limited to, private fire protection systems, classified siding, Class "A" roofing, or triple pane windows.

Delete Chapter 4 in its entirety

Chapter 5 Emergency Water Supplies

Where, in any specific case, the amount of water storage for rural fire fighting conflicts with International Fire Code, the Standard for Water Supplies for Rural Firefighting, attached hereto as Exhibit "C" shall govern.

5-1 General. This chapter describes the process by which provisions for emergency water supplies shall be evaluated, designed, constructed, and maintained.

5-2 Notification. The authority having jurisdiction shall be notified in writing before any water system is constructed, altered, or removed and before site development or construction of any structure commences so that fire protection can be evaluated and ample water supply capabilities pertinent to such construction can be established.

5-3 Evaluation of Water Supply Needs.

5-3.1 Authority. The fire protection agency having jurisdiction shall evaluate all buildings, proposed and existing, to obtain information required for computing minimum water supply. Information obtained from plans or on-site surveys and determinations made and recorded shall reflect the water supply category required. The computation of minimum water supplies for other than municipal, domestic, or fixed fire protection systems shall be in accordance with NFPA 1142 or other approved method.

5-3.2 Design, Construction, and Maintenance. Based upon the water supply evaluation, the authority having jurisdiction shall approve the design, construction, and maintenance of water supplies and distribution systems to ensure that the fire protection concerns have been addressed and adequate water supplies and access thereto have been provided.

5-4 Minimum Water Supply Requirements. Water shall be available to provide a minimum fire flow of two hundred fifty (250) gallons per minute for a two (2) hour duration in accordance with Exhibit C of this Resolution.

5-5 Static Water Supplies. The design and construction of and access to static water supplies shall be in accordance with NFPA 1142 or other approved method.

5-6 Signage of Water Supplies. When required by the authority having jurisdiction, each fire hydrant or access to water shall be identified as follows:

(a) A reflectorized marker, with a minimum dimension of three (3) inches, shall be located on the driveway address sign signifying the hydrant location and on a fire-retardant post located near the fire hydrant, and;

(b) A fire-retardant reflectorized sign with the words "DRAFT WATER" or "PRESSURE WATER" having letters a minimum of four (4) inches in height, with ½-inch stroke, reflectorized and contrasting to the background color, shall be located near the hydrant or access to water.

(c) The signpost shall be within three (3) feet of said fire hydrant or access to water, with the sign no less than three (3) feet nor greater than five (5) feet above the ground and visible from the driveway.

Chapter 6 Structural Design and Construction

6-1 General. All proposed buildings or structures in the wildland-urban interface or the wildland-urban intermix shall be designed and constructed to comply with the requirements of this chapter and with this standard. All buildings and structures located in the National Forest shall be required to comply with the requirements of this chapter and with this standard. Agricultural properties, not located in a subdivision, shall have the applicability of this standard determined upon application for a building permit.

6-1.1 Minimum Requirements. Structures and developments in or adjacent to wildland fire hazard areas shall be located, designed, and constructed in a manner to minimize the possibility of ignition from a wildfire and to minimize the spread of a structural fire to the wildland.

6-2 Roofing. Only listed roof covering tested and rated in accordance with UL 790, NFPA 256, Standard Methods of Fire Tests of Roof Coverings; ASTM E 108, Standard Test Methods for Fire Tests of Roof Coverings; or equivalent, shall be used. Subdivision covenants, conditions, and restrictions shall not require the use of roof covering materials that do not meet this Standard.

6-2.1 Wood Shakes and Wood Shingles. Wood shakes and wood shingles are prohibited within the boundaries of the Wildfire Hazard Overlay District.

6-2.2 Replacement or Repair of Roof Coverings. The roof covering on buildings or structures in existence prior to the adoption of this standard that are replaced or have 100 square feet or more replaced in a 12-month period shall be replaced entirely with a roof covering required for new construction in accordance with Chapter 7 of this Standard.

6-3 Vents. Vents for attic and subfloor ventilation shall be screened with a corrosion-resistant, noncombustible wire mesh with the mesh not to exceed nominal 1/8 inches in size.

6-4 Exterior Vertical Walls. Exterior vertical walls shall be constructed of at least ½-inch nominal sheathing or equivalent material and shall extend from the top of the foundation to the roof line.

6-5 Chimneys and Flues.

6-5.1 Outlet Screen. Every chimney, flue, or vent shall be provided with an approved spark arrester consisting of 12-gauge welded or woven wire mesh not exceeding ½ inch.

6-5.2 Construction. Chimney or flue outlets shall be constructed with 10-foot clearance from all vegetation and obstructions.

6-6 Manufactured Homes. Manufactured homes shall meet all applicable construction and safety standards. Permanently located mobile and manufactured homes with an open space beneath shall be provided with full skirting constructed of noncombustible material or a fire resistive assembly having a minimum fire resistive rating of 20 minutes.

6-6.1 Enclosed space beneath the mobile or manufactured homes. Any enclosed space beneath the mobile or manufactured home shall be vented according to 7-3.

6-7 Location of LP Fuel Storage Tanks. Location of LP fuel storage tanks shall be in accordance with the International Fire Code.

Chapter 7 Public Fire Prevention and Fire Safety Information and Education

7-1 Information and Education Plan. The authority having jurisdiction shall prepare a year-round fire prevention and fire safety public information/education plan. The plan, at a minimum, shall identify and analyze:

(a) Specific hazards

(b) Risks

(c) Fire causes

(d) Applicable prevention and safety programs

(e) Target audiences

(f) Activities.

The plan shall utilize a variety of communication techniques to achieve desired objectives.

Chapter 8 Referenced Publications

8-1 The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document.

8-1.1 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire 2018 edition

NFPA 1141, Standard for Fire Protection in Planned Building Groups, 2017 edition

NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting, 2022 edition

8-1.2 International Code Council

International Wildland-Urban Interface Code 2024 edition

8-1.2 Colorado State Forest Service

Standard for Creating and Maintaining the Home Ignition Zone - 2021

Commentary on Defensible Space Zone Prescriptions

Descriptions

Zone 1

The size of Zone 1 is 5 feet, measured from the edges of the structure.

Remove all native vegetation from Zone 1 to reduce fire hazards. If you do keep a tree, consider it part of the structure, and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune it to at least 10 feet above the ground. Remove any branches that interfere with the roof or are within 10 feet of the chimney. Remove all “ladder fuels” from beneath the tree. Ladder fuels are vegetation with vertical continuity that allows fire to burn from ground level up into the branches and crowns of trees. Ladder fuels are potentially very hazardous but are easy to mitigate. No ladder fuels can be allowed under tree canopies. In all other areas, prune all branches of shrubs or trees up to a height of 10 feet above ground (or 1/2 the height, whichever is the least).

Zone 2

Zone 2 is an area of fuel reduction designed to reduce the intensity of any fire approaching a building or structure. Follow these management steps.

Thin trees and large shrubs so there are at least 10 feet between crowns. Crown separation is measured from the furthest branch of one tree to the nearest branch on the next tree (Figure 3).

On steep slopes, allow more space between tree crowns. (See Figure 4 for minimum required spacing for trees on steep slopes.) Remove all ladder fuels from under these remaining trees. Carefully prune trees to a height of at least 10 feet.

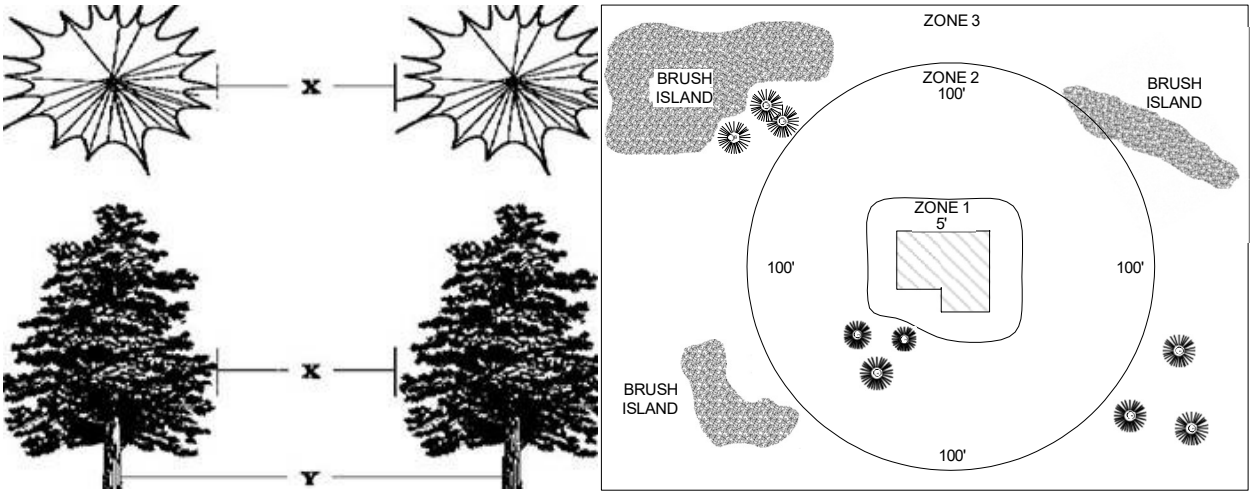

Figure 1: X = crown spacing; Y = stem spacing. Do not measure between stems for crown spacing, measure between the edges of tree crowns.

Small clumps of 2 to 3 trees may be occasionally left in Zone 2. Leave more space between the crowns of these clumps and surrounding trees.

Because Zone 2 forms an aesthetic buffer and provides a transition between zones, it is necessary to blend the requirements for Zones 1 and 3. Thin the portions of Zone 3 adjacent to Zone 2 more heavily than the outer portions.

Zone 3

This zone is of no specified size. It extends from the edge of the defensible space to the property lines.

Forest management in Zone 3 is an opportunity to increase the health and growth rate of the forest in this zone. Keep in mind that root competition for available moisture limits tree growth and ultimately the health of the forest.

A greater number of wildlife trees can remain in Zone 3. Make sure that dead trees pose no threat to power lines or vehicular access.

Mowing is not necessary in Zone 3.

Any approved method of slash treatment is acceptable for this zone, including chipping or lop-and-scatter.

Grasses

Keep dead, dry or curing grasses mowed to less than 6 inches. Defensible space size where grass is the predominant fuel can be reduced. Use Figure 4 when applying this practice.

Figure 2: Minimum tree crown and shrub clump spacing

% Slope	Tree Crown Spacing	Brush and Shrub Clump Spacing
0 -10 %	10′	2 1/2 x shrub height
11 - 20%	15′	3 x shrub height
21 - 40%	20′	4 x shrub height
> 40%	30′	6 x shrub height

Figure 3: Minimum tree spacing for Zone 3.

Tree Diameter Average Stem Spacing Between Trees

(In inches)	**(In feet)**
3	10
4	11
5	12
6	13
7	14
8	15
9	16
10	17
11	19
12	21
13	23
14	24
15	26
16	28
17	29
18	31
19	33
20	35
21	36
22	38
23	40
24	42

Figure 4: Minimum defensible space size for grass fuels.

% Slope	Defensible space size (uphill, downhill, sidehill)
0 - 20 %	30’ Feet
21 - 40%	50’ Feet
> 40%	70’ Feet

Exhibit C

STANDARD FOR WATER SUPPLIES FOR RURAL FIRE FIGHTING

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Section 3. Rural Water Supply Standard for Buildings Other Than One and Two-Family Dwellings

Appendix A

A-2-1 General

A-2-2 Cistern

A-2-3 Natural Bodies of Water

A-2-4 Testing and Maintenance

Figure (1) 45 Foot Radius

Figure (2) 20 Foot X 60 Foot Rectangle

Figure (3) Intersection

Appendix B

Dry Hydrant Manual, A Guide for Developing Alternative Water Sources for Rural Fire Protection; Chestatee- Chattahoochee Resource Conservation & Development Council of Gainesville, Georgia.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates explanatory material on that paragraph in Appendix A.

Section 1 Administration

1-1 Scope.
This standard defines the minimum requirements for fire protection water supplies necessary for the protection of property in rural areas of Douglas County. This standard applies to new parcels in rural areas in which adequate and reliable water supplies do not exist and shall apply to all portions of unincorporated Douglas County. Douglas County subdivision regulations may require greater amounts of water storage. Where, in any specific case, the amount of water storage for rural fire fighting conflicts with the International Fire Code for Group R- 3 occupancies, the requirements of this chapter shall govern.

1-2 Purpose.
This standard specifies minimum requirements for water supply for firefighting purposes to protect property from fire in areas where water must be transported from a river, lake, canal, stream, pond, cistern, or other similar source of water that is available as a suction supply for fire department use. A hydrant served by a water distribution system shall be permitted to be the source of supply for water that is transported to the rural fire area.

It is the intent of this standard to provide and maintain water supplies for firefighting purposes through the establishment of a cooperative working arrangement among the Douglas County Fire Districts, the developers of rural parcels, and the property owners.

1-3 Referenced Criteria.
The fire protection water requirements in this standard are based in part on NFPA 1142, NFPA 1144, ISO Fire Suppression Rating Schedule, and the International Fire Code. The information from these publications was evaluated and incorporated into this minimum standard in a manner which accounted for the actual fire flow and storage amounts, the ability of Douglas County Fire Districts to utilize the water, the need to account for increased and more effective operations as the fire districts strive to obtain the improved fire insurance ratings for their citizens, and the existing but sometimes unrecorded or undeveloped natural water sources within Douglas County.

1-4 Definitions.
Accessible. A condition that allows for fire department vehicles to approach and connect to a water supply. It shall be an all-weather road surface, capable of supporting a 20-ton fire apparatus, and it shall be maintained during all weather conditions to assure unimpeded vehicular access every day of the year.

Authority Having Jurisdiction (AHJ). The Douglas County Building Official shall be the "authority having jurisdiction".

Cistern. A water storage tank, usually underground and designed with positive pressure, designed to contain a designated volume of water and to permit the removal of water at no less than 1,000 gallons per minute.

Dry Barrel Hydrant. An outlet, for suction supply of fire protection water, connected to a cistern, which is designed with positive pressure and / or requires freeze protection. Dry barrel hydrants shall have a five (5) inch National Standard Thread (NST) outlet and be adapted for the

local fire district suction hose. Dry barrel hydrants shall meet the requirements of American Water Works Association (AWWA C502-85 Standard for Dry Barrel Hydrants).

Dry Hydrant. An outlet for suction supply of fire protection water connected to a natural body of water or cistern, which is designed without positive pressure or does not require freeze protection. Dry hydrants shall have a five (5) inch National Standard Thread (NST) outlet and be adapted for local fire district suction hose. Dry hydrants shall meet the requirements of the dry hydrant section of this standard and the Dry Hydrant Manual in Appendix B.

Fire Flow. The total amount of water expressed in volume at a prescribed rate (in gallons per minute) applied to suppress a fire and protect exposures.

ISO. The Insurance Service Office.

Natural Body of Water. A river, lake, canal, stream, or pond which, if upon evaluation is deemed acceptable during drought or freezing weather, could be utilized as a reliable and adequate source of water for fire protection.

Section 2 Rural Water Supply Standard for One and Two-Family Dwellings

2-1* General.

The standard requires a water supply system which is capable of providing two hundred fifty (250) gallons per minute (GPM) fire flow, with water storage sufficient to maintain the fire flow for a duration of two (2) hours. The water storage shall not be more than two (2) miles travel distance from the vehicular entrance to any parcel served by the water storage site. The water storage facility shall be funded and installed by the developer/owner prior to construction of any structure within the development.

2-1.1 Water Supply Evaluation Criteria.

The Fire Districts within Douglas County shall perform a survey of all developed water supplies suitable for fire protection use within their respective jurisdictions. This information shall be compiled into a usable format and shall be kept in the office of the Building Official for Douglas County. All Fire Districts shall be responsible for providing updated information to the Building Official, to maintain a current County Water Supply Report.

When reviewing proposed developments, the Building Official shall consult with the Fire District for a joint review of existing water for fire protection, utilizing the County Water Supply Report. This review shall evaluate water supplies within the Fire District's jurisdiction as well as those located within the two (2) miles travel distance within neighboring jurisdictions. All currently recognized water supplies shall be credited when determining the need for and the placement of new water storage sites.

2-1.2 Application.

This standard shall apply to all new rural developments that contain or create four (4) or more residential parcels. Developments legally in existence at the time of the adoption of this standard, or new developments that contain or create less than four (4) residential parcels, and

additions or modifications to existing homes, are not required to provide minimum water supplies or upgrade existing water supplies to meet this standard.

2-1.3 Design Approval.
One (1) set of installation drawings, manufacturer's installation instructions, and a site plan shall be submitted to the Building Official for approval, and all permits required by Douglas County shall be obtained. All water storage systems shall be installed according to manufacturer's installation instructions. The Fire District and the Building Official may inspect the installation at any time.

2-2* Cistern Design.

2-2.1 Tank Size.
The minimum tank capacity shall not be less than thirty thousand (30,000) gallons. Two smaller tanks may be utilized in areas which may present unique installation problems. If two smaller tanks are installed, they must be connected to allow proper filling as well as discharge, and the combined capacity of both tanks shall not be less than thirty thousand (30,000) gallons.

2-2.2 Tank Material.
All water supply tanks shall be constructed of steel, fiberglass, plastic, or engineered concrete and shall be approved by the manufacturer to be appropriate for non-potable water storage. Steel tanks shall be coated and shall be provided with cathodic protection. Fiberglass and plastic tanks shall be constructed in accordance with appropriate ASTM Standards. Tanks and associated piping and appurtenances shall be new and have been used for no other purpose.

2-2.3 Outlet Piping.
All discharge piping shall be a minimum of six (6) inch diameter PVC Schedule Forty (40). Drain, waste and vent (DWV) pipe and fittings are not acceptable.

2-2.4 Fittings.
All fittings shall be of the type and schedule to be compatible with the piping being used.

2-2.5 Tank Access.
Tanks shall have a manhole or other approved means of access for tank inspection and repair. This access shall be capable of being closed and secured for purposes of safety.

2-2.6 Tank Fill Valve.
A tank fill valve shall be installed on the supply line from the well and shall be controlled by an approved tank level sensor that will ensure that the tank remains full.

2-2.7 Suction Supply Outlet.
All water supply cisterns shall have a minimum of one outlet that meets the size and design requirements of the local fire district. Cisterns designed with positive pressure and systems with

discharge pipes that require freeze protection shall have at least one Dry Barrel Hydrant. Cisterns designed without positive pressure shall have at least one Dry Hydrant.

2-2.8 Tank to Outlet Line Valve.
All water storage tanks designed with positive pressure shall have a valve between the tanks and the outlet pipe. This valve shall be capable of being manually operated from ground level.

2-2.9 Tank Installation.
Tanks shall be installed in accordance with manufacturer's recommendations. The tank shall be installed in a manner, which will prevent freezing and surface erosion.

2-2.10 Pipe Installation.
Piping shall be installed in accordance with manufacturer's recommendations. Piping shall be installed in a manner which will prevent freezing and surface erosion.

2-2.11 Water Supply Easement.
An easement shall be recorded to allow the Fire District to repair, use, and maintain the water storage facility.

2-2.12 Water Use Agreement.
An agreement shall be signed and recorded, encumbering the property, granting the Fire District the perpetual right to utilize the water for the fire protection needs of the property to be served.

2-2.13 Well.
A well, installed in accordance with the requirements of the Colorado Division of Water Resources shall be connected to a cistern to maintain the fill level. The well may be a low volume (15 GPM) and shall be connected to the tank in an appropriate manner.

2-3* Natural Bodies of Water.

2-3.1 Outlet Piping.
All discharge piping shall be a minimum of six (6) inch diameter PVC Schedule Forty (40). Drain, waste and vent (DWV) pipe and fittings are not acceptable.

2-3.2 Fittings.
All fittings shall be of the type and schedule to be compatible with the piping being used.

2-3.3 Suction Supply Outlet.
All natural bodies of water utilized for fire protection water supplies shall have a minimum of one outlet that meets the size and design requirements of the local fire district. Natural bodies of water designed with positive pressure and systems with discharge pipes which required freeze protection shall have a minimum of one Dry Barrel Hydrant. Natural bodies of water with suction outlets designed without positive pressure shall have at least one Dry Hydrant.

2-3.4 Pipe Installation.
Piping shall be installed in accordance with manufacturer's recommendations. Piping shall be installed in a manner, which will prevent freezing and surface erosion.

2-3.5 Water Supply Easement.
An easement shall be recorded to allow the Fire District to repair, use, and maintain the water supply facility.

2-3.6 Water Use Agreement.
An agreement shall be signed and recorded, encumbering the property, granting the Fire District the perpetual right to utilize the water for the fire protection needs of the property to be served.

2-4* Water Supply Access.
The water supply site shall be accessible from a public or private roadway.
A fire apparatus pullout shall be connected to the roadway and constructed to permit fire apparatus to position for water removal and to permit tenders to be filled and turned around. The pullout shall be designed as a forty-five (45) foot radius or twenty (20) foot by sixty (60) foot rectangular area with the water supply hydrant outlet located at the apex of the radius or the centerline of a rectangle. The outlet shall be located not more than eight (8) feet or less than six (6) feet from the edge of the all-weather surface. Two steel posts (bollards) shall be placed at the edge of the all-weather surface to protect the hydrant.

2-5* Testing and Maintenance.

2-5.1 Testing.
Acceptance testing shall be performed jointly by the Building Official and the Fire District whenever possible, prior to the construction of any structures within the development served by the water storage facility. Acceptance testing shall include vacuum test of draft piping, pressure testing at fifty (50) pounds per square inch for pipes in those systems designed with head pressure, and a flow test.

After acceptance, each water storage location shall be checked periodically, and reports kept by the Fire District. Fire Districts should establish a program for testing and maintenance of water supply facilities within their jurisdiction.

2-5.2 Maintenance.
The Fire District shall be responsible to ensure the operational readiness of the water supply facility. The Fire District may choose to delegate the cost and responsibility of the water system maintenance to an organization other than the Fire District. In such case the Fire District shall stipulate to a maintenance agreement, which must be reviewed and approved by Douglas County, that ensures the operational readiness and continued maintenance of each water supply facility.

Section 3 Rural Water Supply Standard for Buildings Other Than One and Two-Family Dwellings

3-1 General.
The required fire flow for buildings other than one and two-family dwellings shall be in accordance with the International Fire Code as amended.

3-2 Application.
Fire flow requirements may be modified when agreed upon by the fire code official and the building official. The Douglas County Standard for Water Supplies for Rural Fire Fighting, NFPA 1141, NFPA 1142, ISO Fire Suppression Rating Schedule or other approved method may be utilized to determine fire flow requirements.

APPENDIX "A"

A-2-1 General.
The application of this standard will, over a period of time, ensure adequate fire suppression water supplies for a large portion of Douglas County. The standard uses a systems approach to fire protection water supply requirements by encouraging a uniform application of these requirements. The installation of standard water supplies, in developed areas of the county, enhances the operation of mutual and auto aide companies in routine and conflagration fires. The use of a uniform standard by all fire districts can diminish the review problems encountered by fire personnel, planners, and developers.

Fire Flow.
The minimum fire flow requirement is two hundred fifty (250) GPM based on the Fire Districts ability to transport water using their equipment. The ability to increase the fire flow from two hundred fifty (250) GPM to five hundred (500) GPM or more can be accomplished by utilizing auto aid or additions of tenders by the Fire District.

The two hundred fifty (250) GPM is recognized by ISO as the minimum fire flow necessary for credit as a protected property (Class 9) and a strong argument can be made for all Douglas County Fire Districts ability to apply the available fire flow to the fire. An analysis of response times for arriving engines and tankers can demonstrate the initial ability to utilize a fire flow of two hundred fifty (250) GPM. As other apparatus arrives from more distant locations, including auto aide water hauling tenders, increases in fire flow can be expected and utilized.

Water Storage.
Water for fire protection can utilize either stored water in an underground tank (cistern) or by access to a natural body of water. The minimum amount of water storage is thirty thousand (30,000) gallons, which translates into two (2) hours of the minimum fire flow.

The storage of two (2) hours of fire flow is an accepted fire service standard (IFC Appendix B) and is substantiated by the minimum requirements of the insurance standard. The resulting cistern size of thirty thousand (30,000) gallons works well in a system approach to suppression water. Natural Bodies of Water offer an excellent source for fire protection.

The initial use of the closest water source to develop two hundred fifty (250) GPM may be supplemented by more distant sources by auto aid water hauling tenders. The use of more water storage sites may become a necessary requirement to relieve congestion at a single water storage site used to fill tenders at a set rate.

Travel Distance.
The maximum travel distance shall be two (2) miles from the water source (cistern or natural body of water) to each parcel. The travel distance is computed using ISO formulas for time and distance based on average speed of thirty-five (35) miles per hour. Since rural operations often involve standard operations, which account for long driveways, the driveways are not included. The maximum travel distance of two miles limits the total travel to four miles round trip and places the thirty thousand (30,000) gallon cisterns every four miles. The limit of four travel miles, round trip, encourages developers to ensure an effective roadway network with connections that maximizes the effectiveness of each water storage site.

A-2-2 Cistern Design.
Cisterns shall be built to hold thirty thousand (30,000) gallons and installed with a low volume well, less than fifteen (15) gallons per minute to maintain the water level once the cistern is full. An all-weather road shall accommodate access to engines and tenders and provide a hydrant (wet or dry) with standardized NST connections installed with head pressure whenever possible. The well can be utilized for domestic water supply to a building site, which is encouraged. The daily use of the well helps to ensure it's in service operation and does not compromise the ability to maintain the water level in the cistern. The developer must grant an easement on the building site, which best serves, the area as the cistern location. An agreement for reimbursement of cost to operate the well for large usage can be arranged with the homeowner, while incidental "topping off" is paid for by the daily user of the well.

A-2-3 Natural Bodies of Water.
The use of natural bodies of water requires a field survey which:

- Measures the potential for fire protection water availability every date of the year
- Measures the useful depth of the water as a function of draftable height to the pump intake
- Studies flow characteristics during each of the annual weather seasons for a stream or river source
- Addresses the ability to install an accessible hydrant

The Dry Hydrant Manual referenced in Appendix B provides detailed checklists for the field survey and the draftable limits in feet as function of elevation as designated by the Colorado State Forest Service.

A-2-4 Water Supply Access.
The access specified in Section 2-4 can be accomplished by utilizing different designs provided that the design accommodates an unobstructed area, located outside of the traffic lanes, and permits fire engine connection to the outlet and clearance to accommodate tender approach hose connection, and turn around. See examples in Figures 1 through 3.

A-2-5 Testing and Maintenance.
It is important for the Fire District not only to require the proper placement and design of water storage facilities, but also to ensure the continued operational effectiveness. As additional water supplies are installed, the Fire District must formulate a plan to address the future maintenance of the facilities. The standard allows the Fire District many options to meet this end. For example, the Fire District may choose to allow the well serving a facility to be utilized for the domestic needs of the parcel on which the storage facility is located. By doing so, the Fire District has ensured the continued daily function of the well at no cost to the Fire District and has provided an economic incentive to the developer and/or property owner. The balance of the water supply system should be relatively cost effective as little or no maintenance is required on a properly designed and installed system. The standard will allow and encourage creative and individual methods for Fire Districts to address the maintenance requirements of a growing number of water supply facilities located within their jurisdiction.

APPENDIX "B"

Dry Hydrant Manual, A Guide for Developing Alternative Water Sources for Rural Fire Protection; Chestatee-Chattahoochee Resource Conservation & Development Council of Gainesville, Georgia. Copies are available by contacting the Franktown District of the Colorado State Forest Service; P.O. Box 485; Franktown, Colorado 80116. Telephone (303) 660-9625. Copies are also available at the Douglas County Building Division.

Exhibit D

INSTALLATION STANDARDS FOR POTABLE WATER STORAGE TANKS AND CISTERNS FOR DOMESTIC USE IS - 22 – 98

This standard shall govern the installation of potable water storage tanks and underground cisterns for domestic water use in dwellings. This standard includes both interior and exterior underground installations and establishes minimum standards for installation. Interior installations are recommended because they are more suitable for periodic inspection and maintenance by the homeowner.

This standard shall be utilized only when a reliable source of water is not available. In areas where wells are the primary source of water, a well test shall be performed to indicate the gallons per minute flow from the well. If the well fails to produce water or the flow is deemed inadequate by the authority having jurisdiction, only then shall this standard be utilized.

This standard shall apply to all new dwellings and additions or alterations where bedrooms are being added. In cases where existing wells are being used, a well test must be performed to indicate the gallons per minute flow from the well.

301.1 Minimum Standards.

301.1.1 Potable water above ground storage tanks and underground cisterns shall be of materials that are listed for potable use and approved by FDA Title 21, NSF, or AWWA. Steel and concrete tanks must be properly prepared and painted on the inside using an NSF epoxy paint. Additionally, underground steel tanks must be asphaltic coated, or epoxy coated on the outside to retard rusting.

301.1.2 Concrete cisterns or vaults shall be of such design that there are no seams below the fill line of the tank or vault. Concrete cisterns or vaults shall be properly prepared and coated on the inside using an NSF approved epoxy paint.

301.1.3 All piping, fittings, and valves must meet the mandatory referenced standards included in Chapter 14 of the 2024 International Plumbing Code.

301.1.4 The minimum capacity of water storage required for a single-family dwelling shall be based upon a formula using 80 gallons of water per day, per person. Homes served by wells producing less than .5 gallons per minute shall be sized for a minimum 5-day supply. Homes served by wells producing .5 gallons per minute and greater shall be sized for 3-day supply. The number of persons shall be based on a bedroom count assuming that the first bedroom will count for two people and additional bedrooms counting for one person (i.e., 3-bedroom house counts for 4 people and requires 960 gallons storage if gpm is .5 gpm or greater and 1600 gallons of storage if less than .5 gallons). The actual storage capacity of the pressure tank and the water heater may be taken into consideration for the total amount of water storage required.

301.1.5 Buried tanks shall be placed upon and completely surrounded with pea gravel or other manufacturer's approved material and shall not be less than 12 inches in thickness at any point.

301.1.6 All tanks shall be placed in a fashion to permit periodic maintenance, inspection, and repair. This shall include, but not be limited to:

1) Minimum 22 inches manway access into the cistern.

2) Vent piping to the atmosphere must be brass-screened mesh #24 and terminate not less than 36 inches above grade.

3) All connections of wet piping to the cistern shall be made with approved flexible couplings permitting independent movement of the tank due to seismic activity or shrink/swell movement of the soils.

301.1.7 Cisterns shall be located at least 25 feet from buildings, 50 feet away from sewer lines or septic tanks, and at least 100 feet from sewage disposal field.

301.1.8 No structure or traffic path may be constructed over a buried tank system unless required and must be approved by the tank manufacturer.

301.2 All installations shall conform to applicable codes and regulations adopted by the jurisdiction and shall be reviewed for compliance and approved by the Building Official prior to commencement of work.

301.3 Water storage cisterns and associated piping shall not be used for bonding of the electrical system. An alternative method of bonding, compatible with the most current edition of the National Electrical Code shall be used.

301.4 All such systems and associated piping shall be cleaned and sanitized prior to being placed into service.

301.5 All storage vessels shall be new and have been used for no other purpose.

301.6 All systems shall be capable of being filled from an outside source.

301.7 All systems shall be tested for leaks by filling the system with water. No system shall be tested using air pressure (hydrostatic). The test shall incorporate the use of either the vent pipe or fill pipe as a water column with no increase or decrease of more than one inch in the water column over a 24-hour period.

302.1 Interior Water Storage.

302.1.1 Interior spaces where water storage tanks are located shall be a conditioned space to prevent freezing. Tanks and piping shall be accessible for removal, replacement,

inspection, and repair. Interior spaces where tanks are located shall be provided with a floor drain. Pumps, pressure vessels, controls, and associated equipment shall be listed by an approved testing agency and approved by the Building Official.

302.1.2 Tanks shall be securely mounted into position. Vertical, upright positioned tanks exceeding 5 feet in height shall be provided with at least two wall mounted supports, one at the top and one at the bottom of the tank.

303.1 Exterior Buried Cisterns.

303.1.1 Exterior buried vessels shall be positioned at least one foot below frost line. The average frost line in Douglas County has been established at 36 inches. A minimum 22" diameter manway and extension with gasketed, bolted cover shall extend to 6 inches above grade for service and maintenance.

303.1.2 Penetrations of the cistern walls, connections, or joints of any kind in any buried cistern for piping and manways shall incorporate the use of flanged, bolted connections.

Explanatory Notes.

Tanks and cisterns are an acceptable means of providing water to a residence where the water well may be a low producing well or in cases where wells have become non-producing. This should not be considered an alternative to being served by a water district or other reliable source of water.

Locating storage tanks within a conditioned space should be strongly considered to eliminate the need for frost protection. The system can be installed in a multiple tank configuration, which allows the owner or occupant the opportunity to clean and provide maintenance on one tank at a time without taking the entire potable water system out of service. Inside translucent polyethylene tank systems can be more easily monitored for visual volume and quality of the water that is being used. Any type of system will eventually accumulate silt particles in the bottom of the tank over a period of time. Exterior buried systems will be much more difficult to clean and maintain and likely will have a higher silt accumulation over a period of time when compared to inside installations.

Water quality should be checked at regular intervals. Water should be tested for bacteria and other harmful waterborne agents. Bacteria or minerals can usually be removed or destroyed with proper treatment technology should such a situation be identified after testing.

Individuals may find that the minimum amount of water storage required by regulation is insufficient and may want to install a larger capacity storage tank. Consideration should also be taken into account that you may see a reduction in the quality of water that has been stored for too long a period of time.

Another issue that should be considered is pump protection for low producing wells. Well pumps can be wired into protective switches that shut off the pump when the pump is running free (i.e., not pumping water because there is no water to pump). Such a condition can shorten the life of a

pump and replacement of a well pump usually involves pulling the pump, which can be expensive, even with a shallow well.

Exhibit E

2024 IBC Appendix Chapter Q

Section Q-1205 Solar Photovoltaic Power Systems

Q-1205.1 General. Solar photovoltaic (PV) systems shall be installed in accordance with the *International Building Code* or *International Residential Code*. The electrical portion of solar PV systems shall be installed in accordance with NFPA 70. Rooftop-mounted solar photovoltaic systems shall be installed in accordance with Sections 1205.2 through 1205.4.3. Ground-mounted solar photovoltaic systems shall comply with Section 1205.5.

Q-1205.2 Access and pathways. Roof access, pathways and spacing requirements shall be provided in accordance with Sections 1205.2.1 through 1205.3.3. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit, or mechanical equipment.

Exceptions:

(1) Detached, non-habitable Group U structures including, but not limited to, detached garages serving Group R-3 buildings, parking shade structures, carports, solar trellises, and similar structures.

(2) Roof access, pathways and spacing requirements need not be provided where the *fire code official* has determined that rooftop operations will not be employed.

(3) Building-integrated photovoltaic (BIPV) systems where the BIPV systems are *approved*, integrated into the finished roof surface, and are *listed* in accordance with a national test standard developed to address Section 690.12(B)(2) of NFPA way of portions of the PV system during fire-fighting operations shall expose a fire fighter to electrical shock

Q-1205.2.1 Solar photovoltaic (PV) systems for Group R- 3 buildings. Solar photovoltaic (PV) systems for Group R-3 buildings shall comply with Sections 1205.2.1.1 through 1205.2.3.

Exceptions:

1. These requirements shall not apply to structures designed and constructed in accordance with the *International Residential Code*.
2. These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (16.7-percent slope) or less.

Q-1205.2.1.1 Pathways to ridge. Not fewer than two 36- inch-wide (914 mm) pathways on separate roof planes, from lowest roof edge to ridge, shall be provided on all buildings. Not fewer than one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, not fewer than one 36-inch-wide (914 mm) pathway from lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, on an adjacent roof plane or straddling the same and adjacent roof planes.

Q-1205.2.1.2 Setbacks at ridge. For photovoltaic arrays occupying 33 percent or less of the plan view total roof area, a setback of not less than 18 inches (457 mm) wide is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33 percent of the

plan view total roof area, a setback of not less than 36 inches (457 mm) wide is required on both sides of a horizontal ridge.

Q-1205.2.1.3 Alternative setbacks at ridge. Where an *automatic sprinkler system* is installed within the *dwelling* in accordance with Section 903.3.1.3, setbacks at the ridge shall conform to one of the following:

1. For photovoltaic arrays occupying 66 percent or less of the plan view total roof area, a setback of not less than 18 inches (457 mm) wide is required on both sides of a horizontal ridge.
2. For photovoltaic arrays occupying more than 66 percent of the plan view total roof area, a setback of not less than 36 inches (914 mm) wide is required on both sides of a horizontal ridge.

Q-1205.2.2 Emergency escape and rescue openings. Panels and modules installed on Group R-3 buildings shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A pathway of not less than 36 inches (914 mm) wide shall be provided to the emergency escape and rescue opening.

Q-1205.2.3 Building-integrated photovoltaic (BIPV) systems. Where building-integrated photovoltaic (BIPV) systems are installed in a manner that creates areas with electrical hazards to be hidden from view, markings shall be provided to identify the hazardous areas to avoid. The markings shall be reflective and be visible from grade.

> **Exception:** BIPV systems *listed* in accordance with Section 690.12(B)(2) of NFPA 70, where the removal or cutting away of portions of the BIPV system during fire-fighting operations have been determined to not expose a fire fighter to electrical shock hazards.

Q-1205.3 Other than Group R-3 buildings. Access to systems for buildings, other than those containing Group R-3 occupancies, shall be provided in accordance with Sections 1205.3.1 through 1205.3.3.

> **Exception:** Where it is determined by the *fire code official* that the roof configuration is similar to that of a Group R-3 occupancy, the residential access and ventilation requirements in Sections 1205.2.1.1 through 1205.2.1.3 are a suitable alternative.

Q-1205.3.1 Perimeter pathways. There shall be a mini- mum 6-foot-wide (1829 mm) clear perimeter around the edges of the roof.

> **Exception:** Where either axis of the building is 250 feet (76 200 mm) or less, the clear perimeter around the edges of the roof shall be permitted to be reduced to a minimum width of 4 feet (1219 mm).

Q-1205.3.2 Interior pathways. Interior pathways shall be provided between array sections to meet the following requirements:

1. Pathways shall be provided at intervals not greater than 150 feet (45 720 mm) throughout the length and width of the roof.
2. A pathway not less than 4 feet (1219 mm) wide in a straight line to roof standpipes or ventilation hatches.

3. A pathway not less than 4 feet (1219 mm) wide around roof access hatches, with not fewer than one such pathway to a parapet or roof edge.

Q-1205.3.3 Smoke ventilation. The solar installation shall be designed to meet the following requirements:

1. Where non-gravity-operated smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) wide shall be provided bordering all sides.
2. Where gravity-operated dropout smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) wide on not fewer than one side.
3. Smoke ventilation options between array sections shall be one of the following:
   - 3.1. A pathway not less than 8 feet (2438 mm) wide.
   - 3.2. A pathway not less than 4 feet wide bordering 4-foot by 8-foot venting cutouts every 20 feet (6096mm) on alternating sides of the pathway.

Q-1205.4 Buildings with rapid shutdown. Buildings with rapid shutdown solar photovoltaic systems shall have permanent labels in accordance with Sections 1205.4.1 through 1205.4.3.

Q-1205.4.1 Rapid shutdown type. The type of solar photovoltaic system rapid shutdown shall be labeled with one of the following:

1. For solar photovoltaic systems that shut down the array and the conductors leaving the array, a label shall be provided. The first two lines of the label shall be uppercase characters with a minimum height of 3/8 inch (10 mm) in black on a yellow background. The remaining characters shall be uppercase with a minimum height of 3/16 inch (5 mm) in black on a white background. The label shall be in accordance with Figure 1205.4.1(1) and state the following:

   SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN. TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY.

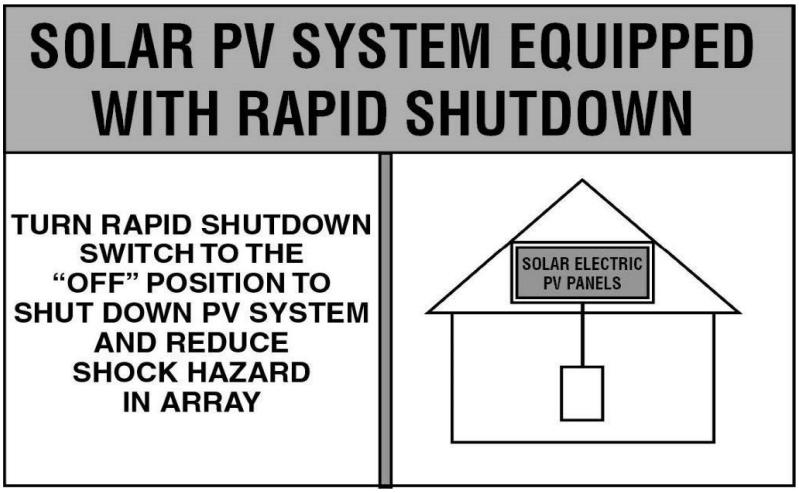


FIGURE 1205.4.1(1)
LABEL FOR SOLAR PV SYSTEMS THAT REDUCE SHOCK HAZARD WITHIN ARRAY AND SHUT DOWN CONDUCTORS LEAVING ARRAY

2. For photovoltaic systems that only shut down conductors leaving the array, a label shall be provided. The first two lines of the label shall be uppercase characters with a minimum height of 3/8 inch (10 mm) in white on a red background and the remaining characters shall be capitalized with a minimum height of 3/16 inch (5 mm) in black on a white background. The label shall be in accordance with Figure 1205.4.1(2) and state the following:

THIS SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN. TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS WITHIN ARRAY REMAIN ENERGIZED IN SUNLIGHT.

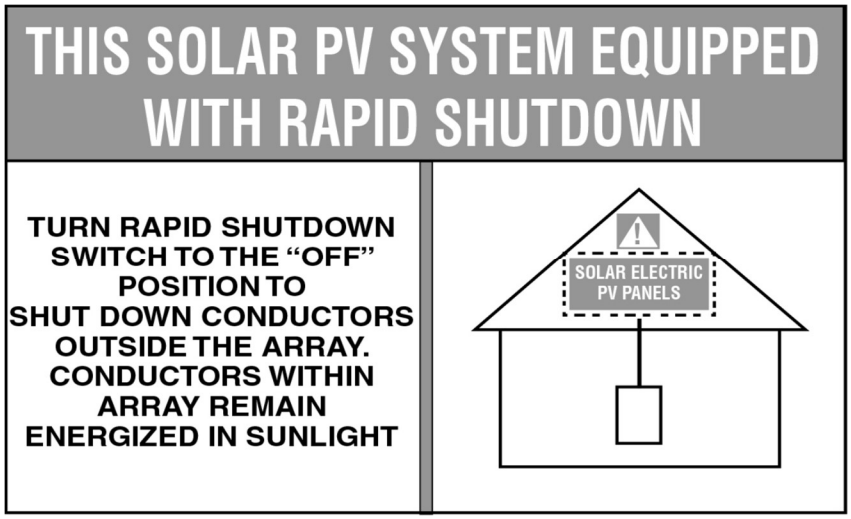


FIGURE 1205.4.1(2)
LABEL FOR SOLAR PV SYSTEMS THAT ONLY SHUT DOWN CONDUCTORS LEAVING ARRAY

Q-1205.4.1.1 Diagram. The labels in Section 1205.4.1 shall include a simple diagram of a building with a roof. Diagram sections in red signify sections of the solar photovoltaic system that are not shut down when the rapid shutdown switch is turned off.

Q-1205.4.1.2 Location. The rapid shutdown label in Section 1205.4.1 shall be located not greater than 3 feet (914 mm) from the service disconnecting means to which the photovoltaic systems are connected and shall indicate the location of all identified rapid shutdown switches if not at the same location.

Q-1205.4.2 Buildings with more than one rapid shutdown type. Solar photovoltaic systems that contain rapid shutdown in accordance with both Items 1 and 2 of Section 1205.4.1 or solar photovoltaic systems where only portions of the systems on the building contain rapid shutdown, shall provide a detailed plan view diagram of the roof showing each different photovoltaic system and a dotted line around areas that remain energized after the rapid shutdown switch is operated.

Q-1205.4.3 Rapid shutdown switch. A rapid shutdown switch shall have a label located not greater than 3 feet (914 mm) from the switch that states the following:

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

Q-1205.5 Ground-mounted photovoltaic panel systems. Ground-mounted photovoltaic panel systems shall be installed in accordance with this section. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays.

Q-1205.5.1 Vegetation control. A clear, brush-free area of 10 feet (3048 mm) shall be required around the perimeter of the ground-mounted photovoltaic arrays. A noncombustible base of gravel or a maintained vegetative surface or a noncombustible base, *approved* by the *fire code official*, shall be installed, and maintained under the photovoltaic arrays and associated electrical equipment installations.

Exhibit F

Colorado Model Electric Ready and Solar Ready Code

Published: June 1, 2023

Chapter 1 Scope and Administration

SECTION 101 SCOPE AND GENERAL REQUIREMENTS.

101.1 Title. This code shall be known as the **Electric Ready and Solar Ready Code** of Douglas County and shall be cited as such. It is referred to herein as "this code".

101.2 Scope. This code applies to all buildings and dwelling units, and the buildings' sites and associated systems and equipment.

101.3 Intent. This code shall regulate the design and construction of buildings to prepare new buildings for solar photovoltaic or solar thermal, electric vehicle charging infrastructure, and electrification of building systems. This code is intended to provide flexibility and balance upfront construction costs with the future cost to retrofit buildings to accommodate these systems. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

101.4. Applicability. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

> **101.4.1 Residential Buildings.** *Residential buildings* must comply with the Residential Chapters of this code.
>
> **101.4.2 Commercial Buildings.** *Commercial buildings* must comply with the Commercial Chapters of this code.

SECTION 102 WAIVER AND VARIANCE.

102.1 Scope. The following waivers shall be permitted to be requested if buildings meet the following requirements.

> **102.1.1 Commercial Buildings Greater than 10,000 sq. ft.** *Commercial buildings* that have a gross floor area greater than 10,000 sq. ft. shall be eligible to request a partial waiver to the requirements of this code if they meet the requirements of Section **102.2**.
>
> **102.1.2 Buildings Impacted by a Natural Disaster.** Douglas County Building Division is permitted to authorize, upon appeal in specific cases, a waiver from the requirements of this code where, owing to a declared natural disaster that has destroyed buildings or resulted in other exceptional and extraordinary circumstances as determined by Douglas County Building Division, and Douglas County Building Division determines enforcement of the provisions of this code will result in unnecessary hardship.

102.2 Substantial Cost Differential Waiver. Douglas County Building Division shall be permitted to authorize, upon appeal, a waiver from the requirements of this code for an applicant that asserts that compliance with this code will result in a substantial cost differential. Douglas County Building Division, when authorizing such a waiver, shall be permitted to waive certain requirements of this code only until

the cost differential for compliance with the remaining requirements reaches one percent or less. The burden of proof is upon the applicant to provide substantiation of a cost differential, such as quotes or other licensed design professional analyses as *approved* by Douglas County Building Division.

> **102.2.1 Substantial Cost Differential.** For the purposes of Section **102.2**, "substantial cost differential" means costs incurred as a result of compliance with the requirements of this code would exceed one percent of total mechanical, electrical, and plumbing construction costs inclusive of materials and labor.

SECTION 103 CONSTRUCTION DOCUMENTS.

103.1 General. Construction documents and other supporting data shall be submitted in one or more sets, or in a digital format where allowed by the *code official*, with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

> **Exception**: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

103.2 Information on Construction Documents. Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems, and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Location and size of the *solar-ready zone.*
2. Structural design loads of roof dead load and roof live load.
3. Pathways for routing of conduit from the *solar-ready zone* to the electrical service panel.
4. Number and location of *EV capable light spaces.*
5. Number and location of *EV capable spaces.*
6. Number and location of *EV ready spaces.*
7. Number and location of *EVSE installed spaces.*
8. Locations of conduit and termination points serving the aforementioned parking spaces.
9. Location for condensate drainage where *combustion equipment* for space heating and water heating is installed.

103.3 Examination of Documents. The *code official* shall examine or cause to be examined the accompanying documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances. The *code official*

is authorized to utilize a registered design professional, or other *approved* entity not affiliated with the building design or construction, in conducting the review of the plans and specifications for compliance with the code.

103.3.1 Approval of Construction Documents. When the *code official* issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code Compliance". Such *approved* construction documents shall not be changed, modified, or altered without authorization from the *code official*. Work shall be done in accordance with the *approved* construction documents.

One set of "Reviewed for Code Compliance" construction documents shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work, and shall be open to inspection by the *code official* or a duly authorized representative.

103.3.2 Previous Approvals. This code shall not require changes in the construction documents, construction, or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned; except that the *code official* is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each.

103.3.3 Phased Approval. The *code official* shall have the authority to issue a permit for the construction of part of a solar ready, EV ready, or electric ready installation before the construction documents for the entire system have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire solar ready, EV ready, or electric ready installation will be granted.

l03.4 Amended Construction Documents. Changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

103.5 Retention of Construction Documents. One set of *approved* construction documents shall be retained by the *code official* for a period of not less than 180 days from the date of completion of the permitted work, or as required by state or local laws.

103.6 Building Documentation and Closeout Submittal Requirements. The construction documents shall specify that the documents described in this section be provided to the building

owner or owner's authorized agent within 90 days of the date of receipt of the certificate of occupancy.

Exception: *Residential buildings.*

103.6.1 Record Documents. Construction documents shall be updated to convey a record of the completed work. Such updates shall include mechanical, electrical, and control drawings that indicate all changes to size, type, and location of components, equipment, and assemblies.

103.6.2 Compliance Documentation. Compliance documentation and supporting calculations shall be delivered in one document to the building owner as a part of the project record documents or manuals, or as a standalone document. This document shall include the specific energy code edition utilized for compliance determination for each system.

SECTION 104 INSPECTIONS.

104.1 General. Construction or work for which a permit is required shall be subject to inspection by the *code official*, his or her designated agent or an *approved agency*, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain visible and/or able to be accessed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expenses entailed in the removal or replacement of any material, product, system or building component required to allow an inspection to validate compliance with this code.

104.2 Required Inspections. The *code official*, his or her designated agent or an *approved agency*, upon notification, shall make the inspections set forth in Sections **104.2.1** through **104.2.4**.

104.2.1 Solar Ready. Inspections shall verify all of the following as required by this code, *approved* plans, and specifications:

1. The location and size of the *solar-ready zone* or the capacity of an installed on-site renewable energy system.
2. Electrical capacity and reserved physical space for circuit breakers in the main electrical service panel that are properly labeled.

104.2.2 Electric Vehicle Ready. Inspections shall verify all of the following as required by this code, *approved* plans, and specifications:

1. *EV* power transfer infrastructure requirements.
2. Electrical equipment associated with each parking space type, including branch circuits, conduit and/or raceway, junction boxes, receptacles, and *EVSE* are properly labeled and installed.
3. Electrical capacity and reserved physical space for circuit breakers in the main electrical service panel are properly labeled, if applicable.

104.2.3 Electric Ready. Inspections shall verify all of the following as required by this code, *approved* plans, and specifications:

1. Branch circuits, conduit and/or raceway, wiring, junction boxes, and receptacles for *future electric equipment* or appliances are properly labeled and installed, as applicable.
2. Reserved physical space for *future electric equipment* or appliances.
3. Electrical capacity and reserved physical space for circuit breakers in the main electrical service panel are properly labeled.

104.2.4 Final Inspection. The final inspection shall include verification of the installation and proper labeling of all requirements of this code.

104.3 Reinspection. A building shall be reinspected where determined necessary by the *code official*.

104.4 Approved Inspection Agencies. The *code official* is authorized to accept reports of third-party inspection agencies not affiliated with the building design or construction, provided that such agencies are *approved* as to qualifications and reliability relevant to the building components and systems that they are inspecting.

104.5 Inspection Requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

104.6 Reinspection and Testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

SECTION 105 NOTICE OF APPROVAL.

105.1 Approval. After the prescribed inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*.

105.2 Revocation. The *code official* is authorized to suspend or revoke, in writing, a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 106 VALIDITY.

106.1 General. If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.

SECTION 107 REFERENCED STANDARDS.

107.1 General. The codes and standards referenced in this code shall be listed in Section **107.2**, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference.

107.2 Referenced Codes and Standards. The codes and standards referenced in this code are as follows:

1. International Building Code
    a. Chapter 3
    b. Chapter 11
2. International Energy Conservation Code
3. International Fire Code
4. International Residential Code
5. National Electrical Code Article 625
6. UL2202 and 2594

107.2.1 Conflicts. Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

107.2.2 Provisions in Referenced Codes and Standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the

provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

107.3 Applications of References. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section, or provision of this code.

107.4 Other Laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 108 STOP WORK ORDER.

108.1 Authority. Where the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the *code official* is authorized to issue a stop work order.

108.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property, the owner's authorized agent, or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

108.3 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

108.4 Failure to Comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by Douglas County Building Division.

SECTION 109 BOARD OF REVIEW.

109.1 General. In order to hear and decide appeals of orders, decisions, or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of review. The *code official* shall be an ex officio member of said board but shall not have a vote on any matter before the board. The board of review shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

109.2 Limitations on Authority. An application for review shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall not have the authority to waive the requirements of this code.

109.3 Qualifications. The board of review shall consist of members who are qualified by experience and training and are not employees of Douglas County.

Chapter 2 Definitions

SECTION 201 GENERAL.

201.1 Scope. Unless stated otherwise, the following words and terms in this code shall have the meanings indicated in this chapter.

201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural includes the singular.

201.3 Terms Defined in Other Codes. Terms that are not defined in this code but are defined in the International Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Energy Conservation Code, or International Residential Code shall have the meanings ascribed to them in those codes.

201.4 Terms not Defined. Terms not defined by this chapter or the codes listed under 201.3 shall have ordinarily accepted meanings such as the context implies.

SECTION 202 GENERAL DEFINITIONS.

ADDITIONS. An increase in occupiable gross floor area of an existing building or structure by more than 500 square feet, or any increase in the number of stories or height of a building or structure.

APPROVED. Acceptable to the *code official*.

APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests or furnishing inspection services, or furnishing product certification, where such agency has been approved by the *code official.*

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

COMBUSTION EQUIPMENT. For this code, any equipment or appliance used for spaceheating, service water heating, cooking, clothes drying or lighting that uses *fuel gas* or *fuel oil*.

COMMERCIAL BUILDING. For this code, all commercial buildings and R-Occupancies that are covered by the International Building Code.

CORE AND SHELL. The first phase of a commercial project that has the outer building envelope constructed and may contain interior lighting and heating and has not received a permanent Certificate of Occupancy.

DIRECT CURRENT FAST CHARGER (DCFC) EVSE. Equipment capable of fast charging on a 100A or higher 480VAC three-phase branch circuit. AC power is converted into a controlled DC voltage and current within the *EVSE* that will then directly charge the *electric vehicle*.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, including but not limited to, passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, and electric motorcycles, primarily powered by an electric motor that draws current from a building electrical service, *EVSE*, a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Off-road, self-propelled electric mobile equipment, including but not limited to, industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, and boats are not considered electric vehicles.

ELECTRIC VEHICLE CAPABLE LIGHT SPACE (EV CAPABLE LIGHT SPACE). A designated vehicle parking space that has conduit and/or raceway installed to support future implementation of *electric vehicle* charging installation, and has sufficient physical space adjacent to the existing electrical equipment for future electric upgrades.

ELECTRIC VEHICLE CAPABLE SPACE (EV CAPABLE SPACE). A designated vehicle parking space that has the electric panel capacity and conduit and/or raceway installed to support future implementation of *electric vehicle* charging.

ELECTRIC VEHICLE READY SPACE (EV READY SPACE). A designated vehicle parking space that has the electric panel capacity, raceway wiring, receptacle, and circuit overprotection devices installed to support future implementation of *electrical vehicle* charging.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). An *electric vehicle* charging system or device that is used to provide electricity to a plug-in *electric vehicle* or *plug-in hybrid electric vehicle*, is designed to ensure that a safe connection has been made between the electrical grid and the vehicle, and is able to communicate with the vehicle's control system so that electricity flows at an appropriate voltage and current level.

ELECTRIC VEHICLE SUPPLY EQUIPMENT INSTALLED SPACE (EVSE INSTALLED SPACE). A vehicle parking space that is provided with a dedicated *EVSE* connection.

FIRST TENANT FINISH. The first tenant finish(es) in a new structure or *core and shell* building that is credited towards meeting the requirements of this Chapter.

FUEL GAS. A natural gas, manufactured gas, liquefied petroleum gas, or mixtures of these gasses.

FUEL OIL. Kerosene or any hydrocarbon oil having a flash point of not less than 100°F (38°C).

FUTURE ELECTRIC EQUIPMENT. Equipment or appliances necessary to support future all-electric space and water heating, cooking, or clothes drying.

MAJOR RENOVATIONS. Any alteration, repair, reconstruction, or combination thereof that requires a permit and affects more than 50 percent of the gross floor area of an existing building or structure, as measured within any 12-month period.

PLUG-IN HYBRID ELECTRIC VEHICLE. An *electric vehicle* having a second source of motive power.

RESIDENTIAL BUILDING. For this code, one- and two-family dwellings and townhouses as defined in the International Residential Code.

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for future installation of a solar photovoltaic system or solar thermal system.

Chapter 3 Electric Ready

PART 1 RESIDENTIAL ELECTRIC READY

SECTION RE301 SCOPE

RE301.1 General. These provisions shall be applicable for all new buildings, and major renovations and additions.

SECTION RE302 ADDITIONAL ELECTRIC INFRASTRUCTURE

RE302.1 Additional Electric Infrastructure. *Combustion equipment* in *residential buildings* must meet the requirements of Sections **RE302.2** through **RE302.6**.

Exceptions:

1. Interior fireplaces that do not serve as a primary source of heating.
2. Exterior fireplaces and firepits.

RE302.2 Combustion Equipment. *Combustion equipment* shall be provided with all of the following:

1. A dedicated, appropriately phased branch circuit sized to accommodate *future electric equipment* or appliances to serve a comparable capacity to meet the heating load.
2. An electric receptacle or junction box that meets the requirements of Section **RE302.5**, and is connected to the electrical panel through the branch circuit. Each electrical receptacle or junction box shall have reasonable access to the *combustion equipment* or dedicated physical space for *future electric equipment* with no obstructions other than the current *combustion equipment*.

3. Where *combustion equipment* is used for space or water heating, dedicated physical space shall be provided for *future electric equipment,* including an electric resistance backup coil for ducted systems, if applicable.

   Exception: Dwelling units with installed air conditioning systems are not required to provide additional dedicated physical space for an outdoor heat pump.

RE302.3 Electrical Panel Space. The electrical panel shall have a reserved space for a minimum two-pole circuit breaker for each branch circuit provided for *future electric equipment* or appliances.

RE302.4 Labeling. The junction box or receptacle and the dedicated circuit breaker space serving *future electric equipment* or appliances in the electrical panel shall be labeled for their intended use.

RE302.5 Adjacency. The electrical receptacle or junction box must be provided within 3 feet of the *combustion equipment* or appliances, or within 3 feet of the dedicated physical space for *future electric equipment* or appliances.

Exception: For *combustion equipment* dedicated to space or water heating, the electrical receptacle or junction box shall be located not more than 6 feet from the *combustion equipment* or the dedicated physical space for *future electric equipment*.

RE302.6 Condensate Drain. Where *combustion equipment* for space heating and water heating is installed, a location shall be provided for condensate drainage.

PART 2 COMMERCIAL ELECTRIC READY

SECTION CE301 SCOPE

CE301.1 General. These provisions shall be applicable for all new buildings, additions, and *first tenant finish* permits.

CE301.1.1 First Tenant Finishes. In the case that a *first tenant finish* to a commercial *core and shell* building or unfinished space is credited towards meeting the requirements of this Chapter, the *code official* shall not issue a Certificate of Occupancy to the tenant until the requirements of Section **CE302** are met.

SECTION CE302 ADDITIONAL ELECTRIC INFRASTRUCTURE

CE302.1 Additional Electric Infrastructure. *Combustion equipment* in *commercial buildings* shall meet the electric infrastructure requirements of Sections **CE302.2** or **CE302.3**.

Exceptions:

1. Interior fireplaces that do not serve as a primary source of heating.
2. Exterior fireplaces and fire pits.

3. Additions to buildings that do not provide new space-heating equipment will not be required to provide additional electrical infrastructure to the existing space-heating equipment.

CE302.2 Commercial Buildings Less than 10,000 sq. ft. and all R-Occupancies. *Commercial buildings* that have a gross floor area of less than 10,000 sq. ft., and all Roccupancies of any size, shall comply with Sections **CE302.2.1** through **CE302.2.5**.

CE302.2.1 Combustion Equipment. *Combustion equipment* shall be provided with all of the following:

1. A dedicated, appropriately phased branch circuit sized to accommodate *future electric equipment* or appliances to serve a comparable capacity to meet the heating load.

2. An electric receptacle or junction box that meets the requirements of Section **CE302.2.5**, and is connected to the electrical panel through the branch circuit. Each electrical receptacle or junction box shall have reasonable access to the *combustion equipment* or dedicated physical space for *future electric equipment* with no obstructions other than the current *combustion equipment*.

3. Where *combustion equipment* is used for space or water heating, dedicated space shall be provided for all *future electric equipment*, including an electric resistance backup coil for ducted systems if applicable.

   Exception: Buildings with installed air conditioning systems are not required to provide additional dedicated physical space for an outdoor heat pump.

CE302.2.2 Electrical Panel Space. The electrical panel shall have reserved physical space for a minimum two-pole or three-pole circuit breaker for each branch circuit provided for *future electric equipment* or appliances. The physical space in the electrical panel for each circuit breaker shall be sized with sufficient breaker capacity to meet the electrical demand of the *future electric equipment* or appliance that is sized to serve a comparable capacity to meet the heating load.

CE302.2.3 Labeling. The junction box or receptacle and the dedicated circuit breaker space serving *future electric equipment* or appliances in the electrical panel shall be labeled for their intended use.

CE302.2.4 Adjacency. The electrical receptacle or junction box must be provided within 3 feet of the *combustion equipment* or appliances or within 3 feet of the dedicated physical space for *future electric equipment* or appliances.

Exception: For *combustion equipment* dedicated to space or water heating, the electrical receptacle or junction box shall be located not more than 6 feet from the *combustion equipment* or the dedicated physical space for *future electric equipment*.

CE302.2.5 Condensate Drain. Where *combustion equipment* dedicated to space heating and water heating is installed, a location shall be provided for condensate drainage.

CE302.3 Commercial Buildings 10,000 sq. ft. or Greater. All *commercial buildings* that have a gross floor area of 10,000 sq. ft. or greater shall comply with the following requirements.

Exception: R-occupancies.

CE302.3.1 Combustion Equipment or Appliances. All *combustion equipment* shall be provided with the following:

1. A junction box that is located in the same physical space as the *combustion equipment* and is reasonably accessible, and that is connected to the electrical panel by continuous conduit and/or raceways.
2. Dedicated electrical panel space for an appropriately phased branch circuit sized to accommodate *future electric equipment* or appliances to serve a comparable capacity to meet the heating load.
3. Where *combustion equipment* is used for space and water heating, dedicated physical space shall be provided for all *future electric equipment*.

CE302.3.2 Electrical Panel Space. The electrical panel shall have reserved physical space for a minimum two-pole or three-pole circuit breaker for each branch circuit provided for *future electric equipment* or appliances. The physical space in the electrical panel for each circuit breaker shall be sized with sufficient breaker capacity to meet the electrical demand of the *future electric equipment* or appliance that is sized to serve a comparable capacity to meet the heating load.

CE302.3.3 Labeling. The dedicated circuit breaker space serving *future electric equipment* or appliances in the electrical panel shall be labeled ”For future electric equipment”.

CE302.3.4 Physical Space. Dedicated physical space shall be provided for additional electric equipment, including but not limited to transformers and cabinets, necessary for electrical service to *future electric equipment* or appliances.

Chapter 4 Solar Ready

PART 1 RESIDENTIAL SOLAR READY.

SECTION RS401 SCOPE.

RS401.1 General. These provisions shall be applicable for new buildings, and major renovations and additions.

SECTION RS402 SOLAR READY ZONE.

RS402.1 General. New *residential buildings* with not less than 600 square feet of roof area oriented between 110 degrees and 270 degrees of true north or that is a lowsloped roof, shall comply with Sections **RS402.2** through **RS402.8**.

Exceptions:

1. New residential dwelling units with a permanently installed on-site renewable energy system that provides electricity to the dwelling unit's electrical system.
2. A building where all areas of the roof that would otherwise meet the requirements of Section **RS402** are in full or partial shade for more than 70 percent of daylight hours annually.

RS402.2 Construction Document Requirements for Solar-Ready Zone. Construction documents shall indicate the *solar-ready zone*.

RS402.3 Solar-Ready Zone Areas. The total *solar-ready zone* area for each dwelling unit shall be not less than 300 square feet exclusive of mandatory access or setback areas as required by the International Fire Code. The *solar-ready zone* shall be composed of areas not less than 5 feet in width and not less than 80 square feet exclusive of access or setback areas as required by the International Fire Code.

Exception: New townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet of conditioned space per townhouse unit shall have a *solar-ready zone* area of not less than 150 square feet.

RS402.4 Obstructions. *Solar-ready zones* shall be free from obstructions, including but not limited to, vents, chimneys, and roof-mounted equipment.

RS402.5 Shading. The *solar-ready zone* shall be set back from any existing or new permanently affixed object on the building or site that is located south, east, or west of the *solar-ready zone* a distance not less than two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees, and roof plantings either existing at the time of permit application or planned for on the construction documents.

RS402.6 Roof Load Documentation. The structural design loads of roof dead load and roof live load shall be clearly indicated on the construction documents.

RS402.7 Interconnection Pathway. Construction documents shall indicate at least one potential pathway for routing of conduit and/or raceway from the *solar-ready zone* to the electrical service panel and shall be labeled as "Potential Pathway" on the construction documents.

RS402.8 Electrical Service Reserved Space. The main electrical service panel shall have sufficient reserved space to allow the installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

RS402.9 Construction Documentation Certificate. A permanent certificate, indicating the *solar-ready zone* and other requirements of this Part, shall be posted near the electrical distribution panel, water heater, or other conspicuous location.

PART 2 COMMERCIAL SOLAR READY

SECTION CS401 SCOPE

CS401.1 General. These provisions shall be applicable for new buildings, and major renovations and additions.

SECTION CS402 SOLAR-READY ZONE

CS402.1 General. A *solar-ready zone* shall be located on the roof of all new *commercial buildings* that are oriented between 110 and 270 degrees of true north or have low-sloped roofs. *Solar-ready zones* shall comply with Sections **CS402.2** through **CS402.7**.

Exceptions:

1. A building with a permanently-installed, on-site renewable energy system that meets the following criteria.
    a. The system produces the energy output equivalent to covering 40 percent of the net roof area with solar photovoltaic calculated as the horizontally projected gross roof area less the area covered by skylights, occupied roof decks, vegetative roof areas, and mandatory access or set back areas as required by the International Fire Code.
    b. The system is located on the roof or overhang of the building or on the roof or overhang of another structure located within 250 feet of the building, on the building premises, on covered parking, or another *approved* location installed with the building project and under the same property ownership.
2. A building with a *solar-ready zone* that is shaded for more than 70 percent of daylight hours annually.
3. A building where a licensed design professional certifies that the incident solar radiation available to the building is not suitable for a *solar-ready zone*.

4. A building where a licensed design professional certifies that the *solarready zone* area required by Section **CS402.3** cannot be met because of extensive rooftop equipment, skylights, vegetative roof areas, or other obstructions.

CS402.2 Construction Document Requirements for a Solar-Ready Zone. Construction documents shall indicate the *solar-ready zone*.

CS402.3 Solar-Ready Zone Area. The total *solar-ready zone* area shall not be less than 40 percent of the roof area calculated as the horizontally projected gross roof area less the area covered by skylights, occupied roof decks, vegetative roof areas, and mandatory access or set back areas as required by the International Fire Code. The *solar-ready zone* shall be a single area or smaller, separated sub-zone areas. Each sub-zone area shall be not less than 5 feet in width in the narrowest dimension.

The *solar-ready zone* shall be located on the roof or overhang of the building or on the roof or overhang of another structure located within 250 feet of the building, on the building premises, on covered parking, or another *approved* location installed with the building project and under the same property ownership .

CS402.4 Obstructions. *Solar-ready zones* shall be free from obstructions, including pipes, vents, ducts, HVAC equipment, skylights, and roof-mounted equipment.

CS402.5 Roof Loads and Documentation. The structural design loads for roof dead load and roof live load shall be indicated on the construction documents.

CS402.6 Interconnection Pathway. Construction documents shall indicate at least one potential pathway for routing of conduit and/or raceway from the *solar-ready zone* to an electrical service panel and shall be labeled as “Potential Pathway” on the construction documents.

CS402.7 Electrical Service Reserved Space. The main electrical service panel shall have a minimum bus bar rating of not less than 200 amps. The main electrical service panel shall have a reserved space to allow installation of a dual-pole circuit breaker for future solar electric. This space shall be labeled “For Future Solar Electric.” The reserved space shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

PART 3 RESIDENTIAL SOLAR PANEL CAPACITY

SECTION RS410 SCOPE

RS410.1 General. These provisions shall be applicable for all new buildings, and major renovations and additions.

RS410.2 Electric Service Reserved Space. The main electrical service panel shall have sufficient reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled “For Future Solar Electric.” The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

Exception: A dwelling unit that already must comply with the solar ready provisions in Chapter 4 or that has a permanently installed on-site renewable energy system that provides electricity to the dwelling unit's electrical system.

PART 4 COMMERCIAL SOLAR PANEL CAPACITY

SECTION CS410 SCOPE

CS410.1 General. These provisions shall be applicable for new buildings, and major renovations and additions.

CS410.2 Electric Service Reserved Space. The main electrical service panel shall have a minimum bus bar rating of not less than 200 amps. The main electrical service panel shall have sufficient reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

Exception: A building that already must comply with the solar ready provisions in Chapter 4 or that has a permanently installed on-site renewable energy system that provides electricity to the building's electrical system.

Chapter 5 Electric Vehicle Ready

PART 1 RESIDENTIAL ELECTRIC VEHICLE READY

SECTION RV501 SCOPE

RV501.1 General. These provisions shall be applicable for all new buildings, and major renovations and additions.

SECTION RV502 ELECTRIC VEHICLE POWER TRANSFER INFRASTRUCTURE

RV502 Electric Vehicle Power Transfer Infrastructure. New vehicle parking spaces for *residential buildings* shall be provided in accordance with Sections **RV502.1** and **RV502.3**.

RV502.1 One- and Two-family Dwellings and Townhouses. Each dwelling unit with a dedicated attached or detached garage or other onsite designated parking provided for the dwelling unit shall be provided with one *EV ready space* per dwelling unit.

RV502.2 EV Ready Spaces. Each *EV ready space* shall have a branch circuit that complies with all of the following:

1. Terminates at a receptacle, located within 3 feet of each *EV ready space* it serves. *EV ready* includes two adjacent parking spaces if the receptacle for the electrical facilities of this section is installed adjacent to and between both parking spaces.
2. Has a minimum circuit capacity of 8.3 kVA (40A 208/240V).
3. The electrical panel, electrical distribution equipment directory, and all outlets or enclosures shall be marked "For future electric vehicle supply equipment".

Exception: A receptacle need not be provided if a hard-wired *EVSE* is installed.

RV502.3 Identification. Construction documents shall designate the *EV ready space* and indicate the locations of raceway and/or conduit and the termination points serving them. The circuits or spaces reserved in the electrical panel for *EV ready spaces* shall be clearly identified in the panel or subpanel directory.

PART 2 COMMERCIAL ELECTRIC VEHICLE READY

SECTION CV501 SCOPE

CV501.1 General. These provisions shall be applicable for all new buildings, and major renovations and additions.

SECTION CV502 ELECTRIC VEHICLE POWER TRANSFER INFRASTRUCTURE

CV502 Electric Vehicle Power Transfer Infrastructure. Where new parking is provided for *commercial buildings,* it shall be provided with *electric vehicle* power transfer infrastructure in compliance with Sections **CV502.1** through **CV502.9**.

CV502.1 Quantity. The number of required *EVSE installed spaces, EV ready spaces, EV capable spaces,* and *EV capable light spaces* shall be determined in accordance with this Section and **Table CV502.1** based on the total number of provided vehicle parking spaces and shall be rounded up to the nearest whole number. This includes all covered parking under carports or detached garages.

CV502.1.1 Where more than one parking lot is provided on a building site, the number of provided vehicle parking spaces required to have *EV* power transfer infrastructure shall be calculated separately for each parking lot.

CV502.1.1.1 R-2 Occupancies, as defined in Chapter 3 of the International Building Code, shall use the total parking requirement for the entire development to determine the *EV* power transfer infrastructure requirements using **Table CV502.1**.

CV502.1.2 For *commercial buildings* that install a *DCFC EVSE,* each *DCFC EVSE* installed shall be permitted to be substituted for other space types as follows:

1. *Commercial buildings* other than R-2 Occupancies shall be permitted to substitute up to 10 spaces when the building provides a minimum of 20 percent of parking spaces as a combination of *EV Capable*, *EV ready*, or *EVSE installed spaces*.
2. R-2 Occupancies shall be permitted to substitute up to 5 spaces when the building provides a minimum of 60 percent of parking spaces as a combination of *EV Capable light, EV Capable, EV ready*, or *EVSE installed spaces*.

CV502.1.3 *EVSE installed spaces* that exceed the minimum requirements of this section are permitted to be used to meet minimum requirements for *EV ready spaces*, *EV capable spaces*, and *EV capable light spaces*.

CV502.1.4 E*V ready spaces* that exceed the minimum requirements of this section are permitted to be used to meet minimum requirements for *EV capable spaces* and *EV capable light spaces*.

CV502.1.5 *EV capable spaces* that exceed the minimum requirements of this section are permitted to be used to meet the minimum requirements for *EV capable light spaces*.

CV502.1.6 All attached garages with direct connection to a dwelling unit will be required to have one *EV ready space*.

Table CV502.1: EV Power Transfer Infrastructure Requirements

Building Type / Space Type	*EVSE Installed Space*	*EV Ready Space*	*EV Capable Space*	*EV Capable Light Space*
All *commercial buildings*, except for R-2 occupancies, with 10 or less parking spaces.	0	2 spaces	0	0
***Commercial buildings*, except for R-2 occupancies, with greater than 10 parking spaces.**	2% of spaces	8% of spaces	10% of spaces	10% of spaces
R-2 occupancies with 10 or less parking spaces	0	15% of spaces	10% of spaces	10% of spaces

R-2 occupancies with greater than 10 parking spaces.	5% of spaces	15% of spaces	10% of spaces	30% of spaces

CV502.2 EV Capable Light Spaces. Each *EV capable light space* shall comply with all of the following:

1. A continuous raceway and/or conduit shall be installed between a suitable electrical panel or other electrical distribution equipment and terminate within 3 feet of the *EV capable light space* and shall be capped. *EV capable light* includes two adjacent parking spaces if the raceway and/or conduit terminates adjacent to and between both parking spaces.
2. Installed raceway and/or conduit shall be sized and rated to supply a minimum of 208 volts and a minimum of 40-ampere rated circuits.
3. Dedicated physical space to accommodate all equipment necessary for electrical service to future *EVSE*.
4. The routing of the raceway and/or conduit must be noted on the construction documents and the raceway shall be permanently and visibly marked "EV CAPABLE" at the load center and termination point locations.

CV502.3 EV Capable Spaces. Each *EV capable space* shall comply with all of the following:

1. A continuous raceway and/or conduit shall be installed between a suitable electrical panel or other electrical distribution equipment and terminate within 3 feet of the *EV capable space* and shall be capped. *EV capable* includes two adjacent parking spaces if the raceway and/or conduit terminates adjacent to and between both parking spaces.
2. The installed raceway and/or conduit shall be sized and rated to supply a minimum of 208 volts and a minimum of 40-ampere rated circuits.
3. The electrical panel or other electrical distribution equipment to which the raceway and/or conduit connects shall have sufficient dedicated space and spare electrical capacity to supply a minimum of 208 volts and a minimum of 40-ampere rated circuits.
4. The termination point of the conduit and/or raceway and the electrical distribution equipment directory shall be marked: "For future electric vehicle supply equipment (EVSE)."
5. Reserved capacity shall be no less than 8.3 kVA (40A 208/240V) for each *EV capable space*.

CV502.4 EV Ready Spaces. Each *EV ready space* shall have a branch circuit that complies with all of the following:

1. Terminates at a receptacle or junction box located within 3 feet of each *EV ready space* it serves. *EV ready* includes two adjacent parking spaces if the receptacle is installed adjacent to and between both parking spaces.
2. Has a minimum circuit capacity of 8.3 kVA (40A 208/240V).
3. The electrical panel, electrical distribution equipment directory, and all outlets or enclosures shall be marked "For future electric vehicle supply equipment (EVSE)."

CV502.5 Electric Vehicle Supply Equipment (EVSE). All *EVSE* shall meet all of the following requirements:

1. The installed *EVSE* shall meet one of the following requirements:
   a. A power capacity of at least 6.2 kVa (or 30A at 208/240V) and has the ability to connect to the internet.
   b. An inductive charging system for battery-powered *electric vehicles* that:
      i. Is ENERGY STAR certified; and
      ii. Has the ability to connect to the internet.
2. An *electric vehicle* charging system shall be wall-mounted or pedestal style and may provide multiple cords to connect with *electric vehicles*.
3. An *electric vehicle* charging system shall be listed and labeled for *EV* charging and must comply with the current version of Article 625 of the National Electrical Code.

CV502.6 EVSE Installed Spaces. An installed *EVSE* with multiple output connections shall be permitted to serve multiple *EVSE installed spaces*. Each *EVSE* installed serving either a single *EVSE installed space* or multiple *EVSE installed spaces*, shall comply with all of the following:

1. Have a minimum charging rate in accordance with Section **CV502.7**.
2. Be located within 3 feet of each *EVSE installed space* it serves.
3. Be installed in accordance with Section **CV502.8**.
4. Have a minimum circuit capacity of 8.3 kVA (40A 208/240V).
5. Must meet the requirements of Section **CV502.5**.

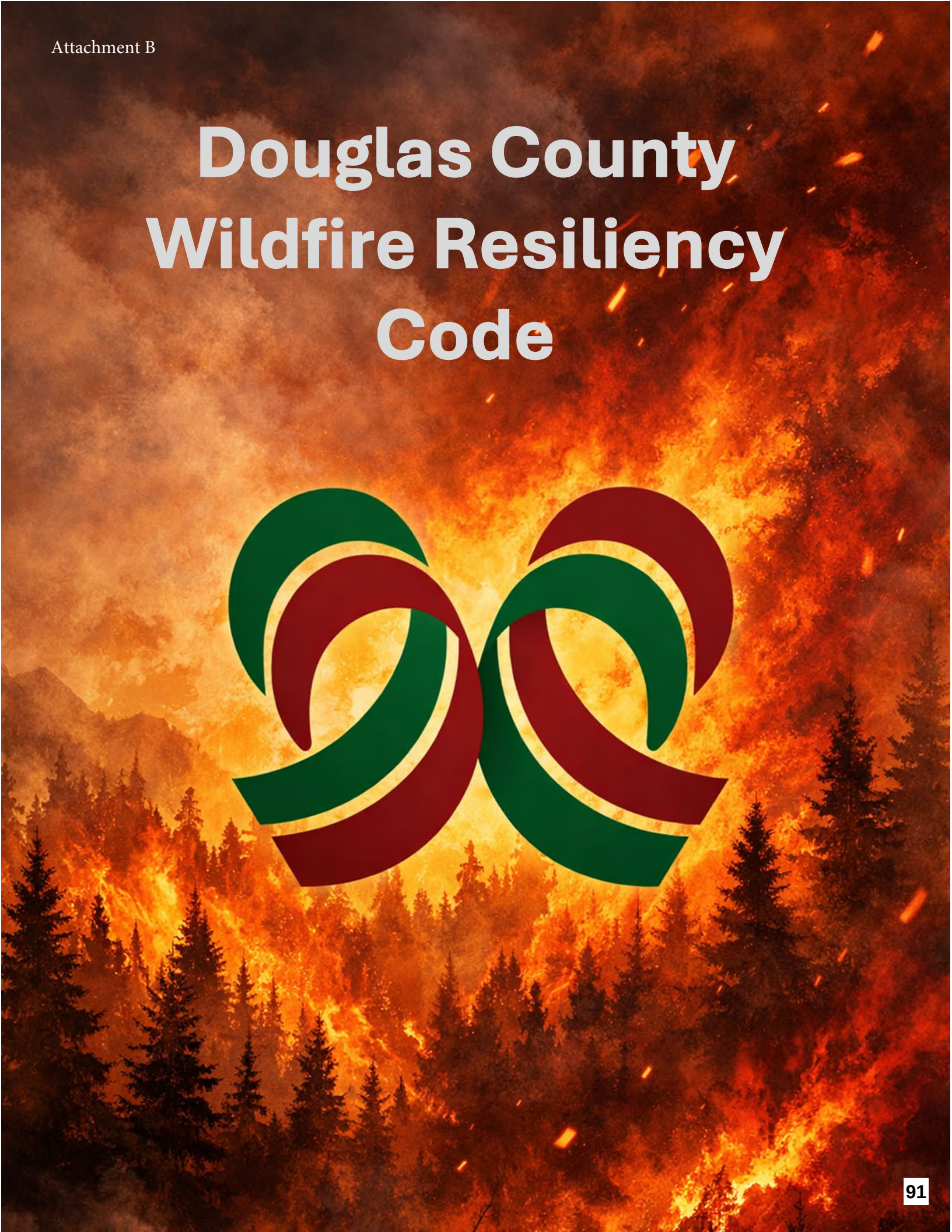
CV502.7 EVSE Minimum Charging Rate. Each installed *EVSE* shall comply with one of the following:

1. Be capable of charging at a minimum rate of 6.2 kVA (or 30A at 208/240V).
2. When serving multiple *EVSE installed spaces* and controlled by an energy management system providing load management, be capable of simultaneously sharing each *EVSE installed space* at a minimum charging rate of no less than 3.3 kVA.

CV502.8 EVSE Installation. *EVSE* shall be installed in accordance with NFPA 70 and shall be listed and labeled in accordance with UL 2202 or UL 2594. When serving an accessible parking space, *EVSE* shall be accessible in accordance with the International Building Code Chapter 11.

CV502.9 Identification. Construction documents shall designate all *EVSE installed spaces, EV ready spaces, EV capable spaces,* and *EV capable light spaces,* and indicate the locations of raceway and/or conduit and termination points serving them. The circuits or spaces reserved for *EVSE installed spaces, EV ready spaces,* and *EV capable spaces* shall be clearly identified in the panel or subpanel directory. The raceway and/or conduit for *EV ready spaces, EV capable spaces* and *EV capable light spaces* shall be clearly identified at both the panel or subpanel and the termination point at the parking space.

Douglas County Wildfire Resiliency Code



ATTRIBUTIONS

This Code is comprised of a majority of the 2025 Colorado Wildfire Resiliency Code adopted by the Colorado Wildfire Resiliency Code Board.

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Chapter 1 - Scope and Administration

PART 1 GENERAL PROVISIONS

SECTION 101 SCOPE AND GENERAL REQUIREMENTS

101.1 Title. These regulations shall be known as the Douglas County Wildfire Resiliency Code as adopted by Douglas County, hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to the construction, alteration, movement, repair, maintenance and use of any building, structure or premises that contain *occupiable* and/or *habitable space*, or change in use resulting in an occupiable and/or habitable space, unless excepted, within the *wildland-urban interface* areas of Douglas County that are outside the corporate limits of a city or town and outside the boundaries of a fire protection district. Buildings or conditions in existence at the time of the adoption of this code are allowed to have their use or occupancy continued, if such condition, use or occupancy was legal at the time of the adoption of this code, provided that such continued use does not constitute a distinct danger to life or property. Buildings or structures moved into or within the *wildland-urban interface* areas of Douglas County, unless excepted, that are outside the corporate limits of a city or town and outside the boundaries of a fire protection district shall comply with the provisions of this code for new buildings or structures.

101.2.1 Appendices. Nonapplicable. None adopted.

101.2.2 Factory-Built Structures (nonresidential, residential, and tiny homes). Structure hardening provisions of this code for factory-built structures as defined by sections 24-32-3302(9), (10), (11), and (35), C.R.S., are in accordance with Rules adopted by the Division of Housing in 8 CCR 1302-1, Rule 2 Codes and Standards.

101.2.3 HUD Code Homes. Homes built to the HUD Manufactured Home Construction and Safety Standards are exempt from structure hardening requirements on their first installation. Homes built to the HUD Manufactured Home Construction and Safety Standards which are moved into an applicable Wildfire Resiliency code area are subject to the provisions of this code as required by the authority having jurisdiction.

101.3 Purpose. The purpose of this code is to establish minimum regulations for the safeguarding of life and for property protection. Regulations in this code are intended to mitigate the risk to life and structures from intrusion of fire from wildland fire exposures and fire exposures from adjacent structures and to mitigate structure fires from spreading to wildland fuels. The extent of this regulation is intended to be tiered commensurate with the relative level of hazard present.

The unrestricted use of property in *wildland-urban interface* areas is a potential threat to life and property from fire and resulting erosion. Safeguards to prevent the occurrence of fires and to provide adequate fire protection facilities to control the spread of fire in *wildland-urban interface* areas shall be in accordance with this code.

This code shall supplement Douglas County's building and fire codes, if such codes have been adopted, to provide for special regulations to mitigate the fire- and life-safety hazards of the

wildland-urban interface areas.

101.4 Retroactivity. The provisions of the code shall apply to conditions arising after the adoption thereof, conditions not legally in existence at the adoption of this code and conditions that, in the opinion of the *code official*, constitute a distinct hazard to life or property.

Exception: Provisions of this code that specifically apply to existing conditions are retroactive.

101.5 Additions or alterations. Additions or alterations shall be permitted to be made to any building or structure without requiring the existing building or structure to comply with all of the requirements of this code, provided that, when the work increases the footprint of the existing structure by 500 square feet or greater, the addition or alteration conforms to that required for a new building or structure.

Exception: Provisions of this code that specifically apply to existing conditions are retroactive.

Additions or alterations shall not be made to an existing building or structure that will cause the existing building or structure to be in violation of any of the provisions of this code nor shall such additions or alterations cause the existing building or structure to become unsafe. An unsafe condition shall be deemed to have been created if an addition or alteration will cause the existing building or structure to become structurally unsafe or overloaded; will not provide adequate access in compliance with the provisions of this code or will obstruct existing exits or access; will create a fire hazard; will reduce required fire resistance or will otherwise create conditions dangerous to human life.

101.6 Roof coverings. The *roof covering* on buildings or structures in existence prior to adoption of this code that are replaced or have 25 percent or more of the surface area of the roof replaced, or where work to reconstruct, alter, or repair the *roof covering* effectively replaces such material, shall require the entirety of the *roof covering* to be replaced with a *roof covering* required for new construction specified in Sections 403.2 through 403.2.2.

Exception: Existing *roof coverings* that are compliant with Section 403.2.

101.7 Exterior walls. The exterior walls of building or structures in existence prior to adoption of this code where 25 percent or more of the total exterior wall surface area is replaced, or where work to reconstruct, alter or repair the exterior walls effectively replaces the exterior wall material, shall require the entirety of the exterior wall surface area, including attachments, to be replaced with materials required for new construction specified in Section 404.3 through 404.3.2 and the immediate zone within 5 feet of the structure shall be made to comply with Section 503.1.

Exception: Existing exterior walls that are compliant with Section 404.3.

101.8 Maintenance. Buildings, structures, landscape materials, vegetation, *defensible space* or other devices or safeguards required by this code shall be maintained in conformance to the code edition under which installed. The owner or the owner's authorized agent shall be responsible for the maintenance of buildings, structures, landscape materials and vegetation.

SECTION 102—APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern. Where, in any specific case, different sections of this code, or any other adopted code, specify different materials, methods of construction or other requirements, the most restrictive shall govern.

102.2 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

102.3 Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

102.4 Referenced codes and standards. The codes and standards referenced in this code are listed throughout this code. Such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.4.1 and 102.4.2.

102.4.1 Conflicts. Where conflicts occur between provisions of this code and the referenced codes and standards, the provisions of this code shall govern.

102.4.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced standard.

102.5 Subjects not regulated by this code. Where applicable standards or requirements are not set forth in this code, or are contained within other laws, codes, regulations, ordinances or policies adopted by Douglas County, compliance with applicable standards of other nationally recognized safety standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within Douglas County.

102.6 Matters not provided for. Requirements that are essential for the public safety of an existing or proposed activity, building or structure, or for the safety of the occupants thereof, which are not specifically provided for by this code, shall be determined by the *code official* consistent with the necessity to establish the minimum requirements to safeguard the public health, safety and general welfare.

102.7 Partial invalidity. In the event that any part or provision of this code is held to be illegal or void, this shall not have the effect of making void or illegal any of the other parts or provisions.

102.8 Existing conditions. The legal occupancy or use of any structure or condition existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *Internation Building Code*, *International Residential Code*, *International Fire Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public.

102.9 Historic structures. A variance is authorized to be issued for the repair or rehabilitation of a historic structure or construction of a contributing structure upon a determination that the

proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure, and the variance is the minimum necessary to preserve the historic character and design of the structure, within the spirit of this code.

Exception: Within wildfire hazard areas, historic structures that do not meet one or more of the following designations:

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places.
2. Determined as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district.
3. Designated as historic under a state or local historic preservation program.

102.9.1 Historic preservation exemption. Douglas County may establish a historic preservation exemption or exemptions in their jurisdiction that consists of the spirit and intent of this code.

102.10 Work exempt from permit under this code. Exemptions from code requirements shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of Douglas County. Compliance with this code shall not be required for the following:

1. Interior alterations of existing structures.
2. Additions that do not increase the footprint of a structure by more than 500 square feet.
3. The reconstruction, replacement, alteration, or repair of the exterior walls of an existing building, when less than 25 percent of the surface area of all exterior walls is affected.
4. The reconstruction, replacement, alteration, or repair of the exterior *roof covering* of an existing building, when less than 25 percent of the surface area of the exterior *roof covering* or an attachment thereto is affected.
5. Alterations or repairs to the exterior of an existing structure, or an attachment to it, when less than twenty-five percent of the exterior of the structure is affected by the alteration or repair.
6. Painting, staining and similar maintenance or restorative work.
7. One-story detached accessory, nonhabitable structures, such as tool and storage sheds, playhouses and similar uses, provided that the floor area does not exceed 120 square feet and the structure is located greater than or equal to 10 feet from the nearest adjacent occupiable structure.
8. *Accessory structures* and buildings of an accessory character classified as Utility and Miscellaneous Group U (including Agricultural Structures) located more than 50 feet from a structure containing *occupiable* or *habitable space*.
9. Fences located more than 8 feet from a habitable structure.
10. Any thirty-five acre parcel with only one residential structure on it that does not abut a residential or commercial area.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103—CODE COMPLIANCE AGENCY

103.1 Creation of agency. The Douglas County Building Division is hereby the agency responsible

and the official in charge thereof shall be known as the *code official*. The function of the agency shall be the implementation, administration and enforcement of the provisions of this code.

103.2 Appointment. The *code official* shall be the Douglas County Chief Building Official.

103.3 Deputies. In accordance with the prescribed procedures of Douglas County, the *code official* shall have the authority to appoint a deputy *code official*, other related technical officers, inspectors and other employees. Such employees shall have powers as delegated by the *code official*.

SECTION 104—DUTIES AND POWERS OF THE CODE OFFICIAL

104.1 Powers and duties of the code official. The *code official* is hereby authorized to enforce the provisions of this code.

104.2 Determination of compliance. The *code official* shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

104.2.1 Technical assistance. To determine compliance with this code, the *code official* is authorized to require the owner, the owner's authorized agent or the person in possession or control of the building or premises to provide a technical opinion and report.

104.2.1.1 Costs. A technical opinion and report shall be provided without charge to Douglas County.

104.2.1.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the *code official*. The *code official* is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

104.2.1.3 Content. The technical opinion and report shall analyze the properties of the design, operation or use of the building or premises, the facilities and appurtenances situated thereon and fuel management to identify and propose necessary recommendations.

104.2.1.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the *code official* shall have the authority to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the *code official* shall approve the testing procedures. Such tests shall be performed by a party acceptable to the *code official*.

104.2.2 Alternative materials, design and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*.

104.2.2.1 Approval authority. An alternative material, design or method shall be *approved* where the *code official* finds that the proposed alternative is satisfactory and complies with Sections 104.2.2.2 through 104.2.2.7, as applicable.

104.2.2.2 Application and disposition. Where required, a request to use an alternative material, design or method of construction shall be submitted in writing to the *code official* for approval. Where the alternative material, design or method of construction is not approved, the *code official* shall respond in writing, stating the reasons the alternative was not approved.

104.2.2.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code.

104.2.2.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality.
2. Strength.
3. Effectiveness.
4. Durability.
5. Safety, other than fire safety.
6. Fire safety.

104.2.2.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the *code official.*

104.2.2.5.1 Fire tests. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the *code official*.

104.2.2.6 Reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.2.6.1 and 104.2.2.6.2.

104.2.2.6.1 Evaluation reports. Evaluation reports shall be issued by an *approved* agency and use of the evaluation report shall require approval by the *code official* for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the *code official*'s recognition of the *approved* agency. Criteria used for the evaluation shall be identified within the report and, where required, provided to the *code official*.

104.2.2.6.2 Other reports. Reports not complying with Section 104.2.2.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence. The report shall be prepared by a qualified engineer, specialist, laboratory or fire safety

specialty organization acceptable to the *code official*. The *code official* is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

104.2.2.7 Peer review. The *code official* is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is *approved* by the *code official*.

104.2.3 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the *code official* shall have the authority to grant modifications for individual cases, provided that the *code official* shall first find that one or more special individual reasons make the strict letter of this code impractical, that the modification is in conformance with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety requirements. The details of the written request and action granting modifications shall be recorded and entered into the files of the Douglas County Building Division.

104.3 Applications and permits. The *code official* is authorized to receive applications, review construction documents and issue permits for construction regulated by this code, issue permits for operations regulated by this code, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code. Any permit required for compliance with this code will be reviewed and processed by the Douglas County Building Division through existing procedures.

104.4 Access to Property. For the purpose of inspecting and enforcing the provisions of this code and the terms and conditions of any permit issued under this code, the *code official* is authorized to enter upon private property at reasonable times and upon reasonable notice for the purpose of determining compliance with this code and to evaluate conditions relative to the permit application.

104.4.1 Authorization. The owner or occupant of the property having a permit under this code shall allow the *code official* access to the property to perform the required inspections. If access is denied, the *code official* shall apply to the Court with jurisdiction to seek authority to access the property.

104.5 Identification. The *code official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.6 Notices and orders. The *code official* shall issue all necessary notices or orders to ensure compliance with this code.

104.7 Official records. The *code official* shall keep official records as required by Sections 104.7.1 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other regulations.

104.7.1 Approvals. A record of approvals shall be maintained by the *code official* and shall be available for public inspection during business hours in accordance with applicable laws.

104.7.2 Inspections. The *code official* shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.2; modifications in accordance with Section 104.2.3; and documentation of the final decision of the *code official* for either shall be in writing and shall be retained in the official records.

104.7.4 Tests. The *code official* shall keep a record of tests conducted to comply with Sections 104.2.1.4 and 104.2.2.5.

104.7.5 Fees. The *code official* shall keep a record of fees collected and refunded in accordance with Section 106.

104.8 Liability. The *code official*, member of the board of appeals or employee charged with the enforcement of this code, while acting for Douglas County, in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered personally liable, either civilly or criminally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of an act or by reason of any act or omission in the discharge of official duties.

104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of Douglas County until final termination of the proceedings. The *code official* or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code.

104.9 Approved materials and equipment. Materials, equipment and devices approved by the *code official* shall be constructed and installed in accordance with such approval.

104.9.1 Materials and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working order and *approved*.

104.10 Other agencies. When requested to do so by the *code official*, other officials of Douglas County shall assist and cooperate with the *code official* in the discharge of the duties required by this code.

SECTION 105—TEMPORARY USES, EQUIPMENT AND SYSTEMS

105.1 General. The *code official* is authorized to issue a permit for temporary uses, equipment and systems. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The *code official* is authorized to grant extensions for demonstrated cause.

105.2 Conformance. Temporary uses, equipment and systems shall conform to the requirements of this code as necessary to ensure health, safety and general welfare.

105.3 Temporary service utilities. The *code official* is authorized to give permission to temporarily supply service utilities.

105.4 Termination of approval. The *code official* is authorized to terminate such permit for

temporary uses, equipment and systems and to order the same to be discontinued.

SECTION 106—FEES

106.1 General. Douglas County has not established any fees related to this code.

SECTION 107—FAILURE TO COMPLY, STOP WORK ORDER AND ENFORCEMENT

107.1 Authority. Where the *code official* finds any work regulated by this code being performed or already performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the *code official* is authorized to issue a stop work order or a Notice of Violation.

107.2 Issuance. A stop work order or Notice of Violation shall be in writing and shall be given to the owner of the property, the owner's authorized agent or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume. The Notice of Violation shall specify the violation, required corrective action, and compliance deadline.

107.3 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

107.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, or fails to correct a violation of the code as specified in a Notice of Violation shall be subject to fines established by Douglas County. Code violation penalties will be sought in accordance with Sections 30-28-209 and 30-28-210 Colorado Revised Statutes (C.R.S.).

Chapter 2 - Definitions

SECTION 201 GENERAL

201.1 Scope. Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this chapter.

201.2 Interchangeability. Words stated in the present tense include the future; words stated in the masculine gender include the feminine and neuter; and the singular number includes the plural and the plural the singular.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in other International Codes, such terms shall have the meanings ascribed to them as in those codes.

201.4 Terms not defined. Where terms are not defined through the methods authorized by this section, such terms shall have their ordinarily accepted meanings such as the context implies.

SECTION 202 DEFINITIONS

ACCESSORY STRUCTURE. A building or structure used to shelter or support any material, equipment, chattel or occupancy other than a habitable building.

AGRICULTURAL BUILDING. A structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products. This structure shall not be a place of human habitation or a place of employment where agricultural products are processed, treated or packaged, nor shall it be a place used by the public.

APPROVED. Acceptable to the *code official*.

BUILDING. Any structure intended for supporting or sheltering any occupancy.

CLASS A TESTS. Class A Tests are applicable to *roof coverings* that are expected to be effective against severe fire exposure, afford a high degree of fire protection to the *roof deck*, do not slip from position, and are not expected to present a flying brand hazard.

CODE OFFICIAL. The code official is the Chief Building Official.

DEFENSIBLE SPACE. An area either natural or man-made, where material capable of allowing a fire to spread unchecked has been treated, cleared or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression operations to occur.

EMBELLISHMENTS. Elements incorporated in design and construction for ornamental or decorative purpose that are not integral to the structure or structural support.

FIRE INTENSITY CLASSIFICATION. The level of fire intensity identified for areas where significant fuel hazards and associated dangerous fire behavior may exist, based upon vegetative fuels, topography, weather conditions, and flame length value.

FIRE-RESISTANCE-RATED CONSTRUCTION. The use of materials and systems in the

design and construction of a building or structure to safeguard against the spread of fire within a building or structure and the spread of fire to or from buildings or structures to the *wildland-urban interface* area.

FIRE-RETARDANT-TREATED WOOD. Fire-retardant-treated wood is any wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E84 or UL 723, a listed *flame spread index* of 25 or less. The ASTM E84 or UL723 test shall be continued for an additional 20-minute period and the flame front shall not progress more than 10.5 feet beyond the centerline of the burners at any time during the test.

FLAME SPREAD INDEX. A comparative measure, expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time for a material tested in accordance with ASTM E84.

FUEL MODIFICATION. A method of modifying fuel load by reducing the amount of nonfire-resistive vegetation or altering the type of vegetation to reduce the fuel load.

HABITABLE SPACE. A space in a building for living, sleeping, eating or cooking.

HEAVY TIMBER CONSTRUCTION. As described in Section 602.4 of the 2024 *International Building Code*.

HOME IGNITION ZONE. Home Ignition Zone is the home and the area around the home (or structure). The HIZ takes into account both the potential of the structure to ignite and the quality of *defensible space* surrounding it.

IGNITION-RESISTANT BUILDING MATERIAL. A type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from wildfire exposure of burning embers and small flames.

IGNITION-RESISTANT VEGETATION. Plants that are less likely to readily ignite from a flame or other ignition source and produce fewer embers. While they can still be damaged by fire, their foliage and stems don't significantly contribute to the intensity of the fire.

LOG WALL CONSTRUCTION. A type of construction in which exterior walls are constructed of solid wood members and where the smallest horizontal dimension of each solid wood member is not less than 6 inches. Log wall construction shall follow requirements of ICC 400.

MULTILAYERED GLAZED PANELS. Window or door assemblies that consist of two or more independently glazed panels installed parallel to each other, having a sealed air gap in between, within a frame designed to fill completely the window or door opening in which the assembly is intended to be installed.

NONCOMBUSTIBLE. As applied to building construction material means a material that, in the

form in which it is used, is either one of the following:

1. Material of which no part will ignite and burn when subjected to fire.

2. Any material conforming to ASTM E136 shall be considered noncombustible within the meaning of this section.

3. For the purposes of this code, fire-rated gypsum board tested in accordance with ASTM C1396 with no less than a 1-hour fire-resistance-rating with fire exposure from the outside only is considered a noncombustible material.

OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, education or similar purposes or in which occupants are engaged at labor.

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. The system consists of a *roof covering* and *roof deck* or a single component serving as both the *roof covering* and the *roof deck*. A *roof assembly* can include an underlayment, thermal barrier, ignition barrier, insulation or a vapor retarder.

ROOF COVERING. The covering applied to the *roof deck* for weather resistance, fire classification or appearance.

ROOF DECK. The flat or sloped surface not including its supporting members or vertical supports.

SLOPE. The variation of terrain from the horizontal; the number of feet rise or fall per 100 feet measured horizontally, expressed as a percentage.

STRUCTURE. That which is built or constructed.

STRUCTURE IGNITION ZONE. Structure Ignition Zone is the structure and the area around the structure (or home). The SIZ takes into account both the potential of the structure to ignite and the quality of *defensible space* surrounding it.

TREE CROWN. The primary and secondary branches growing out from the main stem, together with twigs and foliage.

WILDLAND-URBAN INTERFACE. The geographic areas within Douglas County identified on the Colorado Wildfire Resiliency Code Map where structures and other human development meet or intermingle with wildland or vegetative fuels.

Chapter 3 - Wildfire Hazard Identification

SECTION 301 GENERAL

301.1 Scope. The provisions of this chapter provide methodology to establish and record wildfire hazard based on the findings of fact to be regulated by this code.

301.2 Objective. The objective of this chapter is to provide simple baseline criteria for determining *wildland-urban interface* areas based on the wildfire hazard.

SECTION 302 WILDLAND-URBAN INTERFACE AREA DESIGNATIONS

302.1 Declaration. Douglas County declares the *wildland-urban interface* areas within Douglas County as shown on the Colorado Wildfire Resiliency Code Map, available at: https://experience.arcgis.com/experience/34c113129c044004bc672ca5493378de/

SECTION 303 MAPPING AND APPLICABILITY

303.1 Mapping of Wildfire Hazard Areas. The Wildfire Hazard area map for Douglas Count is the Colorado Wildfire Resiliency Code Map. This map identifies areas subject to the provisions of this code and is available at the link provided above and at the Douglas County Building Division Office.

303.1.1 Map. This map is based on a combination of factors including, but not limited to, vegetative fuels, topography, local weather patterns, and fire behavior modeling data.

303.1.2 Locally Developed Mapping. Douglas County may develop and adopt local maps designating wildfire hazard and *fire intensity classifications* within its jurisdictional boundaries in accordance with Sections 303.1 through 303.3.

303.2 Fire Intensity Classification. *Fire Intensity Classification* is identified on the map in accordance with Section 303.1. *Fire Intensity Classification* is determined by expected wildfire behavior, including flame length and suppression difficulty and is separated into three levels: low, moderate, and high. The identified *fire intensity classification* establishes code requirements for construction and mitigation.

303.2.1 Low Fire Intensity Classification. Low *Fire Intensity Classification* is identified in areas with light to medium surface fuels, such as grasses, shrubs, and scattered low-density vegetation. These fuels are often discontinuous, which limits flame propagation but can sustain burning under moderate weather conditions. Fires in this class may occur on gentle to moderate *slopes*, where topography begins to influence the rate of spread. Although flame lengths remain relatively small—typically less than two feet—limited spotting may occur, especially with wind. Trained firefighters with protective equipment and standard hand tools can usually suppress these fires through direct attack, particularly on *slopes* under 30 percent. Mechanized equipment is typically unnecessary.

Key Characteristics Include:

1. **Fuels**: Light to medium surface fuels, including grasses, shrubs, and scattered vegetation (e.g., WNL, USL fuel types).

2. **Flame Length**: Less than 2 feet.
3. **Rate of Spread**: Low, increasing with *slopes* over 20 percent.
4. **Spotting**: Very short-range spotting is possible under windy conditions.
5. **Terrain Influence**: More active fire behavior on moderate *slopes* (20 to 30 percent).
6. **Suppression Difficulty**: Easily suppressed by trained firefighters using basic protective gear and hand tools. Direct attack is effective, and mechanized support is rarely needed.

303.2.2 Moderate Fire Intensity Classification. Moderate *Fire Intensity Classification* is identified in areas with moderate to heavy fuel loads, such as dense shrubs, small trees, and accumulated ground fuels. Fires in this class present continuous horizontal and vertical fuel arrangements, allowing flames to reach up to 8 feet in length. Fire behavior is notably influenced by moderate to steep *slopes*, often accelerating the spread.

Short-range spotting becomes more common, complicating suppression efforts. Ground crews typically require mechanized support, such as engines and dozers, to establish control lines. Aircraft assistance may be necessary, particularly in inaccessible terrain. There is a significant increase in the potential for property damage and risk to life, especially in *wildland-urban interface* areas.

Key Characteristics Include:

1. **Fuels**: Moderate to heavy fuels, including dense shrublands, small trees, timber litter, and canopy fuels (e.g., USH, UIH fuel types).
2. **Flame Length**: Up to 8 feet.
3. **Rate of Spread**: Moderate to high, increasing significantly on *slopes* over 30 percent.
4. **Spotting**: Short-range spotting is common.
5. **Terrain Influence**: Steep *slopes* (30 percent or greater) increase fire spread and intensity.
6. **Suppression Difficulty**: Challenging for ground crews without support from engines, dozers, or aircraft. Dozers and plows are generally effective on moderate terrain.

303.2.3 High Fire Intensity Classification. High *Fire Intensity Classification* is identified in areas with heavy, continuous fuel loads, such as dense forest canopies, thick understory growth, and heavy dead/downed material. Fires in this class frequently occur on steep *slopes*, often exceeding 40 percent, where topography dramatically increases the rate of spread and severity. Flame lengths can exceed 30 feet, and both short- and medium-range spotting are common, particularly in windy conditions. Direct suppression by ground crews is typically ineffective, requiring indirect attack strategies, such as backburns and aerial retardant drops. Fires in this class pose extreme risk to life, property, and firefighter safety, especially in rugged or remote areas.

Key Characteristics Include:

1. **Fuels**: Heavy fuels, including dense forests, urban core areas with heavy fuel loads, and canopy-dominated regions (e.g., WNH, USH, UCH fuel types).

2. **Flame Length**: Up to 30 feet or more.
3. **Rate of Spread**: Rapid, especially on *slopes* greater than 40 percent.
4. **Spotting**: Short-range spotting is common; medium-range spotting is possible under windy conditions.
5. **Terrain Influence**: *Slopes* over 40 percent amplify intensity and spread, creating dangerous conditions for suppression.
6. **Suppression Difficulty**: Direct attack by ground forces and dozers is generally ineffective. Indirect strategies (backburning, aerial support) are often necessary. These fires present significant danger to life, property, and responder safety.

303.3 Applicability of Code Provisions. The requirements of this code shall apply to all parcels located within the designated Wildfire Hazard Areas and corresponding *fire intensity classifications* as identified on the Colorado Wildfire Resiliency Code Map. The level of structure hardening, *defensible space*, and other mitigation measures required shall correspond to the applicable *fire intensity classification*—Low, Moderate, or High—as established by the board.
Structures and parcels identified with low *fire intensity classification* shall be constructed and maintained in accordance with the provisions for Class 1 structure hardening and site and area requirements.
Structures and parcels identified with moderate to high *fire intensity classifications* shall be constructed and maintained in accordance with the provisions for Class 2 structure hardening and site and area requirements.

SECTION 304 GROUND-TRUTHING

304.1 Purpose. This section establishes a process for owners or the owners authorized representative to request a ground-truthing review of their property's Wildfire Hazard or *fire intensity classification* as identified on state or locally adopted maps. The intent is to provide an opportunity to verify that mapping accurately reflects current, site-specific conditions.

304.2 Determination of Fire Intensity Classification and Code Requirements. As determined by the *code official,* the *fire intensity classification* and associated requirements shall be based on a review of the vegetative fuels on the parcel and within 300' of the parcel boundary, topography, local weather patterns, and fire behavior modeling data and in accordance with the following *fire intensity classifications*:

304.2.1 Low *Fire Intensity Classification* in accordance with Section 303.2.1
304.2.2 Moderate *Fire Intensity Classification* in accordance with Section 303.2.2
304.2.3 High *Fire Intensity Classification* in accordance with Section 303.2.3

This determination shall be made based on existing conditions or conditions that have been established by a development plan approved by Douglas County. Technical documentation shall be submitted in support of such request by a qualified wildfire professional and in accordance with Section 104.2.

Chapter 4- Structure Hardening

SECTION 401 GENERAL

401.1 Scope. Exterior design and construction of new buildings and structures within the *wildland-urban interface* areas of Douglas County that are outside the corporate limits of a city or town and outside the boundaries of a fire protection district shall be constructed in accordance with this chapter.

Exceptions:

1. Buildings of an accessory character classified as Group U occupancy (including *agricultural buildings*) of any size located at least 50 feet from a structure containing *occupiable* or *habitable space*.
2. One-story detached accessory, nonhabitable structures, such as tool and storage sheds, playhouses and similar uses, provided that the floor area does not exceed 120 square feet and the structure is located greater than or equal to 10 feet from the nearest adjacent occupiable structure.
3. The reconstruction, replacement, alteration, or repair of the exterior walls of an existing building, when less than 25 percent of the surface area of all exterior walls is affected.
4. The reconstruction, replacement, alteration, or repair of the exterior *roof covering* of an existing building, when less than 25 percent of the surface area of the exterior *roof covering* or an attachment thereto is affected.
5. Alterations or repairs to the exterior of an existing structure, or an attachment to it, when less than twenty-five percent of the exterior of the structure is affected by the alteration or repair.
6. Additions that do not increase the footprint of a structure by more than 500 square feet.

SECTION 402 BUILDING MATERIAL

402.1 Building material. Building materials shall comply with any one of the requirements in Section 402.2 through 402.4.

402.2 Noncombustible material. *Noncombustible* material shall comply with the definition of *noncombustible* materials in Section 202.

402.3 Fire-retardant-treated wood. *Fire-retardant-treated wood* shall be identified for exterior use and shall meet the requirements of Section 2303.2 of the 2024 *International Building Code*.

402.4 Ignition-resistant building material. Material shall be tested on the front and back faces in accordance with the extended ASTM E84 or UL 723 test, for a total test period of 30 minutes, or with the ASTM E2768 test. The materials shall bear identification showing the fire test results. Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch. The materials, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, shall comply with Sections 402.4.1 through 402.4.3.3. Materials or products which melt, drip or delaminate to the extent that the flame front is interrupted are not permitted.

Exception: Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch thickness or corrosion-

resistant steel at a minimum 0.0149 inch thickness shall not be required to be tested with a ripped or cut longitudinal gap.

402.4.1 Flame spread. The material shall exhibit a *flame spread index* not exceeding 25.

402.4.2 Flame front. The material shall exhibit a flame front that does not progress more than 10 feet 6 inches beyond the centerline of the burner at any time during the test.

402.4.3 Weathering. *Ignition-resistant building materials* shall maintain their performance in accordance with this section under conditions of use. The materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in Sections 402.4.3.1 through 402.4.3.3, as applicable to the materials and conditions of use.

402.4.3.1 Evaluation requirements for weathering. Fire-retardant-treated wood, wood-plastic composite materials and plastic lumber materials shall be evaluated after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898.

402.4.3.2 Wood-plastic composite materials. Wood-plastic composite materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation, then weathering in accordance with ASTM D7032 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

402.4.3.3 Plastic lumber materials. Plastic lumber materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation, then weathering in accordance with ASTM D6662 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

SECTION 403 CLASS 1 STRUCTURE HARDENING

General. Class 1 structure hardening shall be in accordance with Sections 403.2 through 403.4.2 and shall apply to buildings and structures hereafter constructed, modified or relocated into or within areas of the *wildland-urban interface* having a low fire hazard severity.

403.1 Roofing. Roofs shall have a *roof covering* or *roof assembly* classified as Class A when tested in accordance with ASTM E108 or UL 790.

403.1.1 Flame and ember protection of roofs. For roof assemblies where the roof covering profile creates a space between the roof covering and roof deck, the space shall resist the entry of flames and embers by one or more of the following methods:

1. Firestopping with noncombustible material of the space between the roof covering and the roof deck.

2. Installation of one layer of cap sheet complying with ASTM D3909 over the combustible roof deck.
3. Installation of a listed Class A classified roof assembly.

403.1.2 Roof valley flashings. Valley flashings shall be not less than 0.019 inch (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36- inch-wide underlayment consisting of one layer of cap sheet complying with ASTM D3909 running the full length of the valley.

403.2 Gutters and downspouts. Gutters and downspouts shall be constructed of *noncombustible* material.

403.3 Ventilation Openings. Ventilation openings for enclosed attics, enclosed rafter spaces, and underfloor spaces shall be in accordance with Section 403.4.1 or Section 403.4.2 as applicable.

403.3.1 Performance Requirements. Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

403.3.2 Prescriptive Requirements. Ventilation openings for enclosed attics, enclosed rafter spaces, and underfloor spaces shall be covered with *noncombustible* 404.3corrosion-resistant mesh with openings not to exceed ⅛-inch.

SECTION 404 CLASS 2 STRUCTURE HARDENING

404.1 General. Class 2 structure hardening shall be in accordance with Sections 404.2 through 404.10.1 as well as the provisions of Class 1 structure hardening in Sections 403.2-403.4.2 and shall apply to buildings and structures hereafter constructed, modified or relocated into or within areas of the *wildland-urban interface* having a moderate or high fire hazard severity. See also Sections 101.6-101.7.

404.2 Protection of eaves. Eaves and soffits shall be protected on the exposed underside by *noncombustible material, ignition-resistant materials,* or by materials approved for not less than 1-hour *fire-resistance-rated construction*, *⅝-inch Type X drywall,* 2-inch nominal dimension lumber, or 1 inch nominal *fire-retardant-treated wood* or ¾ inch nominal fire-retardant-treated plywood, identified for exterior use and meeting the requirements of Section 2303.2 of the 2024 *International Building Code*. Fascias are required and shall be protected on the backside by *noncombustible material, ignition-resistant materials,* or by materials approved for not less than 1-hour *fire-resistance-rated construction, ⅝-inch Type X drywall,* or 2-inch nominal dimension lumber.

404.3 Exterior Walls. Exterior walls of buildings or structures shall be constructed with one of

the following methods:

1. Exterior wall assemblies with a minimum of 1-hour fire-resistance rating, rated for exposure on the exterior side.
2. *Approved noncombustible materials.*
3. *Heavy timber* or *log wall construction.*
4. *Noncombustible* materials complying with Section 402.2 on the exterior side.
5. *Fire-retardant treated wood* complying with Section 402.3 on the exterior side. The *fire-retardant-treated wood* shall be labeled for exterior use and meet the requirements of Section 2303.2 of the 2024 *International Building Code*.
6. Ignition-resistant materials complying with Section 402.4 on the exterior side.

Such material shall extend from the top of the foundation to the underside of the eave or the underside of the roof sheathing.

Exceptions:

1. Exterior wall *embellishments* and architectural trim (exclusive of trim on exterior windows and doors) not to exceed 5 percent of the square footage of the exterior wall.
2. Roof or wall top cornice projections and similar assemblies.
3. Solid wood rafter tails and solid wood blocking installed between rafters having minimum dimension 2 inch nominal.

404.3.1 Exterior Wall Coverings. Exterior wall coverings shall be limited to the following:

1. *Noncombustible* materials.
2. *Fire-retardant-treated wood*.
3. *Ignition-resistant building materials*.

Exception: Where options 1 or 2 in section 404.3 are used, vinyl siding may be used as an exterior covering.

404.3.2 Flashing. A minimum of 6 inches of metal flashing or *noncombustible* material applied vertically between the wall sheathing and the exterior cladding shall be installed at the ground, decking, and roof intersections.

Combustible sheathing products exposed by the gap created at the base of the exterior walls, posts, or columns must be protected with *noncombustible material* or *ignition-resistant building materials* while still permitting drainage and moisture control from behind exterior cladding.

404.4 Underfloor enclosure. Buildings or structures shall have underfloor areas enclosed to the ground or comply with exterior walls in accordance with Section 404.3.

404.5 Decking. Unenclosed decks shall have the deck walking surface constructed of one of the following:

1. *Approved noncombustible* materials
2. Class A rated material

   Exception: Composite decking material with a minimum of Class B rating
3. *Fire-retardant-treated wood* identified for exterior use and meeting the requirements of Section 2303.2 of the 2024 *International Building Code*
4. *Ignition-resistant building materials* in accordance with Section 402.4.

404.6 Appendages and Projections. Appendages and projections shall be constructed in

accordance with Section 404.3.

404.7 Exterior Glazing. Exterior windows, window walls and glazed doors, windows within exterior doors, and skylights shall be tempered glass, *multilayered glazed panels*, glass block or have a fire protection rating of not less than 20 minutes.

404.8 Exterior Doors. Exterior doors shall be *approved noncombustible* construction, solid core wood not less than 1 ¾-inches thick, or have a fire protection rating of not less than 20 minutes. Windows within doors and glazed doors shall be in accordance with Section 404.7.

Exception: Vehicle access doors.

404.9 Vehicle Access Door Perimeter Gap. Exterior vehicle access doors shall resist the intrusion of embers from entering by preventing gaps between doors and door openings, at the head, sill, and jamb of doors from exceeding ⅛ inch as approved by the AHJ.

Gaps between doors and door openings shall be controlled by one of the following methods:

1. Weather-stripping products made of materials that: (a) have been tested for tensile strength in accordance with ASTM D638 (Standard Test Method for Tensile Properties of Plastics) after exposure to ASTM G155 (Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials) for a period of 2,000 hours, when the maximum allowable difference in tensile strength values between exposed and non-exposed samples does not exceed 10 percent; and (b) exhibit a V-2 or better flammability rating when tested to UL 94 (Standards for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances).
2. Door overlaps onto jambs and headers.
3. Garage door jambs and headers covered with metal flashing.

404.10 Detached Accessory Structures. Detached *accessory structures* located less than 50 feet from a building containing *habitable* or *occupiable space* shall have exterior walls constructed in accordance with Section 404.3 through 404.3.2.

404.10.1 Underfloor areas. Where the detached structure is located and constructed so that the structure or any portion thereof projects over a descending *slope* surface greater than 10 percent, the area below the structure shall have underfloor areas enclosed to within 6 inches of the ground, with exterior wall construction in accordance with Section 404.3 or underfloor protection in accordance with Section 404.4 or with ⅛-inch metal corrosion-resistant screen with a hardened zone within 5 feet.

Exception: The enclosure shall not be required where the underside of exposed floors and exposed structural columns, beams and supporting walls are protected as required for exterior 1-hour *fire-resistance-rated construction, heavy timber construction, noncombustible* materials on the exterior side, or *fire-retardant-treated wood* on the exterior side. The *fire-retardant-treated wood* shall be labeled for exterior use and meet the requirements of Section 2303.2 of the 2024 *International Building Code.*

Chapter 5- Site and Area Requirements

SECTION 501 GENERAL

501.1 Scope. The provisions of this chapter shall apply to parcels subject to this code.

501.2 Reference. As needed, the *code official* shall refer to the Home Ignition Zone (HIZ) Guide as developed by the Colorado State Forest Service.

Where conflicts occur between provisions of this code and the HIZ Guide, the provisions of this code shall govern. The provisions of this code, as applicable, shall take precedence over the provisions in the referenced standard.

SECTION 502 CLASS 1 REQUIREMENTS

502.1 Structure Ignition Zone 1 (0-5 feet): Immediate Zone

502.1.1 Objective. This zone is designed to reduce or eliminate ember ignition and direct flame contact with the structure, decks, stairs, and attachments.

502.1.2 Materials. Use *noncombustible*, hard surface materials in this zone, such as rock, gravel, sand, concrete, bare earth or stone/concrete pavers.

Exception: Ignition-resistant plantings, per an approved list by the AHJ that is not less than that created by the Colorado State Forest Service, are allowed in the Immediate Zone.

502.1.3 Plantings. Remove all plantings including shrubs, slash, combustible mulch and other woody debris, with the exception of ignition-resistant vegetation.

502.1.4 Trees. There shall be no planting of new trees in the immediate zone. Mature trees of no less than 10-inch diameter at 4.5 feet above ground level may be maintained.

Tree crowns extending to within 10 feet of any structure shall be pruned to maintain a minimum clearance of 10 feet.

Prune tree branches to a height of 6-10 feet from the ground or a third of the total height of the tree, whichever is less.

502.2 Site Signage

502.2.1 Marking of roads. *Approved* signs or other *approved* notices shall be provided and maintained for access roads and driveways to identify such roads and prohibit the obstruction thereof.

502.2.2 Marking of fire protection equipment. Fire protection equipment and fire hydrants shall be clearly identified in a manner *approved* by the *code official* to prevent obstruction.

502.2.3 Address markers. Buildings shall have a permanently posted address, which shall be placed at each driveway entrance and be visible from both directions of travel along the road. In all cases, the address shall be posted at the beginning of construction and shall be maintained thereafter, and the address shall be visible and legible from the road on which the address is located in a manner *approved* by the *code official*.

502.3 Retaining Walls

502.3.1 Retaining Walls. Retaining walls shall be constructed with either *noncombustible* or ignition-resistant materials when any of the following conditions exist:

1. The retaining wall is within 8 feet of a structure regulated by this code or up to the property line when the property line is less than 8 feet away from the structure.
2. The retaining wall is integral to the support of a structure regulated by this code.
3. The retaining wall is integral to the egress from a structure regulated by this code to a public way, easement, or private road.

502.4 Fencing

502.4.1 Fencing. Fencing within 8 feet of a structure regulated by this code or up to the property line when the property line is less than 8 feet away from the structure shall be constructed with *noncombustible* or ignition-resistant materials.

Exception: Vinyl fencing. Vinyl fencing may be allowed.

SECTION 503 CLASS 2 REQUIREMENTS

503.1 General. Class 2 site and area requirements shall be in accordance with Sections 503.2 through 503.3.2 and include all requirements of Class 1 in Sections 502.1 through 502.4.

503.2 Structure Ignition Zone 2 (5-30 feet) Intermediate Zone

503.2.1 Objective. This zone is designed to give an approaching fire less fuel, which will help reduce its intensity as it gets nearer to structures.

503.2.2 Dead Materials. Within the *fuel modification* area, hazardous dead plant material must be removed from live vegetation.

503.2.3 Fuels Accumulation. Avoid large accumulations of surface fuels such as logs, branches, slash and combustible mulch.

503.2.4 Trees. *Tree crowns* extending to within 10 feet of any structure shall be pruned to maintain a minimum clearance of 10 feet.

Prune tree branches to a height of 6-10 feet from the ground or a third of the total height of the tree, whichever is less.

503.2.4.1 Tree Spacing. *Tree crowns* within this zone shall be spaced to prevent structure ignition and promote fuel discontinuity to limit fire spread.

503.2.5 Shrubs. Shrub groups within this zone shall be spaced to prevent structure ignition. Shrubs shall be at least 10 feet away from the edge of tree branches.

503.3 Structure Ignition Zone 3 (30-100 feet) Expanded Zone

503.3.1 Objective. This zone focuses on mitigation that keeps fire on the ground.

503.3.2 Tree Spacing. *Tree crowns* within this zone shall be spaced at a minimum of 6-10 feet.

MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Trevor Bedford, AICP, Senior Planner

DESCRIPTION: 7440 North US Highway 85 - Range Metro District Infrastructure Project - Location and Extent - Project File: LE2025-027.

SUMMARY: The request is for approval of a Location and Extent for the construction of two water pumpstations, a water storage tank, and associated infrastructure include water pipelines internal to the Range Planned Development.

STAFF ASSESSMENT: Staff evaluated the application in accordance with Section 32 of the Dougals County Zoning Resolution. Should the Planning Commission approve the Location and Extent request, the applicant will be required to receive approval of all necessary permits prior to commencement of the project.

ATTACHMENTS:

Cover Page
Staff Report - LE2025-027
Supplemental Info
Update Memo - LE2025-027

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Staff Report - LE2025-027

DOUGLAS COUNTY
COLORADO

Location and Extent Staff Report

Date: January 21, 2026

To: Douglas County Planning Commission

From: Trevor Bedford, AICP, Senior Planner TB
Jeanette Bare, AICP, Current Planning Manager JB
Steven E. Koster, AICP, Assistant Director of Planning Services SK

Subject: **7440 North US Highway 85 – Range Metro District Infrastructure Project – Location and Extent**

Project File: **LE2025-027**

Planning Commission Hearing: **February 2, 2026 @ 6:00 p.m.**

I. EXECUTIVE SUMMARY

Range Metropolitan District (RMD) requests approval of a Location and Extent (L&E) for two proposed water pump stations, a water storage tank, and associated infrastructure necessary to provide water service to residential lots within the Range Planned Development. The project is located on the east side of the intersection of US Highway 85 and Airport Road and will connect to off-site water infrastructure recently approved as part of a separate Location and Extent application.

The property is within the Louviers Rural Community as identified by the 2040 Comprehensive Master Plan.

II. APPLICATION INFORMATION

A. Applicant

Range Metropolitan District Nos. 1-3
2154 E. Commons Ave, Suite 2000
Centennial, CO 80122

B. Applicant's Representative

Bryan Horan
8678 Concord Center Drive, Suite 200
Englewood, CO 80112

C. Request

The applicant requests approval of an L&E for the construction of two water pump stations, a water storage tank, and associated infrastructure include water pipelines internal to the Range PD.

D. Location

The project is located within the Range Planned Development east of the intersection of US Highway 85 and Airport Road. The attached vicinity map, zoning map, and aerial map highlight site location and existing conditions.

E. Project Description

RMD proposes to construct two pump stations, a water tank, and associated infrastructure to provide the Range Planned Development with water utility service.

The lower pump station will be located along the north entrance road, approximately 1,000 feet east of US Highway 85. This pump station will include an approximately 20-foot by 17-foot building that will contain boost pumps to send water to the upper pump station. The upper pump station will be located in the southeast corner of the Range Filing 1 subdivision, approximately 2,900 feet east of US Highway 85. The upper pump station will include fire boost pumps within a 35-foot by 17-foot building. An emergency diesel generator will be located outside of the pump house to provide power in emergencies.

The water tank will be located near the upper pump station, approximately 37 feet from the eastern property line. The tank is proposed to be above ground and will measure 63 feet in diameter and 24 feet in height. The DCZR requires water storage tanks to be buried "unless this requirement is waived by the Director due to geological/topographical conditions that would prevent burial." In this case, as the project is a Location and Extent request, the Planning Commission would consider the overall tank design as part of its review of the L & E. In the project narrative, the applicants explained that the water tank must be above ground to ensure optimal performance and long-term reliability. They stated that a below-grade installation would reduce the elevation advantage needed for adequate pressure and would require larger pumps. They also stated that a below-grade tank would complicate inspections and maintenance.

The applicant anticipates construction to begin following approval of the Range Filing 1 final plat which is currently under review by County staff.

III. CONTEXT

A. Background

The proposed infrastructure is for the Range PD which was approved by the Board of County Commissioners (BCC) in 2021 for 550 residential units on 399 acres. The PD requires central water and sewer services. A preliminary plan for the 550 units was approved by the BCC in May of 2025. A condition of approval of the preliminary plan was "Prior to approval of the first final plat, Location and Extent applications shall be approved for water and sewer infrastructure improvements necessary to serve the Range." On December 15, 2025, the Planning Commission approved a Location and

Extent application for off-site utilities. This submittal is for additional on-site utilities to serve the Range.

B. Adjacent Land Uses and Zoning

Adjacent lands include residential, agricultural, industrial, and Highlands Ranch Backcountry.

Zoning and Land Use

	Zoning	Land Use
North	Rural Residential and Highlands Ranch PD	Residential Tract and Highlands Ranch Backcountry
South	Agricultural One	Vacant
East	Highlands Ranch PD	Highlands Ranch Backcountry
West	Agricultural One and General Industrial	Agricultural and Industrial

IV. PHYSICAL SITE CHARACTERISTICS

A. Site Characteristics and Constraints

The Range property generally slopes upwards towards the southeast corner of the property. A final plat is under review to develop the property for residential development.

B. Access

The lower pump house will be connected to a roadway within the Range Filing 1 via an driveway connection. The upper pump house and water storage tank will be connected to a trail with a roadway connection within Range Filing 1 via a driveway.

C. Drainage and Erosion

The applicant provided a Phase III Drainage Report for review. Engineering responded to the referral request noting that the project is in general conformance with Douglas County Engineering criteria and that detailed comments regarding site work will be provided with Range Filing 1 final plat comments. Approval of any necessary plans and permits including GESC and construction plans will be required prior to commencement of construction.

D. Floodplain

There is 100-year floodplain on a portion of the northern half of the Range property. The proposed improvements are south of the floodplain.

V. PROVISION OF SERVICES

A. Schools

This is an infrastructure project and does not directly impact school services. The Range Planned Development will continue to be evaluated for school impacts through the subdivision process.

B. Fire Protection

South Metro Fire Rescue (SMFR) provides fire and emergency services to the site. SMFR responded to the referral request with a conditional non-objection and with information regarding proposed addresses. The applicant will be required to obtain any approvals or permits necessary from SMFR prior to commencement of construction.

C. Sheriff Services

The Douglas County Sheriff's Office (DCSO) will provide police protection to the site. The Office of Emergency Management responded to the referral request with no comment. No responses were received from E911 or DCSO.

D. Water and Sanitation

The purpose of this project is to provide water services to the Range Planned Development.

E. Utilities

Area utility providers were provided a referral on this application. AT&T and Xcel Energy responded with no conflicts. No response was received from CenturyLink or Comcast.

F. Other Required Processes and Permits

In addition to the L&E approval, the following permits and other approvals may be required prior to commencement of construction:

- Engineering: Construction Drawings approval, GESC report and plans approval, approval of any other necessary plans and permits.
- Building Division: Building permits.
- South Metro Fire Department: Any necessary permits.

VI. PUBLIC NOTICE AND INPUT

Courtesy notices of an application in progress were sent to adjacent property owners. At the preparation of the staff report, no members of the public had responded to courtesy notices. Any comments received will be provided prior to the hearing. Referral responses were sent to required referral agencies on December 16, 2025. Referral responses were due at the conclusion of the referral period on December 30, 2025, or prior to the Planning Commission Hearing.

Referral agency responses received to date are attached to the staff report for reference. The Highlands Ranch Community Association (HRCA) noted concerns with the appearance of an above-ground water storage tank near the Backcountry Wilderness Area. HRCA requested that the tank be constructed below grade and that sound mitigation be required for generators. The applicant's responses to referral comments are attached to the staff report.

VII. STAFF ASSESSMENT

Staff evaluated the application in accordance with Section 32 of the DCZR. Should the Planning Commission approve the L&E request, the applicant will be required to receive approval of all necessary permits prior to commencement of the project.

ATTACHMENTS **PAGE**

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LAND USE APPLICATION

Please complete, sign, and date this application. Return it with the required items listed on the Submittal Checklist to planningsubmittals@douglas.co.us. Submittals may also be mailed or submitted in person to Planning Services. *NOTE: The Planning Commission or the Board of County Commissioners should not be contacted regarding an open application*.

OFFICE USE ONLY

PROJECT TITLE:

PROJECT NUMBER: LE2025-027

PROJECT TYPE: Location and Extent

MARKETING NAME: Range Metropolitan District Range Planned Development

PRESUBMITTAL REVIEW PROJECT NUMBER: PS2025-211

PROJECT SITE:

Address: US-85 and Airport Road

State Parcel Number(s): 2353-031-00-001

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

PROPERTY OWNER(S):

Name(s): Range Metropolitan District Nos. 1-3

Address: 2154 E. Commons Ave., Suite 2000, Centennial CO 80122

Phone: 303-525-2683

Email: bhoran@ventanacap.com

AUTHORIZED REPRESENTATIVE: *(Notarized Letter of Authorization is required from the property owner, unless the owner is acting as the representative)*

Name: Bryan Horan

Address: 8678 Concord Center Drive, Suite 200 Englewood, CO 80112

Phone: 303-525-2683

Email: bhoran@ventanacap.com

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

Applicant Signature

12/11/2025
Date

PREBLE'S MEADOW JUMPING MOUSE

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

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

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

1. Unauthorized or unpermitted collection, handling, harassing, or taking of the species;

2. Activities that directly or indirectly result in the actual death or injury death of the mouse, or that modify the known habitat of the species, thereby significantly modifying essential behavioral patterns (e.g., plowing, mowing, or cutting; conversion of wet meadow or riparian habitats to residential, commercial, industrial, recreational areas, or cropland; overgrazing; road and trail construction; water development or impoundment; mineral extraction or processing; off-highway vehicle use; and, hazardous material cleanup or bioremediation); and;

3. The application or discharge of agrichemicals or other pollutants and pesticides onto plants, soil, ground water, or other surfaces in violation of label directions or any use following Service notification that such use, application or discharge is likely to harm the species; would be evidence of unauthorized use, application or discharge.

How to determine if a proposed activity would violate the Endangered Species Act.
Any questions regarding whether an activity will impact the Preble's Meadow Jumping Mouse or its habitat should be directed to:

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

Where to find more information on the Preble's Meadow Jumping Mouse.
More information can be found at the US Fish and Wildlife Service website at:
https://ecos.fws.gov/ecp/species/4090

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

TECHNICAL MEMORANDUM

DOUGLAS COUNTY LOCATION AND EXTENT REPORT

RANGE METROPOLITAN DISTRICT
RANGED PLANNED DEVELOPMENT
WATER SUPPLY SYSTEM
US-85 & AIRPORT RD.

Prepared for:
Douglas County

Prepared by:
RICK Engineering

On Behalf of:
Range Metropolitan District

RICK Job No. 2215
December 2025

RICK

RICK

303-537-8020
rickengineering.com

8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

December 3, 2025

Planning Service Division
Douglas County
100 Third Street
Castle Rock, CO 80104

RE: Range Metropolitan District Range Planned Development Water Supply System

Dear Douglas County Planning Service Division:

Please accept this letter on behalf of the Range Metropolitan District for district infrastructure proposed to support the Range Planned Development. We are pleased to submit this Limits and Extents application for Range Filing No 1 for your approval, located at the intersection of US 85 and Airport Rd. within the approved Range Planned Development area in unincorporated Douglas County. This report will outline the upper and lower pump stations connected by a feed line that is proposed for this project.

Construction

Construction will include site preparation and grading for two pump stations and a water storage tank to established design elevations. Water utilities will be installed, including all associated piping, appurtenances, and a dedicated feed line between the lower and upper pump stations. Following utility installation, access drives will be constructed to provide maintenance and operational access to the facilities. Final site work will include installation of landscaping and site stabilization measures to restore disturbed areas and provide long-term erosion control.

Location & Appearance

The proposed lower water pump station will be situated approximately 1,000 feet east of the intersection of US 85 and Airport Road, located off the north entrance road. The building will measure approximately 20 feet in width by 17 feet in length. This will house the boost pumps which will send water through approximately 3,700 feet of feed line pipe to the upper pump station. The upper pump station and the associated water tank will be in the southeast corner of the Range Filing 1 clustered homes, approximately 2,900 feet east of US-85 and adjacent to the east property line. The pump house measures approximately 35 feet wide by 17 feet long and will contain the fire boost pumps. An emergency diesel generator will be just outside of the pump house and will provide power to the fire boost pumps in the event of an emergency. The water tank measures 63 feet in diameter and 24 feet in height. This will hold approximately 560,000 gallons. Both buildings will utilize fully cut-off exterior lighting to ensure illumination remains contained on-site, preventing light spillover onto adjacent properties. The buildings and the water tank will be finished in natural, subdued tones and screened with native trees to blend with the surrounding environment and enhance visual compatibility with nearby residences.

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

The water tank is being installed above ground to ensure optimal system performance and long-term reliability. Because the site is located on a hill above the adjacent housing development, burying the tank would significantly reduce the natural elevation advantage needed to achieve adequate pressure and would require a substantially larger fire pump to meet emergency flow standards. An underground installation would also complicate routine inspections and maintenance, limiting access to valves, fittings, and structural components and increasing the potential for undetected leaks or corrosion. While cost is a consideration, the primary drivers for an above-ground configuration are improved operational efficiency, better fire-response capability, and enhanced accessibility for safe maintenance over the life of the system.

Conformance with Douglas County Master Plan

Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts.

Stormwater

An onsite storm sewer system will convey runoff to one of five detention ponds which will provide water quality controls and then release it at historical rates along existing drainage ways. The Phase III Drainage Report and map have been included that show adequate drainage has been designed for the site.

Noise Control

Noise attenuation measures for the pumps and generator focus on minimizing operational sound levels at nearby residences while maintaining equipment performance. Because the selected pump house structure is wood framed rather than concrete, additional mitigation strategies will be implemented to compensate for its lower inherent sound attenuation. These measures include installing insulation and sound-dampening materials within the building envelope to reduce pump noise transmission, as well as orienting the ventilation system away from neighboring homes to limit exterior sound propagation.

The emergency generator located at the upper pump house will be housed in a dedicated enclosure outfitted with acoustic insulation, and, if required to meet target noise thresholds, sound-attenuated air intake and exhaust vents will be incorporated to further reduce noise emissions.

RICK
303-537-8020
rickengineering.com
8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

Traffic

Traffic associated with the pump houses is expected to be minimal and limited to periodic operational needs. The Range Metro District will make infrequent site visits for routine inspections, repairs, and landscape maintenance, resulting in only occasional vehicle access to the facilities. Due to the low frequency and short duration of these visits, traffic impacts on nearby residents are anticipated to be negligible and will not alter normal neighborhood traffic patterns or adversely affect residents' quality of life. The Range TIA has been included for reference purposes.

Paving Design

All pavement design for roadways and paved areas leading up to the pump houses is included as part of the Range Development Filing 1 submittal. The pump houses themselves will be served only by small access drives, the design and construction of which will be directed in the field by a qualified geotechnical engineer based on site-specific subsurface conditions and performance requirements.

Anticipated Process Timing

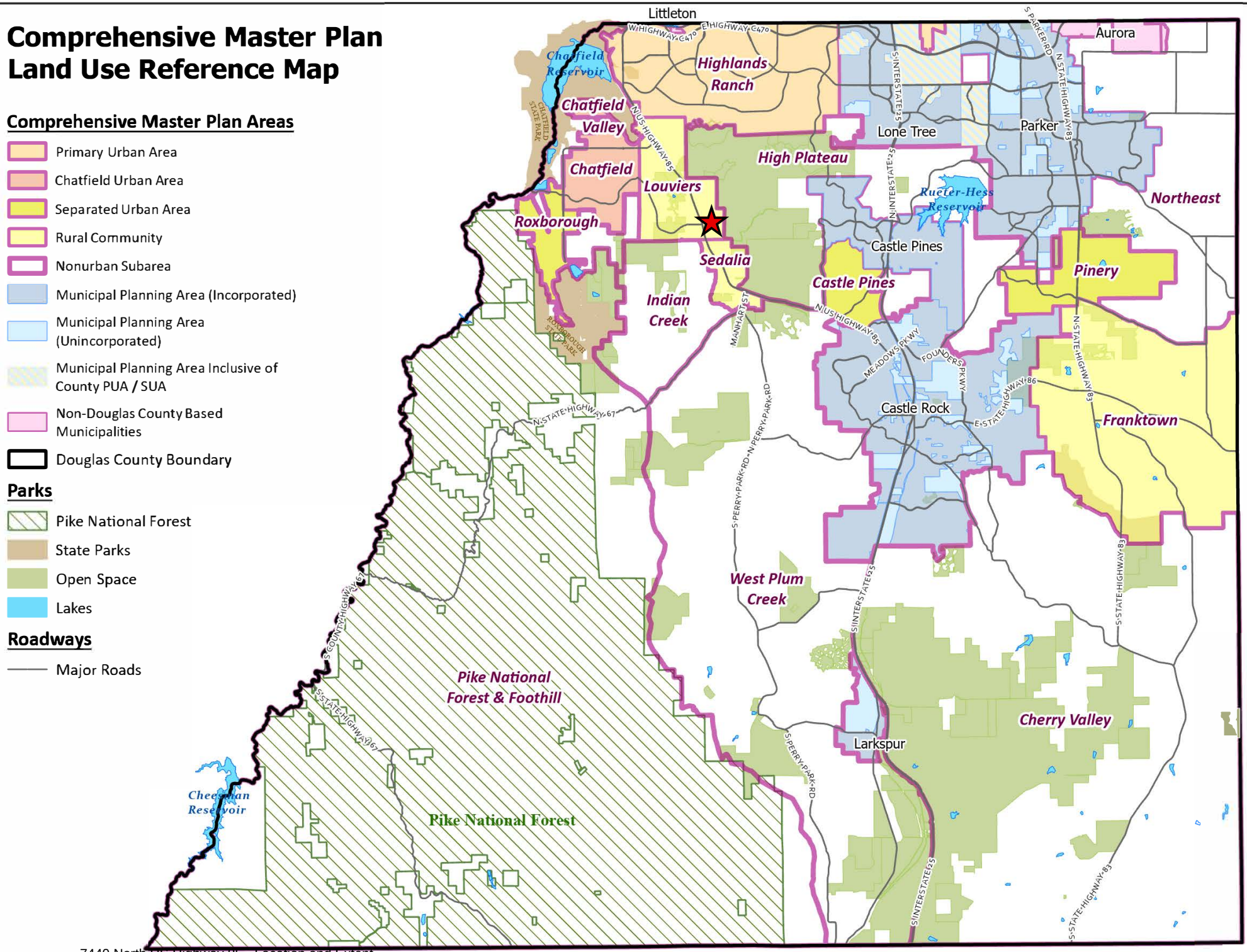
The Final Plat for Range Planned Development Filing 1 was placed in its first referral on December 9, 2025. We expect final permitting approvals in early 2026 with construction commencing shortly after county approvals. We anticipate Final Plat of Filing 2 to lag behind Filing 1 by approximately 6 months.

Thank you for your consideration of this pump house and water tank approval. We look forward to collaborating with Douglas County. Please do not hesitate to reach out with any questions or concerns you may have to help facilitate the approval process, and we look forward to your response.

Respectfully,

Troy Bales
tbales@rickengineering.com

Comprehensive Master Plan Land Use Reference Map



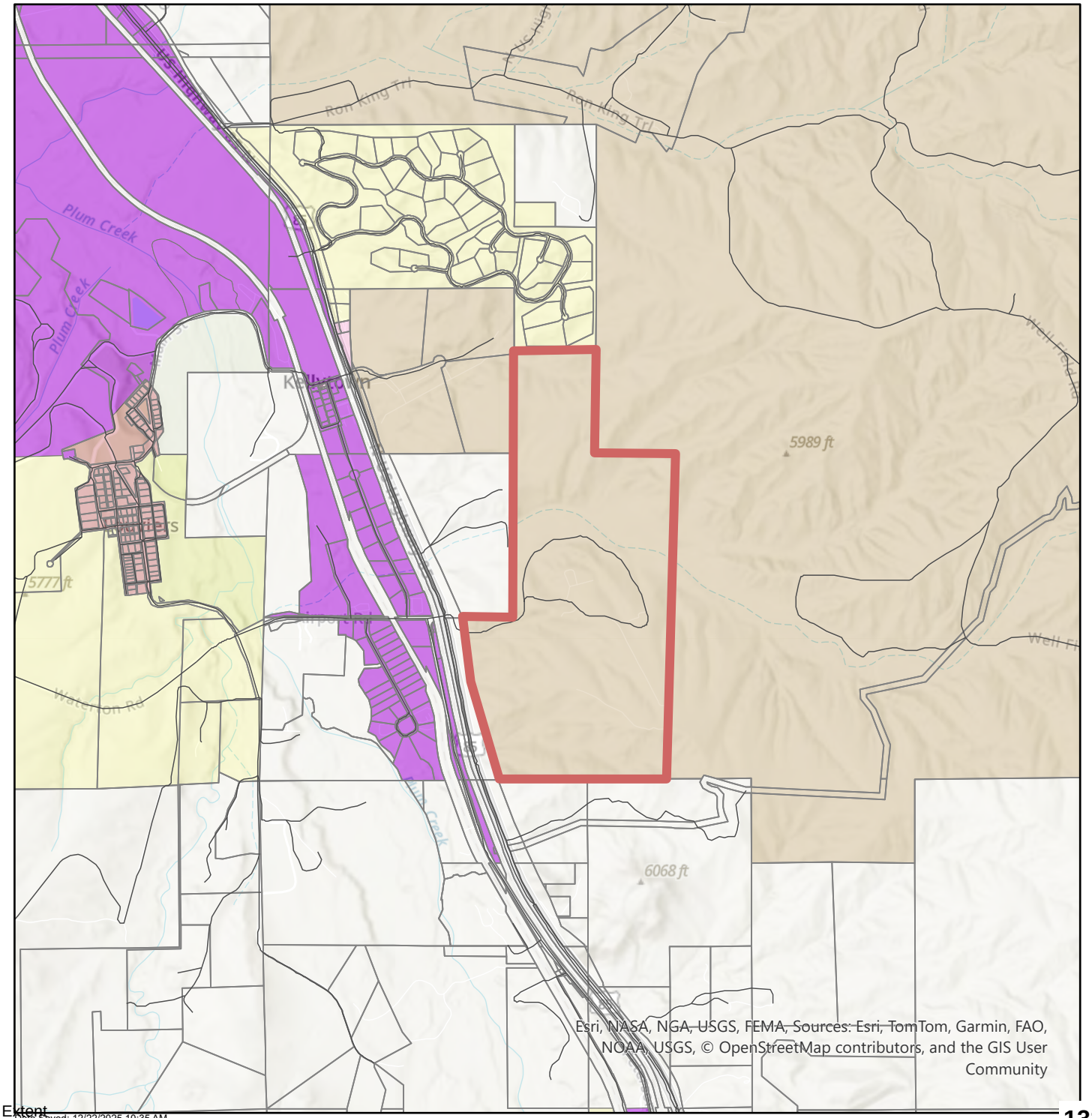
7440 North US Highway 85

LE2025-027
Zoning Map

N

LEGEND

- Major Roads
- Parcels - PARCELS
- A1 - AGRICULTURAL ONE
- RR - RURAL RESIDENTIAL
- SR - SUBURBAN RESIDENTIAL
- B - BUSINESS
- GI - GENERAL INDUSTRIAL
- PD - PLANNED DEVELOPMENT



7440 North US Highway 85 - Location and Extent
Date Saved: 12/22/2025 10:35 AM
Source: https://apps.douglas.co.us/gisportal/apps/webappviewer/index.html?id=9cd173c692b7436891bd0

7440 North US Highway 85

LE2025-027
Aerial Map

N

LEGEND
- Major Roads
- Parcels - PARCELS

7440 North US Highway 85 - Location and Extent
Date Saved: 12/22/2025 10:35 AM
Source: https://apps.douglas.co.us/gisportal/apps/webappviewer/index.html?id=9cd173c692b7436891bd0

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
Addressing Analyst	12/16/2025	Received: Proposed addresses are: 7518 N US HWY 85 - LOWER PUMP STATION 7508 N US HWY 85 - UPPER PUMP STATION These addresses are not to be used for any purpose other than for plan review until after this project is approved. Proposed addresses are subject to changes as necessary for 911 dispatch and life safety purposes. Addresses are recorded by Douglas County following all necessary approvals. Contact DCAddressing@douglas.co.us or 303.660.7411 with questions.	Information acknowledged by applicant
AT&T Long Distance - ROW	12/17/2025	Received: This is in response to your eReferral with a utility map showing any buried AT&T Long Line Fiber Optics near 7440 N HWY 85 Sedalia, Colorado. The Earth map shows the project area in red and the buried AT&T Long Line/Core Fiber Optics in yellow. Based on the address and/or map you provided, there should be NO conflicts with the AT&T Long Line facilities.	Information acknowledged by applicant
Building Services	12/22/2025	Received: Permit is required for structures. Please visit Douglas County's web site for requirements and contact 303-660-7497 if you have any questions.	Applicant acknowledged future permit requirement
CDPHE - All Referrals	12/22/2025	Received: See attached letter. Summary: Provided information regarding air quality regulations and fugitive dust pollution.	Applicant acknowledged comments and indicated that recommendations will be incorporated into the Range GESC plans as needed.
CDPHE - Water Quality Control Division		No Response Received:	No response necessary
CenturyLink		No Response Received:	No response necessary

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
Chatfield Community Association		No Response Received:	No response necessary
Chatfield Watershed Authority		No Response Received:	No response necessary
Cherokee Ridge Estates HOA		No Response Received:	No response necessary
Colorado Department of Transportation CDOT-Region # 1	12/16/2025	Received: I have reviewed the referral for the L and E for construction of two pump stations and a water storage tank for the Range Metro District and have no objections. If any work will take place in the State Highway Right-of-Way a permit will be required. Application is made online at the following link: https://socgov.my.site.com/portal/s/login/?ec=302&startURL=%2Fportal%2Fs%2F	Applicant indicated no work specific to this L&E will take place in CDOT right-of-way

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
Colorado Division of Water Resources	12/24/2025	Received: We have received your December 16, 2025 referral for Range Metropolitan District approval of a Location and Extent for the construction of two pump stations and a water storage tank. This referral does not appear to qualify as a "subdivision" as defined in section 30-28-101 (10)(a), C.R.S. Therefore, pursuant to the State Engineer's March 4, 2005 and March 11, 2011 memorandums to county planning directors, this office will only perform a cursory review of the referral information and provide informal comments. The comments do not address the adequacy of the water supply plan for this project or the ability of the water supply plan to satisfy any County regulations or requirements. In addition, the comments provided herein cannot be used to guarantee a viable water supply plan or infrastructure, the issuance of a well permit, or physical availability of water. Our office has no objections to the proposed construction of two pump stations and a water storage, since no changes to the water supply plan for the Range Development were proposed.	Information acknowledged by applicant
Comcast		No Response Received:	No response necessary

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
CORE Electric Cooperative	12/29/2025	Received: CORE Electric Cooperative has reviewed the materials included in the above-referenced referral response packet. Our review focused on existing CORE facilities, utility easements, electric loading, and overall service requirements for the proposed project. Based on this review, CORE offers the following comments and requests: CORE Electric Cooperative approves the Location and Extent for the project. Additional information is required. Due to the nature of this submittal, CORE requests that the applicant complete the enclosed Data Summary Sheet, which provides essential details regarding projected electrical loads and anticipated construction phasing. Please forward the attached Data Summary Sheet to the applicant and instruct them to return the completed form directly to me. The developer must provide information regarding: The maximum expected or allowable building square footage for each lot; and The anticipated type of business or occupancy for each lot. CORE understands that some of this information may be preliminary or based on best estimates; however, any details the applicant can provide will significantly assist us in ensuring that adequate electric facilities and capacity can be planned for and made available.	Applicant provided the requested information.
Dominion Water and Sanitation District		No Response Received:	No response necessary

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
Douglas County Health Department	12/30/2025	Received: See attached letter Summary: Provided information regarding stormwater runoff and mosquito control.	Applicant indicated that the Phase III drainage plan for the Range Filing 1 final plat addresses the concerns.
Engineering Services	12/29/2025	Received: Overall the project appears to be in general conformance with Douglas County Engineering criteria. Detailed comments regarding site work for the pump and tank sites will be provided with Range Filing 1 final plat comments.	Applicant will address any concerns with the Range Filing 1 final plat.

Highlands Ranch Community Association	12/17/2025	Received: The Highlands Ranch Community Association appreciates the opportunity to review and comment on this L&E. As noted in §3 of our 12/10/2025 Letter to Mike Pesicka (Principal Planner, DougCO) regarding DougCo SB2025-036 (Range Flg 1, Final Plat), "HRCA notes that the Range water system includes a major water storage tank and pump station facilities located near the southeastern portion of the project. Given the proximity to HRCA land, HRCA requests that: • Architectural treatment and landscape screening be required to mitigate visual impacts. • Lighting for these facilities be dark-sky compliant and oriented to minimize spillover. • Sound attenuation be incorporated for pump and generator equipment. These measures are important to preserve the natural character of the adjacent Backcountry Wilderness Area." These concerns are not addressed in this L&E. For example, the above ground water storage tank located in the southeast corner of the Range property will stand approximately 30' above grade, and only approximately 37' from the shared property line. Additionally, the generator for the "upper pump station" in this location will also be located approximately 47' from the shared property line. The HRCA strongly encourages Douglas County to require the water storage tank be constructed below grade - like the multiple water storage tanks that serve Highlands Ranch - especially those close to the	Applicant provided additional information to justify the placement of the proposed water tank. The applicant indicated landscaping will be used to screen the area. Applicant indicated that dark sky wall pack lights will be used and any backup generators will be enclosed with standard sound attenuation materials. See applicant's responses for further details.

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
		Backcountry Wildnerness Area, like this tank. This tank, placed on top of a manufactured high point, will not be aesthetically pleasing for either future residents of Range, or from the Backcountry Wilderness Area. A "residential grade muffler" for the generator should be required to ensure sound mitigation.	

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Louviers Conservation Partnership	12/28/2025	Received: Louviers Conservation Partnership (LCP) has reviewed the documents for the 7440 North US Highway 85 Request by Range Metropolitan District for two water pump stations and a water storage tank and has comments following the document excepts below:: Below are excerpts from the documents reviewed of items important to the Town of Louviers including about Louviers and the current eastbound Airport Road level of Service (LOS). Conformance with Douglas County Master Plan Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts. Felsburg Holt & Ullevig Range 5th Revised Traffic Impact Analysis The Town of Louviers is to the northwest of US 85 and the project site. It is a relatively small enclave of residential homes that was originally constructed as a company town to support the E.I. du Pont de Nemours dynamite manufacturing facilities and it is one of the best preserved company towns in Colorado.	Applicant acknowledged comments and indicated that any comments will be addressed with the traffic review of the final plat. The traffic study mentioned was provided as a reference and is not specific to this L&E application.

		The evaluation of an intersection controlled by a traffic signal provides average vehicle delay and LOS information for the entire intersection, as well as for individual movements. Figure 3 also shows the LOS results for existing conditions which finds that the US 85/Airport Road intersection is currently operating at LOS B during the AM and PM peak hours. Given the relatively high traffic demand on US 85, however, eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour. Of note, the operational analyses are based on signal timing data provided by CDOT and it is understood that this intersection operates in a "free" mode which allows the traffic signal to fluctuate to meet vehicle movement demand without a specified cycle length. As such, the traffic signal controller appears to allocate more "green time" to movements along US 85, which, in turn, creates a higher level of delay for the eastbound Airport Road movements that result in the poor eastbound LOS. Projected vehicle-trips for Range is almost 5,000 vehicles per day with approximately 400 during the AM peak hour and about 525 during the PM peak hour. Although this is just location and extents for 2 pump stations and a water storage tank which would only have an impact when being built, it does include a full traffic study which mentions eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during	

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Agency	Date Received	Agency Response	Response Resolution
		the PM peak hour. This study used existing traffic data from 2020 which will not include the approved Brannan Asphalt Plant which has not started operating yet in addition to the approved Brannan crushing and existing Brannan concrete plant for a total of 1008 truck trips per day and also the added traffic from the recently approved Zebulon Mega Sports Complex where they are now requesting a change to add more residential units. Randy Johnson Director Louviers Conservation Partnership	
Mile High Flood District		No Response Received:	No response necessary
Office of Emergency Management	12/18/2025	No Comment:	No response necessary
Rural Water Authority of Douglas County		No Response Received:	No response necessary
Sheriff's Office		No Response Received:	No response necessary
Sheriff's Office E911		No Response Received:	No response necessary

Project Name: 7440 North US Highway 85
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Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
South Metro Fire Rescue	12/23/2025	Received: South Metro Fire Rescue (SMFR) has reviewed the provided documents and has conditional non-objection to the proposed Location and Extent. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project. COMMENTS: 1. Referrals for new structures must not use unapproved addresses as the project name. These facilities will be addressed from future roadways and will not be addressed from US Hwy 85, Addresses proposed by the Addressing Analyst (which does not match the project title) will also change. Building addresses and unit numbers shall be coordinated with and approved by SMFR and the Douglas County Addressing Analyst prior to submitting for construction permits.	Applicant acknowledged information.
Wildfire Mitigation		No Response Received:	No response necessary
Xcel Energy-Right of Way & Permits	12/19/2025	Received: Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the above-mentioned application and currently has no apparent conflict. As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 for utility locates prior to construction.	Applicant acknowledged information.

REFERRAL RESPONSE REQUEST – LOCATION AND EXTENT

Date sent: December 16, 2025 Comments due by: **December 30, 2025**

Project Name:	7440 North US Highway 85– Location and Extent
Project File #:	LE2025-027
Project Summary:	Range Metropolitan District requests approval of a Location and Extent for the construction of two pump stations and a water storage tank.

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

☐	No Comment		
☒	Please be advised of the following concerns: Overall, the project appears to be in general conformance with Douglas County Engineering criteria. Detailed comments regarding site work for the pump and tank sites will be provided with Range Filing 1 final plat comments.		
☐	See letter attached for detail.		
Agency:	Douglas County Public Works	**Phone #:**	303-660-7490
Your Name:	Ken Murphy, P.E.	**Your Signature:**	Ken Murphy
	(please print)	**Date:**	29 DEC 2025

A public hearing on this request will be held before the Douglas County Planning Commission on **Monday, January 5, 2026, at 6:00 pm**. ***This public hearing will be held on-line and in person. See the County website or contact the Planning Department for more information.***

Sincerely,

Trevor Bedford, AICP, Senior Planner

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

VIA EMAIL
RE: Douglas County eReferral (Project Number LE2025-027) Is Ready For Review

Dear Trevor Bedford,

The Colorado Department of Public Health and Environment's Air Pollution Control Division (APCD or Division) received a request for an air quality administrative review concerning the proposed pump and water tank project as described in your correspondence dated December 16, 2025. The Division has reviewed the project letter and respectfully offers the following comments. Please note that the following Air Quality Control Commission (AQCC) regulations may not be inclusive of the regulations the proposed project will be subject to. It is the responsibility of the involved parties to determine what regulations they are subject to and follow them accordingly.

Land Development
We also note that projects similar to this proposal often involve land development. Under Colorado air quality regulations, land development refers to all land clearing activities, including but not limited to land preparation such as excavating or grading, for residential, commercial or industrial development. Land development activities release fugitive dust, a pollutant regulation by the Division. Small land development activities are not subject to the same reporting and permitting requirements as large land activities. Specifically, land development activities that are less than 25 contiguous acres and less than 6 months in duration do not need to report air emissions to the Division. It is important to note that even if a permit is not required, fugitive dust control measures including the Land Development APEN Form APCD-223 must be followed at the site. Fugitive dust control techniques commonly included in the plan are included in the table below.

Control Options for Unpaved Roadways	
Watering	Use of chemical stabilizer
Paving	Controlling vehicle speed
Graveling	
Control Options for Mud and Dirt Carry-Out Onto Paved Surfaces	
Gravel entry ways	Washing vehicle wheels
Covering the load	Not overfilling trucks
Control Options for Disturbed Areas	
Watering	Application of a chemical stabilizer
Revegetation	Controlling vehicle speed
Compaction	Furrowing the soil
Wind Breaks	Minimizing the areas of disturbance
	Synthetic or Natural Cover for Slopes

Please refer to the website https://cdphe.colorado.gov/apens-and-air-permits for information on land use APENs and permit forms. Click on “Land Development” to access the land development specific APEN form. Please contact KC Houlden, Construction Permits Unit Supervisor, at 303-691-4092, kenneth.houlden@state.co.us if you have any specific questions about APENs and permit forms.

If you have any other questions or need additional information, please use the contact info listed above, or e-mail or call me directly. Thank you for contacting the Air Pollution Control Division about your project.

Sincerely,
Brendan Cicione
Air Quality and Transportation Planner
General SIP Unit
Air Pollution Control Division
Colorado Department of Public Health and Environment
303-691-4104 // brendan.cicione@state.co.us

DOUGLAS COUNTY
HEALTH DEPARTMENT COLORADO

December 29, 2025

Trevor Bedford
Planning Services
100 Third Street
Castle Rock, CO 80104

RE: LE2025-027

Dear Trevor Bedford,

Thank you for the opportunity to review and comment on the referenced approval request of a Location and Extent for the construction of two pump stations and a water storage tank application submitted by Range Metropolitan District. Douglas County Health Department (DCHD) staff have reviewed the application for compliance with pertinent environmental and public health regulations. After reviewing the application, DCHD has the following comment(s):

Stormwater Impacts on Nearby Waterway
Development of the subject parcel will potentially result in an increase of stormwater and snowmelt runoff that may contribute significant pollutant loadings to the Daniels Park drainage, a tributary to Plum Creek. These pollutants include bacteria, nutrients, metals, and oxygen consuming contaminants. *A Phase III Drainage Report for Range Filing 1 has been submitted.*

Mosquito Control - Stormwater Facilities
The site plan indicates that five full-spectrum detention ponds are proposed. Detention ponds can become sites for mosquito breeding. To reduce the potential for human exposures to West Nile and other mosquito-borne viruses, DCHD recommends that the applicant prepare a mosquito control plan. Elements of the plan should include proper design, construction and regular inspection and maintenance of stormwater quality facilities, and larviciding if mosquito larvae become a problem.

Please feel free to contact me at 720-907-4887 or KHochstetler@douglas.co.us if you have any questions about our comments.

Sincerely,

Kristin Hochstetler
Environmental Health Specialist
Douglas County Health Department

Trevor Bedford

From: Loeffler - CDOT, Steven <steven.loeffler@state.co.us>
Sent: Tuesday, December 16, 2025 2:58 PM
To: Trevor Bedford
Cc: Jessica Varner - CDOT; Joseph Tripple - CDOT
Subject: Re: Douglas County eReferral (Project Number LE2025-027) Is Ready For Review

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

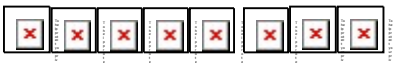
Trevor,

I have reviewed the referral for the L and E for construction of two pump stations and a water storage tank for the Range Metro District and have no objections. If any work will take place in the State Highway Right-of-Way a permit will be required. Application is made online at the following link: https://socgov.my.site.com/portal/s/login/?ec=302&startURL=%2Fportal%2Fs%2F

Thank you for the opportunity to review this referral.

Steve Loeffler
Permits Unit- Region 1

P 303.757.9891 | F 303.757.9053
2829 W. Howard Pl. 2nd Floor, Denver, CO 80204
steven.loeffler@state.co.us | www.codot.gov | www.cotrip.org



On Tue, Dec 16, 2025 at 11:29 AM <tbedford@douglas.co.us> wrote:

> There is an eReferral for your review. Please use the following link to log on to your account: https://urldefense.com/v3/__https://apps.douglas.co.us/planning/projects/Login.aspx__;!!PUG2raq7KiCZwBk!eD8BOdbfe29ir2cjwvGNRSsLcqg6I8fCXBFb3ee8FMdmUf4TnN9WmN6zn7QsiSg4ocEoRA5iIpdl2YR1KONHlpQgp_uw$
>
> Project number LE2025-027, 7440 North US Highway 85.
>
> Range Metropolitan District requests approval of a Location and Extent for the construction of two pump stations and a water storage tank.
>
> This referral will close on Tuesday, December 30, 2025.
>
> If you have any questions, please contact me.

Sincerely,

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

PROJECT REFERRAL LOADING AND DATA SUMMARY SHEET

Dear Applicant:

Please complete the following summary sheet and return to:

Sean Atkinson
CORE Electric Cooperative
5496 North U.S. Highway 85
P.O. Drawer A
Sedalia, Colorado 80135
satkinson@core.coop

Project Name _____

Residential Developments:

1. Total number of homes or units in development _____
2. Lot breakdown of construction phases:

Phase	Filing(s)	Block(s)	Lot(s)	Construction Date (Month/Year)

3. Electrical loads of homes or units:
   - Typical size of home or unit _____ (sq. ft.)
   - Typical size of electrical service _____ (amps)
   - Number of homes or units designed or built with A/C _____
4. Other electrical loads (Examples: schools, wells, booster pumps, water treatment facilities, clubhouses, or golf courses):
   _____
   _____

Commercial Developments:

1. Extent of commercial development:

Lot/Block	Lot Size (sq. ft.)	Building Size (sq. ft.)	Type of Business (i.e. retail, office, industrial, restaurant)	Construction Date (Month/Year)

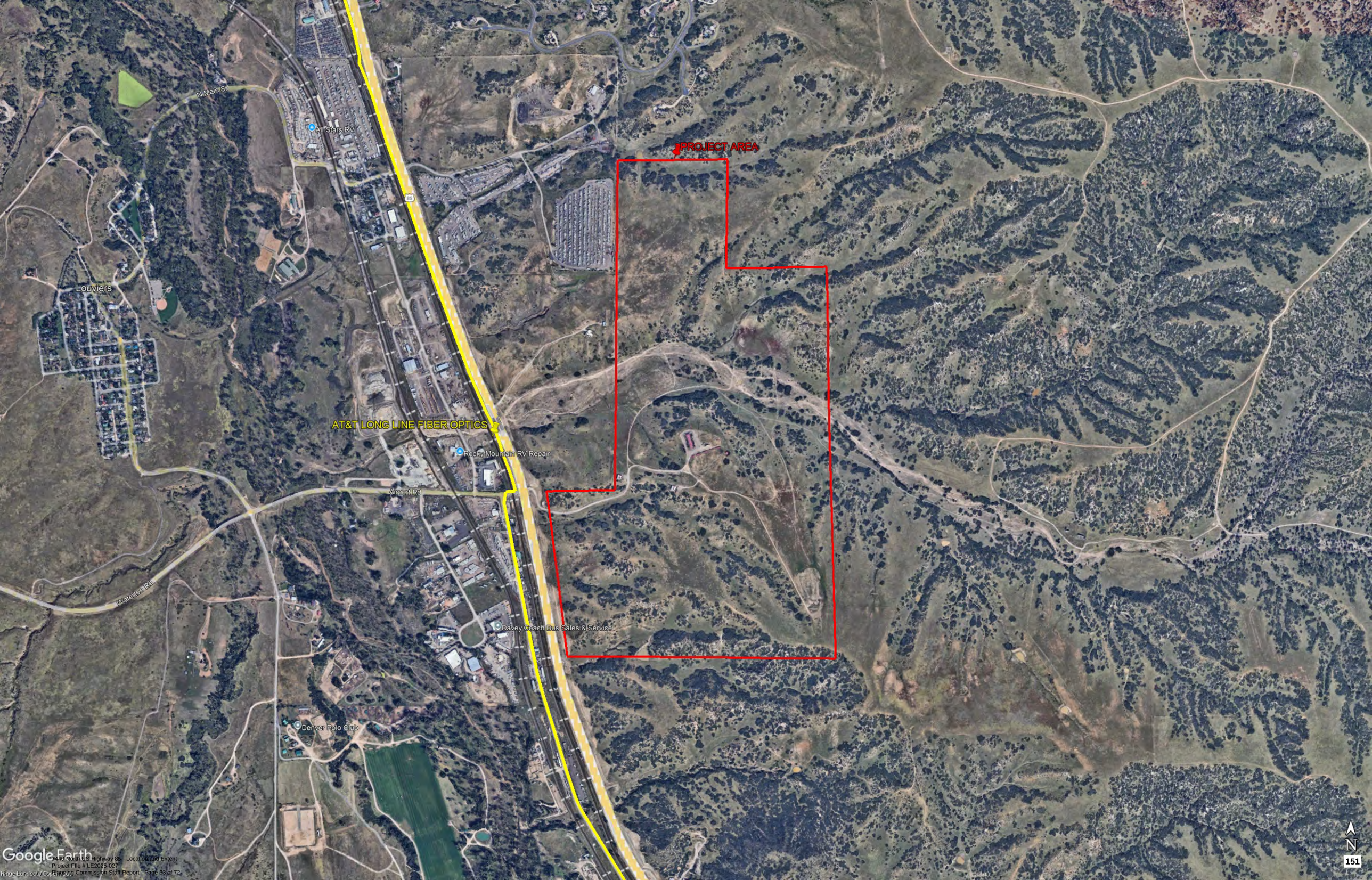
2. Type of electrical service: ☐ 1Ø, 120/240 V ☐ 3Ø, 120/208 V ☐ 3Ø, 277/480V
3. Estimated kW demand of load(s) if known:
   _____
   _____
4. Other electrical loads (Examples: wells, booster pumps, or water treatment facilities):
   _____
   _____

Project contact:

Name _____ Phone _____
Company _____
Address _____
_____

Thank you for completing the above information. If you have any questions, please contact me at (720) 733-5480.

Sean Atkinson
System Planner


PROJECT AREA
AT&T LONG LINE FIBER OPTICS
N Main St
All Stars RV
Louviers
Rocky Mountain RV Repair
Airport Rd
Waterton Rd
Davey Coach Bus Sales & Service
Denver Polo Club
Google Earth
Image Landsat / Copernicus

HIGHLANDS RANCH
COMMUNITY ASSOCIATION

Wednesday - December 10, 2025

Sent Via: Email to: mpesicka@douglas.co.us

Mr. Mike Pesicka, Principal Planner
Douglas County, ComDev Dpt: PLANNING
100 Third Street
Castle Rock, CO 80104-2425

RE: **DougCo SB2025-036: Range Filing 1, Final Plat**

HRCA Comments and Concerns

Greetings, Mr. Pesicka:

The Highlands Ranch Community Association (HRCA) appreciates the opportunity to review and opine on the Final Plat submittal for Range Filing No. 1. As you know, HRCA owns and manages the Backcountry Wilderness Area, which directly abuts the eastern and northeastern boundary of the Range property, and therefore has a significant interest in the long-term interface between this development and protected open space.

After reviewing the Final Plat documents and supporting technical materials, HRCA acknowledges that Filing No. 1 appears to be generally consistent with the previously approved Planned Development and Preliminary Plan, and that utility systems, drainage facilities, and roadway infrastructure are designed to be contained within the Range project and the associated metropolitan districts.

Accordingly, HRCA offers conditional support for Final Plat Filing No. 1, subject to the following concerns and expectations being formally recognized and addressed through future filings, site improvement plans, and associated approvals.

HRCA Conditions and Preserved Objections

1. *Boundary Treatment, Fencing, and Trespass Prevention*

   HRCA previously raised concerns during Preliminary Plan review regarding boundary treatments, fencing, and trespass management along the shared interface between Range and the Backcountry Wilderness Area. Those concerns remain unresolved at this stage.

   HRCA requests that future filings explicitly include:

   - Permanent fencing or physical boundary controls where residential lots or trails abut HRCA land.
   - Signage identifying the boundary between private/community property and protected open space.
   - Design measures that prevent informal access into HRCA property from Range neighborhoods.

Education and wayfinding, while beneficial, do not replace physical boundary measures where development directly interfaces with conservation land.

2. *Trail Design and Connectivity*

HRCA requests that trail systems be designed to:

- Avoid directing users toward HRCA land unless an access agreement exists.
- Prevent trail terminations that encourage informal use or "social trails" into the Backcountry.
- Acknowledge HRCA property as a restricted, managed open space rather than general recreation land.

Any future trail planning near the HRCA boundary shall be coordinated with HRCA prior to approval.

3. *Infrastructure Siting: Water Storage Tank and Pump Stations*

HRCA notes that the Range water system includes a major water storage tank and pump station facilities located near the southeastern portion of the project.

Given the proximity to HRCA land, HRCA requests that:

- Architectural treatment and landscape screening be required to mitigate visual impacts.
- Lighting for these facilities be dark-sky compliant and oriented to minimize spillover.
- Sound attenuation be incorporated for pump and generator equipment.

These measures are important to preserve the natural character of the adjacent Backcountry Wilderness Area.

4. *Weed Control and Edge Management*

HRCA requests that the Final Plat and associated agreements clearly establish responsibility for:

- Ongoing weed control along the shared boundary.
- Native revegetation and restoration in areas disturbed adjacent to HRCA property.
- Prevention of invasive species transport into protected open space.

Control programs should be formalized in operating agreements, not left to informal management practices.

5. *Future Filings and Record Preservation*

HRCA expects that the matters outlined above be addressed in detail in:

- Filing No. 2.
- Any future Site Improvement Plans (SIPs).
- Utility facility approvals.
- Trail infrastructure submittals.

HRCA submits this letter to ensure these issues are documented in the land-use record and preserved for future review.

In summary, HRCA does not oppose Final Plat Filing No. 1 as a technical matter. However, HRCA's support is expressly conditioned on the expectation that boundary treatment, trail design, and infrastructure impacts are addressed in future approvals in a manner that protects HRCA-owned conservation lands.

Nothing in this letter shall be construed as a waiver of HRCA's ability to comment on or object to future filings, permits, or approvals related to the Range development that affect HRCA land or operational interests.

Please include this letter in the official project file. HRCA appreciates the opportunity to remain engaged in this process and welcomes continued coordination with Douglas County and the applicant as future submittals occur.

Sincerely,

HIGHLANDS RANCH COMMUNITY ASSOCIATION
Community Improvement Services

Weylan A. "Woody" Bryant, M LS, PE
Director: Community Improvement Services
303.471.8802 (direct) | 303.471.8821 (general office) | 303.549.0053 (cell)
Woody.Bryant@hrcaonline.org (email) | commercialreview@hrcaonline.org (alternate email)

Attachments: As noted, if applicable.

Cc: Mr. Mike Bailey, GM/CEO HRCA via: mike.bailey@hrcaonline.org
Mr. John Mezger, HRCA via: john.mezger@hrcaonline.org

HELP CONSERVE OUR NATURAL RESOURCES!

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

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

Project Name:	7440 North US Highway 85 – Location and Extent
Project File #:	**LE2025-027**
S Metro Review #	REFSP25-00312
Review date:	December 23, 2025
Plan reviewer:	Aaron Miller 720.989.2246 aaron.miller@southmetro.org
Project Summary:	Range Metropolitan District requests approval of a Location and Extent for the construction of two pump stations and a water storage tank
Code Reference:	Douglas County Fire Code, 2018 International Fire Code, and 2021 International Building Code with amendments as adopted by Douglas County.

South Metro Fire Rescue (SMFR) has reviewed the provided documents and has conditional non-objection to the proposed Location and Extent. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project.

COMMENTS:

1. **Referrals for new structures must not use unapproved addresses as the project name.** These facilities will be addressed from future roadways and will not be addressed from US Hwy 85, Addresses proposed by the Addressing Analyst (which does not match the project title) will also change. Building addresses and unit numbers shall be coordinated with and approved by SMFR and the Douglas County Addressing Analyst prior to submitting for construction permits.

Fire Flow per Appendix B

Construction Type	Building Area (SF)	Fire Flow (GPM)	Sprinkler System (Type)	Reduced Fire Flow

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

FIRE ACCESS ROAD DESIGN CRITERIA

BUILDING exterior walls (and any portion thereof) of any buildings that are more than 150 feet from the curb line of a public street shall be served by a Fire Apparatus Access Road which shall be unobstructed. This distance is measured by an approved route around the exterior of the building or facility. Additional allowances may be made for some sprinkler protected structures. Alternate access arrangements may be accepted based on site conditions and building fire protection features.

Due to the possibility of heavy vehicle traffic, residential and commercial collector and arterial roads may not be considered adequate for fire suppression operations; no credit for access to perimeter of buildings shall be given from collectors or arterials, unless specifically approved.

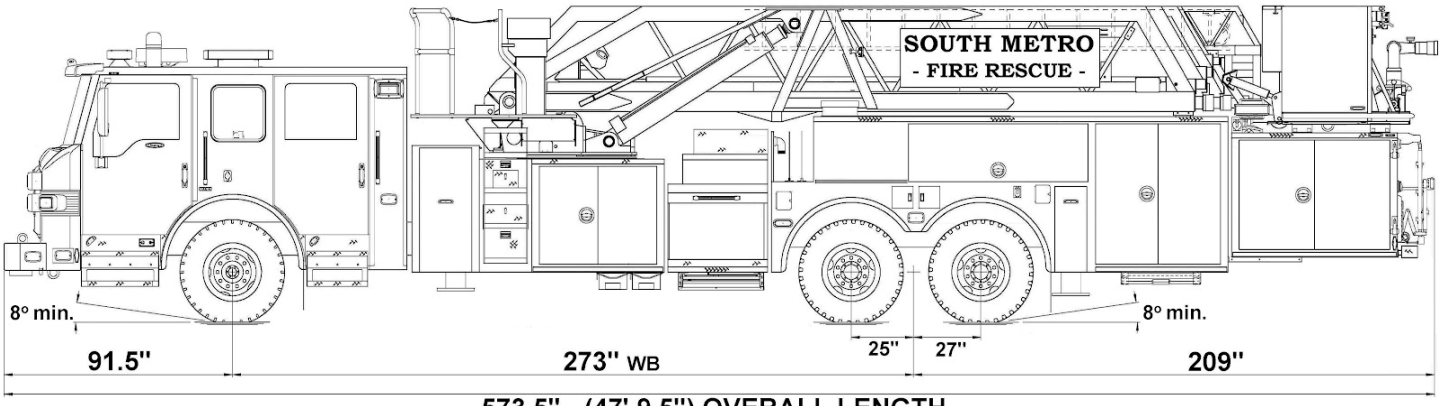
Sites not be capable of meeting these requirements and any alternative means must be evaluated and approved by the Fire Marshal.

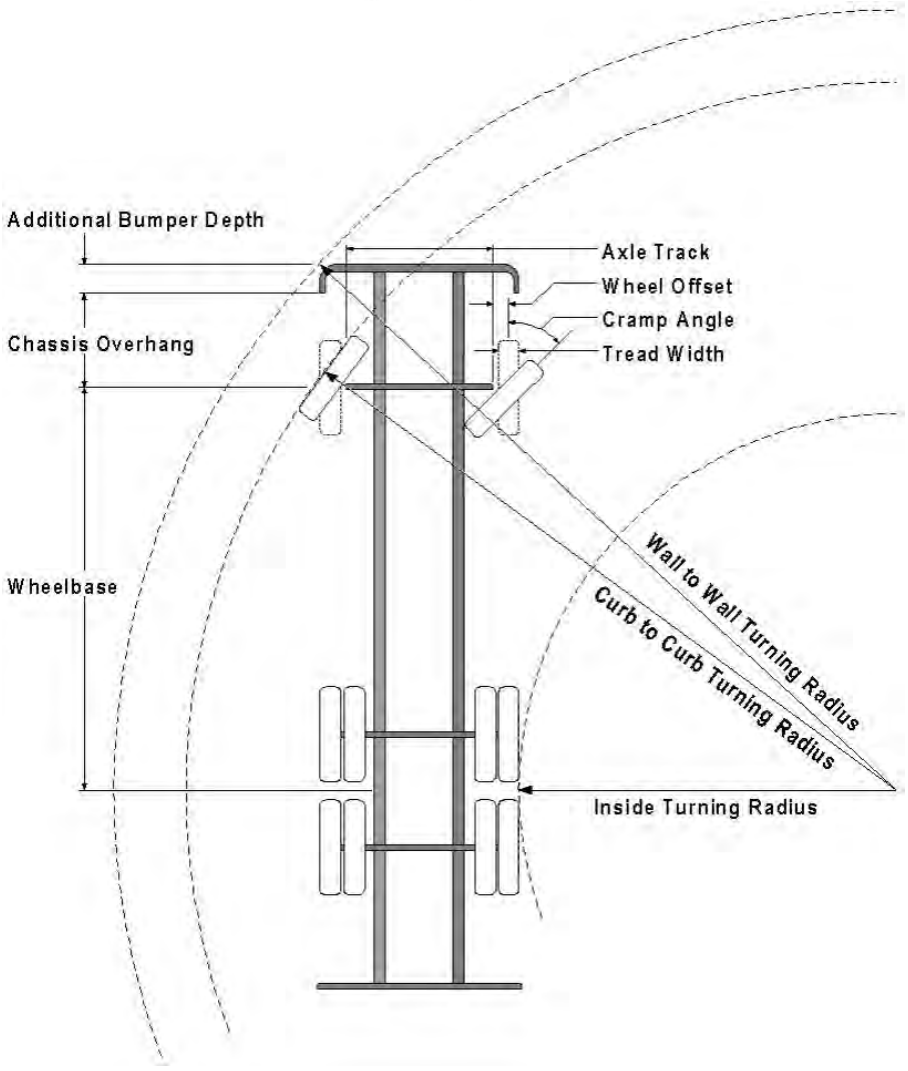
FIRE APPARATUS ACCESS ROADS shall be of an all-weather surface capable of supporting the imposed loads of fire apparatus. Maximum grade on site shall not exceed six percent (6%). Roads shall be asphalt or concrete. Other surfaces may be accepted on a case by case basis.

The minimum unobstructed width of the fire apparatus access road shall be 20 feet. In order to maintain the minimum width and prevent obstructions such as parking of vehicles fire lane signs shall be installed in an approved manner. A minimum vertical clearance of 13 feet, 6 inches shall be maintained for the entire required width of the access road.

Any dead-end access road over 150 feet long shall be provided with an approved turnaround that may be a circle, tee, hammerhead, or other functional approved design.

VEHICLE SPECIFICATIONS are provided for the largest apparatus in use by South Metro Fire Rescue. Fire Apparatus Access Roads shall be capable of accommodating this apparatus.





Vehicle Specifications

Length: 47' 9.5"

Width: 8' 5" - (10' 1" mirror to mirror)

Height: 10' 9"

Wheelbase: 273 in.

Design load: 80,000 pounds

Inside Cramp Angle: 40°

Axle Track: 83"

Wheel Offset: 5.3"

Tread Width: 13.5"

Turning Radii:

Inside Turn: 26 ft. 1 in.

Curb to curb: 41 ft. 11 in.

Wall to wall: 46 ft. 8 in.

Where objects are present adjacent to the fire apparatus access road, particularly on turns and turn arounds which require backing, a reasonable safety margin shall be provided to prevent potential damage to the property and to the fire apparatus.

PRIVATE ROADS that provide access to more than two dwellings or one or more commercial buildings shall be constructed to meet the roadway standards approved by the South Metro Fire Rescue Authority for fire apparatus access. Private roads that do not meet the roadway standard may be accepted provided that alternative methods and materials are incorporated into the subdivision that address the fire and life safety of the citizens.

Outlook

Louviers Conservation Partnership Range Location and Extent (LE2025-027) Comments

From Randy Johnson <rj2376@outlook.com>
Date Sun 12/28/2025 8:39 PM
To tbedford@douglas.co.us <tbedford@douglas.co.us>

Louviers Conservation Partnership (LCP) has reviewed the documents for the 7440 North US Highway 85 Request by Range Metropolitan District for two water pump stations and a water storage tank and has comments following the document excepts below::

Below are excerpts from the documents reviewed, noting in Bold items important to the Town of Louviers including about Louviers and the current eastbound Airport Road level of Service (LOS) highlighted in bold.

Conformance with Douglas County Master Plan

Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. **The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts.**

Felsburg Holt & Ullevig Range 5th Revised Traffic Impact Analysis

The Town of Louviers is to the northwest of US 85 and the project site. It is a relatively small enclave of residential homes that was originally constructed as a company town to support the E.I. du Pont de Nemours dynamite manufacturing facilities and it **is one of the best preserved company towns in Colorado.**

The evaluation of an intersection controlled by a traffic signal provides average vehicle delay and LOS information for the entire intersection, as well as for individual movements. Figure 3 also shows the LOS results for existing conditions which finds that the US 85/Airport Road intersection is currently operating at LOS B during the AM and PM peak hours. **Given the relatively high traffic demand on US 85, however, eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour.**

Of note, the operational analyses are based on signal timing data provided by CDOT and it is understood that this intersection operates in a "free" mode which allows the traffic signal to fluctuate to meet vehicle movement demand without a specified cycle length. As such, the traffic signal controller appears to allocate more "green time" to movements along US 85, which, in turn, **creates a higher level of delay for the eastbound Airport Road movements that result in the poor eastbound LOS.**

Projected vehicle-trips for Range is almost 5,000 vehicles per day with approximately 400 during the AM peak hour and about 525 during the PM peak hour.

Although this is just location and extents for 2 pump stations and a water storage tank which would only have an impact when being built, it does include a full traffic study which mentions **eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour.** This study used existing traffic data from 2020 which will not include the approved Brannan Asphalt Plant which has not started operating yet in addition to the approved Brannan crushing and existing Brannan concrete plant for a total of 1008 truck trips per day and also the added traffic from the recently approved Zebulon Mega Sports Complex where they are now requesting a change to add more residential units.

Randy Johnson
Director
Louviers Conservation Partnership

Right of Way & Permits

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

December 19, 2025

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

Attn: Trevor Bedford

Re: 7440 North US Highway 85, Case # LE2025-027

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the above-mentioned application and currently has **no apparent conflict**.

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

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

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Applicant Responses to Referral Comments
Addressing Analyst	12/16/2025	Received: Proposed addresses are: 7518 N US HWY 85 - LOWER PUMP STATION 7508 N US HWY 85 - UPPER PUMP STATION These addresses are not to be used for any purpose other than for plan review until after this project is approved. Proposed addresses are subject to changes as necessary for 911 dispatch and life safety purposes. Addresses are recorded by Douglas County following all necessary approvals. Contact DCAddressing@douglas.co.us or 303.660.7411 with questions.	Acknowledged. These temporary addresses will be used until the permanent street name is recorded and Addressing issues the final address.
AT&T Long Distance - ROW	12/17/2025	Received: This is in response to your eReferral with a utility map showing any buried AT&T Long Line Fiber Optics near 7440 N HWY 85 Sedalia, Colorado. The Earth map shows the project area in red and the buried AT&T Long Line/Core Fiber Optics in yellow. Based on the address and/or map you provided, there should be NO conflicts with the AT&T Long Line facilities.	Noted, we acknowledge your approval.
Building Services	12/22/2025	Received: Permit is required for structures. Please visit Douglas County's web site for requirements and contact 303-660-7497 if you have any questions.	A permit will be requested and approved before any vertical construction takes place.
CDPHE - All Referrals	12/22/2025	Received: See attached letter. Summary: Provided information regarding air quality regulations and fugitive dust pollution.	See CDPHE response letter
CDPHE - Water Quality Control Division		No Response Received:	
CenturyLink		No Response Received:	

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Applicant Responses to Referral Comments
Chatfield Community Association		No Response Received:	
Chatfield Watershed Authority		No Response Received:	
Cherokee Ridge Estates HOA		No Response Received:	
Colorado Department of Transportation CDOT-Region # 1	12/16/2025	Received: I have reviewed the referral for the L and E for construction of two pump stations and a water storage tank for the Range Metro District and have no objections. If any work will take place in the State Highway Right-of-Way a permit will be required. Application is made online at the following link: https://socgov.my.site.com/portal/s/login/?ec=302&startURL=%2Fportal%2Fs%2F	See CDOT response letter

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Applicant Responses to Referral Comments
Colorado Division of Water Resources	12/24/2025	Received: We have received your December 16, 2025 referral for Range Metropolitan District approval of a Location and Extent for the construction of two pump stations and a water storage tank. This referral does not appear to qualify as a "subdivision" as defined in section 30-28-101 (10)(a), C.R.S. Therefore, pursuant to the State Engineer's March 4, 2005 and March 11, 2011 memorandums to county planning directors, this office will only perform a cursory review of the referral information and provide informal comments. The comments do not address the adequacy of the water supply plan for this project or the ability of the water supply plan to satisfy any County regulations or requirements. In addition, the comments provided herein cannot be used to guarantee a viable water supply plan or infrastructure, the issuance of a well permit, or physical availability of water. Our office has no objections to the proposed construction of two pump stations and a water storage, since no changes to the water supply plan for the Range Development were proposed.	Acknowledged. Thank you for the review.
Comcast		No Response Received:	

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Applicant Responses to Referral Comments
CORE Electric Cooperative	12/29/2025	Received: CORE Electric Cooperative has reviewed the materials included in the above-referenced referral response packet. Our review focused on existing CORE facilities, utility easements, electric loading, and overall service requirements for the proposed project. Based on this review, CORE offers the following comments and requests: CORE Electric Cooperative approves the Location and Extent for the project. Additional information is required. Due to the nature of this submittal, CORE requests that the applicant complete the enclosed Data Summary Sheet, which provides essential details regarding projected electrical loads and anticipated construction phasing. Please forward the attached Data Summary Sheet to the applicant and instruct them to return the completed form directly to me. The developer must provide information regarding: The maximum expected or allowable building square footage for each lot; and The anticipated type of business or occupancy for each lot. CORE understands that some of this information may be preliminary or based on best estimates; however, any details the applicant can provide will significantly assist us in ensuring that adequate electric facilities and capacity can be planned for and made available.	The data summary sheet has been filled out and provided with this submittal
Dominion Water and Sanitation District		No Response Received:	

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Applicant Responses to Referral Comments
Douglas County Health Department	12/30/2025	Received:	
Engineering Services	12/29/2025	Received: Overall the project appears to be in general conformance with Douglas County Engineering criteria. Detailed comments regarding site work for the pump and tank sites will be provided with Range Filing 1 final plat comments.	We will respond to any comments with the Filing 1 submittals.

Highlands Ranch Community Association	12/17/2025	Received: The Highlands Ranch Community Association appreciates the opportunity to review and comment on this L&E. As noted in §3 of our 12/10/2025 Letter to Mike Pesicka (Principal Planner, DougCO) regarding DougCo SB2025-036 (Range Flg 1, Final Plat), "HRCA notes that the Range water system includes a major water storage tank and pump station facilities located near the southeastern portion of the project. Given the proximity to HRCA land, HRCA requests that: • Architectural treatment and landscape screening be required to mitigate visual impacts. • Lighting for these facilities be dark-sky compliant and oriented to minimize spillover. • Sound attenuation be incorporated for pump and generator equipment. These measures are important to preserve the natural character of the adjacent Backcountry Wilderness Area." These concerns are not addressed in this L&E. For example, the above ground water storage tank located in the southeast corner of the Range property will stand approximately 30' above grade, and only approximately 37' from the shared property line. Additionally, the generator for the "upper pump station" in this location will also be located approximately 47' from the shared property line. The HRCA strongly encourages Douglas County to require the water storage tank be constructed below grade - like the multiple water storage tanks that serve Highlands Ranch - especially those close to the	Facilities and Visual Character: The developer study the feasibility of above ground and below ground tank. An above ground tank placed on a graded pad near the existing ground elevation at highest point of the site was chosen. This solution proved to be the most efficient to achieve required water main pressure for development by reasonably maximizing gravity provided system pressure while minimizing pump assisted pressure. Long term, this solution will minimize noise and operation and maintenance costs creating a more resilient system for the district. Landscaping, including shrubs and trees, will be provided to help visually screen the facilities from view from HRCA and Range lands. Lighting and Sound: The only outside lighting planned for the structures is a wall pack over the building's openings (i.e. man door, sectional doors, etc.). A dark-sky compliant wall pack can be specified. Necessary backup generated located outside of the pump houses will be enclosed. This will be equipped with standard sound attenuation materials to dampen the noise. The pump house enclosure will be insulated and will provide dampening to noise made from the pumps. Weekly generator testing can be scheduled during the day to provide the least amount of disturbance to surrounding areas.

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Applicant Responses to Referral Comments
		Backcountry Wildnerness Area, like this tank. This tank, placed on top of a manufactured high point, will not be aesthetically pleasing for either future residents of Range, or from the Backcountry Wilderness Area. A "residential grade muffler" for the generator should be required to ensure sound mitigation.	

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Louviers Conservation Partnership	12/28/2025	Received: Louviers Conservation Partnership (LCP) has reviewed the documents for the 7440 North US Highway 85 Request by Range Metropolitan District for two water pump stations and a water storage tank and has comments following the document excepts below:: Below are excerpts from the documents reviewed of items important to the Town of Louviers including about Louviers and the current eastbound Airport Road level of Service (LOS). Conformance with Douglas County Master Plan Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts. Felsburg Holt & Ullevig Range 5th Revised Traffic Impact Analysis The Town of Louviers is to the northwest of US 85 and the project site. It is a relatively small enclave of residential homes that was originally constructed as a company town to support the E.I. du Pont de Nemours dynamite manufacturing facilities and it is one of the best preserved company towns in Colorado.	See LCP response letter

		The evaluation of an intersection controlled by a traffic signal provides average vehicle delay and LOS information for the entire intersection, as well as for individual movements. Figure 3 also shows the LOS results for existing conditions which finds that the US 85/Airport Road intersection is currently operating at LOS B during the AM and PM peak hours. Given the relatively high traffic demand on US 85, however, eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour. Of note, the operational analyses are based on signal timing data provided by CDOT and it is understood that this intersection operates in a "free" mode which allows the traffic signal to fluctuate to meet vehicle movement demand without a specified cycle length. As such, the traffic signal controller appears to allocate more "green time" to movements along US 85, which, in turn, creates a higher level of delay for the eastbound Airport Road movements that result in the poor eastbound LOS. Projected vehicle-trips for Range is almost 5,000 vehicles per day with approximately 400 during the AM peak hour and about 525 during the PM peak hour. Although this is just location and extents for 2 pump stations and a water storage tank which would only have an impact when being built, it does include a full traffic study which mentions eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during	

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Applicant Responses to Referral Comments
		the PM peak hour. This study used existing traffic data from 2020 which will not include the approved Brannan Asphalt Plant which has not started operating yet in addition to the approved Brannan crushing and existing Brannan concrete plant for a total of 1008 truck trips per day and also the added traffic from the recently approved Zebulon Mega Sports Complex where they are now requesting a change to add more residential units. Randy Johnson Director Louviers Conservation Partnership	
Mile High Flood District		No Response Received:	
Office of Emergency Management	12/18/2025	No Comment:	
Rural Water Authority of Douglas County		No Response Received:	
Sheriff's Office		No Response Received:	
Sheriff's Office E911		No Response Received:	

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Applicant Responses to Referral Comments
South Metro Fire Rescue	12/23/2025	Received: South Metro Fire Rescue (SMFR) has reviewed the provided documents and has conditional non-objection to the proposed Location and Extent. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project. COMMENTS: 1. Referrals for new structures must not use unapproved addresses as the project name. These facilities will be addressed from future roadways and will not be addressed from US Hwy 85, Addresses proposed by the Addressing Analyst (which does not match the project title) will also change. Building addresses and unit numbers shall be coordinated with and approved by SMFR and the Douglas County Addressing Analyst prior to submitting for construction permits.	Noted we acknowledge your approval.
Wildfire Mitigation		No Response Received:	
Xcel Energy-Right of Way & Permits	12/19/2025	Received: Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the above-mentioned application and currently has no apparent conflict. As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 for utility locates prior to construction.	Acknowledged.

RICK

303-537-8020
rickengineering.com

8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

January 12, 2026

Colorado Department of Transportation
Permits Unit – Region 1
2829 W. Howard Place
Denver, CO 80204
Attn: Steve Loeffler

RE: Range Location and Extent, LE2025-027

Dear Steve Loeffler,

Please find below our point-by-point responses to the 1st Location & Extent referral review email received on behalf of CDOT, dated December 16, 2025, for the Range Development. Responses are shown in blue beneath staff's comments.

I have reviewed the referral for the L and E for construction of two pump stations and a water storage tank for the Range Metro District and have no objections. If any work will take place in the State Highway Right of Way a permit will be required. Application is made online at the following link:
https://socgov.my.site.com/portal/s/login/?ec=302&startURL=%2Fportal%2Fs%2F

- **Rick Response Comments: No work will be completed within the CDOT right of way during pump house construction.**

Please let me know if you have any questions concerning this response letter and/or the enclosed documents.

Sincerely,

RICK ENGINEERING COMPANY

Dave Ploense

David Ploense, PE
Project Manager

RICK

303-537-8020
rickengineering.com

8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

January 12, 2026

Colorado Department of Public Health
4300 Cherry Creek Drive South
Denver, CO 80246
Attn: Brendan Cicione

Dear Brendan Cicione,

Please find below our point-by-point responses to the 1st Location & Extent referral review email received on behalf of CDOT, dated December 22, 2025, for the Range Development. Responses are shown in blue beneath staff's comments.

The Colorado Department of Public Health and Environment's Air Pollution Control Division (APCD or Division) received a request for an air quality administrative review concerning the proposed pump and water tank project as described in your correspondence dated December 16, 2025. The Division has reviewed the project letter and respectfully offers the following comments. Please note that the following Air Quality Control Commission (AQCC) regulations may not be inclusive of the regulations the proposed project will be subject to. It is the responsibility of the involved parties to determine what regulations they are subject to and follow them accordingly.

Rick's response comments: All regulations will be considered and outlined within the GESC report prepared for the overall project.

Land Development

We also note that projects similar to this proposal often involve land development. Under Colorado air quality regulations, land development refers to all land clearing activities, including but not limited to land preparation such as excavating or grading, for residential, commercial or industrial development. Land development activities release fugitive dust, a pollutant regulation by the Division. Small land development activities are not subject to the same reporting and permitting requirements as large hand activities. Specifically, hand development activities that are less than 25 contiguous acres and less than 6 months in duration do not need to report air emissions to the Division. It is important to note that even if a permit is not required, fugitive dust control measures including the Land Development APEN Form APCD-223 ITIUSt be followed at the site. Fugitive dust control techniques commonly included in the plan are included in the table below:

Control Options for Unpaved Roadways	
Watering	Use of chemical stabilizer
Paving	Controlling vehicle speed
Graveling	
Control Options for Mud and Dirt Carry-Out onto Paved Surfaces	
Gravel entry ways	Washing vehicle wheels
Covering the load	Not overfilling trucks
Control Options for Disturbed Areas	
Watering	Application of a chemical stabilizer
Revegetation	Controlling vehicle speed
Compaction	Furrowing the soil
Wind Breaks	Minimizing the areas of disturbance
	Synthetic or Natural Cover for Stopes

Please refer to the website https://cdphe.colorado.eov/apens-and-air-permits for information on land use APENs and permit forms. Click on “Land Development" to access the land development specific APEN form. Please contact KC Houlden, Construction Permits Unit Supervisor, at 303-691-4092, kenneth.houlden@state.co.us If you have any specific questions about APENs and permit forms.

Rick’s response comments: Acknowledged. Thank you.

Please let me know if you have any questions concerning this response letter and/or the enclosed documents.

Sincerely,

RICK ENGINEERING COMPANY

Dave Ploense

David Ploense, PE
Project Manager

PROJECT REFERRAL LOADING AND DATA SUMMARY SHEET

Dear Applicant:

Please complete the following summary sheet and return to:

Sean Atkinson
CORE Electric Cooperative
5496 North U.S. Highway 85
P.O. Drawer A
Sedalia, Colorado 80135
satkinson@core.coop

Project Name RANGE WATER SYSTEM (LOWER PUMP STATION)

Residential Developments:

1. Total number of homes or units in development _____
2. Lot breakdown of construction phases:

Phase	Filing(s)	Block(s)	Lot(s)	Construction Date (Month/Year)

3. Electrical loads of homes or units:
   - Typical size of home or unit _____ (sq. ft.)
   - Typical size of electrical service _____ (amps)
   - Number of homes or units designed or built with A/C _____
4. Other electrical loads (Examples: schools, wells, booster pumps, water treatment facilities, clubhouses, or golf courses):

_____
_____

Commercial Developments:

1. Extent of commercial development:

Lot/Block	Lot Size (sq. ft.)	Building Size (sq. ft.)	Type of Business (i.e. retail, office, industrial, restaurant)	Construction Date (Month/Year)

2. Type of electrical service: ☐ 1Ø, 120/240 V ☐ 3Ø, 120/208 V ☒ 3Ø, 277/480V
3. Estimated kW demand of load(s) if known:
   67 KVA OF DEMAND LOAD
   _____
4. Other electrical loads (Examples: wells, booster pumps, or water treatment facilities):
   15 HP PUMP ON RVSS, 30 KVA LIGHTING TRANSFORMER, 15 KW HEATER

Project contact:

Name Michael Maughan Phone 801-299-1327
Company AQUA Engineering
Address 533 W. 2600 S., Ste 275
Bountiful, UT 84010

Thank you for completing the above information. If you have any questions, please contact me at (720) 733-5480.

Sean Atkinson
System Planner

PROJECT REFERRAL LOADING AND DATA SUMMARY SHEET

Dear Applicant:

Please complete the following summary sheet and return to:

Sean Atkinson
CORE Electric Cooperative
5496 North U.S. Highway 85
P.O. Drawer A
Sedalia, Colorado 80135
satkinson@core.coop

Project Name RANGE WATER SYSTEM (UPPER PUMP STATION)

Residential Developments:

1. Total number of homes or units in development _____
2. Lot breakdown of construction phases:

Phase	Filing(s)	Block(s)	Lot(s)	Construction Date (Month/Year)

3. Electrical loads of homes or units:
   - Typical size of home or unit _____ (sq. ft.)
   - Typical size of electrical service _____ (amps)
   - Number of homes or units designed or built with A/C _____
4. Other electrical loads (Examples: schools, wells, booster pumps, water treatment facilities, clubhouses, or golf courses):

_____
_____

Commercial Developments:

1. Extent of commercial development:

Lot/Block	Lot Size (sq. ft.)	Building Size (sq. ft.)	Type of Business (i.e. retail, office, industrial, restaurant)	Construction Date (Month/Year)

2. Type of electrical service: ☐ 1Ø, 120/240 V ☐ 3Ø, 120/208 V ☒ 3Ø, 277/480V
3. Estimated kW demand of load(s) if known:
   59 KVA OF DEMAND LOAD
   _____
4. Other electrical loads (Examples: wells, booster pumps, or water treatment facilities):
   3 - 5 HP PUMP ON VFD, 30 KVA LIGHTING TRANSFORMER, 15 KW HEATER

Project contact:

Name Michael Maughan Phone 801-299-1327
Company AQUA Engineering
Address 533 W. 2600 S., Ste 275
Bountiful, UT 84010

Thank you for completing the above information. If you have any questions, please contact me at (720) 733-5480.

Sean Atkinson
System Planner

RICK

303-537-8020
rickengineering.com

8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

January 12, 2026

Douglas County Health Department
11045 E. Lansing Circle, Suite 300
Englewood, CO 80112
Attn: Kristin Hochstetler

RE: Range Location & Extent
SB2025-036

Dear Kristin Hochstetler,

Please find below our point-by-point responses to the 1st Location & Extent referral review email received on behalf of the Douglas County Health Department, dated December 29, 2025, for the Range Development. Responses are shown in blue beneath staff's comments.

Thank you for the opportunity to review and comment on the referenced approval request of a Location and Extent for the construction of two pump stations and a water storage tank application submitted by Range Metropolitan District. Douglas County Health Department (DCHD) staff have reviewed the application for compliance with pertinent environmental and public health regulations. After reviewing the application, DCHD has the following comment(s):

Stormwater Impacts on Nearby Waterway
Development of the subject parcel will potentially result in an increase of stormwater and snowmelt runoff that may contribute significant pollutant loadings to the Daniels Park drainage, a tributary to Plum Creek. These pollutants include bacteria, nutrients, metals, and oxygen consuming contaminants, A Phase III Drainage Report for Range Filing 1 has been submitted.

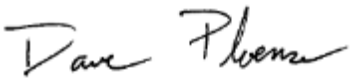
Mosquito Control – Stormwater Facilities
The site plan indicates that five full-spectrum detention ponds are proposed. Detention ponds can become sites for mosquito breeding. To reduce the potential for human exposures to West Nile and other mosquito-borne viruses, DCHD recommends that the applicant prepare a mosquito control plan. Elements of the plan should include proper design, construction and regular inspection and maintenance of stormwater quality facilities, and larvicide if mosquito larvae become a problem.

- **Rick Response Comments: Acknowledged. Our Range Filing 1 Phase III Drainage design addresses all the noted concerns.**

Please let me know if you have any questions concerning this response letter and/or the enclosed documents.

Sincerely,

RICK ENGINEERING COMPANY



David Ploense, PE
Project Manager

RICK

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rickengineering.com

8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

January 12, 2026

Louviers Conservation Partnership
7791 Valley View Street
Louvier, CO 80131
Attn: Randy Johnson

RE: Range Location and Extent
LE2025-027

Dear Randy Johnson,

Please find below our point-by-point responses to the 1st Location & Extent referral review email received on behalf of LCP, dated December 28, 2025, for the Range Development. Responses are shown in blue beneath staff's comments.

Louviers Conservation Partnership (LCP) has reviewed the documents for the 7440 North US Highway 85 Request by Range Metropolitan District for two water pump stations and a water storage tank and has comments following the document excepts below:

Below are excerpts from the documents reviewed, noting in Bold items important to the Town of Louviers including about Louviers and the current eastbound Airport Road level of Service (LOS) highlighted in bold.

Conformance with Douglas County Master Plan

Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. **The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts.**

- **Rick Response Comments: Acknowledged.**

Felsburg Holt & Ullevig Range 5th Revised Traffic Impact Analysis

The Town of Louviers is to the northwest of US 85 and the project site. It is a relatively small enclave of residential homes that was originally constructed as a companv town to support the E.I. du Pont de Nemours dynamite manufacturing facilities, and it **is one of the best-preserved company towns in Colorado**.

The evaluation of an intersection controlled by a traffic signal provides average vehicle delay and LOS information for the entire intersection, as well as for individual movements. Figure 3 also shows the LOS results for existing conditions which finds that the US 85/Airport Road intersection is currently operating at LOS B during the AM and PM peak hours. **Given the relatively high traffic demand on US 85, however, eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour**.

Of note, the operational analyses are based on signal timing data provided by CDOT and it is understood that this intersection operates in a ”free" mode which allows the traffic signal to fluctuate to meet vehicle movement demand without a specified cycle length. As such, the traffic signal controller appears to allocate more “green time” to movements a(ong US 85, which, in turn, **creates a higher level of delay for the eastbound Airport Road movements that result in the poor eastbound LOS**.

Projected vehicle-trips for Range is almost 5,000 vehicles per day with approximately 400 during the AM peak hour and about 525 during the PM peak hour.

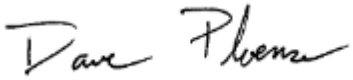
Although this is just location and extents for 2 pump stations and a water storage tank which would only have an impact when being built, it does include a full traffic study which mentions **eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour**. This study used existing traffic data from 2020 which will not include the approved Brannan Asphalt Plant which has not started operating yet in addition to the approved Brannan crushing and existing Brannan concrete plant for a total of 1008 truck trips per day and also the added traffic from the recently approved Zebulon Mega Sports Complex where they are now requesting a change to add more residential units.

- **Rick Response Comments: Noted that the traffic study was submitted for reference. We acknowledge the comments and will address them in the Traffic Study submitted with the Final Plat.**

Please let me know if you have any questions concerning this response letter and/or the enclosed documents.

Sincerely,

RICK ENGINEERING COMPANY



David Ploense, PE
Project Manager

COMMUNITY AMENITY BUILDING

WATER LATERAL

PROPOSED ROADWAY

8" WATER TRANSMISSION LINE

LOWER PUMP STATION SEE FIGURE 2

550 LOT RESIDENTIAL DEVELOPMENT

WALKWAY

RETENTION POND

PROPERTY BOUNDARY (TYP)

US HIGHWAY 87

8" WATER TRANSMISSION LINE

RETENTION POND

RETENTION POND

PROPOSED ROADWAY

8" WATER TRANSMISSION LINE

WATER STORAGE TANK & UPPER PUMP STATION SEE DRAWING FIGURE 3

OVERALL SITE PLAN

1"=150'-0"

0 150 300

Scale in Feet

C:\USERS\DEREK.HYDE\DCVACCDOCS\AQUA ENGINEERING\002885.C - RANGE METRO DISTRICT\PROJECT FILES\001 SITE CIVIL\FIGURE 1 - OVERALL SITE PLAN.DWG

12/5/2025

DRAWING IS TO SCALE
IF BAR MEASURES:
1" = FULL SCALE
1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	10/15/2025	ALF	VE	-

REVISIONS

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

CIVIL
OVERALL SITE PLAN

AQUA ENGINEERING

DRAWING NO.

FIGURE 1

SHEET

AQUA ENGINEERING LLC. © COPYRIGHT 2023 BOUNTIFUL, UTAH

RESIDENTIAL BUFFER BOUNDARY

TREES (BY OTHERS)

SURVEY SECTION

20'-3"

17'-6"

LOWER PUMP STATION

UTILITY EASEMENT

PROPERTY RIGHT OF WAY

PROPOSED ROADWAY

ACCESS DRIVEWAY & PARKING AREA

8" WATER TRANSMISSION LINE

8" WATER TRANSMISSION LINE

ROAD CENTERLINE (TYP)

PROPERTY RIGHT OF WAY

5780 5781 5782 5783 5784 5785 5786 5787 5788 5789 5790 5791 5792 5793 5794 5795 5796 578

LOWER PUMP STATION SITE PLAN

1"=8'-0"

0 8 16

Scale in Feet

AQUA ENGINEERING LLC. © COPYRIGHT 2023 BOUNTIFUL, UTAH

DRAWING IS TO SCALE
IF BAR MEASURES:
1" = FULL SCALE
1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	10/15/2025	ALF	VE	-

REVISIONS

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN
CIVIL
LOWER PUMP STATION SITE PLAN

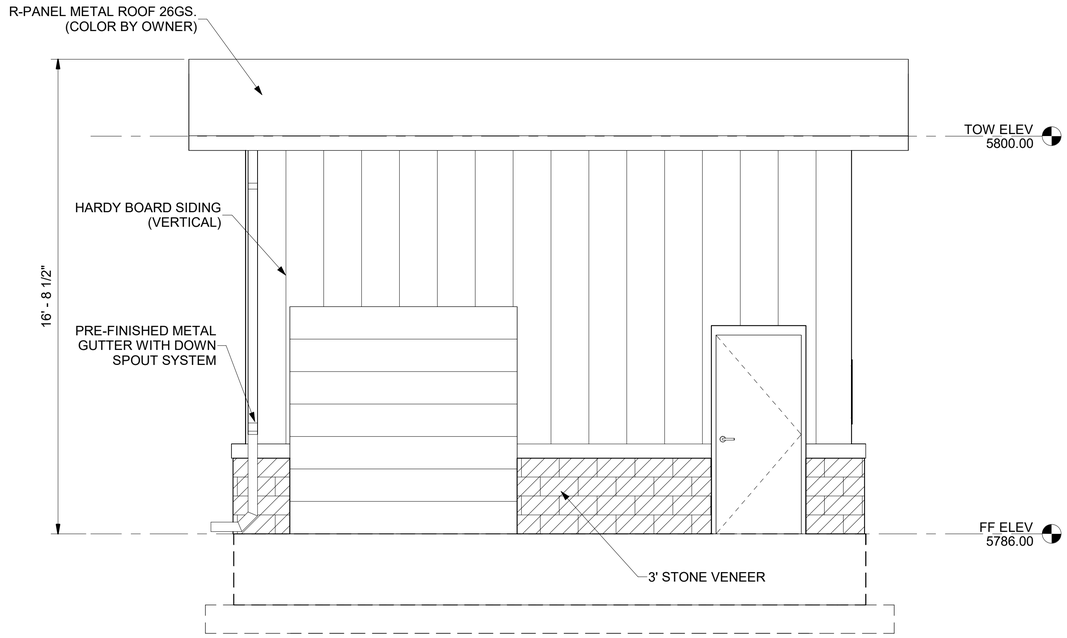
AQUA ENGINEERING

DRAWING NO.

FIGURE 2

SHEET

12/4/2025 C:\USERS\DEREK.HYDE\DCACCDOCS\AQUA ENGINEERING\002885.C - RANGE METRO DISTRICT\PROJECT FILES\001 SITE CIVIL\FIGURE 2 - ENLARGED SITE PLAN.DWG

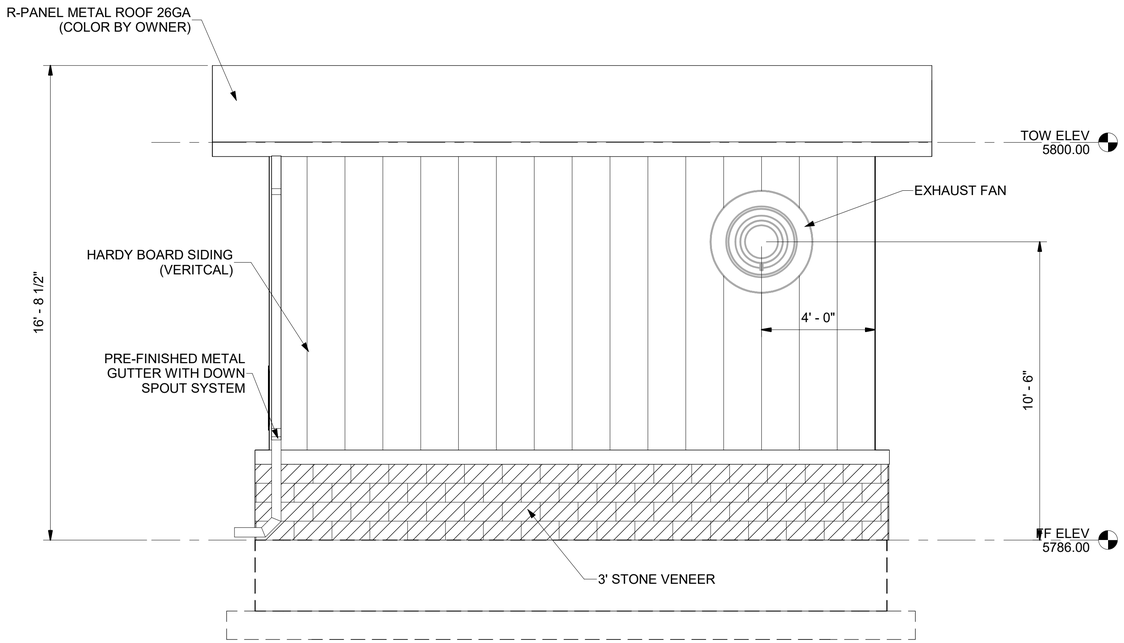


NORTH ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet



SOUTH ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet

NOT FOR CONSTRUCTION

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	08/08/2021	Designer	Author	Checker

REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

LOWER PUMP STATION
ARCHITECTURAL
ELEVATIONS

AQUA ENGINEERING

DRAWING NO.

10A301

SHEET

11/12/2025 11:29:19 AM Autodesk Docs://002885.C - Range Metro District/10-LOWER PUMP STATION-V24.rvt

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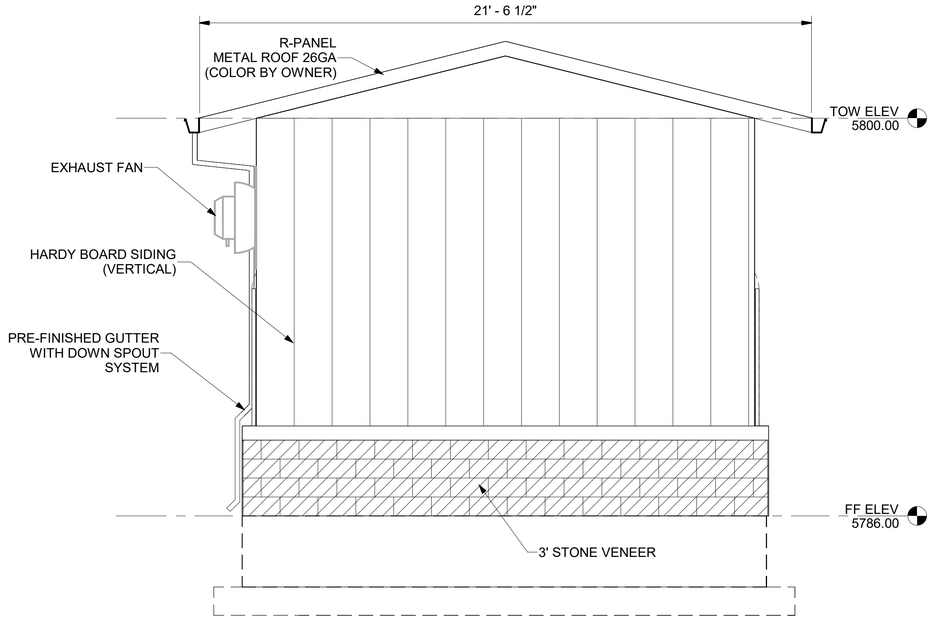
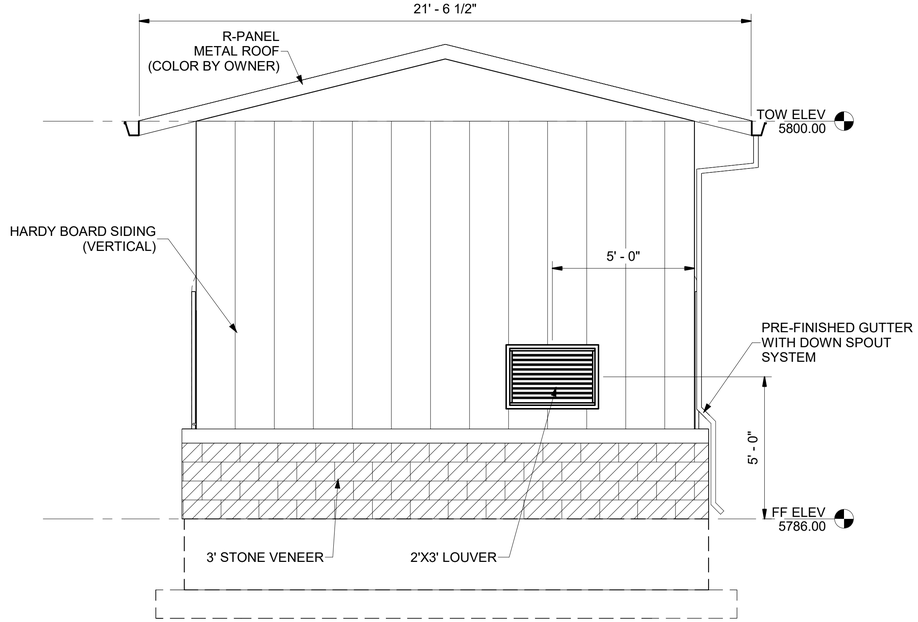


EAST ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet



WEST ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet

NOT FOR CONSTRUCTION

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	08/08/2021	Designer	Author	Checker

REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

LOWER PUMP STATION
ARCHITECTURAL
ELEVATIONS

AQUA ENGINEERING

DRAWING NO.

10A302

SHEET

11/12/2025 11:29:20 AM Autodesk Docs://002885.C - Range Metro District/10-LOWER PUMP STATION-V24.rvt

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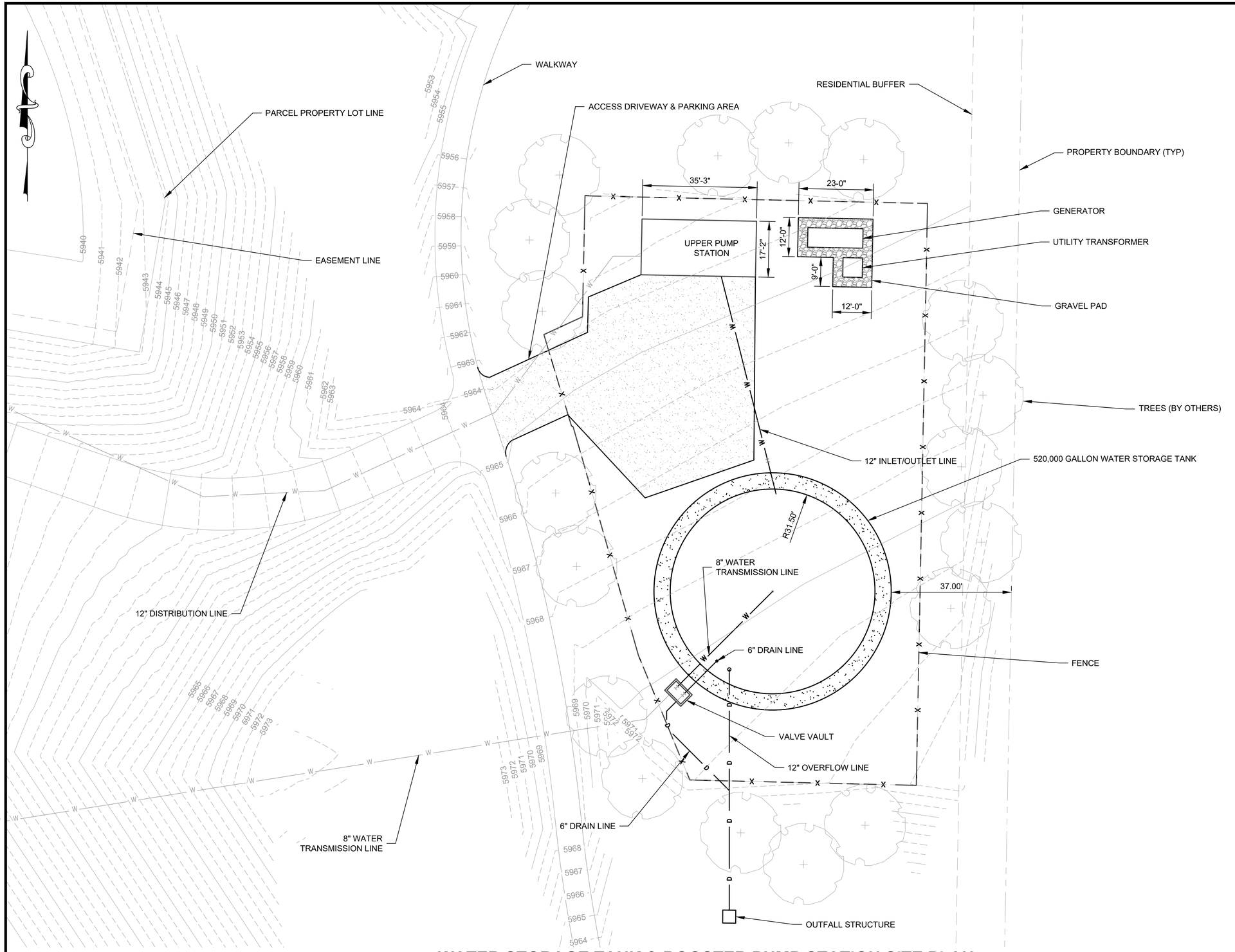

WATER STORAGE TANK & BOOSTER PUMP STATION SITE PLAN

1"=15'-0"

0 15 30

Scale in Feet

C:\USERS\DEREK.HYDE\DCVACCDOCS\AQUA ENGINEERING\002885.C - RANGE METRO DISTRICT\PROJECT FILES\001 SITE CIVIL\FIGURE 3 - ENLARGED SITE PLAN.DWG

12/5/2025

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	10/15/2025	ALF	VE	-

REVISIONS

RANGE METRO DISTRICT

RANGE WATER SYSTEM DESIGN

CIVIL

WATER STORAGE TANK & BOOSTER PUMP STATION SITE PLAN

AQUA ENGINEERING

DRAWING NO.

FIGURE 3

SHEET

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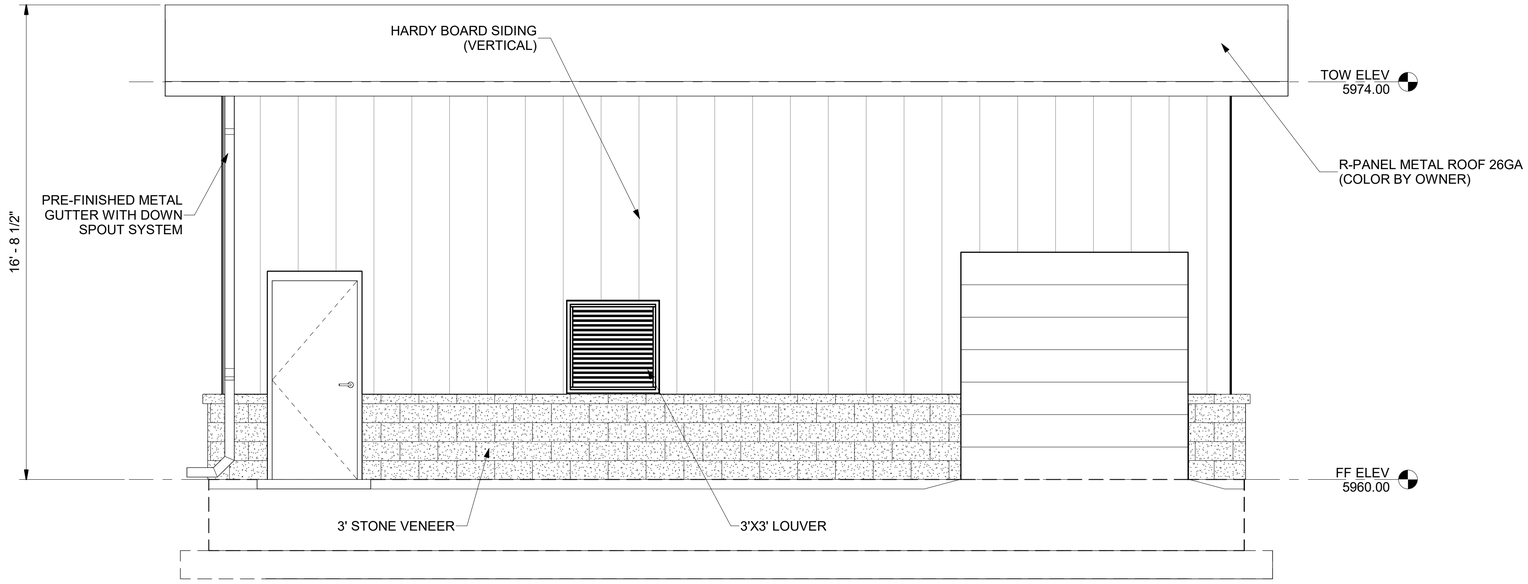
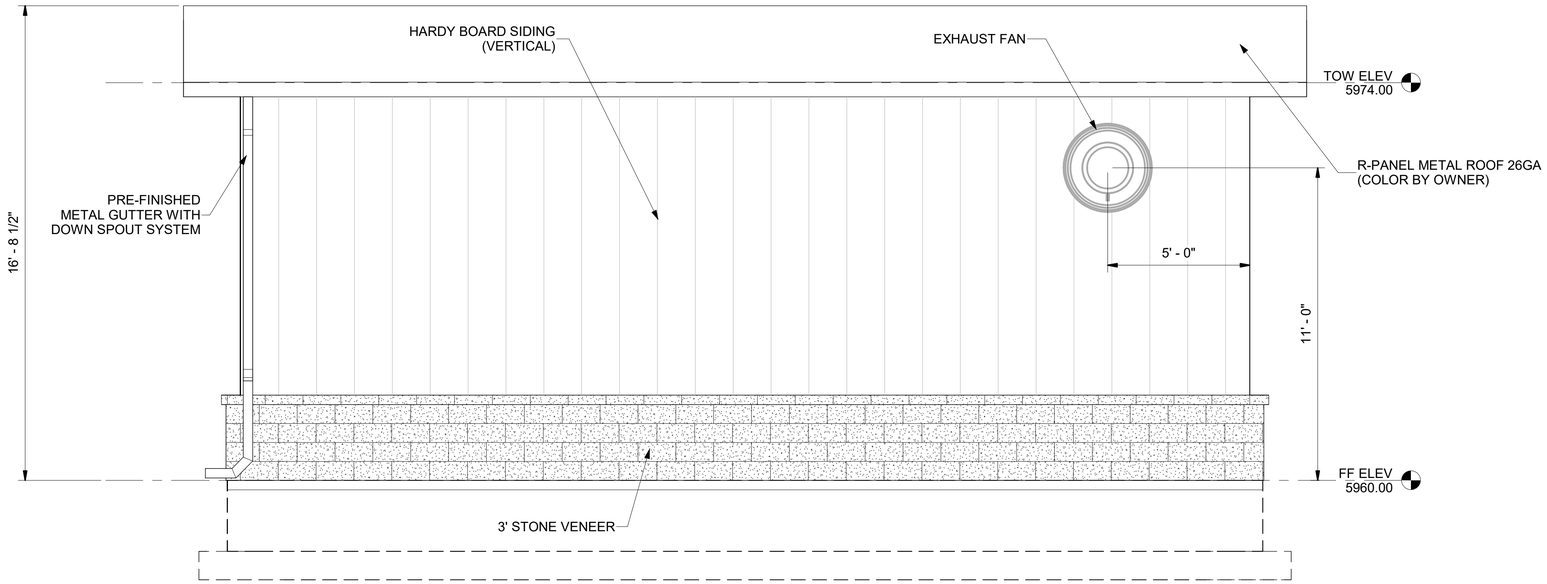


NORTH ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet



SOUTH ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet

NOT FOR CONSTRUCTION

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	08/08/2021	Designer	Author	Checker

REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

UPPER PUMP STATION
ARCHITECTURAL
ELEVATIONS

AQUA ENGINEERING

DRAWING NO.

30A301

SHEET

11/12/2025 3:24:30 PM Autodesk Docs://002885.C - Range Metro District/30-UPPER PUMP STATION-V24.rvt

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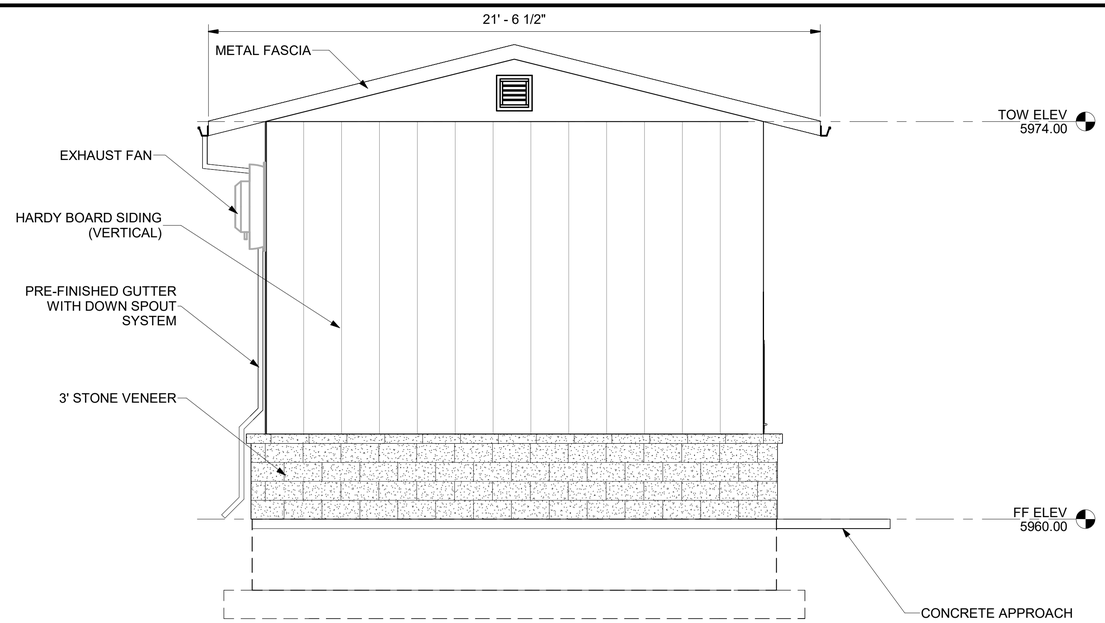
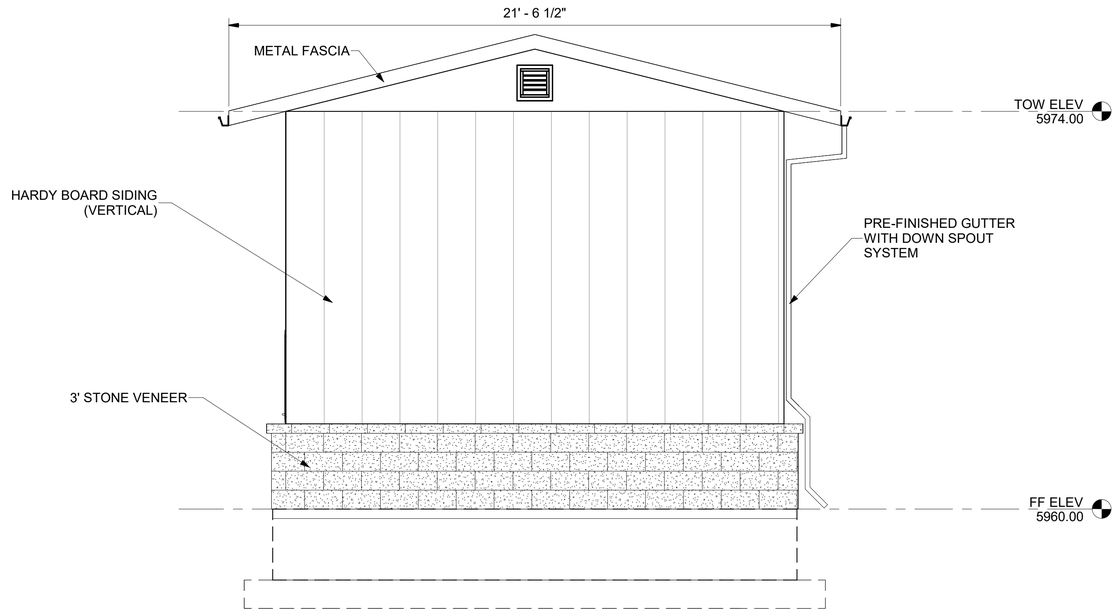


EAST ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet



WEST ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet

NOT FOR CONSTRUCTION

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	08/08/2021	Designer	Author	Checker

REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

UPPER PUMP STATION
ARCHITECTURAL
ELEVATIONS

AQUA ENGINEERING

DRAWING NO.

30A302

SHEET

11/12/2025 3:24:31 PM Autodesk Docs://002885.C - Range Metro District/30-UPPER PUMP STATION-V24.rvt

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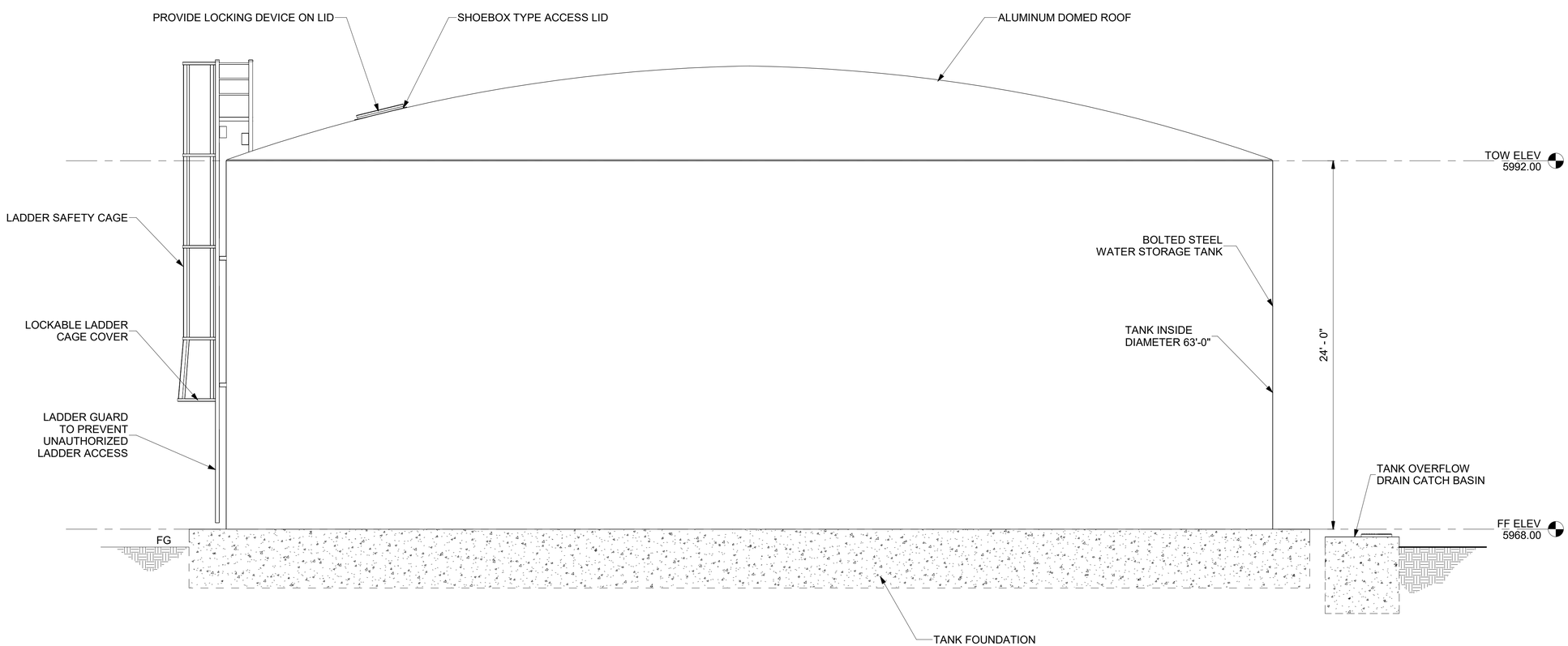

TANK ELEVATION

1/4" = 1'-0"

0 4 8

Scale in Feet

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	12/05/2025	ALF	DNS	MMM

REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT

RANGE WATER SYSTEM DESIGN

520,000 GALLON TANK
ARCHITECTURAL
ELEVATION

AQUA ENGINEERING

DRAWING NO.

20A301

SHEET

12/4/2025 11:25:55 AM Autodesk Docs://002885.C - Range Metro District/20-TANK-V24.rvt

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DOUGLAS COUNTY
COLORADO

Staff Report Addendum

Date: January 2, 2026

To: Douglas County Planning Commission

From: Trevor Bedford, AICP, Senior Planner TB
Jeanette Bare, AICP, Planning Manager
Steven E. Koster, AICP, Assistant Director of Planning Services KC for SK

Subject: **7440 North US Highway 85**

Project File: **LE2025-027**

Planning Commission Hearing: **January 5, 2026 @ 6:00 p.m.**

The applicant has provided an updated narrative to clarify that the dimensions of the water tank are 63 feet in diameter and 24 feet in height with a capacity of approximately 560,000 gallons.

Additional referral responses have been received since the staff report was written and are attached to this addendum. The applicant will provide responses to comments prior to or at the Planning Commission Hearing.

ATTACHMENT **PAGE**

Updated Narrative 2
Referral Agency Response Report 6
Referral Letters 17

TECHNICAL MEMORANDUM

DOUGLAS COUNTY LOCATION AND EXTENT REPORT

RANGE METROPOLITAN DISTRICT
RANGED PLANNED DEVELOPMENT
WATER SUPPLY SYSTEM
US-85 & AIRPORT RD.

Prepared for:
Douglas County

Prepared by:
RICK Engineering

On Behalf of:
Range Metropolitan District

RICK Job No. 2215
December 2025

RICK

RICK

303-537-8020
rickengineering.com

8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

December 3, 2025

Planning Service Division
Douglas County
100 Third Street
Castle Rock, CO 80104

RE: Range Metropolitan District Range Planned Development Water Supply System

Dear Douglas County Planning Service Division:

Please accept this letter on behalf of the Range Metropolitan District for district infrastructure proposed to support the Range Planned Development. We are pleased to submit this Limits and Extents application for Range Filing No 1 for your approval, located at the intersection of US 85 and Airport Rd. within the approved Range Planned Development area in unincorporated Douglas County. This report will outline the upper and lower pump stations connected by a feed line that is proposed for this project.

Construction

Construction will include site preparation and grading for two pump stations and a water storage tank to established design elevations. Water utilities will be installed, including all associated piping, appurtenances, and a dedicated feed line between the lower and upper pump stations. Following utility installation, access drives will be constructed to provide maintenance and operational access to the facilities. Final site work will include installation of landscaping and site stabilization measures to restore disturbed areas and provide long-term erosion control.

Location & Appearance

The proposed lower water pump station will be situated approximately 1,000 feet east of the intersection of US 85 and Airport Road, located off the north entrance road. The building will measure approximately 20 feet in width by 17 feet in length. This will house the boost pumps which will send water through approximately 3,700 feet of feed line pipe to the upper pump station. The upper pump station and the associated water tank will be in the southeast corner of the Range Filing 1 clustered homes, approximately 2,900 feet east of US-85 and adjacent to the east property line. The pump house measures approximately 35 feet wide by 17 feet long and will contain the fire boost pumps. An emergency diesel generator will be just outside of the pump house and will provide power to the fire boost pumps in the event of an emergency. The water tank measures 63 feet in diameter and 24 feet in height. This will hold approximately 560,000 gallons. Both buildings will utilize fully cut-off exterior lighting to ensure illumination remains contained on-site, preventing light spillover onto adjacent properties. The buildings and the water tank will be finished in natural, subdued tones and screened with native trees to blend with the surrounding environment and enhance visual compatibility with nearby residences.

The water tank is being installed above ground to ensure optimal system performance and long-term reliability. Because the site is located on a hill above the adjacent housing development, burying the tank would significantly reduce the natural elevation advantage needed to achieve adequate pressure and would require a substantially larger fire pump to meet emergency flow standards. An underground installation would also complicate routine inspections and maintenance, limiting access to valves, fittings, and structural components and increasing the potential for undetected leaks or corrosion. While cost is a consideration, the primary drivers for an above-ground configuration are improved operational efficiency, better fire-response capability, and enhanced accessibility for safe maintenance over the life of the system.

Conformance with Douglas County Master Plan

Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts.

Stormwater

An onsite storm sewer system will convey runoff to one of five detention ponds which will provide water quality controls and then release it at historical rates along existing drainage ways. The Phase III Drainage Report and map have been included that show adequate drainage has been designed for the site.

Noise Control

Noise attenuation measures for the pumps and generator focus on minimizing operational sound levels at nearby residences while maintaining equipment performance. Because the selected pump house structure is wood framed rather than concrete, additional mitigation strategies will be implemented to compensate for its lower inherent sound attenuation. These measures include installing insulation and sound-dampening materials within the building envelope to reduce pump noise transmission, as well as orienting the ventilation system away from neighboring homes to limit exterior sound propagation.

The emergency generator located at the upper pump house will be housed in a dedicated enclosure outfitted with acoustic insulation, and, if required to meet target noise thresholds, sound-attenuated air intake and exhaust vents will be incorporated to further reduce noise emissions.

RICK
303-537-8020
rickengineering.com
8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

Traffic

Traffic associated with the pump houses is expected to be minimal and limited to periodic operational needs. The Range Metro District will make infrequent site visits for routine inspections, repairs, and landscape maintenance, resulting in only occasional vehicle access to the facilities. Due to the low frequency and short duration of these visits, traffic impacts on nearby residents are anticipated to be negligible and will not alter normal neighborhood traffic patterns or adversely affect residents' quality of life. The Range TIA has been included for reference purposes.

Paving Design

All pavement design for roadways and paved areas leading up to the pump houses is included as part of the Range Development Filing 1 submittal. The pump houses themselves will be served only by small access drives, the design and construction of which will be directed in the field by a qualified geotechnical engineer based on site-specific subsurface conditions and performance requirements.

Anticipated Process Timing

The Final Plat for Range Planned Development Filing 1 was placed in its first referral on December 9, 2025. We expect final permitting approvals in early 2026 with construction commencing shortly after county approvals. We anticipate Final Plat of Filing 2 to lag behind Filing 1 by approximately 6 months.

Thank you for your consideration of this pump house and water tank approval. We look forward to collaborating with Douglas County. Please do not hesitate to reach out with any questions or concerns you may have to help facilitate the approval process, and we look forward to your response.

Respectfully,

Troy Bales
tbales@rickengineering.com

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
Addressing Analyst	12/16/2025	Received: Proposed addresses are: 7518 N US HWY 85 - LOWER PUMP STATION 7508 N US HWY 85 - UPPER PUMP STATION These addresses are not to be used for any purpose other than for plan review until after this project is approved. Proposed addresses are subject to changes as necessary for 911 dispatch and life safety purposes. Addresses are recorded by Douglas County following all necessary approvals. Contact DCAddressing@douglas.co.us or 303.660.7411 with questions.	Information provided to applicant
AT&T Long Distance - ROW	12/17/2025	Received: This is in response to your eReferral with a utility map showing any buried AT&T Long Line Fiber Optics near 7440 N HWY 85 Sedalia, Colorado. The Earth map shows the project area in red and the buried AT&T Long Line/Core Fiber Optics in yellow. Based on the address and/or map you provided, there should be NO conflicts with the AT&T Long Line facilities.	No response necessary
Building Services	12/22/2025	Received: Permit is required for structures. Please visit Douglas County's web site for requirements and contact 303-660-7497 if you have any questions.	Information provided to applicant
CDPHE - All Referrals	12/22/2025	Received: See attached letter. Summary: Provided information regarding air quality regulations and fugitive dust pollution.	Information provided to applicant
CDPHE - Water Quality Control Division		No Response Received:	No response necessary
CenturyLink		No Response Received:	No response necessary

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
Chatfield Community Association		No Response Received:	No response necessary
Chatfield Watershed Authority		No Response Received:	No response necessary
Cherokee Ridge Estates HOA		No Response Received:	No response necessary
Colorado Department of Transportation CDOT-Region # 1	12/16/2025	Received: I have reviewed the referral for the L and E for construction of two pump stations and a water storage tank for the Range Metro District and have no objections. If any work will take place in the State Highway Right-of-Way a permit will be required. Application is made online at the following link: https://socgov.my.site.com/portal/s/login/?ec=302&startURL=%2Fportal%2Fs%2F	Information provided to applicant

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
Colorado Division of Water Resources	12/24/2025	Received: We have received your December 16, 2025 referral for Range Metropolitan District approval of a Location and Extent for the construction of two pump stations and a water storage tank. This referral does not appear to qualify as a "subdivision" as defined in section 30-28-101 (10)(a), C.R.S. Therefore, pursuant to the State Engineer's March 4, 2005 and March 11, 2011 memorandums to county planning directors, this office will only perform a cursory review of the referral information and provide informal comments. The comments do not address the adequacy of the water supply plan for this project or the ability of the water supply plan to satisfy any County regulations or requirements. In addition, the comments provided herein cannot be used to guarantee a viable water supply plan or infrastructure, the issuance of a well permit, or physical availability of water. Our office has no objections to the proposed construction of two pump stations and a water storage, since no changes to the water supply plan for the Range Development were proposed.	No response necessary
Comcast		No Response Received:	No response necessary

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
CORE Electric Cooperative	12/29/2025	Received: CORE Electric Cooperative has reviewed the materials included in the above-referenced referral response packet. Our review focused on existing CORE facilities, utility easements, electric loading, and overall service requirements for the proposed project. Based on this review, CORE offers the following comments and requests: CORE Electric Cooperative approves the Location and Extent for the project. Additional information is required. Due to the nature of this submittal, CORE requests that the applicant complete the enclosed Data Summary Sheet, which provides essential details regarding projected electrical loads and anticipated construction phasing. Please forward the attached Data Summary Sheet to the applicant and instruct them to return the completed form directly to me. The developer must provide information regarding: The maximum expected or allowable building square footage for each lot; and The anticipated type of business or occupancy for each lot. CORE understands that some of this information may be preliminary or based on best estimates; however, any details the applicant can provide will significantly assist us in ensuring that adequate electric facilities and capacity can be planned for and made available.	Comments provided to applicant
Dominion Water and Sanitation District		No Response Received:	No response necessary

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
Douglas County Health Department	12/30/2025	Received: See attached letter Summary: Provided information regarding stormwater runoff and mosquito control.	Information provided to applicant
Engineering Services	12/29/2025	Received: Overall the project appears to be in general conformance with Douglas County Engineering criteria. Detailed comments regarding site work for the pump and tank sites will be provided with Range Filing 1 final plat comments.	Information provided to applicant

Highlands Ranch Community Association	12/17/2025	Received: The Highlands Ranch Community Association appreciates the opportunity to review and comment on this L&E. As noted in §3 of our 12/10/2025 Letter to Mike Pesicka (Principal Planner, DougCO) regarding DougCo SB2025-036 (Range Flg 1, Final Plat), "HRCA notes that the Range water system includes a major water storage tank and pump station facilities located near the southeastern portion of the project. Given the proximity to HRCA land, HRCA requests that: • Architectural treatment and landscape screening be required to mitigate visual impacts. • Lighting for these facilities be dark-sky compliant and oriented to minimize spillover. • Sound attenuation be incorporated for pump and generator equipment. These measures are important to preserve the natural character of the adjacent Backcountry Wilderness Area." These concerns are not addressed in this L&E. For example, the above ground water storage tank located in the southeast corner of the Range property will stand approximately 30' above grade, and only approximately 37' from the shared property line. Additionally, the generator for the "upper pump station" in this location will also be located approximately 47' from the shared property line. The HRCA strongly encourages Douglas County to require the water storage tank be constructed below grade - like the multiple water storage tanks that serve Highlands Ranch - especially those close to the	Comments provided to applicant

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
		Backcountry Wildnerness Area, like this tank. This tank, placed on top of a manufactured high point, will not be aesthetically pleasing for either future residents of Range, or from the Backcountry Wilderness Area. A "residential grade muffler" for the generator should be required to ensure sound mitigation.	

Louviers Conservation Partnership	12/28/2025	Received: Louviers Conservation Partnership (LCP) has reviewed the documents for the 7440 North US Highway 85 Request by Range Metropolitan District for two water pump stations and a water storage tank and has comments following the document excepts below:: Below are excerpts from the documents reviewed of items important to the Town of Louviers including about Louviers and the current eastbound Airport Road level of Service (LOS). Conformance with Douglas County Master Plan Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts. Felsburg Holt & Ullevig Range 5th Revised Traffic Impact Analysis The Town of Louviers is to the northwest of US 85 and the project site. It is a relatively small enclave of residential homes that was originally constructed as a company town to support the E.I. du Pont de Nemours dynamite manufacturing facilities and it is one of the best preserved company towns in Colorado.	Comments provided to applicant

		The evaluation of an intersection controlled by a traffic signal provides average vehicle delay and LOS information for the entire intersection, as well as for individual movements. Figure 3 also shows the LOS results for existing conditions which finds that the US 85/Airport Road intersection is currently operating at LOS B during the AM and PM peak hours. Given the relatively high traffic demand on US 85, however, eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour. Of note, the operational analyses are based on signal timing data provided by CDOT and it is understood that this intersection operates in a "free" mode which allows the traffic signal to fluctuate to meet vehicle movement demand without a specified cycle length. As such, the traffic signal controller appears to allocate more "green time" to movements along US 85, which, in turn, creates a higher level of delay for the eastbound Airport Road movements that result in the poor eastbound LOS. Projected vehicle-trips for Range is almost 5,000 vehicles per day with approximately 400 during the AM peak hour and about 525 during the PM peak hour. Although this is just location and extents for 2 pump stations and a water storage tank which would only have an impact when being built, it does include a full traffic study which mentions eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during	

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
		the PM peak hour. This study used existing traffic data from 2020 which will not include the approved Brannan Asphalt Plant which has not started operating yet in addition to the approved Brannan crushing and existing Brannan concrete plant for a total of 1008 truck trips per day and also the added traffic from the recently approved Zebulon Mega Sports Complex where they are now requesting a change to add more residential units. Randy Johnson Director Louviers Conservation Partnership	
Mile High Flood District		No Response Received:	No response necessary
Office of Emergency Management	12/18/2025	No Comment:	No response necessary
Rural Water Authority of Douglas County		No Response Received:	No response necessary
Sheriff's Office		No Response Received:	No response necessary
Sheriff's Office E911		No Response Received:	No response necessary

Project Name: 7440 North US Highway 85
Project File #: LE2025-027
Date Sent: 12/16/2025 **Date Due:** 12/30/2025

Agency	Date Received	Agency Response	Response Resolution
South Metro Fire Rescue	12/23/2025	Received: South Metro Fire Rescue (SMFR) has reviewed the provided documents and has conditional non-objection to the proposed Location and Extent. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project. COMMENTS: 1. Referrals for new structures must not use unapproved addresses as the project name. These facilities will be addressed from future roadways and will not be addressed from US Hwy 85, Addresses proposed by the Addressing Analyst (which does not match the project title) will also change. Building addresses and unit numbers shall be coordinated with and approved by SMFR and the Douglas County Addressing Analyst prior to submitting for construction permits.	Comment provided to applicant
Wildfire Mitigation		No Response Received:	No response necessary
Xcel Energy-Right of Way & Permits	12/19/2025	Received: Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the above-mentioned application and currently has no apparent conflict. As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 for utility locates prior to construction.	Information provided to applicant

REFERRAL RESPONSE REQUEST – LOCATION AND EXTENT

Date sent: December 16, 2025 Comments due by: **December 30, 2025**

Project Name:	7440 North US Highway 85– Location and Extent
Project File #:	LE2025-027
Project Summary:	Range Metropolitan District requests approval of a Location and Extent for the construction of two pump stations and a water storage tank.

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

☐ No Comment

☒ Please be advised of the following concerns:

Overall, the project appears to be in general conformance with Douglas County Engineering criteria. Detailed comments regarding site work for the pump and tank sites will be provided with Range Filing 1 final plat comments.

☐ See letter attached for detail.

Agency:	Douglas County Public Works	**Phone #:**	303-660-7490
Your Name:	Ken Murphy, P.E.	**Your Signature:**	Ken Murphy
(please print)		**Date:**	29 DEC 2025

A public hearing on this request will be held before the Douglas County Planning Commission on **Monday**, **January 5, 2026, at 6:00 pm**. ***This public hearing will be held on-line and in person. See the County website or contact the Planning Department for more information.***

Sincerely,

Trevor Bedford, AICP, Senior Planner

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

VIA EMAIL
RE: Douglas County eReferral (Project Number LE2025-027) Is Ready For Review

Dear Trevor Bedford,

The Colorado Department of Public Health and Environment's Air Pollution Control Division (APCD or Division) received a request for an air quality administrative review concerning the proposed pump and water tank project as described in your correspondence dated December 16, 2025. The Division has reviewed the project letter and respectfully offers the following comments. Please note that the following Air Quality Control Commission (AQCC) regulations may not be inclusive of the regulations the proposed project will be subject to. It is the responsibility of the involved parties to determine what regulations they are subject to and follow them accordingly.

Land Development
We also note that projects similar to this proposal often involve land development. Under Colorado air quality regulations, land development refers to all land clearing activities, including but not limited to land preparation such as excavating or grading, for residential, commercial or industrial development. Land development activities release fugitive dust, a pollutant regulation by the Division. Small land development activities are not subject to the same reporting and permitting requirements as large land activities. Specifically, land development activities that are less than 25 contiguous acres and less than 6 months in duration do not need to report air emissions to the Division. It is important to note that even if a permit is not required, fugitive dust control measures including the Land Development APEN Form APCD-223 must be followed at the site. Fugitive dust control techniques commonly included in the plan are included in the table below.

Control Options for Unpaved Roadways	
Watering	Use of chemical stabilizer
Paving	Controlling vehicle speed
Graveling	
Control Options for Mud and Dirt Carry-Out Onto Paved Surfaces	
Gravel entry ways	Washing vehicle wheels
Covering the load	Not overfilling trucks
Control Options for Disturbed Areas	
Watering	Application of a chemical stabilizer
Revegetation	Controlling vehicle speed
Compaction	Furrowing the soil
Wind Breaks	Minimizing the areas of disturbance
	Synthetic or Natural Cover for Slopes

Please refer to the website https://cdphe.colorado.gov/apens-and-air-permits for information on land use APENs and permit forms. Click on “Land Development” to access the land development specific APEN form. Please contact KC Houlden, Construction Permits Unit Supervisor, at 303-691-4092, kenneth.houlden@state.co.us if you have any specific questions about APENs and permit forms.

If you have any other questions or need additional information, please use the contact info listed above, or e-mail or call me directly. Thank you for contacting the Air Pollution Control Division about your project.

Sincerely,
Brendan Cicione
Air Quality and Transportation Planner
General SIP Unit
Air Pollution Control Division
Colorado Department of Public Health and Environment
303-691-4104 // brendan.cicione@state.co.us

DOUGLAS COUNTY
HEALTH DEPARTMENT COLORADO

December 29, 2025

Trevor Bedford
Planning Services
100 Third Street
Castle Rock, CO 80104

RE: LE2025-027

Dear Trevor Bedford,

Thank you for the opportunity to review and comment on the referenced approval request of a Location and Extent for the construction of two pump stations and a water storage tank application submitted by Range Metropolitan District. Douglas County Health Department (DCHD) staff have reviewed the application for compliance with pertinent environmental and public health regulations. After reviewing the application, DCHD has the following comment(s):

Stormwater Impacts on Nearby Waterway
Development of the subject parcel will potentially result in an increase of stormwater and snowmelt runoff that may contribute significant pollutant loadings to the Daniels Park drainage, a tributary to Plum Creek. These pollutants include bacteria, nutrients, metals, and oxygen consuming contaminants. *A Phase III Drainage Report for Range Filing 1 has been submitted.*

Mosquito Control - Stormwater Facilities
The site plan indicates that five full-spectrum detention ponds are proposed. Detention ponds can become sites for mosquito breeding. To reduce the potential for human exposures to West Nile and other mosquito-borne viruses, DCHD recommends that the applicant prepare a mosquito control plan. Elements of the plan should include proper design, construction and regular inspection and maintenance of stormwater quality facilities, and larviciding if mosquito larvae become a problem.

Please feel free to contact me at 720-907-4887 or KHochstetler@douglas.co.us if you have any questions about our comments.

Sincerely,

Kristin Hochstetler
Environmental Health Specialist
Douglas County Health Department

Trevor Bedford

From: Loeffler - CDOT, Steven <steven.loeffler@state.co.us>
Sent: Tuesday, December 16, 2025 2:58 PM
To: Trevor Bedford
Cc: Jessica Varner - CDOT; Joseph Tripple - CDOT
Subject: Re: Douglas County eReferral (Project Number LE2025-027) Is Ready For Review

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

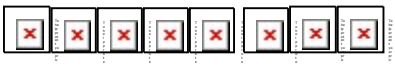
Trevor,

I have reviewed the referral for the L and E for construction of two pump stations and a water storage tank for the Range Metro District and have no objections. If any work will take place in the State Highway Right-of-Way a permit will be required. Application is made online at the following link: https://socgov.my.site.com/portal/s/login/?ec=302&startURL=%2Fportal%2Fs%2F

Thank you for the opportunity to review this referral.

Steve Loeffler
Permits Unit- Region 1

P 303.757.9891 | F 303.757.9053
2829 W. Howard Pl. 2nd Floor, Denver, CO 80204
steven.loeffler@state.co.us | www.codot.gov | www.cotrip.org



On Tue, Dec 16, 2025 at 11:29 AM <tbedford@douglas.co.us> wrote:

> There is an eReferral for your review. Please use the following link to log on to your account: https://urldefense.com/v3/__https://apps.douglas.co.us/planning/projects/Login.aspx__;!!PUG2raq7KiCZwBk!eD8BOdbfe29ir2cjwvGNRSsLcqg6I8fCXBFb3ee8FMdmUf4TnN9WmN6zn7QsiSg4ocEoRA5iIpdl2YR1KONHlpQgp_uw$
>
> Project number LE2025-027, 7440 North US Highway 85.
>
> Range Metropolitan District requests approval of a Location and Extent for the construction of two pump stations and a water storage tank.
>
> This referral will close on Tuesday, December 30, 2025.
>
> If you have any questions, please contact me.

Sincerely,

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

PROJECT REFERRAL LOADING AND DATA SUMMARY SHEET

Dear Applicant:

Please complete the following summary sheet and return to:

Sean Atkinson
CORE Electric Cooperative
5496 North U.S. Highway 85
P.O. Drawer A
Sedalia, Colorado 80135
satkinson@core.coop

Project Name _____

Residential Developments:

1. Total number of homes or units in development _____
2. Lot breakdown of construction phases:

Phase	Filing(s)	Block(s)	Lot(s)	Construction Date (Month/Year)

3. Electrical loads of homes or units:
   - Typical size of home or unit _____ (sq. ft.)
   - Typical size of electrical service _____ (amps)
   - Number of homes or units designed or built with A/C _____
4. Other electrical loads (Examples: schools, wells, booster pumps, water treatment facilities, clubhouses, or golf courses):
   _____
   _____

Commercial Developments:

1. Extent of commercial development:

Lot/Block	Lot Size (sq. ft.)	Building Size (sq. ft.)	Type of Business (i.e. retail, office, industrial, restaurant)	Construction Date (Month/Year)

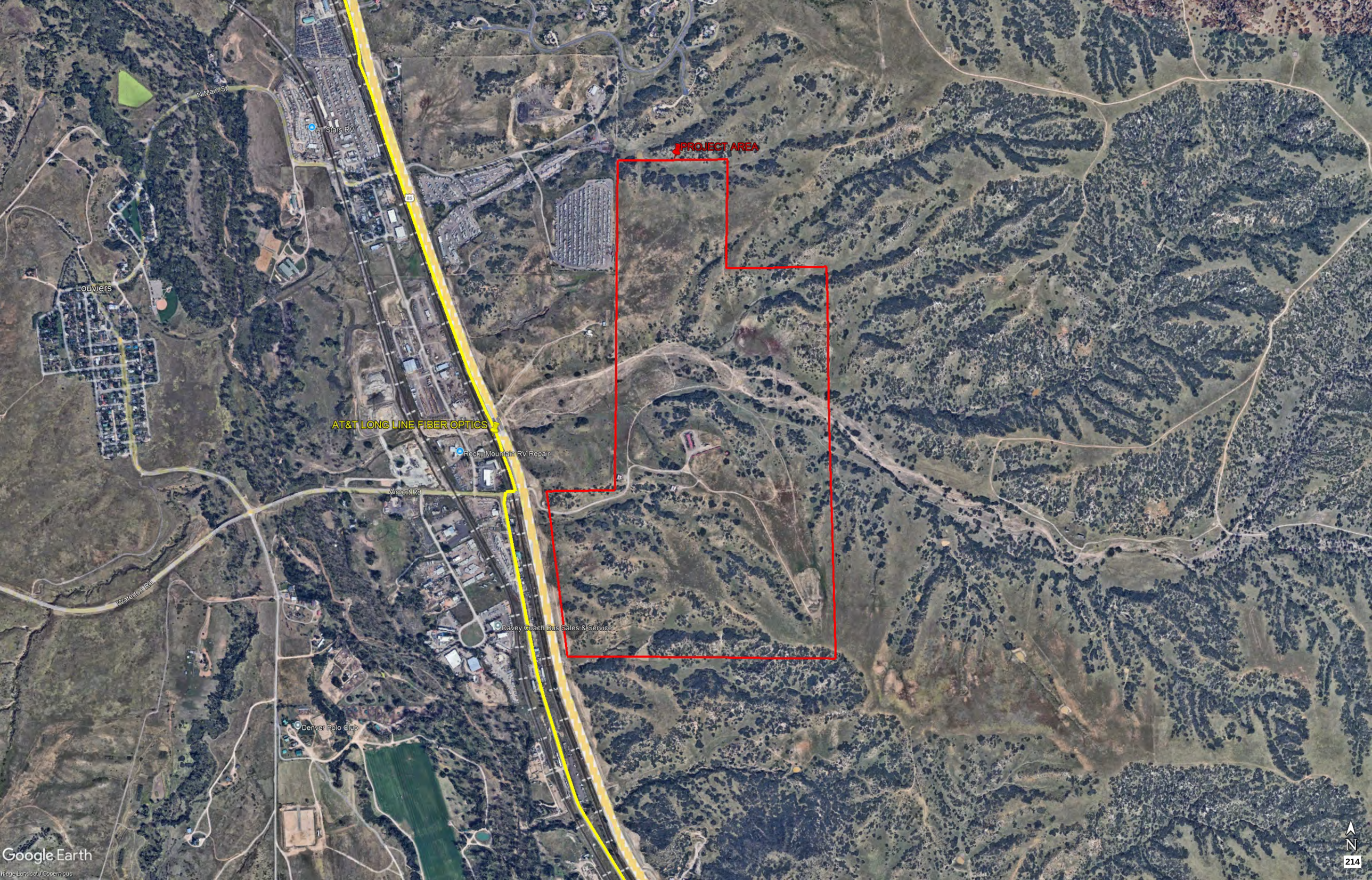
2. Type of electrical service: ☐ 1Ø, 120/240 V ☐ 3Ø, 120/208 V ☐ 3Ø, 277/480V
3. Estimated kW demand of load(s) if known:
   _____
   _____
4. Other electrical loads (Examples: wells, booster pumps, or water treatment facilities):
   _____
   _____

Project contact:

Name _____ Phone _____
Company _____
Address _____
_____

Thank you for completing the above information. If you have any questions, please contact me at (720) 733-5480.

Sean Atkinson
System Planner


PROJECT AREA
AT&T LONG LINE FIBER OPTICS
N Main St
All Stars RV
Louviers
Rocky Mountain RV Repair
Airport Rd
Watertech Rd
Davey Coach Bus Sales & Service
Denver Polo Club
Google Earth
Image Landsat / Copernicus
N
214

HIGHLANDS RANCH
COMMUNITY ASSOCIATION

Wednesday - December 10, 2025

Sent Via: Email to: mpesicka@douglas.co.us

Mr. Mike Pesicka, Principal Planner
Douglas County, ComDev Dpt: PLANNING
100 Third Street
Castle Rock, CO 80104-2425

RE: **DougCo SB2025-036: Range Filing 1, Final Plat**

HRCA Comments and Concerns

Greetings, Mr. Pesicka:

The Highlands Ranch Community Association (HRCA) appreciates the opportunity to review and opine on the Final Plat submittal for Range Filing No. 1. As you know, HRCA owns and manages the Backcountry Wilderness Area, which directly abuts the eastern and northeastern boundary of the Range property, and therefore has a significant interest in the long-term interface between this development and protected open space.

After reviewing the Final Plat documents and supporting technical materials, HRCA acknowledges that Filing No. 1 appears to be generally consistent with the previously approved Planned Development and Preliminary Plan, and that utility systems, drainage facilities, and roadway infrastructure are designed to be contained within the Range project and the associated metropolitan districts.

Accordingly, HRCA offers conditional support for Final Plat Filing No. 1, subject to the following concerns and expectations being formally recognized and addressed through future filings, site improvement plans, and associated approvals.

HRCA Conditions and Preserved Objections

1. *Boundary Treatment, Fencing, and Trespass Prevention*

   HRCA previously raised concerns during Preliminary Plan review regarding boundary treatments, fencing, and trespass management along the shared interface between Range and the Backcountry Wilderness Area. Those concerns remain unresolved at this stage.

   HRCA requests that future filings explicitly include:

   - Permanent fencing or physical boundary controls where residential lots or trails abut HRCA land.
   - Signage identifying the boundary between private/community property and protected open space.
   - Design measures that prevent informal access into HRCA property from Range neighborhoods.

Education and wayfinding, while beneficial, do not replace physical boundary measures where development directly interfaces with conservation land.

2. *Trail Design and Connectivity*

HRCA requests that trail systems be designed to:

- Avoid directing users toward HRCA land unless an access agreement exists.
- Prevent trail terminations that encourage informal use or "social trails" into the Backcountry.
- Acknowledge HRCA property as a restricted, managed open space rather than general recreation land.

Any future trail planning near the HRCA boundary shall be coordinated with HRCA prior to approval.

3. *Infrastructure Siting: Water Storage Tank and Pump Stations*

HRCA notes that the Range water system includes a major water storage tank and pump station facilities located near the southeastern portion of the project.

Given the proximity to HRCA land, HRCA requests that:

- Architectural treatment and landscape screening be required to mitigate visual impacts.
- Lighting for these facilities be dark-sky compliant and oriented to minimize spillover.
- Sound attenuation be incorporated for pump and generator equipment.

These measures are important to preserve the natural character of the adjacent Backcountry Wilderness Area.

4. *Weed Control and Edge Management*

HRCA requests that the Final Plat and associated agreements clearly establish responsibility for:

- Ongoing weed control along the shared boundary.
- Native revegetation and restoration in areas disturbed adjacent to HRCA property.
- Prevention of invasive species transport into protected open space.

Control programs should be formalized in operating agreements, not left to informal management practices.

5. *Future Filings and Record Preservation*

HRCA expects that the matters outlined above be addressed in detail in:

- Filing No. 2.
- Any future Site Improvement Plans (SIPs).
- Utility facility approvals.
- Trail infrastructure submittals.

HRCA submits this letter to ensure these issues are documented in the land-use record and preserved for future review.

In summary, HRCA does not oppose Final Plat Filing No. 1 as a technical matter. However, HRCA's support is expressly conditioned on the expectation that boundary treatment, trail design, and infrastructure impacts are addressed in future approvals in a manner that protects HRCA-owned conservation lands.

Nothing in this letter shall be construed as a waiver of HRCA's ability to comment on or object to future filings, permits, or approvals related to the Range development that affect HRCA land or operational interests.

Please include this letter in the official project file. HRCA appreciates the opportunity to remain engaged in this process and welcomes continued coordination with Douglas County and the applicant as future submittals occur.

Sincerely,

HIGHLANDS RANCH COMMUNITY ASSOCIATION
Community Improvement Services

Weylan A. "Woody" Bryant, M LS, PE
Director: Community Improvement Services
303.471.8802 (direct) | 303.471.8821 (general office) | 303.549.0053 (cell)
Woody.Bryant@hrcaonline.org (email) | commercialreview@hrcaonline.org (alternate email)

Attachments: As noted, if applicable.

Cc: Mr. Mike Bailey, GM/CEO HRCA via: mike.bailey@hrcaonline.org
Mr. John Mezger, HRCA via: john.mezger@hrcaonline.org

HELP CONSERVE OUR NATURAL RESOURCES!

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

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

Project Name:	7440 North US Highway 85 – Location and Extent
Project File #:	**LE2025-027**
S Metro Review #	REFSP25-00312
Review date:	December 23, 2025
Plan reviewer:	Aaron Miller 720.989.2246 aaron.miller@southmetro.org
Project Summary:	Range Metropolitan District requests approval of a Location and Extent for the construction of two pump stations and a water storage tank
Code Reference:	Douglas County Fire Code, 2018 International Fire Code, and 2021 International Building Code with amendments as adopted by Douglas County.

South Metro Fire Rescue (SMFR) has reviewed the provided documents and has conditional non-objection to the proposed Location and Extent. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project.

COMMENTS:

1. **Referrals for new structures must not use unapproved addresses as the project name.** These facilities will be addressed from future roadways and will not be addressed from US Hwy 85, Addresses proposed by the Addressing Analyst (which does not match the project title) will also change. Building addresses and unit numbers shall be coordinated with and approved by SMFR and the Douglas County Addressing Analyst prior to submitting for construction permits.

Fire Flow per Appendix B

Construction Type	Building Area (SF)	Fire Flow (GPM)	Sprinkler System (Type)	Reduced Fire Flow

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

FIRE ACCESS ROAD DESIGN CRITERIA

BUILDING exterior walls (and any portion thereof) of any buildings that are more than 150 feet from the curb line of a public street shall be served by a Fire Apparatus Access Road which shall be unobstructed. This distance is measured by an approved route around the exterior of the building or facility. Additional allowances may be made for some sprinkler protected structures. Alternate access arrangements may be accepted based on site conditions and building fire protection features.

Due to the possibility of heavy vehicle traffic, residential and commercial collector and arterial roads may not be considered adequate for fire suppression operations; no credit for access to perimeter of buildings shall be given from collectors or arterials, unless specifically approved.

Sites not be capable of meeting these requirements and any alternative means must be evaluated and approved by the Fire Marshal.

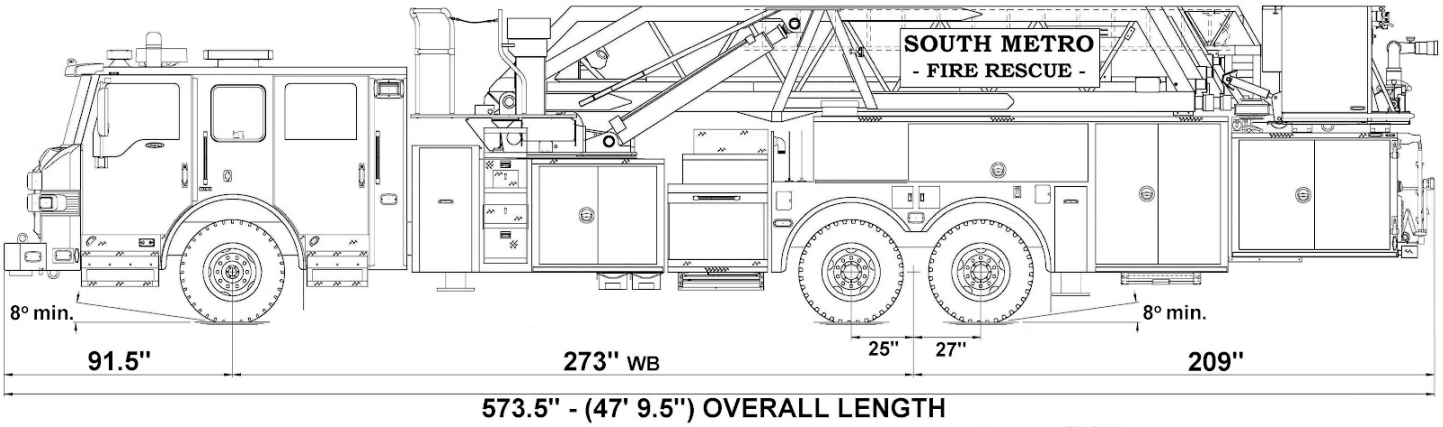
FIRE APPARATUS ACCESS ROADS shall be of an all-weather surface capable of supporting the imposed loads of fire apparatus. Maximum grade on site shall not exceed six percent (6%). Roads shall be asphalt or concrete. Other surfaces may be accepted on a case by case basis.

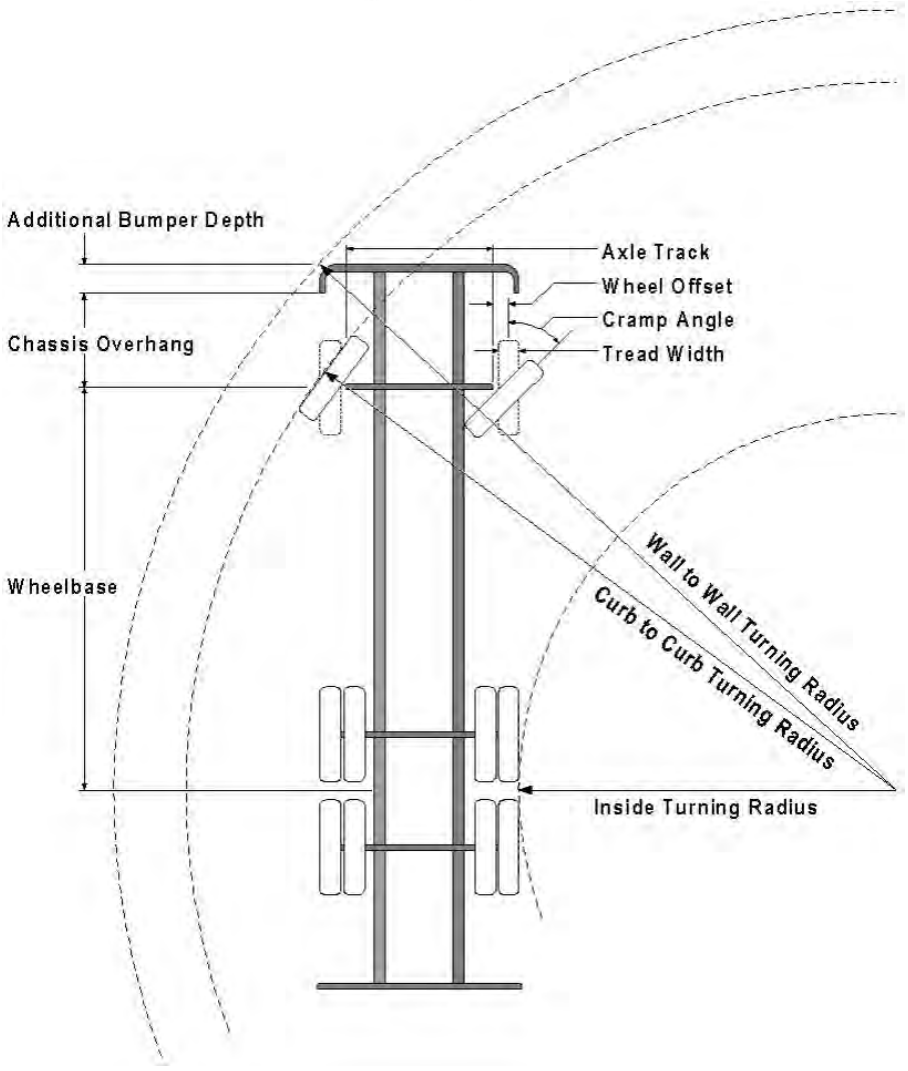
The minimum unobstructed width of the fire apparatus access road shall be 20 feet. In order to maintain the minimum width and prevent obstructions such as parking of vehicles fire lane signs shall be installed in an approved manner. A minimum vertical clearance of 13 feet, 6 inches shall be maintained for the entire required width of the access road.

Any dead-end access road over 150 feet long shall be provided with an approved turnaround that may be a circle, tee, hammerhead, or other functional approved design.

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

VEHICLE SPECIFICATIONS are provided for the largest apparatus in use by South Metro Fire Rescue. Fire Apparatus Access Roads shall be capable of accommodating this apparatus.





9195 East Mineral Avenue, Centennial, Colorado 80112 Phone: 720-989-2230 Fax: 720-989-2030

Vehicle Specifications

Length: 47' 9.5"

Width: 8' 5" - (10' 1" mirror to mirror)

Height: 10' 9"

Wheelbase: 273 in.

Design load: 80,000 pounds

Inside Cramp Angle: 40°

Axle Track: 83"

Wheel Offset: 5.3"

Tread Width: 13.5"

Turning Radii:

Inside Turn: 26 ft. 1 in.

Curb to curb: 41 ft. 11 in.

Wall to wall: 46 ft. 8 in.

Where objects are present adjacent to the fire apparatus access road, particularly on turns and turn arounds which require backing, a reasonable safety margin shall be provided to prevent potential damage to the property and to the fire apparatus.

PRIVATE ROADS that provide access to more than two dwellings or one or more commercial buildings shall be constructed to meet the roadway standards approved by the South Metro Fire Rescue Authority for fire apparatus access. Private roads that do not meet the roadway standard may be accepted provided that alternative methods and materials are incorporated into the subdivision that address the fire and life safety of the citizens.

Outlook

Louviers Conservation Partnership Range Location and Extent (LE2025-027) Comments

From Randy Johnson <rj2376@outlook.com>
Date Sun 12/28/2025 8:39 PM
To tbedford@douglas.co.us <tbedford@douglas.co.us>

Louviers Conservation Partnership (LCP) has reviewed the documents for the 7440 North US Highway 85 Request by Range Metropolitan District for two water pump stations and a water storage tank and has comments following the document excepts below::

Below are excerpts from the documents reviewed, noting in Bold items important to the Town of Louviers including about Louviers and the current eastbound Airport Road level of Service (LOS) highlighted in bold.

Conformance with Douglas County Master Plan

Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. **The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts.**

Felsburg Holt & Ullevig Range 5th Revised Traffic Impact Analysis

The Town of Louviers is to the northwest of US 85 and the project site. It is a relatively small enclave of residential homes that was originally constructed as a company town to support the E.I. du Pont de Nemours dynamite manufacturing facilities and it **is one of the best preserved company towns in Colorado.**

The evaluation of an intersection controlled by a traffic signal provides average vehicle delay and LOS information for the entire intersection, as well as for individual movements. Figure 3 also shows the LOS results for existing conditions which finds that the US 85/Airport Road intersection is currently operating at LOS B during the AM and PM peak hours. **Given the relatively high traffic demand on US 85, however, eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour.**

Of note, the operational analyses are based on signal timing data provided by CDOT and it is understood that this intersection operates in a "free" mode which allows the traffic signal to fluctuate to meet vehicle movement demand without a specified cycle length. As such, the traffic signal controller appears to allocate more "green time" to movements along US 85, which, in turn, **creates a higher level of delay for the eastbound Airport Road movements that result in the poor eastbound LOS.**

Projected vehicle-trips for Range is almost 5,000 vehicles per day with approximately 400 during the AM peak hour and about 525 during the PM peak hour.

Although this is just location and extents for 2 pump stations and a water storage tank which would only have an impact when being built, it does include a full traffic study which mentions **eastbound movements on Airport Road are currently experiencing LOS E during the AM peak hour and LOS F during the PM peak hour.** This study used existing traffic data from 2020 which will not include the approved Brannan Asphalt Plant which has not started operating yet in addition to the approved Brannan crushing and existing Brannan concrete plant for a total of 1008 truck trips per day and also the added traffic from the recently approved Zebulon Mega Sports Complex where they are now requesting a change to add more residential units.

Randy Johnson
Director
Louviers Conservation Partnership

Right of Way & Permits

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

December 19, 2025

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

Attn: Trevor Bedford

Re: 7440 North US Highway 85, Case # LE2025-027

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the above-mentioned application and currently has **no apparent conflict**.

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

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

DOUGLAS COUNTY
COLORADO

Staff Report Addendum

Date: February 26, 2026

To: Douglas County Planning Commission

From: Trevor Bedford, AICP, Senior Planner TB
Jeanette Bare, AICP, Planning Manager JB
Steven E. Koster, AICP, Assistant Director of Planning Services SK

Subject: **7440 North US Highway 85 – Range Metro District Infrastructure Project – Location and Extent**

Project File: **LE2025-027**

Planning Commission Hearing: **March 2, 2026 @ 6:00 p.m.**

At the February 2, 2026 Planning Commission public hearing, the request for the Range Metro District's on-site water infrastructure was continued until the March 2, 2026. The applicant has provided an updated exhibit and narrative based on feedback provided by the Planning Commission. The applicant has indicated that the proposed water tank will be partially recessed into the ground and screened by a berm on three sides.

ATTACHMENT **PAGE**

Updated Narrative 2
Updated Location and Extent Exhibit 6

TECHNICAL MEMORANDUM

DOUGLAS COUNTY LOCATION AND EXTENT REPORT

RANGE METROPOLITAN DISTRICT
RANGED PLANNED DEVELOPMENT
WATER SUPPLY SYSTEM
US-85 & AIRPORT RD.

Prepared for:
Douglas County

Prepared by:
RICK Engineering

On Behalf of:
Range Metropolitan District

RICK Job No. 2215
February 2026

RICK

RICK

303-537-8020
rickengineering.com

8678 Concord Center Drive #200
Englewood, CO 80112

SAN DIEGO ORANGE RIVERSIDE SACRAMENTO SAN LUIS OBISPO SANTA CLARITA PHOENIX TUCSON LAS VEGAS DENVER

February 19, 2026

Planning Service Division
Douglas County
100 Third Street
Castle Rock, CO 80104

RE: Range Metropolitan District Range Planned Development Water Supply System
Dear Douglas County Planning Service Division:

Please accept this letter on behalf of the Range Metropolitan District for district infrastructure proposed to support the Range Planned Development. We are pleased to submit this Limits and Extents application for Range Filing No 1 for your approval, located at the intersection of US 85 and Airport Rd. within the approved Range Planned Development area in unincorporated Douglas County. This report will outline the upper and lower pump stations connected by a feed line that is proposed for this project.

Construction

Construction will include site preparation and grading for two pump stations and a water storage tank to established design elevations. Water utilities will be installed, including all associated piping, appurtenances, and a dedicated feed line between the lower and upper pump stations. Following utility installation, access drives will be constructed to provide maintenance and operational access to the facilities. Final site work will include installation of landscaping and site stabilization measures to restore disturbed areas and provide long-term erosion control.

Location & Appearance

The proposed lower water pump station will be situated approximately 1,000 feet east of the intersection of US 85 and Airport Road, located off the north entrance road. The building will measure approximately 20 feet in width by 17 feet in length. This will house the boost pumps which will send water through approximately 3,700 feet of feed line pipe to the upper pump station and tank. The upper pump station and the associated water tank will be in the southeast corner of the Range Filing 1 clustered homes, approximately 2,900 feet east of US-85 and adjacent to the east property line. The pump house measures approximately 35 feet wide by 17 feet long and will contain domestic water supply pumps and a diesel powered fire boost pump. An emergency diesel generator will be just outside of the pump house and will provide power to the domestic pumps in the event of a power outage. The water tank will be an above ground tank that measures 63 feet in diameter and 30 feet in height and has a capacity of 520,000 gallons.

The lower pump station will utilize fully cut-off exterior lighting to ensure illumination remains contained on-site, preventing light spillover onto adjacent properties. The lower pump station will be finished natural, subdued tones and screened with native trees to blend with the surrounding environment and enhance visual compatibility with nearby residences. The upper pump station and tank will also be finished with natural, subdued tones but are placed on a site with enhanced screening due to the site's geographically prominent location. The structures will be placed on a graded pad which is recessed into existing ground which is surrounded by a berm on three sides. The site berm provides visual screening of the structures on the west, south, and east sides and opens to the northeast to provide maintenance and emergency

vehicle access. Landscaping is proposed on top of the berm to provide further screening. In addition to the site design the structures will utilize fully cut-off exterior lighting to minimize any light pollution beyond the physical site screening.

The water tank is being installed above ground to ensure constructability, optimal system performance, and long-term reliability. The site where the tank needs to be located experiences shallow bedrock which only allows for 7ft excavation complicating a buried tank. An underground installation would also complicate routine inspections and maintenance, limiting access to valves, fittings, and structural components and increasing the potential for undetected leaks or corrosion. The primary drivers for an above-ground configuration are improved operational efficiency, better fire-response capability, and enhanced accessibility for safe maintenance over the life of the system. We believe the above ground installation within a site that is designed to screen the facilities provides an excellent alternative to an underground tank installation.

Conformance with Douglas County Master Plan

Care has been taken to ensure the project aligns with the applicable goals of the Louviers Rural Community Master Plan. The design prioritizes conservation and integration of the site's natural features, with terrain disturbance minimized to maintain existing topography and preserve trees and shrubs wherever feasible. Building colors for the pump houses and the water tank have been selected to blend with the surrounding environment, and site berming with landscape screening will be incorporated to the greatest extent possible to further reduce visual impacts.

Stormwater

An onsite storm sewer system will convey runoff to one of five detention ponds which will provide water quality controls and then release it at historical rates along existing drainage ways. The Phase III Drainage Report and map have been included that show adequate drainage has been designed for the site.

Noise Control

Noise attenuation measures for the pumps and generator focus on minimizing operational sound levels at nearby residences while maintaining equipment performance. Because the selected pump house structure is wood framed rather than concrete, additional mitigation strategies will be implemented to compensate for its lower inherent sound attenuation. These measures include installing insulation and sound-dampening materials within the building envelope to reduce pump noise transmission, as well as orienting the ventilation system away from neighboring homes to limit exterior sound propagation.

The emergency generator located at the upper pump house will be housed in a dedicated enclosure outfitted with acoustic insulation, and, if required to meet target noise thresholds, sound-attenuated air intake and exhaust vents will be incorporated to further reduce noise emissions.

Traffic

Traffic associated with the pump houses is expected to be minimal and limited to periodic operational needs. The Range Metro District will make infrequent site visits for routine inspections, repairs, and landscape maintenance, resulting in only occasional vehicle access to the facilities. Due to the low

frequency and short duration of these visits, traffic impacts on nearby residents are anticipated to be negligible and will not alter normal neighborhood traffic patterns or adversely affect residents' quality of life. The Range TIA has been included for reference purposes.

Paving Design

All pavement design for roadways and paved areas leading up to the pump houses is included as part of the Range Development Filing 1 submittal. The pump houses themselves will be served only by small access drives, the design and construction of which will be directed in the field by a qualified geotechnical engineer based on site-specific subsurface conditions and performance requirements.

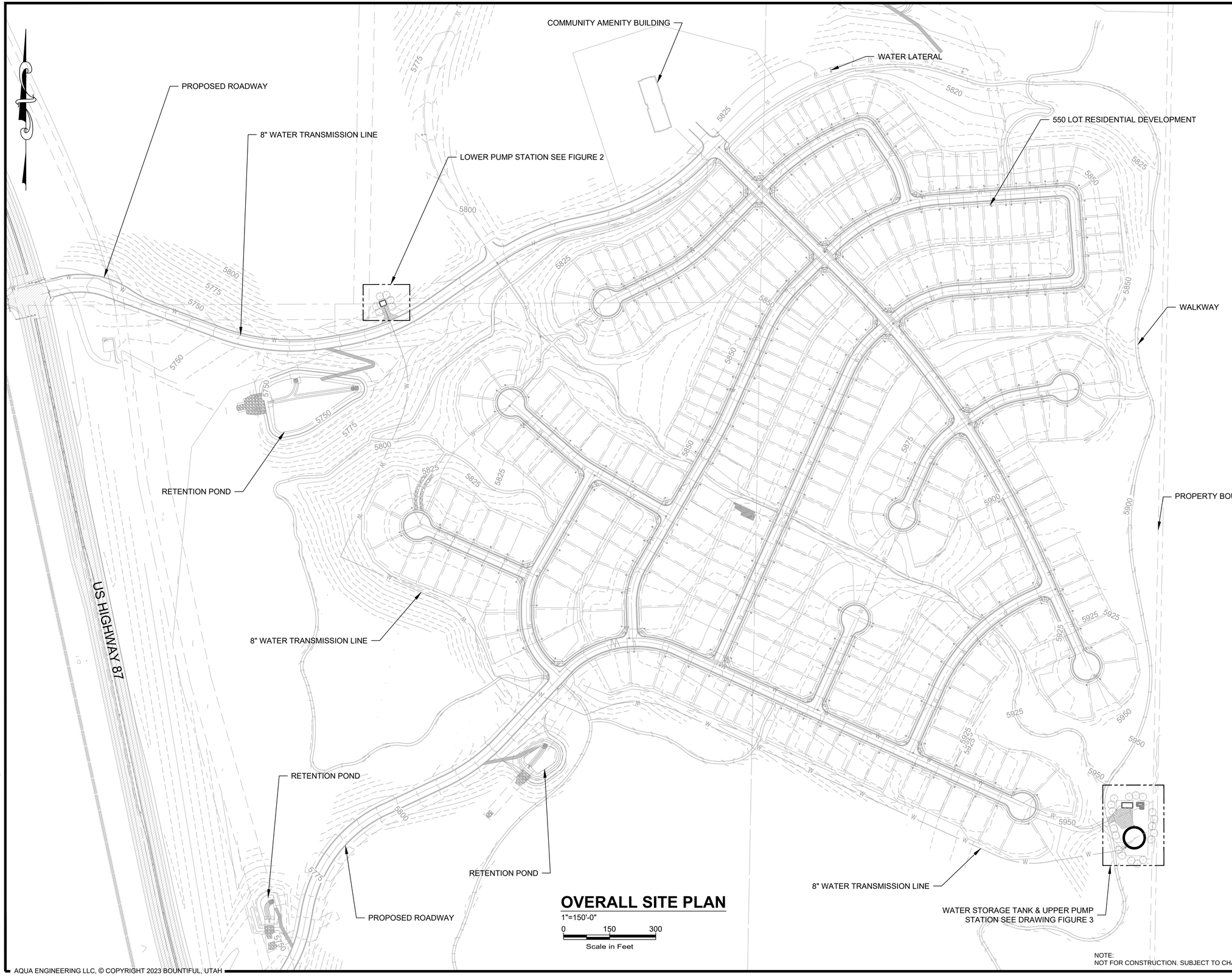
Anticipated Process Timing

The Final Plat for Range Planned Development Filing 1 was placed in its first referral on December 9, 2025. We expect final permitting approvals in early 2026 with construction commencing shortly after county approvals. We anticipate Final Plat of Filing 2 to lag behind Filing 1 by approximately 6 months.

Thank you for your consideration of this pump house and water tank approval. We look forward to collaborating with Douglas County. Please do not hesitate to reach out with any questions or concerns you may have to help facilitate the approval process, and we look forward to your response.

Respectfully,

Kristofer Carlstedt
kcarlstedt@rickengineering.com



OVERALL SITE PLAN

1"=150'-0"

0 150 300

Scale in Feet

NOTE:
NOT FOR CONSTRUCTION. SUBJECT TO CHANGE DURING FINAL DESIGN

DRAWING IS TO SCALE
IF BAR MEASURES:
1" = FULL SCALE
1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	10/15/2025	ALF	VE	-

REVISIONS

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

CIVIL
OVERALL SITE PLAN

AQUA ENGINEERING

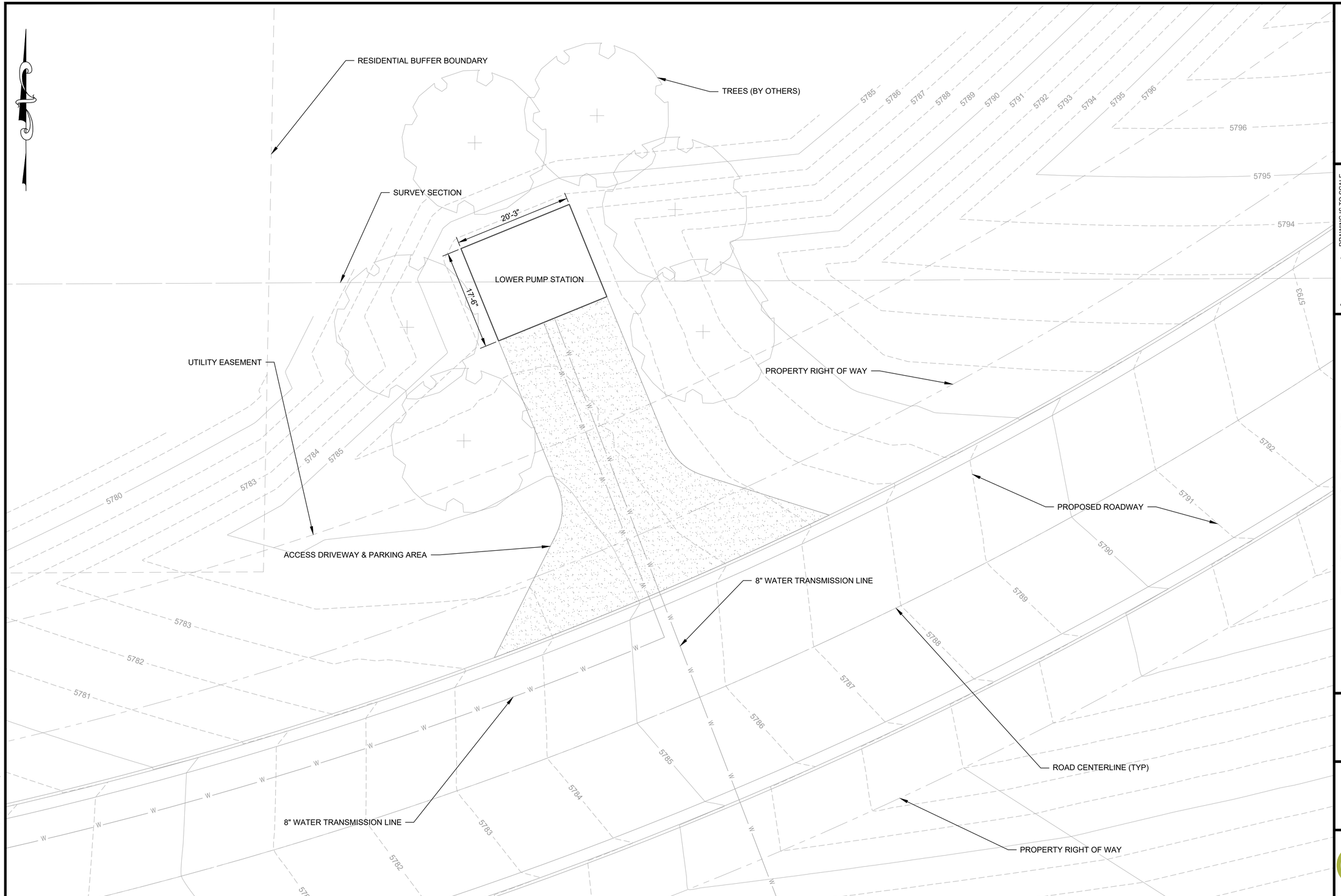
DRAWING NO.

FIGURE 1

SHEET

12/5/2025 C:\USERS\DEREK.HYDE\DCVACCDOCS\AQUA ENGINEERING\002885.C - RANGE METRO DISTRICT\PROJECT FILES\001 SITE CIVIL\FIGURE 1 - OVERALL SITE PLAN.DWG

AQUA ENGINEERING LLC, © COPYRIGHT 2023 BOUNTIFUL, UTAH



LOWER PUMP STATION SITE PLAN

1"=8'-0"

0 8 16

Scale in Feet

NOTE:
NOT FOR CONSTRUCTION. SUBJECT TO CHANGE DURING FINAL DESIGN

DRAWING IS TO SCALE
IF BAR MEASURES:
1" = FULL SCALE
1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	10/15/2025	ALF	VE	-

REVISIONS

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN
CIVIL
LOWER PUMP STATION SITE PLAN

AQUA ENGINEERING

DRAWING NO.

FIGURE 2

SHEET

C:\USERS\DEREK.HYDE\DCACCDOCS\AQUA ENGINEERING\002885.C - RANGE METRO DISTRICT\PROJECT FILES\001 SITE CIVIL\FIGURE 2 - ENLARGED SITE PLAN.DWG

12/4/2025

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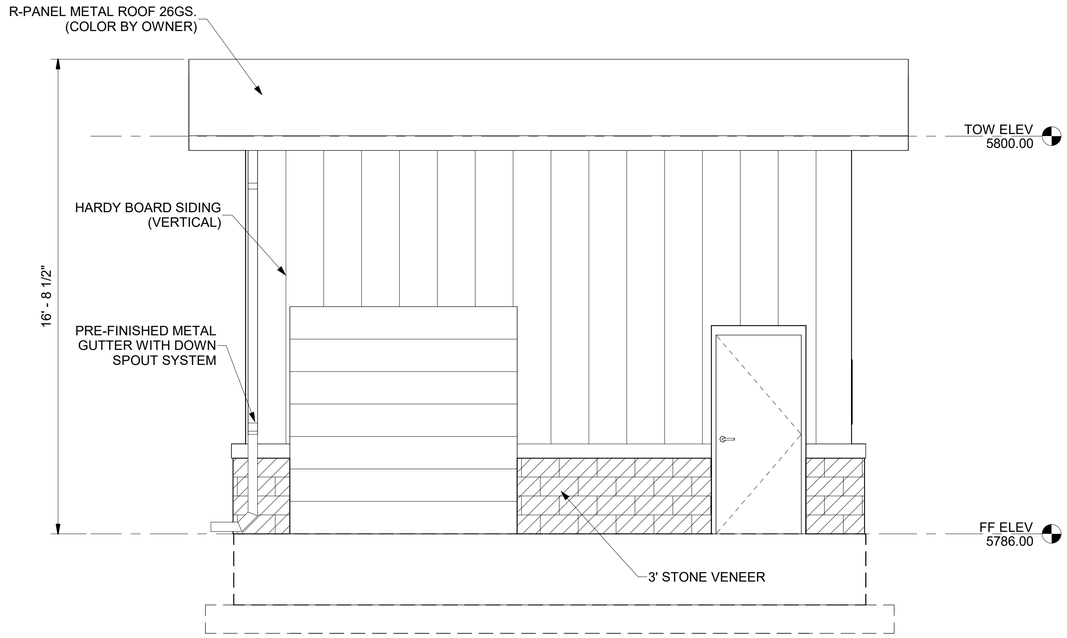
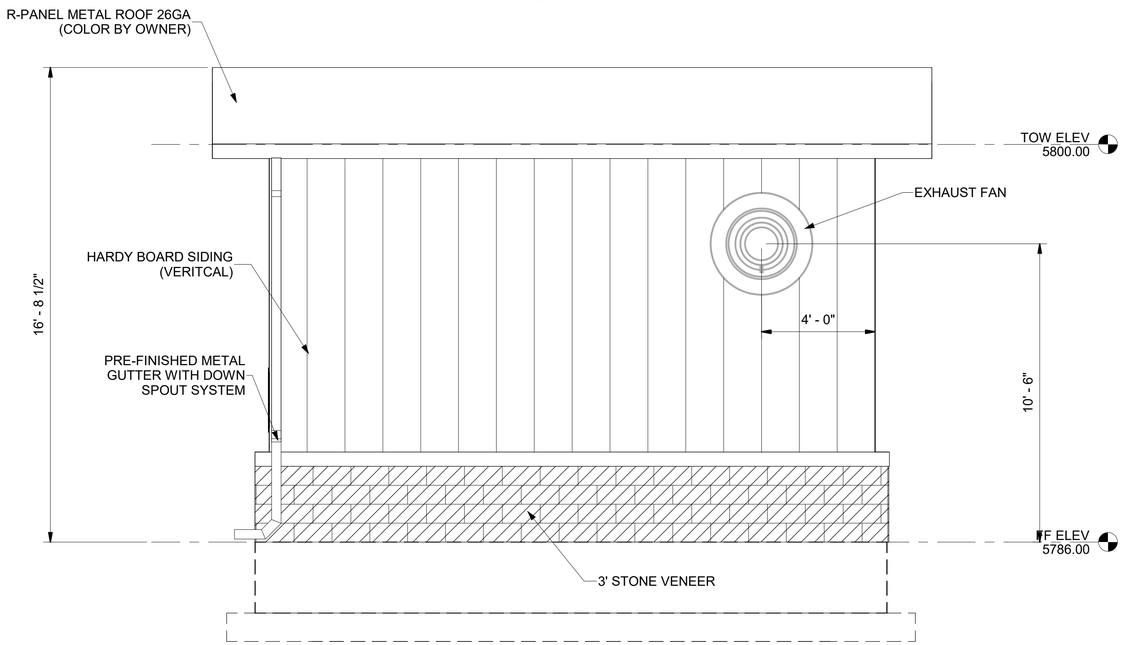


NORTH ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet



SOUTH ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet

NOTE:
NOT FOR CONSTRUCTION. SUBJECT TO CHANGE DURING FINAL DESIGN

NOT FOR CONSTRUCTION

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	08/08/2021	Designer	Author	Checker

REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

LOWER PUMP STATION
ARCHITECTURAL
ELEVATIONS

AQUA ENGINEERING

DRAWING NO.

10A301

SHEET

11/12/2025 11:29:19 AM Autodesk Docs://002885.C - Range Metro District/10-LOWER PUMP STATION-V24.rvt

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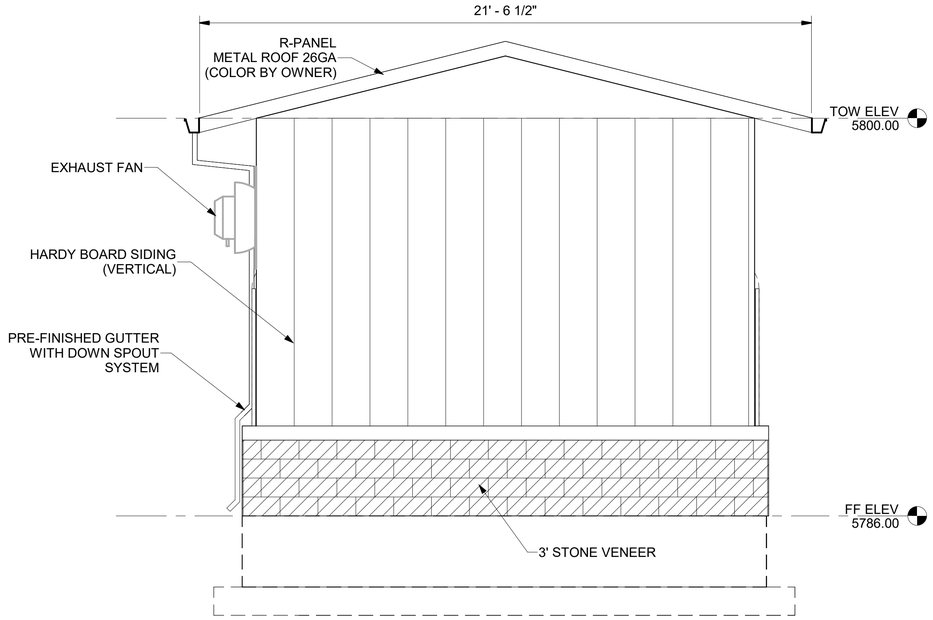

EAST ELEVATION

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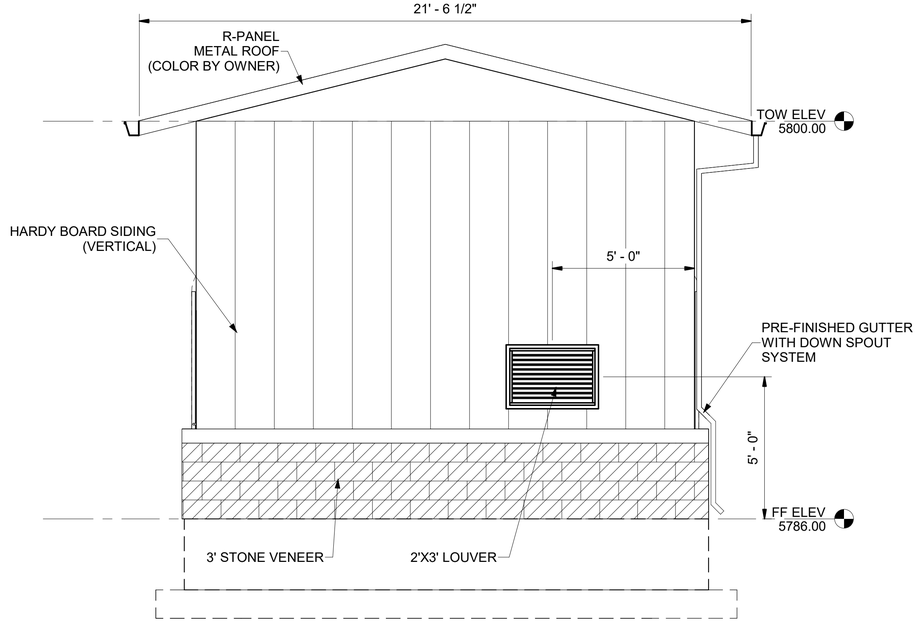
Scale in Feet



WEST ELEVATION

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0 2 4

Scale in Feet

NOTE:
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NOT FOR CONSTRUCTION

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

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ORIGINAL

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REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

LOWER PUMP STATION
ARCHITECTURAL
ELEVATIONS

AQUA ENGINEERING

DRAWING NO.

10A302

SHEET

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UPPER PUMP STATION HOUSE
ELEV: 5958.92

PEDESTRIAN TRAIL

GENERATOR

PROPOSED FENCE

WATER STORAGE TANK
63' DIA.
520,000 GALLONS
ELEV: 5963

HIGHLANDS RANCH COMMUNITY ASSOC INC (PLANNED DEVELOPMENT)

RESIDENTIAL HOME

RALPHIE ROAD

CONCRETE ACCESS ROUTE

20'

8'

WEST TO EAST PROFILE

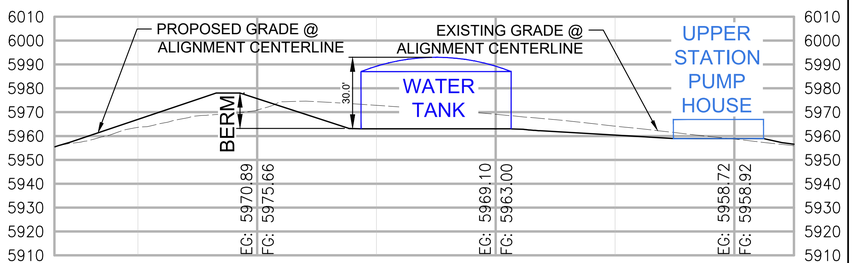
PROPERTY BOUNDARY

SOUTH TO NORTH PROFILE

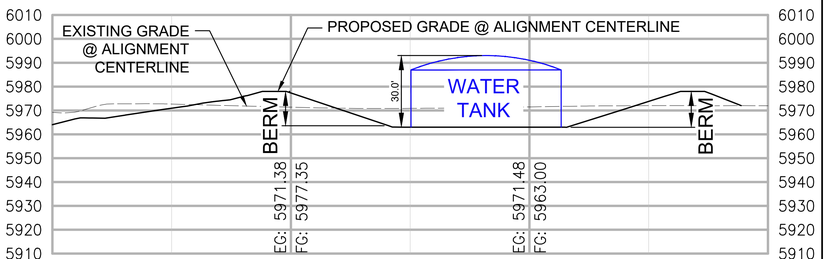
PEDESTRIAN TRAIL

PROPOSED LANDSCAPING TREES

KEY MAP
SCALE: 1"=900'



SOUTH TO NORTH PROFILE
HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=30'



WEST TO EAST PROFILE
HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=30'

20 10 0 20 40
HORIZONTAL SCALE: 1"=20'

N

NOTE:
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RICK
8678 CONCORD CENTER DR #200
ENGLEWOOD, CO 80112
303-537-8020
rickengineering.com

RANGE METRO DISTRICT

UPPER PUMP STATION AND TANK EXHIBIT

PROJECT NO:	2215	SCALE:	1"=20'
DRAWN BY:	KEC/DAL	DATE:	2/20/2026

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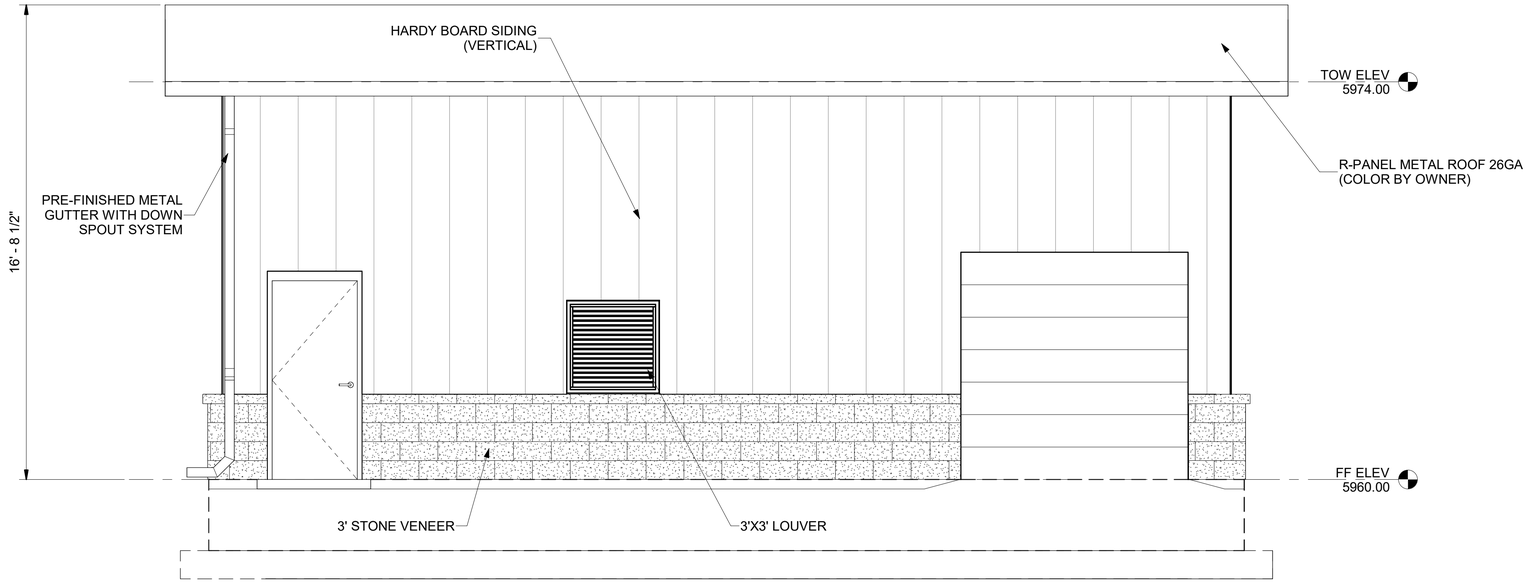
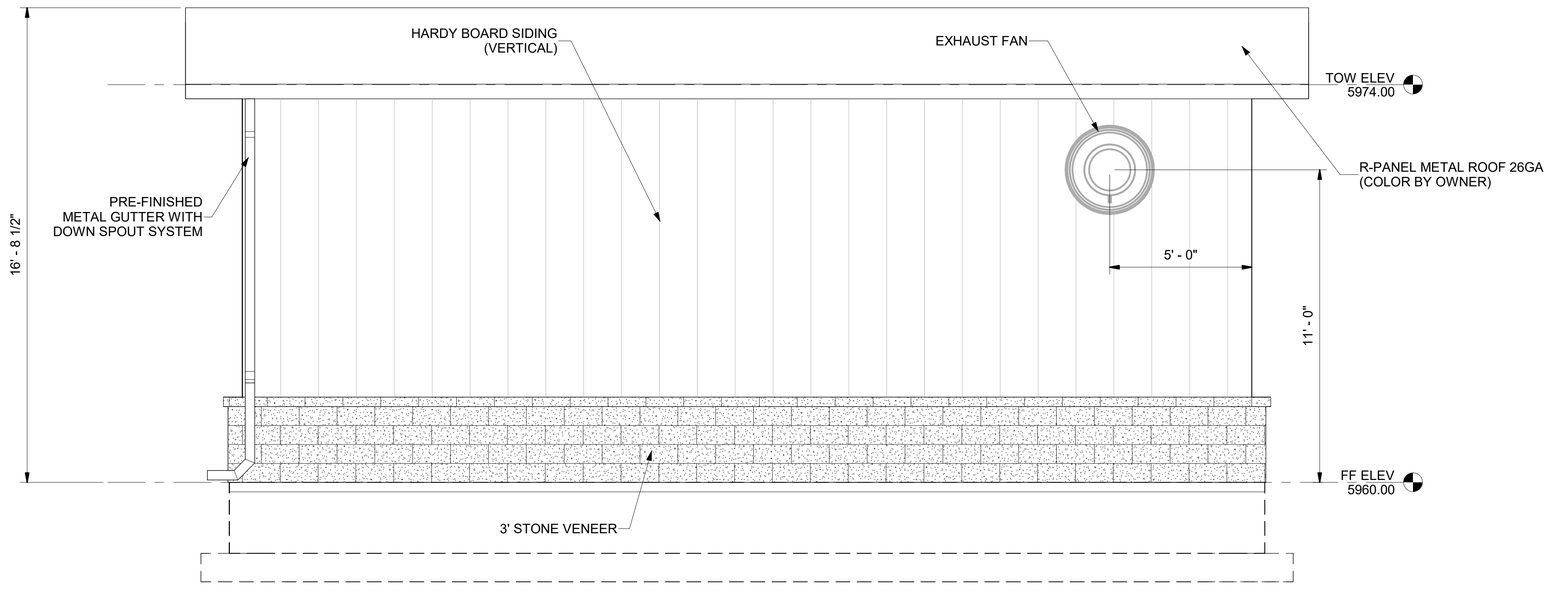


EAST ELEVATION

3/8" = 1'-0

0 2 4

Scale in Feet



WEST ELEVATION

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0 2 4

Scale in Feet

NOTE:
NOT FOR CONSTRUCTION. SUBJECT TO CHANGE DURING FINAL DESIGN

NOT FOR CONSTRUCTION

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
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REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

UPPER PUMP STATION
ARCHITECTURAL
ELEVATIONS

AQUA ENGINEERING

DRAWING NO.

30A301

SHEET

11/12/2025 3:24:30 PM Autodesk Docs://002885.C - Range Metro District/30-UPPER PUMP STATION-V24.rvt

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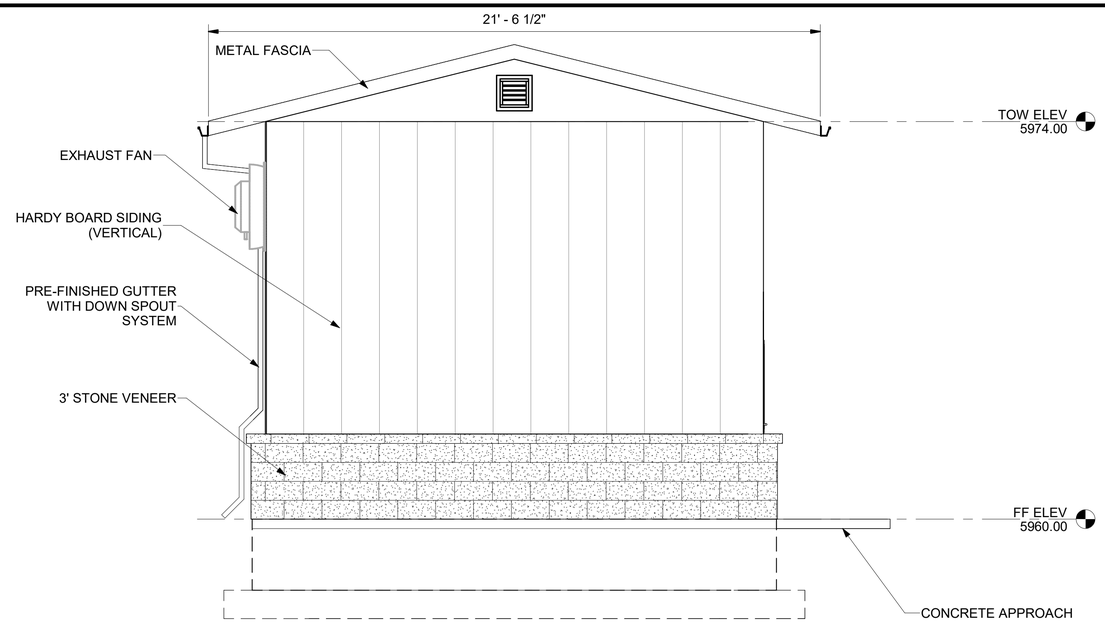
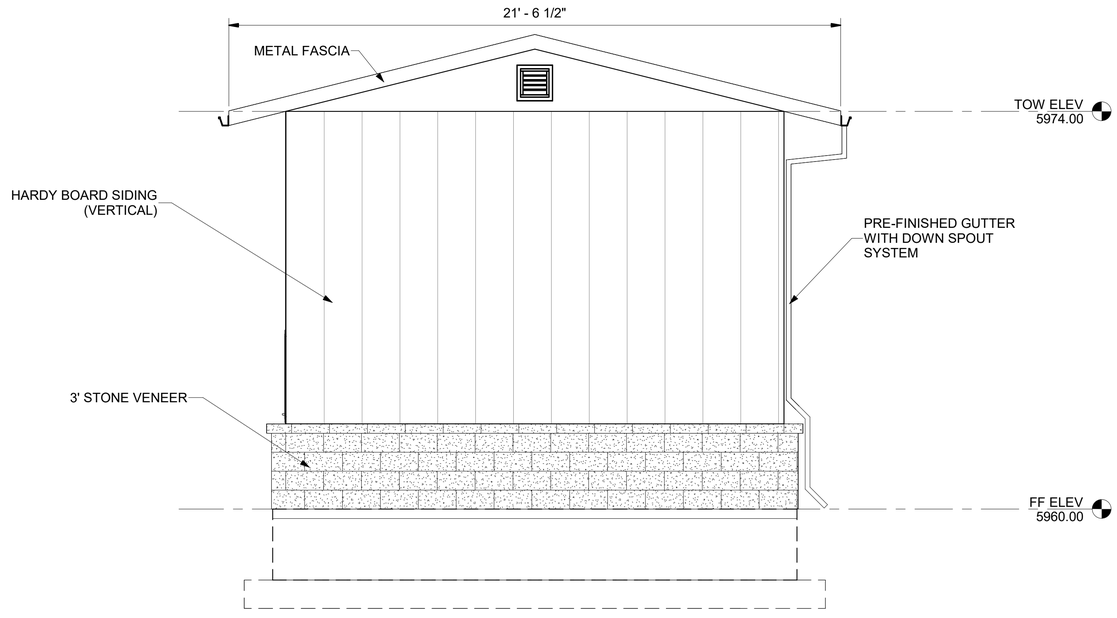


NORTH ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet



SOUTH ELEVATION

3/8" = 1'-0"

0 2 4

Scale in Feet

NOTE:
NOT FOR CONSTRUCTION. SUBJECT TO CHANGE DURING FINAL DESIGN

NOT F
ONSTRUCTION

DRAWING IS TO SCALE
IF BAR MEASURES:
1" = FULL SCALE
1/2" = HALF SCALE

0 1/2 1

ORIGINAL

NO.	DATE	DESIGN	DRAWN	CHECKED
0	08/08/2021	Designer	Author	Checker

REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT
RANGE WATER SYSTEM DESIGN

UPPER PUMP STATION
ARCHITECTURAL
ELEVATIONS

AQUA ENGINEERING

DRAWING NO.

30A302

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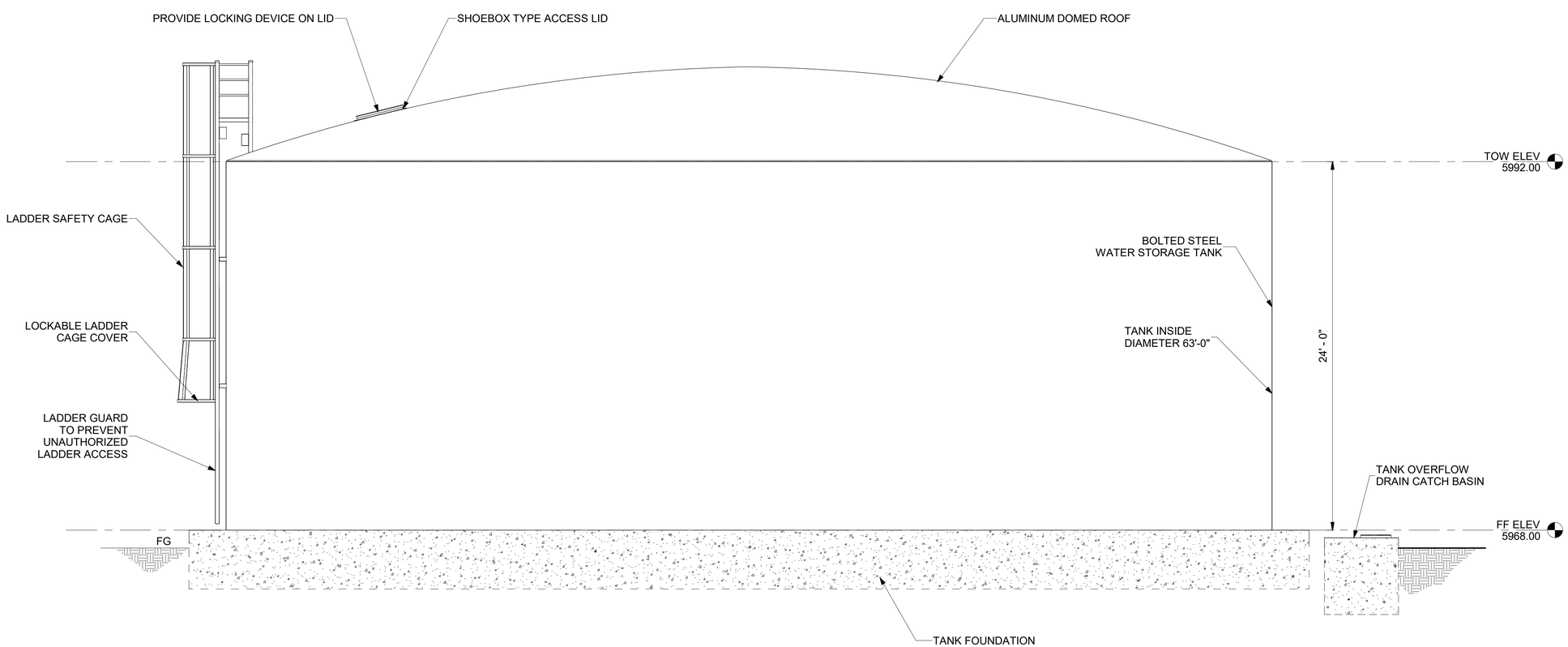

TANK ELEVATION

1/4" = 1'-0"

0 4 8

Scale in Feet

NOTE:
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DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE

0 1/2 1

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REVISIONS

NO.	DATE	DESIGN	DRAWN	CHECKED

RANGE METRO DISTRICT

RANGE WATER SYSTEM DESIGN

520,000 GALLON TANK
ARCHITECTURAL
ELEVATION

AQUA ENGINEERING

DRAWING NO.

20A301

SHEET

12/4/2025 11:25:55 AM Autodesk Docs://002885.C - Range Metro District/20-TANK-V24.rvt

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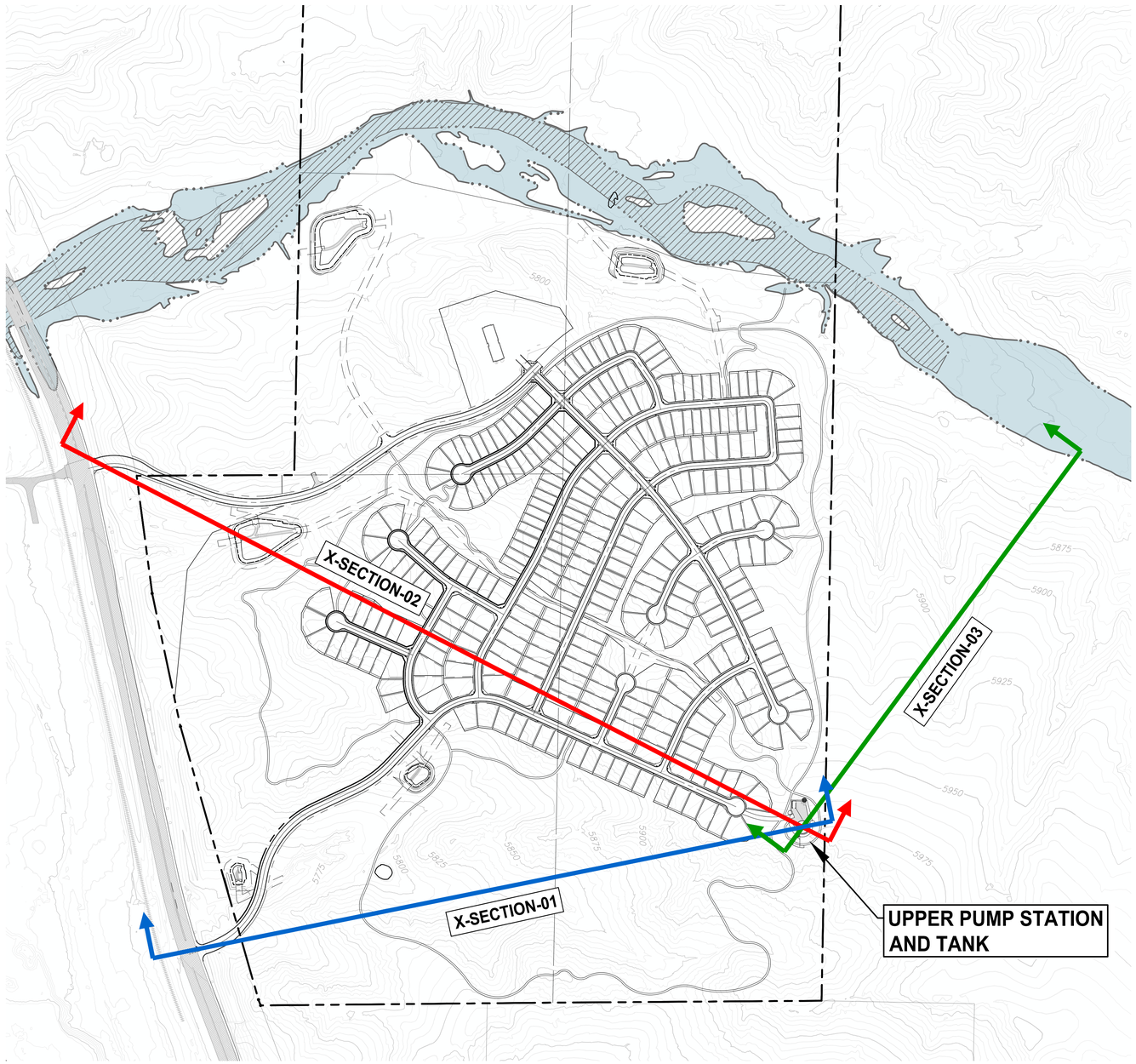
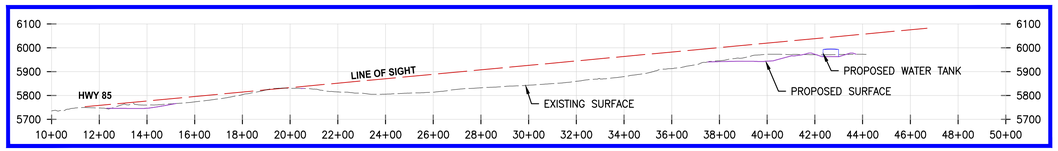
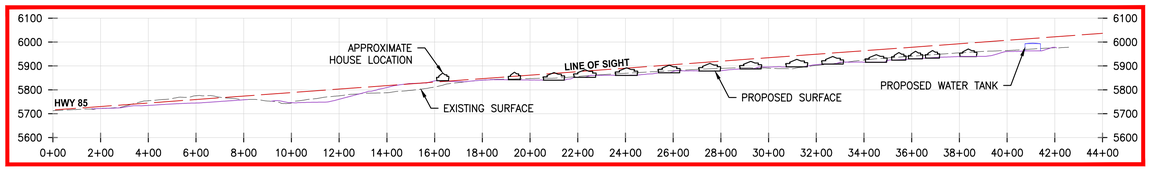




X–SECTION–01

SCALE HORIZ: 1"= 300' VERT: 1" = 300'



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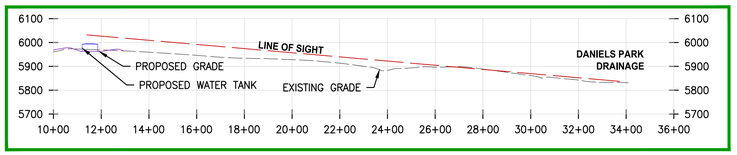

X–SECTION–03

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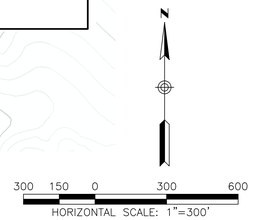

NOTE:
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ENGLEWOOD, CO 80112
303-537-8020
rickengineering.com

RANGE METRO DISTRICT

UPPER PUMP STATION AND TANK VIEW EXHIBIT

PROJECT NO:	2215	SCALE:	1"=20'
DRAWN BY:	KEC/DAL	DATE:	2/20/2026

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MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Carolyn Washee-Freeland, AICP, Senior Planner

DESCRIPTION: Highlands Ranch Filing 159 - Minor Development Final Plat - Project File: SB2023-022.

SUMMARY: The request is for a Minor Development Final Plat to establish one 9.69-acre lot for future development of a senior apartment complex.

STAFF ASSESSMENT: Staff has evaluated the Minor Development Final Plat request in accordance with Article 6A of the Douglas County Subdivision Resolution. Should the Planning Commission find that the approval standards have been met, it may recommend approval of the Minor Development Final Plat to the Board of County Commissioners subject to the following proposed conditions.

1. During construction activity within the development, the applicant, its successors and assigns shall conduct a burrowing owl study if any earth moving will take place between March 15 and October 31.
2. During construction activity within the development, the owner, its successors and assigns shall take all reasonable care to watch for historic resources, paleontological resources, and other cultural history resources and shall immediately notify Douglas County in the event of such discovery.
3. Prior to recordation of the Minor Development Final Plat, technical corrections to the plat exhibit shall be made to the satisfaction of Douglas County.

REVIEW:

Steven E Koster	Approve	2/19/2026
Samantha Hutchison - FYI	Notified - FYI	2/19/2026

ATTACHMENTS:

Cover Page
Staff Report - SB2023-022

MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Carolyn Washee-Freeland, AICP, Senior Planner

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REVIEW:

ATTACHMENTS:

Staff Report - SB2023-022

DOUGLAS COUNTY
COLORADO

Minor Development Final Plat Staff Report

Date: February 17, 2026

To: Douglas County Planning Commission

From: Carolyn Washee-Freeland, AICP, Senior Planner CWF
Jeanette Bare, AICP, Planning Manager SK for JB
Steven E. Koster, AICP, Deputy Director of Community Development SK

Subject: **Highlands Ranch Filing 159 – Minor Development Final Plat**

Project File: **SB2023-022**

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

I. EXECUTIVE SUMMARY

The applicant requests a Minor Development Final Plat to establish one 9.69-acre lot. Proposed Highlands Ranch Filing 159 is zoned as part of the Highlands Ranch Planned Development (HRPD), Planning Area (PA) 79. A future site improvement plan for a proposed senior apartment development will follow the approval of the plat request.

The property is located on Plaza drive, approximately one-half mile west of the Plaza Drive and Kendrick Castillo Way intersection, and less than one mile east of US Highway 85. The lot will be served by Highlands Ranch Water and Sanitation District and will take access from Plaza Drive.

The subject property is located within the Primary Urban Area as identified in the Douglas County 2040 Comprehensive Master Plan (CMP).

II. APPLICATION INFORMATION

A. Applicant

Dave Witte
Central Park at Highlands Ranch, LLC
6380 S. Fiddlers Green Circle, Suite 400
Greenwood Village, CO 80111

B. Applicant's Representative

Rog Oglesby, PE, Sr. Project Engineer
Redland
1500 West Canal Court
Littleton, CO 80120

C. Request

The applicant requests a Minor Development Final Plat to establish one 9.69-acre lot for future development of a senior apartment complex.

D. Process

A Non-Residential and Multifamily Minor Development Final Plat application is processed pursuant to Article 6A of the Douglas County Subdivision Resolution (DCSR). Article 6A states the intent of the process is "to provide a streamlined review process for nonresidential and multifamily subdivisions."

Per Section 604A.06 of the DCSR, "The Planning Commission shall evaluate the minor development final plat, staff report, referral agency comments, applicant responses, and public comment and testimony, and make a recommendation to the Board to approve, approve with conditions, continue, table for further study, or deny the minor development request. The Planning Commission's decision shall be based on the evidence presented; compliance with adopted County standards, regulations, and policies; and other guidelines."

E. Location

The site is located on Plaza Drive, approximately one-quarter of a mile east of Erickson Boulevard, and immediately south of C-470; one-half mile west of the Plaza Drive and Kendrick Castillo Way intersection; and less than one mile east of US Highway 85. The project vicinity, zoning and aerial maps are provided in the attachments to this staff report.

F. Project Description

The applicant requests a Minor Development Final Plat to establish one 9.69-acre lot for a senior apartment development. The new lot will be accessed by a private off-site driveway connecting to Plaza Drive for which an easement has been obtained. Additionally, a new sidewalk easement will be dedicated to the County to complete a gap in the existing sidewalk segment adjacent to Plaza Drive. General-purpose utility easements will also be dedicated to the County via the plat.

III. CONTEXT

A. Background

The HRPD was originally approved in 1979. PA 79 is also referred to as the Highlands Ranch Plaza Center. As a use by right, PA 79 permits multiple family dwellings, for sale or lease, with a minimum of 10 units per building.

The project area has several existing easements that either border the site or are located within proposed Lot 1. These include existing water easements associated with the High Line Canal, an off-site access easement from Denver Water, a water and sanitary sewer line easement, and several Xcel Energy utility easements.

B. Adjacent Land Uses and Zoning

The site is bound by a multi-family residential development to the east, the Highlands Ranch Water and Sanitation District's water treatment facility to the south, Highway C-470 to the north, and vacant tracts located to the west, owned by the Highlands Ranch Metropolitan District and the Regional Transportation District (RTD). Additionally, the Wind Crest by Erickson Senior Living, a 54.66-acre development, is located southwest of the subject property.

Zoning and Land Use

Direction	Zoning	Land Use
North	HRPD	CDOT Tract containing C-470 Right-of-way
South	HRPD	Highlands Ranch Metro District vacant tract; Highlands Ranch Water and Sanitation District water treatment plant tract
East	HRPD	CDOT vacant tract; Highlands Ranch Filing 157 Solana Lucent Station multi-family apartment complex
West	HRPD and Planned Development – Erickson PD	Highlands Ranch Metropolitan District Vacant Tract D, Erickson Filing 1; Regional Transportation District (RTD) vacant Tract G, Erickson Filing 1.

IV. PHYSICAL SITE CHARACTERISTICS

A. Site Characteristics and Constraints

The topography of the site consists of contour elevations that range from 5,540 feet to 5,560 feet in height. The applicant's supplemental exhibit shows existing site conditions containing slopes that range between 15% to 25%. The Phase III Drainage Report for the site notes that the project area slopes from east to west and drains to the High Line Canal via an existing swale between the rear property line of the site and C-470. Vegetation on the site contains native grasses and some shrubbery, along with a small, landscaped area located in the northeastern corner of the site, near the C-470 right-of-way.

The site is impacted by noise from C-470 traffic. The applicant will address noise mitigation during the Site Improvement Plan (SIP) design process.

B. Access

The applicant has obtained an off-site private access easement from Denver Water located on Tract D, Erickson Filing No. 1 for access to the new lot. This access easement connects to Plaza Drive. With the future SIP submittal, the applicant will be proposing a future parking lot easement for the public to access the High Line Canal

trail system. Additionally, the future SIP may include another access drive from Plaza Drive.

C. Soils and Geology

Based on a review of the 2040 Douglas County Comprehensive Master Plan (CMP) Class 3 Hazards and Environmental Constraints Map, the project area does not include any hazardous geologic or soil conditions. The applicant's geotechnical study for the subject property was reviewed by the Colorado Geological Survey and was found to be valid.

D. Drainage and Erosion

The applicant will be required to meet all engineering requirements for drainage, grading, and erosion control during future development of the site. Douglas County Engineering did not require a Site Improvements Agreement (SIA) with the Minor Development Final Plat. Improvements will be identified and secured with the future SIP.

E. Floodplain

No portion of the site is within the 100-year flood plain.

F. Wildlife

The CMP Wildlife Resources Map shows the site as a low habitat value for wildlife. The site is not located within an overland connection, wildlife movement corridor, or wildlife crossing area. Colorado Parks and Wildlife (CPW) noted that the site may contain some small ground-dwelling mammals, small birds, raptors, and other common urban species. CPW further acknowledged that there may be burrowing owls on the site, which is a state protected species. CPW recommended a burrowing owl survey be conducted between March 15th and August 31st during the year prior to construction activities. Additionally, CPW recommended that the applicant complete a weed management plan. The applicant has agreed to implement CPWs recommendations. A weed management plan was completed and approved by Douglas County Public Works Engineering.

G. Historic Preservation

Douglas County Historic Preservation provided referral comments on the application. The County Curator reviewed the applicant's Limited-Results Cultural Resource Survey and had no further comments and stated that there were no impacts to cultural resources in the area.

V. PROVISION OF SERVICES

A. Schools

The Douglas County School District (DCSD) reviewed the request, and it was determined that the required school land dedication has been accounted for within the Highlands Ranch PD. DCSD stated that the proposed development is within the

overall unit count of Highlands Ranch as outlined in the HRPD. DSCD had no objection to the approval of the Minor Development Final Plat.

B. Fire Protection

South Metro Fire Rescue (SMFR) provides fire protection services to the site and reviewed the request. SMFR provided a "conditional non-objection" to the request. SMFR referral comments noted that a fire hydrant plan indicating hydrant location will be required for future development.

C. Sheriff Services

The Douglas County Sheriff's Office (DSCO) provides police protection services to the site. No response was received from DSCO and DSCO 911.

D. Water and Sanitation

The water and sanitation services for the proposed lot will be provided by the Highlands Ranch Water and Sanitation District.

F. Utilities

Utility Service providers are AT&T, Black Hills Energy, and Xcel Energy. Phone and data services are provided by CenturyLink and Comcast. AT&T and CenturyLink had no objections to the proposal; and Black Hills Energy did not respond to the request. Xcel Energy reviewed the request and stated that the agency owns and operates existing underground electric facilities along the east and north property lines and required that these facilities be shown on the plat exhibit. Additionally, Xcel Energy requested a plat note for the general-purpose utility easement and stated that additional utility easements may be needed by separate instrument with future development. The applicant has provided a 10-foot general utility easement to meet these needs along the southerly, westerly and northerly lines of the Minor Development Final Plat.

G. Dedications

The applicant will dedicate a 10-foot general purpose utility easement to the County for public utility purposes, and a 10-foot sidewalk easement to close a gap in the existing sidewalk segment on Plaza Drive.

H. Parks and Trails

Douglas County Parks and Trails reviewed the request and determined that Parks commitments have been met through previous dedications within the HRPD and stated that no dedications or fees are required. With the future SIP submittal, the applicant may propose a parking easement for public access to the High Line Canal trail system.

I. Open Space

Douglas County Open Space and Natural Resources reviewed the request and had no comments on the proposed Minor Development Final Plat.

VI. PUBLIC NOTICE AND INPUT

Courtesy notices were mailed to abutting property owners. No comments were received regarding the Minor Development Final Plat request.

Referrals were sent to the Highlands Ranch Community Association (HRCA), the Highlands Ranch Golf Club HOA, and the Highlands Ranch Metropolitan District. The HRCA commented that the proposed development should be in compliance with HRCA development standards. HRCA provided further comments relating to architectural design for future development. The applicant has coordinated with HRCA on the proposed Minor Development Final Plat and stated that they will consider incorporating HRCA recommendations into their future design. No referral agency comments were received from the Highlands Ranch Golf Club HOA. The Highlands Ranch Metropolitan District (HRMD) provided informational comments pertaining to future development of the site. The applicant stated that they will work directly with HRMD to address the agency's comments.

The applicant has provided responses to all referral comments within a separate letter included in the staff report attachments.

VII. STAFF ANALYSIS

Per Article 603A of the DCSR, a Minor Development Final Plat may be approved upon the finding by the Board that the Minor Development Final Plat:

603A.01: Conforms with the goals, objectives, and policies of the Master Plan.
Staff Comment: The CMP establishes goals and objectives applicable to development in the County. The application is generally consistent with the CMP policies in Objective 2-1B and 2-1C of the Urban Land Use, and the goals, policies and objectives of the Primary Urban Area. The subdivision is near the High Line Canal trail system creating recreational opportunities for future residents. Fire protection and police services are provided to the site and provision for access and utilities have been verified.

603A.02: Addresses the design elements established in Section 404 – Preliminary Plan, herein.
Staff Comment: The minor development is in conformance with the design elements as established in the DCSR Section 404 Preliminary Plan. The proposed lot will be accessible from Plaza Drive, providing opportunities for vehicular and pedestrian access. The proposed lot meets the minimum lot size and setbacks of the Highlands Ranch PD zone district. Off-street parking requirements can be met. Geotechnical and building analysis will occur at building permit for the proposed senior apartment development. The applicant will ensure that archaeological or historic resources are identified during construction. Drainage and grading plans have been accepted by Douglas County Engineering.

603A.03: Conforms with Section 18A, Water Supply Overlay District, of the Zoning Resolution.
Staff Comment: DCZR Section 1803A establishes approval standards to be used in the evaluation of land use applications reviewed under Section 18A, Water Supply. The proposed subdivision will receive central water and sewer service from Highlands Ranch Water. Highlands Ranch Water has committed to serve the future development of the proposed subdivision. According to the will serve letter provided by Highlands Ranch Water, the water supply resources are adequate to serve the proposed lot and meets all other approval standards of Section 18A. The applicant has indicated that this will serve letter will be applicable to the proposed senior apartment development, as the development will contain 165 units in a single building, versus the proposed 240-unit multi-family two-building development previously proposed.

The Colorado Division of Water Resources (CWR) and the County's water consultant have reviewed the request and the required water documentation and have determined that the supply is adequate to serve the subdivision.

Below are the water supply approval standards used for evaluating land use applications.

1803A.01: The applicant has demonstrated that the water rights can be used for the proposed use(s).
Staff Comment: The CWR and the County water consultant have reviewed the Minor Development Final Plat request and the required water documentation and have determined that the supply is adequate to serve the subdivision without injuring water rights. The proposed subdivision will be served by central water and sewer services from Highlands Ranch Water (formally known as Centennial Water & Sanitation District).

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

1803A.03: The Water Plan is deemed adequate and feasible by the County to ensure that water supply shortages will not occur due to variations in the hydrologic cycle.
Staff Comment: No water plan is required when service is provided by a district.

1803A.04: The Water Plan is sufficient to meet the demand applicable to the project based on the minimum water demand standards in Section 1805A herein.
Staff Comment: No water plan is required when service is provided by a district.

603A.05: Identifies all areas of the proposed subdivision which may involve soil or topographical conditions presenting hazards or requiring special precautions and that the proposed uses of these areas are compatible with such conditions.
Staff Comment: Standard geotechnical exploration of the individual building site is required as part of the building permit process. The applicant's geotechnical study for the

subject property was reviewed by the Colorado Geological Survey and was found to be valid.

603A.06: Provides adequate drainage improvements.
Staff Comment: A Phase III Drainage Report, and a GESC plan and report have been accepted by Douglas County Engineering Services.

603A.07: Provides adequate transportation improvements.
Staff Comment: The applicant's traffic analysis has been reviewed by Douglas County Engineering and found to be acceptable.

603A.08: Protects significant cultural, archaeological, natural, and historical resources, and unique landforms.
Staff Comment: No unique site features or artifacts were identified within the applicant's Limited Results Cultural Resource Survey. During construction activity within the development, the applicant, its successors and assigns shall take all reasonable care to watch for historic resources, paleontological resources, and other cultural history resources and shall immediately notify Douglas County in the event of such discovery.

603A.09: Demonstrates the extraction of any known commercial mining deposit shall not be impeded.
Staff Comment: There are no known commercial mining deposits or significant mineral deposits on site per the Douglas County Mineral Extraction Plan.

603A.10: Has available all necessary services, including fire and police protection, recreation facilities, utility service facilities, streets, and open space to serve the proposed subdivision.
Staff Comment: The subdivision will be served by SMFR, the Douglas County Sheriff's Office, the Douglas County School District, Black Hills Energy, CORE Electric Cooperative, Comcast, CenturyLink, and Xcel Energy. The required school land dedication and Parks commitments have been met through previous dedications within the Highlands Ranch PD.

VIII. STAFF ASSESSMENT

Staff has evaluated the Minor Development Final Plat request in accordance with Article 6A of the DCSR. Should the Planning Commission find that the approval standards have been met, it may recommend approval of the Minor Development Final Plat to the Board of County Commissioners subject to the following proposed conditions.

1. During construction activity within the development, the applicant, its successors and assigns shall conduct a burrowing owl study if any earth moving will take place between March 15 and October 31.

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

paleontological resources, and other cultural history resources and shall immediately notify Douglas County in the event of such discovery.

3. Prior to recordation of the Minor Development Final Plat, technical corrections to the plat exhibit shall be made to the satisfaction of Douglas County.

ATTACHMENTS **PAGE**

Douglas County Land Use Application 10
Applicant's Narrative 11
CMP, Zoning and Aerial Maps 13
Referral Agency Response Report 16
Referral Response Letters 29
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Phase III Drainage Report 64
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Minor Development Final Plat Exhibit 280
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LAND USE APPLICATION

Please fill in this application form completely. An incomplete application will not be processed.

Note: Neither the Planning Commission nor the Board of County Commissioners should be contacted regarding an open application.

OFFICE USE ONLY

PROJECT NAME: Highlands Ranch Filing 159, A Portion of PA79 - Minor Development Plat

PROJECT FILE #: SB2023-022

PROJECT TYPE: Minor Development Plat

MARKETING NAME: Kaos Apartments

SITE ADDRESS: Highlands Ranch - Filing No. 159 - A portion of Planning Area 79

OWNER(S): Shea Properties

Name(s):

Address:

Phone:

Email:

AUTHORIZED REPRESENTATIVE *(requires notarized letter of authorization if other than owner)*

Name: Dave Witte / Rob Oglesby

Address:

Phone:

Email:

PLANNING FEES: $2,600.00

ENGINEERING FEES:

TOTAL FEES:

RELATED PROJECTS: PS2022-244, SP2023-035

LEGAL DESCRIPTION:

Subdivision Name: Highlands Ranch PA 79

Filing #: 157 Lot #: Block #: Section #: NE 5 Township: 6 S Range: 68 W

STATE PARCEL NUMBER(S): 2229-051-00-009

ZONING:

Present Zoning: PD - Planned Development Proposed Zoning: PD - Planned Development Gross Acreage: 9.69 AC

Gross Site Density (DU per AC): # of Lots or Units Proposed: 240 units

SERVICE PROVIDERS:

Fire District: South Metro Fire Rescue Metro District: Highlands Ranch Gas: Xcel Energy

Water: Centennial Water & Sewer Sewer: Centennial Water & Sewer Electric: Xcel Energy

Roads: ☐ Public ☒ Private (please explain): Private access drive lanes and parking

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

Applicant Signature

04/03/2023
Date

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

January 6, 2026

Carolyn Freeland
Douglas County Community Development Department
Planning Services Division
100 Third St., Castle Rock, CO 80104

Re: Lot 1, Highlands Ranch Filing No. 159
SB2023-022

Dear Matt,

Please accept this letter on behalf of Central Park at Highlands Ranch, LLC, a Colorado limited liability company, by Shea Properties Management Company, Inc., a Delaware corporation, the applicant for Lot 1, Highlands Ranch Filing No. 159. Shea Properties is proposing to combine three separate tracts into one lot of 9.86 acres north of Plaza Drive and east of the Highline Canal.

Based on the 2040 Comprehensive Master Plan (CMP), this Minor Development Plat (MDP) will aid the County in achieving goals outlined within the CMP. The single lot proposed with this MDP will encourage development in this area and support a healthy community with its proximity to the Highline Canal Trail. The single lot will conform to the adjacent multi-family use to the east.

The applicant has reviewed the site's development and is proposing to revise the project from market rate multi-family to affordable senior apartments, proposing approximately 165 units in a single building (roughly 17 dwelling units per acre). Since this plan has a lower density compared to the previous SIP for the site, it's expected that the existing Water and Sewer Will Serve Letter will remain valid. Other engineering reports will be updated as needed to reflect changes to the site plan and unit count during the SIP process with Douglas County.

The following is a narrative per Section 605A.02 of the Douglas County Zoning Resolution.

605A.02.1:

The total area to be subdivided will be 9.686 acres.

605A.02.2:

There will be 1 lot with a proposed use of multi-family.

605A.02.3:

The total number of units and density will be determined by the SIP.

605A.02.4:

The total land area to be preserved as open space will be evaluated at future development reviews.

605A.02.5:

There are no public roads or tracts proposed with this Minor Development Plat. All existing and proposed utilities within easements shall be maintained by the entity responsible for the utility.

605A.02.6:

Land dedication for parks and schools has been accounted for within the Highlands Ranch PD.

605A.02.7:

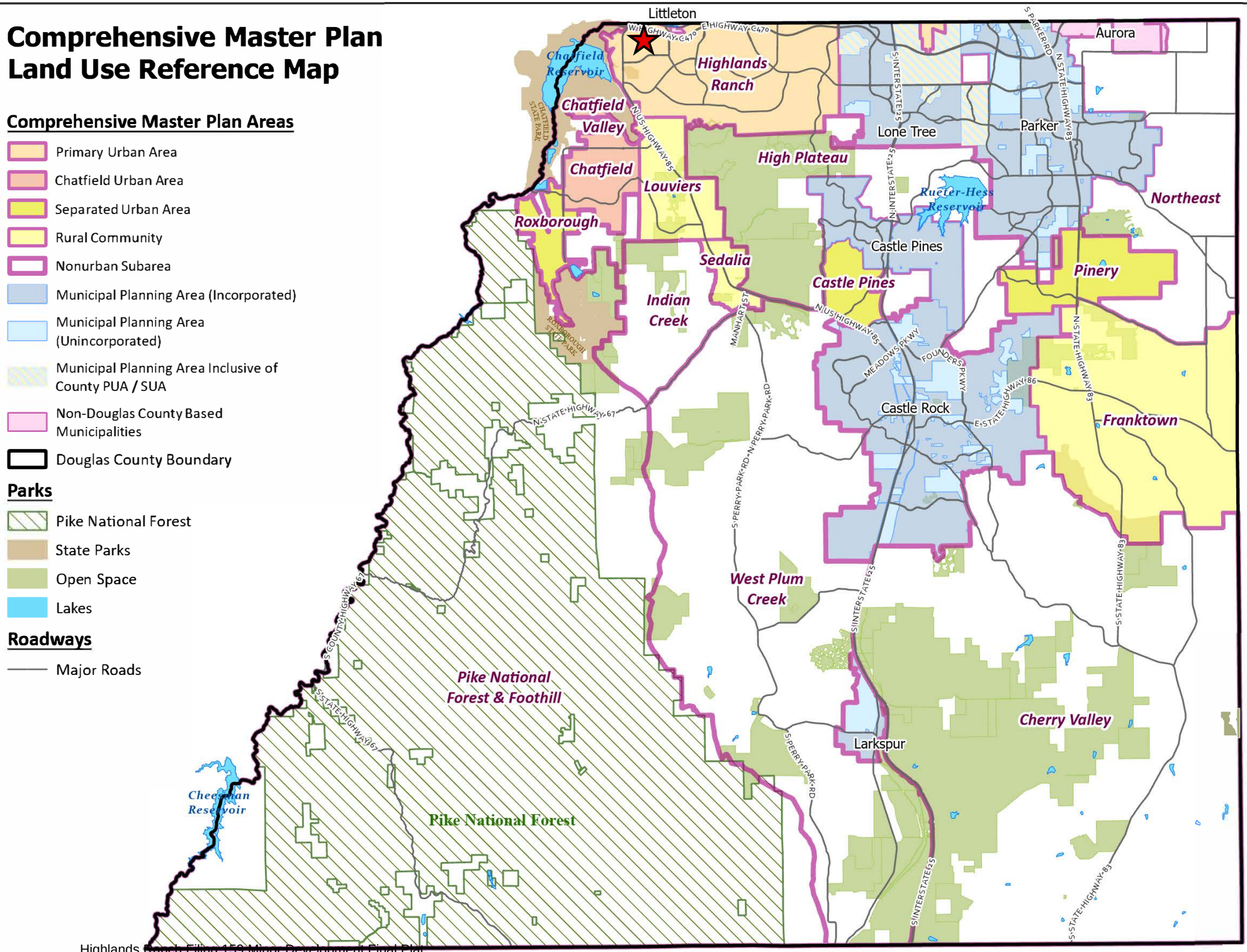
Water and sewer for the site shall be provided by Centennial Water and Sanitation District as outlined in the attached letter.

Please let me know if you need any clarifications. We look forward to working with you on the success of the project.

Sincerely,

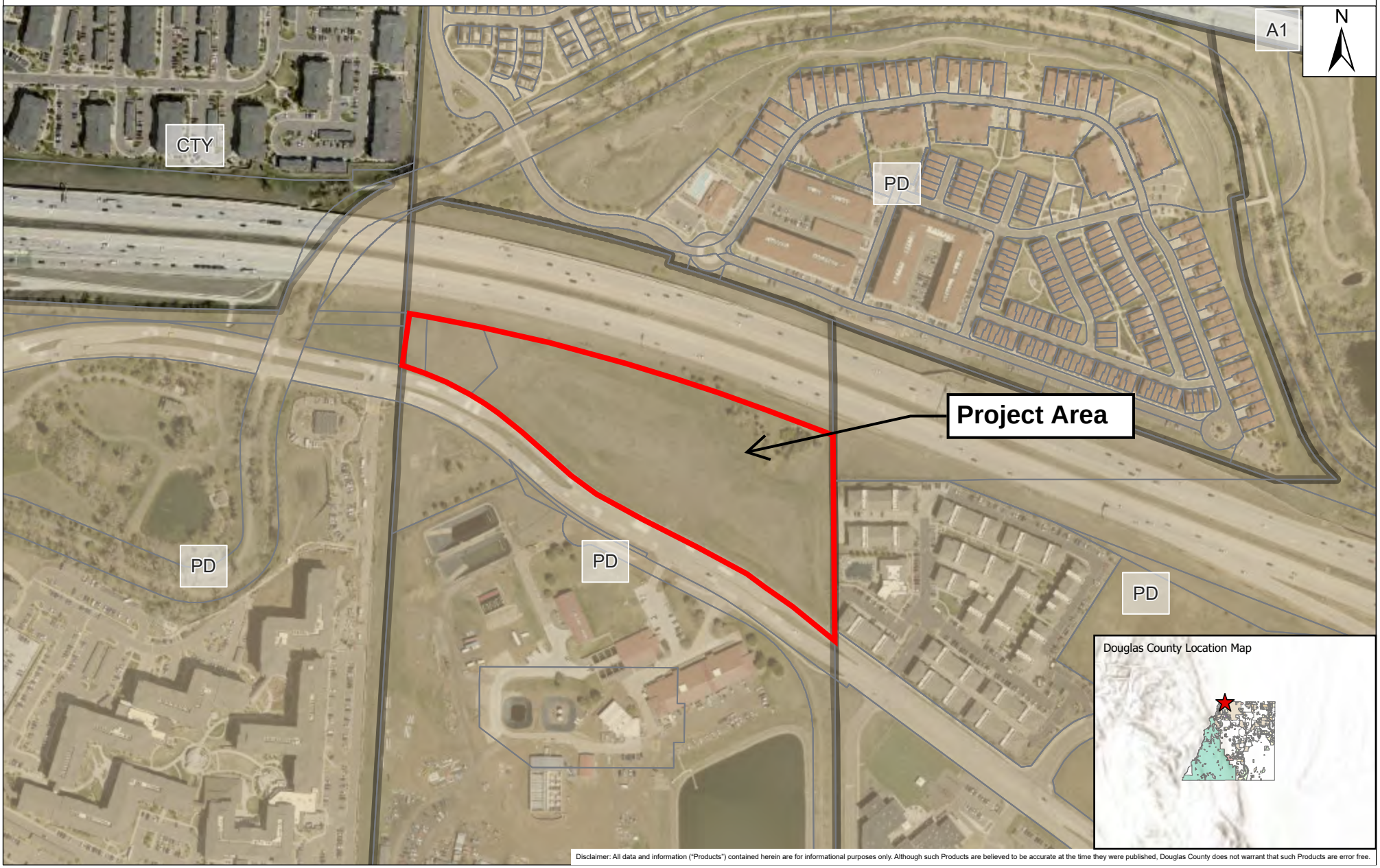
Rob Oglesby, PE
Sr. Project Engineer

Comprehensive Master Plan Land Use Reference Map



Minor Development Final Plat - Highlands Ranch Filing 159 SB2023-022

DOUGLAS COUNTY COLORADO



Date Saved: 2/12/2026 8:45 AM

A1 - AGRICULTURAL ONE

PD - PLANNED DEVELOPMENT

Minor Development Final Plat - Highlands Ranch Filing 159, SB2023-022

DOUGLAS COUNTY COLORADO

Date Saved: 2/11/2026 4:43 PM

PD - PLANNED DEVELOPMENT

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Addressing Analyst	06/16/2023	No Comment	Addressing of the proposed lot will occur during the SIP process.
Arapahoe County Engineering Services Division	06/20/2023	Verbatim response: Engineering Services Division of Arapahoe County Public Works and Development (Staff) thanks you for the opportunity to review the outside referral for the proposed project located in Douglas County. The Engineering Division has no comments regarding the referral at this time based on the information submitted. Please know that other Divisions in the Public Works Department may submit comments as well. Thank you, Sue Liu, PE, CFM Arapahoe County Public Works & Development, Engineering Services Division	No further action necessary
Arapahoe County PWD/ Planning	06/20/2023	Verbatim response: Thank you for the opportunity to review and comment on this project. The Arapahoe County Planning Division has no comments; however, other departments and/or divisions may submit comments. TERRI MAULIK, Planning Technician Public Works and Development - Planning Division	No further action necessary
Assessor	06/29/2023	Verbatim response: Please be aware of the following comments and concerns: - Acreage on plat is showing 9.686, the deeded area of parcels before plat is 10.335 acres. Please verify acreage on plat is correct. Regards, Mark Rankin	Applicant has addressed Assessor comments and verified the correct acreage of the proposed lot as noted it on the plat exhibit.

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
AT&T Long Distance - ROW	06/30/2023	Verbatim response: The Earth map shows the project area in red and based on the address and/or map you provided, there should be NO conflicts with the AT&T Long Lines, as we do not have facilities in that area. Please feel free to contact us with any questions or concerns. Ann Barnowski, Clearwater Consulting Group Inc, 120 9th Avenue South, Suite 140, Nampa, ID 83651 Annb@cwc64.com	No further action necessary
Building Services	06/22/2023	Verbatim response: Permit is required, please visit Douglas County's web site for requirements and contact 303-660-7497 with questions.	Applicant has acknowledged Building Services comment. Building permits will be submitted following approval of an SIP.
Centennial Water and Sanitation District	07/13/2023	No Comment	No further action necessary
CenturyLink		No Response Received	The plat establishes a general purpose utility easement. No encroachments are anticipated.

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Colorado Department of Transportation CDOT-Region # 1	07/07/2023	Summary: **For ANY ground disturbance/work within CDOT ROW---** **Required:** Since this is a permit, a file search for Arch, Paleo and History is required. If the file search identifies anything, a more extensive report will be required. If nothing is identified, then the file search should be sufficient. **Clear Zone**: Ensure that any new landscaping/trees are outside of the clear zones for any State Highway/ CDOT ROW and that the new landscaping/trees do not interfere with site lines from any State Highway/CDOT ROW. **Landscape:** Any new or changes to existing landscaping within CDOT ROW must be reviewed and approved by CDOT. Landscaping plans should be submitted and should include details of all proposed plant species and seed mixes/ratios. **WQ**: Will This development be taking any drainage from CDOT ROW? Has the Highline Canal company been contacted in regards to the proposed water quality measures being installed? **Right of Way Comments:** All work appears to be to the south of existing ROW- there is a 10' setback from the C-470 property line and only a little minor grading work was proposed in this 10' strip on the east end of the project. No A-Lines, No Dedications to CDOT, no real concerns that I can see from a ROW or Survey Perspective. **Permits Comments**: It appears that CDOT ROW runs along the north side of this development (470). Please keep in mind that any work in the CDOT ROW unrelated to access will require a permit from our office.	Applicant has acknowledged CDOT referral comments. In response to CDOT comments, the applicant has indicated that no work is anticipated within the State Highway CDOT ROW. The applicant is working with the High Line Canal and other entities on the drainage plan and stormwater management for the future senior apartment development.

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Colorado Division of Water Resources	07/06/2023	Verbatim response: We have received the proposal for a minor development plat under Case No. SB2023-022. The Applicant is requesting to construct 240 multifamily units known as the "Kaos Apartments". This referral for Shea Properties, Case No. SB2023-022, on 9.69 acres in Sec. 5, T6S, R68W, 6th P.M., does not appear to qualify as a “subdivision” as defined in section 30-28-101(10)(a), C.R.S. Therefore, pursuant to the State Engineer’s March 4, 2005 and March 11, 2011 memorandums to county planning directors, this office only performed a cursory review of the referral information. Upon review, it appears that the proposed water supply source for the property is service provided by the Centennial Water and Sanitation District. There are no permitted wells on the subject property. Therefore, our office has no comments on this referral. Thank you for the opportunity to review Case No. SB2023-022. Please let us know if you have any questions or concerns. Mike Matz, Water Resource Engineer P 303.866.3581 x 8241 1313 Sherman Street, Room 818, Denver, CO 80203 michael.matz@state.co.us www.colorado.gov/water	No further action required. The property is served by a district and no groundwater wells exist on the property.
Colorado Geological Survey	07/26/2023	Verbatim response: No comment. The recommendations in Cesare's 10/6/2022 geotechnical investigation are valid.	No further action required

Colorado Parks and Wildlife	07/05/2023	Summary: District Wildlife Manager Justin Olson recently analyzed the project site. CPW would expect to find occasional use of the proposed site by small ground-dwelling mammals, small birds, raptors, and other common urban species. Prairie dogs may occur within or near the proposed development site, and as a result, the potential may also exist for the presence of burrowing owls. These raptors are classified as a state threatened species and are protected by both state and federal laws, including the Migratory Bird Treaty Act. These laws prohibit the killing of burrowing owls or disturbance of their nest. Therefore, if any earth-moving will begin between March 15th and August 31st, a burrowing owl survey should be performed. Guidelines for performing a burrowing owl survey can be obtained from your local District Wildlife Manager. If prairie dogs are present and any earth-moving is to be done on site, CPW recommends euthanasia or relocation (with the appropriate permit) prior to any work being done. If relocation is chosen, please consult with the local district wildlife manager for the required permit. Care should also be taken to make sure no raptor nests will be impacted during this project. Raptors are protected from take, harassment, and nest disruption at both the state and federal levels. CPW recommends that buffer zones be implemented around any nest discovered within the project vicinity during any period of activity that may interfere with nesting season. This will prevent the intentional or unintentional destruction of an active nest. For further information on this topic, a copy of the document "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors" and CPW High Priority Habitat designations are available from your local District Wildlife Manager. Following the recommendations outlined in these documents will decrease the likelihood of unintentional	Applicant acknowledged CPW referral comments and will follow the CPW recommended guidelines if any wildlife is encountered on the site.

Agency	Date Received	Agency Response	Response Resolution
		take through disturbance. Noxious weeds should be monitored very closely. CPW would recommend implementation of a weed management plan that may already exist within Douglas County and re-vegetation of any disturbed sites with native seed mixes. In addition, if any aspects of this project will require fencing, CPW would recommend the use of wildlife-friendly fencing designs that allow for ease of movement and reduced likelihood of entanglement. Information about wildlife friendly fencing can be obtained from your local CPW Office. Current CPW policy directs our efforts towards proposals that will potentially have high impacts to wildlife and wildlife habitat. The emphasis of CPW's concerns is on large acreages, critical habitats, wildlife diversity, and impacts to species of special concern, or those that are state or federally endangered. Due to the small acreage of the proposed project and limited disturbance to nearby habitat areas, impacts of the development can be characterized as minimal. This may not mean that the landscape has no value to wildlife or value to the community. It is important to remember that incremental and cumulative loss of natural areas and open spaces will, over time, significantly degrade the overall quality of wildlife habitat in the area. Therefore, in this case, we want to focus our recommendations on planning and implementing your proposal to minimize negative impacts and maximize potential enhancements to support living with wildlife in our community. If you have any further questions, please contact District Wildlife Manager Justin Olson at (303) 291-7131. Sincerely, Matt Martinez, Area Wildlife Manager Cc: M. Leslie, S. Schaller, J. Olson	
Comcast		No Response Received	No further action required

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Denver Water Board	07/12/2023	Summary: In summary, Denver Water's main concerns related to grading and drainage on their easement and commented on the following: Label 50' wide Denver Water easement on the plans. Also show the 24" Denver Water Conduit 100. Per our easement terms, no utility crossings are allowed, but storm sewer may be permitted by special provision and a Denver Water license. Drainage plans need to be reviewed to look at flows, connections to pond and if there are any impacts to High Line Canal. No trees, fencing or structures are allowed in the easement. Denver Water stated that they may not approve grading changes over the waterline, but will discuss this after reviewing plans. The agency asked who would be maintaining the access drive on their easement. **Gina Begly** | Property Management | Real Estate Sr Specialist **Denver Water** t: 303-628-6219 1600 West 12th Avenue Denver, CO 80204 denverwater.org	The applicant acknowledged Denver Water Board referral comments and has been coordinating with the agency to address all concerns related to grading, drainage, stormwater management, and potential impacts to the High Line Canal. The applicant has revised the MDP exhibit to show all Denver Water easements. Additionally, the applicant has indicated that Mile High Flood District's consultant RESPEC has reviewed the potential impacts on the High Line Canal, and found that there would be no impact from the proposed future development. Shea Properties will maintain the access drive.
Douglas County Conservation District	07/14/2023	Summary: The Douglas County Conservation District provided comments relating to soil conditions and recommended alternatives to mitigate the limitations of the soil in the final engineering design of the future development. All disturbed areas should be seeded and mulched with weed free hay mulch at 4,000 lbs. /acre. Disturbed land should be mulched or revegetated within 45 days of disturbance. An Integrated Noxious Weed Control plan was recommended to be completed. Low Impact Development (LID) techniques were recommended to be implemented for economic and conservation benefits.	The applicant has completed a weed management plan and has coordinated with Douglas County Engineering to address construction plan comments.

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Douglas County Health Department	06/26/2023	Verbatim response: Thank you for the opportunity to review and comment on the request to plat one multi-family residential lot. Douglas County Health Department (DCHD) staff have reviewed the application for compliance with pertinent environmental and public health regulations. After reviewing the application, DCHD has no comments. Please feel free to contact me at 720-907-4888 or bfreyer@douglas.co.us if you have any questions about our comments. Sincerely, Brent Freyer, Environmental Health Specialist I	No further action necessary
Douglas County Historic Preservation	07/18/2023	Summary: Upon reading the Limited-Results Cultural Resource Survey of the subject site written by ERO Resources Corporation in 2023, the Douglas County Curator has no further comments. There are no impacts to cultural resources in the area. Thank you in advance for your attention to the preservation and protection of Douglas County's cultural resources for future generations. Sincerely, Brittany Cassell, Curator	No further action necessary
Douglas County Parks and Trails	06/21/2023	Verbatim response: Parks commitments have been met through previous dedications within the PD. Thus, no dedications or fees are required.	No further action necessary

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Douglas County School District RE 1	06/26/2023	Received: Summary - DCSD has calculated the amount of school site land dedication required for students generated by the proposal. A total of 18 students are expected from the development requiring a total land dedication requirement of 0.396 acres. The required school land dedication has been accounted for within the Highlands Ranch PD. The proposed development is within the overall unit count of Highlands Ranch as outlined in the Highlands Ranch PD. Since the overall unit count within Highlands Ranch is not increasing, all land dedication for parks and schools has been accounted for. DCSD has no objection to approval of this application. The proposed subdivision is currently located in the school attendance areas of Northridge, Mountain Ridge Middle School and Mountain Vista High School. Shavon Caldwell, Planning Manager, DCSD Planning & Construction, shavon.caldwell@dcsdk12.org office: 303.387.0417 mobile: 720.428.1170	No further action necessary

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Engineering Services	07/06/2023	Verbatim response: Engineering has reviewed the above referenced submittal and have the following comments: ***Final Plat Comments*** **Comment #1-**On sheet 1, please remove general note #8. The only secondary drainage easement that will be dedicated to Douglas County will be for the detention/water quality pond which will be handled through a separate easement dedication. **Comment #2-**On sheet 2, please provide us with an executed copy of the access easement with the Highlands Ranch Metropolitan District for the westerly access. **Comment #3-**On sheet 2, please designate which entity the proposed drainage easement along the north side of lot 1 will be dedicated. **Comment #4-**A Public Improvements Agreement (PIA) for the median island improvements in Plaza Drive will be required. I will provide you with a copy of this agreement. A separate set of construction plans will need to be submitted with the final plat that incorporates these widening/median island improvements. We cannot recommend approval of this minor development plat until our comments have been addressed. If you have any questions, please give me a call. Sincerely, Chuck Smith Development Review Engineer See attachments	Comments have been forwarded to the applicant. The applicant has addressed all Douglas County Engineering comments. After further evaluation of this MDP, engineering will not require a PIA for this proposed subdivision for one lot.
High Line Canal Conservancy		No Response Received	No further action necessary

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Highlands Ranch Community Association (HRCA)	07/12/2023	Summary: The HRCA development and design team commented on the architecture, landscaping, and site improvements and indicated that these would be complimentary to the surrounding developments. Additional discussions related to the applicant's traffic study, and stormwater management. The HRCA further noted that the project will finish portions of the public sidewalk along Plaza Drive and a trail connection to the High Line Canal providing pedestrian connectivity.	The applicant has met with the HRCA, and has indicated that they will look to incorporate some of the HRCA comments on future development of the site.
Highlands Ranch Golf Club HOA		No Response Received	No further action necessary
Highlands Ranch Metro District	07/05/2023	Verbatim response: Informational response: site civil plans must be submitted to the District for review and approval. Thanks, Jon Klassen | Project Manager Centennial Water & Sanitation District	The applicant is working directly with HRMD to resolve referral comments.
Jefferson County Planning and Zoning		No Response Received	No further action necessary
City of Littleton		No Response Received	No further action necessary
Mile High Flood District	07/06/2023	Verbatim response: Since the outfall discharges into the High Line Canal (HLC), we are referring the design report to RESPEC, who maintains a living SWMM model for the HLC. RESPEC will coordinate with Redland on running the proposed conditions in the SWMM model, in order to confirm there are no adverse impacts. As a note, outfalls into the HLC are not considered maintenance eligible.	The applicant has coordinated with Douglas County Engineering, MHFD and RESPEC to address any adverse impacts.

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
Office of Emergency Management		No Response Received	No further action necessary
Open Space and Natural Resources	06/20/2023	No Comment	No further action necessary
RTD - Planning & Development Dept		No Response Received	No further action necessary
Sheriff's Office		No Response Received	No further action necessary
Sheriff's Office E911		No Response Received	No further action necessary
South Metro Fire Rescue	06/28/2023	Verbatim response: South Metro Fire Rescue (SMFR) has reviewed the provided documents and has conditional non-objection to the proposed Minor Development Plat. Comments must be resolved as required by planner for Plat approval. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project. COMMENTS: 1. Fire Hydrant locations will not be approved as shown on Water and Sanitary Plans resulting in required revisions to utility easements. Once required fire flow requirements for the buildings have been determined and hydrant requirements verified, a plan indicating revised hydrant locations will be required to be reviewed by SMFR for approval.	The applicant continues to work with SMFR to address fire hydrant locations and utility easements needs. These will be finalized with future development of the Senior Apartment facility site design.

Project Name: Highlands Ranch Filing 159
Project File #: SB2023-022
Date Sent: 06/16/2023 **Date Due:** 07/14/2023

Agency	Date Received	Agency Response	Response Resolution
South Suburban Park & Recreation District	07/13/2023	Verbatim response: South Suburban staff reviewed the referral for SB2023-022 - Highlands Ranch Filing 159, Minor Development Plat and have the following comments. This development is outside of South Suburban Park and Recreation District. Any comments should be provided by Highlands Ranch Metro District. Thank you for the opportunity to comment on SB2023-022 - Highlands Ranch Filing 159, Minor Development Plat. Sincerely, Melissa Reese-Thacker Planning Manager	No further action necessary
Xcel Energy-Right of Way & Permits	06/27/2023	Summary: Public Service Company requests that all existing and proposed utility easements be depicted graphically on the MDP plat. While these easements may accommodate certain utilities to be installed in the subdivision, some additional easements may be required as planning and building progresses. PSCo owns and operates existing underground electric facilities along east and north property lines and requires all facilities are shown on the plan. The property owner/developer/ contractor must complete the application process for any new natural gas or electric service, or modification to existing facilities via xcelenergy.com/ InstallAndConnect. It is then the responsibility of the developer to contact the Designer assigned to the project for approval of design details. Additional easements may need to be acquired by separate document. The Designer must contact the appropriate Right-of-Way Agent. Violeta Ciocanu (Chokanu), Right of Way and Permits Public Service Company of Colorado dba Xcel Energy Office: 303-285-6612 – Email: violeta.ciocanu@xcelenergy.com	The applicant has dedicate a 10-foot utility easement along the southerly, westerly, and northerly property lines of the MDP plat exhibit.

July 6, 2023

Rob Oglesby, P.E. DV 2023-168
Authorized Representative
Redland Consulting Group, Inc.
1500 West Canal Court B
Littleton, CO 80120

Subject: Highlands Ranch Filing 159 – Minor Development Plat

Dear Rob,

Plan Review Summary:

Submitted to Engineering	-	6/16/23
Comments Sent Out	-	7/6/23

Engineering has reviewed the above referenced submittal and have the following comments:

Final Plat Comments

Comment #1-On sheet 1, please remove general note #8. The only secondary drainage easement that will be dedicated to Douglas County will be for the detention/water quality pond which will be handled through a separate easement dedication.

Comment #2-On sheet 2, please provide us with an executed copy of the access easement with the Highlands Ranch Metropolitan District for the westerly access.

Comment #3-On sheet 2, please designate which entity the proposed drainage easement along the north side of lot 1 will be dedicated.

Comment #4-A Public Improvements Agreement (PIA) for the median island improvements in Plaza Drive will be required. I will provide you with a copy of this agreement. A separate set of construction plans will need to be submitted with the final plat that incorporates these widening/median island improvements.

We cannot recommend approval of this minor development plat until our comments have been addressed. If you have any questions, please give me a call.

Sincerely,

Chuck Smith
Development Review Engineer

cc: Matt Williams, P.E.; Assistant Director of Public Works Engineering
Carolyn Washee-Freeland, AICP; Senior Planner

DV23168

Wednesday - July 12, 2023

To: **HRCA DEVELOPMENT REVIEW COMMITTEE**

Cc: Mr. Mike Bailey *via: Mike.Bailey@hrcaonline.org*
Ms. Diana Sklenar *via: Diana.Sklenar@hrcaonline.org*

From: Weylan A. "Woody" Bryant, PE *for the HRCA Staff*

Subject: **KAOS APARTMENTS (SHEA PROPERTIES)**
Highlands Ranch Filing 159, Lot 1 (Plaza Drive – west of Solana Lucent Station Apartments)
HRCA STAFF REVIEW FINDINGS AND RECOMMENDATIONS

Staff has completed our review of the above noted application and offers the following findings and recommendations:

RECOMMENDATION: ☐ Approve ☐ Approve w/Conditions ☐ Deny ☐ Continue ☒ Other: **COMMENT**

BACKGROUND AND APPLICATION INFORMATION:

This project is proposed by and located on property owned by the Declarant, Shea Properties. For Declarant projects on Declarant owned property, the DRC's review and approval authority is limited by Article VII: Declarant's Rights & Reservations of the Community Declaration, specifically §7.4 that notes, in part, "Nothing contained in this Community Declaration shall…require the Declarant to seek or obtain the approval of the Architectural Committee or of the Community Association…." Accordingly, **the DRC is only a referral entity to Douglas County, tasked to offer comments, concerns, suggestions, etc. to Douglas County for their (and the Declarant's) consideration**.

The proposed project is located on Lot 1 of Highlands Ranch Filing 159 and totals 9.69 acres (note: The development team has submitted for a concurrent review of a Minor Development Plat to combine the existing three separate tracts into the one lot of 9.69 acres).

The Site Improvement Plan reflects two multi-family buildings and a clubhouse. Each multi-family building is proposed to have 72 one-bedroom units, 44 two-bedroom units and 4 three-bedroom units, for a total of 240 units. Additionally, the development will include such amenities as a pool, exercise facility, dog park, grill stations and fire pits.

The development and design team believe the architecture, landscaping and site improvements (e.g. retaining walls, fencing, hand rails, etc) will be complimentary to the surrounding developments. Finally, they note that the project will finish portions of the public sidewalk along Plaza Drive and a trail connection to the Highline Canal providing pedestrian connectivity.

FINDINGS AND RECOMMENDATIONS:

The project is located within Planning Area 79, "Plaza Center" on the north side of Plaza Drive, south of C-470 and west of the existing Solana at Lucent Station apartment complex. Multi-family dwellings (for sale or lease, with a minimum of 10 units per building) are a Use Permitted by Right per §X-C: Plaza Center (PA 77-A, 77-B, and 79) of the Highlands Ranch Planned Development Guide (hereinafter, HRPDG). First floor retail is allowed, but not required and private leasing and sales offices are allowed. The accessory buildings (club house and fitness center) are generally allowed per §XIV: Accessory Uses of the HRPDG.

Development Standards per the HRPDG:

Per §X-C: Plaza Center (PA 77-A, 77-B, and 79).

1. Minimum Lot Area: 5,000 square feet.
    a. **COMPLIANT**. The project site, as previously noted, is 9.69 acres (421,904 square feet).
2. Maximum Building Height: 70 feet.
    a. **COMPLIANT**. The building height, including the necessary parapet to screen the roof top equipment, is approximately 60 feet.
3. Minimum Setbacks: 20 feet abutting property boundary lines; however, no setback is required adjacent to property lines which merely separate uses.
    a. **COMPLIANT**. The least dimension proposed is 20.27' from the corner of the eastern building to the property line.
4. Lighting: Comply with Douglas County regulations.
5. Loading Areas & Trash/Storage Areas: Screened from view by placement within building or enclosure with opaque walls at least five feet in height (wall to compliment exterior building materials).
    a. **COMPLIANT**. The trash/storage areas are internal to the buildings, accessed by small drive lanes.

6. Screening of mechanical equipment placed on roof: Must be screened from view from any street.
    a. **COMPLIANT**. The design includes an approximately seven-foot-tall parapet wall providing full screening of the roof top equipment.
7. Landscaping:
    a. Installed on at least 15% of the acreage of the lot.
        i. **COMPLIANT**. The "planted area" and "existing vegetation" account for approximately 40% of the gross site area.
    b. Installed along all property lines abutting perimeter public streets to a width of at least 10 feet.
        i. **COMPLIANT**. Landscaping is proposed within 10 feet of the northern and eastern property lines. Additional landscape area is provided along Plaza Drive and within the planned stormwater management pond at the west end of the development.

Per §XVI: Off-Street Parking.

1. ¶C.4.b discusses multiple-family dwellings.
    a. One-bedroom unit: 1.3 spaces per unit x 144 units = 188 spaces required
    b. Two-bedroom unit: 1.6 spaces per unit x 88 units = 141 spaces required
    c. Three-bedroom unit: 2.0 spaces per unit x 8 units = 16 spaces required
    d. Visitor parking: 0.5 spaces for each unit x 240 units = 120 spaces required
    e. 465 spaces required | 470 spaces provided (mix between garage and surface)
        i. **COMPLIANT**. Note: Additional ADA and "Highline" spaces provided (+23 spaces)

Discussion:

1. Regarding Architecture. In reviewing the architectural design, it appears there is some similarity to the design used with Windcrest (same scale buildings, building elevation materials, etcetera); however, the abutting Solana Lucent Station Apartments have "tower elements" to break up the monotony of the building roofline that is not planned with this project. The design does add some vertical material elements to break up the elevation view of the building; however, **Staff recommends that the bottom band of brick proposed on the two residential structures be replaced with the "Manufactured Stone Veneer: Lyons Sandstone College Rose with mortar" to tie the two residential buildings in with the Clubhouse's and Fitness Center's design.**

2. Regarding Building Height. As noted above, the design is compliant with the Development Standards for this Planning Area; however, Solana's maximum building height is three-stories while this project proposes five-stories (plus), so there isn't consistency to the abutting development. In comparing the building height to other developments in the general vicinity, the Golf Course Community Homes are at (roughly) elevation 5616' and the ground level in the center of KAOS is 5553', so roughly 63' lower. Add back into that a conservative 60 feet for the KAOS buildings (because that's the maximum height of their buildings, and the ground slopes from east→west) and the top of the proposed buildings will be roughly 10-feet below the ground grade at the Golf Course Community Homes.

3. Regarding Landscaping: The designers are presenting a varied palate of materials, which will be aesthetically pleasing. Staff is concerned with the quantity of irrigated "Turf-Sod-RTF" that is planned; however, it is acknowledged that the

majority of the area is along the frontage of Plaza Drive with smaller "pocket parks" internal to the site, which may be appropriate. The larger areas (e.g. Dog Park in northeast corner and stormwater management pond in the northwest corner) are planned as native grass.

4. Regarding Traffic: A Traffic Impact Study was prepared for this development. The purpose of the Study was to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The following intersections were incorporated into the Study in accordance with Douglas County standards and requirements:
    a. County Line Road and Erickson Boulevard (#1)
    b. Plaza Drive and Erickson Boulevard (#2)
    c. Plaza Drive and Lucent Boulevard (#3)

    In addition, two (2) full movement accesses and one (1) proposed right-in/right-out access along Plaza Drive were evaluated.

    The Study found that the development is expected to generate approximately 1,100 weekday daily trips, with 94 of these trips occurring during each of the morning and afternoon peak hours.

    The Study provided the following recommended improvements:

    a. R1-1 "STOP" signs are recommended to be installed on the southbound approaches of all three (3) accesses, exiting the development.
    b. A R3-2 "NO LEFT TURN" sign should be placed underneath the R1-1 "STOP" sign at the right-in/right-out (RIRO) access that is proposed approximately 450 east of the full movement access that is aligned with the Centennial Water & Sanitation driveway.
    c. A R6-1R "ONE WAY" sign could be placed within the existing raised median of Plaza Drive.
    d. The eastbound left turn lanes at the full movement accesses provide a length of 250 feet.

    Staff recommends that the DRC encourage the applicant to address the recommendations of their Traffic Engineer in their Site Improvement Plan and Construction Drawings for this project. It appears that some, but not all, of these recommendations are captured on the current Site Improvement Plans.

5. Regarding Stormwater Management: A Phase III Drainage Report was prepared for this development. Runoff from the site will by collected by a private drainage system and storm sewer which will outfall into a proposed "Full-Spectrum Detention Pond". The pond is sized per Douglas County requirements to accommodate the Water Quality Capture Volume (WQCV), Excess Urban Runoff Volume (EURV), and the 100-year Recurrent Storm Interval Runoff Volume. The pond includes a controlled release to the Highline Canal at or below historic rates, as required. It is expected that downstream infrastructure will not be adversely impacted with the development since the discharge will be controlled.

    The stormwater management pond will be enclosed with a fence and the plans note "reference to Landscape Plans for Fence Details"; however, the Landscape Plans do not include details for this fencing. **Staff recommends this fencing be the same as what is proposed for the "Dog Park Perimeter Fence", as shown on Drawing 10 of 25, for consistency in look**.

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

June 26, 2023

Matt Jakubowski, Chief Planner
Douglas County Department of Community Development
Planning Services Division
100 Third St., Castle Rock, CO 80104
303-660-7460
mjakubow@douglas.co.us

Carolyn Washee-Freeland, Senior Planner
Douglas County Department of Community Development
100 Third St., Castle Rock, CO 80104
303-814-4361
cfreeland@douglas.co.us

RE: Highlands Ranch Filing 159-Minor Development Plat and Site Plan (SB2023-022, SP2023-035)

Dear Mr. Jakubowski and Ms. Washee-Freeland,

Thank you for the opportunity to respond to the above referenced application. It is our understanding that the applicant is requesting approval for the construction of two multifamily buildings and a clubhouse (240 multifamily residential units) on 9.86 acres. The property is located at the southeast intersection of Colorado State Highway 470 and the High Line Canal and Trail.

CASH-IN-LIEU CALCULATION
STUDENT GENERATION

PROJECT NAME: HIGHLANDS RANCH FILING 159-MINOR DEVELOPMENT PLAT AND SITE PLAN					
DU/	ACRES		DENSITY		
240	9.86		24.34		
			Generation	Number	
STUDENT GENERATION RATES	No. of DU's		Rate	of Students	
ELEMENTARY	240	X	0.05	12	
MIDDLE SCHOOL	240	X	0.008	2	
HIGH SCHOOL	240	X	0.017	4	
				18	
				Required	
			School	Land	
	Number		Acreage	Dedication	
SCHOOL LAND DEDICATION	of Students		Per Student	Acreage	
ELEMENTARY	12	X	0.018	0.216	
MIDDLE SCHOOL	2	X	0.030	0.058	
HIGH SCHOOL	4	X	0.030	0.122	
			TOTAL	0.396	

On behalf of Douglas County School District, we have a couple comments regarding this application. DCSD has calculated the amount of school site land dedication required for students generated by the proposal. A total of 18 students are expected from the development requiring a total land dedication requirement of 0.396 acres.

The required school land dedication has been accounted for within the Highlands Ranch PD. The proposed development is within the overall unit count of Highlands Ranch as outlined in the Highlands Ranch PD. Since the overall unit count within Highlands Ranch is not increasing, all land dedication for parks and schools has been accounted for. DCSD has no objection to approval of this application.

The proposed subdivision is currently located in the school attendance areas of Northridge, Mountain Ridge Middle School and Mountain Vista High School.

Shavon Caldwell, Planning Manager
DCSD Planning & Construction
shavon.caldwell@dcsdk12.org
office: 303.387.0417
mobile: 720.428.1170

REFERRAL RESPONSE REQUEST

Date sent June 16, 2023 **Comments due by July 14, 2023**

Project Name:	**Highlands Ranch Filing 159 – Minor Development Plat**
Project File #:	**SB2023-022**
Project Summary:	The applicant requests approval of a Minor Development Plat (MDP) for one lot within the Highlands Ranch Planned Development (PD), Filing 159. The property consists of 9.2 acres and is located within Planning Area 79. The subject property is located between C-470 and Plaza Drive, and east of Erickson Blvd. and west of Lucent Blvd. State Parcel Number: 2229-051-00-009. This MDP request will be processed concurrently with the associated Site Improvement Plan (SP2023-035) to construct 240 multi-family residential units known as the Kaos Apartments.

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

☒	No Comment	The recommendations in Cesare's 10/6/2022 geotechnical investigation are valid
☐	Please be advised of the following concerns:	
☐	See letter attached for detail.	
Agency:	Colorado Geological Survey	**Phone #:** 303-384-2643
Your Name:	Jill Carlson	**Your Signature:** J Carlson
	(please print)	**Date:** 7/25/2023

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

Sincerely,

Carolyn Washee-Freeland

Carolyn Washee-Freeland, AICP
Senior Planner, Planning Services
303-660-7460
cfreeland@douglas.co.us

STATE OF COLORADO

Traffic & Safety
Region 1
2829 W. Howard Place
Denver, Colorado 80204

COLORADO
Department of Transportation

Project Name: **Kaos Residential**

		Highway:	Mile Marker:
Print Date:	7/7/2023	C-470	18.142

Environmental Comments:

No Planning concerns

For ANY ground disturbance/work within CDOT ROW---
Required:
Arch/History/Paleo:
Since this is a permit, a file search for Arch, Paleo and History is required. If the file search identifies anything, a more extensive report will be required. If nothing is identified, then the file search should be sufficient. For the file search contact:

Cultural/History File Search: https://www.historycolorado.org/file-access Email: hc_filesearch@state.co.us
Paleo File Search: Colorado University Museum of Natural History - Email: jacob.vanveldhuizen@colorado.edu and https://www.dmns.org/science/earth-sciences/earth-sciences-collections/ and/or Denver Museum of Nature and Science – Email: kristen.mackenzie@dmns.org https://www.dmns.org/science/earth-sciences/earth-sciences-collections/

Clear Zone: It is the responsibility of the engineer/architect who stamps the plans to ensure that: any new landscaping/trees are outside of the clear zones for any State Highway/CDOT ROW and that the new landscaping/trees do not interfere with site lines from any State Highway/CDOT ROW.

Landscape: Any new or changes to existing landscaping within CDOT ROW must be reviewed and approved by CDOT. Landscaping plans should be submitted and should include details of all proposed plant species and seed mixes/ratios.

WQ: Will This development be taking any drainage from CDOT ROW? **Has the Highline Canal company been contacted in regards to the proposed water quality measures being installed?**

The Landscaping and trees cannot have any visual effect on C-470.

Right of Way Comments:

MJO 6/22/2023 - All work appears to be to the south of existing ROW- there is a 10' setback from the C-470 property line and only a little minor grading work was proposed in this 10' strip on the east end of the project. No A-Lines, No Dedications to CDOT, no real concerns that I can see from a ROW or Survey Perspective.

SDH 6/22/2023 - Agree with John there are no concerns from the ROW or Survey perspective.

Permits Comments:

7-5-23 It appears that CDOT ROW runs along the north side of this development (470). Please keep in mind that any work in the CDOT ROW unrelated to access will require a permit from our office. This includes, but is not limited to survey, landscaping, or utility work. Application is made online at the following link: https://cdotpermits.force.com/portal/s/login/?ec=302&startURL=%2Fportal%2Fs%2F **AE 7-5-23**

REFERRAL RESPONSE REQUEST – SITE IMPROVEMENT PLAN

Date sent: June 16, 2023

Comments due by: **July 7, 2023**
Fax: 303.660.9550

Project Name:	Highlands Ranch Filing 159, Lot 1
Project File #:	SP2023-035
Project Summary:	Site Improvement Plan (SIP) request for construction of a 240-unit multi-family residential development consisting of 2 buildings and a clubhouse. The parcel is located on Plaza Drive, approximately ¼ mile west of the intersection of Plaza Drive and Greensborough Drive within Planning Area 79 of the Highlands Ranch Planned Development. *Note: this proposal is being processed concurrently with, and is related to, the Highlands Ranch Filing No. 159 Minor Development Plat (SB2023-022).*

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

☐ No Comment

☑ Please be advised of the following concerns:

Since the outfall discharges into the High Line Canal (HLC), we are referring the design report to RESPEC, who maintains a living SWMM model for the HLC. RESPEC will coordinate with Redland on running the proposed conditions in the SWMM model, in order to confirm there are no adverse impacts. As a note, outfalls into the HLC are not considered maintenance eligible.

☐ See letter attached for detail.

Agency: Mile High Flood District	**Phone #:** 303-455-6277
Your Name: Jeff Battiste	**Your Signature:**
(please print)	**Date:** 7/6/23

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

Sincerely,

MattJakubowski, Chief Planner
Enclosure

Carolyn Freeland

From: annb cwc64.com <annb@cwc64.com>
Sent: Friday, June 30, 2023 11:58 AM
To: Carolyn Freeland
Cc: Pam Choy (pc2914@att.com); duanew cwc64.com; jt cwc64.com
Subject: Plaza Dr Littleton, Colorado Douglas County eReferral #SB2023-022
Attachments: Plaza Dr Littleton, Colorado.jpg

Hi Carolyn,

This is in response to your eReferral with a utility map showing any buried AT&T Long Line Fiber Optics near Plaza Dr Littleton, Colorado. The Earth map shows the project area in red and based on the address and/or map you provided, there should be NO conflicts with the AT&T Long Lines, as we do not have facilities in that area.

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

Ann Barnowski
Clearwater Consulting Group Inc
120 9th Avenue South
Suite 140
Nampa, ID 83651
Annb@cwc64.com

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

-----Original Message-----
From: duanew cwc64.com <duanew@cwc64.com>
Sent: Monday, June 19, 2023 11:42 AM
To: annb cwc64.com <annb@cwc64.com>
Subject: FW: Douglas County eReferral (SB2023-022) Is Ready For Review

Please do not hesitate to contact me with any questions or concerns!

Thank you!!

Duane Ward
Clearwater Consulting Group Inc
120 9th Ave South
STE 140
Nampa Id 83687
Duanew@cwc64.com
208-866-2956

McLellen Reservoir
W County Line Rd
W County Line Rd
PROJECT AREA
Plaza Dr
Lucent Blvd
Lucent Blvd
Plaza Dr
Town Center Dr
470
470
85
85
280
Google

Carolyn Freeland

From: Matz - DNR, Michael <michael.matz@state.co.us>
Sent: Thursday, July 6, 2023 2:42 PM
To: Carolyn Freeland
Cc: dave.witte@sheaproperties.com
Subject: Case No. SB2023-022 Highlands Ranch Filing 159, Minor Development Plat

Good Afternoon Carolyn,

We have received the proposal for a minor development plat under Case No. SB2023-022.

The Applicant is requesting to construct 240 multi-family units known as the "Kaos Apartments".

This referral for Shea Properties, Case No. SB2023-022, on 9.69 acres in Sec. 5, T6S, R68W, 6th P.M., does not appear to qualify as a “subdivision” as defined in section 30-28-101(10)(a), C.R.S. Therefore, pursuant to the State Engineer’s March 4, 2005 and March 11, 2011 memorandums to county planning directors, this office only performed a cursory review of the referral information. Upon review, it appears that the proposed water supply source for the property is service provided by the Centennial Water and Sanitation District. There are no permitted wells on the subject property. Therefore, our office has no comments on this referral.

Thank you for the opportunity to review Case No. SB2023-022.

Please let us know if you have any questions or concerns.

Best Regards,

Mike Matz
Water Resource Engineer
P 303.866.3581 x 8241
1313 Sherman Street, Room 818, Denver, CO 80203
michael.matz@state.co.us | www.colorado.gov/water

COLORADO
Parks and Wildlife
Department of Natural Resources

Northeast Regional Office
6060 Broadway
Denver, CO 80216
P 303.291.7227

July 5, 2023

Carolyn Washee-Freeland, AICP/Senior Planner
Douglas County Planning Services
100 Third Street
Castle Rock, CO 80104

RE: Highlands Ranch Filing 159, Minor Development Plat

Dear Ms. Washee-Freeland:

Thank you for the opportunity to comment on the Highlands Ranch Preliminary Filing 159 MDP Project in Douglas County, Colorado. The mission of Colorado Parks and Wildlife (CPW) is to perpetuate the wildlife resources of the state, to provide a quality state parks system, and to provide enjoyable and sustainable outdoor recreation opportunities that educate and inspire current and future generations to serve as active stewards of Colorado's natural resources. Our goal in responding to land use proposals such as this is to provide complete, consistent, and timely information to all entities who request comment on matters within our statutory authority.

District Wildlife Manager Justin Olson recently analyzed the project site. The project is located within the Highlands Ranch Planned Development (Planning Area 79) and is located between C-470 and Plaza Drive, east of Erickson Boulevard, west of Lucent Boulevard, and the parcel size is 9.2 acres. The project is proposing 240 multi-family residential units and associated amenities. CPW would expect to find occasional use of the proposed site by small ground-dwelling mammals, small birds, raptors, and other common urban species.

Prairie dogs may occur within or near the proposed development site, and as a result, the potential may also exist for the presence of burrowing owls. Burrowing owls live on flat, treeless land with short vegetation, and nest underground in burrows dug by prairie dogs, badgers, and foxes. These raptors are classified as a state threatened species and are protected by both state and federal laws, including the Migratory Bird Treaty Act. These laws prohibit the killing of burrowing owls or disturbance of their nest. Therefore, if any earth-moving will begin between March 15th and August 31st, a burrowing owl survey should be performed. Guidelines for performing a burrowing owl survey can be obtained from your local District Wildlife Manager. If prairie dogs are present and any earth-moving is to be done on site, CPW recommends euthanasia or relocation (with the appropriate permit) prior to any work being done. If relocation is chosen, please consult with the local district wildlife manager for the required permit.

Care should also be taken to make sure no raptor nests will be impacted during this project. Raptors are protected from take, harassment, and nest disruption at both the state and

Jeff Davis, Director, Colorado Parks and Wildlife
Parks and Wildlife Commission: Carrie Besnette Hauser, Chair • Dallas May, Vice-Chair • Marie Haskett, Secretary • Taishya Adams
Karen Bailey • Betsy Blecha • Gabriel Otero • Duke Phillips, IV • Richard Reading • James Jay Tutchton • Eden Vardy

federal levels. CPW recommends that buffer zones be implemented around any nest discovered within the project vicinity during any period of activity that may interfere with nesting season. This will prevent the intentional or unintentional destruction of an active nest. For further information on this topic, a copy of the document "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors" and CPW High Priority Habitat designations are available from your local District Wildlife Manager. Following the recommendations outlined in these documents will decrease the likelihood of unintentional take through disturbance.

Noxious weeds should be monitored very closely. The spread and control of noxious weeds on and around this Douglas County site is a concern for wildlife. Invasive plants endanger the ecosystem by disturbing natural processes and jeopardizing the survival of native plants and the wildlife that depend on them. CPW would recommend implementation of a weed management plan that may already exist within Douglas County and re-vegetation of any disturbed sites with native seed mixes. In addition, if any aspects of this project will require fencing, CPW would recommend the use of wildlife-friendly fencing designs that allow for ease of movement and reduced likelihood of entanglement. Information about wildlife-friendly fencing can be obtained from your local CPW Office.

Current CPW policy directs our efforts towards proposals that will potentially have high impacts to wildlife and wildlife habitat. The emphasis of CPW's concerns is on large acreages, critical habitats, wildlife diversity, and impacts to species of special concern, or those that are state or federally endangered. Due to the small acreage of the proposed project and limited disturbance to nearby habitat areas, impacts of the development can be characterized as minimal. This may not mean that the landscape has no value to wildlife or value to the community. It is important to remember that incremental and cumulative loss of natural areas and open spaces will, over time, significantly degrade the overall quality of wildlife habitat in the area. Therefore, in this case, we want to focus our recommendations on planning and implementing your proposal to minimize negative impacts and maximize potential enhancements to support living with wildlife in our community. If you have any further questions, please contact District Wildlife Manager Justin Olson at (303) 291-7131.

Sincerely,

Matt Martinez
Area Wildlife Manager

Cc: M. Leslie, S. Schaller, J. Olson

Carolyn Freeland

From: Begly, Gina <Gina.Begly@denverwater.org>
Sent: Wednesday, July 12, 2023 11:59 AM
To: mjakubow@dougas.co.us; Carolyn Freeland
Cc: Boothe, Gary W.
Subject: Highlands Ranch 159 SB2023-022 / SP2023-035
Attachments: 1983 Exclusive Esmt.pdf

Hi Matt and Carolyn,
Thank you for sending us a referral and giving up the opportunity to comment.
Denver Water has an exclusive 50' wide easement on the west edge of this project, see a. ached. Although our easement appears to be off site, this project will still have improvements over us.
Our biggest concerns are the grading and drainage. Denver Water has the following comments:

- Please show/label 50' wide Denver Water easement on the plans. Also show the 24" Denver Water Conduit 100. We recommend you add a plat note to page 1 stating this is an exclusive easement for water purposes, any and all future crossings/improvements need to be approved in writing by Denver Water. (we can discuss language of note)
- Per our easement terms, no utility crossings are allowed, but storm sewer may be permitted by special provision and a Denver Water license. Please send plan and profile for storm sewer crossing at this location.
- The plat shows several easements crossing us, to be dedicated by separate document. Overlapping easements are subject to our approval. Please send for our review.
- Drainage plans need to be reviewed to look at flows, connections to pond and if there are any impacts to High Line Canal.
- Review #2-prohibited obstructions of our easement. No trees, fencing, structures are allowed in the easement.
- We need to review a complete set of grading plans. Our pipe has to maintain a certain depth, we need to see cut/fill over the pipe. We may not approve grading changes over the waterline but we can discuss after reviewing plans.
- Who is maintaining the access drive on our easement? Please show our easement in relationship to easement drive on the plans.

Matt, I apologize I missed your deadline. I hope there's still a way my comments can get incorporated and sent to the applicant.
We are happy to get on a call if you have any questions,

Gina Begly | Property Management | Real Estate Sr Specialist
Denver Water t: 303-628-6219
1600 West 12th Avenue Denver, CO 80204
denverwater.org

DENVER WATER

BOOK 467 PAGE 335
RECORDER
$15.00 pd
MAR 2 3 35 PM '83

RIGHT OF WAY AGREEMENT

THIS AGREEMENT, made and entered into as of the 19th day of January 19 83
by and between Bowen Farms, Inc.

FILE NO. 427 DOC. NO. 241

hereinafter called "Grantor", (whether grammatically singular or plural) and the CITY AND COUNTY OF DENVER, acting by and through its BOARD OF WATER COMMISSIONERS, hereinafter called "Board",

WITNESSETH:

For and in consideration of the sum of
Forty Thousand and no/100----------DOLLARS ($ 40,000.00)
to the Grantor in hand paid by the Board, the receipt whereof is hereby acknowledged, the Grantor hereby grants to the Board, its successors and assigns, the sole, exclusive and permanent right to enter, re-enter, occupy and use the hereinafter described property to construct, maintain, repair, replace, remove, enlarge and operate one or more water pipelines and all underground and surface appurtenances thereto, including electric or other control systems related thereto including underground cables, wires and connections and surface appurtenances thereto. By way of example and not by way of limitation, the parties intend to include within the terms pipelines and appurtenances, the following: mains and conduits, valves, vaults, manholes, control systems, ventilators and the like in, through, over and across the following described parcel of land situate, lying and being in the County of Douglas and State of Colorado, to-wit:

A parcel of land situated in the east half of the northeast quarter ($E\frac{1}{2}$ $NE\frac{1}{4}$) of Section 5, Township 6 South, Range 68 West of the Sixth Principal Meridian, more particularly described and bounded as follows:

Beginning at a point, at the intersection of the Grantor's east property line with the north boundary of the Board's Conduit Number 96 right-of-way, said point being sixty (60) feet north of the east-west centerline of said Section 5, whence the east quarter corner of said Section 5 bears South 87°35'05" East a distance of 1313.6 feet more or less; thence South 89°47'51" West along the north boundary of the Board's Conduit Number 96 right-of-way a distance of 50.10 feet to a point; thence North 03°22'39" East, fifty (50) feet west of and parallel with the Grantor's east property line a distance of 2062.65 feet to a point on the southerly boundary of the Board's High Line Canal property; thence North 71°38'14" East along the said southerly boundary of the Board's High Line Canal property a distance of 53.83 feet to a point on the Grantor's east property line; thence South 03°22'39" West, along the Grantor's east property line, a distance of 2079.5 feet more or less to the point of beginning as shown on D.W.D. drawing Dr. 68 No. 2021 a copy of which is attached hereto and made a part hereof.

The above described parcel of land contains 103,553 square feet (2.38 acres) more or less.

IT IS HEREBY MUTUALLY covenanted and agreed by and between the parties hereto as follows:

1. The Board shall have and exercise the right of ingress and egress in, to, over, through and across the above described property for any purpose needful for the full enjoyment of any other right of occupancy or use provided for herein.

2. The Grantor shall not construct or place any structure or building, street light, power pole, yard light, mail box or sign, temporary or permanent, or plant any shrub, tree, woody plant or nursery stock, on any part of the above described right-of-way. Any structure or building, street light, power pole, yard light, mail box or sign, temporary or permanent, or shrub, tree, woody plant or nursery stock, of any kind situated on the above described right-of-way as of the date of this Agreement, may be removed by the Board without liability for damages arising therefrom.

(COND.)

5028/8/79

3. The Grantor shall not construct new fencing across or within the right-of-way herein described without the written approval of the Board.

4. The Grantor grants to the Board the right to occupy the right-of-way in order to protect its interests in and right of occupancy of the right-of-way at all times and particularly during times of construction, repair, removal, replacement or enlargement of water facilities.

5. All water pipelines installed within the above described right-of-way shall be laid not less than two and one-half feet below the natural surface of the adjacent ground

6. The Board shall have and exercise the right of subjacent and lateral support to whatever extent is necessary or desirable for the full, complete and unmolested enjoyment of the rights hereinabove described. It is specifically agreed between the parties that the Grantor shall take no action which would impair the earth cover over, or the lateral or subjacent support for any water pipeline or lines and appurtenances within the right-of-way, provided, however, that upon obtaining the specific written permission of the Board, the earth cover over any water pipeline or lines may be modified, but normally permission will not be granted for a modification involving a cover of less than two and one-half feet nor greater than ten feet measured vertically from the top of any water pipeline or lines, and any modification undertaken by the Grantor would be upon terms which would provide for reimbursement to the Board of the cost of any alterations to any pipeline facility made necessary by the change.

7. After construction of any water pipeline or lines as hereinabove referred to, the general surface of the ground, except as necessarily modified to accommodate appurtenances, shall be restored, as nearly as may reasonably be, to the grade and condition it was in immediately prior to construction. Topsoil shall be replaced in cultivated and agricultural areas, and any excess earth resulting from installations by the Board shall be removed from the right-of-way at the sole expense of the Board. The Board agrees that for a period of one year following construction which involved disturbance of the surface of the ground, the Board will maintain the surface elevation and quality of the soil by correcting any settling or subsiding that may occur as a result of the work done by the Board.

8. The Grantor has retained the right to the undisturbed use and occupancy of the subject property insofar as such use and occupancy is consistent with and does not impair any grant herein contained and except as herein otherwise provided.

9. It is mutually agreed by and between the parties hereto that the Board may commence the exercise of its rights hereunder forthwith or it may postpone the exercise of all or some part of its rights hereunder to some indeterminate future time. The Board may properly acquire, own, and exercise the rights in the subject property as herein provided for in order to insure to the Board a dominant right-of-way for the exercise of the Board's functions and that the exercise of any rights in the subject property other than those retained by the Grantor should be within the sound discretion of the Board. The Board agrees to permit and authorize such other uses of the subject property, not reserved in the Grantor, as will not impair the Board's dominant rights, upon the payment of reasonable compensation to the Board and upon such reasonable terms, limitations, and conditions as the Board shall find reasonably necessary to protect its dominant right of occupancy of the subject property for the purpose of the Board without undue or unnecessary injury to or impairment of the estate retained by the Grantor.

10. In case the Board shall abandon its rights herein granted and cease to use the same, all right, title and interest hereunder of the Board shall cease and terminate, and the Grantor shall hold said premises, as the same may then be, free from the rights so abandoned and shall own all material and structures of the Board so abandoned, but nothing herein shall be construed as working a forfeiture or abandonment of any interest derived hereunder and not owned by the Board at the time of the abandonment of Board rights.

11. The Grantor warrants that he has full right and lawful authority to make the grant hereinabove contained, and promises and agrees to defend the Board in the exercise of its rights hereunder against any defect in his title to the land involved or his right to make the grant hereinabove contained.

12. Each and every one of the benefits and burdens of this Agreement shall inure to and be binding upon the respective legal representatives, heirs, executors, administrators, successors and assigns of the parties hereto.

(COND)

5028 8/79

13. Unless special provisions are attached hereto, the above and foregoing constitute the whole agreement between the parties and no additional or different oral representation, promise or agreement shall be binding on any of the parties hereto with respect to the subject matter of this instrument. To the extent that any special provisions attached hereto are in conflict with any other provisions hereof, such special provisions shall control and supersede any other term or provisions hereof.

SPECIAL PROVISIONS:

FILE NO. 427 DOC. NO. 241

The Board agrees that public and private roadways and utilities such as sanitary sewer, storm sewer and gas lines may be installed across the herein-described right-of-way, provided they do not interfere with the rights herein granted to the Board; however, plans for the construction/ installation of any and all of said roadways and utilities must first be approved in writing by the Board. Approval will be by license from the Board in accordance with its licensing procedure, which shall set forth the limitations and conditions necessary to protect the Board's existing and future facilities. Installation by "open cut" method will be authorized provided the Board's facilities are adequately protected.

FILE NO. 427 DOC. NO. 24

BOOK 467 PAGE 338

IN WITNESS WHEREOF, the parties hereto have executed the within Agreement as of the day and year first above written.

Bowen Farms, Inc.

By: John G. Bowen
President

ATTEST:

John A. Bowen Sec.
Secretary (TITLE)

(TITLE)

(Corporate Acknowledgment)

STATE OF COLORADO)
) ss.
COUNTY OF Douglas)

The foregoing instrument was acknowledged before me by John G. Bowen as President and John A. Bowen as Secretary of Bowen Farms, Inc., a Colorado corporation on this 19th day of January, 1983.

My commission expires: My Commission Expires Oct. 4, 1985
1600 West 12th Ave.
Denver, Colorado 80254

Witness my hand and official seal.

Ernest R. Christ
Notary Public

Address:

CITY AND COUNTY OF DENVER,
acting by and through its
BOARD OF WATER COMMISSIONERS

By: William A. Hill

REGISTERED AND COUNTERSIGNED
Auditor, City and County of Denver

By: Charles T. Byrne
D-3 2/8/83

APPROVED:

J. Saya
Director of Engineering

APPROVED AS TO FORM:

Alan Goldberg
Legal Division

(CONT.)

5028 8 79

FILM NO. 427 DOC. NO. 241
BOOK 467 PAGE 339

NE 1/4 SECTION 5, TOWNSHIP 6 SOUTH, RANGE 68 WEST 6th P.M.
DOUGLAS COUNTY

CO. LINE ROAD
ARAPAHOE COUNTY
DOUGLAS COUNTY
N.89°54'09"W
N LINE NE 1/4 SEC 5

1/2 dia B.M. Brass Cap
NE Cor Sec 5
T 5 S.
T 6 S
4

PROPERTY OF
MARTIN L. & JUDITH BOWEN

NW 1/4 NE 1/4
SEC. 5

PROPERTY OF
NE 1/4 NE 1/4
SEC. 5

N

PROPOSED N BOUNDARY STATE HWY C-470

CONDUIT NO 100
STA 206+82.08

PT 783+94

64.5

PC 785+29.3

MISSION

N 21°38'14" E
53.83

PROPERTY OF

PC 781+62.4

BOWEN FARMS

HIGH LINE CANAL

℄

S 03°22'39" E
226.65'

N 03°22'39" W
207.95'±

NOTE
Bearings are based on the North line NE 1/4 Sec 5 being N 89°54'09" W
For field notes see DWD field book No 1421 pages 7 thru 8

℄ COND. NO. 100

PROPOSED S BOUNDARY STATE HWY C-470

SW 1/4 NE 1/4
SEC 5

S 89°47'51" W
50.10

Point of Beginning

S 89°35'05"E
313.6'±

1/2" dia B.M. Brass Cap

E 1/4 Sec 5

CONDUIT NO 100
STA 228+21.80

℄ COND. NO. 96

E-W ℄ SEC 5

N 89°47'51" E

CONDUIT NO 96
STA 143+23.91

SCALE IN FEET

PARCEL CONTAINS 103,553 SQ. F.T. (2.38 ACRES±)

LEGEND

BOUNDARY D.W.D PROPERTY

RIGHT-OF-WAY ACQUIRED

BOUNDARY D.W.D. RIGHT OF-WAY

DOCUMENT DATED
BETWEEN ETC.

DENVER WATER DEPARTMENT

CONDUIT NO. 100
RIGHT-OF-WAY ACQUIRED FROM
BOWEN FARMS, INC.

SCALE: 1" = 100'	DATE: JULY 28, 1982
DRN. J.A.Y. TR. ——	CK. &
APP.	DR 68 NO 2021

Please be aware that PSCo owns and operates existing underground electric facilities along east and north property lines and requires all facilities are shown on the plan.

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

Additional easements may need to be acquired by separate document. The Designer must contact the appropriate Right-of-Way Agent.

As a safety precaution, PSCo would like to remind the developer to contact Colorado 811 for utility locates prior to construction.

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

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

Matthew Jakubowski, Chief Planner
Douglas County Department of Community Development, Planning Services
100 Third St
Castle Rock Co 80104
303.660.7460
303.660.9550 Fax

Project Name:	Highlands Ranch Filing 159, Minor Development Plat
Project File #:	**SB2023-022**
S Metro Review #	REFFP23-00131
Review date:	June 28, 2023
Plan reviewer:	Aaron Miller 720.989.2246 aaron.miller@southmetro.org
Project Summary:	The applicant requests approval of a Minor Development Plat (MDP) for one lot within the Highlands Ranch Planned Development (PD), Filing 159. The property consists of 9.2 acres and is located within Planning Area 79. The subject property is located between C-470 and Plaza Drive, and east of Erickson Blvd. and west of Lucent Blvd. State Parcel Number: 2229-051-00-009. This MDP request will be processed concurrently with the associated Site Improvement Plan (SP2023-035) to construct 240 multi-family residential units known as the Kaos Apartments.
Code Reference:	Douglas County Fire Code, 2018 International Fire Code, and 2018 International Building Code with amendments as adopted by Douglas County.

South Metro Fire Rescue (SMFR) has reviewed the provided documents and has conditional non-objection to the proposed Minor Development Plat. Comments must be resolved as required by planner for Plat approval. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project.

COMMENTS:

1. Fire Hydrant locations will not be approved as shown on Water and Sanitary Plans resulting in required revisions to utility easements. Once required fire flow requirements for the buildings have been determined and hydrant requirements verified, a plan indicating revised hydrant locations will be required to be reviewed by SMFR for approval.

Carolyn Freeland

From: Terri Maulik <TMaulik@arapahoegov.com>
Sent: Tuesday, June 20, 2023 11:57 AM
To: Carolyn Freeland
Cc: Ava Pecherzewski; Cathleen Valencia; Michelle Lengyel; Referrals; Robert Victor; Roger Harvey
Subject: RE: Douglas County eReferral (SB2023-022) Is Ready For Review

Carolyn,
Thank you for the opportunity to review and comment on this project. The Arapahoe County Planning Division has no comments; however, other departments and/or divisions may submit comments.

ARAPAHOE COUNTY
PUBLIC WORKS & DEVELOPMENT

TERRI MAULIK
Planning Technician | Public Works and Development - Planning Division
6924 S Lima St., Centennial Co 80112
O: 720-874-6840 | M: 720-874-6650
arapahoegov.com | Facebook | Twitter | Instagram | Nextdoor

Many County services can be accessed online. You are encouraged to visit our website at https://www.arapahoegov.com/519/Public-Works-and-Development. Please consider emailing us at planning@arapahoegov.com as this email inbox is monitored by several staff members. You may also call (720) 874-6650 to leave a message.

-----Original Message-----
From: cfreeland@douglas.co.us <cfreeland@douglas.co.us>
Sent: Friday, June 16, 2023 2:02 PM
To: Referrals <Referrals@arapahoegov.com>
Subject: Douglas County eReferral (SB2023-022) Is Ready For Review

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

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

SB2023-022 - Highlands Ranch Filing 159, Minor Development Plat

The applicant requests approval of a Minor Development Plat (MDP) for one lot within the Highlands Ranch Planned Development (PD), Filing 159. The property consists of 9.2 acres and is located within Planning Area 79. The subject property is located between C-470 and Plaza Drive, and east of Erickson Blvd. and west of Lucent Blvd. State Parcel Number: 2229-051-00-009. This MDP request will be processed concurrently with

DOUGLAS COUNTY
HEALTH DEPARTMENT COLORADO

June 26, 2023

Carolyn Washee-Freeland
100 Third St.
Castle Rock, CO 80104

RE: SB2023-022

Dear Mr. Washee-Freeland,

Thank you for the opportunity to review and comment on the request to plat one multi-family residential lot. Douglas County Health Department (DCHD) staff have reviewed the application for compliance with pertinent environmental and public health regulations. After reviewing the application, DCHD has no comments.

Please feel free to contact me at 720-907-4888 or bfreyer@douglas.co.us if you have any questions about our comments.

Sincerely,

Brent Freyer
Environmental Health Specialist I
Douglas County Health Department

July 18, 2023

Carolyn Washee-Freeland, AICP, Senior Planner
Douglas County Department of Community Development
Planning Services Division
100 Third St., Castle Rock, CO 80104

Re: SB2023-022 - Highlands Ranch Filing 159

Dear Mrs. Washee-Freeland:

This letter provides comments regarding the request for approval of a Minor Development Plat (MDP) for one lot within the Highlands Ranch Planned Development (PD), Filing 159. The property consists of 9.2 acres and is located within Planning Area 79. The subject property is located between C-470 and Plaza Drive, and east of Erickson Blvd. and west of Lucent Blvd. State Parcel Number: 2229-051-00-009. This MDP request will be processed concurrently with the associated Site Improvement Plan (SP2023-035) to construct 240 multi-family residential units known as the Kaos Apartments.

Upon reading the Limited-Results Cultural Resource Survey of the subject site written by ERO Resources Corporation in 2023, the Douglas County Curator has no further comments. There are no impacts to cultural resources in the area.

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

Sincerely,

Brittany Cassell

Brittany Cassell, Curator

ARAPAHOE COUNTY

PUBLIC WORKS & DEVELOPMENT
BRYAN D. WEIMER, PWLF Director
6924 South Lima Street
Centennial, CO 80112-3853
Phone: 720-874-6500
Relay Colorado: 711
www.arapahoegov.com

Engineering Services Division Referral Comments

June 20, 2023

Douglas County – Planning Services Division
100 Third St
Castle Rock, CO 80104
Attn: Planning Case Manager

Re: SB2023-022 - Highlands Ranch Filing 159
Minor Development Plat

Engineering Services Division of Arapahoe County Public Works and Development (Staff) thanks you for the opportunity to review the outside referral for the proposed project located in the Douglas County. The Engineering Division has no comments regarding the referral at this time based on the information submitted.

Please know that other Divisions in the Public Works Department may submit comments as well.

Thank you,
Sue Liu, PE, CFM
Arapahoe County Public Works & Development
Engineering Services Division
cc Arapahoe County Case No. O23-170

REFERRAL RESPONSE REQUEST

Date sent June 16, 2023 Comments due by July 14, 2023

Project Name:	**Highlands Ranch Filing 159 – Minor Development Plat**
Project File #:	**SB2023-022**
Project Summary:	The applicant requests approval of a Minor Development Plat (MDP) for one lot within the Highlands Ranch Planned Development (PD), Filing 159. The property consists of 9.2 acres and is located within Planning Area 79. The subject property is located between C-470 and Plaza Drive, and east of Erickson Blvd. and west of Lucent Blvd. State Parcel Number: 2229-051-00-009. This MDP request will be processed concurrently with the associated Site Improvement Plan (SP2023-035) to construct 240 multi-family residential units known as the Kaos Apartments.

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

☐	No Comment	
☐	Please be advised of the following concerns:	
☑	See letter attached for detail.	
Agency: Douglas Co. Cons. Dist		**Phone #:** 303-218-2622
Your Name: David Shohet		**Your Signature:** David Shohet
(please print) President		**Date:** June 16, 2023

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

Sincerely,

Carolyn Washee-Freeland

Carolyn Washee-Freeland, AICP
Senior Planner, Planning Services
303-660-7460
cfreeland@douglas.co.us

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

June 26, 2023

RE: SB2023-022, Highlands Ranch Filing 159, Minor Development Plat

According to the Natural Resources Conservation Service (NRCS) soils survey, the Fondis loam, 0 to 3 percent slopes is somewhat limited for dwellings with basements. The Blakeland loamy sand, 0 to 9 percent slopes is not limited for dwellings with basements.

According to the NRCS soils survey, the Fondis loam, 0 to 3 percent slopes, is "very limited" for **streets, roads, and shallow excavations** due to frost action, slope, shrink-well properties, and low strength. The Blakeland loamy sand, 0 to 9 percent slopes is not limited for streets and shallow excavations. Due to the limitations on the above soils on the site, alternatives to mitigate the limitations of the soil will be required in your engineering design or construction techniques.

Topsoil should be stripped to a depth of 6 inches and all stockpiles should have side slopes no steeper than 3:1 and seeded. All disturbed areas should be seeded and mulched with weed free hay mulch at 4,000 lbs. /acre. All disturbed areas should be reseeded between the planting dates of Nov. 1-April 30th. Grass seed should be drilled at a depth of ¼ to ½ inch deep and if broadcasted, double the rate.

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

The Conservation District recommends using a phased grading approach. By limiting the area being graded to 15 acres or less and seeding with native grasses the land area disturbed is minimized. The development site is 9.2 acres.

There is no Integrated Noxious Weed Control plan, and it is recommended that an integrated weed management program be reviewed and approved by the Douglas

15 YEARS Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

August 31, 2023

Carolyn Washee-Freeland, AICP
Senior Planner
Douglas County Department of Community Development
100 Third Street
Castle Rock, CO 80104

Re: Highlands Ranch Filing 159 – Lot 1 – Minor Development Plat

Dear Ms. Washee-Freeland:
Please accept this letter on behalf of Redland. We received your comment letter dated July 28, 2023, and we offer the following response:

MINOR DEVELOPMENT PLAT EXHIBIT COMMENTS

1. Dedication Statement – add information about the access easements that will be dedicated by plat – see redlines.
   Response: Information added.

2. General Notes - plat notes will be updated as the project progresses. Please update the plat notes accordingly per engineering's referral comments; and per Article 606A.17.
   Response: Noted.

3. Vicinity Map - Please change the scale of the vicinity map to be 1-inch equals 1,000-ft.
   Response: Revised.

4. Planning Commission Certificate – address redlines to the certificate.
   Response: Revised.

5. Sheet 2 - Address all redlines and comments regarding easements shown on the sheet.
   Response: Revised.

6. Sheet 3 -
   a. Provide draft easements that will be dedicated by plat with the next submittal for County Review.
   b. Address all redlines and comments regarding easements shown on this sheet. Add dimensions where indicated.
   Response: Revised.

COUNTY WATER CONSULTANT REVIEW

1. The County's water consultant provided a review of the MDP request. Please see the attached review letter.
   Response: Thank you for your review. We understand your office has no comments on this referral.

PUBLIC COMMENTS/COMMUNITY OUTREACH

1. Douglas County encourages community outreach to abutting property owners, neighbors, and nearby HOAs that may have interest in the project. The applicant is encouraged to communicate with property owners abutting the site. Please submit neighborhood feedback or other information generated from any community meetings that are held.
   Response: The HRCA has submitted feedback from our DRC meeting. Our team will continue to forward any other neighborhood feedback or other information generated from other community meetings held.

MINERAL RIGHTS OWNERS

1. The title commitment submitted with the application materials indicates that there may be mineral rights owners of the property. A completed mineral rights certificate of compliance must be completed during the review process certifying that all mineral rights holders have been notified of the proposal. Notices must be sent a minimum of 30 days prior to the public hearing date. If the applicant owns all mineral rights underlying the land, this notice is not required. In that case, please provide verification of the applicant's mineral rights ownership. Please see the attached forms for reference.
   Response: A completed mineral rights certificate of compliance will be completed. It is noted that mineral rights holders will be notified a minimum of 30 days prior to the public hearing date.

REFERRAL COMMENTS

ASSESSOR COMMENTS

1. Please be aware of the following comments and concerns:
   - Acreage on plat is showing 9.686, the deeded area of parcels before plat is 10.335 acres. Please verify acreage on plat is correct.
   Response: Area has been verified. 9.686 acres is correct.

CDOT COMMENTS

1. Clear Zone: It is the responsibility of the engineer/architect who stamps the plans to ensure that: any new landscaping/trees are outside of the clear zones for any State Highway/ CDOT ROW and that the new landscaping/trees do not interfere with site lines from any State Highway/CDOT ROW.
   Response: No work is proposed within State Highway / CDOT ROW.

2. Landscape: Any new or changes to existing landscaping within CDOT ROW must be reviewed and approved by CDOT. Landscaping plans should be submitted and should include details of all proposed plant species and seed mixes/ratios.
   Response: No work is proposed within State Highway / CDOT ROW.

3. WQ: Will This development be taking any drainage from CDOT ROW? Has the Highline Canal company been contacted in regards to the proposed water quality measures being installed?
   Response: Our project team is working with the Highline Canal and other entities with respect of discharging the proposed full-spectrum pond into the canal.

4. The Landscaping and trees cannot have any visual effect on C-470.
   Response: Noted, thank you.

5. Right of Way Comments:
   MJO 6/22/2023 - All work appears to be to the south of existing ROW- there is a 10' setback from the C-470 property line and only a little minor grading work was proposed in this 10' strip on the east end of the project. No A-Lines, No Dedications to CDOT, no real concerns that I can see from a ROW or Survey Perspective.

   SDH 6/22/2023 - Agree with John there are no concerns from the ROW or Survey perspective.
   Response: Noted, thank you.

6. Permits Comments:
   7-5-23 It appears that CDOT ROW runs along the north side of this development (470). Please keep in mind that any work in the CDOT ROW unrelated to access will require a permit from our office. This includes, but is not limited to survey, landscaping, or utility work.
   Response: No work is proposed within State Highway / CDOT ROW.

COLORADO PARKS AND WILDLIFE COMMENTS

Response: Thank you for your comments. Our team will follow the recommended guidelines if any wildlife is encountered on site

DENVER WATER COMMENTS

1. Please show/label 50' wide Denver Water easement on the plans. Also show the 24" Denver Water Conduit 100. We recommend you add a plat note to page 1 stating this is an exclusive easement for water purposes, any and all future crossings/improvements need to be approved in writing by Denver Water. (we can discuss language of note).
   Response: The 50ft wide Denver Water easement will be shown on future submittals of the SIP & Civil CD's, it is shown on the Minor Development Plat.

2. Per our easement terms, no utility crossings are allowed, but storm sewer may be permitted by special provision and a Denver Water license. Please send plan and profile for storm sewer crossing at this location.
   Response: Plan and Profile of the storm sewer crossing will be sent to Denver Water with the next submittal of the SIP & Civil CD's.

3. The plat shows several easements crossing us, to be dedicated by separate document. Overlapping easements are subject to our approval. Please send for our review.
   Response: Overlapping easements will be sent to Denver Water for review.

4. Drainage plans need to be reviewed to look at flows, connections to pond and if there are any impacts to High Line Canal.
   Response: Mile High Flood District has reviewed the plans and coordinated with RESPEC for the hydraulic analysis of the proposed flows. According to RESPEC's letter, the additional flow will have no impact to the High Line Canal.

5. Review #2-prohibited obstructions of our easement. No trees, fencing, structures are allowed in the easement
   Response: Noted, our plans will not show any obstructions within the easement.

6. We need to review a complete set of grading plans. Our pipe has to maintain a certain depth, we need to see cut/fill over the pipe. We may not approve grading changes over the waterline but we can discuss after reviewing plans.
   Response: Grading Plans will be sent to Denver Water with the next submittal of the SIP & Civil CD's.

7. Who is maintaining the access drive on our easement? Please show our easement in relationship to easement drive on the plans.
   Response: Shea Properties will maintain the access drive. The relationship to the existing Denver Water easement is shown on the Plat.

DOUGLAS COUNTY CONSERVATION DISTRICT COMMENTS

Response: All Erosion Control BMP's will follow Douglas County standards. Low Impact Development (LID) techniques have been utilized within the project including detached impervious areas.

Redland
WHERE GREAT PLACES BEGIN

ENGINEERING SERVICES COMMENTS

1. On sheet 1, please remove general note #8. The only secondary drainage easement that will be dedicated to Douglas County will be for the detention/water quality pond which will be handled through a separate easement dedication.
   Response: Note #8 has been removed.

2. On sheet 2, please provide us with an executed copy of the access easement with the Highlands Ranch Metropolitan District for the westerly access.
   Response: Access Easement document to be provided.

3. On sheet 2, please designate which entity the proposed drainage easement along the north side of lot 1 will be dedicated.
   Response: Note #8 has been removed.

4. A Public Improvements Agreement (PIA) for the median island improvements in Plaza Drive will be required. I will provide you with a copy of this agreement. A separate set of construction plans will need to be submitted with the final plat that incorporates these widening/median island improvements.
   Response: A Public Improvements Agreement (PIA) will be submitted with the next submittal of the SIP & Civil CD's.

HIGHLANDS RANCH COMMUNITY ASSOCIATION COMMENTS

Response: Thank you for your comments and time to meet on the project. We will look to incorporate some of your suggestions into our design.

HIGHLANDS RANCH METRO DISTRICT COMMENTS

1. Informational response: site civil plans must be submitted to the District for review and approval.
   Response: We are working directly with HRMD on their comments.

MILE HIGH FLOOD DISTRICT COMMENTS

1. Since the outfall discharges into the High Line Canal (HLC), we are referring the design report to RESPEC, who maintains a living SWMM model for the HLC. RESPEC will coordinate with Redland on running the proposed conditions in the SWMM model, in order to confirm there are no adverse impacts. As a note, outfalls into the HLC are not considered maintenance eligible.
   Response: Based on the review memo from RESPEC dated July 31, 2023, the proposed conditions resulted in insignificant decreases in freeboard, at or less than 0.01 ft.

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SOUTH METRO FIRE RESCUE COMMENTS

1. Fire Hydrant locations will not be approved as shown on Water and Sanitary Plans resulting in required revisions to utility easements. Once required fire flow requirements for the buildings have been determined and hydrant requirements verified, a plan indicating revised hydrant locations will be required to be reviewed by SMFR for approval.
   Response: **Fire hydrant locations and utility easements have been updated and shown on this Minor Development Plat. Our team will continue to work with SMFR through the approval process.**

XCEL ENERGY – RIGHT OF WAY AND PERMITS COMMENTS

Response: **10' PSCo easement has been added along the southerly, westerly and northerly lines of the plat.**

On behalf of Shea Properties and our project team, thank you for your time and consideration reviewing the Highlands Ranch Filing 159 – Lot 1 – Minor Development Plat Submittal. If you have any questions, please contact me at roglesby@redland.com or 720-283-6783 ext. 133.

Sincerely,

Rob Oglesby, P.E.

Redland
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720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

Phase III Drainage Report
Highlands Ranch – Filing No. 159

Prepared for:

Shea Properties
8351 E Belleview Ave.
Denver, CO 80237
Office 303.486.1371 voice
Contact: Mr. David Witte

Prepared by:

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM
Contact: Rob Oglesby, PE

March 2023
Project No. 22029

ENGINEER'S CERTIFICATION

"This report and plan for the Phase III drainage design of Highlands Ranch Filing No. 159 was prepared by me (or under my direct supervision) in accordance with the provisions of Douglas County Drainage Design and Technical Criteria for the owners thereof. I understand that Douglas County does not and will not assume liability for drainage facilities designed by others.

_____

Rob Oglesby, P.E.
Registered Professional Engineer
State of Colorado No. 54400

OWNERS STATEMENT

Shea Properties hereby certifies that the drainage facilities for Highlands Ranch Filing No, 159 shall be constructed according to the design presented in this report. I understand that Douglas County does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that Douglas County reviews drainage plans pursuant to Colorado Revised Statues, Title 30, Article 28, but cannot, on behalf of Highlands Ranch Filing No. 159 guarantee that final drainage design review will absolve Shea Properties and/or their successors and/or assigns future liability for improper design. I further understand that approval of the Final Plat does not imply approval of my engineer's drainage design.

_____
Name of Developer

_____
Authorized Signature

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Introduction

INTRODUCTION

This Phase III drainage report presents an analysis for the proposed drainage patterns and requirements for the proposed Highlands Ranch Filing No. 159, hereafter referred to as the Site.

Site Location

The Highlands Ranch – Filing No. 159 project ("Site") is located in the northeast quarter of Section 5, Township 6 South, Range 68 west of the sixth principal meridian. The Site is generally located to the south of State Highway C-470 and north of Plaza Drive. The site is to the west of Solana Lucent Station, an apartment complex, north of the Centennial Water Plant, and east of the High Line Canal.

Site Description

Highlands Ranch – Filing No. 159 is an approximately 9.69 acres and is currently undeveloped with the exception of the Highlands Ranch monument at the northeast corner of the site. Native grasses and weeds currently cover the site. The site slopes from east to west at approximately 3% and ultimately drains to Highline Canal to the west of the site and to the C-470 right-of-way to the north. It is important to note that there is a swale between the back property line of the site and C-470, but this swale drains to the Highline Canal.

Proposed Project Description

The property is proposed to be a multifamily development, which will include 2 five-story apartment buildings, the bottom level will serve as parking, and a clubhouse with a pool. Infrastructure improvements include wet and dry utilities, parking lots, drive aisles, retaining walls, walks, and a trail connection to the Highline Canal to the northwest of the site. A full-spectrum detention pond will be located at the west end of the site. This pond will treat runoff from the site and provide 100-year detention. The pond will outfall to the Highline Canal.

Flood Hazard and Drainage Studies Relevant to the Site

The site is contained within FIRM panels 08035C009F and 08035C0017F. According to Panel # 08035C009F and 08035C0017F, the site is Zone X and no part of the site lies within the 100- year flood plain (see Appendix A).

Soil Type

The NRCS soil survey indicates that the soil on site is primarily Fondis Loam (66.6%) whose hydrologic soil group is Type C. Approximately 33.4% of the site in the northwest and southwest corners is Blackland Loamy San whose hydrologic soil group is Type A. A soil map has been included in the Appendix A for reference.

Historic Drainage System

Major Basins

The site is currently undeveloped and existing runoff generally flows from the southeast to the northwest at a 3% slope. The runoff sheet flows to the swale north of the site and eventually outfalls into the Highline Canal. The site has been previously described in the Phase III drainage report for The West Plaza Drive Extension prepared by Felsburg Holt & Ullevig, Inc. dated August 4, 2006. This report indicates that the Site is included in parts of existing major basins OS-2 and PD-N; minor basins OS-2C, PD-N3, and PD-N4. The report reaffirms the current drainage patterns outlined in previous sections. It is important to note that the proposed sidewalk for the Site was anticipated to flow and collect at inlets along Plaza.

Proposed Drainage System and Basins

Criteria

This report has been prepared in accordance with the Douglas County Storm Drainage Design and Technical Criteria and the Urban Drainage and Flood Control District Criteria Manual. This Drainage Plan also references the Phase III Drainage report for the *West Plaza Drive Extension* prepared by *Felsburg Holt & Ullevig, Inc.* dated August 4, 2006, herein referred to the Master Report.

The hydrologic design was computed using the Rational Method as defined by Mile High Flood District. The 5-year storm was used as the minor storm event, while the 100-year storm was used as the major event. The one-hour point rainfall depth used for the 5-year storm was 1.43 inches and 2.60 inches for the 100-year event. The Rational Method was used to analyze fully developed conditions. Cumulative flow calculations and storm sewer sizing were performed using StormCAD. Runoff was also computed using a spreadsheet to ensure that the values obtained from StormCAD are reasonable. The proposed inlets were sized to accommodate their respective flows for both the major and minor storm. The proposed inlets sizes were calculated using Mile High Flood District spreadsheet MHFD-Inlet v5.02. The proposed full-spectrum detention pond was sized to accommodate the flows from the site under fully developed conditions. The pond

configuration was calculated using Mile High Flood District Pond Sizing spreadsheet MHFD-Detention v4 06.

Runoff / Proposed Basin Description

Major Basins

The Site will be split into two proposed major basins Basin A, consisting of the on-site drainage, and Basins OS, consisting of the off-site drainage. The on-site basins will collect into the proposed storm system and be treated at the proposed full-spectrum pond to the northwest of the site which will release at historic rates. The on-site basins have an overall imperviousness of 58% and the off-site basins have an overall imperviousness of 23%.

Sub-basins

Basin A1 (0.37 Acres)

Basin A1 consists of the proposed full-spectrum detention pond, and subsequent walls. All of these flows will collect at the bottom of the pond where they will be routed through a drainage pan to an Outlet Structure at Design Point A1. This basin has an overall imperviousness of 2%.

$C_5 = 0.05$ $C_{100} = 0.49$

$Q_5 = 0.1$ CFS $Q_{100} = 1.6$ CFS

Basin A2 (0.41 Acres)

Basin A2 consists of parking area, sidewalk, and landscape islands. Flows will sheet flow into curb and gutter and be collected at the 10' Type R Inlet at Design Point A2. The calculations for street and inlet capacity are collected in Appendix C for reference. This basin has an overall imperviousness of 54%.

$C_5 = 0.47$ $C_{100} = 0.70$

$Q_5 = 0.8$ CFS $Q_{100} = 2.3$ CFS

Basin A3 (1.09 Acres)

Basin A3 consists of parking areas, sidewalks, and landscape. Flows will sheet flow into curb and gutter and be collected at the 10' Type R Inlet at Design Point A3. The calculations for street and inlet capacity are collected in Appendix C for reference. This basin has an overall imperviousness of 76%.

$C_5 = 0.66$ $C_{100} = 0.79$

$Q_5 = 3.0$ CFS $Q_{100} = 6.5$ CFS

Basin A4 (0.62 Acres)

Basin A4 consists of parking areas, sidewalks, concrete drive lanes and landscape. Flows will sheet flow into area drains around the basin and combine at the 12" PVC SD pipe which will be routed into the storm system near the area drain at Design Point A4. This basin has an overall imperviousness of 12%.

$C_5 = 0.13$ $C_{100} = 0.53$

$Q_5 = 0.3$ CFS $Q_{100} = 2.3$ CFS

Basin A5 (0.50 Acres)

Basin A5 consists of 2/3 of the western apartment building roof area. Flows will collect at roof drains which will outfall into the area drain system in Basin A4. This basin has an overall imperviousness of 90%.

$C_5 = 0.77$ $C_{100} = 0.85$

$Q_5 = 1.9$ CFS $Q_{100} = 3.8$ CFS

Basin A6 (1.10 Acres)

Basin A6 consists of parking areas, sidewalks, and landscape. Runoff will sheet flow through chases, into curb and gutter and will be collected by the 10' Type R inlet at Design Point A6. The calculations for street and inlet capacity can be found in Appendix C. This basin has an overall imperviousness of 63%.

$C_5 = 0.55$ $C_{100} = 0.74$

$Q_5 = 2.4$ CFS $Q_{100} = 6.0$ CFS

Basin A7 (1.32 Acres)

Basin A7 consists of parking areas, sidewalks, and landscape. Runoff will sheet flow into curb and gutter and area inlets that collect at the 10' Type R inlet at Design Point A7. The area inlets in this basin were sized to carry the minor storm with the additional storm collection in the major gathering at Design Point A7. The calculations for street and inlet capacity can be found in Appendix C. This basin has an overall imperviousness of 28%.

$C_5 = 0.27$ $C_{100} = 0.60$

$Q_5 = 1.3$ CFS $Q_{100} = 5.4$ CFS

Basin A8 (0.22 Acres)

Basin A8 consists of the clubhouse roof area. Runoff will collect in roof drains which will outfall into the private drainage system near Design Point A8. The private drainage system around basin A8 was designed to carry the major flows of the clubhouse. The private drainage system ultimately outfalls to 10' Type R Inlet at design point A7. This basin has an overall imperviousness of 90%.

$C_5 = 0.77$ $C_{100} = 0.85$

$Q_5 = 0.8$ CFS $Q_{100} = 1.7$ CFS

Basin A9 (0.51 Acres)

Basin A9 consists of the pool area, landscape, and sidewalk. Runoff will collect at the area inlets and outfall into the private drainage system at Design Point A9. The private drain system ultimately outfalls to the 10' Type R Inlet at Design Point A7. This basin has an overall imperviousness of 44%.

$C_5 = 0.40$ $C_{100} = 0.67$

$Q_5 = 0.9$ CFS $Q_{100} = 2.7$ CFS

Basin A10 (0.31 Acres)

Basin A10 comprises of 1/3 of the western apartment building roof area. Flows will collect at roof drains which will outfall into the area drain system in Basin A6. These flows will ultimately outfall into the storm system at Design Point A7. This basin has an overall imperviousness of 90%.

$C_5 = 0.77$ $C_{100} = 0.85$

$Q_5 = 1.1$ CFS $Q_{100} = 2.3$ CFS

Basin A11 (1.50 Acres)

Basin A11 consists of parking areas, sidewalks, concrete drive lanes and landscape. Runoff will collect into area inlets, curb and gutter, drainage pans and be captured at the 10' Type R Inlet at Design Point A11. This basin has an overall imperviousness of 68%.

$C_5 = 0.59$ $C_{100} = 0.76$

$Q_5 = 3.7$ CFS $Q_{100} = 8.8$ CFS

Basin A12 (0.86 Acres)

Basin A12 entails the eastern apartment building roof area. Flows will collect at roof drains which will ultimately outfall to the 10' Type R Inlet at Design Point A11. This basin has an overall imperviousness of 90%.

$C_5 = 0.77$ $C_{100} = 0.85$

$Q_5 = 3.0$ CFS $Q_{100} = 6.1$ CFS

Basin OS-1 (0.85 Acres)

Basin OS-1 consists of the landscape buffer on the northern side of the site and includes the existing Highlands Ranch monument sign. Flows will sheet flow and collect into the swale behind the property line that eventually runs to the Highline canal. Due to the low imperviousness and the general nature of the swale no changes are made to the historical drainage condition of the Highline Canal.

$C_5 = 0.05$ $C_{100} = 0.49$

$Q_5 = 0.2$ CFS $Q_{100} = 3.7$ CFS

Basin OS-2 (0.28 Acres)

Basin OS-2 comprises of the eastern landscape buffer of the site. Flows will concentrate into the swale along the eastern property line and outfalls to the north. Due to the low imperviousness and the general nature of the basin no changes are made to the historical drainage condition of the Highline Canal.

$C_5 = 0.05$ $C_{100} = 0.49$

$Q_5 = 0.1$ CFS $Q_{100} = 1.2$ CFS

Basin OS-3 (0.09 Acres)

Basin OS-3 consists of sidewalk, pavement and landscape. Flows will sheet flow onto Plaza Drive and collect at the existing 10' Type R Inlet at Design Point OS-3. In Master report, it was assumed that flows along Plaza would sheet flow and collect into the subsequent inlets along Plaza. This basin has an overall imperviousness of 67%.

$C_5 = 0.58$ $C_{100} = 0.76$

$Q_5 = 0.3$ CFS $Q_{100} = 0.6$ CFS

Basin OS-4 (0.32 Acres)

Basin OS-4 consists of sidewalk and associated landscape. Flows will sheet flow onto Plaza Drive and collect at the existing 10' Type R Inlet at Design Point OS-4. In the Master Report, it was assumed that flows along Plaza Drive would sheet flow and collect into its subsequent inlets along Plaza. This basin has an overall imperviousness of 64%.

$C_5 = 0.56$ $C_{100} = 0.75$

$Q_5 = 0.8$ CFS $Q_{100} = 1.9$ CFS

Basin OS-5 (0.34 Acres)

Basin OS-5 consists of sidewalk and associated landscape. Flows will concentrate along the curb of Plaza drive and collect at an existing 10' Type R Inlet further downstream. In the Master Report, it was assumed that flows along Plaza Drive would sheet flow and collect into its subsequent inlets along Plaza Drive. This basin has an overall imperviousness of 41%.

$C_5 = 0.37$ $C_{100} = 0.65$

$Q_5 = 0.4$ CFS $Q_{100} = 1.4$ CFS

Basin OS-6 (0.04 Acres)

Basin OS-6 consists of sidewalk. Flows will sheet flow into a 12" FES near the Highline Canal Trail. It was anticipated by Douglas County that a trail would be built in the future. The design of the proposed trail mimics the design trail that the county approved (see Appendix D). This basin has an overall imperviousness of 90%.

$C_5 = 0.77$ $C_{100} = 0.85$

$Q_5 = 0.1$ CFS $Q_{100} = 0.3$ CFS

Proposed Full-Spectrum Extended Detention Basin

The Site will utilize a full-spectrum extended detention basin (EDB) for on-site water quality and detention requirements. The proposed storm infrastructure will capture the runoff from Basin A and route flows to the pond. Tributary basins make up approximately 8.8 acres with an imperviousness of 58%.

The proposed EDB is designed to have a total volume of approximately 0.808 acre-feet, that includes forebay, micropool, access road and emergency overflow. It was sized using the Mile-High Flood District spreadsheet MHFD-Detention_v4.04. There will be a 4' concrete channel at the bottom of the pond for low flows. The pond has been sized for Water Quality Capture Volume, Excess Urban Runoff Volume and 100-year detention. Excess Urban Runoff Volume is defined as the difference between the developed condition runoff volume and the pre-development volume. Orifice plates will keep the 100-year release rate below historical runoff for the site. See Appendix B for detention calculations.

POND TABLE			
	ELEV.	V_REQUIRED (AC-FT)	Q RELEASE (CFS)
WQCV	5625.03	0.169	0.1
EURV	5627.43	0.363	0.2
100-YEAR	5628.83	0.276	6.7
OVERFLOW	5628.92	N/A	N/A

The pond and the outlet structure shall be owned and maintained by the Highlands Ranch Metropolitan District. The pond and outlet structures shall have maintenance access via the path from the southwest corn of the pond.

Water Quality Enhancement Best Management Practices

The pond discussed in the previous section has been designed in accordance with the *Douglas County Storm Drainage Design and Stormwater Quality Control Criteria, July 8, 2008* and the *MHFD Urban Storm Drainage Criteria Manual Volumes 1, 2 and 3*. The pond was designed to detain the Excess Urban Runoff Volume and the 100-year Detention Volume for the entire site.

Conclusion

Highlands Ranch Filing No. 159 is proposed to be a multi-family project with a proposed on-site Full-Spectrum Detention Pond. Runoff from the site will by collected by a private drainage system and storm sewer which will outfall into the proposed pond. The pond has been sized for WQCV, EURV and 100-year detention which will outfall to the Highline Canal at or below historic rates. Since the site will reduce the total runoff of the site to the historic drainage location, downstream infrastructure will not be negatively affected.

References

REFERENCES

1. Douglas County Storm Drainage Design and Stormwater Quality Control Criteria, July 8, 2008

2. Mile High Flood District Urban Storm Drainage Criteria Manual, Volume 1-3, latest online addition.

3*. Douglas County GESC Manual, January 2013.*

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Appendix A - Vicinity Map, FIRM Map, Soils Map

105° 1' 18" W
105° 0' 59" W
498150
498190
498230
498270
498310
498350
498390
498430
498470
498510
498550
39° 33' 47" N
39° 33' 38" N
4379280
4379240
4379200
4379160
4379120
4379080
4379040
4379000
470
12
51
12
Driveway
Soil Map may not be valid at this scale.
Map Scale: 1:1,990 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 25 50 100 150
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 17, Sep 7, 2022

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

Date(s) aerial images were photographed: Jul 1, 2020—Jul 2, 2020

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
12	Blakeland loamy sand, 0 to 9 percent slopes	A	2.3	33.4%
51	Fondis loam, 0 to 3 percent slopes	C	4.7	66.6%
Totals for Area of Interest			**7.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

National Flood Hazard Layer FIRMette

FEMA

105°1'27"W 39°33'56"N

105°0'50"W 39°33'28"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/24/2023 at 4:52 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

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Appendix B - Hydrologic Calculation

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STANDARD FORM SF-1 - DEVELOPED RUNOFF COEFFICIENTS

PROJECT NAME: Kaos Apartments
PROJECT NUMBER: 22029
CALCULATED BY: RO
CHECKED BY: RO

DATE: 3/24/2023
JURISDICTION: Douglas - Zone 1

LAND USE:	Paved Road	Drive/Walk	Roof	Lawn			
IMPERVIOUSNESS	100%	90%	90%	2%			

NRCS SOIL TYPE: TYPE C

OVERALL SITE STUDY AREA

DESIGN BASIN	DESIGN POINT	Paved Road (AC)	Drive/Walk (AC)	Roof (AC)	Lawn (AC)	(AC)	(AC)	(AC)	TOTAL AREA (AC)	$C_d(2)$	$C_d(5)$	$C_d(10)$	$C_d(100)$	Imp (%)
A1	A1				0.37				**0.37**	0.01	0.05	0.15	0.49	2%
A2	A2	0.21	0.01		0.19				**0.41**	0.41	0.47	0.53	0.70	54%
A3	A3	0.76	0.07		0.26				**1.09**	0.61	0.66	0.69	0.79	76%
A4	A4		0.07		0.55				**0.62**	0.07	0.13	0.22	0.53	12%
A5	A5			0.50					**0.50**	0.74	0.77	0.80	0.85	90%
A6	A6	0.63	0.05		0.41				**1.10**	0.49	0.55	0.60	0.74	63%
A7	A7	0.28	0.08		0.96				**1.32**	0.20	0.27	0.34	0.60	28%
A8	A8			0.22					**0.22**	0.74	0.77	0.80	0.85	90%
A9	A9		0.25		0.26				**0.51**	0.33	0.40	0.46	0.67	44%
A10	A10			0.31					**0.31**	0.74	0.77	0.80	0.85	90%
A11	A11	0.94	0.08		0.49				**1.50**	0.54	0.59	0.63	0.76	68%
A12	A12			0.86					**0.86**	0.74	0.77	0.80	0.85	90%
									0.00					
									0.00					
									0.00					
BASIN A		**2.82**	**0.61**	**1.90**	**3.50**				**8.82**	0.45	0.51	0.56	0.72	**58%**
		31.9%	**6.9%**	**21.5%**	**39.7%**				**100.0%**					
									0.00					
		.							**0.00**					
ON SITE STUDY AREA		**2.82**	**0.61**	**1.90**	**3.50**				**8.82**	0.45	0.51	0.56	0.70	58%
		31.9%	**6.9%**	**21.5%**	**39.7%**				**100.0%**					
OS-1	OS-1				0.85				**0.85**	0.01	0.05	0.15	0.49	2%
OS-2	OS-2				0.28				**0.28**	0.01	0.05	0.15	0.49	2%
OS-3	OS-3	0.02	0.04		0.03				**0.09**	0.53	0.58	0.62	0.76	67%
OS-4	OS-4	0.02	0.20		0.10				**0.32**	0.51	0.56	0.61	0.75	64%
OS-5	OS-5	0.01	0.13		0.19				**0.34**	0.30	0.37	0.43	0.65	41%
OS-6	OS-6		0.04						**0.04**	0.74	0.77	0.80	0.85	90%
OFF SITE BASINS		**0.06**	**0.41**		**1.44**				**1.92**	0.17	0.23	0.31	0.58	**24%**
		3.2%	**21.7%**		**75.2%**				**100.0%**					
OVERALL STUDY AREA		**2.88**	**1.02**	**1.90**	**4.94**				**10.74**	0.40	0.46	0.52	0.67	52%
		26.8%	**9.5%**	**17.7%**	**46.0%**				**100.0%**					

Redland

STANDARD FORM SF-2 - DEVELOPED TIME OF CONCENTRATION

PROJECT NAME: Kaos Apartments
PROJECT NUMBER: 22029
CALCULATED BY: RO
CHECKED BY: RO

DATE: 3/24/2023
JURISDICTION: Douglas - Zone 1

SUB-BASIN DATA			INITIAL TIME (T_i)			TRAVEL TIME (T_t)						tc CHECK (URBANIZED BASINS)			FINAL Tc	RUNOFF COEFFICIENT	
DESIGN BASIN (1)	AREA (AC) (2)	C_5 (3)	LENGTH* (FT) (4)	SLOPE (%) (5)	T_i (MINUTES) (6)	LENGTH (FT) (7)	SLOPE (%) (8)	C_v (9)	Land Surface (10)	VEL (FPS) (11)	T_t (MINUTES) (12)	COMP. t_c (13)	TOTAL LENGTH (14)	REGIONAL tc (15)	Min. t_c	C_5	C_{100}
A1	0.37	0.05	35	25.0%	4	130	0.5%	20.0	Paved Areas	1.4	1.5	5.4	165	25.9	5.4	0.05	0.49
A2	0.41	0.47	75	3.5%	6.5	190	1.8%	20.0	Paved Areas	2.7	1.2	7.7	265	17.1	7.7	0.47	0.70
A3	1.09	0.66	120	3.5%	5.9	420	2.0%	20.0	Paved Areas	2.8	2.5	8.3	540	13.5	8.3	0.66	0.79
A4	0.62	0.13	160	20.0%	8.3	270	2.0%	20.0	Paved Areas	2.8	1.6	9.9	430	24.3	9.9	0.13	0.53
A5	0.50	0.77	65	2.0%	3.8	210	2.0%	20.0	Paved Areas	2.8	1.2	5.1	275	10.9	5.1	0.77	0.85
A6	1.10	0.55	105	3.5%	6.8	355	2.0%	20.0	Paved Areas	2.8	2.1	8.9	460	15.7	8.9	0.55	0.74
A7	1.32	0.27	85	9.5%	6.6	670	2.0%	20.0	Paved Areas	2.8	3.9	10.6	755	21.8	10.6	0.27	0.60
A8	0.22	0.77	70	2.0%	4.0	100	2.0%	20.0	Paved Areas	2.8	0.6	4.6	170	10.8	5.0	0.77	0.85
A9	0.51	0.40	65	5.0%	6.1	205	4.0%	20.0	Paved Areas	4.0	0.9	6.9	270	18.6	6.9	0.40	0.67
A10	0.31	0.77	30	2.0%	2.6	520	2.3%	20.0	Paved Areas	3.0	2.9	5.5	550	11.1	5.5	0.77	0.85
A11	1.50	0.59	70	5.0%	4.6	650	2.6%	20.0	Paved Areas	3.2	3.4	7.9	720	15.0	7.9	0.59	0.76
A12	0.86	0.77	70	2.0%	4.0	350	2.0%	20.0	Paved Areas	2.8	2.1	6.0	420	11.0	6.0	0.77	0.85
OS-1	0.85	0.05				120	5.9%	7.0	Short Pasture/Lawn	1.7	1.2	1.2	120	25.7	5.0	0.05	0.49
OS-2	0.28	0.05				110	5.9%	20.0	Paved Areas	4.9	0.4	0.4	110	25.7	5.0	0.05	0.49
OS-3	0.09	0.58	14	2.0%	2.8	245	2.6%	20.0	Paved Areas	3.2	1.3	4.1	259	14.9	5.0	0.58	0.76
OS-4	0.32	0.56	14	2.0%	2.9	949	3.1%	20.0	Paved Areas	3.5	4.5	7.4	963	15.7	7.4	0.56	0.75
OS-5	0.34	0.37	14	2.0%	4.0	635	3.0%	7.0	Short Pasture/Lawn	1.2	8.7	12.7	649	19.5	12.7	0.37	0.65
OS-6	0.04	0.77				115	8.4%	20.0	Paved Areas	5.8	0.3	0.3	115	10.7	5.0	0.77	0.85

* L = 500' max for non-urban land uses and 300' max for urban land uses

$$T_i = \frac{0.395(1.1-C)L^{1/2}}{S^{1/3}}$$

$$T_t = \frac{L}{60V}$$

$$V = C_v S_w^{0.5}$$

$$t_c = \frac{L}{180} + 10$$

$$t_c = (26-17i) + \frac{L_t}{60(14i+9)\sqrt{S_t}}$$

Table RO-2—Conveyance Coefficient, C_v

Type of Land Surface	Conveyance Coefficient, C_v
Heavy meadow	2.5
Tillage/field	5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

Redland

STANDARD FORM SF-3 - DEVELOPED
STORM DRAINAGE DESIGN - RATIONAL METHOD 5 YEAR EVENT

PROJECT NAME: Kaos Apartments
PROJECT NUMBER: 22029
CALCULATED BY: RO
CHECKED BY: RO

P_1 (1-Hour Rainfall) = 1.43

DATE: 3/24/2023
JURISDICTION: Douglas - Zone 1

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF C_5	t_c (minutes)	C*A(AC)	I (in/hr)	Q (cfs)	t_c(minutes)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	t_t (Minutes)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	A1	A1	0.4	0.05	5.4	0.0	4.75	0.1													
	A2	A2	0.4	0.47	7.7	0.2	4.26	0.8													
	A3	A3	1.1	0.66	8.3	0.7	4.14	3.0	9.88	0.80	3.89	3.09									Sum of A3 and A4
	A4	A4	0.6	0.13	9.9	0.1	3.89	0.3													
	A5	A5	0.5	0.77	5.1	0.4	4.83	1.9													
	A6	A6	1.1	0.55	8.9	0.6	4.04	2.4													
	A7	A7	1.3	0.27	10.6	0.4	3.78	1.3	10.59	0.56	3.78	2.10									Sum of A7 and A9
	A8	A8	0.2	0.77	5.0	0.2	4.85	0.8													
	A9	A9	0.5	0.40	6.9	0.2	4.41	0.9													
	A10	A10	0.3	0.77	5.5	0.2	4.74	1.1													
	A11	A11	1.5	0.59	7.9	0.9	4.22	3.7													
	A12	A12	0.9	0.77	6.0	0.7	4.60	3.0													
	OS-1	OS-1	0.8	0.05	5.0	0.0	4.85	0.2													
	OS-2	OS-2	0.3	0.05	5.0	0.0	4.85	0.1													
	OS-3	OS-3	0.1	0.58	5.0	0.1	4.85	0.3													
	OS-4	OS-4	0.3	0.56	7.4	0.2	4.31	0.8													
	OS-5	OS-5	0.3	0.37	12.7	0.1	3.50	0.4													
	OS-6	OS-6	0.0	0.77	5.0	0.0	4.85	0.1													

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STANDARD FORM SF-3 - DEVELOPED
STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Kaos Apartments
PROJECT NUMBER: 22029
CALCULATED BY: RO
CHECKED BY: RO

P_1 (1-Hour Rainfall) = 2.6

DATE: 3/24/2023
JURISDICTION: Douglas - Zone 1

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF C_{100}	t_c (minutes)	C*A(ac)	I (in/hr)	Q (cfs)	t_c(minutes)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	t_t (minutes)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	A1	A1	0.4	0.49	5.4	0.2	8.63	1.6													
	A2	A2	0.4	0.70	7.7	0.3	7.74	2.3													
	A3	A3	1.1	0.79	8.3	0.9	7.53	6.5	9.88	1.20	7.07	8.45									Sum of A3 and A4
	A4	A4	0.6	0.53	9.9	0.3	7.07	2.3													
	A5	A5	0.5	0.85	5.1	0.4	8.78	3.8													
	A6	A6	1.1	0.74	8.9	0.8	7.35	6.0													
	A7	A7	1.3	0.60	10.6	0.8	6.87	5.4	10.59	1.13	6.87	7.78									Sum of A7 and A9
	A8	A8	0.2	0.85	5.0	0.2	8.82	1.7													
	A9	A9	0.5	0.67	6.9	0.3	8.03	2.7													
	A10	A10	0.3	0.85	5.5	0.3	8.61	2.3													
	A11	A11	1.5	0.76	7.9	1.1	7.67	8.8													
	A12	A12	0.9	0.85	6.0	0.7	8.36	6.1													
		OS-1	0.8	0.49	5.0	0.4	8.82	3.7	0.00	0.00	12.13	0.00									
		OS-2	0.3	0.49	5.0	0.1	8.82	1.2	0.00	0.00	12.13	0.00									
		OS-3	0.1	0.76	5.0	0.1	8.82	0.6	0.00	0.00	12.13	0.00									
		OS-4	0.3	0.75	7.4	0.2	7.84	1.9	0.00	0.00	12.13	0.00									
		OS-5	0.3	0.65	12.7	0.2	6.37	1.4	0.00	0.00	12.13	0.00									
		OS-6	0.0	0.85	5.0	0.0	8.82	0.3	0.00	0.00	12.13	0.00									

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PROJECT NAME:	Kaos Apartments	DATE:	3/24/2023
PROJECT NUMBER:	22029.000	JURISDICTION:	Douglas - Zone 1
CALCULATED BY:	RO		
CHECKED BY:	RO		

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
A1	0.37	0.05	0.49	2%	0.1	1.6
A2	0.41	0.47	0.70	54%	0.8	2.3
A3	1.09	0.66	0.79	76%	3.0	6.5
A4	0.62	0.13	0.53	12%	0.3	2.3
A5	0.50	0.77	0.85	90%	1.9	3.8
A6	1.10	0.55	0.74	63%	2.4	6.0
A7	1.32	0.27	0.60	28%	1.3	5.4
A8	0.22	0.77	0.85	90%	0.8	1.7
A9	0.51	0.40	0.67	44%	0.9	2.7
A10	0.31	0.77	0.85	90%	1.1	2.3
A11	1.50	0.59	0.76	68%	3.7	8.8
A12	0.86	0.77	0.85	90%	3.0	6.1

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
OS-1	0.85	0.05	0.49	2%	0.2	3.7
OS-2	0.28	0.05	0.49	2%	0.1	1.2
OS-3	0.09	0.58	0.76	67%	0.3	0.6
OS-4	0.32	0.56	0.75	64%	0.8	1.9
OS-5	0.34	0.37	0.65	41%	0.4	1.4
OS-6	0.04	0.77	0.85	90%	0.1	0.3

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WHERE GREAT PLACES BEGIN
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1500 West Canal Court
Littleton, Colorado 80120
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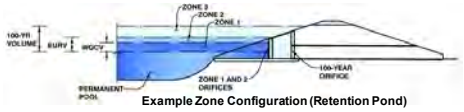
Appendix C - Hydraulic Calculations

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: Kaos Apartments

Basin ID: Basin A



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	8.83	acres
Watershed Length =	1,550	ft
Watershed Length to Centroid =	525	ft
Watershed Slope =	0.030	ft/ft
Watershed Imperviousness =	58.00%	percent
Percentage Hydrologic Soil Group A =	33.4%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	66.6%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Highlands Ranch - Highlands Ranch Mansion	

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

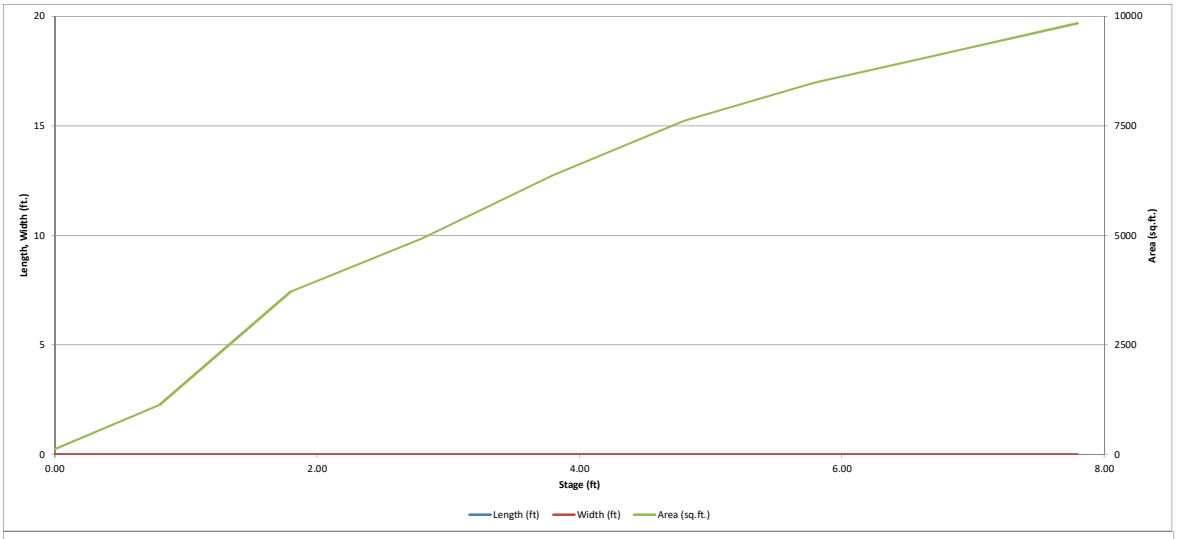
			Optional User Overrides
Water Quality Capture Volume (WQCV) =	0.169	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	0.532	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 0.82 in.) =	0.305	acre-feet	inches
5-yr Runoff Volume (P1 = 1.09 in.) =	0.435	acre-feet	inches
10-yr Runoff Volume (P1 = 1.32 in.) =	0.563	acre-feet	inches
25-yr Runoff Volume (P1 = 1.67 in.) =	0.836	acre-feet	inches
50-yr Runoff Volume (P1 = 1.95 in.) =	1.034	acre-feet	inches
100-yr Runoff Volume (P1 = 2.25 in.) =	1.284	acre-feet	inches
500-yr Runoff Volume (P1 = 3.01 in.) =	1.848	acre-feet	inches
Approximate 2-yr Detention Volume =	0.291	acre-feet	
Approximate 5-yr Detention Volume =	0.432	acre-feet	
Approximate 10-yr Detention Volume =	0.521	acre-feet	
Approximate 25-yr Detention Volume =	0.643	acre-feet	
Approximate 50-yr Detention Volume =	0.706	acre-feet	
Approximate 100-yr Detention Volume =	0.808	acre-feet	

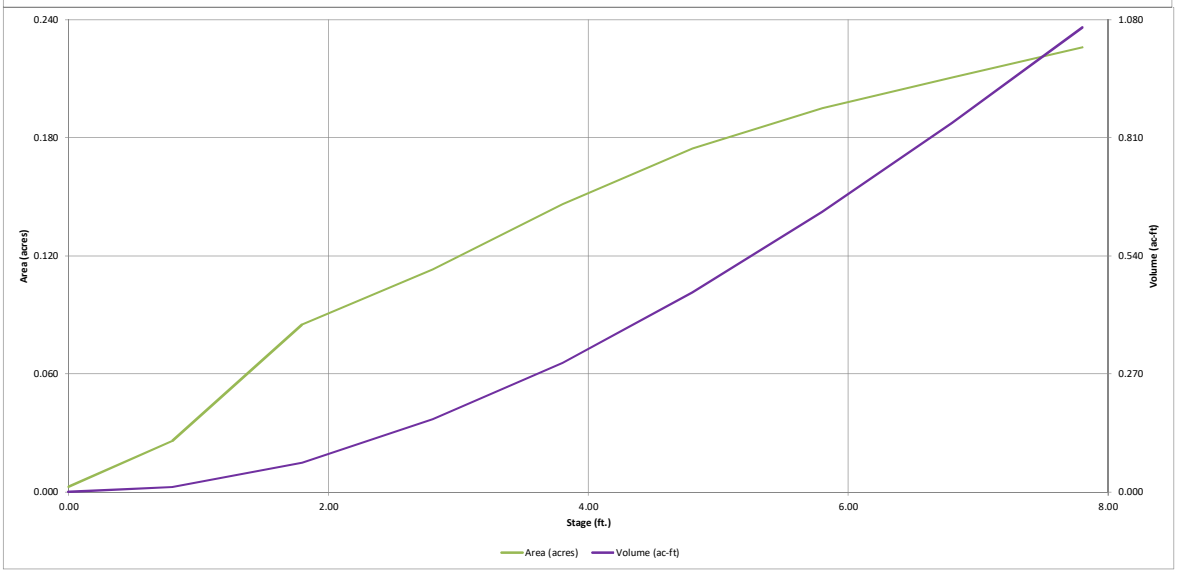
Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.169	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.363	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.276	acre-feet
Total Detention Basin Volume =	0.808	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	120	0.003		
5523	--	0.80	--	--	--	1,130	0.026	500	0.011
5524	--	1.80	--	--	--	3,710	0.085	2,920	0.067
5525	--	2.80	--	--	--	4,930	0.113	7,240	0.166
5526	--	3.80	--	--	--	6,370	0.146	12,890	0.296
5527	--	4.80	--	--	--	7,610	0.175	19,880	0.456
5528	--	5.80	--	--	--	8,500	0.195	27,935	0.641
5529	--	6.80	--	--	--	9,170	0.211	36,770	0.844
5530	--	7.80	--	--	--	9,840	0.226	46,275	1.062


20
15
10
5
0
Length, Width (ft.)
10000
7500
5000
2500
0
Area (sq.ft.)
0.00
2.00
4.00
6.00
8.00
Stage (ft)
Length (ft)
Width (ft)
Area (sq.ft.)

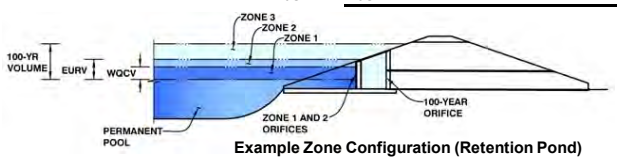

0.240
0.180
0.120
0.060
0.000
Area (acres)
1.080
0.810
0.540
0.270
0.000
Volume (ac-ft)
0.00
2.00
4.00
6.00
8.00
Stage (ft.)
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: Kaos Apartments

Basin ID: Basin A



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.83	0.169	Orifice Plate
Zone 2 (EURV)	5.23	0.363	Orifice Plate
Zone 3 (100-year)	6.63	0.276	Weir&Pipe (Restrict)
Total (all zones)		0.808	

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

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft²
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

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

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	6.806E-03	ft²
Depth at top of Zone using Orifice Plate =	5.23	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	22.00	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	0.98	sq. inches (diameter = 1-1/8 inches)	Elliptical Slot Area =	N/A	ft²

Calculated Parameters for Plate

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.80	3.60					
Orifice Area (sq. inches)	0.98	0.98	0.98					

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

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected			Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	N/A	N/A	ft²
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	N/A	N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches				

Calculated Parameters for Vertical Orifice

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

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	5.25	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	5.98	N/A	feet
Overflow Weir Front Edge Length =	3.00	N/A	feet	Overflow Weir Slope Length =	3.01	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	11.40	N/A	
Horiz. Length of Weir Sides =	2.92	N/A	feet	Overflow Grate Open Area w/o Debris =	6.28	N/A	ft²
Overflow Grate Type =	Type C Grate	N/A		Overflow Grate Open Area w/ Debris =	3.14	N/A	ft²
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

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

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	0.55	N/A	ft²
Outlet Pipe Diameter =	18.00	N/A	inches	Outlet Orifice Centroid =	0.31	N/A	feet
Restrictor Plate Height Above Pipe Invert =	6.30		inches	Half-Central Angle of Restrictor Plate on Pipe =	1.27	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6.72	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.34	feet
Spillway Crest Length =	30.00	feet	Stage at Top of Freeboard =	7.73	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	0.22	acres
Freeboard above Max Water Surface =	0.67	feet	Basin Volume at Top of Freeboard =	1.04	acre-ft

Calculated Parameters for Spillway

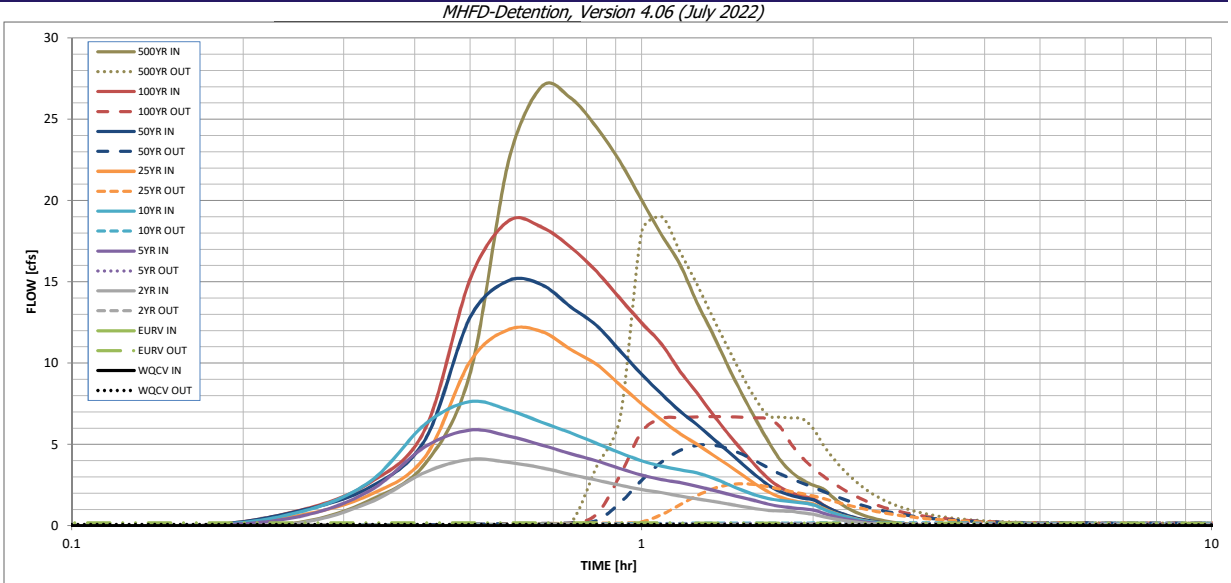
Routed Hydrograph Results

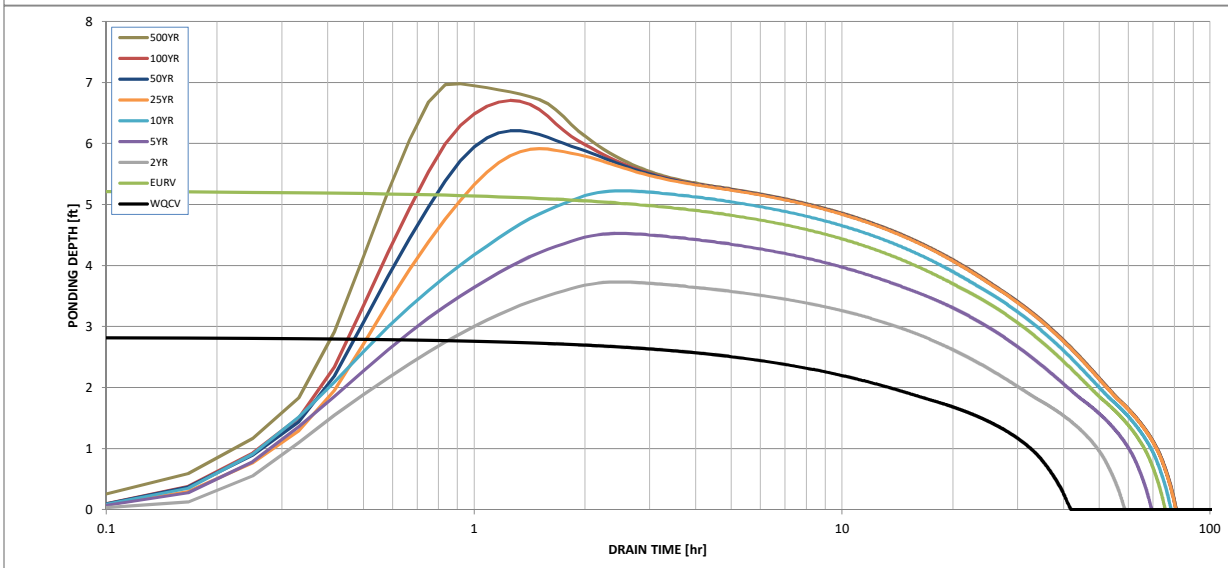
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

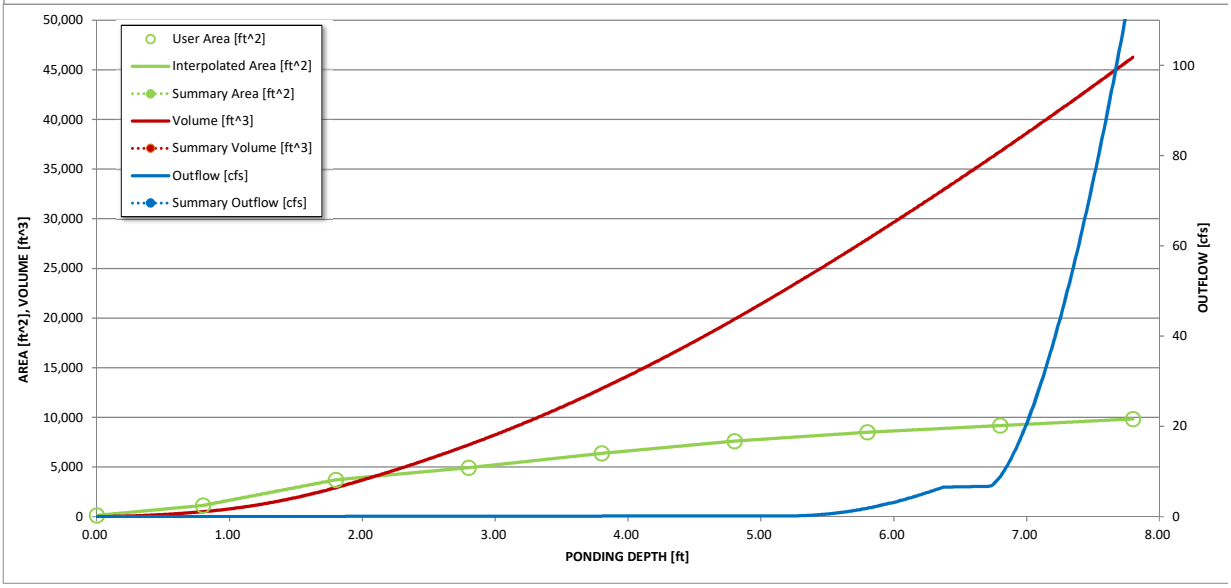
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	0.82	1.09	1.32	1.67	1.95	2.25	3.01
CUHP Runoff Volume (acre-ft) =	0.169	0.532	0.305	0.435	0.563	0.836	1.034	1.284	1.848
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.305	0.435	0.563	0.836	1.034	1.284	1.848
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.0	0.1	0.6	3.4	5.1	7.3	12.0
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.01	0.07	0.38	0.58	0.83	1.36
Peak Inflow Q (cfs) =	N/A	N/A	4.1	5.9	7.6	12.1	15.1	18.7	27.0
Peak Outflow Q (cfs) =	0.1	0.2	0.1	0.2	0.2	2.6	5.0	6.7	19.0
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.6	0.3	0.8	1.0	0.9	1.6
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.4	0.8	1.0	1.1
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	38	67	53	62	70	69	67	65	60
Time to Drain 99% of Inflow Volume (hours) =	**40**	72	56	66	74	75	75	74	72
Maximum Ponding Depth (ft) =	2.83	5.23	3.73	4.52	5.22	5.92	6.21	6.71	6.98
Area at Maximum Ponding Depth (acres) =	0.11	0.18	0.14	0.17	0.18	0.20	0.20	0.21	0.21
Maximum Volume Stored (acre-ft) =	0.170	0.533	0.284	0.409	0.532	0.663	0.723	0.823	0.880

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)







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

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

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

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
	0:15:00	0.00	0.00	0.17	0.56	0.83	0.63	0.91	0.94	1.58
	0:20:00	0.00	0.00	1.44	2.16	2.72	1.91	2.38	2.65	3.82
	0:25:00	0.00	0.00	3.29	4.87	6.25	4.24	5.30	5.94	9.41
	0:30:00	0.00	0.00	4.09	5.89	7.64	10.12	12.83	15.18	22.39
	0:35:00	0.00	0.00	3.90	5.53	7.13	12.07	15.08	18.75	27.01
	0:40:00	0.00	0.00	3.57	4.97	6.38	11.96	14.84	18.38	26.32
	0:45:00	0.00	0.00	3.16	4.44	5.72	10.85	13.47	17.14	24.51
	0:50:00	0.00	0.00	2.81	3.99	5.07	9.92	12.32	15.64	22.37
	0:55:00	0.00	0.00	2.50	3.52	4.49	8.65	10.74	13.97	20.02
	1:00:00	0.00	0.00	2.23	3.12	3.99	7.50	9.31	12.47	17.89
	1:05:00	0.00	0.00	2.04	2.85	3.67	6.52	8.10	11.18	16.08
	1:10:00	0.00	0.00	1.84	2.66	3.45	5.67	7.05	9.52	13.72
	1:15:00	0.00	0.00	1.66	2.44	3.25	5.02	6.22	8.17	11.79
	1:20:00	0.00	0.00	1.50	2.19	2.94	4.35	5.37	6.84	9.83
	1:25:00	0.00	0.00	1.34	1.95	2.55	3.74	4.59	5.67	8.10
	1:30:00	0.00	0.00	1.19	1.73	2.19	3.13	3.82	4.63	6.57
	1:35:00	0.00	0.00	1.06	1.54	1.89	2.57	3.11	3.70	5.20
	1:40:00	0.00	0.00	0.96	1.34	1.68	2.09	2.51	2.90	4.05
	1:45:00	0.00	0.00	0.91	1.20	1.56	1.76	2.10	2.36	3.29
	1:50:00	0.00	0.00	0.89	1.11	1.48	1.56	1.86	2.03	2.81
	1:55:00	0.00	0.00	0.79	1.05	1.41	1.44	1.70	1.81	2.50
	2:00:00	0.00	0.00	0.71	0.97	1.29	1.36	1.60	1.66	2.27
	2:05:00	0.00	0.00	0.56	0.77	1.03	1.07	1.26	1.28	1.74
	2:10:00	0.00	0.00	0.44	0.60	0.80	0.82	0.96	0.95	1.29
	2:15:00	0.00	0.00	0.34	0.46	0.61	0.63	0.74	0.72	0.96
	2:20:00	0.00	0.00	0.26	0.36	0.47	0.48	0.56	0.54	0.73
	2:25:00	0.00	0.00	0.20	0.27	0.35	0.37	0.43	0.41	0.55
	2:30:00	0.00	0.00	0.15	0.20	0.26	0.27	0.32	0.31	0.41
	2:35:00	0.00	0.00	0.12	0.15	0.20	0.20	0.24	0.23	0.31
	2:40:00	0.00	0.00	0.09	0.11	0.15	0.15	0.18	0.18	0.23
	2:45:00	0.00	0.00	0.06	0.08	0.11	0.11	0.13	0.13	0.17
	2:50:00	0.00	0.00	0.04	0.05	0.07	0.08	0.09	0.09	0.12
	2:55:00	0.00	0.00	0.02	0.03	0.05	0.05	0.06	0.06	0.07
	3:00:00	0.00	0.00	0.01	0.02	0.02	0.03	0.03	0.03	0.04
	3:05:00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.
The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

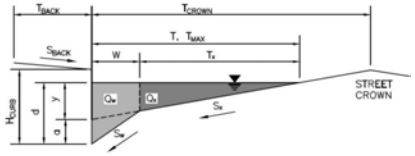
Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Inlet ID: **Inlet A2**



Gutter Geometry:

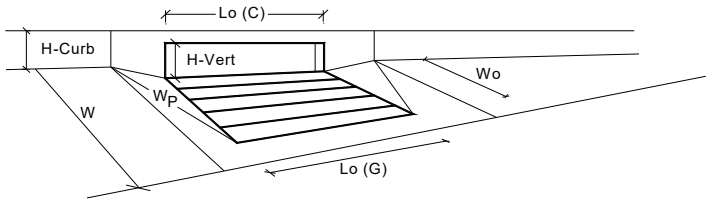
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.000	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	26.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.006	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.015	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	13.0	13.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



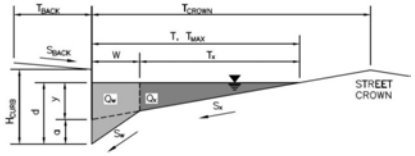
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	2.8	6.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.15	0.42	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.91	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**1.2**	**5.9**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.8	2.3	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Inlet ID: **Inlet A3**



Gutter Geometry:

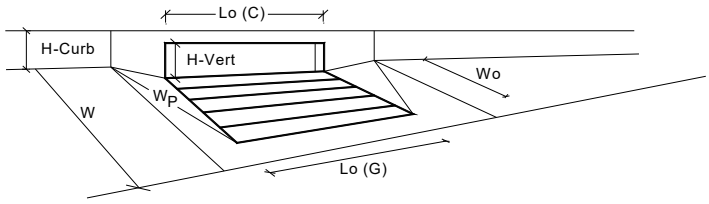
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.000	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	19.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.035	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	19.0	19.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



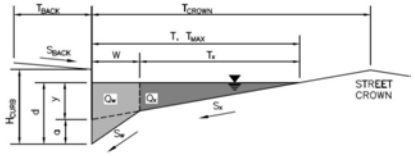
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	2	2	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	inches
Grate Information		MINOR	MAJOR	Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.42	0.42	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	0.93	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**10.0**	**10.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	3.1	8.5	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Inlet ID: **Inlet A6**



Gutter Geometry:

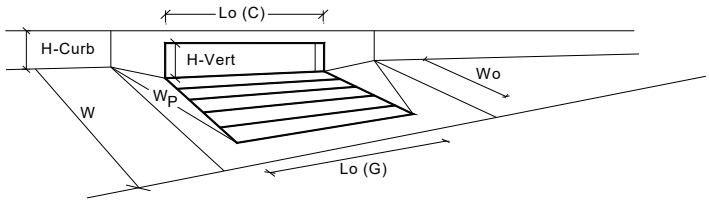
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.000	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	19.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.033	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.015	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	19.0	19.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



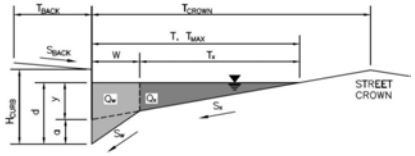
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	2	2	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	inches
Grate Information		MINOR	MAJOR	Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.42	0.42	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	0.93	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**10.0**	**10.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.4	6.0	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Inlet ID: **Inlet A7**



Gutter Geometry:

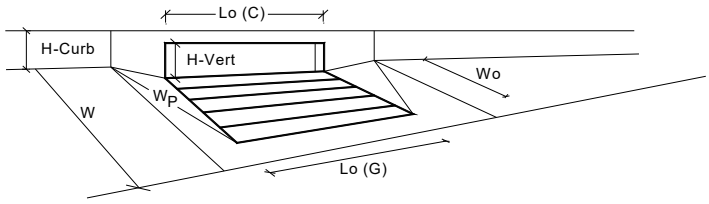
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	19.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.040	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.015	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	19.0	19.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



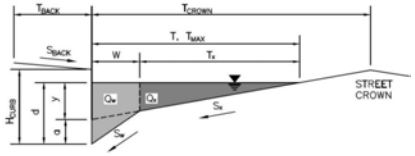
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	2	2	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	inches
Grate Information		MINOR	MAJOR	Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.42	0.42	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	0.93	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**10.0**	**10.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.1	7.8	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Inlet ID: **A11**



Gutter Geometry:

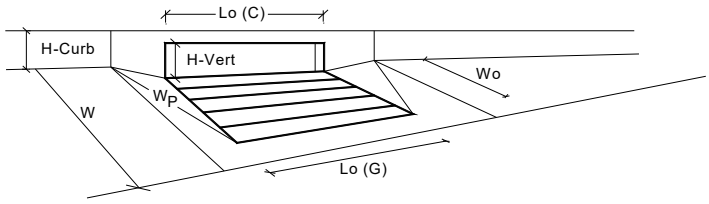
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.000	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	19.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.028	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.015	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	19.0	19.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	2	2	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	inches
Grate Information		MINOR	MAJOR	Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.42	0.42	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	0.93	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**10.0**	**10.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	3.7	8.8	cfs

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

Appendix D - Reference Documents

DV06-155

DOUGLAS COUNTY
AUG 11 2006
DEPARTMENT OF PUBLIC WORKS

May 3, 2006
Revised August 4, 2006

Phase III Drainage Report for the West Plaza Drive Extension

Douglas County, Colorado

Prepared for:

Highlands Ranch Metro District

Prepared by:

FELSBURG HOLT & ULLEVIG

FHU Reference No. 04-220

Basin PD-N1

This basin includes 1.83 acres of new Plaza Drive pavement and half of the seeded median. The historic flow pattern in this basin flows from south to north and discharges into the existing roadside ditch along C-470. The flows from the new roadway will be collected via inlets and storm sewer that will discharge into the detention/water quality pond west of the CWSD.

Basin OS-3A

Historical drainage patterns in basin OS-3A flow from south to north in front of the CWSD access and are discharged into an existing system that parallels Plaza Drive. The basin is 0.43 acres of paved parking for the CWSD and sodded area. No changes will be made to historic drainage patterns and the proposed improvements include minor grading enhancements and construction of a new area inlet in the southwest corner of the CWSD access and Plaza Drive. This system drains to the detention/water quality pond west of CWSD.

Basin PD-S3

This basin includes 1.69 acres of east bound Plaza Drive pavement and half of the median that will be seeded. Historically much of the drainage in this basin is collected through a series of inlets, storm sewer and swales from the existing CWSD access and discharges into the existing pond located west of the CWSD. Proposed improvements include adding an on-grade inlet and storm sewer to discharge flows into the detention/water quality pond located in the western part of the basin.

The existing pond has an approximate detention\water quality volume of 2.0 acre feet. The pond will be impacted by the new roadway alignment. The proposed improvements include re-grading the pond to the south of Plaza Drive and providing additional volume for the new portions of Plaza Drive pavement that will drain into this pond per direction of Highlands Ranch Metro Districts (HRMD). Contributing to the pond are basins PD-S1, PD-N1, PD-S3, PD-N3, OS-2B and OS-3A (Appendix A and B for additional information and details).

Basin PD-N3

The contributing area for basin PD-N3 includes 1.10 acres of east bound Plaza Drive pavement and half of the seeded median area. As mentioned in Basin PD-S3, much of the historic runoff was intercepted by the existing CWSD access roadside ditch and storm drainage system. The new on-grade inlet and storm sewer will discharge into the CWSD detention/water quality pond.

Basin OS-2B

Contributing to basin OS-2B is predominately the CWSD property and a small portion of single family homes south of the CWSD. Historic drainage patterns flow from south to north and are intercepted by the existing CWSD roadside ditch, area inlets, storm sewer and existing swales through out the property. The majority of flows concentrate at the existing detention pond located west of the CWSD. The existing emergency overflow is located in the northern portion of the

Basin OS-2C

Historical drainage patterns in basin OS-2C flow from southeast in front of the CWSD to the northwest towards C-470 and discharge into the High Line Canal. No historical drainage patterns will be changed with this project. No portions of the Plaza Drive pavement will drain to the High Line Canal. All paved portions of Plaza Drive will drain either to the CWSD detention/water quality pond or the proposed water quality pond located in the northeast corner of Plaza Drive and Erickson Boulevard intersection.

Basin PD-S4

This basin includes 0.99 acres of east bound Plaza Drive pavement and half of the seeded median. Historic conditions in this basin are primarily sheet flows that concentrate at the High Line Canal. These flows will be intercepted by the new roadway alignment and collected in an on-grade inlet and storm sewer and discharged west of the High Line Canal.

Basin PD-N4

The contributing area for basin PD-N4 includes 1.07 acres of west bound Plaza Drive pavement and half of the seeded median area. As mentioned in Basin PD-S4, much of the historic runoff was intercepted by the High Line Canal. The new on-grade inlet and storm sewer will collect flows and discharge west of the High Line Canal into a roadside ditch that concentrates at a water quality pond near the intersection of Plaza Drive and Erickson Boulevard.

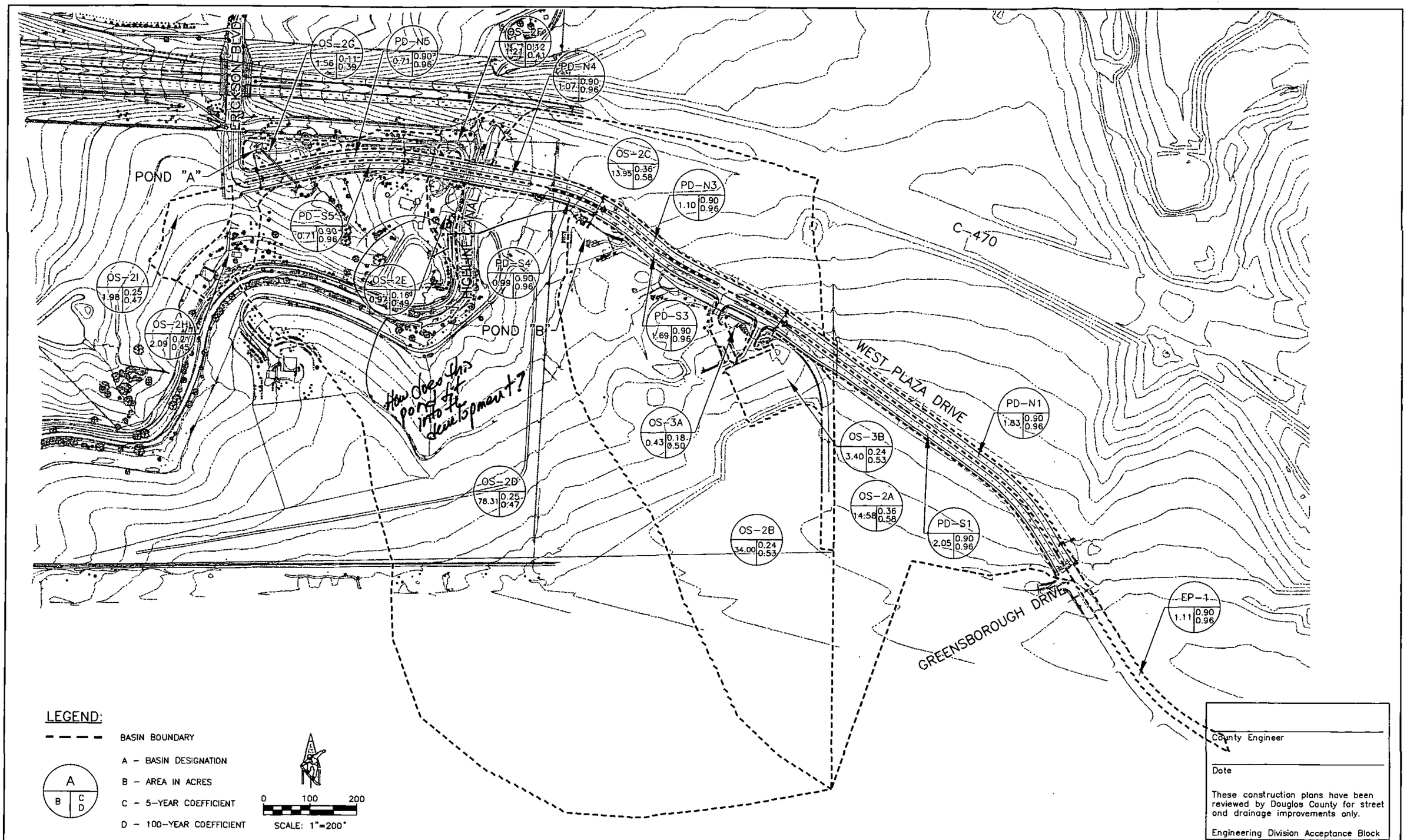
Basin OS-2E & OS-2F

Contributing to these two basins are approximately 2.18 acres of undisturbed C-470 side slopes and existing High Line Canal bike paths. These basins historically flow west towards Erickson Boulevard and will continue to do so as a part of this project.

During the summer of 2006, a new pedestrian box culvert was constructed to allow pedestrian movement under the future Plaza Drive Extension. Inlets and storm sewer were also constructed to drain the pedestrian box culvert. This system will be connected to the Plaza Drive drainage system and storm drainage flows from basins OS-2E & OS-2F will be conveyed to the water quality pond near the intersection of Plaza Drive and Erickson Boulevard.

Basin PD-S5

Basin PD-S5 consists of a 0.71 acres of east bound Plaza Drive pavement and half of the median that will be un-landscaped. Historic flows for this basin concentrate at an existing energy dissipator located south of C-470. The dissipator is connected to an existing 60" RCP that drains the majority of basin OS-2D. Proposed improvements include providing an inlet and storm drainage system to drain to the proposed water quality pond.



LEGEND:

BASIN BOUNDARY

A – BASIN DESIGNATION
B – AREA IN ACRES
C – 5-YEAR COEFFICIENT
D – 100-YEAR COEFFICIENT

A | B | C | D

0 100 200
SCALE: 1"=200'

County Engineer

Date

These construction plans have been reviewed by Douglas County for street and drainage improvements only.

Engineering Division Acceptance Block

Computer File Information			
Creation Date:	05/02/06	Initials:	RSA
Last Modification Date:	07/26/06	Initials:	CDT
Full Path:	J:\04220\ACAD\SHEETS\		
Drawing File Name:	D04220MAP02.dwg		
Acad Ver. 2004	Scale: SEE SHEET	Units:	ENGLISH

Index of Revisions		

METRO DISTRICTS
Highlands Ranch
62 W. Plaza Drive
Highlands Ranch, CO 80129
Phone: 303-791-0430
Fax: 303-791-0437

FELSBURG HOLT & ULLEVIG
6300 South Syracuse Way
Suite 600
Centennial, CO 80111
(303) 721-1440
Fax (303) 721-0832

As Constructed
No Revisions:
Revised:
Void:

PLAZA DRIVE EXTENSION
BASIN MAP

Designer:	CDT	Structure Numbers	
Detailer:	RSA		
Sheet Subset:	DRAINAGE	Subset Sheets:	BM-1 of 1

Project No./Code
351-210-81-192

Sheet Number

DOUGLAS COUNTY
DEPARTMENT OF PUBLIC WORKS ENGINEERING

PLAN AND PROFILE OF PROPOSED

PLAZA DRIVE SIDEWALK IMPROVEMENTS

PROJECT NO. TF 2013-026
DOUGLAS COUNTY, COLORADO

SUBMITTAL
SEPTEMBER 10, 2013

APPROVED BY: DOUGLAS COUNTY

AMY BRANSTETTER PROJECT MANAGER	DATE
LEONARD CHELOCK, PE TRAFFIC ENGINEERING/ TRAFFIC OPERATIONS MANAGER	DATE
ROBERT KENNY, PE, PTOE PRINCIPAL TRAFFIC ENGINEER	DATE
JANET HERMAN, PE ASST. DIRECTOR OF DEVELOPMENT REVIEW	DATE
FRED KOCH, PE ENGINEERING SERVICES DIRECTOR	DATE

AS CONSTRUCTED INFORMATION

CONTRACTOR _____

_____ ENGINEER _____

PROJECT STARTED _____

PROJECT COMPLETED _____

AS CONSTRUCTED PLANS APPROVED BY:

_____ _____

TITLE: DATE

INDEX OF SHEETS

1	TITLE SHEET
2	STANDARD PLAN LIST
3	GENERAL NOTES
4	SUMMARY OF APPROXIMATE QUANTITIES
5	TABULATION OF QUANTITIES
6	TYPICAL SECTIONS
7	ROADWAY DETAIL
8-10	GEOMETRIC PLAN
11	PROJECT KEY MAP
12-20	STORM WATER MANAGEMENT PLANS
21-29	PLAZA DRIVE SIDEWALK PLAN AND PROFILE
30	CONSTRUCTION TRAFFIC CONTROL PLANS
100-107	PLAZA DRIVE SIDEWALK CROSS SECTIONS (FOR INFORMATION ONLY)

SCALE OF ORIGINAL DRAWINGS

PLAN: 1" = 20'
PROFILE: 1" = 20' HORIZONTAL
1" = 5' VERTICAL

VICINITY MAP

DOUGLAS COUNTY STANDARDS

GESC PLAN STANDARD NOTES AND DETAILS (3 SHEETS)
CONCRETE JOINTS (STANDARD DRAWING NO. SP.31)

CDOT M&S-STANDARDS ATTACHED

M-608-1 CURB RAMPS (6 SHEETS)
M-609-1 CURB, GUTTERS, AND SIDEWALKS (4 SHEETS)
S-614-1 GROUND SIGN PLACEMENT (2 SHEETS)
S-630-1 TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION (20 SHEETS)

TABULATION OF LENGTH

STATION	SIDEWALK	
	LIN. FEET	MILES
PLAZA DRIVE SIDEWALK IMPROVEMENTS : BEGIN PROJECT 4+84.01 END PROJECT 46+77.38	4193.37	0.794
TOTALS	4193.37	0.794

INDEX OF REVISIONS

Rev	Date	Description	App

DOUGLAS COUNTY COLORADO
Engineering Division - Traffic
100 Third Street
Castle Rock, Colorado 80104
(303) 660-7490

TITLE SHEET

PLAZA DRIVE SIDEWALK IMPROVEMENTS

Design:	D. DYER
Drawn:	D. DYER
Checked:	M. HARTWIG
Date Created:	7/10/13
Date Modified:	
Scale:	N/S
Job No.:	TF 2013-026

SHEET
1
OF – 30

HARTWIG & Associates, Inc.

PLOT DRIVER: S:\01Bi*Workspace\System\plicfg\ha*11X17.plicfg
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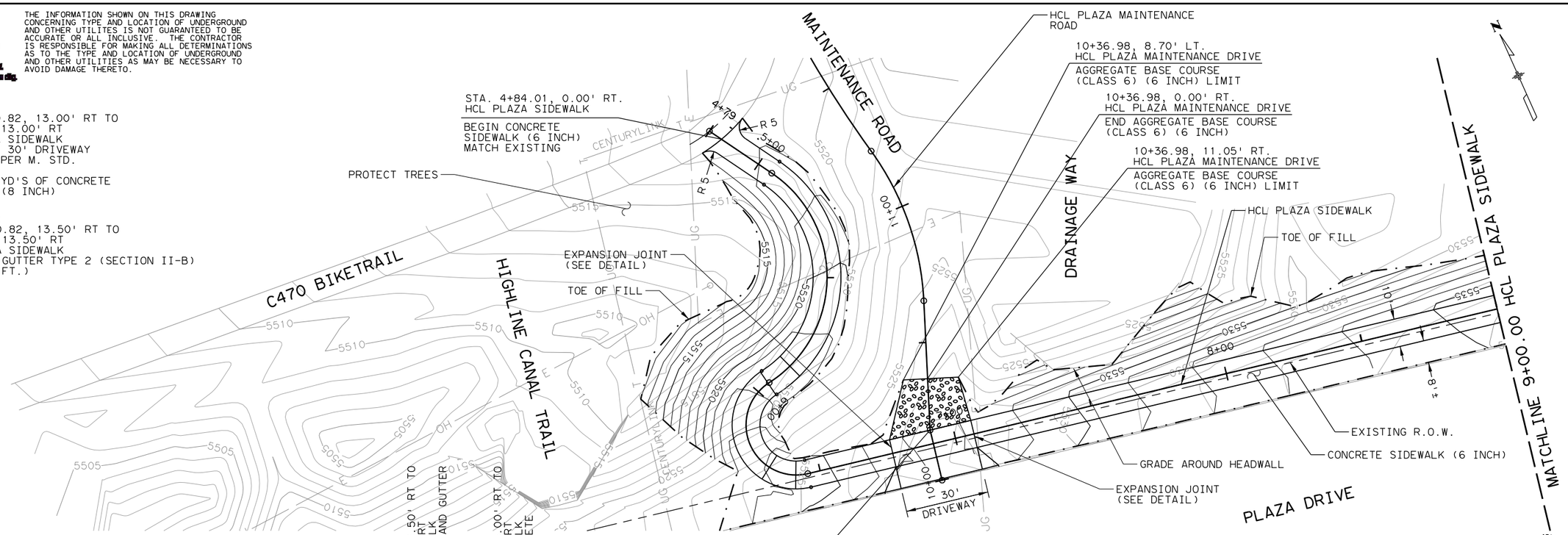
THE INFORMATION SHOWN ON THIS DRAWING CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ALL DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.

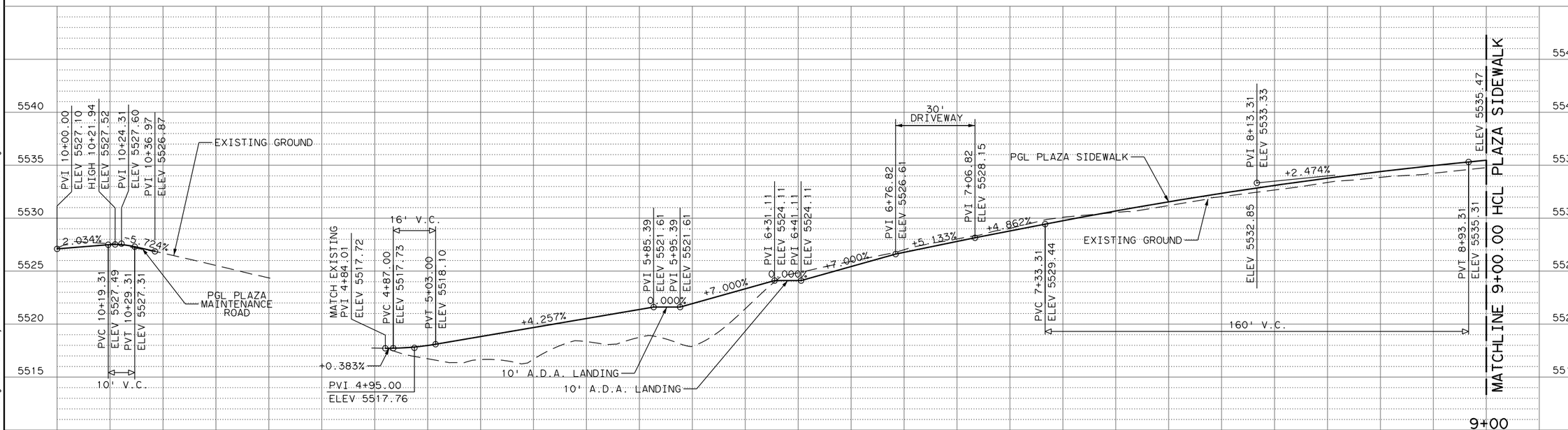
REQUIRED:
STA. 6+70.82, 13.00' RT TO
7+12.82, 13.00' RT
HCL PLAZA SIDEWALK
CONSTRUCT 30' DRIVEWAY
CURB CUT PER M. STD.
M-609-1.
34.5 SQ. YD'S OF CONCRETE
PAVEMENT (8 INCH)

REQUIRED:
STA. 6+70.82, 13.50' RT TO
7+12.82, 13.50' RT
HCL PLAZA SIDEWALK
CURB AND GUTTER TYPE 2 (SECTION II-B)
(42 LIN. FT.)



NOTES:

1. SEE GEOMETRIC PLAN SHEETS FOR ADDITIONAL INFORMATION.
2. EXISTING R.O.W. LINE FROM BEST AVAILABLE INFORMATION, NOT SURVEYED.
3. INCLUDE EXPANSION JOINT MATERIAL BETWEEN COLORED MEDIAN COVER MATERIAL, SIDEWALKS, DRIVEWAYS, AND CURB RAMPS.



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Rev	Date	INDEX OF REVISIONS Description	App

DOUGLAS COUNTY COLORADO
Engineering Division - Traffic
100 Third Street
Castle Rock, Colorado 80104
(303) 660-7490

PLAN AND PROFILE
4+84.01 TO 9+00

PLAZA DRIVE SIDEWALK IMPROVEMENTS

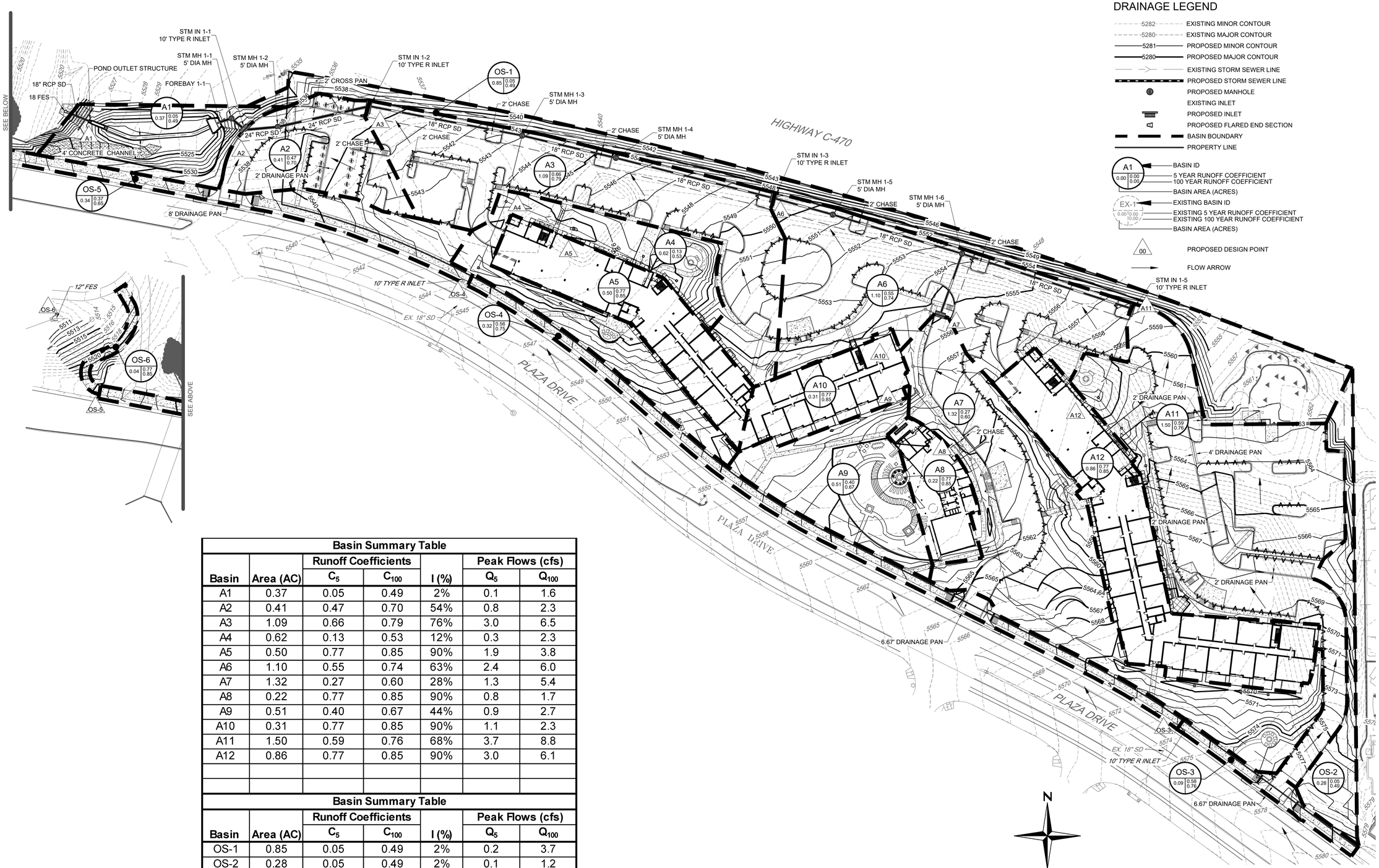
Design:	K. BRUBAKER
Drawn:	D. DYER
Checked:	M. HARTWIG
Date Created:	7/24/13
Date Modified:	
Scale:	20:1
Job No.:	TF 2013-026

SHEET
21
OF – 30

HARTWIG & Associates, Inc.

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

Appendix E - Drainage Maps



Basin Summary Table						
		Runoff Coefficients			Peak Flows (cfs)	
Basin	Area (AC)	C_5	C_{100}	I (%)	Q_5	Q_{100}
A1	0.37	0.05	0.49	2%	0.1	1.6
A2	0.41	0.47	0.70	54%	0.8	2.3
A3	1.09	0.66	0.79	76%	3.0	6.5
A4	0.62	0.13	0.53	12%	0.3	2.3
A5	0.50	0.77	0.85	90%	1.9	3.8
A6	1.10	0.55	0.74	63%	2.4	6.0
A7	1.32	0.27	0.60	28%	1.3	5.4
A8	0.22	0.77	0.85	90%	0.8	1.7
A9	0.51	0.40	0.67	44%	0.9	2.7
A10	0.31	0.77	0.85	90%	1.1	2.3
A11	1.50	0.59	0.76	68%	3.7	8.8
A12	0.86	0.77	0.85	90%	3.0	6.1

Basin Summary Table						
		Runoff Coefficients			Peak Flows (cfs)	
Basin	Area (AC)	C_5	C_{100}	I (%)	Q_5	Q_{100}
OS-1	0.85	0.05	0.49	2%	0.2	3.7
OS-2	0.28	0.05	0.49	2%	0.1	1.2
OS-3	0.09	0.58	0.76	67%	0.3	0.6
OS-4	0.32	0.56	0.75	64%	0.8	1.9
OS-5	0.34	0.37	0.65	41%	0.4	1.4
OS-6	0.04	0.77	0.85	90%	0.1	0.3

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 REDLAND.COM
▪ Land Planning ▪ Civil Engineering ▪ Landscape Architecture ▪ Construction Management

NOT FOR CONSTRUCTION

NOTES	NO.	DATE

PROJECT NO.	22029
DATE	NO	NOTES
03/28/2023	1	ISSUED FOR REVIEW

KAOS APARTMENTS
DRAINAGE PLAN

SHEET
DNG-1

I:\2022\22029 – Kaos Apartments\CAD\Sheet Sets\Drainage\22029–Kaos Drainage Plan.dwg tab: DRN – DRAINAGE PLAN Mar 24, 2023 – 12:24pm chartland

ERO

Consultants in Natural Resources and the Environment

Noxious Weed Management Plan
Highlands Ranch Planning Area 79
Douglas County, Colorado

Prepared for—

Shea Properties Colorado
8351 East Belleview Avenue
Denver, Colorado 80237

Prepared by—

ERO Resources Corporation
1626 Cole Boulevard, Suite 100
Lakewood, Colorado 80401
(303) 830-1188
ERO Project #25-059

April 8, 2025

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Appendix B CDA Noxious Weed Fact Sheets

Noxious Weed Management Plan
Highlands Ranch Planning Area 79
Douglas County, Colorado

April 8, 2025

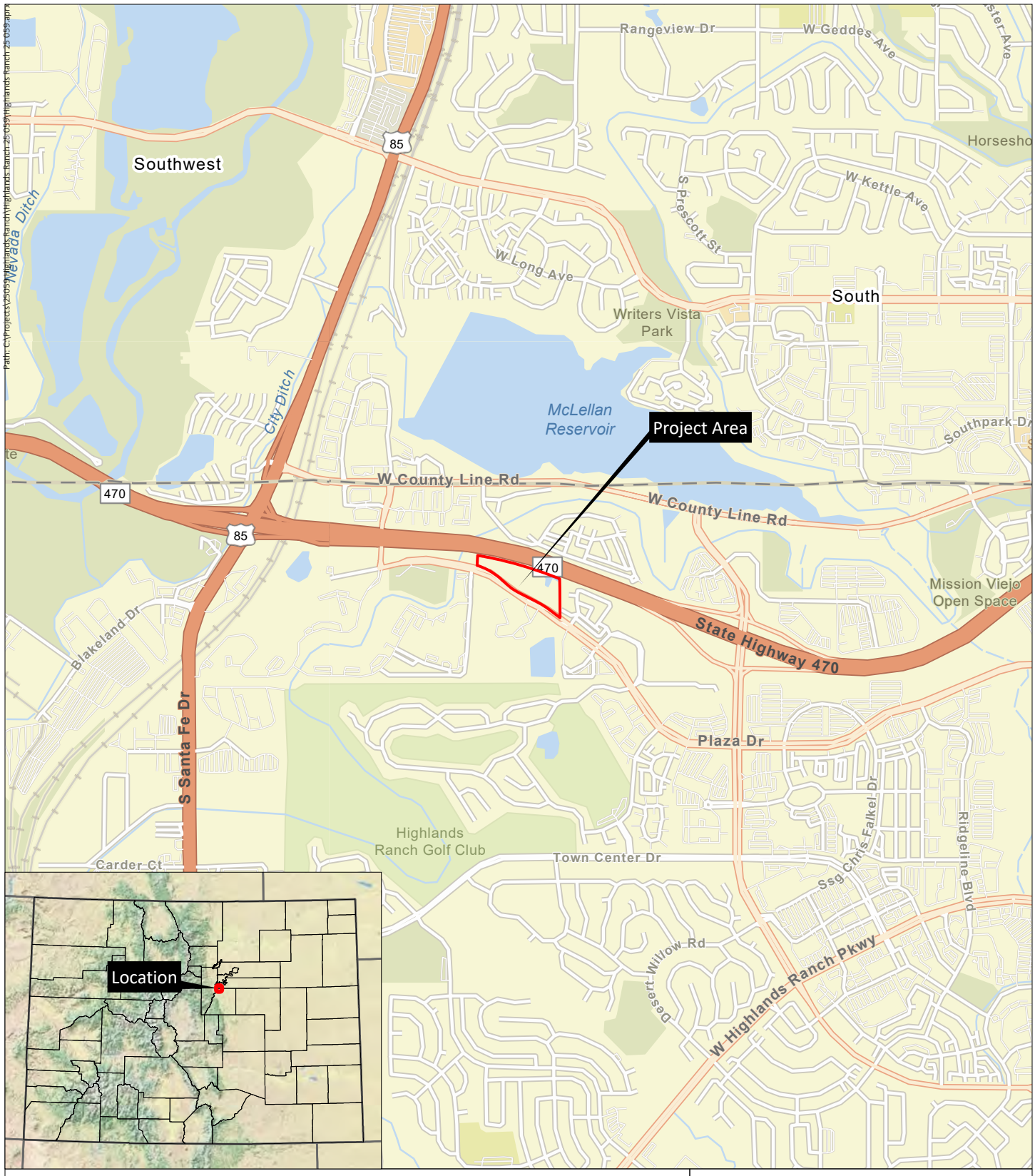
Introduction

Shea Properties Colorado (SPC) is proposing to construct the Highlands Ranch Planning Area 79 development project (project) in Douglas County, Colorado (project area; Figure 1). SPC contracted ERO Resources Corporation (ERO) to prepare this Noxious Weed Management Plan for the project. This Noxious Weed Management Plan has been developed to follow an integrated weed management approach of mechanical, chemical, and biological control strategies.

As defined by the Colorado Department of Agriculture (CDA), noxious weeds are nonnative aggressive invaders that replace native vegetation, reduce agricultural productivity, cause wind and water erosion, and pose an increased threat to communities from wildfire (CDA 2025). Noxious weeds are ranked by the CDA into one of the following lists based on the severity of potential impacts and other factors:

- List A – Contains noxious weed species designated in Colorado for eradication upon detection.
- List B – Contains noxious weed species common enough in parts of Colorado that eradication is not feasible, though these species are still recommended for eradication, suppression, or containment depending on distribution and densities around the state. Noxious weed management plans for these species are designed to stop the continued spread of these species.
- List C – Contains noxious weed species widespread in Colorado. Noxious weed management plans for these species are designed to provide additional education, research, and biological resources to reduce the harm associated with these species.
- Watch List Species – Contains weed species that are rare or unknown in the state but display noxious characteristics in plant communities similar to those in Colorado. Watch list species are not designated as noxious but are included in the list to educate and encourage identification and reporting.

The noxious weeds identified in the project area are discussed in further detail in the *Results* section of this report.



Highlands Ranch Planning Area 79

Section 5, T6S, R68W; 6th PM

UTM NAD 83: Zone 13N; 498362mE, 4379165mN

Longitude 105.019077W, Latitude 39.562185N

USGS Littleton, CO Quadrangle

Douglas County, Colorado

0 1,000 2,000 Feet

N

Figure 1
Vicinity Map

Prepared for: Shea Properties
Colorado
File: 25059 Figure 1 (MT)
April 2, 2025

ERO Resources Corp.

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Project Location

The project area is in Section 5, Township 6 South, Range 68 West of the 6th Principal Meridian in Douglas County, Colorado (Figure 1). The UTM coordinates of the approximate center of the project area are NAD 83: 498362mE, 4379165mN, Zone 13 North. The longitude/latitude of the project area is 105.019077°W/39.562185°N. The elevation of the project area is approximately 5,550 feet above sea level. Representative photos of the project area are included in Appendix A, and the photo points are shown on Figure 2.

Project Area Description

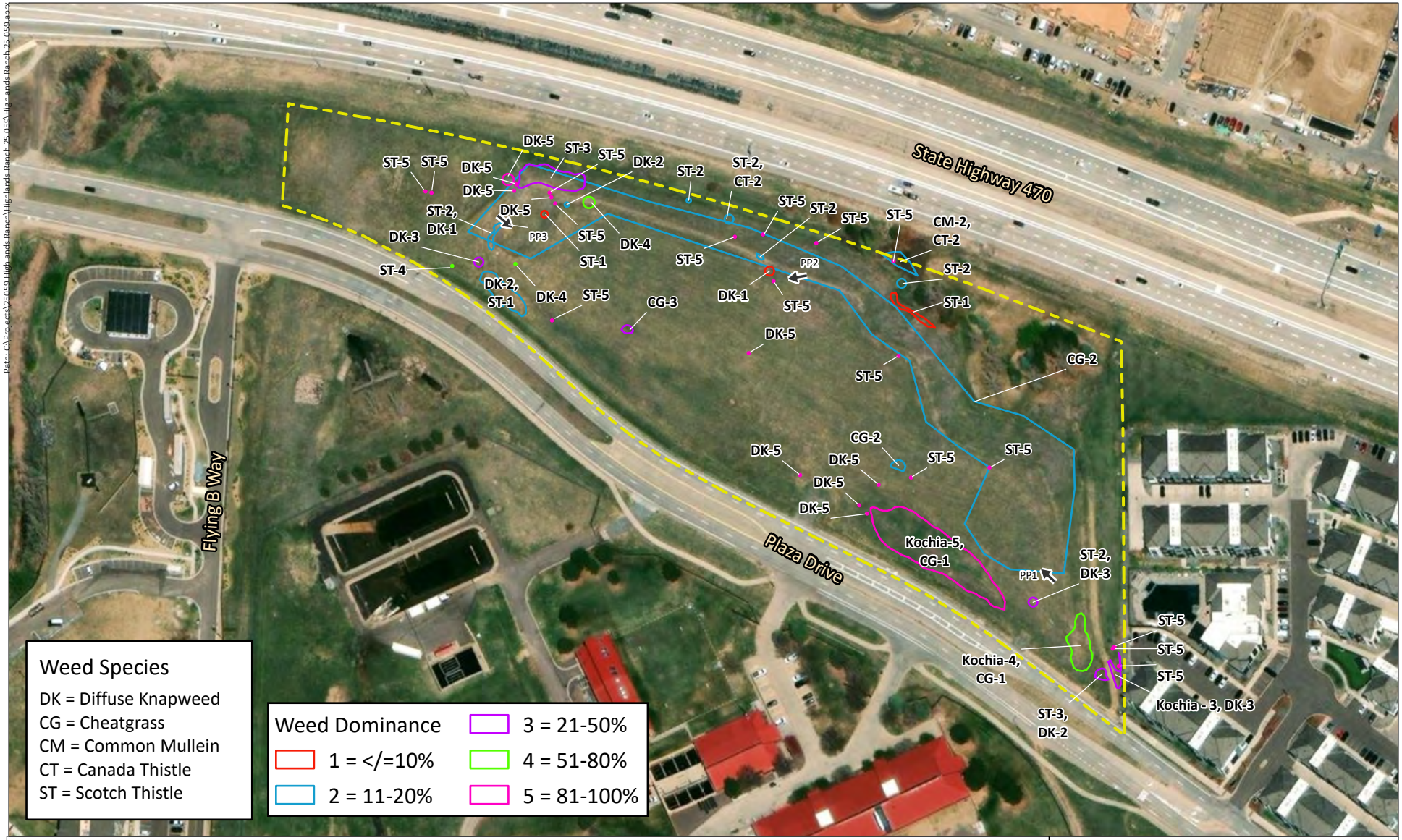
The project area is surrounded primarily by existing infrastructure including Colorado State Highway 470 to the north, an existing residential development to the east, Plaza Drive to the south, and undeveloped land to the west (Figure 2). Vegetation in the project area is dominated by a mix of nonnative and native upland species including smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), and rubber rabbitbrush (*Ericameria nauseosa*) with curly dock (*Rumex crispus*) and Japanese brome (*Bromus arvensis*) prevalent throughout (Photo 1 through Photo 3).

Results

On March 20, 2025, Anna Wistrom and Joshua Dresen, biologists with ERO, assessed the project area for noxious weeds (2025 site visit). No List A or Watch List species were documented in the project area during the 2025 site visit. During the 2025 site visit, ERO documented three List B noxious weed species and two List C noxious weed species in the project area, as described below (Table 1). Additionally, during the 2025 site visit, ERO identified three high-density populations of kochia (*Bassia scoparia*) (Figure 2). While kochia is not classified as a noxious weed by the CDA, it is an undesirable, nonnative species known to outcompete native vegetation. The observed weed populations in the project area consisted of small and large populations and scattered individual weeds. Noxious weed data are shown on Figure 2.

List B Species

- **Canada thistle (*Cirsium arvense*) –** Low-density Canada thistle populations were observed in two locations along the northern boundary of the project area.
- **Diffuse knapweed (*Centaurea diffusa*) –** Diffuse knapweed was present throughout much of the project area as low-density populations with one high-density population in the northwestern portion of the project area and scattered individuals.
- **Scotch thistle (*Onopordum acanthium*) –** Scotch thistle occurred throughout the project area, mainly as scattered individuals, with a few low-density populations.



Highlands Ranch Planning Area 79

→ Photo Point

Project Area

0 100 200 feet

N

Figure 2
Existing Conditions

Prepared for: Shea Properties Colorado
File: 25059 Figure 2 (MT)
April 4, 2025

ERO Resources Corp.

Image Source: Maxar Technologies© May 5th, 2023

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List C Species

- **Cheatgrass (*Bromus tectorum*) –** Low-density cheatgrass populations were observed sporadically in the project area with the largest and most significant infestation occurring on a gentle hillslope along the perimeter of the project area.
- **Common mullein (*Verbascum thapsus*) –** A low-density population of common mullein was observed in a single location along the northern boundary of the project area.

Table 1. Noxious weeds found in the project area.

Common Name	Scientific Name	CDA Noxious Weed List
Canada thistle	*Cirsium arvense*	B
Diffuse knapweed	*Centaurea diffusa*	B
Scotch thistle	*Onopordum acanthium*	B
Cheatgrass	*Bromus tectorum*	C
Common mullein	*Verbascum thapsus*	C

Management Recommendations

The management recommendations are divided into (1) targeted methods focused on individual species and (2) best management practices (BMPs) to prevent the spread of noxious weeds during and after construction of the residential development.

Targeted Methods

Below are the targeted control methods for the noxious weeds found in the project area during the 2025 site visit. For herbicide recommendations, the Environmental Protection Agency regulates pesticide residue in waterways as a discharge of a pollutant regulated under the Clean Water Act. A general National Pollutant Discharge Elimination System Permit has been issued that covers the application of pesticides in or near water. In general, only herbicides rated as safe near water must be used, and Douglas County and the applicator must keep records of the herbicide operations. Additionally, when using herbicides, the directions on the labels must be strictly followed.

List B Species: Canada Thistle, Diffuse Knapweed, and Scotch Thistle

Canada Thistle

Mechanical methods, like hand pulling and tilling, are not recommended for controlling Canada thistle, as root fragments can stimulate new growth. Chemical spot-spray treatment with approved herbicides applied in the rosette and pre-flower (i.e., bolting) growth stages is recommended (CDA 2015). During flowering or seed production, cut off the flower heads, place them in a bag, and dispose of the bag in an area where the flower heads or seeds will not grow. If chemical methods are used, see the noxious weed factsheets (Appendix B) for herbicide recommendations.

Diffuse Knapweed

The populations of diffuse knapweed found in the project area can be best controlled by mechanical means in combination with approved herbicide applied in the rosette and bolting growth stages (CDA 2015). Diffuse knapweed can be controlled by any physical or mechanical method that severs the root below the soil surface and is best controlled in the rosette stage. Preventing seed production is crucial,

so it is important to stop the plant from flowering. If flowers are present, they should be collected, bagged, and properly disposed of in an area where the flower heads or seeds will not grow, as recommended by the CDA (CDA 2015). If chemical methods are used, see the noxious weed factsheets (Appendix B) for herbicide recommendations.

Scotch Thistle
Mechanical methods, such as mowing, chopping, and deadheading, are not recommended for controlling Scotch thistle, as seeds will mature and germinate if left on the ground. Mechanical methods, including tilling (small infestations), hoeing, and digging, along with chemical spot treatment with approved herbicides in the rosette and early bolting growth stages is recommended (CDA 2016). During flowering or seed production, flower heads must be collected, bagged, and disposed of or destroyed, as recommended by the CDA (CDA 2016). Fire gives Scotch thistle a competitive advantage; therefore, this method is not recommended. If chemical methods are used, see the noxious weed factsheets (Appendix B) for herbicide recommendations.

List C Species: Cheatgrass and Common Mullein

Cheatgrass
Mechanical methods, such as mowing and chopping, are not recommended as they leave roots behind, stimulate flower production, disperse seeds, and expand the size of the infested area. To control cheatgrass, mechanical control methods, including tilling, in combination with approved chemical herbicide are recommended (CDA 2019). Any tilling must be deeper than 6 inches to be successful at inhibiting cheatgrass regeneration. If chemical methods are used, see the noxious weed factsheets (Appendix B) for herbicide recommendations.

Common Mullein
To control common mullein, hand pulling or digging up the plants when the soil is moist in combination with approved chemical herbicide are recommended (CDA 2009). Removed plants should also be bagged to prevent the spread of seeds. If chemical methods are used, see the noxious weed factsheets (Appendix B) for herbicide recommendations.

Best Management Practices

In areas where construction is proposed, the BMPs described below should be used to prevent the spread of these species:

- Major equipment (track equipment, rubber tire loaders, and backhoes) should be cleaned with high-pressure air or water spray before being delivered to the project area to avoid introducing undesirable plants and noxious weeds.
- Disturbed areas should be reclaimed as soon as practicable after completion of construction and seeded with an appropriate native seed mix (certified as noxious-weed-free). In areas where construction is complete, but seeding cannot immediately occur due to the time of year, mulch and mulch tackifier should be used for temporary erosion control until seeding can occur.
- Certified weed-free seed, mulch, and borrow material should be used for revegetation. Weed-free straw bales should be used for sediment barriers.
- Locally or regionally available seed and mulch should be used when practicable.

- Fertilizers in seeded areas should be kept to a minimum because fertilizers tend to promote the growth of many noxious weeds and other undesirable species.
- Large bare patches should be reseeded as soon as practicable to prevent the establishment of noxious weeds.
- The project area should be monitored for one year after construction in the residential development areas and for three years in open space areas. If noxious weeds are present, weed control plans should be formulated and completed. Control of noxious weeds should be implemented as soon as practicable to prevent establishment because noxious weeds are more difficult to control after they have been established.

References

Colorado Department of Agriculture (CDOA). 2009. "Common Mullein Idenfication and Management." https://ag.colorado.gov/conservation/noxious-weeds/noxious-weed-species-id/common-mullein.

Colorado Department of Agriculture (CDOA). 2015a. "Canada Thistle Identification and Management." https://ag.colorado.gov/conservation/noxious-weeds/noxious-weed-species-id/canada-thistle.

Colorado Department of Agriculture (CDOA). 2015b. "Diffuse Knapweed Identification and Management." https://ag.colorado.gov/conservation/noxious-weeds/noxious-weed-species-id/diffuse-knapweed.

Colorado Department of Agriculture (CDOA). 2016. "Scotch Thistle Identification and Management." https://ag.colorado.gov/conservation/noxious-weeds/noxious-weed-species-id/scotch-thistle.

Colorado Department of Agriculture (CDOA). 2019. "Cheatgrass Identification and Management." https://drive.google.com/file/d/1rzVSgQmhdyerHekDpfAvUs4x34BaPoog/view.

Colorado Department of Agriculture (CDOA). 2025. "Colorado Noxious Weed List (Including Watch List)." https://ag.colorado.gov/conservation/noxious-weeds/species-id.

Appendix A Photo Log

Photo 1 - Overview of site conditions in the eastern portion of the project area. View is northwest.

Photo 2 - Overview of site conditions in the central portion of the project area. View is west.

Photo 3 - Overview of site conditions in the western portion of the project area. View is southeast.

Appendix B CDA Noxious Weed Fact Sheets

Canada Thistle Identification and Management

List B

Canada thistle (*Cirsium arvense*) is a non-native, deep-rooted perennial that spreads by seeds and aggressive creeping, horizontal roots called rhizomes. Canada thistle can grow 2 to 4 feet in height. The leaves are oblong, spiny, bright green, and slightly hairy on the undersurface. Unlike other noxious biennial thistles which have a solitary flower at the end of each stem, Canada thistle flowers occur in small clusters of 1 to 5 flowers. They are about 1 cm in diameter, tubular shaped, and vary from white to purple in color.

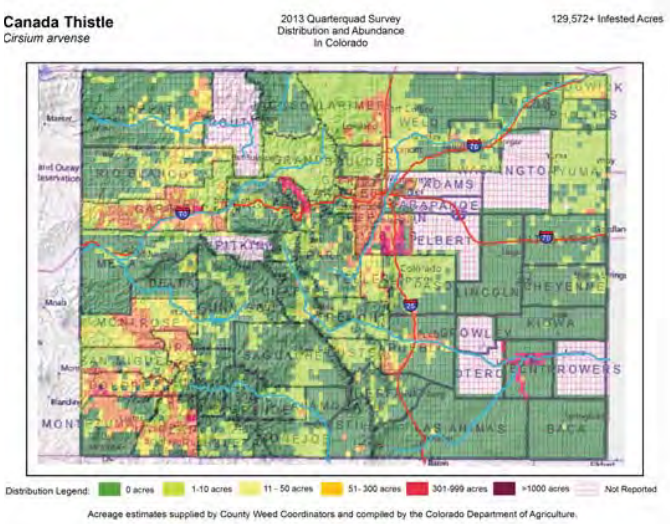
Canada thistle emerges from its root system from late April through May. It flowers in late spring and throughout the summer. It produces about 1,000 to 1,500 seeds per plant that can be wind dispersed. Seeds survive in the soil for up to 20 years. Additionally, Canada thistle reproduces vegetatively through its root system, and quickly form dense stands. Each fragmented piece of root, 0.25 inch or larger, is capable of forming new plants. The key to controlling Canada thistle is to eliminate seed production and to reduce the plant's nutrient reserves in its root system through persistent, long-term management.

Canada thistle is one of the most troublesome noxious weeds in the U.S. It can infest diverse land types, ranging from roadsides, ditch banks, riparian zones, meadows, pastures, irrigated cropland, to the most productive dryland cropland. Large infestations significantly reduce crop and cattle forage production and native plant species. It is a host plant to several agricultural pests and diseases. Canada thistle prefers moist soils, but it can be found in a variety of soil types. It has been found at elevations up to 12,000 feet.

Effective Canada thistle control requires a combination of methods. Prevention is the most important strategy. Maintain healthy pastures and rangelands, and continually monitor your property for new infestations. Established plants need to be continually stressed. Management options become limited once plants begin to produce seeds. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Canada thistle is designated as a "List B" species as described in the Colorado Noxious Weed Act. It is required to be either eliminated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds and click on the Noxious Weed Program link or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, (303) 869-9030.

2013 Quarter Quad Survey



Key ID Points

1. Cluster of 1-5 white to purple flowers on a stem.
2. Floral bracts are spineless.
3. Small flowers that are 1 cm in diameter.
4. Perennial, rhizomatous plant with spiny, oblong, green leaves.

Canada thistle
Cirsium arvense

List B

Integrated Weed Management Recommendations

Integrated weed management is imperative for effective Canada thistle control. This weed needs to be continually stressed, forcing it to exhaust root nutrient stores, and eventually die. Mowing or grazing can be followed up with herbicide application. Avoid hand-pulling and tilling which can stimulate the growth of new plants.

Canada thistle

Cirsium arvense

CULTURAL

Prevention is the best control strategy. Maintain healthy pastures , riparian areas, and rangelands. Prevent bare ground caused by overgrazing, and continually monitor your property for new infestations. Establishment of select grasses can be an effective control.

BIOLOGICAL

Cattle, goats, and sheep will graze on Canada thistle when plants are young and succulent in the spring. Follow up grazing with a fall herbicide application. Insects are available, and provide limited control. Currently, collection and distribution methods for Canada thistle rust (*Puccinia punctiformis*) are being refined. For more information on Canada thistle biocontrol, contact the Colorado Department of Agriculture - Palisade Insectary at (970) 464-7916.

MECHANICAL

Due to Canada thistle's extensive root system, hand-pulling and tilling create root fragments and stimulate the growth of new plants. Mowing can be effective if done every 10 to 21 days throughout the growing season. Combining mowing with herbicides will further enhance Canada thistle control.

CHEMICAL

The table below includes recommendations for herbicides that can be applied to rangeland and some pastures. Treatments may be necessary for an additional 1 to 3 years because of root nutrient stores. Always read, understand, and follow the label directions.

Herbicide	Rate	Application Timing
Aminopyralid* (Milestone)	5-7 oz. product/acre + 0.25% v/v non-ionic surfactant OR 1 teaspoon product/gal water + 0.32 oz./gal water	Apply in spring at the pre-bud growth stage until flowering and/or to fall regrowth. Can also add chlorsulfuron (Telar) at 1 oz./acre to the mix.
Clopyralid + Triclopyr (Prescott; Redeem; others)	3 pints product/acre + 0.25% v/v non-ionic surfactant OR 1.25 oz. product/gal water + 0.32 oz./gal water	Apply until flowering and/or fall regrowth.
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	5.5 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply to spring rosette to flower bud growth stage; or fall. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.
Note: *Product not permitted for use in the San Luis Valley.		
Additional herbicide recommendations for this and other species can be found at: **goo.gl/TvWnv9**		

Colorado Department of Agriculture - Conservation Services
305 Interlocken Parkway
Broomfield, CO 80021
(303) 869-9030
www.colorado.gov/ag/weeds

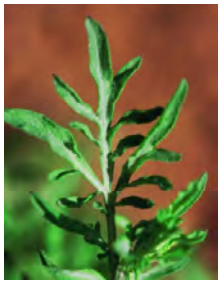
Updated:
07/2015

Diffuse knapweed

Colorado Department of Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Floral bracts have yellow spines with teeth appearing as a comb and a distrinct terminal spinte.
2. Flowers are white or lavender.
3. Seedlings have finely divided leaves

Diffuse knapweed Identification and Management

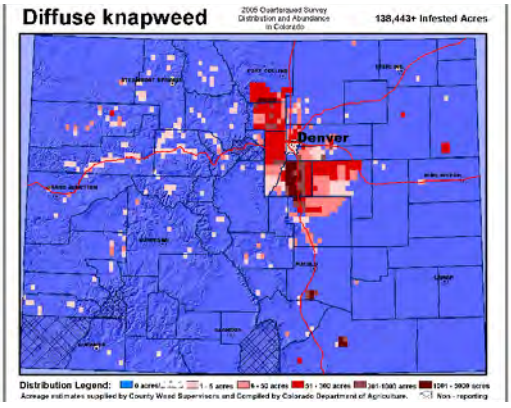
Identification and Impacts

Diffuse knapweed *(Centaurea diffusa)* is a non-native biennial forb that reproduces solely by seed. A biennial is a plant that completes its lifecycle within two years. During the first year of growth, diffuse knapweed appears as a rosette in spring or fall. During the second year in mid to late spring – the stem bolts, flowers, sets seed, and the plant dies. Once the plant dries up, it breaks off at ground level and becomes a tumbleweed which disperses the still viable seeds over long distances. A prolific seed producer, diffuse knapweed can produce up to 18,000 seeds per plant. Therefore, the key to managing this plant is to prevent seed production. Diffuse knapweed can grow 1 to 3 feet tall, and is diffusely branched above ground. This gives the plant a ball-shaped appearance and tumble-weed mobility when broken off. Leaves are small, and are reduced in size near the flowering heads. Flowers are mostly white, sometimes purple, urn-shaped, and are located on each branch tip. Bracts that enclose the flowerheads are divided like the teeth of a comb, and are tipped with a distinct slender spine. Upon drying, the bracts become rough, rendering them injurious to the touch. Flowers bloom July through August. Seed set usually occurs by mid-August.

Diffuse knapweed tends to invade disturbed, overgrazed areas. Other habitats may also include rangeland, roadsides, riparian areas, and trails. It is a tough competitor on dry sites and rapidly invades and dominates disturbed areas. Once established, diffuse knapweed outcompetes and reduces the quantity of desirable native species such as perennial grasses. As a result, biodiversity and land values are reduced, and soil erosion is increased.

The key to effective control of Diffuse knapweed is to prevent the plant from flowering and going to seed. An integrated weed management approach dealing with Diffuse knapweed is highly recommended. There are many options of mechanical, chemical, and biological controls, available. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Diffuse knapweed is designated as a "List B" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information, visit www.colorado.gov/ag/csd and click on the Noxious Weed Program link or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division at 303-239-4100.



Plant photo, top © Kelly Uhing. Infestation map above, Crystal Andrews. Flower photo © Cindy Roche. Rosette and leaf photos © Dale Swenarton.

Centaurea diffusa

Updated on:
07/2015

Management Recomendations

CULTURAL
Establishment of selected grasses can be an effective cultural control of diffuse knapweed. Contact your local Natural Resources Conservation Service for seed mix recommendations. Maintain healthy pastures and prevent bare spots caused by overgrazing. Bareground is prime habitat for weed invasions.

BIOLOGICAL
The seedhead weevil (*Larinus minutus*) and the root weevil fly (*Cyphocleonus achates*) provide fair to good control when used in combination with each other. Expect to wait at least 3 to 5 years for the insects to establish and achieve optimum results. This is an option for large infestations. To obtain the insects, contact the Colorado Department of Agriculture, 970-464-7916.

MECHANICAL
Any mechanical or physical method that severs the root below the soil surface will kill diffuse knapweed. Mowing or chopping is most effective when diffuse knapweed plants are at full-bloom. Be sure to properly dispose of the flowering cut plants, since seeds can mature and become viable after the plant has been cut down.

Integrated Weed Management:

Diffuse knapweed is best controlled in the rosette stage. It is imperative to prevent seed production. Do not allow diffuse knapweed flowers to appear. Management must be persistent in order to deplete the seed bank in the soil.

Diffuse knapweed

HERBICIDES : The following are recommendations for herbicides that can be applied to range and pasturelands. Always read, understand, and follow the label directions. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. **The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 0.25% non-ionic surfactant	Pre-emergence or from seedling to mid-rosette stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.
Aminopyralid* (Milestone)	5-7 oz./acre + 0.25% non-ionic surfactant	Spring at rosette to early bolt stage and/or in the fall to rosettes. Add 1 qt./acre 2,4-D or 3 oz. Perspective when treating in the bolting to flowering growth stages.
Clopyralid (Transline)	0.67-1.33 pints/acre + 0.25% non-ionic surfactant	Apply to spring/fall rosettes before flowering stalk lengthens. Add 1 qt./acre 2,4-D when treating in the bolting to flowering growth stages.
Note: *Not permitted for use in the San Luis Valley.		
Additional herbicide recommendations for this and other species can be found at: **goo.gl/TvWnv9**		

Colorado State University

CDA CO

http://www.colorado.gov/ag/csd

Weevil photo © J. Johnson, Univ. Idaho, bugwood.org. All other photos © Kelly Uhing.

Scotch Thistle Identification and Management

List B

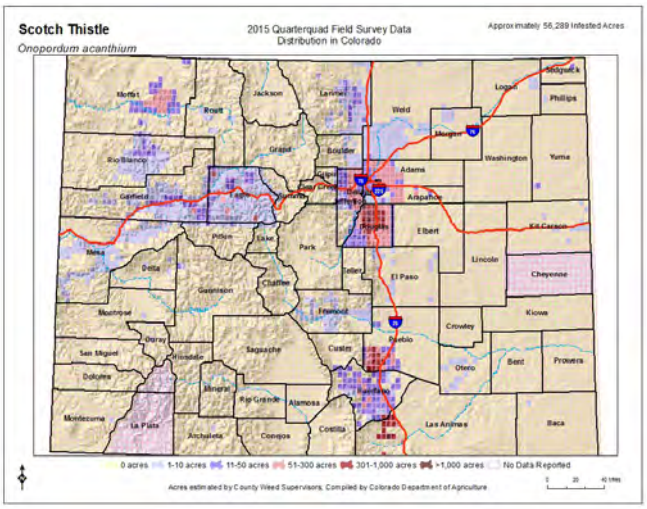
Scotch thistle includes two species, *Onopordum acanthium* L. and *O. tauricum* Willd. Both are non-native biennial forbs. During the first year of growth, both species appear as a rosette in spring or fall. During the second year in mid to late spring the stems bolt, the plants flower, set seed, and the plants die. Both Scotch thistle species can grow up to 12 feet tall and basal rosettes can be up to 2 feet in diameter. Stems are numerous and branched. Characteristically, the entire length of stems from both species have broad wings with spiny tips. *O. acanthium* leaves have an overall gray color from dense woolly hairs. *O. tauricum* leaves are glandular and not as hairy as *O. acanthium*. For both, leaves are spiny. Both species have a distinct mid-rib. Flower heads are terminal, violet to reddish in color, 1 to 3 inches in diameter, and arranged in a raceme. One plant can produce up to 100 flower heads. The spine-tipped bracts curve away from the flowering head. The flower receptacle is fleshy and has pits to hold seeds. The plants flower from mid-June to September. Scotch thistle seeds have the ability to mature in flower buds and heads that have been removed from the stalk. Both species can produce up to 14,000 seeds per plant. Seeds remain viable for up to 30 years but germinate readily with moisture in spring and fall.

Scotch thistle invades rangeland, overgrazed pastures, roadsides, and irrigation ditches. Both species prefer moist soil, such as areas adjacent to creeks and rivers. Roadsides appear to be especially vulnerable to invasion likely due to the water runoff from the shoulders. Maintaining healthy pastures and native plants, minimizing soil disturbance, changing land use practices to prevent overuse, and using seed-free equipment are critical measures to preventing infestations. As with most biennials, once established, limiting seed production is critical to effective control. Due to the robust, spiny nature of Scotch thistle, this plant can act as a living barbed wire fence, making areas impassible for wildlife, livestock, and people and unpalatable to cattle.

To control seed production, plants with buds or flowers should be collected, bagged and immediately disposed of or destroyed. Chemical control is most effective when plants are in rosette stage, spring or early fall. Mechanical controls can be used to eliminate small patches or plants in a later growth stage.

Scotch thistle is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be eradicated; some populations may be contained or suppressed depending on state regulations. For state regulations described for each county, refer to the most recent Rule, or visit www.colorado.gov/ag/coweedcontacts for details.

2015 Quarter Quad Survey



© Leslie Mehrhoff, University of CT

© Bonnie Million, NPS

© Bonnie Million, NPS

Key ID Points

1. Pitted fleshy flower receptacle.
2. Prominent mid-rib.
3. Wide lobed leaves with distinct mid-rib.
4. Wide spiny wings extend the length of the stem.

Scotch thistle

Onopordum acanthium L. and *O. tauricum* Willd.

List B

Integrated Weed Management Recommendations

Scotch thistle

Onopordum acanthium L. and *O. tauricum* Willd.

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. As with most biennials, prevent seed production in the first and second year of growth. Prevent seed from dispersing, such as on contaminated equipment. Rest sites until they are effectively restored. Change land use practices. Use methods appropriate for the site.

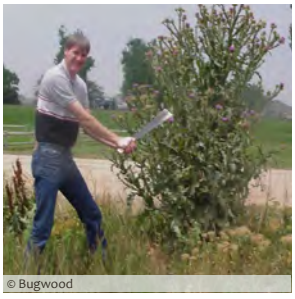
CULTURAL CONTROL METHODS

Effectiveness begins with maintaining or restoring a competitive native forb and forb assemblage. Continue restoration efforts until native plants are robust and abundant. Use locally adapted native seeds whenever possible to improve competitiveness. Include cool season and warm season, as well as perennial and annual grasses in revegetation efforts. Soil may need to be restored by adding soil amendments, soil microbes, mycorrhizal fungi and nitrogen fixing plants such as legumes. Manage land uses so they do not create bare mineral soil or compact soil. Annual crop cultivation appears to be an effective control measure.

© Jacqui Turner, The Timaru Herald

BIOLOGICAL CONTROL METHODS

Domestic livestock are likely to avoid this plant due the large number of spines all over the plant. Goats and sheep may eat flower heads if plants are small. Since most livestock and herbivores avoid the leaves and stems, Scotch thistle can become an "increaser" in over-grazed systems. Properly managed grazing systems can increase desireable plant vigor and indirectly reduce Scotch thistle. There are no known biological control agents effective against scotch thistle or authorized in Colorado. For more information about biological control agents, visit the Colorado Department of Agriculture's Palisade Insectary website at www.colorado.gov/ag/biocontrol.



© Bugwood

MECHANICAL CONTROL METHODS

Methods, such as tilling, hoeing and digging, are best for infestations smaller than 0.5 acres; weigh this against other plants present, ecology and site condition. Sever roots below the soil surface during the first year before the plant stores energy and in the second year before seed production. Mowing, chopping and deadheading stimulates more flower production; these methods require consecutive years of season-long treatments. Flower heads must be collected, bagged, and disposed of or destroyed; seeds will mature and germinate if left on the ground. Fire gives Scotch thistle a competitive advantage. Large fleshy stems and leaves would not be consumed in a low severity fire and seeds would remain unaffected. High severity fires would likely damage native plants, which favors Scotch thistle if seeds are not killed and this is not recommended.

CHEMICAL

NOTE: The following are recommendations for herbicides that can be applied to pastures and rangeland. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Aminopyralid* (Milestone)	7 oz. product/acre + 0.25-0.5% v/v non-ionic surfactant	Apply in spring rosette to early bolting growth stages or in fall to rosettes. *Product not permitted for use in the San Luis Valley.
Chlorsulfuron** (Telar)	1-2.6 oz. product/acre (0.75 oz. active ingredient/acre)+ 0.25% v/v non-ionic surfactant	Spring from bolting to flower bud stages. **This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.
Metsulfuron + Chlorsulfuron (Cimarron X-tra)	2 oz. product/acre + 0.25-0.5% v/v non-ionic surfactant	Apply during rosette to flower bud stages.
Clopyralid (Transline)	0.67-1.33 pints product/acre + 0.25% v/v non-ionic surfactant	Apply to rosettes in spring or fall.
Aminocyclopyrachlor + chlorsulfuron (Perspective)* *Product not permitted for use in the San Luis Valley.	4.75-8 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply from the seedling to the bolting stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.

Colorado Department of Agriculture - Conservation Services
305 Interlocken Parkway
Broomfield, CO 80021
(303) 869-9030
www.colorado.gov/ag/weeds

Rev. 11/16

Cheatgrass Identification and Management

List C

©James Bailey, iNaturalist

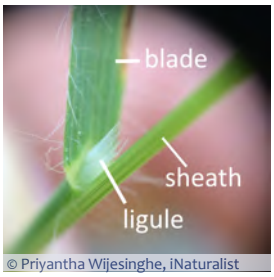
Cheatgrass (*Bromus tectorum* L.) is a winter annual grass in the Poaceae family, also known as downy brome.

Mature plants reach up to 24 inches tall. The stems are smooth but the leaf blades and sheath are hairy (downy). The ligules are fringed, short and membranous. The culms range from five to 90 cm long, can be prostrate or vertical, and have fine short hairs. Its fibrous roots can be up to 60 inches long, but the majority of root biomass is within first 12 inches of the soil surface. Roots are efficient at absorbing soil moisture, allowing cheatgrass to grow quickly early in season, while other plants are still dormant. Green up can occur twice per season. Cheatgrass has an unique spectral signature during seed set and senescence when it turns reddish purple. During these shoulder growing season events, it is easily detectable from other vegetation with satellite imagery.

The flower is a simple one-sided panicle that characteristically flops over and hangs, branches and is open. Spikelets are usually terminal. Usually there are five to many florets; it has perfect flowers. The upper and lower glumes are usually unequal in length and shorter than florets; the lower glume ranges from 4 to 14 mm in length and is one veined. The upper glume is three-veined. The plant disarticulates above the glumes. The lemmas are usually downy, narrowly lanceolate with sharp tips and about 9 to 12 mm long. Usually there are five to many lemmas. Awns are usually present and range from 10 to 18 mm long. It is a prolific seed producer, capable of two seed crops per season. Seeds need to be buried in soil or litter and have fall moisture to germinate. The fall seed crop has greater reproductive success than spring. Seeds lack dispersal anatomy so fall close to parent plants but transport readily with animals, people and equipment. Seed longevity is about three years. Both inbreeding and cross breeding occur.

Cheatgrass is one of the most competitive non-natives in the Western US. It thrives in arid, semi arid, and cold environments. Colorado's high elevation range is not an issue for cheatgrass; plants were recently detected as high as 9,500 feet. It exhibits phenotypic plasticity and genetic diversity, making it highly adaptable to a variety of conditions, likely due to multiple introductions. Its presence has significant negative impacts throughout the West. Most notably, it alters fire regimes and thus engineers a positive fire feedback loop that favors its growth over other plants. This feedback loop is why cheatgrass forms monocultures throughout the West.

It is often confused with Japanese brome (*Bromus japonicus*), which has denser more compact spikelets, shorter awns, and changes from green to gold through the growing season.



© Priyantha Wijesinghe, iNaturalist

© Veronika Johansson, iNaturalist

© Leslie J. Mehrhoff, University of CT

Key ID Points

1. Downy leaf blades, sheaths, ligules
2. Glumes are unequal size, lemmas are downy
3. One-sided panicle that droops, red-purple during seed set & senescence
4. Fibrous roots

Cheatgrass

Bromus tectorum L.

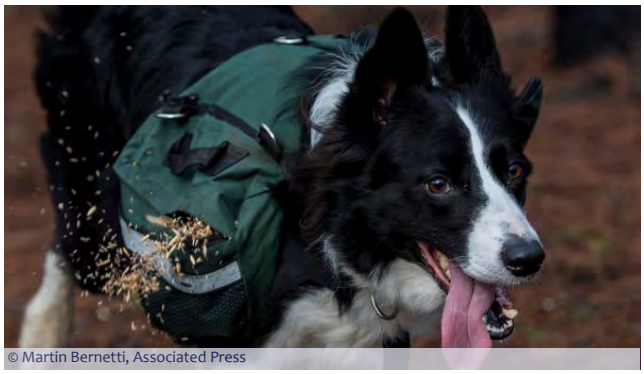
List C

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods in the same site along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seed dispersal, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, including land use practices.

Cheatgrass

Bromus tectorum L.



© Martin Bernetti, Associated Press

© Bureau of Land Management

CULTURAL

Biological soil crust is a soil health indicator of arid and semi arid sites; crusts inhibit cheatgrass seed germination. Aerial spread and cultivate soil crust where it is absent. Aerial and drill seeding bluebunch wheatgrass (*Pseudoroegneria spicata*) and Sandberg bluegrass (*Poa secunda*) with vesicular-arbuscular mycorrhizae; these are drought tolerant natives that are highly competitive against cheatgrass but require mycorrhizae. As these grasses establish and cheatgrass wanes slowly introduce additional species such as thickspike wheatgrass (*Elymus lanceolatus*), winterfat (*Krascheninnikovia lanata*), yarrow (*Achillea millefolium*) in the plant interspaces in subsequent years. Be cautious when purchasing seed as cheatgrass is often a contaminate, especially in mixes. Use seed pillows to disperse seeds.

MECHANICAL

Mechanical methods are best for residential areas and small infestations. Mowing and chopping are not recommeded; they leave roots behind, stimulate flower production, disperse seeds, and expand the size of the infested area. Collect, bag, and dispose of or destroy flowers; seeds can mature and germinate if left. Tilling must be deeper than 6 inches to work. Prescribed fire applied before seed maturity, (late spring or early summer), may kill seeds; the trick is to get green cheatgrass and litter to carry fire and at a hot enough temperature to destroy seeds and seedlings. Always combine prescribed fire with cultural methods, timed appropriately, and base it on site conditions and other plants present. Monitoring and adaptive management are critical if prescribed fire is used as a tool for control.

© Stacy Litz, Associated Press

© Helena Weed Control, Rocky Mountain Elk Foundation

BIOLOGICAL

Sheep and cattle will select green cheatgrass which also affects desired cool-season grasses. Properly managed grazing can improve vigor of desired species and directly reduce cheatgrass. Post-fire grazing management varies depending on site potential and objectives. Currently there are no biological control agents for cheatgrass authorized in Colorado. For more biocontrol information, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol

CHEMICAL

Pseudomonas fluorescens D7 inhibits cheatgrass and is currently approved by EPA and Colorado. NOTE: Herbicide recommendations to control cheatgrass in pastures and rangeland are found at: https://goo.gl/TvWnv9. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Colorado Department of Agriculture - Conservation Services
305 Interlocken Parkway
Broomfield, CO 80021
(303) 869-9030
www.colorado.gov/ag/weeds

Colorado State University

Rev. 2/19

Common mullein

Verbascum thapsus

Colorado Department of Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us

Key ID Points

Identification and Management

Identification and Impacts

Common mullein (*Verbascum thapsus*) is a biennial forb native to Europe and Asia. The first year of the plant it produces a basal rosette. Basal rosettes can grow to 30 inches in diameter. The leaves are light-green in color and are covered in fine soft hairs. The woolly leaves are alternate and overlapping each other and can grow over a foot long. In spring of the second year the plant bolts an erect stem, that grows 2 to 6 feet tall. The flowers of the plant are borne in terminal spikes. These terminal spikes may reach up to 20 inches in length. The flowers are sulfur-yellow in color and have five petals. The flowers range from 3/4 of an inch to 1 1/2 inches in diameter. Numerous two chambered fruits produce 100,000 to 250,000 seeds per plant. Flowering and seed production typical occur from June to August. The plant has a deep taproot along with a fiberous root system.

Habitats for Common mullein are roadsides, waste places, right-of-ways, pastures, hay fields, and abandoned lands. It prefers gravelly soil types, but can grow in other soil types. Livestock will avoid eating Common mullein, due to the hairy leaves of the plants. The plants were originally introduced as a medicinal plant. The Europeans used the flowers for tea, and the leaves for many remedies like burns and rashes. Both the Europeans and the Indians smoked the dried leaves to treat bronchitis.

The key to effective control of Common mullein is preventing the production of seeds. This plant is difficult to control due to the large amount of seed produced and seed bank left in the soil. Mechanical, cultural, biological and chemical treatments can be successful if utilized together in an integrated weed management plan. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Common mullein is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information, visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.

Photos © All Photos from Kelly Uhing, Department of Agriculture; Except Bottom left Mary Ellen (Mel) Harte, United States

Updated on:
08/09

Management Recommendations

Common mullein

CULTURAL
Cultural control can be effective in assistance with other treatment options. Once the parent plants have been removed, cultivating the area with desirable grasses and forbs may outcompete Common mullein seedlings. For specific seed recommendations contact your local Natural Resources Conservation Services for seed mixes.

BIOLOGICAL
Gymnetron tetrum, a seed eating weevil, biological control has been found in eastern Washington State and is currently working on populations there. The weevil has not yet been approved for use in Colorado. Contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916 for more information.

MECHANICAL
Hand pull or dig when soil is moist, prior to flowering and seed production can be effective. If flowers are present, bag specimens carefully so as not to scatter any potential seeds. The key to effective control is to prevent seed production and/or spread.

Integrated Weed Management:

Preventing the establishment and the seed production of Common mullein is key to controlling populations. If the population is established, using a combination of cultural, chemical, biological and mechanical treatments can aid in suppressing population size. Since plants produce thousands of seed treatments need to occur over an extended period of time.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Chlorsulfuron (Telar XP)	1-3 oz/acre	Apply to rosette stages in spring or fall prior to bolting. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water.
2,4-D Picloram (Grazon P+D *this is a Restricted Use Pesticide*)	4 pts/acre	Apply to rosette stages in spring or fall prior to bolting. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water. DO NOT apply near trees/shrubs/high water table.
Picloram (Tordon 22K *this is a Restricted Use Pesticide*)	1-2 qts/acre	Apply to rosette stages to early growth stages in spring or fall. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water. DO NOT Apply near trees/shrubs/high water table.
Metsulfuron (Cimmaron)	1.0 oz/acre	Apply to rosette stages in spring or fall. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water.

Photos © Top to Bottom; Kelly Uhing, Colorado Department of Agriculture; Whitney Cranshaw, Colorado State University, Bugwood.org; Kelly Uhing, Colorado Department of Agriculture

http://www.colorado.gov/ag/weeds

CENTENNIAL
WATER AND SANITATION DISTRICT

June 6, 2023

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

Re: Water and Sewer for Filing 159, Kaos Apartments

To Whom It May Concern:

Pursuant to Section 1805A of the Douglas County Zoning Resolution, Centennial Water and Sanitation District (the "District") acknowledges its willingness and ability to serve all future Kaos Apartment proposed developments in its Highlands Ranch service area, including parcels in Filing 159, Tract IN NE1/4 5-6-68 9.276 AM/L Lying S of C470.

Verification of District Status:

The District hereby verifies that the statements made in the letters and reports submitted by the District for the State Engineer and the County, and in the current materials are true and accurate, with the exception of any updates to the District's available water supply in accordance with the attached information.

Commitment to Serve:

The District is committed to providing service to all future developments within its service area based upon the water supply sources so identified. The connection to and use of such lines, mains and facilities is conditioned upon compliance with all of the Rules and Regulations of the Districts, including the payment of the appropriate fees. Any applicant, owner or customer desiring water and/or sewer service from the District shall pay a Tap Fee prior to the installation of a water meter. Such fee shall be paid in addition to all other charges relating to water and/or sewer service as established from time to time by the Board of Directors.

Water Demand:

Based on the demands at buildout of Highlands Ranch, all existing and future developments within our service area will require 19,600 to 22,600 AF/year. At this time, with the existing development at approximately 95% of buildout, demand has not exceeded 17,000 AF/year.

The representative for the developer has stated that the development will include a mix of multi-family residential uses that will include 240 multi-family units, swimming pool, and associated irrigation for landscaping and common areas equating to 143 Single Family Equivalents (SFE). Based on Centennial's standard water demand requirements, this project will therefore require 72 acre-feet (AF) of water per year.

62 West Plaza Drive
Highlands Ranch, Colorado 80129
www.highlandsranch.org

303-791-0430 Telephone
303-791-0437 Engineering Fax
303-791-3290 Financial Services Fax

Water Supply:

The District's existing water supply (in accordance with the attached report on sources, storage and decrees) of over 30,000 AF/year is adequate to deliver water to all future development within its service area. Centennial's water supply includes an amount sufficient to meet the water demands for this property.

Water Quality:

The District is in compliance with the Colorado Department of Public Health and Environment testing and quality requirements, and provides a high-quality water supply to all of its customers.

Sanitary Sewer Service:

The District shall provide sanitary sewer service for all water taps requested for this development. Treatment is provided by Centennial's Marcy Gulch Wastewater Treatment Plant.

Feasibility of Service:

Since its inception, Centennial has developed and funded an infrastructure plan to provide service to all properties within its service area. It is physically and economically feasible for the District to extend service to the proposed development.

Documentation:

Information describing Centennial's water supply including decrees is contained in the attached letter from Samuel L. Calkins, General Manager of CWSD.

Sincerely,

Jeffrey B. Case, P.E.
Director of Public Works Engineering
Centennial Water and Sanitation District

Enclosures

62 West Plaza Drive
Highlands Ranch, Colorado 80129
www.highlandsranch.org

303-791-0430 Telephone
303-791-0437 Engineering Fax
303-791-3290 Financial Services Fax

Centennial Water Court Case Numbers								7/1/22
Water Right	Original	Change Case	Diligence/ Absolute Decrees					When next
Description	Decree	Decree	First	Second	Third	Fourth	Fifth/Sixth	diligence due
Surface Water Rights								
Plum Creek	W - 6072	85CW415	NA					
		93CW177						
Augmentation Plan/	85CW415	93CW178	94CW286	02CW037	11CW244	19CW3140		1/31/2027
Exchange	19CW3257							7/31/2028
So. Platte Direct	88CW222	93CW179	96CW219	04CW033	12CW184	19CW3222		11/30/2026
Chatfield Storage	84CW411	93CW082	93CW081	01CW101	14CW3155	21CW3183		TBD
		83CW184*	95CW111	02CW041	09CW076	17CW3176		10/31/2024
So. Platte Reservoir	95CW239	93CW082	03CW295	12CW199	20CW3078			2/28/2028
Highlands Ranch	79CW316		85CW288	89CW168	96CW124	03CW266	12CW291	
Reservoirs	to 330		to 294				19CW3139	2/28/2026
Highlands Ranch	86CW332	95CW160	95CW159	02CW311	BD-11CW171			Dropped
Gulches	to 336	(Big Dry)	to 164	to 315	DC-11CW024			Dropped
					SPG-11CW129			Dropped
					MG-11CW130			Dropped
Cline	99CW199(A)		08CW20	15CW3133				11/30/2022
Fairview								
Senior	84CW058							
Junior	85CW314		01CW276	12CW119	18CW3222			8/31/2026
Hock Hocking	W-1318		83CW214	87CW161	97CW222	04CW271		Completed
Randall Ditch/ Tingle Res	05CW111		13CW3029	19CW3223				10/31/2026
Junior Application	09CW180		17CW3207					6/30/2024
CD Catholic Schools	07CW62							
United Development	18CW3188							
Groundwater Rights								
Dawson	82CW480							
Denver Trib	85CW415							
Denver Non-Trib	80CW445	97CW145			88CV335			
		(locations)			D-3 Settlemt			
Arapahoe	W-9192-78	84CW483	84CW482	06CW202				
		(locations)	(diligence)	(A-1 reloca.)				
Laramie-Foxhills	W-9192-78	83CW237	83CW237					
		(locations)						
Chatfield LFH	82CW479							
Willows Arap.(PA -5,7)	W-9310-78	90CW109	also	85CW163, 85CW170, 88CW079,				10CW171
				and 99CW163				PA-7
Plum Creek Non-Trib	W-6072							

CENTENNIAL
WATER AND SANITATION DISTRICT

December 16, 2022

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

Re: Statement of Water Availability

This letter serves as a general summary addressing the water supply for customers seeking water service within the Centennial Water and Sanitation District's (CWSD) service area through the Northern Douglas County Water and Sanitation District (NDCWSD), the Highlands Ranch Metropolitan District and Mirabelle Metropolitan District.

For planning purposes, the water demand projected for all existing and future customers in the CWSD service area is estimated to be from 19,600 to 22,600 acre-feet per year (AF/yr.). The actual annual demand for the last few years has averaged about 17,000 AF/yr. and the CWSD's service area is approximately 95% developed. Approximately 90% of CWSD's reusable water is recycled for municipal purposes in the CWSD water service area.

Water demands in the CWSD service area are met through a robust conjunctive use system that includes both renewable surface water and reusable Denver Basin ground water. Captured surface-water supplies are stored in four reservoirs and in three of the four Denver Basin aquifers through an aquifer storage and recovery (ASR) program. CWSD's surface-water supplies are from several sources on the South Platte River and its tributaries, which are summarized in Table 1.

Table 1

Surface-Water Sources	Average Year Yield (AF/yr.)
Augmentation / Exchange Plan	3,000
Plum Creek	550
Cline Ranch	400
South Platte River / Reservoir	700
Hock Hocking Mine	100
Tingle Reservoir	100
Englewood Agreements	6,120
Denver Water ("Patti water")	1,000
Bargas Ranch	900
Castle Pines North	50
WISE	1,000
Chatfield Reservoir	2,500
Total Surface Water Supply (current)	**16,420**

62 West Plaza Drive
Highlands Ranch, Colorado 80129
www.highlandsranch.org

303-791-0430 Telephone
303-791-0437 Engineering Fax
303-791-3290 Financial Services Fax

CWSD's decreed annual yield of Denver Basin ground-water rights total 17,717 AF/yr., which are defined in Table 2. Ground water can be pumped from the Denver Basin aquifers through a well field array comprised of more than 50 wells.

Table 2

Bedrock Aquifer	Decree Yield (af/yr.)
Arapahoe	4,915
Denver	5,111
Laramie-Fox Hills	4,500
Laramie-Fox Hills West	340
Dawson	390
Not-Nontributary Denver	1,876
Phipps Arapahoe	585
TOTAL	**17,717**

In an average year, the total volume of water currently available for use by CWSD customers is more than 30,000 AF. In addition to these water rights, CWSD has the use of 3,885 AF of storage space in McLellan Reservoir, 6,400 AF of storage space in South Platte Reservoir, 205 AF of storage space in James Tingle Reservoir, and 6,922 AF of storage space in the Chatfield Reservoir Reallocation Project. The total storage space is 17,412 AF.

CWSD operates a successful ASR program that stores treated surface water in three of the four Denver Basin aquifers, and makes that water available for use at any time. The ASR program has been operated for over 20 years. To date, nearly 15,300 AF of treated potable water has been stored in the Denver Basin aquifers beneath Highlands Ranch and is available when needed to supplement the annual decreed quantities defined above.

The attached sheet lists the water right decrees for the various water sources available for service to CWSD customers.

Sincerely,

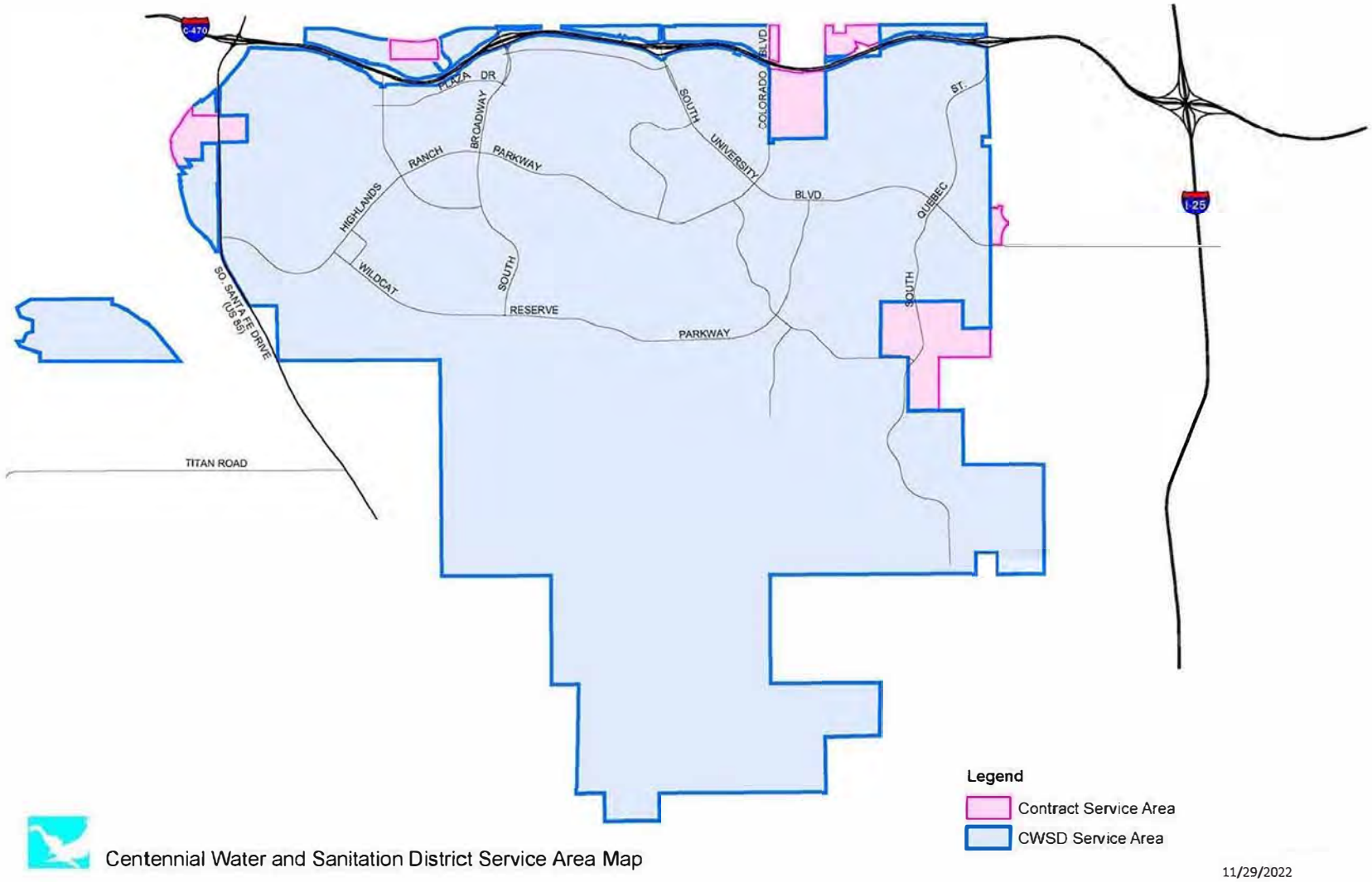
Samuel L. Calkins
General Manager

Cc: Jeffrey Case

Attachment: Water Right Decree List

62 West Plaza Drive
Highlands Ranch, Colorado 80129
www.highlandsranch.org

303-791-0430 Telephone
303-791-0437 Engineering Fax
303-791-3290 Financial Services Fax


C-470
PLAZA DR
BROADWAY
RANCH
PARKWAY
HIGHLANDS
WILDCAT
SOUTH
RESERVE
PARKWAY
SO. SANTA FE DRIVE (US 85)
TITAN ROAD
SOUTH
UNIVERSITY
COLORADO
BLVD.
BLVD
QUEBEC
ST.
SOUTH
I-25
Legend
Contract Service Area
CWSD Service Area
Centennial Water and Sanitation District Service Area Map
11/29/2022

Traffic Impact Study

Kaos

Highlands Ranch/Douglas County, Colorado

Prepared for:

Shea Properties

Kimley»Horn

T R A F F I C I M P A C T S T U D Y

Kaos

Highlands Ranch/Douglas County, Colorado

Prepared for
Shea Properties
8351 E Belleview Avenue
Denver, Colorado 80237

Prepared by
Kimley-Horn and Associates, Inc.
4582 South Ulster Street
Suite 1500
Denver, Colorado 80237
(303) 228-2300

August 2022

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

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1.0 EXECUTIVE SUMMARY

Kaos is proposed to be located along the north side of Plaza Drive, between Erickson Boulevard and Lucent Boulevard in Highlands Ranch within unincorporated Douglas County, Colorado. The project is proposed to include 240 multifamily homes. It is expected that Kaos will be completed in the next couple of years. Therefore, analysis was conducted for the 2024 short-term buildout horizon as well as the 2045 long-term twenty-year planning horizon.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The following intersections were incorporated into this traffic study in accordance with Douglas County standards and requirements:

- County Line Road and Erickson Boulevard (#1)
- Plaza Drive and Erickson Boulevard (#2)
- Plaza Drive and Lucent Boulevard (#3)

In addition, two (2) full movement accesses and one (1) proposed right-in/right-out access along Plaza Drive were evaluated.

Regional access to Kaos will be provided by C-470 and Santa Fe Drive (US-85). Primary access will be provided by County Line Road, Plaza Drive, Erickson Boulevard, and Lucent Boulevard. Direct access will be provided by two full movement accesses along Plaza Drive with the western one aligning with Flying B Way (#4) and the other aligning with the Centennial Water & Sanitation full movement access (#5). In addition, one (1) right-in/right-out access (#6) is proposed approximately 450 feet east of the full movement access aligned with the Centennial Water & Sanitation driveway location.

Kaos is expected to generate approximately 1,100 weekday daily trips, with 94 of these trips occurring during each of the morning and afternoon peak hours.

Based on the analysis presented in this report, Kimley-Horn believes Kaos will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following recommendations:

- With completion of the Kaos project, a full movement access that aligns with Flying B Way and a full movement access that aligns with the Centennial Water & Sanitation full movement access along Plaza Drive will be provided. In addition, one (1) right-in/right-out access is proposed approximately 450 feet east of the full movement access aligned with the Centennial Water & Sanitation driveway location. “STOP” (R1-1) signs are recommended to be installed on the southbound approaches of all three (3) accesses, exiting the development. In addition, a R3-2 No Left Turn sign should be placed underneath the R1-1 “STOP” sign at the right-in/right-out (RIRO) access. Furthermore, a R6-1R “ONE WAY” sign could be placed within the existing raised median of Plaza Drive. The eastbound left turn lanes at the full movement accesses are recommended to provide a length of 250 feet. The western access to align with Flying B Way will require median construction whereas the middle access to align with Centennial Water will just require restriping for the eastbound left turn lanes.

- Any on-site or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the Douglas County and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

2.0 INTRODUCTION

Kimley-Horn and Associates, Inc. has prepared this report to document the results of a Traffic Impact Study for Kaos proposed to be located along the north side of Plaza Drive, between Erickson Boulevard and Lucent Boulevard in Highlands Ranch within unincorporated Douglas County, Colorado. A vicinity map illustrating the Kaos development location is shown in **Figure 1**. Kaos is proposed to include 240 multifamily homes. A conceptual site plan is attached in **Appendix F**. It is expected that Kaos will be completed in the next couple of years; therefore, analysis was conducted for the 2024 short-term buildout horizon as well as the 2045 long-term twenty-year planning horizon.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The following intersections were incorporated into this traffic study in accordance with Douglas County standards and requirements:

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Kimley»Horn
NORTH
NTS 096391027

FIGURE 1
KAOS
HIGHLANDS RANCH, COLORADO
VICINITY MAP

Kimley»Horn

3.0 EXISTING AND FUTURE CONDITIONS

3.1 Existing Study Area

The existing site is vacant land. Directly to the south is the Centennial Water & Sanitation building and directly to the north is C-470. Surrounding the site are a mix of multifamily housing and other undeveloped parcels.

3.2 Existing Roadway Network

County Line Road extends east-west with two through lanes in each direction and a raised median in the study area. Left turn lanes are provided along the roadway at major intersections. The posted speed limit along County Line Road in the study area is 40 miles per hour.

Erickson Boulevard extends north-south with two through lanes in each direction with the north limit being County Line Road and the south limit being Plaza Drive. The posted speed limit is 30 miles per hour.

Plaza Drive extends east-west with two through lanes in each direction with a raised median. The posted speed limit is 40 miles per hour.

Lucent Boulevard extends north-south with three through lanes in each direction with a raised median. The posted speed limit is 40 miles per hour in the study area. Lucent Boulevard provides a C-470 interchange and extends from County Line Road to the north to Broadway to the south.

The signalized intersection of County Line Road and Erickson Boulevard operates with protected-permitted left turn phasing on all four approaches. The northbound Erickson Boulevard and southbound Southpark Circle approaches provide a left turn lane and a shared through/right turn lane. The eastbound and westbound approaches of County Line Road provide a left turn lane and two through lanes with the outside lane being a shared through/right turn lane. An aerial photo of the existing intersection configuration is below (north is up - typical).

County Line Road and Erickson Boulevard

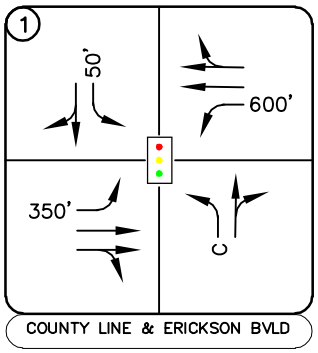
The unsignalized intersection of Plaza Drive and Erickson Boulevard operates with all-way stop control on all four approaches. The westbound Plaza Drive and southbound Erickson Boulevard approaches provide a left turn lane, a through lane, and a right turn lane. The eastbound Plaza Drive approach provides a left turn lane and a shared through/right turn lane. The northbound Mill Vista Road approach provide a single lane shared for all movements. An aerial photo of the existing intersection configuration is below.

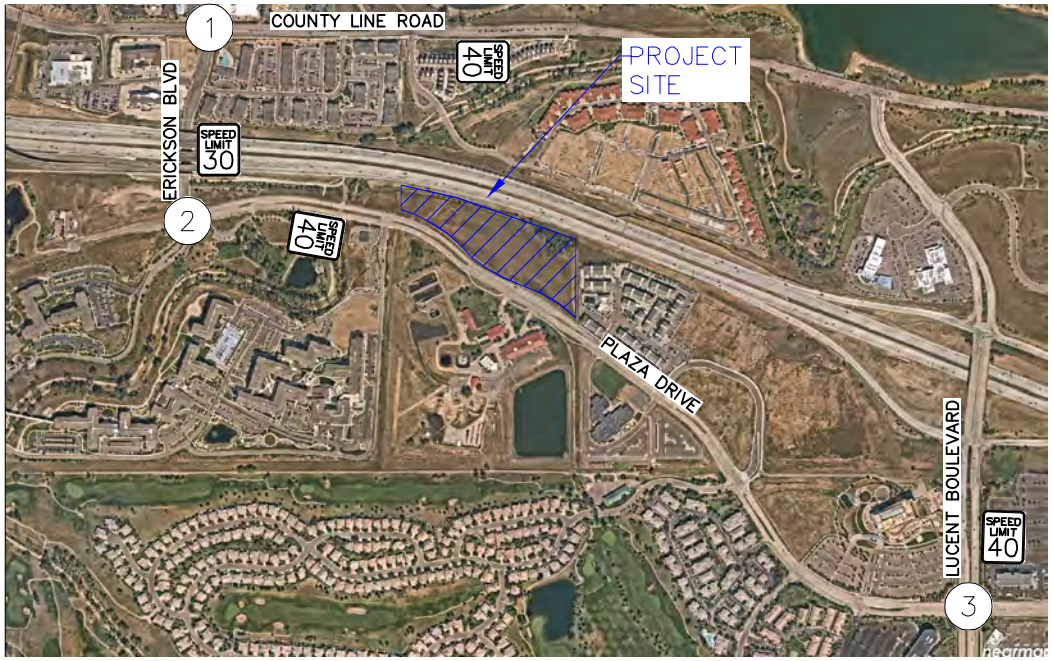
Plaza Drive and Erickson Boulevard

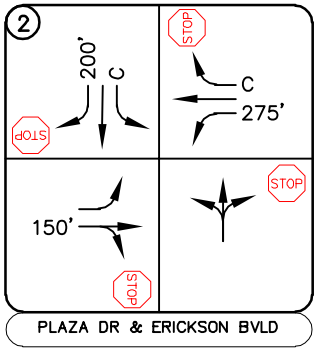
The signalized intersection of Plaza Drive and Lucent Boulevard operates with protected-only left turn phasing on all four approaches. The northbound and southbound approaches of Lucent Boulevard provide dual left turn lanes and three through lanes with the outside lane being a shared through/right turn. The eastbound approach on Plaza Drive provides dual left turn lanes and two through lanes with the outside lane being a shared through/right turn lane. The westbound approach of Plaza Drive provides dual left turn lanes, two through lanes, and a right turn lane. An aerial photo of the existing intersection configuration is below.

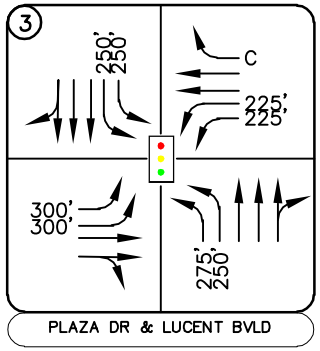
Plaza Drive and Lucent Boulevard

The intersection lane configuration and control for the study area intersections are shown in **Figure 2**.









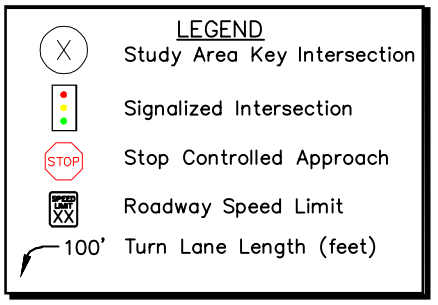


FIGURE 2
KAOS
HIGHLANDS RANCH, COLORADO
EXISTING GEOMETRY AND CONTROL

3.3 Existing Traffic Volumes

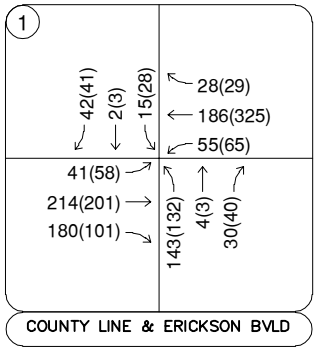
Existing turning movement counts were conducted at the study intersections on Wednesday, March 2, 2022 during the morning and afternoon peak hours. The counts were conducted during the morning and afternoon peak hours of adjacent street traffic in 15-minute intervals from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. The existing intersection traffic volumes are shown in **Figure 3** with count sheets provided in **Appendix A**.

3.4 Unspecified Development Traffic Growth

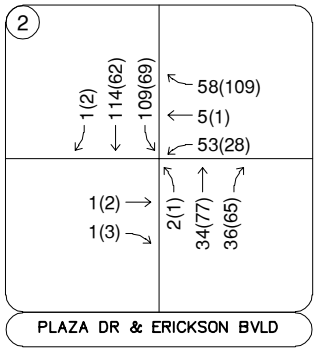
The Douglas County Transportation Plan does not provide existing and future traffic volumes that can be used to calculate an annual growth rate. The surrounding area is mostly developed and DRCOG provided a 0.36 annual growth rate calculation for this area. To provide a conservative analysis, a one (1) percent annual growth rate was used to estimate short-term 2024 and long-term 2045 traffic volume projections at the key intersections.

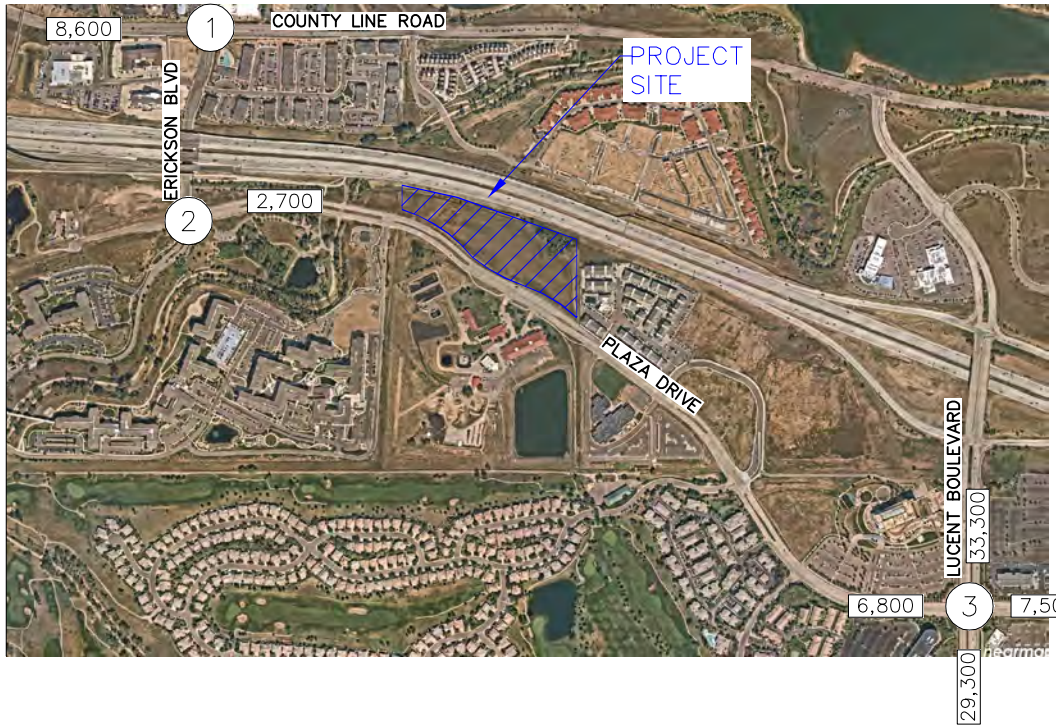
In addition, the west full movement access is proposed to align with Flying B Way. Flying B Way at Plaza Drive is currently not open to the senior living through traffic and is blocked by a temporary gate located approximately 300 feet from Plaza Drive along Flying B Way. The access currently allows through traffic from the Brinkmann Constructors site. However, because the gate is temporary, it is assumed that the senior living traffic will be able to use Flying B Way in the future. Therefore, traffic associated with the Wind Crest Retirement Community was assigned to the Flying B Way access in the future to provide a conservative analysis. Future traffic volume projections and growth rate calculations from DRCOG are provided in **Appendix B** The calculated background traffic volumes for 2024 and 2045 are shown in **Figure 4** and **Figure 5,** respectively.

Wednesday, March 2, 2022
7:45 to 8:45AM (5:00 to 6:00PM)

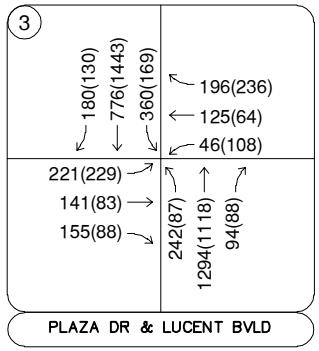


Wednesday, March 2, 2022
7:45 to 8:45AM (4:00 to 5:00PM)





Wednesday, March 2, 2022
7:15 to 8:15AM (4:45 to 5:45PM)



LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume

FIGURE 3
KAOS
HIGHLANDS RANCH, COLORADO
2022 EXISTING TRAFFIC VOLUMES

LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

FIGURE 4
KAOS
HIGHLANDS RANCH, COLORADO
2024 BACKGROUND TRAFFIC VOLUMES

FIGURE 5
KAOS
HIGHLANDS RANCH, COLORADO
2045 BACKGROUND TRAFFIC VOLUMES

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*[1] published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, Kimley-Horn used the ITE Trip Generation Report fitted curve equations that applies to Multifamily Mid-Rise Housing (ITE Land Use Code 221), for traffic associated with the development.

Kaos is expected to generate approximately 1,100 weekday daily trips, with 94 of these trips occurring during each of the morning and afternoon peak hours. Calculations were based on the procedure and information provided in the ITE *Trip Generation Manual, 11th Edition – Volume 1: User's Guide and Handbook*, 2022. **Table 1** summarizes the estimated trip generation for the Kaos. The trip generation worksheets are included in **Appendix C**.

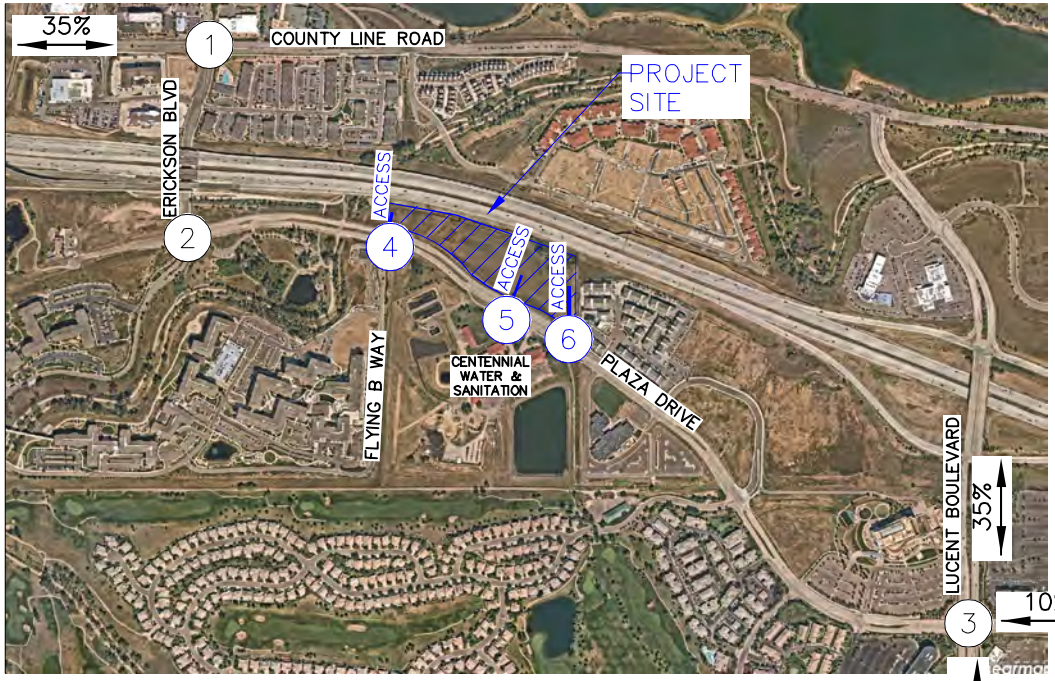
Table 1 – Kaos Traffic Generation

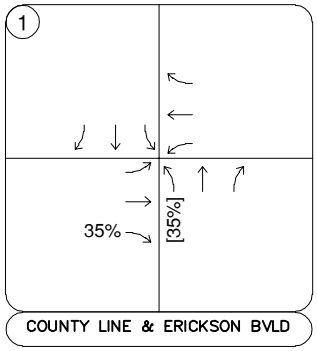
Land Use and Size	Weekday Vehicle Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Multifamily Housing (Mid-Rise) (221) – 240 Dwelling Units	1,100	22	72	94	57	37	94

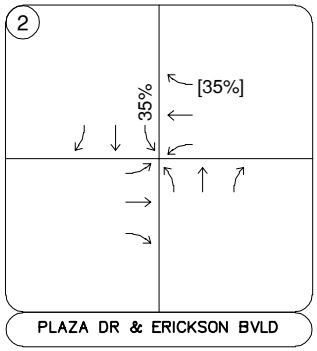
4.2 Trip Distribution

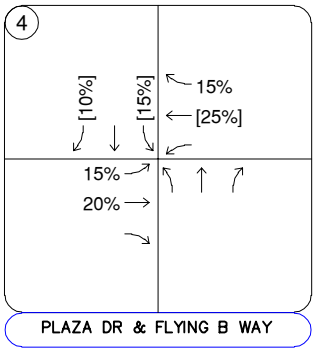
Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding demographic information, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. The project trip distribution for the proposed development is illustrated in **Figure 6**.

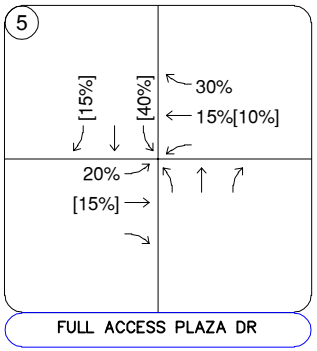
[1] Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition, Washington DC, 2022.

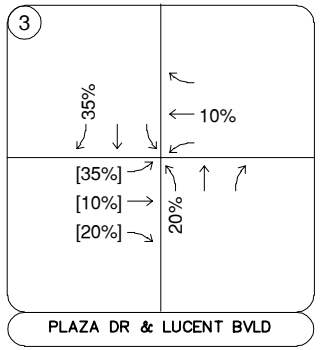


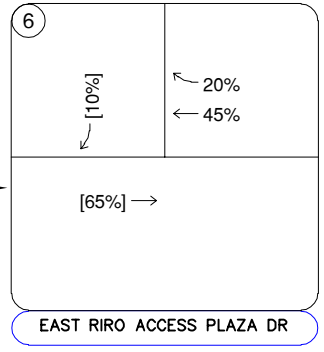












LEGEND

(X) Study Area Key Intersection

(X) Project Access Intersection

XX% External Trip Distribution Percentage

XX%[XX%] Entering[Exiting] Trip Distribution Percentage

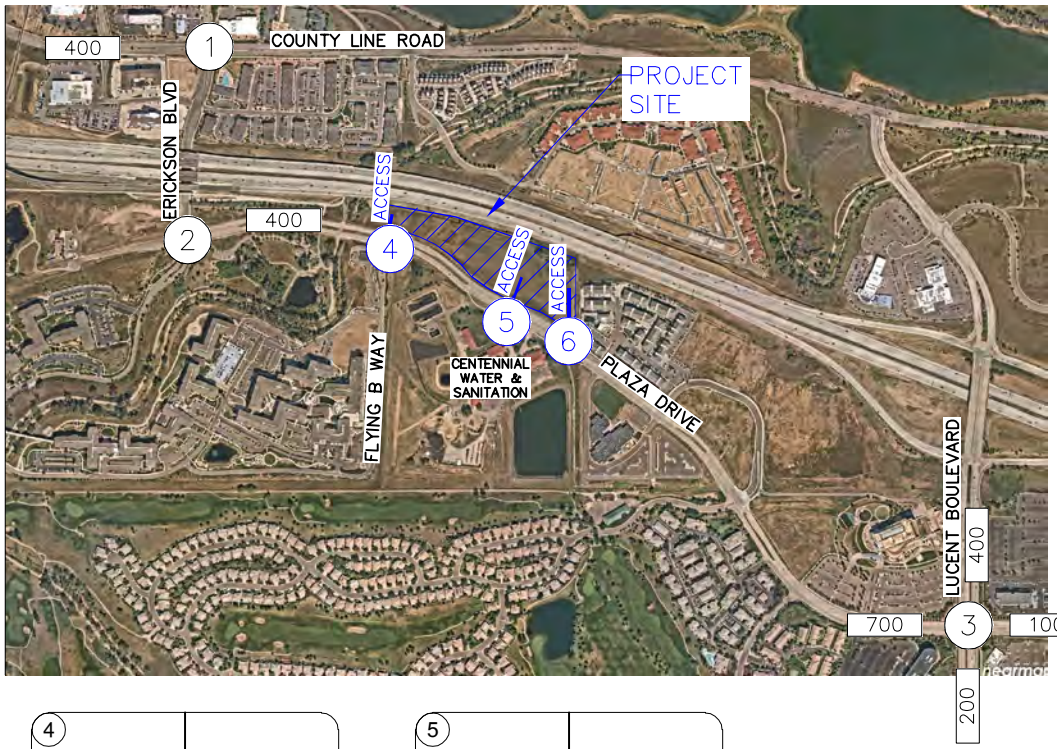
FIGURE 6
KAOS
HIGHLANDS RANCH, COLORADO
PROJECT TRIP DISTRIBUTION

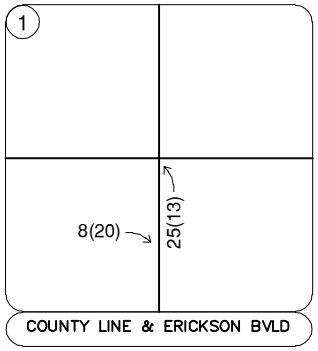
4.3 Traffic Assignment

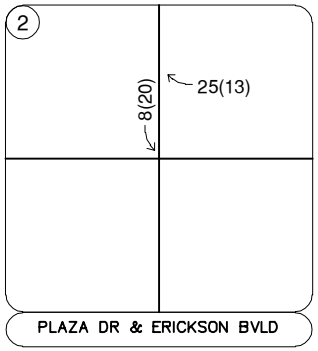
Kaos traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. Traffic assignment is shown in **Figure 7.**

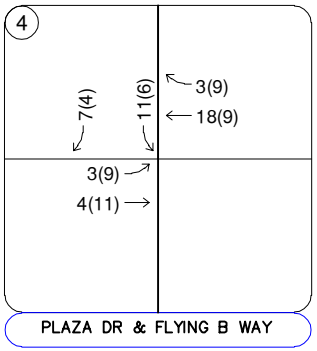
4.4 Total (Background Plus Project) Traffic

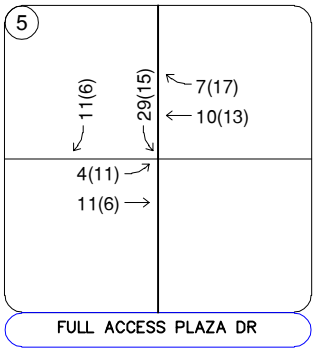
Site traffic volumes were added to the background volumes to represent estimated traffic conditions for the short-term 2024 buildout horizon and long-term 2045 twenty-year planning horizon. These total traffic volumes for the study area are illustrated for the 2024 and 2045 horizon years in **Figures 8** and **9**, respectively.

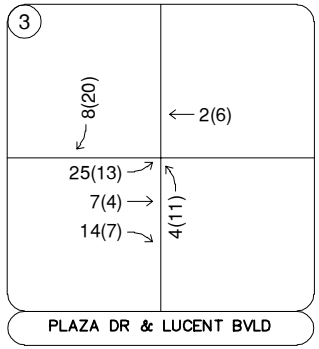


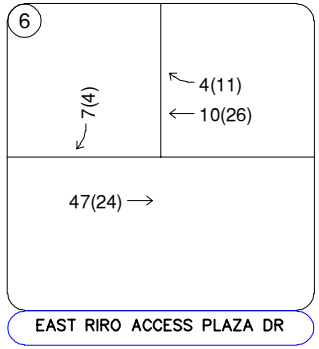












LEGEND

(X) Study Area Key Intersection

(X) Project Access Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

FIGURE 7
KAOS
HIGHLANDS RANCH, COLORADO
PROJECT TRAFFIC ASSIGNMENT

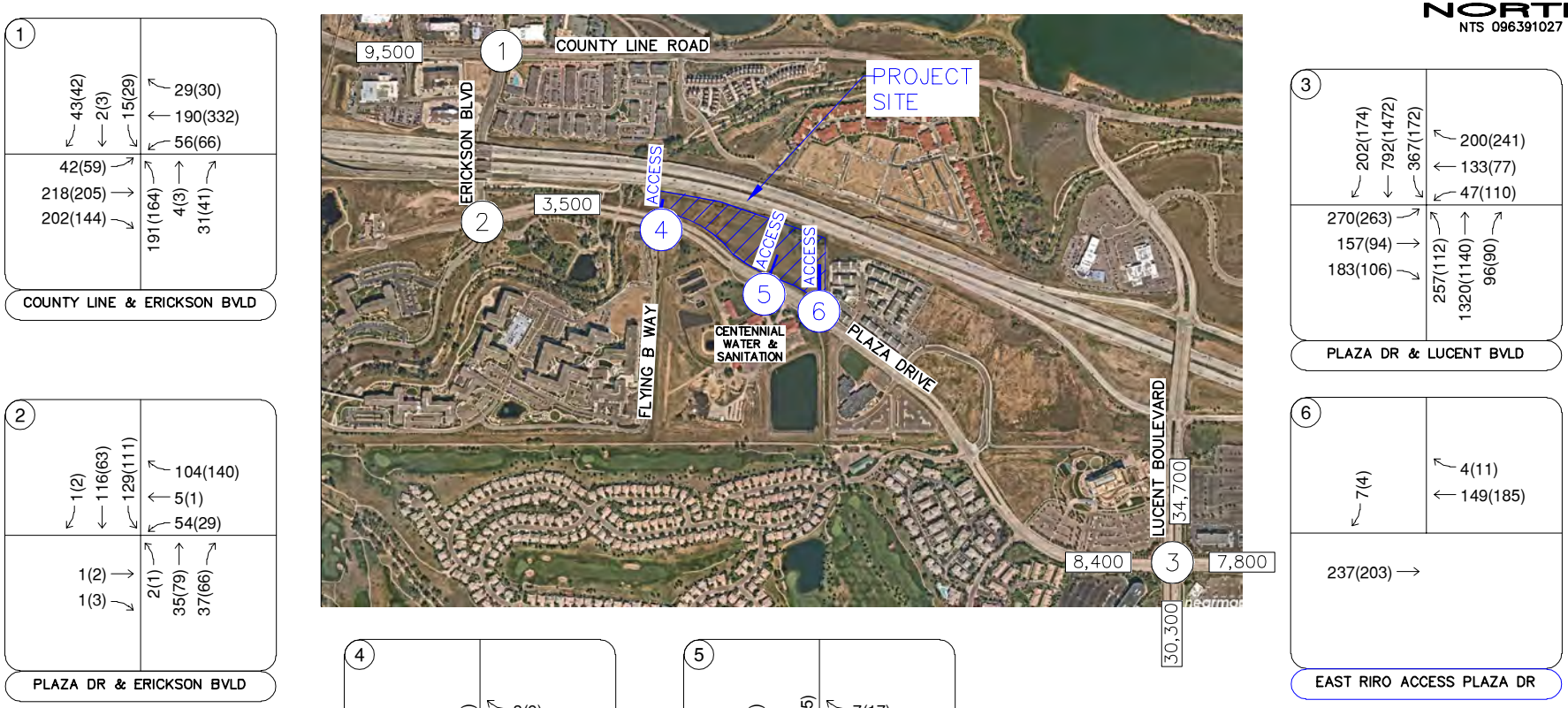
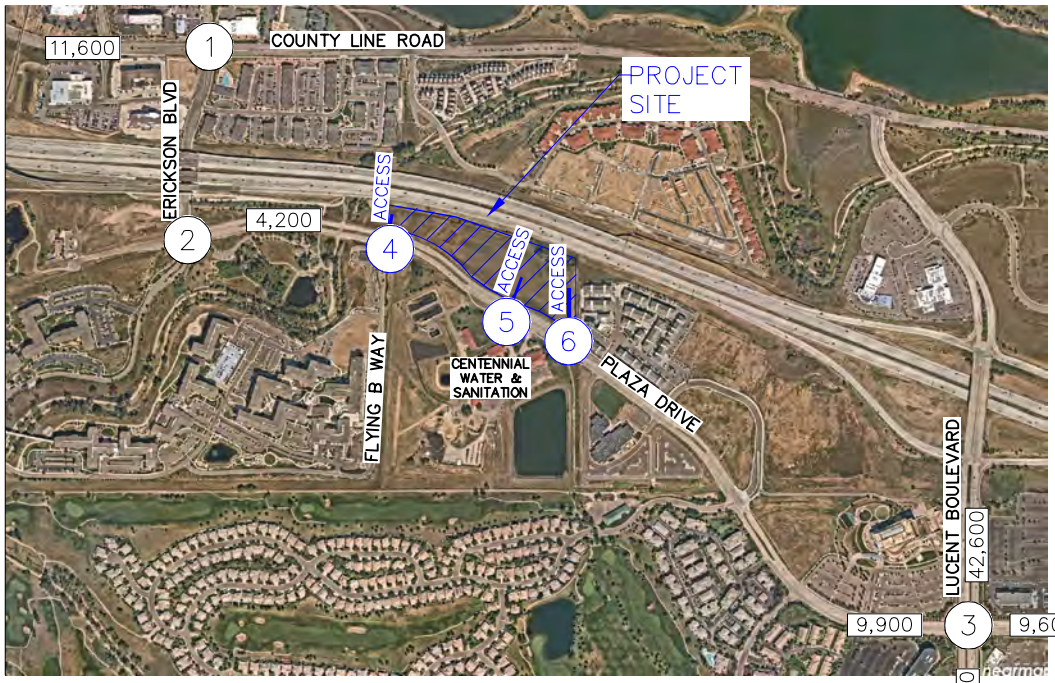
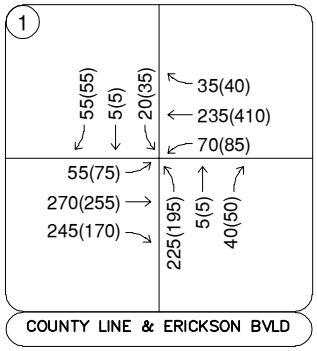
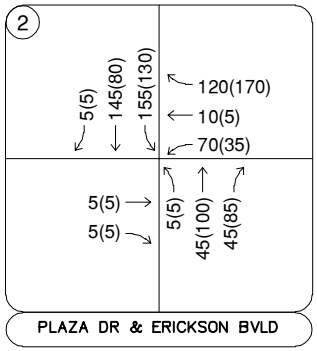
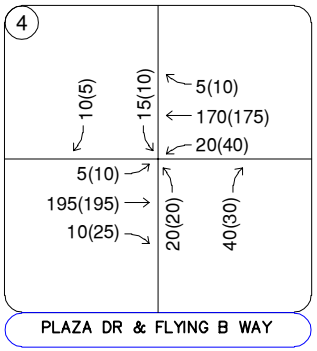


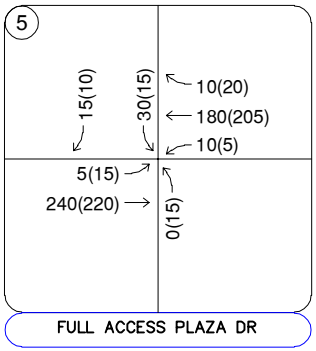
FIGURE 8
KAOS
HIGHLANDS RANCH, COLORADO
2024 TOTAL TRAFFIC VOLUMES

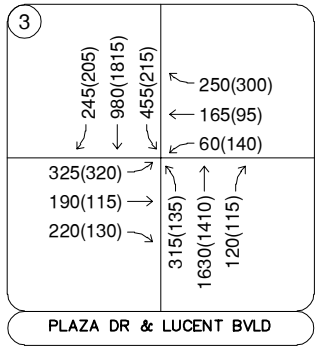


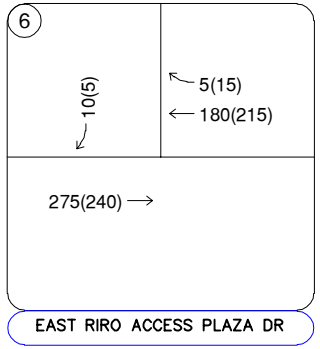












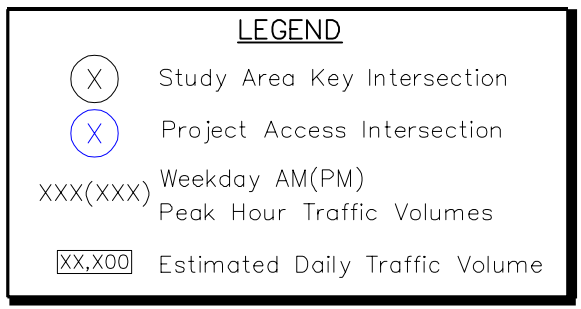


FIGURE 9
KAOS
HIGHLANDS RANCH, COLORADO
2045 TOTAL TRAFFIC VOLUMES

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2024 and 2045 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual (HCM)*[2].

5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, standard traffic engineering practice recommends overall intersection LOS D and movement/approach LOS E as the minimum desirable thresholds for acceptable operations. **Table 2** shows the definition of level of service for signalized and unsignalized intersections.

Table 2 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the LOS for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. LOS for signalized, roundabout, and all-way stop controlled intersections are defined for each approach and for the overall intersection.

[2] Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.

5.2 Key Intersection Operational Analysis

Calculations for the operational level of service at the key intersections for the study area are provided in **Appendix D**. The existing year analysis is based on the lane geometry and intersection control shown in **Figure 2.** Existing peak hour factors were utilized in the existing and 2024 horizon analysis years while the HCM urban standard of 0.92 was used for the long-term 2045 horizon analysis. The signalized intersection analysis utilizes the observed cycle lengths with optimized phasing and timing. Based on increased national attention given to establishing appropriate yellow and all-red clearance intervals to improve intersection safety, these have been calculated and are applied for approaches at the signalized intersections. The increase in yellow and all red time sacrifices intersection capacity for improved safety. Synchro traffic analysis software was used to analyze the signalized, and unsignalized key intersections for HCM level of service.

County Line Road and Erickson Boulevard

The signalized intersection of County Line Road and Erickson Boulevard operates with protected-permitted left turn phasing on all four approaches. The intersection operates acceptably at LOS C during the morning peak hour and LOS D during the afternoon peak hour under existing conditions. With project traffic, the intersection is anticipated to continue operating at an acceptable LOS C during the morning peak hour and LOS D during the afternoon peak hour throughout the 2045 horizon. Therefore, no improvements or modifications are anticipated to be needed at this intersection based on the addition of project traffic and the operational level of service analysis. **Table 3** provides the results of the LOS analysis conducted at this intersection.

Table 3 – County Line Road & Erickson Boulevard LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2022 Existing	32.9	C	35.9	D
2024 Background	33.0	C	36.2	D
2024 Background Plus Project	33.6	C	36.5	D
2045 Background	34.1	C	36.5	D
2045 Background Plus Project	34.5	C	36.8	D

Plaza Drive and Erickson Boulevard

The unsignalized intersection of Plaza Drive and Erickson Boulevard operates with all-way stop control on all four approaches. The intersection operates acceptably at LOS A during both peak hours under existing conditions. With project traffic, the intersection is anticipated to continue operating at an acceptable level of service A during both studied weekday peak hours throughout the 2045 horizon. Therefore, no improvements or modifications are anticipated to be needed at this intersection based on the addition of project traffic and this operational analysis. **Table 4** provides the results of the LOS analysis conducted at this intersection.

Table 4 – Plaza Drive & Erickson Boulevard LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2022 Existing	**8.9**	**A**	**9.2**	**A**
Eastbound Approach	8.2	A	8.3	A
Westbound Approach	7.6	A	8.9	A
Northbound Approach	8.5	A	9.7	A
Southbound Approach	9.1	A	9.0	A
2024 Background	**9.1**	**A**	**9.5**	**A**
Eastbound Approach	8.3	A	8.5	A
Westbound Approach	8.7	A	9.2	A
Northbound Approach	8.7	A	10.0	A
Southbound Approach	9.4	A	9.4	A
2024 Background Plus Project	**9.2**	**A**	**9.9**	**A**
Eastbound Approach	8.4	A	8.6	A
Westbound Approach	8.8	A	9.6	A
Northbound Approach	8.8	A	10.3	B
Southbound Approach	9.5	A	9.8	A
2045 Background	**9.4**	**A**	**9.5**	**A**
Eastbound Approach	8.5	A	8.5	A
Westbound Approach	9.0	A	9.2	A
Northbound Approach	9.1	A	10.1	B
Southbound Approach	9.7	A	9.4	A
2045 Background Plus Project	**9.5**	**A**	**10.0**	**A**
Eastbound Approach	8.8	A	8.8	A
Westbound Approach	9.3	A	9.6	A
Northbound Approach	9.4	A	10.6	B
Southbound Approach	10.0	A	9.8	A

Plaza Drive and Lucent Boulevard

The signalized intersection of Plaza Drive and Lucent Boulevard operates with protected-only left turn phasing on all four approaches. The intersection operates acceptably at LOS D during the morning peak hour and LOS C during the afternoon peak hour under existing conditions. With project traffic, the intersection is anticipated to continue operating at an acceptable level of service of D during the morning peak hour and LOS C during the afternoon peak hour in 2024. In the 2045 horizon, the intersection is anticipated to operate acceptably with a LOS D during both studied weekday peak hours with the addition of project traffic. Therefore, no improvements or modifications are anticipated to be needed at this intersection based on the addition of project traffic and this operational level of service analysis. **Table 5** provides the results of the LOS analysis conducted at this intersection.

Table 5 – Plaza Drive & Lucent Boulevard LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2022 Existing	38.2	D	33.6	C
2024 Background	39.6	D	34.9	C
2024 Background Plus Project	40.6	D	35.8	D
2045 Background	52.5	D	41.0	D
2045 Background Plus Project	54.4	D	42.4	D

Project Accesses

With completion of the Kaos project, a full movement access that aligns with Flying B Way and a full movement access that aligns with the Centennial Water & Sanitation full movement access along Plaza Drive will be provided. In addition, one (1) right-in/right-out access is proposed approximately 450 feet east of the full movement access aligned with the Centennial Water & Sanitation driveway location. “STOP” (R1-1) signs are recommended to be installed on the southbound approaches of all three (3) accesses, exiting the development. In addition, a R3-2 No Left Turn sign should be placed underneath the R1-1 “STOP” sign at the right-in/right-out (RIRO) access. Furthermore, a R6-1R “ONE WAY” sign could be placed within the existing raised median of Plaza Drive. Eastbound left turn lanes are recommended at the full movement access that aligns with Flying B Way and for the full movement access that aligns with the Centennial Water & Sanitation driveway. The western access to align with Flying B Way will require median construction whereas the middle access to align with Centennial Water will just require restriping for the eastbound left turn lanes. **Table 6** provides the results of the level of service analysis for these project accesses. As shown in the table, the project access intersections along Plaza Drive are anticipated to have all movements operating with acceptable LOS B or better during the peak hours in both the buildout year 2024 and the 2045 long term horizons.

Table 6 – Project Access Level of Service Results

Intersection	2024 Total				2045 Total			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS
Plaza Drive & Flying B Way								
Northbound Approach	9.8	A	9.9	A	10.0	B	10.8	B
Eastbound Left	7.5	A	7.6	A	7.6	A	7.7	A
Westbound Left	7.6	A	7.7	A	7.7	A	7.8	A
Southbound Approach	10.0	B	10.2	B	10.3	B	11.3	B
Plaza Drive Full Access								
Northbound Approach	0.0	A	10.8	B	0.0	A	11.3	B
Eastbound Left	7.6	A	7.7	A	7.7	A	7.8	A
Westbound Left	7.7	A	7.6	A	7.8	A	7.7	A
Southbound Approach	10.3	B	10.3	B	10.6	B	10.5	B
Plaza Drive East RIRO								
Southbound Right	8.8	A	8.9	A	8.9	A	9.0	A

5.3 Vehicle Queuing Analysis

A vehicle queuing analysis was conducted for the study area intersections. The queuing analysis was performed using Synchro presenting the results of the 95th percentile queue lengths. Results are shown in the following **Table 7** with calculations provided within the level of service operational sheets of **Appendix D** for unsignalized intersections and **Appendix E** for signalized intersections.

Table 7 – Turn Lane Queuing Analysis Results

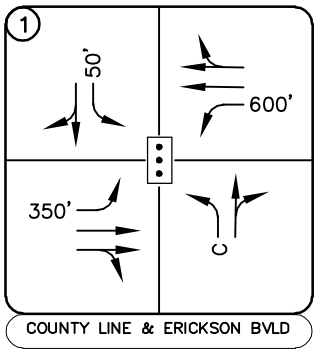
Intersection Turn Lane	Existing Turn Lane Length (feet)	2024 Calculated Queue (feet)	2024 Recommended Length (feet)	2045 Calculated Queue (feet)	2045 Recommended Length (feet)
County Line & Erickson Blvd					
Eastbound Left	350’	54’	350’	61’	350’
Westbound Left	600’	60’	600’	67’	600’
Northbound Left	C	115’	C	142’	C
Southbound Left	50’	25’	50’	31’	50’
Plaza Dr & Erickson Blvd					
Eastbound Through/Right	150’	25’	150’	25’	150’
Westbound Left	275’	25’	275’	25’	275’
Westbound Right	C	25’	C	25’	C
Southbound Left	C	25’	C	25’	C
Southbound Right	200’	25’	200’	25’	200’
Plaza Dr & Lucent Blvd					
Eastbound Left	300’ DL	189’	300’ DL	241’	300’ DL
Westbound Left	225’ DL	85’	225’ DL	104’	225’ DL
Westbound Right	C	182’	C	241’	C
Northbound Left	250’/275’	149’	250’/275’	179’	250’/275’
Southbound Left	250’ DL	200’	250’ DL	250’	250’ DL
Plaza Drive & Flying B Way					
Eastbound Left	DNE	25’	**250’**	25’	**250’**
Westbound Left	275’	25’	275’	25’	275’
Plaza Dr Full Access					
Eastbound Left	DNE	25’	**250’**	25’	**250’**
Westbound Left	275’	25’	275’	25’	275’

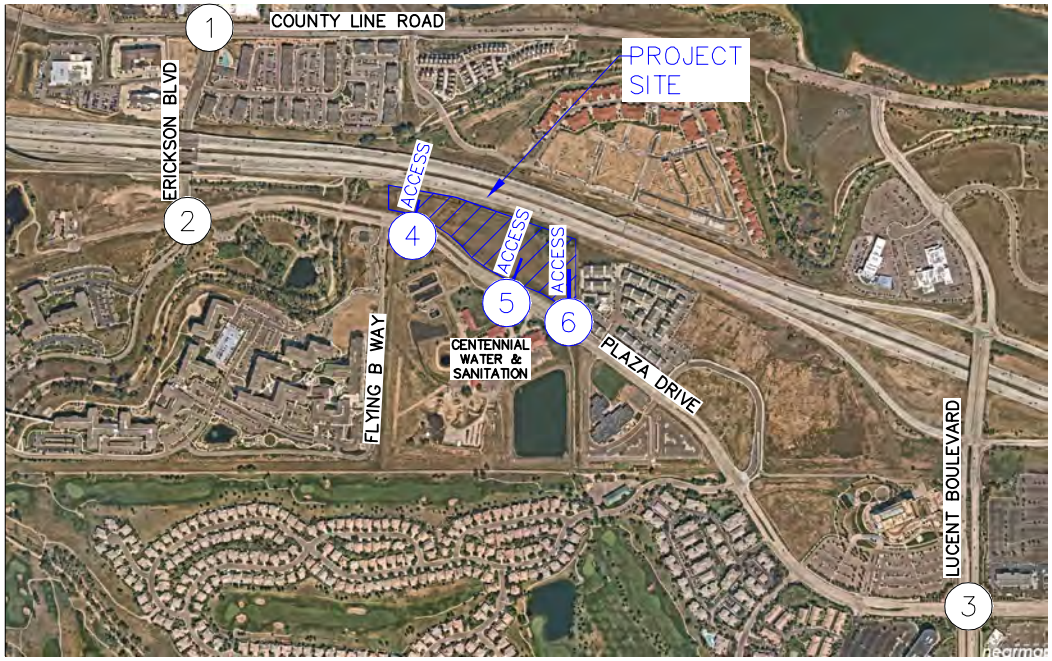
DNE = Does Not Exist; C = Continuous; **Red** Text = Storage Deficiency; **Blue** Text = Recommendation

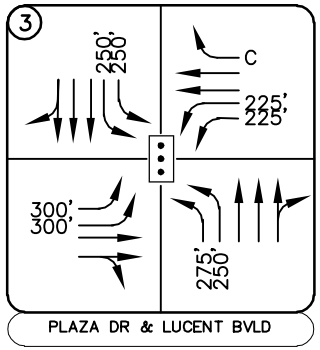
All queues are anticipated to remain within the existing or recommended turn lane lengths through 2045. The eastbound left turn lanes at the full movement accesses are recommended to provide a length of 250 feet.

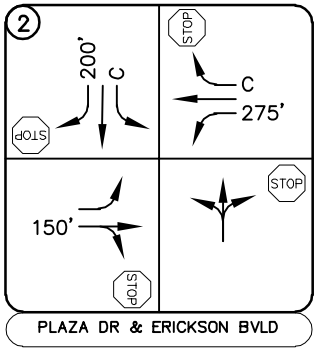
5.4 Improvement Summary

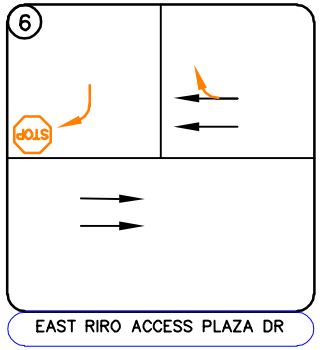
Based on the results of the intersection operational and vehicle queuing analysis, the key intersection recommended improvements and control are shown in **Figure 10**.

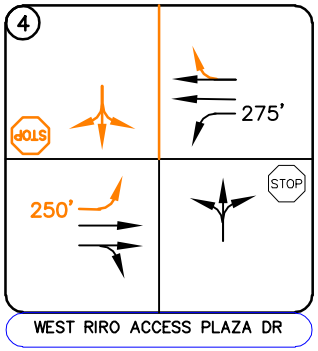


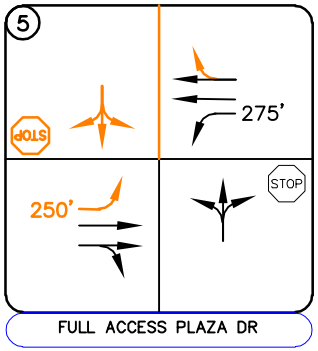












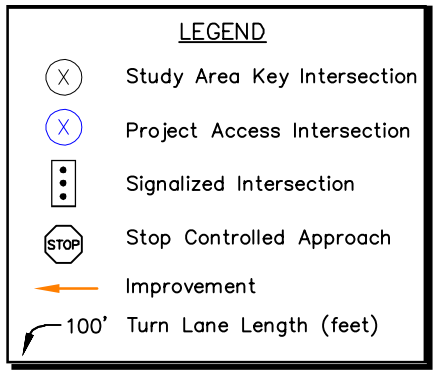


FIGURE 10
KAOS
HIGHLANDS RANCH, COLORADO
RECOMMENDED GEOMETRY AND CONTROL

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, Kimley-Horn believes Kaos will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following recommendations:

- With completion of the Kaos project, a full movement access that aligns with Flying B Way and a full movement access that aligns with the Centennial Water & Sanitation full movement access along Plaza Drive will be provided. In addition, one (1) right-in/right-out access is proposed approximately 450 feet east of the full movement access aligned with the Centennial Water & Sanitation driveway location. “STOP” (R1-1) signs are recommended to be installed on the southbound approaches of all three (3) accesses, exiting the development. In addition, a R3-2 No Left Turn sign should be placed underneath the R1-1 “STOP” sign at the right-in/right-out (RIRO) access. Furthermore, a R6-1R “ONE WAY” sign could be placed within the existing raised median of Plaza Drive. The eastbound left turn lanes at the full movement accesses are recommended to provide a length of 250 feet. The western access to align with Flying B Way will require median construction whereas the middle access to align with Centennial Water will just require restriping for the eastbound left turn lanes.

- Any on-site or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the Douglas County and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

APPENDICES

APPENDIX A

Intersection Count Sheets

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
County Line Rd & Erickson/Southpark

File Name : County Line and Erickson AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 1

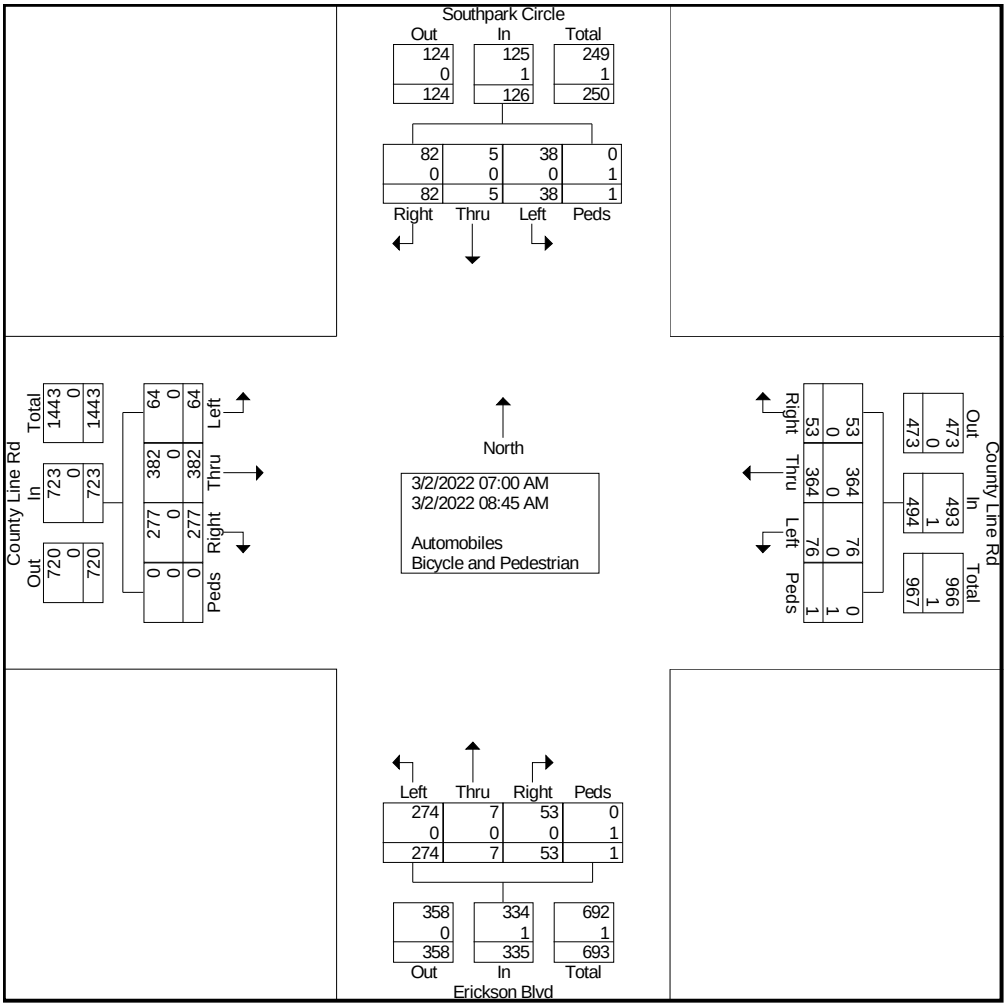
Groups Printed- Automobiles - Bicycle and Pedestrian

	County Line Rd Eastbound					County Line Rd Westbound					Erickson Blvd Northbound					Southpark Circle 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
07:00 AM	8	46	27	0	81	2	43	7	0	52	34	2	7	0	43	6	2	10	0	18	194
07:15 AM	3	29	24	0	56	4	54	2	1	61	41	1	6	1	49	5	0	12	1	18	184
07:30 AM	7	43	19	0	69	8	39	7	0	54	26	0	4	0	30	6	0	11	0	17	170
07:45 AM	11	67	60	0	138	16	51	10	0	77	39	2	7	0	48	7	1	8	0	16	279
Total	29	185	130	0	344	30	187	26	1	244	140	5	24	1	170	24	3	41	1	69	827
08:00 AM	4	50	57	0	111	16	42	9	0	67	34	2	5	0	41	5	1	14	0	20	239
08:15 AM	16	47	34	0	97	14	45	4	0	63	36	0	8	0	44	2	0	8	0	10	214
08:30 AM	10	50	29	0	89	9	48	5	0	62	34	0	10	0	44	1	0	12	0	13	208
08:45 AM	5	50	27	0	82	7	42	9	0	58	30	0	6	0	36	6	1	7	0	14	190
Total	35	197	147	0	379	46	177	27	0	250	134	2	29	0	165	14	2	41	0	57	851
Grand Total	64	382	277	0	723	76	364	53	1	494	274	7	53	1	335	38	5	82	1	126	1678
Apprch %	8.9	52.8	38.3	0		15.4	73.7	10.7	0.2		81.8	2.1	15.8	0.3		30.2	4	65.1	0.8		
Total %	3.8	22.8	16.5	0	43.1	4.5	21.7	3.2	0.1	29.4	16.3	0.4	3.2	0.1	20	2.3	0.3	4.9	0.1	7.5	
Automobiles	64	382	277	0	723	76	364	53	0	493	274	7	53	0	334	38	5	82	0	125	1675
% Automobiles	100	100	100	0	100	100	100	100	0	99.8	100	100	100	0	99.7	100	100	100	0	99.2	99.8
Bicycle and Pedestrian	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	3
% Bicycle and Pedestrian	0	0	0	0	0	0	0	0	100	0.2	0	0	0	100	0.3	0	0	0	100	0.8	0.2

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
County Line Rd & Erickson/Southpark

File Name : County Line and Erickson AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 2

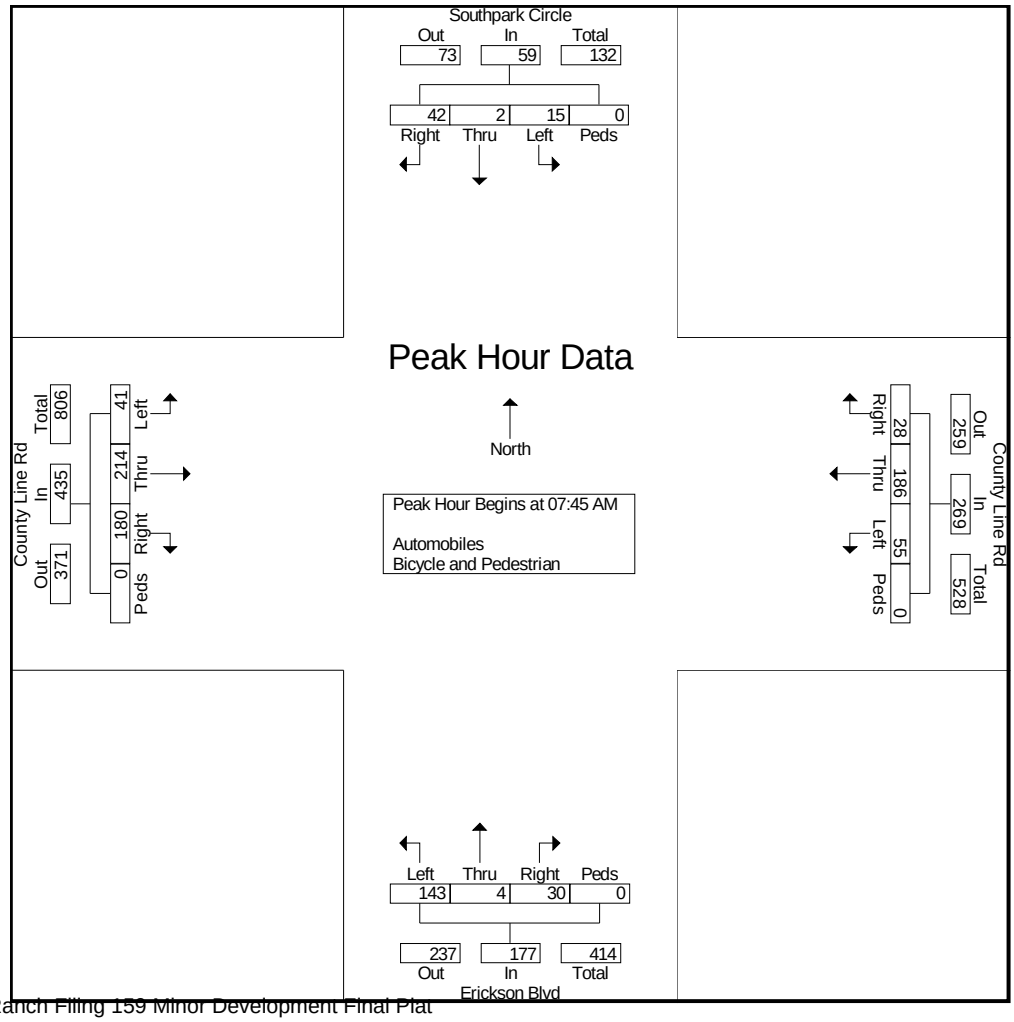


Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
County Line Rd & Erickson/Southpark

File Name : County Line and Erickson AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 3

	County Line Rd Eastbound					County Line Rd Westbound					Erickson Blvd Northbound					Southpark Circle 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 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	11	**67**	**60**	0	**138**	**16**	**51**	**10**	0	**77**	**39**	**2**	7	0	**48**	**7**	**1**	8	0	16	**279**
08:00 AM	4	50	57	0	111	16	42	9	0	67	34	2	5	0	41	5	1	**14**	0	**20**	239
08:15 AM	**16**	47	34	0	97	14	45	4	0	63	36	0	8	0	44	2	0	8	0	10	214
08:30 AM	10	50	29	0	89	9	48	5	0	62	34	0	**10**	0	44	1	0	12	0	13	208
Total Volume	41	214	180	0	435	55	186	28	0	269	143	4	30	0	177	15	2	42	0	59	940
% App. Total	9.4	49.2	41.4	0		20.4	69.1	10.4	0		80.8	2.3	16.9	0		25.4	3.4	71.2	0		
PHF	.641	.799	.750	.000	.788	.859	.912	.700	.000	.873	.917	.500	.750	.000	.922	.536	.500	.750	.000	.738	.842



Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
County Line Rd & Erickson/Southpark

File Name : County Line and Erickson PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 1

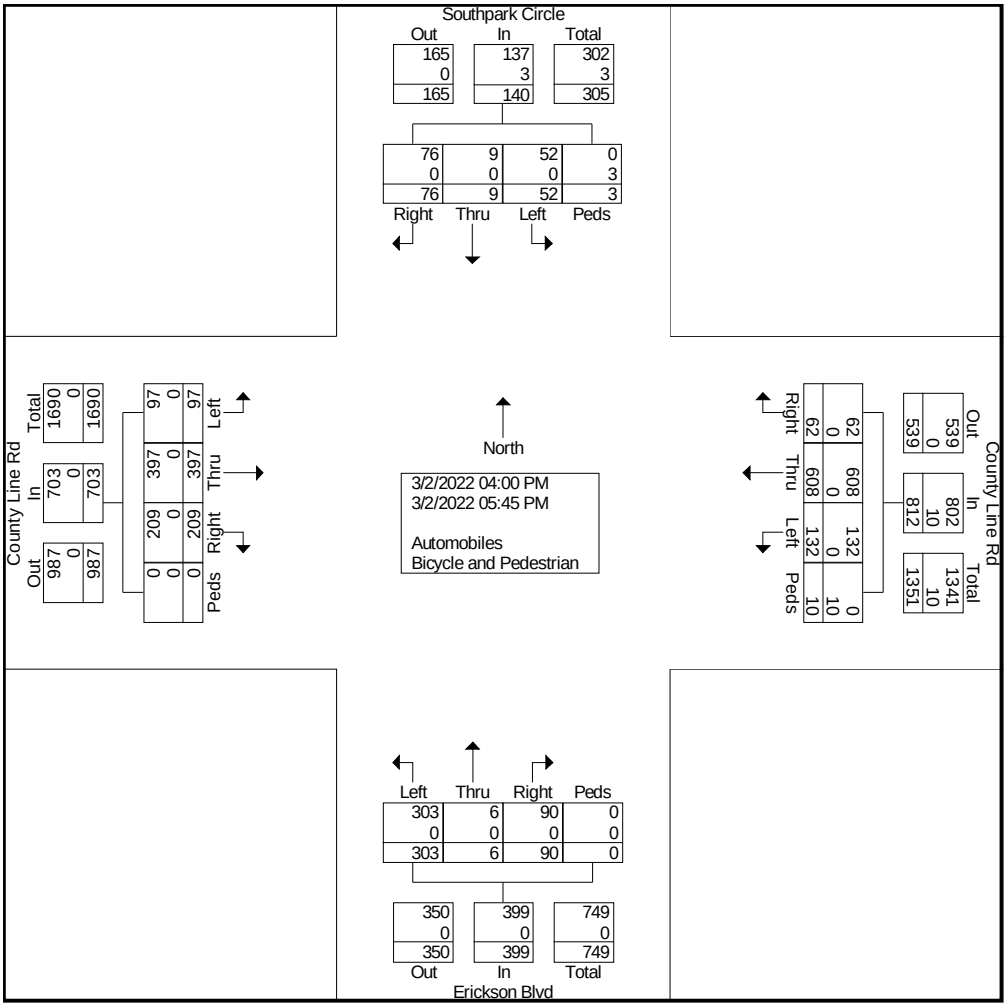
Groups Printed- Automobiles - Bicycle and Pedestrian

	County Line Rd Eastbound					County Line Rd Westbound					Erickson Blvd Northbound					Southpark Circle 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
04:00 PM	8	58	23	0	89	24	70	8	3	105	54	0	15	0	69	7	1	12	1	21	284
04:15 PM	11	48	38	0	97	19	75	8	1	103	39	0	13	0	52	7	2	6	0	15	267
04:30 PM	9	40	29	0	78	14	75	8	0	97	37	1	12	0	50	5	3	11	0	19	244
04:45 PM	11	50	18	0	79	10	63	9	0	82	41	2	10	0	53	5	0	6	0	11	225
Total	39	196	108	0	343	67	283	33	4	387	171	3	50	0	224	24	6	35	1	66	1020
05:00 PM	12	51	27	0	90	21	103	4	1	129	41	0	11	0	52	8	1	11	1	21	292
05:15 PM	13	53	28	0	94	18	75	7	1	101	32	3	9	0	44	12	1	11	0	24	263
05:30 PM	13	45	26	0	84	8	77	8	2	95	35	0	8	0	43	5	0	12	1	18	240
05:45 PM	20	52	20	0	92	18	70	10	2	100	24	0	12	0	36	3	1	7	0	11	239
Total	58	201	101	0	360	65	325	29	6	425	132	3	40	0	175	28	3	41	2	74	1034
Grand Total	97	397	209	0	703	132	608	62	10	812	303	6	90	0	399	52	9	76	3	140	2054
Apprch %	13.8	56.5	29.7	0		16.3	74.9	7.6	1.2		75.9	1.5	22.6	0		37.1	6.4	54.3	2.1		
Total %	4.7	19.3	10.2	0	34.2	6.4	29.6	3	0.5	39.5	14.8	0.3	4.4	0	19.4	2.5	0.4	3.7	0.1	6.8	
Automobiles	97	397	209	0	703	132	608	62	0	802	303	6	90	0	399	52	9	76	0	137	2041
% Automobiles	100	100	100	0	100	100	100	100	0	98.8	100	100	100	0	100	100	100	100	0	97.9	99.4
Bicycle and Pedestrian	0	0	0	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	3	3	13
% Bicycle and Pedestrian	0	0	0	0	0	0	0	0	100	1.2	0	0	0	0	0	0	0	0	100	2.1	0.6

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
County Line Rd & Erickson/Southpark

File Name : County Line and Erickson PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 2

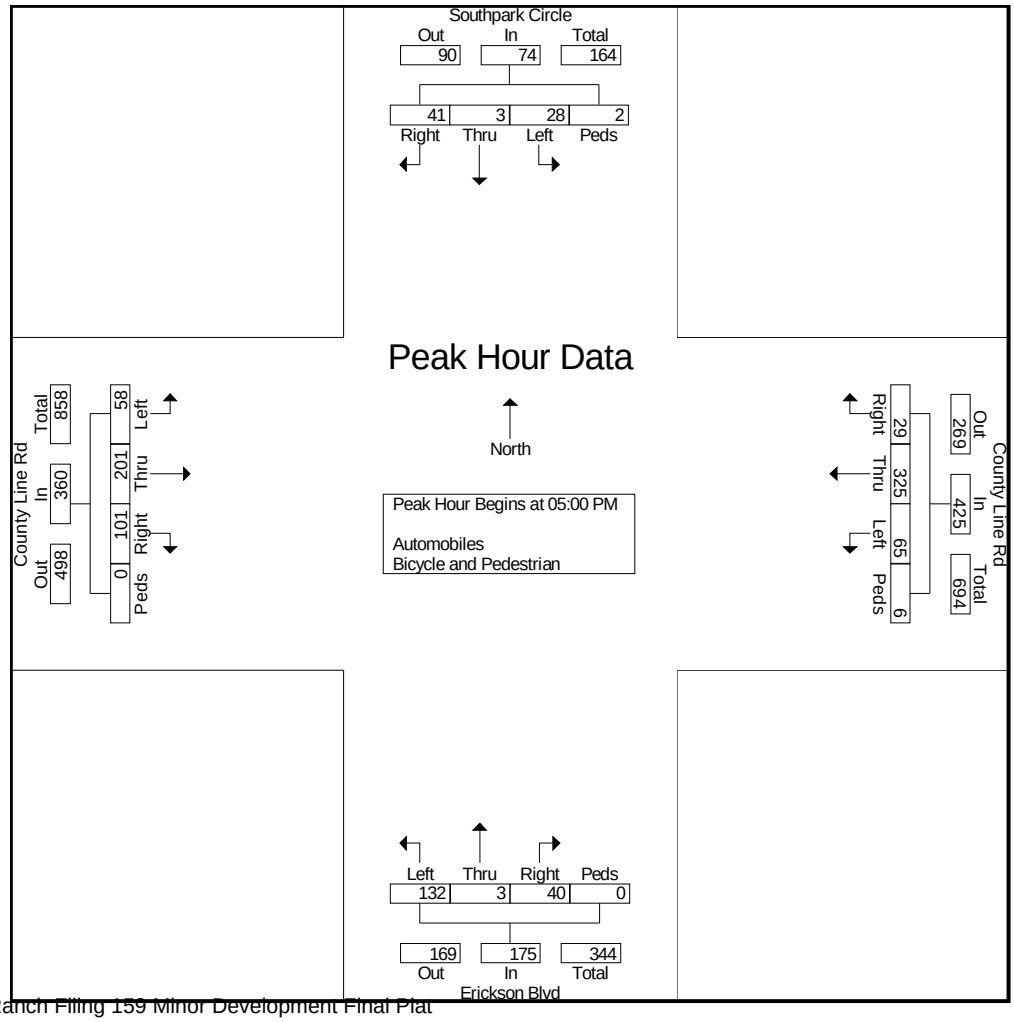


Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
County Line Rd & Erickson/Southpark

File Name : County Line and Erickson PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 3

	County Line Rd Eastbound					County Line Rd Westbound					Erickson Blvd Northbound					Southpark Circle 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 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	12	51	27	0	90	**21**	**103**	4	1	**129**	**41**	0	11	0	**52**	8	**1**	11	**1**	21	**292**
05:15 PM	13	**53**	**28**	0	**94**	18	75	7	1	101	32	**3**	9	0	44	**12**	1	11	0	**24**	263
05:30 PM	13	45	26	0	84	8	77	8	**2**	95	35	0	8	0	43	5	0	**12**	1	18	240
05:45 PM	**20**	52	20	0	92	18	70	**10**	2	100	24	0	**12**	0	36	3	1	7	0	11	239
Total Volume	58	201	101	0	360	65	325	29	6	425	132	3	40	0	175	28	3	41	2	74	1034
% App. Total	16.1	55.8	28.1	0		15.3	76.5	6.8	1.4		75.4	1.7	22.9	0		37.8	4.1	55.4	2.7		
PHF	.725	.948	.902	.000	.957	.774	.789	.725	.750	.824	.805	.250	.833	.000	.841	.583	.750	.854	.500	.771	.885



Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr & Erickson Blvd

File Name : Plaza and Erickson AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 1

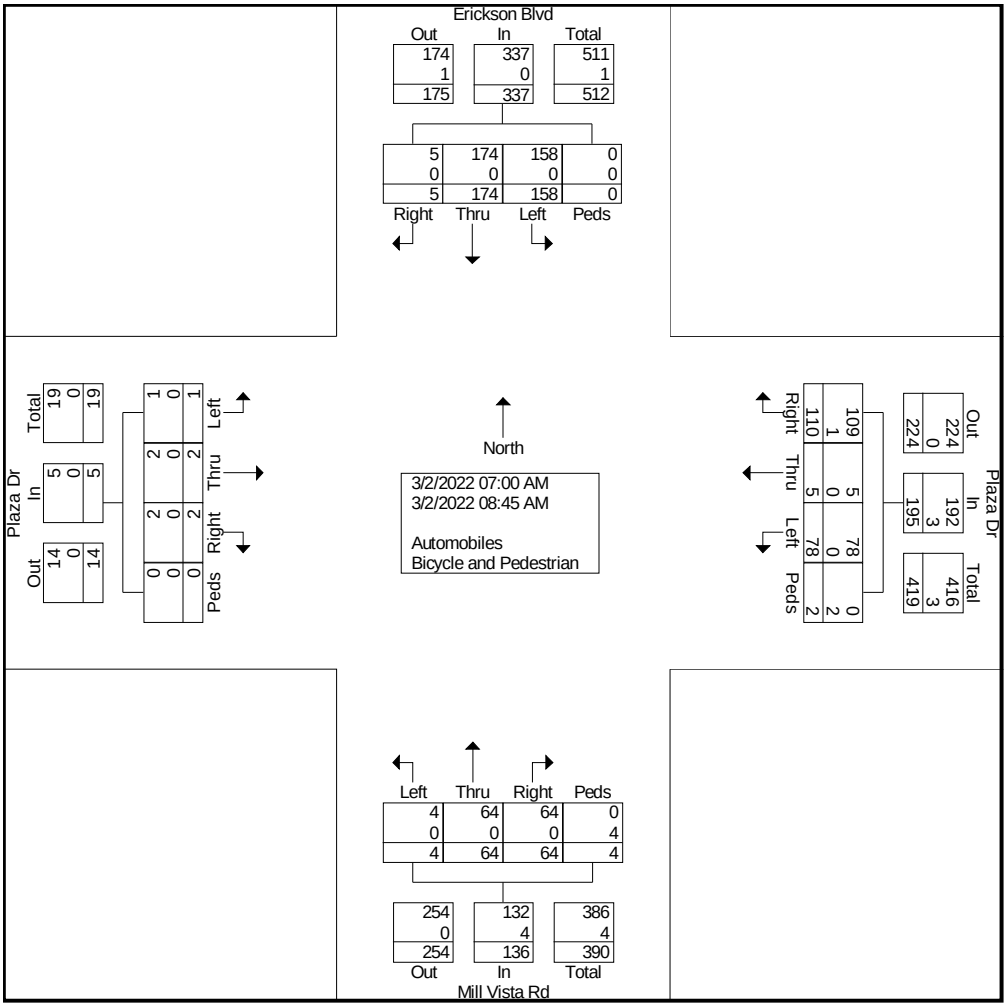
Groups Printed- Automobiles - Bicycle and Pedestrian

	Plaza Dr Eastbound					Plaza Dr Westbound					Mill Vista Rd Northbound					Erickson Blvd 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
07:00 AM	0	0	0	0	0	5	0	14	0	19	1	7	5	1	14	18	15	0	0	33	66
07:15 AM	1	0	0	0	1	5	0	15	1	21	0	4	5	0	9	18	10	2	0	30	61
07:30 AM	0	0	0	0	0	10	0	15	0	25	1	3	7	0	11	12	10	0	0	22	58
07:45 AM	0	0	1	0	1	15	1	16	0	32	1	6	4	0	11	42	33	0	0	75	119
Total	1	0	1	0	2	35	1	60	1	97	3	20	21	1	45	90	68	2	0	160	304
08:00 AM	0	0	0	0	0	15	1	16	1	33	0	7	6	0	13	46	24	0	0	70	116
08:15 AM	0	0	0	0	0	10	0	12	0	22	1	8	16	0	25	10	36	1	0	47	94
08:30 AM	0	1	0	0	1	13	3	14	0	30	0	13	10	0	23	11	21	0	0	32	86
08:45 AM	0	1	1	0	2	5	0	8	0	13	0	16	11	3	30	1	25	2	0	28	73
Total	0	2	1	0	3	43	4	50	1	98	1	44	43	3	91	68	106	3	0	177	369
Grand Total	1	2	2	0	5	78	5	110	2	195	4	64	64	4	136	158	174	5	0	337	673
Apprch %	20	40	40	0		40	2.6	56.4	1		2.9	47.1	47.1	2.9		46.9	51.6	1.5	0		
Total %	0.1	0.3	0.3	0	0.7	11.6	0.7	16.3	0.3	29	0.6	9.5	9.5	0.6	20.2	23.5	25.9	0.7	0	50.1	
Automobiles	1	2	2	0	5	78	5	109	0	192	4	64	64	0	132	158	174	5	0	337	666
% Automobiles	100	100	100	0	100	100	100	99.1	0	98.5	100	100	100	0	97.1	100	100	100	0	100	99
Bicycle and Pedestrian	0	0	0	0	0	0	0	1	2	3	0	0	0	4	4	0	0	0	0	0	7
% Bicycle and Pedestrian	0	0	0	0	0	0	0	0.9	100	1.5	0	0	0	100	2.9	0	0	0	0	0	1

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr & Erickson Blvd

File Name : Plaza and Erickson AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 2

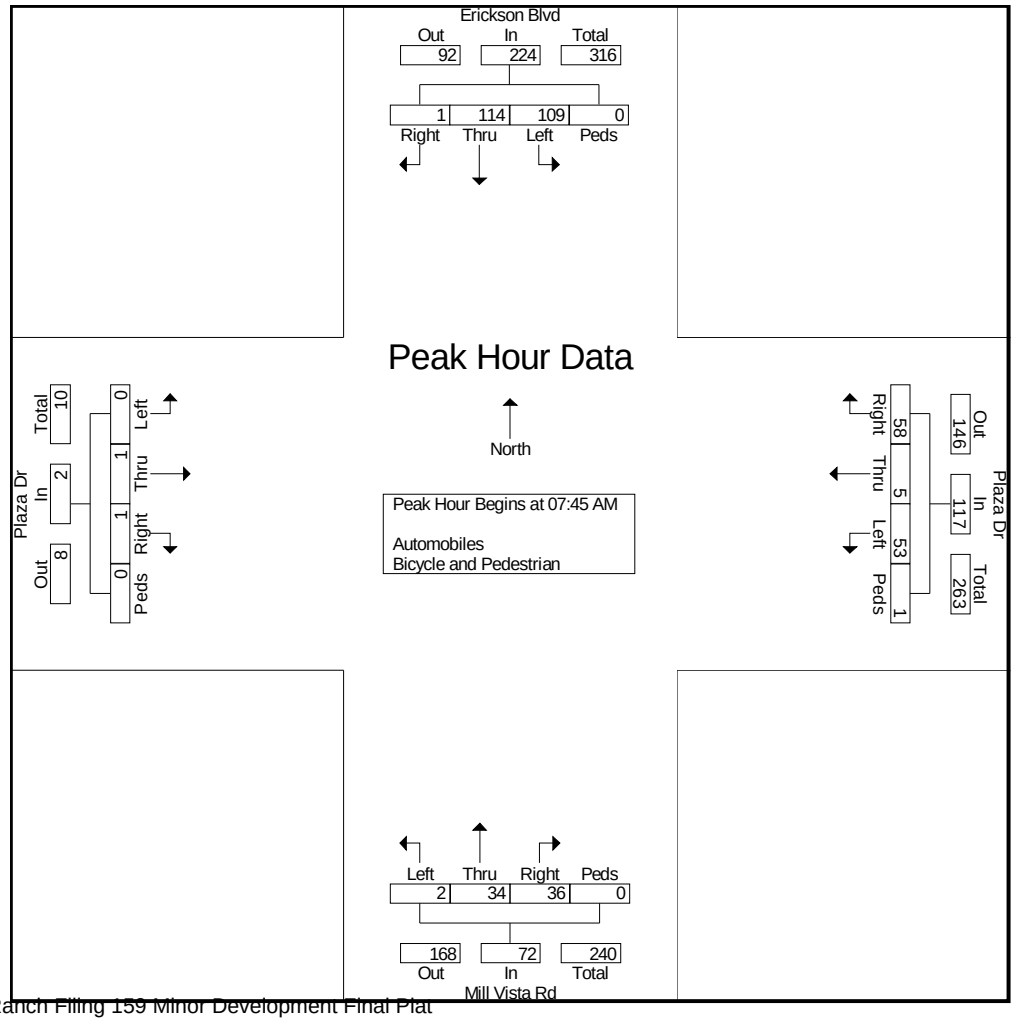


Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr & Erickson Blvd

File Name : Plaza and Erickson AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 3

	Plaza Dr Eastbound					Plaza Dr Westbound					Mill Vista Rd Northbound					Erickson Blvd 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 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	**1**	0	**1**	**15**	1	**16**	0	32	**1**	6	4	0	11	42	33	0	0	**75**	**119**
08:00 AM	0	0	0	0	0	15	1	16	**1**	**33**	0	7	6	0	13	**46**	24	0	0	70	116
08:15 AM	0	0	0	0	0	10	0	12	0	22	1	8	**16**	0	**25**	10	**36**	**1**	0	47	94
08:30 AM	0	**1**	0	0	1	13	**3**	14	0	30	0	**13**	10	0	23	11	21	0	0	32	86
Total Volume	0	1	1	0	2	53	5	58	1	117	2	34	36	0	72	109	114	1	0	224	415
% App. Total	0	50	50	0		45.3	4.3	49.6	0.9		2.8	47.2	50	0		48.7	50.9	0.4	0		
PHF	.000	.250	.250	.000	.500	.883	.417	.906	.250	.886	.500	.654	.563	.000	.720	.592	.792	.250	.000	.747	.872



Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr & Erickson Blvd

File Name : Plaza and Erickson PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 1

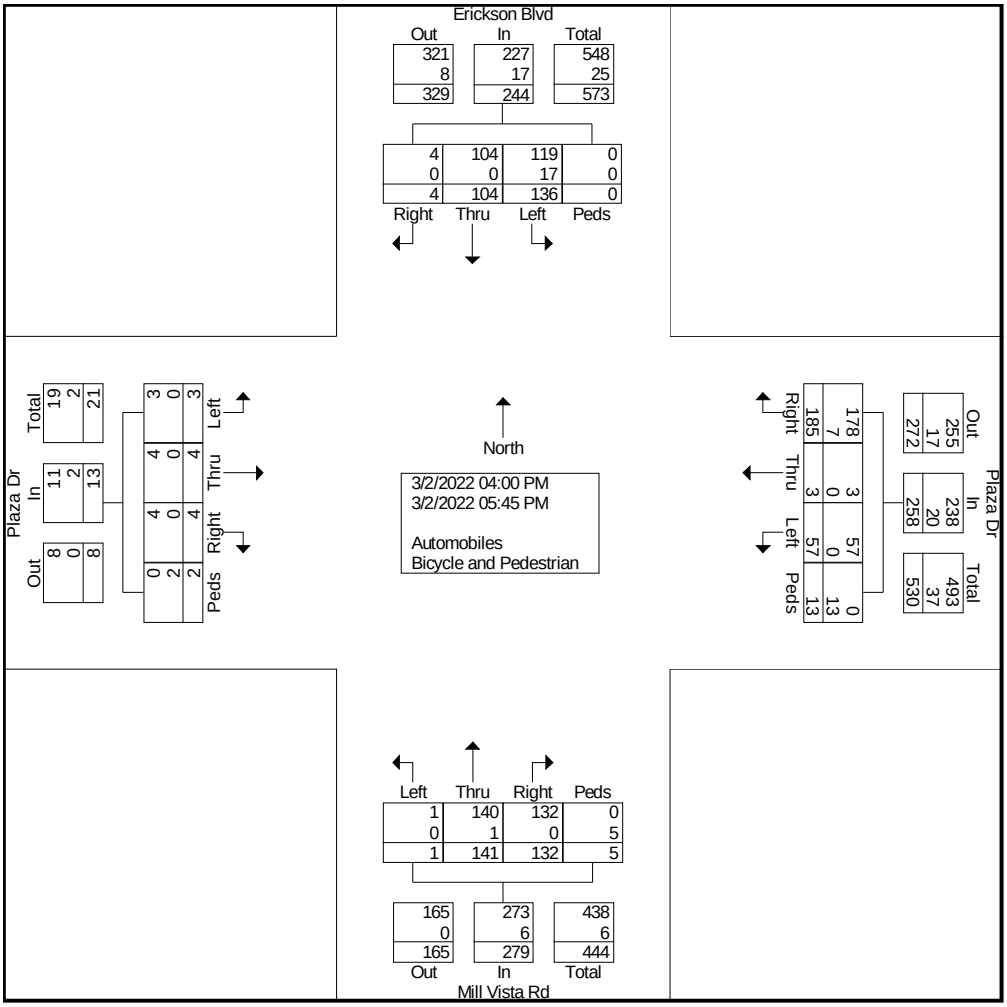
Groups Printed- Automobiles - Bicycle and Pedestrian

	Plaza Dr Eastbound					Plaza Dr Westbound					Mill Vista Rd Northbound					Erickson Blvd 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
04:00 PM	0	0	0	2	2	9	1	29	1	40	0	31	28	0	59	19	20	0	0	39	140
04:15 PM	0	0	1	0	1	9	0	27	2	38	0	15	12	0	27	18	14	1	0	33	99
04:30 PM	0	1	1	0	2	6	0	31	0	37	1	11	13	0	25	19	18	1	0	38	102
04:45 PM	0	1	1	0	2	4	0	22	2	28	0	20	12	2	34	13	10	0	0	23	87
Total	0	2	3	2	7	28	1	109	5	143	1	77	65	2	145	69	62	2	0	133	428
05:00 PM	1	0	1	0	2	9	2	21	3	35	0	24	19	0	43	14	15	1	0	30	110
05:15 PM	1	1	0	0	2	8	0	16	1	25	0	14	20	1	35	20	7	0	0	27	89
05:30 PM	1	1	0	0	2	9	0	23	2	34	0	15	13	0	28	16	10	1	0	27	91
05:45 PM	0	0	0	0	0	3	0	16	2	21	0	11	15	2	28	17	10	0	0	27	76
Total	3	2	1	0	6	29	2	76	8	115	0	64	67	3	134	67	42	2	0	111	366
Grand Total	3	4	4	2	13	57	3	185	13	258	1	141	132	5	279	136	104	4	0	244	794
Apprch %	23.1	30.8	30.8	15.4		22.1	1.2	71.7	5		0.4	50.5	47.3	1.8		55.7	42.6	1.6	0		
Total %	0.4	0.5	0.5	0.3	1.6	7.2	0.4	23.3	1.6	32.5	0.1	17.8	16.6	0.6	35.1	17.1	13.1	0.5	0	30.7	
Automobiles	3	4	4	0	11	57	3	178	0	238	1	140	132	0	273	119	104	4	0	227	749
% Automobiles	100	100	100	0	84.6	100	100	96.2	0	92.2	100	99.3	100	0	97.8	87.5	100	100	0	93	94.3
Bicycle and Pedestrian	0	0	0	2	2	0	0	7	13	20	0	1	0	5	6	17	0	0	0	17	45
% Bicycle and Pedestrian	0	0	0	100	15.4	0	0	3.8	100	7.8	0	0.7	0	100	2.2	12.5	0	0	0	7	5.7

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr & Erickson Blvd

File Name : Plaza and Erickson PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 2

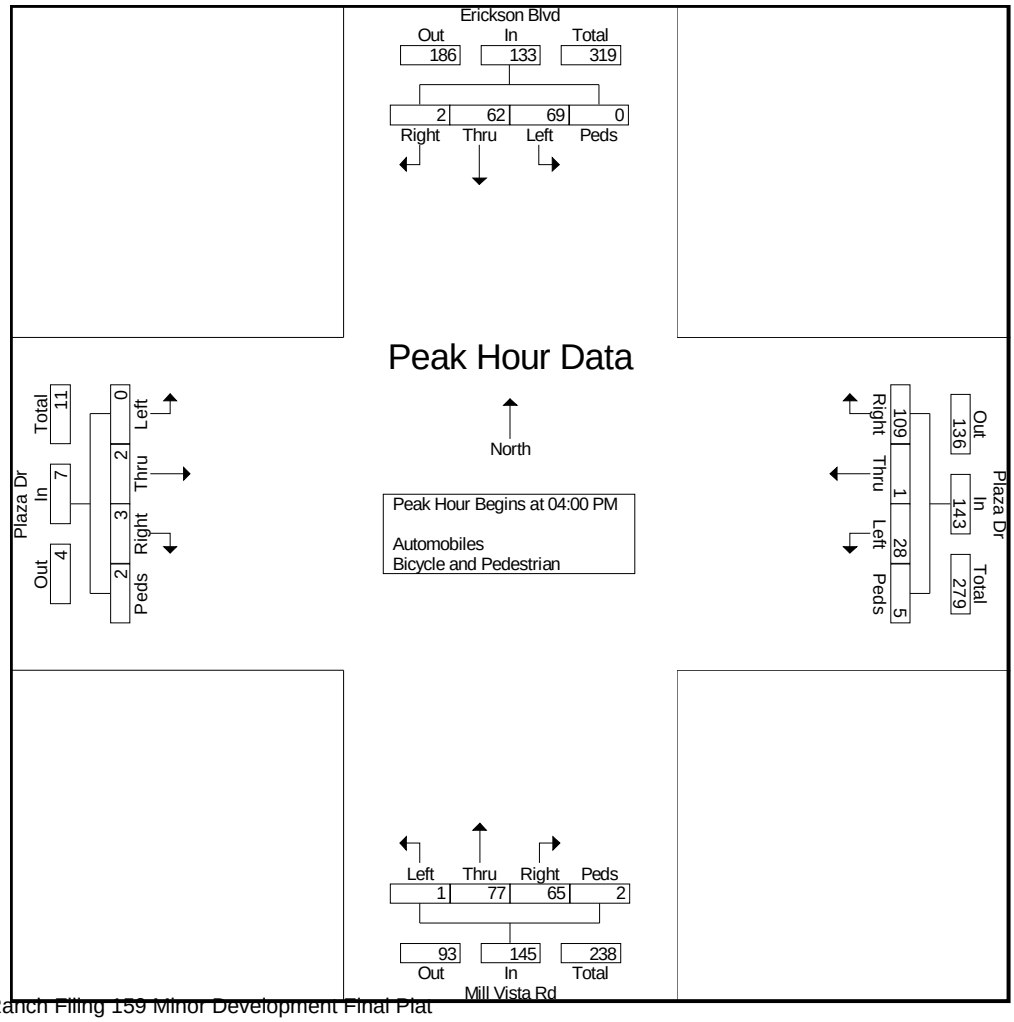


Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr & Erickson Blvd

File Name : Plaza and Erickson PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 3

	Plaza Dr Eastbound					Plaza Dr Westbound					Mill Vista Rd Northbound					Erickson Blvd 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 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	**2**	**2**	**9**	**1**	29	1	**40**	0	**31**	**28**	0	**59**	**19**	**20**	0	0	**39**	**140**
04:15 PM	0	0	**1**	0	1	9	0	27	**2**	38	0	15	12	0	27	18	14	**1**	0	33	99
04:30 PM	0	**1**	1	0	2	6	0	**31**	0	37	**1**	11	13	0	25	19	18	1	0	38	102
04:45 PM	0	1	1	0	2	4	0	22	2	28	0	20	12	**2**	34	13	10	0	0	23	87
Total Volume	0	2	3	2	7	28	1	109	5	143	1	77	65	2	145	69	62	2	0	133	428
% App. Total	0	28.6	42.9	28.6		19.6	0.7	76.2	3.5		0.7	53.1	44.8	1.4		51.9	46.6	1.5	0		
PHF	.000	.500	.750	.250	.875	.778	.250	.879	.625	.894	.250	.621	.580	.250	.614	.908	.775	.500	.000	.853	.764



Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr & Lucent Blvd

File Name : Plaza and Lucent AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 1

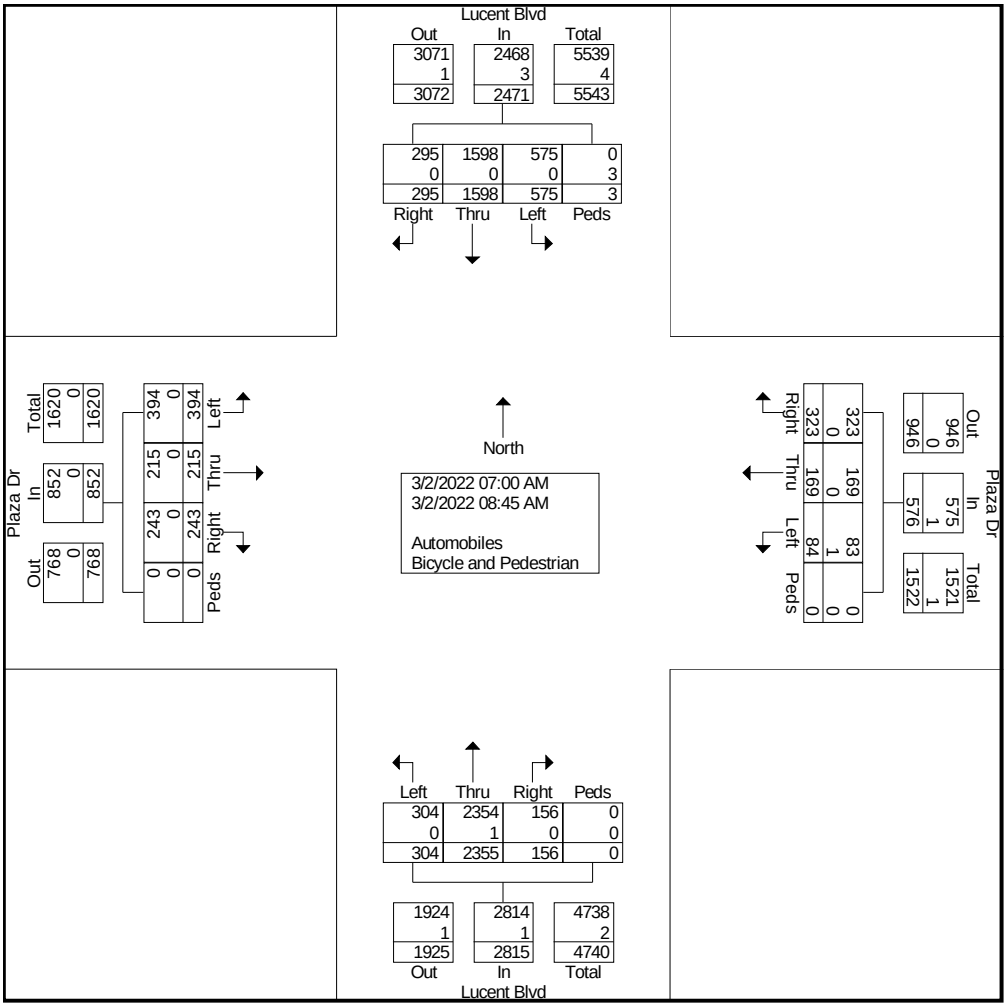
Groups Printed- Automobiles - Bicycle and Pedestrian

	Plaza Dr Eastbound					Plaza Dr Westbound					Lucent Blvd Northbound					Lucent Blvd 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
07:00 AM	33	14	14	0	61	4	7	22	0	33	25	291	9	0	325	53	182	25	1	261	680
07:15 AM	38	16	12	0	66	11	7	67	0	85	17	304	24	0	345	96	193	23	0	312	808
07:30 AM	24	15	11	0	50	10	15	48	0	73	20	382	32	0	434	129	209	33	1	372	929
07:45 AM	69	42	49	0	160	17	57	54	0	128	114	333	16	0	463	78	168	57	1	304	1055
Total	164	87	86	0	337	42	86	191	0	319	176	1310	81	0	1567	356	752	138	3	1249	3472
08:00 AM	90	68	83	0	241	8	46	27	0	81	91	275	22	0	388	57	206	67	0	330	1040
08:15 AM	62	35	41	0	138	13	10	39	0	62	10	245	15	0	270	57	218	32	0	307	777
08:30 AM	35	11	15	0	61	9	17	37	0	63	16	304	15	0	335	66	223	34	0	323	782
08:45 AM	43	14	18	0	75	12	10	29	0	51	11	221	23	0	255	39	199	24	0	262	643
Total	230	128	157	0	515	42	83	132	0	257	128	1045	75	0	1248	219	846	157	0	1222	3242
Grand Total	394	215	243	0	852	84	169	323	0	576	304	2355	156	0	2815	575	1598	295	3	2471	6714
Apprch %	46.2	25.2	28.5	0		14.6	29.3	56.1	0		10.8	83.7	5.5	0		23.3	64.7	11.9	0.1		
Total %	5.9	3.2	3.6	0	12.7	1.3	2.5	4.8	0	8.6	4.5	35.1	2.3	0	41.9	8.6	23.8	4.4	0	36.8	
Automobiles	394	215	243	0	852	83	169	323	0	575	304	2354	156	0	2814	575	1598	295	0	2468	6709
% Automobiles	100	100	100	0	100	98.8	100	100	0	99.8	100	100	100	0	100	100	100	100	0	99.9	99.9
Bicycle and Pedestrian	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	0	0	3	3	5
% Bicycle and Pedestrian	0	0	0	0	0	1.2	0	0	0	0.2	0	0	0	0	0	0	0	0	100	0.1	0.1

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr & Lucent Blvd

File Name : Plaza and Lucent AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 2

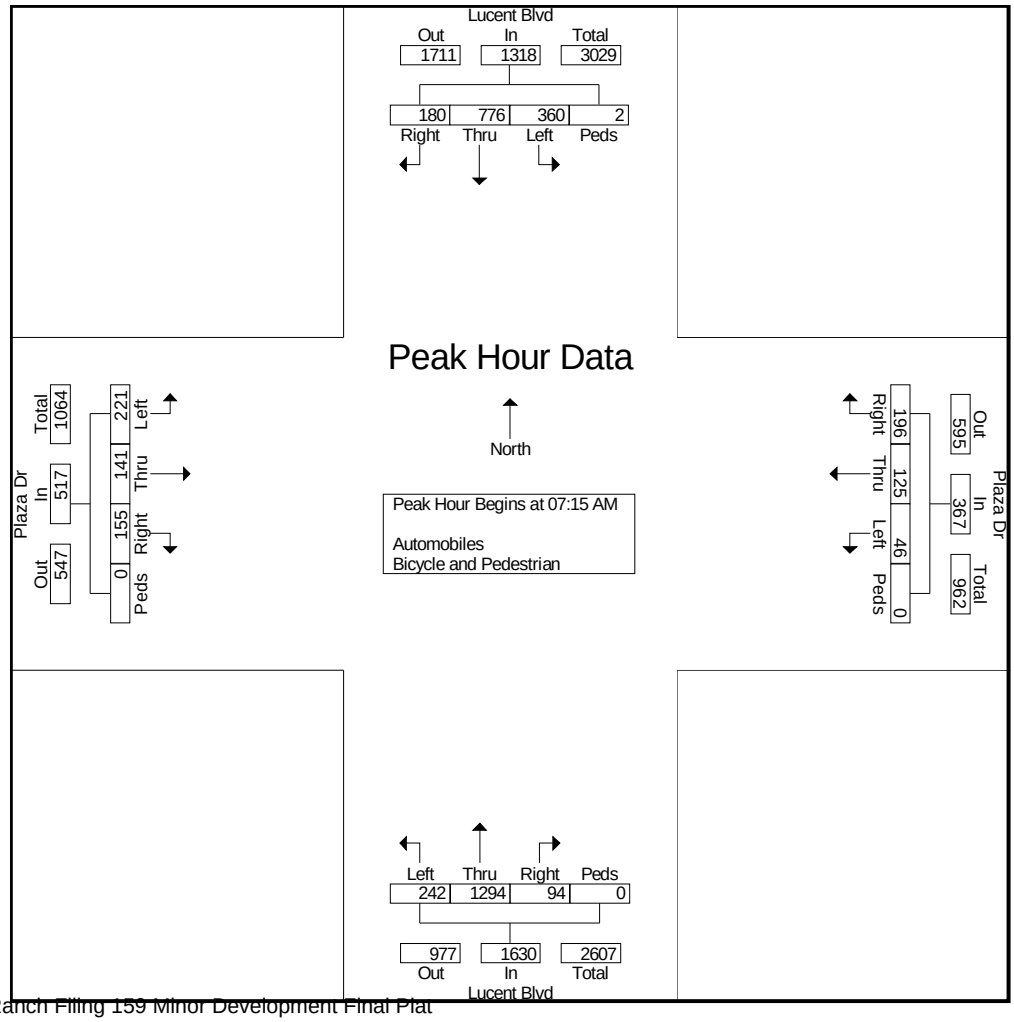


Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr & Lucent Blvd

File Name : Plaza and Lucent AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 3

	Plaza Dr Eastbound					Plaza Dr Westbound					Lucent Blvd Northbound					Lucent Blvd 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 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	38	16	12	0	66	11	7	**67**	0	85	17	304	24	0	345	96	193	23	0	312	808
07:30 AM	24	15	11	0	50	10	15	48	0	73	20	**382**	**32**	0	434	**129**	**209**	33	**1**	**372**	929
07:45 AM	69	42	49	0	160	**17**	**57**	54	0	**128**	**114**	333	16	0	**463**	78	168	57	1	304	**1055**
08:00 AM	**90**	**68**	**83**	0	**241**	8	46	27	0	81	91	275	22	0	388	57	206	**67**	0	330	1040
Total Volume	221	141	155	0	517	46	125	196	0	367	242	1294	94	0	1630	360	776	180	2	1318	3832
% App. Total	42.7	27.3	30	0		12.5	34.1	53.4	0		14.8	79.4	5.8	0		27.3	58.9	13.7	0.2		
PHF	.614	.518	.467	.000	.536	.676	.548	.731	.000	.717	.531	.847	.734	.000	.880	.698	.928	.672	.500	.886	.908



Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr & Lucent Blvd

File Name : Plaza and Lucent PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 1

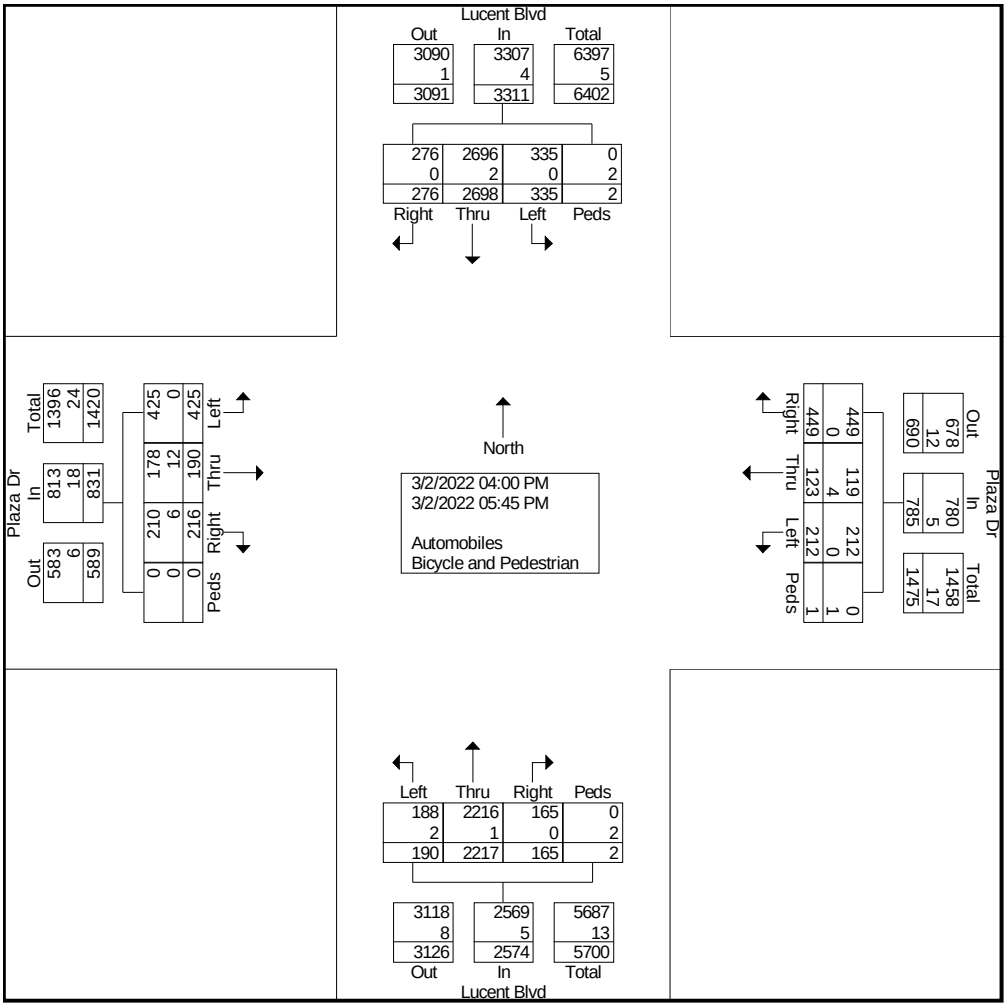
Groups Printed- Automobiles - Bicycle and Pedestrian

	Plaza Dr Eastbound					Plaza Dr Westbound					Lucent Blvd Northbound					Lucent Blvd 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
04:00 PM	55	34	44	0	133	20	14	68	0	102	24	303	22	0	349	50	319	37	0	406	990
04:15 PM	45	26	36	0	107	23	12	63	0	98	22	271	21	1	315	45	304	37	1	387	907
04:30 PM	61	27	30	0	118	26	16	51	0	93	19	287	17	0	323	44	330	43	0	417	951
04:45 PM	45	20	24	0	89	19	22	49	1	91	21	279	18	1	319	53	332	19	0	404	903
Total	206	107	134	0	447	88	64	231	1	384	86	1140	78	2	1306	192	1285	136	1	1614	3751
05:00 PM	66	18	24	0	108	30	14	78	0	122	29	293	25	0	347	37	362	31	0	430	1007
05:15 PM	61	29	22	0	112	30	16	58	0	104	21	255	23	0	299	41	343	37	0	421	936
05:30 PM	57	16	18	0	91	29	12	51	0	92	16	291	22	0	329	38	406	43	1	488	1000
05:45 PM	35	20	18	0	73	35	17	31	0	83	38	238	17	0	293	27	302	29	0	358	807
Total	219	83	82	0	384	124	59	218	0	401	104	1077	87	0	1268	143	1413	140	1	1697	3750
Grand Total	425	190	216	0	831	212	123	449	1	785	190	2217	165	2	2574	335	2698	276	2	3311	7501
Apprch %	51.1	22.9	26	0		27	15.7	57.2	0.1		7.4	86.1	6.4	0.1		10.1	81.5	8.3	0.1		
Total %	5.7	2.5	2.9	0	11.1	2.8	1.6	6	0	10.5	2.5	29.6	2.2	0	34.3	4.5	36	3.7	0	44.1	
Automobiles	425	178	210	0	813	212	119	449	0	780	188	2216	165	0	2569	335	2696	276	0	3307	7469
% Automobiles	100	93.7	97.2	0	97.8	100	96.7	100	0	99.4	98.9	100	100	0	99.8	100	99.9	100	0	99.9	99.6
Bicycle and Pedestrian	0	12	6	0	18	0	4	0	1	5	2	1	0	2	5	0	2	0	2	4	32
% Bicycle and Pedestrian	0	6.3	2.8	0	2.2	0	3.3	0	100	0.6	1.1	0	0	100	0.2	0	0.1	0	100	0.1	0.4

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr & Lucent Blvd

File Name : Plaza and Lucent PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 2

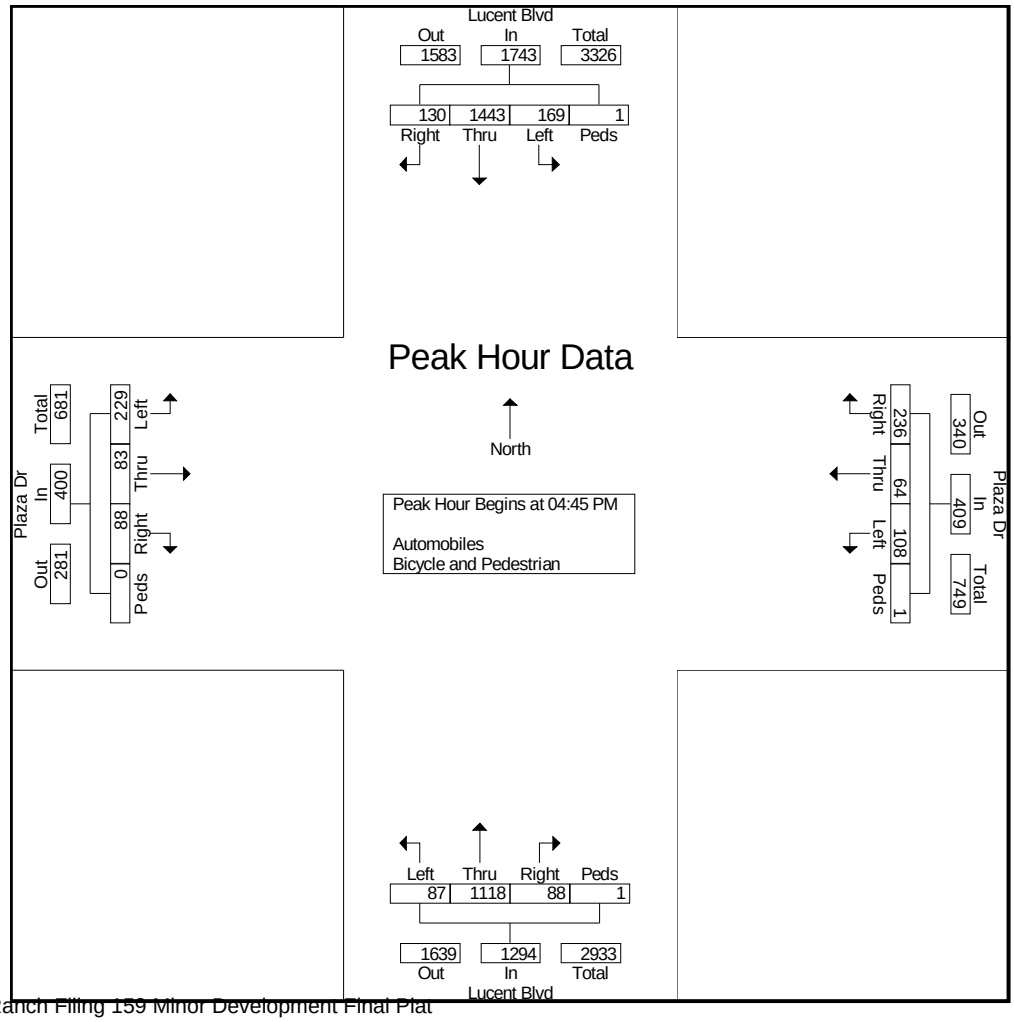


Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr & Lucent Blvd

File Name : Plaza and Lucent PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 3

	Plaza Dr Eastbound					Plaza Dr Westbound					Lucent Blvd Northbound					Lucent Blvd 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 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	45	20	**24**	0	89	19	**22**	49	**1**	91	21	279	18	**1**	319	**53**	332	19	0	404	903
05:00 PM	**66**	18	24	0	108	**30**	14	**78**	0	**122**	**29**	**293**	**25**	0	**347**	37	362	31	0	430	**1007**
05:15 PM	61	**29**	22	0	**112**	30	16	58	0	104	21	255	23	0	299	41	343	37	0	421	936
05:30 PM	57	16	18	0	91	29	12	51	0	92	16	291	22	0	329	38	**406**	**43**	**1**	**488**	1000
Total Volume	229	83	88	0	400	108	64	236	1	409	87	1118	88	1	1294	169	1443	130	1	1743	3846
% App. Total	57.2	20.8	22	0		26.4	15.6	57.7	0.2		6.7	86.4	6.8	0.1		9.7	82.8	7.5	0.1		
PHF	.867	.716	.917	.000	.893	.900	.727	.756	.250	.838	.750	.954	.880	.250	.932	.797	.889	.756	.250	.893	.955



Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr Full Access

File Name : Plaza Dr Full Access AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 1

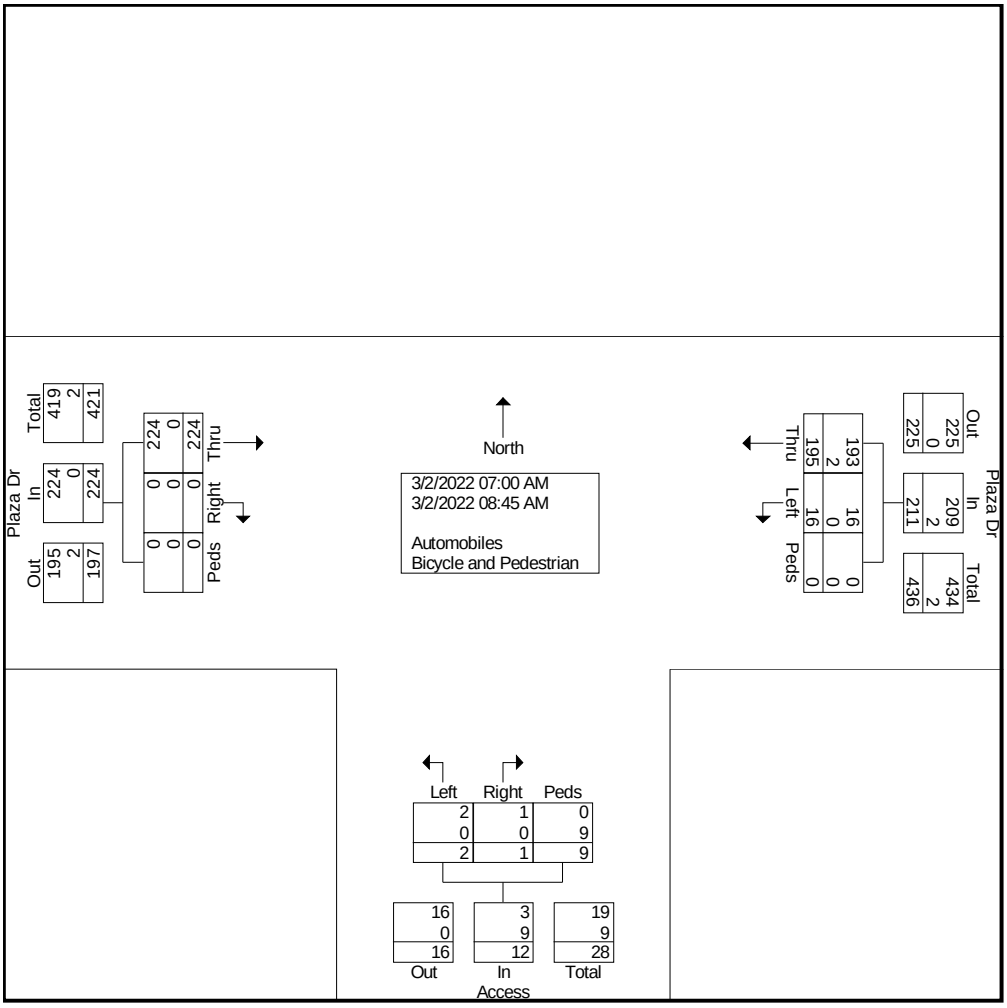
Groups Printed- Automobiles - Bicycle and Pedestrian

	Plaza Dr Eastbound				Plaza Dr Westbound				Access Northbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
07:00 AM	20	0	0	20	4	21	0	25	0	0	0	0	45
07:15 AM	22	0	0	22	4	20	0	24	1	1	1	3	49
07:30 AM	19	0	0	19	0	25	0	25	0	0	0	0	44
07:45 AM	46	0	0	46	1	33	0	34	0	0	2	2	82
Total	107	0	0	107	9	99	0	108	1	1	3	5	220
08:00 AM	56	0	0	56	5	32	0	37	0	0	1	1	94
08:15 AM	25	0	0	25	0	21	0	21	0	0	0	0	46
08:30 AM	24	0	0	24	2	32	0	34	0	0	1	1	59
08:45 AM	12	0	0	12	0	11	0	11	1	0	4	5	28
Total	117	0	0	117	7	96	0	103	1	0	6	7	227
Grand Total	224	0	0	224	16	195	0	211	2	1	9	12	447
Apprch %	100	0	0		7.6	92.4	0		16.7	8.3	75		
Total %	50.1	0	0	50.1	3.6	43.6	0	47.2	0.4	0.2	2	2.7	
Automobiles	224	0	0	224	16	193	0	209	2	1	0	3	436
% Automobiles	100	0	0	100	100	99	0	99.1	100	100	0	25	97.5
Bicycle and Pedestrian	0	0	0	0	0	2	0	2	0	0	9	9	11
% Bicycle and Pedestrian	0	0	0	0	0	1	0	0.9	0	0	100	75	2.5

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr Full Access

File Name : Plaza Dr Full Access AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 2

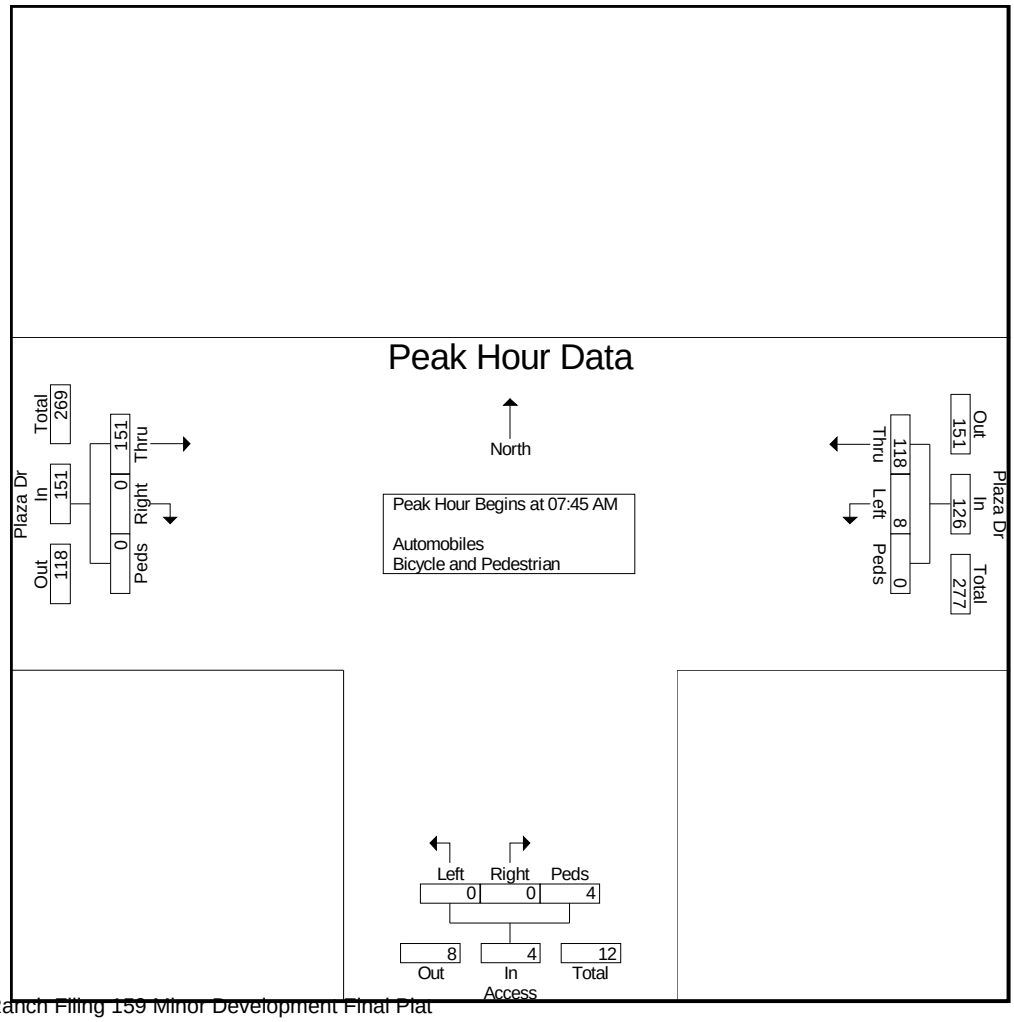


Ridgeview Data Collection

Highlands Ranch, CO
Kaos
AM Peak
Plaza Dr Full Access

File Name : Plaza Dr Full Access AM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 3

	Plaza Dr Eastbound				Plaza Dr Westbound				Access Northbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	46	0	0	46	1	**33**	0	34	0	0	**2**	**2**	82
08:00 AM	**56**	0	0	**56**	**5**	32	0	**37**	0	0	1	1	**94**
08:15 AM	25	0	0	25	0	21	0	21	0	0	0	0	46
08:30 AM	24	0	0	24	2	32	0	34	0	0	1	1	59
Total Volume	151	0	0	151	8	118	0	126	0	0	4	4	281
% App. Total	100	0	0		6.3	93.7	0		0	0	100		
PHF	.674	.000	.000	.674	.400	.894	.000	.851	.000	.000	.500	.500	.747



Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr Full Access

File Name : Plaza Dr Full Access PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 1

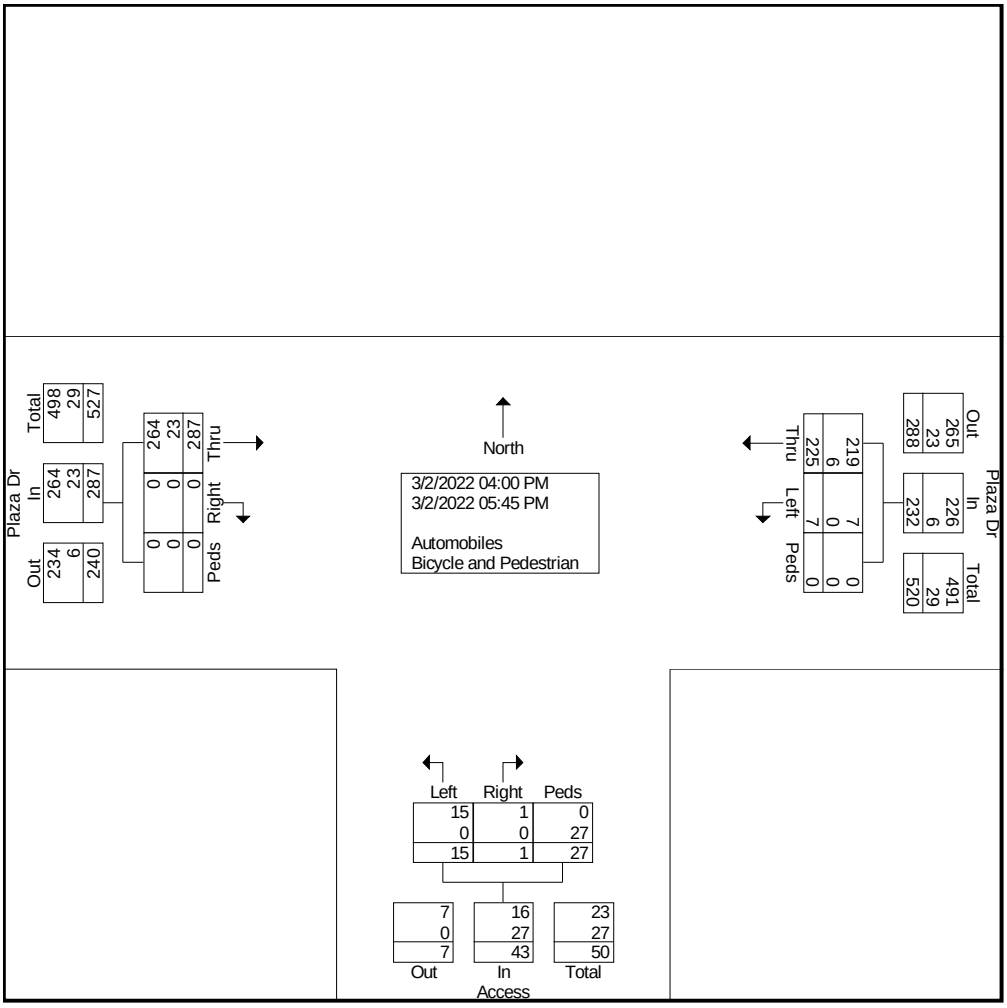
Groups Printed- Automobiles - Bicycle and Pedestrian

	Plaza Dr Eastbound				Plaza Dr Westbound				Access Northbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
04:00 PM	44	0	0	44	1	32	0	33	7	0	0	7	84
04:15 PM	34	0	0	34	0	28	0	28	3	0	4	7	69
04:30 PM	35	0	0	35	0	34	0	34	2	0	3	5	74
04:45 PM	33	0	0	33	3	25	0	28	0	0	4	4	65
Total	146	0	0	146	4	119	0	123	12	0	11	23	292
05:00 PM	34	0	0	34	0	32	0	32	2	0	5	7	73
05:15 PM	44	0	0	44	2	24	0	26	0	1	3	4	74
05:30 PM	33	0	0	33	1	31	0	32	1	0	4	5	70
05:45 PM	30	0	0	30	0	19	0	19	0	0	4	4	53
Total	141	0	0	141	3	106	0	109	3	1	16	20	270
Grand Total	287	0	0	287	7	225	0	232	15	1	27	43	562
Apprch %	100	0	0		3	97	0		34.9	2.3	62.8		
Total %	51.1	0	0	51.1	1.2	40	0	41.3	2.7	0.2	4.8	7.7	
Automobiles	264	0	0	264	7	219	0	226	15	1	0	16	506
% Automobiles	92	0	0	92	100	97.3	0	97.4	100	100	0	37.2	90
Bicycle and Pedestrian	23	0	0	23	0	6	0	6	0	0	27	27	56
% Bicycle and Pedestrian	8	0	0	8	0	2.7	0	2.6	0	0	100	62.8	10

Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr Full Access

File Name : Plaza Dr Full Access PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 2

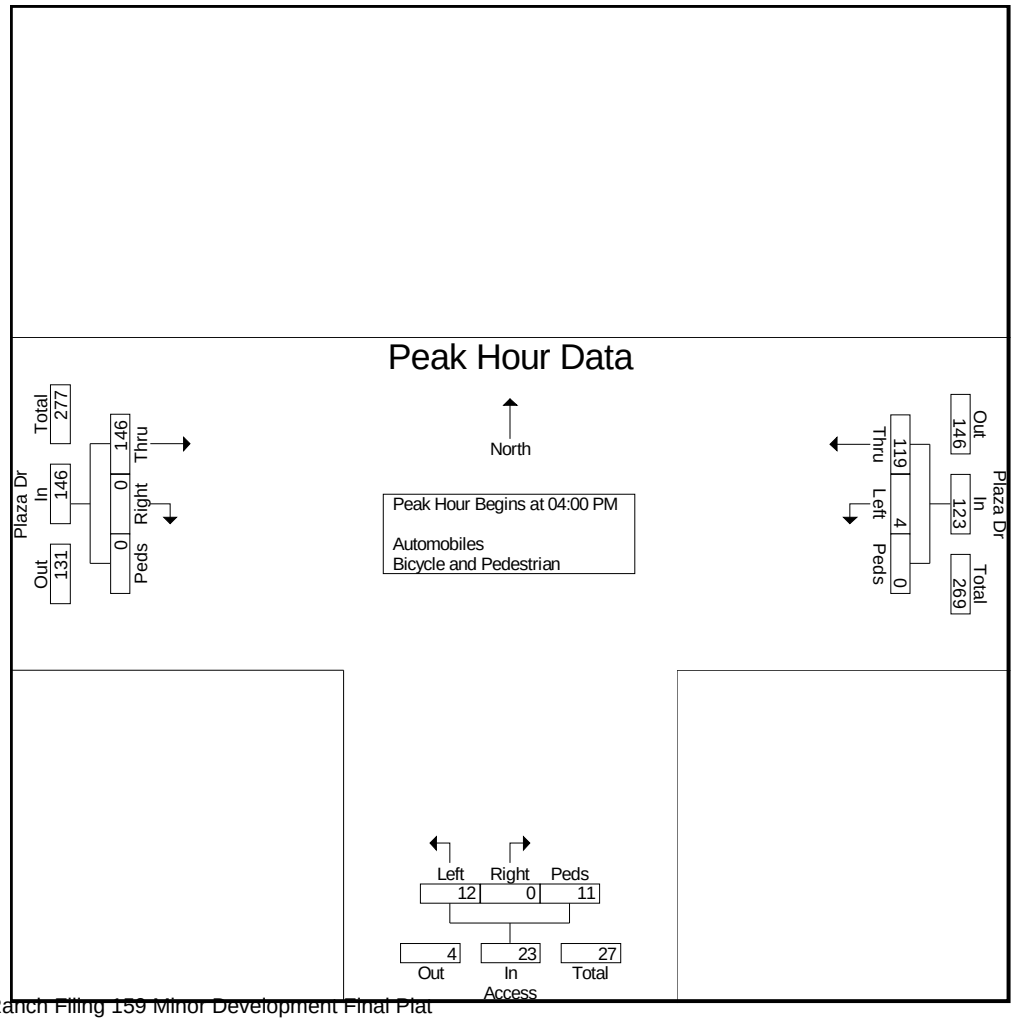


Ridgeview Data Collection

Highlands Ranch, CO
Kaos
PM Peak
Plaza Dr Full Access

File Name : Plaza Dr Full Access PM
Site Code : IPO 596
Start Date : 3/2/2022
Page No : 3

	Plaza Dr Eastbound				Plaza Dr Westbound				Access Northbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	**44**	0	0	**44**	1	32	0	33	**7**	0	0	**7**	**84**
04:15 PM	34	0	0	34	0	28	0	28	3	0	**4**	7	69
04:30 PM	35	0	0	35	0	**34**	0	**34**	2	0	3	5	74
04:45 PM	33	0	0	33	**3**	25	0	28	0	0	4	4	65
Total Volume	146	0	0	146	4	119	0	123	12	0	11	23	292
% App. Total	100	0	0		3.3	96.7	0		52.2	0	47.8		
PHF	.830	.000	.000	.830	.333	.875	.000	.904	.429	.000	.688	.821	.869



APPENDIX B

Future Traffic Projections

DRCOG Traffic Projections: Kaos

Location	2020	2050	Growth Factor	Annual Growth
County Line E/O Erickson Dr	11,000	12,000	1.09	0.36%
Lucent Boulevard N/O Plaza Dr	41,000	43,000	1.05	0.20%
Total	11,000	12,000	1.09	0.36%

APPENDIX C

Trip Generation Worksheets

Kimley»Horn

Project	Kaos - Highlands Ranch				
Subject	Trip Generation for Multifamily Housing (Mid-Rise)				
Designed by	MAG	*Date*	March 16, 2022	*Job No.*	096391027
Checked by		*Date*		*Sheet No.*	of

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Fitted Curve Equations

Land Use Code - Multifamily Housing (Mid-Rise) (221)

Independent Variable - Dwelling Units (X)

X = 240
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 275)

Directional Distribution: 23% ent. 77% exit.

(T) = 0.44 (X) - 11.61
(T) = 0.44 * (240.0) - 11.61

T = 94 Average Vehicle Trip Ends
22 entering 72 exiting

22 + 72 = 94

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 276)

Directional Distribution: 61% ent. 39% exit.

(T) = 0.39 (X) + 0.34
(T) = 0.39 * (240.0) + 0.34

T = 94 Average Vehicle Trip Ends
57 entering 37 exiting

57 + 37 = 94

Weekday (200 Series Page 274)

Directional Distribution: 50% ent. 50% exit.

(T) = 4.77 (X) - 46.46
(T) = 4.77 * (240.0) - 46.46

T = 1100 Average Vehicle Trip Ends
550 entering 550 exiting

550 + 550 = 1100

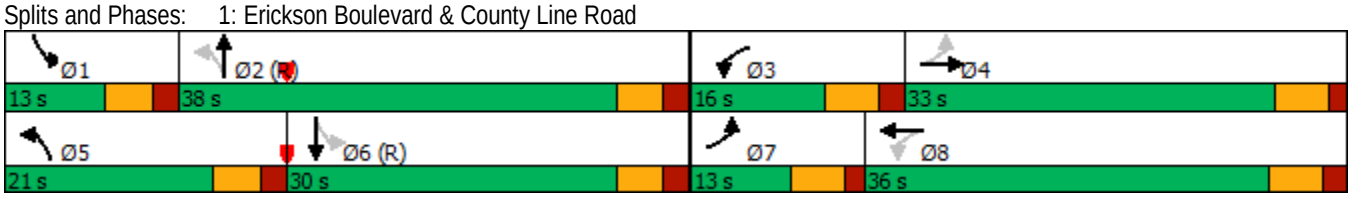
APPENDIX D

Intersection Analysis Worksheets

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	41	214	55	186	143	4	15	2
Future Volume (vph)	41	214	55	186	143	4	15	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	13.0	33.0	16.0	36.0	21.0	38.0	13.0	30.0
Total Split (%)	13.0%	33.0%	16.0%	36.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	20.4	14.6	22.6	15.6	62.6	57.8	53.2	47.2
Actuated g/C Ratio	0.20	0.15	0.23	0.16	0.63	0.58	0.53	0.47
v/c Ratio	0.18	0.71	0.31	0.46	0.21	0.04	0.02	0.07
Control Delay	25.5	28.0	28.5	37.2	10.5	6.8	10.9	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	28.0	28.5	37.2	10.5	6.8	10.9	7.1
LOS	C	C	C	D	B	A	B	A
Approach Delay		27.8		35.4		9.8		8.1
Approach LOS		C		D		A		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 44.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	214	180	55	186	28	143	4	30	15	2	42
Future Volume (veh/h)	41	214	180	55	186	28	143	4	30	15	2	42
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	49	255	214	65	221	33	170	5	36	18	2	50
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	333	269	186	585	86	821	104	752	765	30	738
Arrive On Green	0.04	0.18	0.18	0.04	0.19	0.19	0.07	0.53	0.53	0.02	0.48	0.48
Sat Flow, veh/h	1781	1867	1509	1781	3107	458	1781	197	1418	1781	61	1533
Grp Volume(v), veh/h	49	242	227	65	125	129	170	0	41	18	0	52
Grp Sat Flow(s),veh/h/ln	1781	1777	1599	1781	1777	1788	1781	0	1615	1781	0	1594
Q Serve(g_s), s	2.2	13.0	13.6	3.0	6.1	6.3	4.6	0.0	1.2	0.5	0.0	1.7
Cycle Q Clear(g_c), s	2.2	13.0	13.6	3.0	6.1	6.3	4.6	0.0	1.2	0.5	0.0	1.7
Prop In Lane	1.00		0.94	1.00		0.26	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	279	317	285	186	334	336	821	0	856	765	0	767
V/C Ratio(X)	0.18	0.76	0.79	0.35	0.37	0.38	0.21	0.00	0.05	0.02	0.00	0.07
Avail Cap(c_a), veh/h	346	489	440	290	533	536	975	0	856	863	0	767
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.8	39.1	39.3	32.5	35.4	35.5	10.6	0.0	11.3	12.6	0.0	13.9
Incr Delay (d2), s/veh	0.3	3.8	5.5	1.1	0.7	0.7	0.1	0.0	0.1	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.9	5.7	1.3	2.7	2.8	1.8	0.0	0.5	0.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	42.9	44.8	33.7	36.1	36.2	10.7	0.0	11.4	12.6	0.0	14.1
LnGrp LOS	C	D	D	C	D	D	B	A	B	B	A	B
Approach Vol, veh/h		518			319			211			70	
Approach Delay, s/veh		42.7			35.7			10.9			13.7	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	58.5	10.2	23.9	12.3	53.6	9.2	24.8
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	10.0	* 28	15.5	24.5	7.5	30.0
Max Q Clear Time (g_c+I1), s	2.5	3.2	5.0	15.6	6.6	3.7	4.2	8.3
Green Ext Time (p_c), s	0.0	0.2	0.0	2.3	0.3	0.2	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	32.9
HCM 6th LOS	C

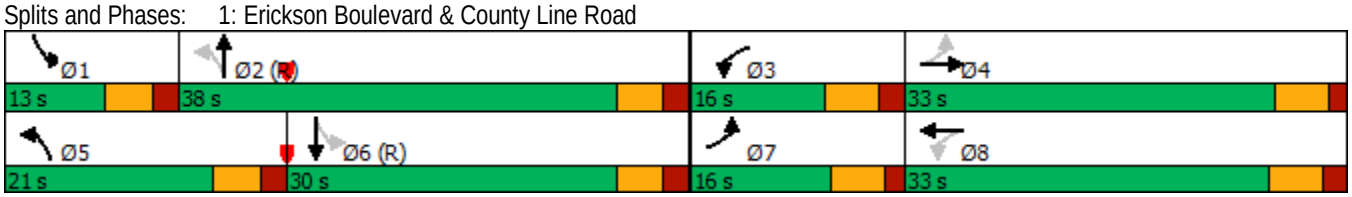
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	58	201	65	325	132	3	28	3
Future Volume (vph)	58	201	65	325	132	3	28	3
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	16.0	33.0	16.0	33.0	21.0	38.0	13.0	30.0
Total Split (%)	16.0%	33.0%	16.0%	33.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	23.6	16.6	23.7	16.6	59.7	53.1	51.9	45.5
Actuated g/C Ratio	0.24	0.17	0.24	0.17	0.60	0.53	0.52	0.46
v/c Ratio	0.26	0.54	0.28	0.68	0.19	0.06	0.04	0.07
Control Delay	25.8	30.9	26.6	44.0	11.2	6.5	11.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	30.9	26.6	44.0	11.2	6.5	11.4	7.7
LOS	C	C	C	D	B	A	B	A
Approach Delay		30.1		41.3		10.0		9.1
Approach LOS		C		D		B		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 29.8	Intersection LOS: C
Intersection Capacity Utilization 42.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	201	101	65	325	29	132	3	40	28	3	41
Future Volume (veh/h)	58	201	101	65	325	29	132	3	40	28	3	41
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	226	113	73	365	33	148	3	45	31	3	46
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	318	153	199	483	43	871	56	835	838	52	790
Arrive On Green	0.04	0.14	0.14	0.05	0.15	0.15	0.06	0.56	0.56	0.03	0.53	0.53
Sat Flow, veh/h	1781	2324	1121	1781	3297	297	1781	100	1500	1781	98	1502
Grp Volume(v), veh/h	65	171	168	73	196	202	148	0	48	31	0	49
Grp Sat Flow(s),veh/h/ln	1781	1777	1669	1781	1777	1817	1781	0	1600	1781	0	1600
Q Serve(g_s), s	3.1	9.2	9.7	3.5	10.6	10.7	3.8	0.0	1.4	0.8	0.0	1.5
Cycle Q Clear(g_c), s	3.1	9.2	9.7	3.5	10.6	10.7	3.8	0.0	1.4	0.8	0.0	1.5
Prop In Lane	1.00		0.67	1.00		0.16	1.00		0.94	1.00		0.94
Lane Grp Cap(c), veh/h	188	243	228	199	261	266	871	0	891	838	0	842
V/C Ratio(X)	0.35	0.70	0.74	0.37	0.75	0.76	0.17	0.00	0.05	0.04	0.00	0.06
Avail Cap(c_a), veh/h	298	489	459	292	480	491	1041	0	891	920	0	842
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.4	41.2	41.4	35.2	40.9	41.0	9.4	0.0	10.1	10.1	0.0	11.6
Incr Delay (d2), s/veh	1.1	3.7	4.6	1.1	4.3	4.4	0.1	0.0	0.1	0.0	0.0	0.1
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	1.4	4.2	4.2	1.6	4.9	5.1	1.4	0.0	0.5	0.3	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	44.9	46.1	36.3	45.3	45.4	9.5	0.0	10.3	10.1	0.0	11.7
LnGrp LOS	D	D	D	D	D	D	A	A	B	B	A	B
Approach Vol, veh/h		404			471			196			80	
Approach Delay, s/veh		44.0			43.9			9.7			11.1	
Approach LOS		D			D			A			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	61.1	10.8	19.7	11.4	58.1	9.8	20.7
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	10.0	* 28	15.5	24.5	10.5	27.0
Max Q Clear Time (g_c+I1), s	2.8	3.4	5.5	11.7	5.8	3.5	5.1	12.7
Green Ext Time (p_c), s	0.0	0.2	0.0	1.8	0.2	0.2	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	35.9
HCM 6th LOS	D

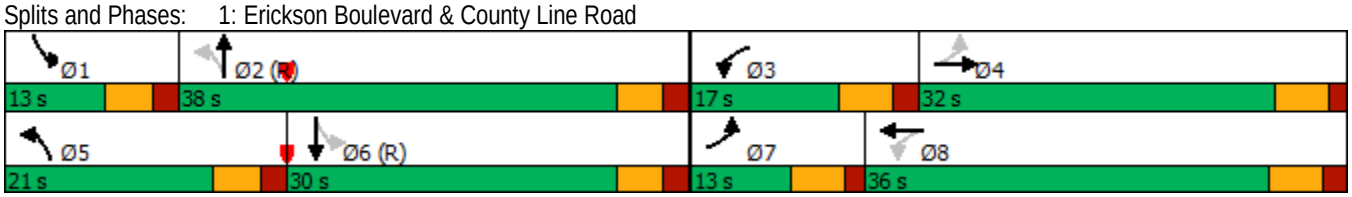
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	42	218	56	190	166	4	15	2
Future Volume (vph)	42	218	56	190	166	4	15	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	13.0	32.0	17.0	36.0	21.0	38.0	13.0	30.0
Total Split (%)	13.0%	32.0%	17.0%	36.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	20.8	15.0	23.2	16.1	62.1	57.3	51.9	45.8
Actuated g/C Ratio	0.21	0.15	0.23	0.16	0.62	0.57	0.52	0.46
v/c Ratio	0.18	0.73	0.31	0.45	0.25	0.04	0.02	0.07
Control Delay	25.1	28.2	28.2	36.6	11.0	6.9	11.4	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	28.2	28.2	36.6	11.0	6.9	11.4	7.6
LOS	C	C	C	D	B	A	B	A
Approach Delay		27.9		34.9		10.3		8.6
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 46.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	218	194	56	190	29	166	4	31	15	2	43
Future Volume (veh/h)	42	218	194	56	190	29	166	4	31	15	2	43
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	50	260	231	67	226	35	198	5	37	18	2	51
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	335	287	186	602	92	814	101	744	742	28	713
Arrive On Green	0.04	0.18	0.18	0.04	0.19	0.19	0.08	0.52	0.52	0.02	0.46	0.46
Sat Flow, veh/h	1781	1814	1554	1781	3090	472	1781	192	1422	1781	60	1534
Grp Volume(v), veh/h	50	254	237	67	129	132	198	0	42	18	0	53
Grp Sat Flow(s),veh/h/ln	1781	1777	1591	1781	1777	1785	1781	0	1614	1781	0	1594
Q Serve(g_s), s	2.2	13.6	14.2	3.0	6.3	6.5	5.5	0.0	1.3	0.5	0.0	1.8
Cycle Q Clear(g_c), s	2.2	13.6	14.2	3.0	6.3	6.5	5.5	0.0	1.3	0.5	0.0	1.8
Prop In Lane	1.00		0.98	1.00		0.26	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	285	328	294	186	346	348	814	0	844	742	0	741
V/C Ratio(X)	0.18	0.78	0.81	0.36	0.37	0.38	0.24	0.00	0.05	0.02	0.00	0.07
Avail Cap(c_a), veh/h	351	471	422	306	533	536	952	0	844	840	0	741
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.3	38.8	39.1	32.1	34.9	35.0	10.8	0.0	11.7	13.4	0.0	14.8
Incr Delay (d2), s/veh	0.3	5.1	7.3	1.2	0.7	0.7	0.2	0.0	0.1	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	6.3	6.1	1.4	2.8	2.9	2.1	0.0	0.5	0.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.6	43.9	46.4	33.3	35.6	35.7	11.0	0.0	11.8	13.4	0.0	15.0
LnGrp LOS	C	D	D	C	D	D	B	A	B	B	A	B
Approach Vol, veh/h		541			328			240			71	
Approach Delay, s/veh		43.8			35.2			11.1			14.6	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	57.8	10.3	24.5	13.3	52.0	9.3	25.5
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	11.0	* 27	15.5	24.5	7.5	30.0
Max Q Clear Time (g_c+I1), s	2.5	3.3	5.0	16.2	7.5	3.8	4.2	8.5
Green Ext Time (p_c), s	0.0	0.2	0.1	2.2	0.3	0.2	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

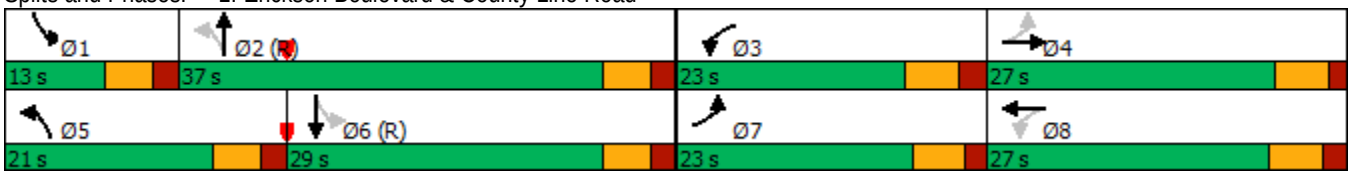
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	59	205	66	332	151	3	29	3
Future Volume (vph)	59	205	66	332	151	3	29	3
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	23.0	27.0	23.0	27.0	21.0	37.0	13.0	29.0
Total Split (%)	23.0%	27.0%	23.0%	27.0%	21.0%	37.0%	13.0%	29.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	23.9	16.8	24.2	16.9	59.6	52.7	50.9	44.5
Actuated g/C Ratio	0.24	0.17	0.24	0.17	0.60	0.53	0.51	0.44
v/c Ratio	0.26	0.56	0.29	0.68	0.22	0.06	0.05	0.07
Control Delay	25.6	28.8	26.5	43.8	11.5	6.6	11.7	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	28.8	26.5	43.8	11.5	6.6	11.7	7.9
LOS	C	C	C	D	B	A	B	A
Approach Delay		28.3		41.1		10.4		9.4
Approach LOS		C		D		B		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 28.9	Intersection LOS: C
Intersection Capacity Utilization 43.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	205	124	66	332	30	151	3	41	29	3	42
Future Volume (veh/h)	59	205	124	66	332	30	151	3	41	29	3	42
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	66	230	139	74	373	34	170	3	46	33	3	47
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	305	177	194	498	45	865	54	826	822	49	772
Arrive On Green	0.04	0.14	0.14	0.05	0.15	0.15	0.07	0.55	0.55	0.03	0.51	0.51
Sat Flow, veh/h	1781	2163	1257	1781	3295	299	1781	98	1502	1781	96	1504
Grp Volume(v), veh/h	66	187	182	74	200	207	170	0	49	33	0	50
Grp Sat Flow(s),veh/h/ln	1781	1777	1644	1781	1777	1817	1781	0	1600	1781	0	1600
Q Serve(g_s), s	3.1	10.1	10.7	3.5	10.8	10.9	4.4	0.0	1.4	0.9	0.0	1.6
Cycle Q Clear(g_c), s	3.1	10.1	10.7	3.5	10.8	10.9	4.4	0.0	1.4	0.9	0.0	1.6
Prop In Lane	1.00		0.76	1.00		0.16	1.00		0.94	1.00		0.94
Lane Grp Cap(c), veh/h	191	251	232	194	268	274	865	0	880	822	0	822
V/C Ratio(X)	0.34	0.75	0.78	0.38	0.75	0.75	0.20	0.00	0.06	0.04	0.00	0.06
Avail Cap(c_a), veh/h	425	382	353	410	373	381	1023	0	880	902	0	822
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.0	41.2	41.5	34.8	40.6	40.7	9.7	0.0	10.4	10.6	0.0	12.2
Incr Delay (d2), s/veh	1.1	4.4	6.3	1.2	5.2	5.4	0.1	0.0	0.1	0.0	0.0	0.1
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	1.4	4.7	4.7	1.6	5.1	5.2	1.7	0.0	0.5	0.3	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	45.7	47.8	36.1	45.8	46.0	9.8	0.0	10.6	10.6	0.0	12.4
LnGrp LOS	D	D	D	D	D	D	A	A	B	B	A	B
Approach Vol, veh/h		435			481			219			83	
Approach Delay, s/veh		45.1			44.4			10.0			11.7	
Approach LOS		D			D			A			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	60.5	10.9	20.1	12.1	56.9	9.9	21.1
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	31.5	17.0	* 22	15.5	23.5	17.5	21.0
Max Q Clear Time (g_c+I1), s	2.9	3.4	5.5	12.7	6.4	3.6	5.1	12.9
Green Ext Time (p_c), s	0.0	0.2	0.1	1.4	0.3	0.2	0.1	1.5

Intersection Summary	
HCM 6th Ctrl Delay	36.2
HCM 6th LOS	D

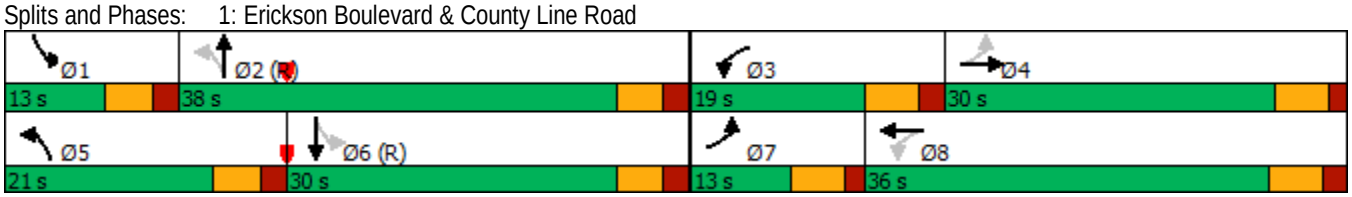
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	42	218	56	190	191	4	15	2
Future Volume (vph)	42	218	56	190	191	4	15	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	13.0	30.0	19.0	36.0	21.0	38.0	13.0	30.0
Total Split (%)	13.0%	30.0%	19.0%	36.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	21.0	15.2	23.4	16.3	61.9	57.1	50.7	44.7
Actuated g/C Ratio	0.21	0.15	0.23	0.16	0.62	0.57	0.51	0.45
v/c Ratio	0.18	0.73	0.31	0.45	0.28	0.04	0.03	0.07
Control Delay	24.9	28.4	28.0	36.3	11.4	7.0	11.7	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	28.4	28.0	36.3	11.4	7.0	11.7	8.0
LOS	C	C	C	D	B	A	B	A
Approach Delay		28.1		34.6		10.7		8.9
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 24.9	Intersection LOS: C
Intersection Capacity Utilization 48.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	218	202	56	190	29	191	4	31	15	2	43
Future Volume (veh/h)	42	218	202	56	190	29	191	4	31	15	2	43
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	50	260	240	67	226	35	227	5	37	18	2	51
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	329	293	184	604	92	817	100	743	728	27	698
Arrive On Green	0.04	0.18	0.18	0.04	0.20	0.20	0.09	0.52	0.52	0.02	0.45	0.45
Sat Flow, veh/h	1781	1779	1583	1781	3090	472	1781	192	1422	1781	60	1534
Grp Volume(v), veh/h	50	260	240	67	129	132	227	0	42	18	0	53
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1785	1781	0	1614	1781	0	1594
Q Serve(g_s), s	2.2	14.0	14.6	3.0	6.3	6.4	6.4	0.0	1.3	0.5	0.0	1.9
Cycle Q Clear(g_c), s	2.2	14.0	14.6	3.0	6.3	6.4	6.4	0.0	1.3	0.5	0.0	1.9
Prop In Lane	1.00		1.00	1.00		0.26	1.00		0.88	1.00		0.96
Lane Grp Cap(c), veh/h	285	329	293	184	347	349	817	0	843	728	0	725
V/C Ratio(X)	0.18	0.79	0.82	0.36	0.37	0.38	0.28	0.00	0.05	0.02	0.00	0.07
Avail Cap(c_a), veh/h	352	435	388	339	533	536	937	0	843	826	0	725
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.3	38.9	39.2	32.1	34.9	35.0	11.1	0.0	11.7	14.0	0.0	15.4
Incr Delay (d2), s/veh	0.3	7.1	10.0	1.2	0.7	0.7	0.2	0.0	0.1	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	6.7	6.4	1.4	2.8	2.9	2.4	0.0	0.5	0.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	46.0	49.2	33.3	35.6	35.7	11.3	0.0	11.8	14.0	0.0	15.6
LnGrp LOS	C	D	D	C	D	D	B	A	B	B	A	B
Approach Vol, veh/h		550			328			269			71	
Approach Delay, s/veh		46.1			35.1			11.3			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	7.5	57.7	10.3	24.5	14.2	51.0	9.3	25.5
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	13.0	* 25	15.5	24.5	7.5	30.0
Max Q Clear Time (g_c+I1), s	2.5	3.3	5.0	16.6	8.4	3.9	4.2	8.4
Green Ext Time (p_c), s	0.0	0.2	0.1	1.9	0.4	0.2	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	33.6
HCM 6th LOS	C

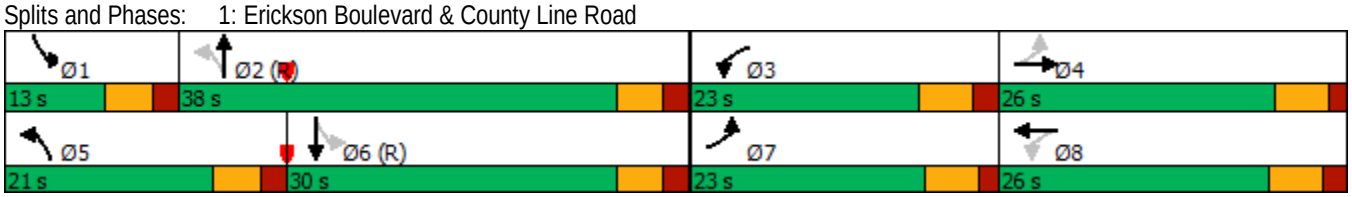
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	59	205	66	332	164	3	29	3
Future Volume (vph)	59	205	66	332	164	3	29	3
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	23.0	26.0	23.0	26.0	21.0	38.0	13.0	30.0
Total Split (%)	23.0%	26.0%	23.0%	26.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	23.9	16.8	24.2	16.9	59.8	52.7	50.4	44.0
Actuated g/C Ratio	0.24	0.17	0.24	0.17	0.60	0.53	0.50	0.44
v/c Ratio	0.26	0.57	0.30	0.68	0.24	0.06	0.05	0.07
Control Delay	25.6	25.1	26.8	43.9	11.7	6.6	11.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	25.1	26.8	43.9	11.7	6.6	11.8	8.0
LOS	C	C	C	D	B	A	B	A
Approach Delay		25.2		41.3		10.6		9.5
Approach LOS		C		D		B		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 27.6	Intersection LOS: C
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	205	144	66	332	30	164	3	41	29	3	42
Future Volume (veh/h)	59	205	144	66	332	30	164	3	41	29	3	42
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	66	230	162	74	373	34	184	3	46	33	3	47
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	198	299	202	192	519	47	858	53	817	807	48	756
Arrive On Green	0.04	0.15	0.15	0.05	0.16	0.16	0.07	0.54	0.54	0.03	0.50	0.50
Sat Flow, veh/h	1781	2030	1371	1781	3295	299	1781	98	1502	1781	96	1504
Grp Volume(v), veh/h	66	200	192	74	200	207	184	0	49	33	0	50
Grp Sat Flow(s),veh/h/ln	1781	1777	1624	1781	1777	1817	1781	0	1600	1781	0	1600
Q Serve(g_s), s	3.1	10.8	11.4	3.5	10.7	10.8	4.8	0.0	1.4	0.9	0.0	1.6
Cycle Q Clear(g_c), s	3.1	10.8	11.4	3.5	10.7	10.8	4.8	0.0	1.4	0.9	0.0	1.6
Prop In Lane	1.00		0.84	1.00		0.16	1.00		0.94	1.00		0.94
Lane Grp Cap(c), veh/h	198	262	240	192	280	286	858	0	870	807	0	804
V/C Ratio(X)	0.33	0.76	0.80	0.39	0.72	0.72	0.21	0.00	0.06	0.04	0.00	0.06
Avail Cap(c_a), veh/h	432	364	333	408	355	363	1007	0	870	887	0	804
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.5	40.9	41.2	34.4	40.0	40.0	9.9	0.0	10.7	11.1	0.0	12.8
Incr Delay (d2), s/veh	1.0	6.1	9.2	1.3	4.9	5.1	0.1	0.0	0.1	0.0	0.0	0.1
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	1.4	5.1	5.1	1.6	5.0	5.2	1.8	0.0	0.5	0.3	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	47.1	50.4	35.7	44.9	45.1	10.0	0.0	10.9	11.1	0.0	12.9
LnGrp LOS	D	D	D	D	D	D	A	A	B	B	A	B
Approach Vol, veh/h		458			481			233			83	
Approach Delay, s/veh		46.8			43.6			10.2			12.2	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	59.9	10.9	20.8	12.6	55.8	9.9	21.8
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	17.0	* 21	15.5	24.5	17.5	20.0
Max Q Clear Time (g_c+I1), s	2.9	3.4	5.5	13.4	6.8	3.6	5.1	12.8
Green Ext Time (p_c), s	0.0	0.2	0.1	1.3	0.3	0.2	0.1	1.4

Intersection Summary	
HCM 6th Ctrl Delay	36.5
HCM 6th LOS	D

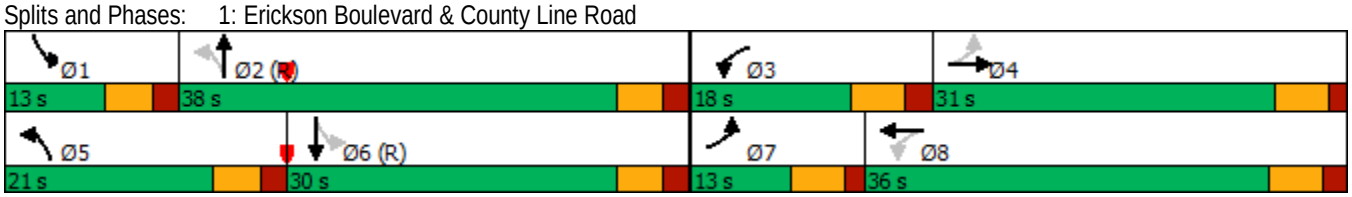
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	52	269	69	234	200	5	19	3
Future Volume (vph)	52	269	69	234	200	5	19	3
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	13.0	31.0	18.0	36.0	21.0	38.0	13.0	30.0
Total Split (%)	13.0%	31.0%	18.0%	36.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	22.9	17.0	25.6	18.3	59.9	55.0	48.8	42.7
Actuated g/C Ratio	0.23	0.17	0.26	0.18	0.60	0.55	0.49	0.43
v/c Ratio	0.20	0.74	0.34	0.45	0.28	0.05	0.03	0.09
Control Delay	23.6	29.8	27.2	35.2	12.5	7.3	12.7	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	29.8	27.2	35.2	12.5	7.3	12.7	8.3
LOS	C	C	C	D	B	A	B	A
Approach Delay		29.2		33.5		11.6		9.4
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 25.7	Intersection LOS: C
Intersection Capacity Utilization 51.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	269	236	69	234	35	200	5	38	19	3	53
Future Volume (veh/h)	52	269	236	69	234	35	200	5	38	19	3	53
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	57	292	257	75	254	38	217	5	41	21	3	58
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	296	362	310	191	658	97	782	88	720	705	34	663
Arrive On Green	0.04	0.20	0.20	0.05	0.21	0.21	0.09	0.50	0.50	0.02	0.44	0.44
Sat Flow, veh/h	1781	1815	1553	1781	3106	459	1781	175	1437	1781	79	1518
Grp Volume(v), veh/h	57	286	263	75	144	148	217	0	46	21	0	61
Grp Sat Flow(s),veh/h/ln	1781	1777	1591	1781	1777	1788	1781	0	1612	1781	0	1597
Q Serve(g_s), s	2.5	15.3	15.9	3.3	6.9	7.1	6.3	0.0	1.5	0.6	0.0	2.2
Cycle Q Clear(g_c), s	2.5	15.3	15.9	3.3	6.9	7.1	6.3	0.0	1.5	0.6	0.0	2.2
Prop In Lane	1.00		0.98	1.00		0.26	1.00		0.89	1.00		0.95
Lane Grp Cap(c), veh/h	296	355	317	191	377	379	782	0	808	705	0	698
V/C Ratio(X)	0.19	0.81	0.83	0.39	0.38	0.39	0.28	0.00	0.06	0.03	0.00	0.09
Avail Cap(c_a), veh/h	359	453	406	321	533	536	904	0	808	800	0	698
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.1	38.2	38.4	31.0	33.8	33.9	12.0	0.0	12.8	14.8	0.0	16.5
Incr Delay (d2), s/veh	0.3	8.1	10.9	1.3	0.6	0.7	0.2	0.0	0.1	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.4	7.1	1.5	3.0	3.1	2.5	0.0	0.5	0.3	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	46.3	49.2	32.3	34.4	34.5	12.2	0.0	12.9	14.8	0.0	16.7
LnGrp LOS	C	D	D	C	C	C	B	A	B	B	A	B
Approach Vol, veh/h		606			367			263			82	
Approach Delay, s/veh		46.1			34.0			12.3			16.3	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	55.6	10.7	26.0	14.2	49.2	9.5	27.2
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	12.0	* 26	15.5	24.5	7.5	30.0
Max Q Clear Time (g_c+I1), s	2.6	3.5	5.3	17.9	8.3	4.2	4.5	9.1
Green Ext Time (p_c), s	0.0	0.2	0.1	2.1	0.3	0.2	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	34.1
HCM 6th LOS	C

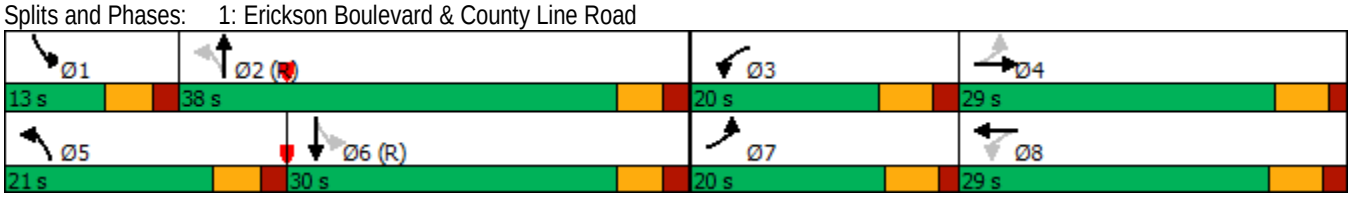
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	73	253	82	409	182	4	35	4
Future Volume (vph)	73	253	82	409	182	4	35	4
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	20.0	29.0	20.0	29.0	21.0	38.0	13.0	30.0
Total Split (%)	20.0%	29.0%	20.0%	29.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	26.7	19.3	27.1	19.4	57.1	49.7	47.0	40.4
Actuated g/C Ratio	0.27	0.19	0.27	0.19	0.57	0.50	0.47	0.40
v/c Ratio	0.31	0.59	0.34	0.71	0.27	0.07	0.06	0.09
Control Delay	24.5	30.1	25.5	42.6	13.5	7.2	13.5	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	30.1	25.5	42.6	13.5	7.2	13.5	8.8
LOS	C	C	C	D	B	A	B	A
Approach Delay		29.2		39.9		12.1		10.6
Approach LOS		C		D		B		B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 29.2	Intersection LOS: C
Intersection Capacity Utilization 47.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	253	148	82	409	36	182	4	50	35	4	52
Future Volume (veh/h)	73	253	148	82	409	36	182	4	50	35	4	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	79	275	161	89	445	39	198	4	54	38	4	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	203	355	202	209	573	50	817	57	773	766	50	707
Arrive On Green	0.05	0.16	0.16	0.06	0.17	0.17	0.08	0.52	0.52	0.03	0.47	0.47
Sat Flow, veh/h	1781	2183	1240	1781	3307	289	1781	110	1491	1781	105	1496
Grp Volume(v), veh/h	79	222	214	89	238	246	198	0	58	38	0	61
Grp Sat Flow(s),veh/h/ln	1781	1777	1647	1781	1777	1818	1781	0	1602	1781	0	1601
Q Serve(g_s), s	3.6	12.0	12.5	4.1	12.8	12.9	5.5	0.0	1.8	1.1	0.0	2.1
Cycle Q Clear(g_c), s	3.6	12.0	12.5	4.1	12.8	12.9	5.5	0.0	1.8	1.1	0.0	2.1
Prop In Lane	1.00		0.75	1.00		0.16	1.00		0.93	1.00		0.93
Lane Grp Cap(c), veh/h	203	289	268	209	308	315	817	0	830	766	0	757
V/C Ratio(X)	0.39	0.77	0.80	0.43	0.77	0.78	0.24	0.00	0.07	0.05	0.00	0.08
Avail Cap(c_a), veh/h	371	418	387	357	409	418	954	0	830	842	0	757
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.1	40.1	40.3	32.9	39.5	39.5	10.9	0.0	12.1	12.5	0.0	14.4
Incr Delay (d2), s/veh	1.2	5.3	7.3	1.4	6.5	6.7	0.2	0.0	0.2	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.6	5.6	1.8	6.1	6.3	2.1	0.0	0.7	0.4	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.3	45.4	47.6	34.3	46.0	46.2	11.1	0.0	12.2	12.5	0.0	14.7
LnGrp LOS	C	D	D	C	D	D	B	A	B	B	A	B
Approach Vol, veh/h		515			573			256			99	
Approach Delay, s/veh		44.6			44.2			11.3			13.8	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	57.3	11.7	22.3	13.3	52.8	10.6	23.3
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	14.0	* 24	15.5	24.5	14.5	23.0
Max Q Clear Time (g_c+I1), s	3.1	3.8	6.1	14.5	7.5	4.1	5.6	14.9
Green Ext Time (p_c), s	0.0	0.3	0.1	1.8	0.3	0.2	0.1	1.8

Intersection Summary	
HCM 6th Ctrl Delay	36.5
HCM 6th LOS	D

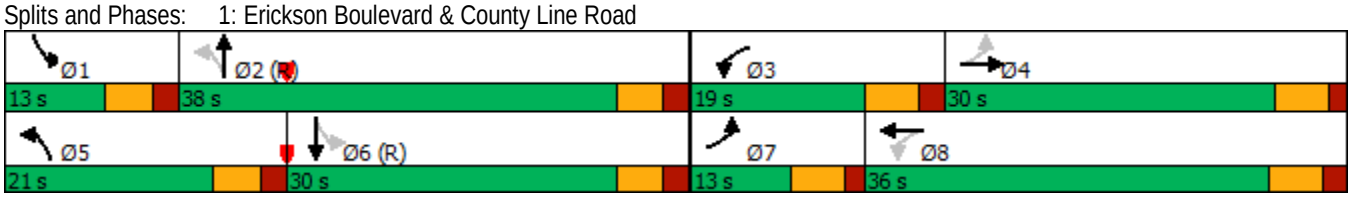
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	270	70	235	225	5	20	5
Future Volume (vph)	55	270	70	235	225	5	20	5
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	13.0	30.0	19.0	36.0	21.0	38.0	13.0	30.0
Total Split (%)	13.0%	30.0%	19.0%	36.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	23.2	17.3	25.9	18.6	59.6	54.6	47.6	41.5
Actuated g/C Ratio	0.23	0.17	0.26	0.19	0.60	0.55	0.48	0.42
v/c Ratio	0.20	0.74	0.35	0.44	0.32	0.05	0.03	0.09
Control Delay	23.5	29.4	27.1	34.8	13.0	7.3	13.1	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	29.4	27.1	34.8	13.0	7.3	13.1	8.8
LOS	C	C	C	C	B	A	B	A
Approach Delay		28.8		33.2		12.1		9.9
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	270	245	70	235	35	225	5	40	20	5	55
Future Volume (veh/h)	55	270	245	70	235	35	225	5	40	20	5	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	60	293	266	76	255	38	245	5	43	22	5	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	298	358	317	190	661	97	780	84	720	689	52	629
Arrive On Green	0.04	0.20	0.20	0.05	0.21	0.21	0.10	0.50	0.50	0.02	0.42	0.42
Sat Flow, veh/h	1781	1786	1577	1781	3107	457	1781	168	1443	1781	123	1480
Grp Volume(v), veh/h	60	291	268	76	144	149	245	0	48	22	0	65
Grp Sat Flow(s),veh/h/ln	1781	1777	1586	1781	1777	1788	1781	0	1611	1781	0	1604
Q Serve(g_s), s	2.6	15.7	16.2	3.3	7.0	7.1	7.3	0.0	1.5	0.7	0.0	2.4
Cycle Q Clear(g_c), s	2.6	15.7	16.2	3.3	7.0	7.1	7.3	0.0	1.5	0.7	0.0	2.4
Prop In Lane	1.00		0.99	1.00		0.26	1.00		0.90	1.00		0.92
Lane Grp Cap(c), veh/h	298	357	318	190	378	381	780	0	803	689	0	682
V/C Ratio(X)	0.20	0.82	0.84	0.40	0.38	0.39	0.31	0.00	0.06	0.03	0.00	0.10
Avail Cap(c_a), veh/h	359	435	389	336	533	536	884	0	803	782	0	682
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.0	38.2	38.4	30.9	33.7	33.8	12.3	0.0	12.9	15.4	0.0	17.2
Incr Delay (d2), s/veh	0.3	9.7	12.9	1.4	0.6	0.7	0.2	0.0	0.1	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	7.7	7.4	1.5	3.1	3.1	2.8	0.0	0.6	0.3	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	47.9	51.3	32.3	34.4	34.4	12.5	0.0	13.1	15.5	0.0	17.5
LnGrp LOS	C	D	D	C	C	C	B	A	B	B	A	B
Approach Vol, veh/h		619			369			293			87	
Approach Delay, s/veh		47.7			34.0			12.6			17.0	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	55.4	10.8	26.1	15.2	48.0	9.6	27.3
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	13.0	* 25	15.5	24.5	7.5	30.0
Max Q Clear Time (g_c+I1), s	2.7	3.5	5.3	18.2	9.3	4.4	4.6	9.1
Green Ext Time (p_c), s	0.0	0.2	0.1	1.9	0.4	0.3	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	34.5
HCM 6th LOS	C

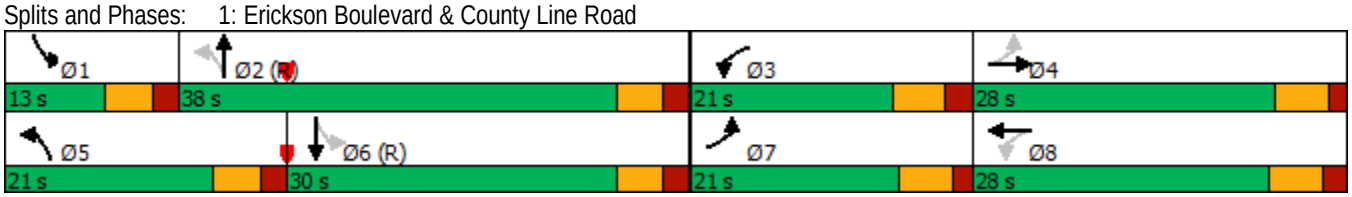
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	75	255	85	410	195	5	35	5
Future Volume (vph)	75	255	85	410	195	5	35	5
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	23.5	11.0	24.0	10.5	23.5	10.5	23.5
Total Split (s)	21.0	28.0	21.0	28.0	21.0	38.0	13.0	30.0
Total Split (%)	21.0%	28.0%	21.0%	28.0%	21.0%	38.0%	13.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	27.0	19.4	27.2	19.5	57.0	49.4	46.4	39.8
Actuated g/C Ratio	0.27	0.19	0.27	0.20	0.57	0.49	0.46	0.40
v/c Ratio	0.32	0.60	0.36	0.71	0.29	0.07	0.06	0.10
Control Delay	24.5	27.6	25.8	42.5	13.8	7.4	13.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	27.6	25.8	42.5	13.8	7.4	13.7	8.9
LOS	C	C	C	D	B	A	B	A
Approach Delay		27.1		39.9		12.4		10.7
Approach LOS		C		D		B		B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Erickson Boulevard & County Line Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	255	170	85	410	40	195	5	50	35	5	55
Future Volume (veh/h)	75	255	170	85	410	40	195	5	50	35	5	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	82	277	185	92	446	43	212	5	54	38	5	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	211	350	227	210	590	57	803	69	749	747	57	680
Arrive On Green	0.05	0.17	0.17	0.06	0.18	0.18	0.08	0.51	0.51	0.03	0.46	0.46
Sat Flow, veh/h	1781	2068	1339	1781	3276	315	1781	136	1470	1781	123	1480
Grp Volume(v), veh/h	82	237	225	92	241	248	212	0	59	38	0	65
Grp Sat Flow(s),veh/h/ln	1781	1777	1629	1781	1777	1814	1781	0	1606	1781	0	1604
Q Serve(g_s), s	3.8	12.8	13.3	4.2	12.9	13.0	6.0	0.0	1.9	1.1	0.0	2.3
Cycle Q Clear(g_c), s	3.8	12.8	13.3	4.2	12.9	13.0	6.0	0.0	1.9	1.1	0.0	2.3
Prop In Lane	1.00		0.82	1.00		0.17	1.00		0.92	1.00		0.92
Lane Grp Cap(c), veh/h	211	301	276	210	320	327	803	0	818	747	0	737
V/C Ratio(X)	0.39	0.79	0.82	0.44	0.75	0.76	0.26	0.00	0.07	0.05	0.00	0.09
Avail Cap(c_a), veh/h	394	400	367	373	391	399	931	0	818	823	0	737
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	39.8	40.0	32.4	38.9	38.9	11.2	0.0	12.5	13.2	0.0	15.2
Incr Delay (d2), s/veh	1.2	7.4	10.1	1.4	6.5	6.6	0.2	0.0	0.2	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	6.1	6.1	1.9	6.1	6.3	2.3	0.0	0.7	0.4	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	47.2	50.2	33.9	45.3	45.6	11.4	0.0	12.7	13.2	0.0	15.5
LnGrp LOS	C	D	D	C	D	D	B	A	B	B	A	B
Approach Vol, veh/h		544			581			271			103	
Approach Delay, s/veh		46.4			43.6			11.6			14.6	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	56.5	11.8	22.9	13.8	51.4	10.8	24.0
Change Period (Y+Rc), s	5.5	5.5	6.0	* 6	5.5	5.5	5.5	6.0
Max Green Setting (Gmax), s	7.5	32.5	15.0	* 23	15.5	24.5	15.5	22.0
Max Q Clear Time (g_c+I1), s	3.1	3.9	6.2	15.3	8.0	4.3	5.8	15.0
Green Ext Time (p_c), s	0.0	0.3	0.1	1.6	0.3	0.3	0.1	1.7

Intersection Summary	
HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	1	53	5	58	2	34	36	109	114	1
Future Vol, veh/h	0	1	1	53	5	58	2	34	36	109	114	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	1	61	6	67	2	39	41	125	131	1
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.2	8.6	8.5	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	3%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	47%	100%	50%	0%	100%	0%	0%	100%	0%
Vol Right, %	50%	0%	50%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	72	0	2	53	5	58	109	114	1
LT Vol	2	0	0	53	0	0	109	0	0
Through Vol	34	0	1	0	5	0	0	114	0
RT Vol	36	0	1	0	0	58	0	0	1
Lane Flow Rate	83	0	2	61	6	67	125	131	1
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.117	0	0.003	0.101	0.009	0.088	0.19	0.18	0.001
Departure Headway (Hd)	5.099	5.746	5.393	5.959	5.457	4.755	5.453	4.952	4.251
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	702	0	661	602	656	753	659	725	841
Service Time	2.838	3.497	3.144	3.69	3.189	2.487	3.182	2.681	1.979
HCM Lane V/C Ratio	0.118	0	0.003	0.101	0.009	0.089	0.19	0.181	0.001
HCM Control Delay	8.5	8.5	8.2	9.4	8.2	7.9	9.5	8.8	7
HCM Lane LOS	A	N	A	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0	0	0.3	0	0.3	0.7	0.7	0

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	2	3	28	1	109	1	77	65	69	62	2
Future Vol, veh/h	0	2	3	28	1	109	1	77	65	69	62	2
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	4	37	1	143	1	101	86	91	82	3
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.3	8.9	9.7	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	1%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	54%	100%	40%	0%	100%	0%	0%	100%	0%
Vol Right, %	45%	0%	60%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	143	0	5	28	1	109	69	62	2
LT Vol	1	0	0	28	0	0	69	0	0
Through Vol	77	0	2	0	1	0	0	62	0
RT Vol	65	0	3	0	0	109	0	0	2
Lane Flow Rate	188	0	7	37	1	143	91	82	3
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.266	0	0.01	0.062	0.002	0.193	0.143	0.117	0.003
Departure Headway (Hd)	5.097	5.911	5.487	6.051	5.549	4.846	5.672	5.17	4.467
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	702	0	647	591	643	737	631	691	797
Service Time	2.849	3.686	3.263	3.8	3.298	2.595	3.421	2.918	2.215
HCM Lane V/C Ratio	0.268	0	0.011	0.063	0.002	0.194	0.144	0.119	0.004
HCM Control Delay	9.7	8.7	8.3	9.2	8.3	8.8	9.4	8.6	7.2
HCM Lane LOS	A	N	A	A	A	A	A	A	A
HCM 95th-tile Q	1.1	0	0	0.2	0	0.7	0.5	0.4	0

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	1	54	5	79	2	35	37	121	116	1
Future Vol, veh/h	0	1	1	54	5	79	2	35	37	121	116	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	1	62	6	91	2	40	43	139	133	1
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.3	8.7	8.7	9.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	3%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	47%	100%	50%	0%	100%	0%	0%	100%	0%
Vol Right, %	50%	0%	50%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	74	0	2	54	5	79	121	116	1
LT Vol	2	0	0	54	0	0	121	0	0
Through Vol	35	0	1	0	5	0	0	116	0
RT Vol	37	0	1	0	0	79	0	0	1
Lane Flow Rate	85	0	2	62	6	91	139	133	1
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.123	0	0.004	0.104	0.009	0.121	0.213	0.186	0.001
Departure Headway (Hd)	5.203	5.854	5.501	6.017	5.515	4.813	5.519	5.018	4.317
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	687	0	648	595	648	744	651	715	827
Service Time	2.95	3.613	3.26	3.755	3.253	2.551	3.254	2.753	2.051
HCM Lane V/C Ratio	0.124	0	0.003	0.104	0.009	0.122	0.214	0.186	0.001
HCM Control Delay	8.7	8.6	8.3	9.5	8.3	8.2	9.8	8.9	7.1
HCM Lane LOS	A	N	A	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0	0	0.3	0	0.4	0.8	0.7	0

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	2	3	29	1	127	1	79	66	91	63	2
Future Vol, veh/h	0	2	3	29	1	127	1	79	66	91	63	2
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	4	38	1	167	1	104	87	120	83	3
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.5	9.2	10	9.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	1%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	54%	100%	40%	0%	100%	0%	0%	100%	0%
Vol Right, %	45%	0%	60%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	0	5	29	1	127	91	63	2
LT Vol	1	0	0	29	0	0	91	0	0
Through Vol	79	0	2	0	1	0	0	63	0
RT Vol	66	0	3	0	0	127	0	0	2
Lane Flow Rate	192	0	7	38	1	167	120	83	3
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.279	0	0.01	0.065	0.002	0.23	0.191	0.121	0.003
Departure Headway (Hd)	5.237	6.073	5.649	6.158	5.656	4.953	5.749	5.247	4.543
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	682	0	627	579	630	720	621	680	782
Service Time	3.004	3.869	3.445	3.92	3.417	2.714	3.51	3.008	2.304
HCM Lane V/C Ratio	0.282	0	0.011	0.066	0.002	0.232	0.193	0.122	0.004
HCM Control Delay	10	8.9	8.5	9.4	8.4	9.2	9.9	8.7	7.3
HCM Lane LOS	A	N	A	A	A	A	A	A	A
HCM 95th-tile Q	1.1	0	0	0.2	0	0.9	0.7	0.4	0

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	1	54	5	104	2	35	37	129	116	1
Future Vol, veh/h	0	1	1	54	5	104	2	35	37	129	116	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	1	62	6	120	2	40	43	148	133	1
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.4	8.8	8.8	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	3%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	47%	100%	50%	0%	100%	0%	0%	100%	0%
Vol Right, %	50%	0%	50%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	74	0	2	54	5	104	129	116	1
LT Vol	2	0	0	54	0	0	129	0	0
Through Vol	35	0	1	0	5	0	0	116	0
RT Vol	37	0	1	0	0	104	0	0	1
Lane Flow Rate	85	0	2	62	6	120	148	133	1
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.125	0	0.004	0.104	0.009	0.161	0.23	0.188	0.001
Departure Headway (Hd)	5.296	5.937	5.585	6.047	5.546	4.844	5.587	5.085	4.383
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	674	0	637	592	644	738	642	704	813
Service Time	3.055	3.709	3.356	3.793	3.291	2.589	3.33	2.828	2.126
HCM Lane V/C Ratio	0.126	0	0.003	0.105	0.009	0.163	0.231	0.189	0.001
HCM Control Delay	8.8	8.7	8.4	9.5	8.3	8.5	10	9	7.1
HCM Lane LOS	A	N	A	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0	0	0.3	0	0.6	0.9	0.7	0

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	2	3	29	1	140	1	79	66	111	63	2
Future Vol, veh/h	0	2	3	29	1	140	1	79	66	111	63	2
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	4	38	1	184	1	104	87	146	83	3
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.6	9.6	10.3	9.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	1%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	54%	100%	40%	0%	100%	0%	0%	100%	0%
Vol Right, %	45%	0%	60%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	0	5	29	1	140	111	63	2
LT Vol	1	0	0	29	0	0	111	0	0
Through Vol	79	0	2	0	1	0	0	63	0
RT Vol	66	0	3	0	0	140	0	0	2
Lane Flow Rate	192	0	7	38	1	184	146	83	3
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.285	0	0.011	0.066	0.002	0.258	0.235	0.122	0.003
Departure Headway (Hd)	5.346	6.309	5.884	6.242	5.74	5.036	5.8	5.297	4.593
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	667	0	612	571	619	707	615	671	771
Service Time	3.128	4.009	3.584	4.014	3.512	2.808	3.575	3.072	2.368
HCM Lane V/C Ratio	0.288	0	0.011	0.067	0.002	0.26	0.237	0.124	0.004
HCM Control Delay	10.3	9	8.6	9.5	8.5	9.6	10.4	8.8	7.4
HCM Lane LOS	B	N	A	A	A	A	B	A	A
HCM 95th-tile Q	1.2	0	0	0.2	0	1	0.9	0.4	0

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	1	67	6	93	3	43	45	147	143	1
Future Vol, veh/h	0	1	1	67	6	93	3	43	45	147	143	1
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	1	73	7	101	3	47	49	160	155	1
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.5	9	9.1	9.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	3%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	47%	100%	50%	0%	100%	0%	0%	100%	0%
Vol Right, %	49%	0%	50%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	0	2	67	6	93	147	143	1
LT Vol	3	0	0	67	0	0	147	0	0
Through Vol	43	0	1	0	6	0	0	143	0
RT Vol	45	0	1	0	0	93	0	0	1
Lane Flow Rate	99	0	2	73	7	101	160	155	1
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.147	0	0.003	0.125	0.01	0.139	0.249	0.22	0.001
Departure Headway (Hd)	5.364	6.06	5.707	6.167	5.666	4.963	5.6	5.099	4.397
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	665	0	622	580	630	719	641	703	811
Service Time	3.126	3.842	3.489	3.921	3.419	2.716	3.343	2.841	2.139
HCM Lane V/C Ratio	0.149	0	0.003	0.126	0.011	0.14	0.25	0.22	0.001
HCM Control Delay	9.1	8.8	8.5	9.8	8.5	8.5	10.2	9.3	7.1
HCM Lane LOS	A	N	A	A	A	A	B	A	A
HCM 95th-tile Q	0.5	0	0	0.4	0	0.5	1	0.8	0

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	4	35	1	153	1	97	82	108	78	3
Future Vol, veh/h	0	3	4	35	1	153	1	97	82	108	78	3
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	4	38	1	166	1	105	89	117	85	3
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.5	9.2	10.1	9.4
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	1%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	54%	100%	43%	0%	100%	0%	0%	100%	0%
Vol Right, %	46%	0%	57%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	0	7	35	1	153	108	78	3
LT Vol	1	0	0	35	0	0	108	0	0
Through Vol	97	0	3	0	1	0	0	78	0
RT Vol	82	0	4	0	0	153	0	0	3
Lane Flow Rate	196	0	8	38	1	166	117	85	3
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.285	0	0.012	0.065	0.002	0.229	0.188	0.124	0.004
Departure Headway (Hd)	5.239	6.083	5.679	6.17	5.668	4.965	5.756	5.254	4.55
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	681	0	623	578	628	718	621	679	781
Service Time	3.004	3.881	3.477	3.936	3.434	2.73	3.517	3.014	2.31
HCM Lane V/C Ratio	0.288	0	0.013	0.066	0.002	0.231	0.188	0.125	0.004
HCM Control Delay	10.1	8.9	8.5	9.4	8.4	9.2	9.9	8.8	7.3
HCM Lane LOS	B	N	A	A	A	A	A	A	A
HCM 95th-tile Q	1.2	0	0	0.2	0	0.9	0.7	0.4	0

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	5	70	10	120	5	45	45	155	145	5
Future Vol, veh/h	0	5	5	70	10	120	5	45	45	155	145	5
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	5	5	76	11	130	5	49	49	168	158	5
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.8	9.3	9.4	10
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	5%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	47%	100%	50%	0%	100%	0%	0%	100%	0%
Vol Right, %	47%	0%	50%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	95	0	10	70	10	120	155	145	5
LT Vol	5	0	0	70	0	0	155	0	0
Through Vol	45	0	5	0	10	0	0	145	0
RT Vol	45	0	5	0	0	120	0	0	5
Lane Flow Rate	103	0	11	76	11	130	168	158	5
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.159	0	0.018	0.132	0.017	0.183	0.268	0.229	0.007
Departure Headway (Hd)	5.551	6.306	5.952	6.254	5.752	5.049	5.723	5.221	4.519
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	640	0	605	571	618	706	625	684	786
Service Time	3.336	4.006	3.652	4.025	3.522	2.819	3.484	2.982	2.28
HCM Lane V/C Ratio	0.161	0	0.018	0.133	0.018	0.184	0.269	0.231	0.006
HCM Control Delay	9.4	9	8.8	10	8.6	9	10.6	9.5	7.3
HCM Lane LOS	A	N	A	A	A	A	B	A	A
HCM 95th-tile Q	0.6	0	0.1	0.5	0.1	0.7	1.1	0.9	0

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	5	35	5	170	5	100	85	130	80	5
Future Vol, veh/h	0	5	5	35	5	170	5	100	85	130	80	5
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	5	5	38	5	185	5	109	92	141	87	5
Number of Lanes	1	1	0	1	1	1	0	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	1	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	3	3	2
HCM Control Delay	8.8	9.6	10.6	9.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	3%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	53%	100%	50%	0%	100%	0%	0%	100%	0%
Vol Right, %	45%	0%	50%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	0	10	35	5	170	130	80	5
LT Vol	5	0	0	35	0	0	130	0	0
Through Vol	100	0	5	0	5	0	0	80	0
RT Vol	85	0	5	0	0	170	0	0	5
Lane Flow Rate	207	0	11	38	5	185	141	87	5
Geometry Grp	8	8	8	8	8	8	7	7	7
Degree of Util (X)	0.309	0	0.018	0.067	0.009	0.261	0.23	0.129	0.007
Departure Headway (Hd)	5.395	6.381	6.027	6.3	5.798	5.094	5.848	5.346	4.642
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	659	0	598	565	612	698	609	665	763
Service Time	3.182	4.081	3.727	4.081	3.579	2.875	3.627	3.124	2.42
HCM Lane V/C Ratio	0.314	0	0.018	0.067	0.008	0.265	0.232	0.131	0.007
HCM Control Delay	10.6	9.1	8.8	9.5	8.6	9.7	10.4	8.9	7.5
HCM Lane LOS	B	N	A	A	A	A	B	A	A
HCM 95th-tile Q	1.3	0	0.1	0.2	0	1	0.9	0.4	0

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	221	141	46	125	196	242	1294	360	776
Future Volume (vph)	221	141	46	125	196	242	1294	360	776
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	19.0	32.0	12.0	25.0	25.0	22.0	51.0	25.0	54.0
Total Split (%)	15.8%	26.7%	10.0%	20.8%	20.8%	18.3%	42.5%	20.8%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	11.9	19.3	5.0	10.0	36.2	14.5	52.8	19.2	57.6
Actuated g/C Ratio	0.10	0.16	0.04	0.08	0.30	0.12	0.44	0.16	0.48
v/c Ratio	0.71	0.49	0.36	0.47	0.37	0.64	0.69	0.72	0.44
Control Delay	64.4	24.3	63.1	57.3	10.9	57.3	29.8	55.3	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	24.3	63.1	57.3	10.9	57.3	29.8	55.3	20.9
LOS	E	C	E	E	B	E	C	E	C
Approach Delay		41.5		33.3			33.9		30.3
Approach LOS		D		C			C		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 33.6	Intersection LOS: C
Intersection Capacity Utilization 72.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	141	155	46	125	196	242	1294	94	360	776	180
Future Volume (veh/h)	221	141	155	46	125	196	242	1294	94	360	776	180
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	243	155	170	51	137	215	266	1422	103	396	853	198
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	301	326	291	118	478	424	329	2082	151	460	1916	442
Arrive On Green	0.09	0.18	0.18	0.03	0.13	0.13	0.10	0.43	0.43	0.13	0.46	0.46
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4859	352	3456	4146	957
Grp Volume(v), veh/h	243	155	170	51	137	215	266	996	529	396	700	351
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1807	1728	1702	1698
Q Serve(g_s), s	8.3	9.4	11.8	1.7	4.2	13.8	9.1	28.4	28.4	13.5	16.7	16.8
Cycle Q Clear(g_c), s	8.3	9.4	11.8	1.7	4.2	13.8	9.1	28.4	28.4	13.5	16.7	16.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.56
Lane Grp Cap(c), veh/h	301	326	291	118	478	424	329	1458	774	460	1573	785
V/C Ratio(X)	0.81	0.48	0.58	0.43	0.29	0.51	0.81	0.68	0.68	0.86	0.44	0.45
Avail Cap(c_a), veh/h	360	378	337	144	533	449	446	1458	774	547	1573	785
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	53.8	43.8	44.8	56.8	46.7	37.2	53.2	27.7	27.7	50.9	21.8	21.9
Incr Delay (d2), s/veh	10.9	1.1	1.9	2.5	0.3	0.9	7.8	2.6	4.8	11.5	0.9	1.8
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	4.1	4.2	4.8	0.8	1.9	5.5	4.3	11.9	13.1	6.6	6.8	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.6	44.9	46.7	59.3	47.1	38.2	61.0	30.3	32.6	62.5	22.8	23.7
LnGrp LOS	E	D	D	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h		568			403			1791			1447	
Approach Delay, s/veh		53.9			43.9			35.5			33.9	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	57.9	11.1	29.0	17.9	62.0	17.0	23.1
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	44.5	5.0	* 26	15.5	* 48	12.5	18.0
Max Q Clear Time (g_c+I1), s	15.5	30.4	3.7	13.8	11.1	18.8	10.3	15.8
Green Ext Time (p_c), s	0.5	8.7	0.0	1.5	0.4	8.4	0.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	38.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	229	83	108	64	236	87	1118	169	1443
Future Volume (vph)	229	83	108	64	236	87	1118	169	1443
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	25.0	32.0	18.0	25.0	25.0	16.0	65.0	25.0	74.0
Total Split (%)	17.9%	22.9%	12.9%	17.9%	17.9%	11.4%	46.4%	17.9%	52.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	16.6	12.5	9.6	8.0	24.9	9.1	79.4	12.5	82.8
Actuated g/C Ratio	0.12	0.09	0.07	0.06	0.18	0.06	0.57	0.09	0.59
v/c Ratio	0.59	0.48	0.48	0.33	0.63	0.41	0.44	0.58	0.55
Control Delay	64.8	32.4	69.5	67.3	30.2	67.9	18.9	68.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.8	32.4	69.5	67.3	30.2	67.9	18.9	68.5	18.9
LOS	E	C	E	E	C	E	B	E	B
Approach Delay		51.0		46.4			22.2		23.7
Approach LOS		D		D			C		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 67.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	229	83	88	108	64	236	87	1118	88	169	1443	130
Future Volume (veh/h)	229	83	88	108	64	236	87	1118	88	169	1443	130
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	239	86	92	112	67	246	91	1165	92	176	1503	135
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	291	260	160	457	310	137	2573	203	231	2657	239
Arrive On Green	0.09	0.16	0.16	0.05	0.13	0.13	0.04	0.53	0.53	0.07	0.56	0.56
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4825	381	3456	4769	428
Grp Volume(v), veh/h	239	86	92	112	67	246	91	822	435	176	1073	565
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1802	1728	1702	1793
Q Serve(g_s), s	9.5	6.0	7.2	4.5	2.3	18.0	3.6	20.8	20.8	7.0	28.5	28.5
Cycle Q Clear(g_c), s	9.5	6.0	7.2	4.5	2.3	18.0	3.6	20.8	20.8	7.0	28.5	28.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		0.24
Lane Grp Cap(c), veh/h	295	291	260	160	457	310	137	1816	961	231	1897	999
V/C Ratio(X)	0.81	0.30	0.35	0.70	0.15	0.79	0.67	0.45	0.45	0.76	0.57	0.57
Avail Cap(c_a), veh/h	457	324	289	272	457	310	234	1816	961	469	1897	999
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	62.9	51.4	51.9	65.8	54.2	53.6	66.3	20.1	20.1	64.2	20.0	20.0
Incr Delay (d2), s/veh	6.1	0.6	0.8	5.4	0.1	13.2	5.5	0.8	1.5	5.1	1.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	2.7	3.0	2.1	1.1	9.4	1.7	8.5	9.2	3.3	11.5	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	52.0	52.8	71.2	54.3	66.9	71.8	20.9	21.6	69.3	21.3	22.4
LnGrp LOS	E	D	D	E	D	E	E	C	C	E	C	C
Approach Vol, veh/h		417			425			1348			1814	
Approach Delay, s/veh		61.9			66.0			24.6			26.3	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	81.2	13.5	30.0	12.0	84.5	18.5	25.0
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	58.5	11.0	* 26	9.5	* 68	18.5	18.0
Max Q Clear Time (g_c+I1), s	9.0	22.8	6.5	9.2	5.6	30.5	11.5	20.0
Green Ext Time (p_c), s	0.4	11.1	0.1	0.8	0.1	16.5	0.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	245	150	47	131	200	253	1320	367	792
Future Volume (vph)	245	150	47	131	200	253	1320	367	792
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	19.0	32.0	12.0	25.0	25.0	22.0	51.0	25.0	54.0
Total Split (%)	15.8%	26.7%	10.0%	20.8%	20.8%	18.3%	42.5%	20.8%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	12.2	19.8	5.0	10.2	36.6	14.9	52.2	19.4	56.7
Actuated g/C Ratio	0.10	0.16	0.04	0.08	0.30	0.12	0.44	0.16	0.47
v/c Ratio	0.77	0.51	0.36	0.48	0.37	0.65	0.71	0.73	0.46
Control Delay	68.1	24.0	63.3	57.3	11.2	57.2	30.7	55.6	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	24.0	63.3	57.3	11.2	57.2	30.7	55.6	21.6
LOS	E	C	E	E	B	E	C	E	C
Approach Delay		43.2		33.7			34.7		30.8
Approach LOS		D		C			C		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 73.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	150	169	47	131	200	253	1320	96	367	792	194
Future Volume (veh/h)	245	150	169	47	131	200	253	1320	96	367	792	194
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	269	165	186	52	144	220	278	1451	105	403	870	213
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	326	342	305	119	486	431	341	2028	147	467	1842	449
Arrive On Green	0.09	0.19	0.19	0.03	0.14	0.14	0.10	0.42	0.42	0.14	0.45	0.45
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4860	352	3456	4097	998
Grp Volume(v), veh/h	269	165	186	52	144	220	278	1016	540	403	722	361
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1807	1728	1702	1691
Q Serve(g_s), s	9.2	9.9	12.9	1.8	4.4	14.1	9.5	29.8	29.8	13.7	17.8	17.9
Cycle Q Clear(g_c), s	9.2	9.9	12.9	1.8	4.4	14.1	9.5	29.8	29.8	13.7	17.8	17.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.59
Lane Grp Cap(c), veh/h	326	342	305	119	486	431	341	1421	754	467	1531	760
V/C Ratio(X)	0.83	0.48	0.61	0.44	0.30	0.51	0.82	0.72	0.72	0.86	0.47	0.47
Avail Cap(c_a), veh/h	360	378	337	144	533	452	446	1421	754	547	1531	760
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	53.4	43.1	44.3	56.8	46.6	36.9	53.0	29.0	29.0	50.8	23.1	23.1
Incr Delay (d2), s/veh	13.5	1.1	2.7	2.5	0.3	0.9	8.7	3.1	5.7	12.0	1.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	4.5	5.3	0.8	2.0	5.6	4.5	12.6	13.9	6.7	7.3	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	44.2	47.0	59.3	46.9	37.9	61.7	32.2	34.8	62.8	24.1	25.2
LnGrp LOS	E	D	D	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h		620			416			1834			1486	
Approach Delay, s/veh		54.9			43.7			37.4			34.9	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.2	56.6	11.1	30.1	18.3	60.5	17.8	23.4
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	44.5	5.0	* 26	15.5	* 48	12.5	18.0
Max Q Clear Time (g_c+I1), s	15.7	31.8	3.8	14.9	11.5	19.9	11.2	16.1
Green Ext Time (p_c), s	0.5	8.2	0.0	1.5	0.4	8.6	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	39.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	250	90	110	71	241	101	1140	172	1472
Future Volume (vph)	250	90	110	71	241	101	1140	172	1472
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	25.0	32.0	18.0	25.0	25.0	16.0	65.0	25.0	74.0
Total Split (%)	17.9%	22.9%	12.9%	17.9%	17.9%	11.4%	46.4%	17.9%	52.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	17.2	13.2	9.6	8.3	25.3	9.6	78.5	12.6	81.5
Actuated g/C Ratio	0.12	0.09	0.07	0.06	0.18	0.07	0.56	0.09	0.58
v/c Ratio	0.62	0.49	0.49	0.35	0.64	0.44	0.45	0.58	0.58
Control Delay	65.4	31.7	69.7	67.5	30.8	68.2	19.6	68.5	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.4	31.7	69.7	67.5	30.8	68.2	19.6	68.5	20.2
LOS	E	C	E	E	C	E	B	E	C
Approach Delay		50.8		47.1			23.3		24.8
Approach LOS		D		D			C		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 29.5	Intersection LOS: C
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	90	99	110	71	241	101	1140	90	172	1472	154
Future Volume (veh/h)	250	90	99	110	71	241	101	1140	90	172	1472	154
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	260	94	103	115	74	251	105	1188	94	179	1533	160
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	301	268	164	457	311	152	2539	201	235	2567	268
Arrive On Green	0.09	0.17	0.17	0.05	0.13	0.13	0.04	0.53	0.53	0.07	0.55	0.55
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4824	382	3456	4697	490
Grp Volume(v), veh/h	260	94	103	115	74	251	105	838	444	179	1111	582
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1802	1728	1702	1782
Q Serve(g_s), s	10.3	6.5	8.1	4.6	2.6	18.0	4.2	21.7	21.7	7.1	30.7	30.8
Cycle Q Clear(g_c), s	10.3	6.5	8.1	4.6	2.6	18.0	4.2	21.7	21.7	7.1	30.7	30.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		0.27
Lane Grp Cap(c), veh/h	316	301	268	164	457	311	152	1792	948	235	1861	974
V/C Ratio(X)	0.82	0.31	0.38	0.70	0.16	0.81	0.69	0.47	0.47	0.76	0.60	0.60
Avail Cap(c_a), veh/h	457	324	289	272	457	311	234	1792	948	469	1861	974
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	62.5	51.0	51.7	65.7	54.3	53.7	66.0	20.8	20.8	64.1	21.4	21.4
Incr Delay (d2), s/veh	7.8	0.6	0.9	5.4	0.2	14.4	5.5	0.9	1.7	5.1	1.4	2.7
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	4.9	3.0	3.3	2.2	1.2	9.7	2.0	8.9	9.6	3.3	12.5	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.3	51.6	52.6	71.1	54.5	68.1	71.5	21.7	22.5	69.2	22.8	24.1
LnGrp LOS	E	D	D	E	D	E	E	C	C	E	C	C
Approach Vol, veh/h		457			440			1387			1872	
Approach Delay, s/veh		62.5			66.6			25.7			27.6	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	80.2	13.6	30.7	12.7	83.0	19.3	25.0
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	58.5	11.0	* 26	9.5	* 68	18.5	18.0
Max Q Clear Time (g_c+I1), s	9.1	23.7	6.6	10.1	6.2	32.8	12.3	20.0
Green Ext Time (p_c), s	0.4	11.3	0.1	0.9	0.1	16.9	0.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	34.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	270	157	47	133	200	257	1320	367	792
Future Volume (vph)	270	157	47	133	200	257	1320	367	792
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	19.0	32.0	12.0	25.0	25.0	22.0	51.0	25.0	54.0
Total Split (%)	15.8%	26.7%	10.0%	20.8%	20.8%	18.3%	42.5%	20.8%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	12.4	20.1	5.0	10.3	36.6	15.1	52.0	19.3	56.2
Actuated g/C Ratio	0.10	0.17	0.04	0.09	0.30	0.13	0.43	0.16	0.47
v/c Ratio	0.84	0.53	0.36	0.48	0.37	0.66	0.71	0.73	0.47
Control Delay	73.7	23.8	63.3	57.3	11.2	57.2	30.9	55.6	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	23.8	63.3	57.3	11.2	57.2	30.9	55.6	21.8
LOS	E	C	E	E	B	E	C	E	C
Approach Delay		45.9		33.8			34.9		30.9
Approach LOS		D		C			C		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	157	183	47	133	200	257	1320	96	367	792	202
Future Volume (veh/h)	270	157	183	47	133	200	257	1320	96	367	792	202
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	297	173	201	52	146	220	282	1451	105	403	870	222
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	351	355	317	119	486	431	344	1992	144	467	1791	455
Arrive On Green	0.10	0.20	0.20	0.03	0.14	0.14	0.10	0.41	0.41	0.14	0.44	0.44
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4860	352	3456	4059	1030
Grp Volume(v), veh/h	297	173	201	52	146	220	282	1016	540	403	729	363
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1807	1728	1702	1685
Q Serve(g_s), s	10.1	10.4	13.9	1.8	4.4	14.1	9.6	30.1	30.1	13.7	18.3	18.4
Cycle Q Clear(g_c), s	10.1	10.4	13.9	1.8	4.4	14.1	9.6	30.1	30.1	13.7	18.3	18.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.61
Lane Grp Cap(c), veh/h	351	355	317	119	486	431	344	1396	741	467	1502	743
V/C Ratio(X)	0.85	0.49	0.63	0.44	0.30	0.51	0.82	0.73	0.73	0.86	0.49	0.49
Avail Cap(c_a), veh/h	360	378	337	144	533	452	446	1396	741	547	1502	743
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	53.0	42.6	44.0	56.8	46.6	36.9	53.0	29.8	29.8	50.8	23.8	23.9
Incr Delay (d2), s/veh	16.6	1.0	3.6	2.5	0.3	0.9	9.0	3.4	6.2	12.0	1.1	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	4.7	5.8	0.8	2.0	5.6	4.6	12.8	14.2	6.7	7.5	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	43.6	47.5	59.3	47.0	37.9	61.9	33.1	36.0	62.8	25.0	26.2
LnGrp LOS	E	D	D	E	D	D	E	C	D	E	C	C
Approach Vol, veh/h		671			418			1838			1495	
Approach Delay, s/veh		56.3			43.7			38.4			35.5	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.2	55.7	11.1	31.0	18.5	59.4	18.7	23.4
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	44.5	5.0	* 26	15.5	* 48	12.5	18.0
Max Q Clear Time (g_c+I1), s	15.7	32.1	3.8	15.9	11.6	20.4	12.1	16.1
Green Ext Time (p_c), s	0.5	8.1	0.0	1.6	0.4	8.7	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	40.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	263	94	110	77	241	112	1140	172	1472
Future Volume (vph)	263	94	110	77	241	112	1140	172	1472
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	25.0	32.0	18.0	25.0	25.0	16.0	65.0	25.0	74.0
Total Split (%)	17.9%	22.9%	12.9%	17.9%	17.9%	11.4%	46.4%	17.9%	52.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	15.9	14.9	9.6	8.6	28.2	10.1	76.9	12.6	79.4
Actuated g/C Ratio	0.11	0.11	0.07	0.06	0.20	0.07	0.55	0.09	0.57
v/c Ratio	0.70	0.47	0.49	0.37	0.59	0.47	0.46	0.58	0.60
Control Delay	69.6	30.4	69.7	67.5	28.8	68.3	20.4	68.5	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.6	30.4	69.7	67.5	28.8	68.3	20.4	68.5	21.6
LOS	E	C	E	E	C	E	C	E	C
Approach Delay		52.7		46.3			24.4		26.0
Approach LOS		D		D			C		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 30.7	Intersection LOS: C
Intersection Capacity Utilization 69.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	263	94	106	110	77	241	112	1140	90	172	1472	174
Future Volume (veh/h)	263	94	106	110	77	241	112	1140	90	172	1472	174
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	274	98	110	115	80	251	117	1188	94	179	1533	181
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	330	308	274	164	457	311	165	2520	199	235	2496	294
Arrive On Green	0.10	0.17	0.17	0.05	0.13	0.13	0.05	0.52	0.52	0.07	0.54	0.54
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4824	382	3456	4630	546
Grp Volume(v), veh/h	274	98	110	115	80	251	117	838	444	179	1127	587
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1802	1728	1702	1772
Q Serve(g_s), s	10.9	6.8	8.6	4.6	2.8	18.0	4.7	21.8	21.9	7.1	31.9	32.0
Cycle Q Clear(g_c), s	10.9	6.8	8.6	4.6	2.8	18.0	4.7	21.8	21.9	7.1	31.9	32.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		0.31
Lane Grp Cap(c), veh/h	330	308	274	164	457	311	165	1778	941	235	1835	955
V/C Ratio(X)	0.83	0.32	0.40	0.70	0.18	0.81	0.71	0.47	0.47	0.76	0.61	0.61
Avail Cap(c_a), veh/h	457	324	289	272	457	311	234	1778	941	469	1835	955
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	62.2	50.7	51.4	65.7	54.4	53.7	65.7	21.2	21.2	64.1	22.2	22.3
Incr Delay (d2), s/veh	8.9	0.6	0.9	5.4	0.2	14.4	5.5	0.9	1.7	5.1	1.5	3.0
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	5.2	3.1	3.5	2.2	1.3	9.7	2.2	8.9	9.7	3.3	13.1	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.1	51.2	52.4	71.1	54.6	68.1	71.2	22.1	22.9	69.2	23.8	25.2
LnGrp LOS	E	D	D	E	D	E	E	C	C	E	C	C
Approach Vol, veh/h		482			446			1399			1893	
Approach Delay, s/veh		62.8			66.4			26.4			28.5	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	79.6	13.6	31.2	13.2	82.0	19.9	25.0
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	58.5	11.0	* 26	9.5	* 68	18.5	18.0
Max Q Clear Time (g_c+I1), s	9.1	23.9	6.6	10.6	6.7	34.0	12.9	20.0
Green Ext Time (p_c), s	0.4	11.3	0.1	1.0	0.1	16.9	0.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	298	183	58	160	246	310	1627	453	976
Future Volume (vph)	298	183	58	160	246	310	1627	453	976
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	19.0	32.0	12.0	25.0	25.0	22.0	51.0	25.0	54.0
Total Split (%)	15.8%	26.7%	10.0%	20.8%	20.8%	18.3%	42.5%	20.8%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	12.5	21.1	5.0	11.2	40.5	16.7	48.0	22.2	53.6
Actuated g/C Ratio	0.10	0.18	0.04	0.09	0.34	0.14	0.40	0.18	0.45
v/c Ratio	0.91	0.56	0.44	0.53	0.42	0.71	0.94	0.77	0.59
Control Delay	82.6	24.7	66.1	57.4	13.8	57.7	45.1	55.4	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.6	24.7	66.1	57.4	13.8	57.7	45.1	55.4	25.7
LOS	F	C	E	E	B	E	D	E	C
Approach Delay		49.8		35.4			47.0		33.8
Approach LOS		D		D			D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 41.8	Intersection LOS: D
Intersection Capacity Utilization 84.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	298	183	206	58	160	246	310	1627	118	453	976	236
Future Volume (veh/h)	298	183	206	58	160	246	310	1627	118	453	976	236
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	324	199	224	63	174	267	337	1768	128	492	1061	259
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	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	360	379	338	126	533	487	396	1809	131	543	1681	410
Arrive On Green	0.10	0.21	0.21	0.04	0.15	0.15	0.11	0.37	0.37	0.16	0.41	0.41
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4860	351	3456	4096	999
Grp Volume(v), veh/h	324	199	224	63	174	267	337	1237	659	492	882	438
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1807	1728	1702	1691
Q Serve(g_s), s	11.1	11.9	15.5	2.1	5.3	16.8	11.5	43.0	43.2	16.8	24.7	24.8
Cycle Q Clear(g_c), s	11.1	11.9	15.5	2.1	5.3	16.8	11.5	43.0	43.2	16.8	24.7	24.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.59
Lane Grp Cap(c), veh/h	360	379	338	126	533	487	396	1267	673	543	1397	694
V/C Ratio(X)	0.90	0.52	0.66	0.50	0.33	0.55	0.85	0.98	0.98	0.91	0.63	0.63
Avail Cap(c_a), veh/h	360	379	338	144	533	487	446	1267	673	547	1397	694
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	53.1	41.8	43.2	56.7	45.6	34.7	52.1	37.2	37.2	49.7	28.1	28.2
Incr Delay (d2), s/veh	24.6	1.3	4.8	3.0	0.4	1.3	13.4	20.3	30.1	18.8	2.2	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	5.4	6.5	1.0	2.4	6.7	5.7	21.1	24.3	8.6	10.4	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.7	43.1	48.0	59.7	45.9	36.0	65.5	57.4	67.3	68.5	30.3	32.5
LnGrp LOS	E	D	D	E	D	D	E	E	E	E	C	C
Approach Vol, veh/h		747			504			2233			1812	
Approach Delay, s/veh		59.6			42.4			61.6			41.2	
Approach LOS		E			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.8	51.2	11.4	32.6	20.2	55.8	19.0	25.0
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	44.5	5.0	* 26	15.5	* 48	12.5	18.0
Max Q Clear Time (g_c+I1), s	18.8	45.2	4.1	17.5	13.5	26.8	13.1	18.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.6	0.3	9.8	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	52.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	304	109	136	86	297	121	1406	212	1814
Future Volume (vph)	304	109	136	86	297	121	1406	212	1814
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	25.0	32.0	18.0	25.0	25.0	16.0	65.0	25.0	74.0
Total Split (%)	17.9%	22.9%	12.9%	17.9%	17.9%	11.4%	46.4%	17.9%	52.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	17.0	15.7	10.2	8.9	31.0	10.5	73.1	15.0	77.6
Actuated g/C Ratio	0.12	0.11	0.07	0.06	0.22	0.08	0.52	0.11	0.55
v/c Ratio	0.76	0.50	0.57	0.40	0.68	0.49	0.60	0.60	0.75
Control Delay	72.0	30.8	72.0	67.7	35.3	68.3	25.4	65.9	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	30.8	72.0	67.7	35.3	68.3	25.4	65.9	26.5
LOS	E	C	E	E	D	E	C	E	C
Approach Delay		54.3		50.3			28.6		30.3
Approach LOS		D		D			C		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	304	109	120	136	86	297	121	1406	111	212	1814	184
Future Volume (veh/h)	304	109	120	136	86	297	121	1406	111	212	1814	184
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	317	114	125	142	90	309	126	1465	116	221	1890	192
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	371	315	281	191	457	331	174	2402	190	278	2471	250
Arrive On Green	0.11	0.18	0.18	0.06	0.13	0.13	0.05	0.50	0.50	0.08	0.52	0.52
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4824	382	3456	4713	476
Grp Volume(v), veh/h	317	114	125	142	90	309	126	1034	547	221	1362	720
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1802	1728	1702	1785
Q Serve(g_s), s	12.6	7.9	9.9	5.7	3.2	18.0	5.0	30.7	30.7	8.8	44.4	45.0
Cycle Q Clear(g_c), s	12.6	7.9	9.9	5.7	3.2	18.0	5.0	30.7	30.7	8.8	44.4	45.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		0.27
Lane Grp Cap(c), veh/h	371	315	281	191	457	331	174	1695	897	278	1785	936
V/C Ratio(X)	0.85	0.36	0.45	0.74	0.20	0.93	0.72	0.61	0.61	0.80	0.76	0.77
Avail Cap(c_a), veh/h	457	324	289	272	457	331	234	1695	897	469	1785	936
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	61.4	50.7	51.5	65.1	54.5	54.4	65.5	25.3	25.3	63.3	26.4	26.6
Incr Delay (d2), s/veh	12.4	0.7	1.1	6.5	0.2	32.6	7.0	1.6	3.1	5.2	3.2	6.1
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	6.2	3.6	4.0	2.7	1.4	13.7	2.4	12.7	13.8	4.1	18.5	20.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.8	51.4	52.6	71.6	54.7	87.1	72.5	27.0	28.4	68.4	29.6	32.6
LnGrp LOS	E	D	D	E	D	F	E	C	C	E	C	C
Approach Vol, veh/h		556			541			1707			2303	
Approach Delay, s/veh		64.4			77.6			30.8			34.2	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	76.2	14.8	31.8	13.6	79.9	21.5	25.0
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	58.5	11.0	* 26	9.5	* 68	18.5	18.0
Max Q Clear Time (g_c+I1), s	10.8	32.7	7.7	11.9	7.0	47.0	14.6	20.0
Green Ext Time (p_c), s	0.4	13.2	0.1	1.1	0.1	15.5	0.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	41.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	325	190	60	165	250	315	1630	455	980
Future Volume (vph)	325	190	60	165	250	315	1630	455	980
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	19.0	32.0	12.0	25.0	25.0	22.0	51.0	25.0	54.0
Total Split (%)	15.8%	26.7%	10.0%	20.8%	20.8%	18.3%	42.5%	20.8%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	12.5	21.3	5.0	11.4	40.7	16.8	47.8	22.3	53.3
Actuated g/C Ratio	0.10	0.18	0.04	0.10	0.34	0.14	0.40	0.19	0.44
v/c Ratio	0.99	0.59	0.45	0.53	0.43	0.71	0.94	0.78	0.60
Control Delay	98.8	26.0	66.6	57.4	14.1	57.8	46.1	55.6	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.8	26.0	66.6	57.4	14.1	57.8	46.1	55.6	26.0
LOS	F	C	E	E	B	E	D	E	C
Approach Delay		58.2		35.7			47.9		34.0
Approach LOS		E		D			D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 43.6	Intersection LOS: D
Intersection Capacity Utilization 85.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	190	220	60	165	250	315	1630	120	455	980	245
Future Volume (veh/h)	325	190	220	60	165	250	315	1630	120	455	980	245
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	353	207	239	65	179	272	342	1772	130	495	1065	266
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	360	379	338	127	533	488	400	1804	132	545	1667	416
Arrive On Green	0.10	0.21	0.21	0.04	0.15	0.15	0.12	0.37	0.37	0.16	0.41	0.41
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4855	355	3456	4074	1017
Grp Volume(v), veh/h	353	207	239	65	179	272	342	1241	661	495	890	441
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1806	1728	1702	1687
Q Serve(g_s), s	12.2	12.5	16.8	2.2	5.4	17.2	11.7	43.3	43.5	16.9	25.1	25.1
Cycle Q Clear(g_c), s	12.2	12.5	16.8	2.2	5.4	17.2	11.7	43.3	43.5	16.9	25.1	25.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.20	1.00		0.60
Lane Grp Cap(c), veh/h	360	379	338	127	533	488	400	1265	671	545	1393	690
V/C Ratio(X)	0.98	0.55	0.71	0.51	0.34	0.56	0.85	0.98	0.98	0.91	0.64	0.64
Avail Cap(c_a), veh/h	360	379	338	144	533	488	446	1265	671	547	1393	690
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	53.6	42.1	43.7	56.7	45.6	34.7	52.1	37.3	37.4	49.7	28.4	28.4
Incr Delay (d2), s/veh	42.1	1.6	6.6	3.1	0.4	1.4	13.8	21.3	31.2	19.0	2.3	4.5
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	7.4	5.6	7.2	1.0	2.4	6.8	5.8	21.4	24.6	8.7	10.6	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.7	43.7	50.4	59.8	46.0	36.1	65.9	58.6	68.6	68.7	30.6	32.9
LnGrp LOS	F	D	D	E	D	D	E	E	E	E	C	C
Approach Vol, veh/h		799			516			2244			1826	
Approach Delay, s/veh		68.7			42.5			62.6			41.5	
Approach LOS		E			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.9	51.1	11.4	32.6	20.4	55.6	19.0	25.0
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	44.5	5.0	* 26	15.5	* 48	12.5	18.0
Max Q Clear Time (g_c+I1), s	18.9	45.5	4.2	18.8	13.7	27.1	14.2	19.2
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.2	9.8	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	54.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	320	115	140	95	300	135	1410	215	1815
Future Volume (vph)	320	115	140	95	300	135	1410	215	1815
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phase	7	4	3	8	1	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.5	25.0	12.0	25.0	11.0	11.5	22.5	11.0	24.0
Total Split (s)	25.0	32.0	18.0	25.0	25.0	16.0	65.0	25.0	74.0
Total Split (%)	17.9%	22.9%	12.9%	17.9%	17.9%	11.4%	46.4%	17.9%	52.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	2.0	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	6.0	6.5	6.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	17.3	16.3	10.2	9.3	31.4	11.1	72.3	15.1	76.4
Actuated g/C Ratio	0.12	0.12	0.07	0.07	0.22	0.08	0.52	0.11	0.55
v/c Ratio	0.79	0.51	0.58	0.42	0.68	0.52	0.61	0.60	0.77
Control Delay	73.4	30.2	72.5	67.9	35.4	68.5	26.0	66.0	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	30.2	72.5	67.9	35.4	68.5	26.0	66.0	27.9
LOS	E	C	E	E	D	E	C	E	C
Approach Delay		54.7		50.9			29.5		31.6
Approach LOS		D		D			C		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Plaza Drive & Lucent Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	115	130	140	95	300	135	1410	115	215	1815	205
Future Volume (veh/h)	320	115	130	140	95	300	135	1410	115	215	1815	205
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	333	120	135	146	99	312	141	1469	120	224	1891	214
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	386	320	286	195	457	332	189	2371	194	281	2401	270
Arrive On Green	0.11	0.18	0.18	0.06	0.13	0.13	0.05	0.49	0.49	0.08	0.52	0.52
Sat Flow, veh/h	3456	1777	1585	3456	3554	1585	3456	4811	393	3456	4657	523
Grp Volume(v), veh/h	333	120	135	146	99	312	141	1039	550	224	1379	726
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1800	1728	1702	1776
Q Serve(g_s), s	13.3	8.3	10.7	5.8	3.5	18.0	5.6	31.2	31.2	8.9	46.2	46.9
Cycle Q Clear(g_c), s	13.3	8.3	10.7	5.8	3.5	18.0	5.6	31.2	31.2	8.9	46.2	46.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		0.29
Lane Grp Cap(c), veh/h	386	320	286	195	457	332	189	1677	887	281	1755	916
V/C Ratio(X)	0.86	0.37	0.47	0.75	0.22	0.94	0.75	0.62	0.62	0.80	0.79	0.79
Avail Cap(c_a), veh/h	457	324	289	272	457	332	234	1677	887	469	1755	916
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	61.1	50.5	51.4	65.1	54.7	54.4	65.2	25.9	25.9	63.2	27.6	27.8
Incr Delay (d2), s/veh	13.7	0.7	1.2	7.0	0.2	33.7	9.6	1.7	3.2	5.2	3.6	7.0
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	6.6	3.8	4.4	2.8	1.6	13.9	2.7	13.0	14.1	4.1	19.4	21.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.8	51.2	52.6	72.1	54.9	88.1	74.8	27.7	29.2	68.4	31.2	34.8
LnGrp LOS	E	D	D	E	D	F	E	C	C	E	C	C
Approach Vol, veh/h		588			557			1730			2329	
Approach Delay, s/veh		64.9			78.0			32.0			35.9	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.4	75.5	14.9	32.2	14.2	78.7	22.1	25.0
Change Period (Y+Rc), s	6.0	6.5	7.0	* 7	6.5	* 6.5	6.5	7.0
Max Green Setting (Gmax), s	19.0	58.5	11.0	* 26	9.5	* 68	18.5	18.0
Max Q Clear Time (g_c+I1), s	10.9	33.2	7.8	12.7	7.6	48.9	15.3	20.0
Green Ext Time (p_c), s	0.5	13.1	0.1	1.2	0.1	14.5	0.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	158	10	19	138	3	20	0	36	11	0	7
Future Vol, veh/h	3	158	10	19	138	3	20	0	36	11	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
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	3	172	11	21	150	3	22	0	39	12	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	153	0	0	183	0	0	301	379	92	286	383	77
Stage 1	-	-	-	-	-	-	184	184	-	194	194	-
Stage 2	-	-	-	-	-	-	117	195	-	92	189	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1425	-	-	1389	-	-	629	552	947	644	549	968
Stage 1	-	-	-	-	-	-	800	746	-	789	739	-
Stage 2	-	-	-	-	-	-	875	738	-	905	743	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1425	-	-	1389	-	-	616	543	947	609	540	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	656	583	-	649	577	-
Stage 1	-	-	-	-	-	-	798	745	-	787	728	-
Stage 2	-	-	-	-	-	-	855	727	-	866	742	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.9	9.8	10
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	817	1425	-	-	1389	-	-	744
HCM Lane V/C Ratio	0.075	0.002	-	-	0.015	-	-	0.026
HCM Control Delay (s)	9.8	7.5	-	-	7.6	-	-	10
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	160	21	38	143	9	16	0	30	6	0	4
Future Vol, veh/h	9	160	21	38	143	9	16	0	30	6	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
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	10	174	23	41	155	10	17	0	33	7	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	165	0	0	197	0	0	366	453	99	349	459	83
Stage 1	-	-	-	-	-	-	206	206	-	242	242	-
Stage 2	-	-	-	-	-	-	160	247	-	107	217	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1411	-	-	1373	-	-	565	501	937	581	497	960
Stage 1	-	-	-	-	-	-	777	730	-	740	704	-
Stage 2	-	-	-	-	-	-	826	701	-	887	722	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1411	-	-	1373	-	-	547	482	937	545	479	960
Mov Cap-2 Maneuver	-	-	-	-	-	-	606	537	-	598	529	-
Stage 1	-	-	-	-	-	-	772	725	-	735	683	-
Stage 2	-	-	-	-	-	-	798	680	-	850	717	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	1.5	9.9	10.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	787	1411	-	-	1373	-	-	704
HCM Lane V/C Ratio	0.064	0.007	-	-	0.03	-	-	0.015
HCM Control Delay (s)	9.9	7.6	-	-	7.7	-	-	10.2
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	195	10	20	170	5	20	0	40	15	0	10
Future Vol, veh/h	5	195	10	20	170	5	20	0	40	15	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
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	5	212	11	22	185	5	22	0	43	16	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	190	0	0	223	0	0	365	462	112	348	465	95
Stage 1	-	-	-	-	-	-	228	228	-	232	232	-
Stage 2	-	-	-	-	-	-	137	234	-	116	233	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1381	-	-	1343	-	-	566	495	920	582	493	943
Stage 1	-	-	-	-	-	-	754	714	-	750	711	-
Stage 2	-	-	-	-	-	-	852	710	-	876	711	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1381	-	-	1343	-	-	551	485	920	546	483	943
Mov Cap-2 Maneuver	-	-	-	-	-	-	608	542	-	603	537	-
Stage 1	-	-	-	-	-	-	751	711	-	747	700	-
Stage 2	-	-	-	-	-	-	828	699	-	832	708	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.8	10	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	786	1381	-	-	1343	-	-	705
HCM Lane V/C Ratio	0.083	0.004	-	-	0.016	-	-	0.039
HCM Control Delay (s)	10	7.6	-	-	7.7	-	-	10.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	195	25	40	175	10	20	0	30	10	0	5
Future Vol, veh/h	10	195	25	40	175	10	20	0	30	10	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	212	27	43	190	11	22	0	33	11	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	201	0	0	239	0	0	429	535	120	410	543	101
Stage 1	-	-	-	-	-	-	248	248	-	282	282	-
Stage 2	-	-	-	-	-	-	181	287	-	128	261	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1368	-	-	1325	-	-	510	450	909	526	445	935
Stage 1	-	-	-	-	-	-	734	700	-	701	676	-
Stage 2	-	-	-	-	-	-	803	673	-	862	691	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1368	-	-	1325	-	-	492	432	909	492	427	935
Mov Cap-2 Maneuver	-	-	-	-	-	-	492	432	-	492	427	-
Stage 1	-	-	-	-	-	-	728	694	-	695	654	-
Stage 2	-	-	-	-	-	-	772	651	-	824	685	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.4	10.8	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	679	1368	-	-	1325	-	-	584
HCM Lane V/C Ratio	0.08	0.008	-	-	0.033	-	-	0.028
HCM Control Delay (s)	10.8	7.7	-	-	7.8	-	-	11.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	201	0	8	149	7	0	0	0	29	0	11
Future Vol, veh/h	4	201	0	8	149	7	0	0	0	29	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
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	4	218	0	9	162	8	0	0	0	32	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	170	0	0	218	0	0	325	414	109	301	410	85
Stage 1	-	-	-	-	-	-	226	226	-	184	184	-
Stage 2	-	-	-	-	-	-	99	188	-	117	226	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1405	-	-	1349	-	-	604	527	924	629	530	957
Stage 1	-	-	-	-	-	-	756	716	-	800	746	-
Stage 2	-	-	-	-	-	-	896	743	-	875	716	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1405	-	-	1349	-	-	592	522	924	625	525	957
Mov Cap-2 Maneuver	-	-	-	-	-	-	634	568	-	662	569	-
Stage 1	-	-	-	-	-	-	754	714	-	798	741	-
Stage 2	-	-	-	-	-	-	879	738	-	873	714	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	0	10.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1405	-	-	1349	-	-	723
HCM Lane V/C Ratio	-	0.003	-	-	0.006	-	-	0.06
HCM Control Delay (s)	0	7.6	-	-	7.7	-	-	10.3
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	185	0	4	172	17	12	0	0	15	0	6
Future Vol, veh/h	11	185	0	4	172	17	12	0	0	15	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	201	0	4	187	18	13	0	0	16	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	205	0	0	201	0	0	327	438	101	329	429	103
Stage 1	-	-	-	-	-	-	225	225	-	204	204	-
Stage 2	-	-	-	-	-	-	102	213	-	125	225	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1364	-	-	1368	-	-	602	511	935	600	517	932
Stage 1	-	-	-	-	-	-	757	716	-	779	732	-
Stage 2	-	-	-	-	-	-	893	725	-	866	716	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1364	-	-	1368	-	-	592	505	935	595	511	932
Mov Cap-2 Maneuver	-	-	-	-	-	-	633	555	-	639	561	-
Stage 1	-	-	-	-	-	-	750	710	-	772	730	-
Stage 2	-	-	-	-	-	-	884	723	-	858	710	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	10.8	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	633	1364	-	-	1368	-	-	702
HCM Lane V/C Ratio	0.021	0.009	-	-	0.003	-	-	0.033
HCM Control Delay (s)	10.8	7.7	-	-	7.6	-	-	10.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	240	0	10	180	10	0	0	0	30	0	15
Future Vol, veh/h	5	240	0	10	180	10	0	0	0	30	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
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	5	261	0	11	196	11	0	0	0	33	0	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	207	0	0	261	0	0	391	500	131	365	495	104
Stage 1	-	-	-	-	-	-	271	271	-	224	224	-
Stage 2	-	-	-	-	-	-	120	229	-	141	271	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1361	-	-	1300	-	-	543	471	894	566	474	931
Stage 1	-	-	-	-	-	-	712	684	-	758	717	-
Stage 2	-	-	-	-	-	-	872	713	-	847	684	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1361	-	-	1300	-	-	528	465	894	561	468	931
Mov Cap-2 Maneuver	-	-	-	-	-	-	587	528	-	615	528	-
Stage 1	-	-	-	-	-	-	709	681	-	755	711	-
Stage 2	-	-	-	-	-	-	849	707	-	844	681	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	0	10.6
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1361	-	-	1300	-	-	693
HCM Lane V/C Ratio	-	0.004	-	-	0.008	-	-	0.071
HCM Control Delay (s)	0	7.7	-	-	7.8	-	-	10.6
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	220	0	5	205	20	15	0	0	15	0	10
Future Vol, veh/h	15	220	0	5	205	20	15	0	0	15	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
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	16	239	0	5	223	22	16	0	0	16	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	245	0	0	239	0	0	393	526	120	396	515	123
Stage 1	-	-	-	-	-	-	271	271	-	244	244	-
Stage 2	-	-	-	-	-	-	122	255	-	152	271	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1318	-	-	1325	-	-	541	455	909	538	462	905
Stage 1	-	-	-	-	-	-	712	684	-	738	703	-
Stage 2	-	-	-	-	-	-	869	695	-	835	684	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1318	-	-	1325	-	-	528	448	909	532	455	905
Mov Cap-2 Maneuver	-	-	-	-	-	-	584	513	-	592	520	-
Stage 1	-	-	-	-	-	-	703	676	-	729	700	-
Stage 2	-	-	-	-	-	-	855	692	-	825	676	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	11.3	10.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	584	1318	-	-	1325	-	-	687
HCM Lane V/C Ratio	0.028	0.012	-	-	0.004	-	-	0.04
HCM Control Delay (s)	11.3	7.8	-	-	7.7	-	-	10.5
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	237	149	4	0	7
Future Vol, veh/h	0	237	149	4	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	258	162	4	0	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	83
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	960
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	960
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	960
HCM Lane V/C Ratio	-	-	-	0.008
HCM Control Delay (s)	-	-	-	8.8
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	203	185	11	0	4
Future Vol, veh/h	0	203	185	11	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	221	201	12	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	107
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	926
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	926
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	926
HCM Lane V/C Ratio	-	-	-	0.005
HCM Control Delay (s)	-	-	-	8.9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	275	180	5	0	10
Future Vol, veh/h	0	275	180	5	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	299	196	5	0	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	101
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	935
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	935
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	935
HCM Lane V/C Ratio	-	-	-	0.012
HCM Control Delay (s)	-	-	-	8.9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	240	215	15	0	5
Future Vol, veh/h	0	240	215	15	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	261	234	16	0	5

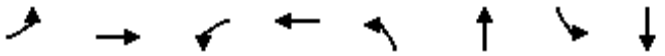
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	125
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	902
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	902
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	902
HCM Lane V/C Ratio	-	-	-	0.006
HCM Control Delay (s)	-	-	-	9
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

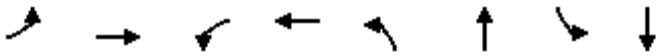
APPENDIX E

Queues Analysis Worksheets



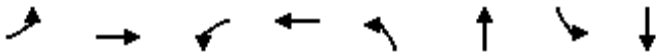
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	500	67	261	227	42	18	53
v/c Ratio	0.18	0.73	0.31	0.45	0.28	0.04	0.03	0.07
Control Delay	24.9	28.4	28.0	36.3	11.4	7.0	11.7	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	28.4	28.0	36.3	11.4	7.0	11.7	8.0
Queue Length 50th (ft)	23	89	31	74	63	1	4	1
Queue Length 95th (ft)	42	119	52	94	115	21	15	26
Internal Link Dist (ft)		308		275		1177		185
Turn Bay Length (ft)	350		600				50	
Base Capacity (vph)	283	970	295	1053	830	939	740	741
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.52	0.23	0.25	0.27	0.04	0.02	0.07

Intersection Summary



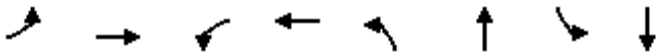
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	392	74	407	184	49	33	50
v/c Ratio	0.26	0.57	0.30	0.68	0.24	0.06	0.05	0.07
Control Delay	25.6	25.1	26.8	43.9	11.7	6.6	11.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	25.1	26.8	43.9	11.7	6.6	11.8	8.0
Queue Length 50th (ft)	30	71	34	127	51	1	8	1
Queue Length 95th (ft)	54	110	60	165	101	24	25	28
Internal Link Dist (ft)		308		275		1177		185
Turn Bay Length (ft)	350		600				50	
Base Capacity (vph)	396	813	378	717	807	864	727	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.48	0.20	0.57	0.23	0.06	0.05	0.07

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	559	76	293	245	48	22	65
v/c Ratio	0.20	0.74	0.35	0.44	0.32	0.05	0.03	0.09
Control Delay	23.5	29.4	27.1	34.8	13.0	7.3	13.1	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	29.4	27.1	34.8	13.0	7.3	13.1	8.8
Queue Length 50th (ft)	27	109	35	83	73	1	6	2
Queue Length 95th (ft)	49	156	60	110	142	26	20	36
Internal Link Dist (ft)		308		275		1177		185
Turn Bay Length (ft)	350		600				50	
Base Capacity (vph)	301	970	296	1053	794	901	693	701
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.58	0.26	0.28	0.31	0.05	0.03	0.09

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	82	462	92	489	212	59	38	65
v/c Ratio	0.32	0.60	0.36	0.71	0.29	0.07	0.06	0.10
Control Delay	24.5	27.6	25.8	42.5	13.8	7.4	13.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	27.6	25.8	42.5	13.8	7.4	13.7	8.9
Queue Length 50th (ft)	35	95	40	151	66	2	11	2
Queue Length 95th (ft)	61	137	67	193	128	30	31	36
Internal Link Dist (ft)		308		275		1177		185
Turn Bay Length (ft)	350		600				50	
Base Capacity (vph)	366	878	354	796	760	821	667	674
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.53	0.26	0.61	0.28	0.07	0.06	0.10

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	297	374	52	146	220	282	1556	403	1092
v/c Ratio	0.84	0.53	0.36	0.48	0.37	0.66	0.71	0.73	0.47
Control Delay	73.7	23.8	63.3	57.3	11.2	57.2	30.9	55.6	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	23.8	63.3	57.3	11.2	57.2	30.9	55.6	21.8
Queue Length 50th (ft)	118	64	20	57	36	108	352	155	193
Queue Length 95th (ft)	#189	112	42	90	92	149	458	200	260
Internal Link Dist (ft)		2568		360			1117		582
Turn Bay Length (ft)	300		225			275		250	
Base Capacity (vph)	357	854	143	530	606	470	2185	589	2344
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.44	0.36	0.28	0.36	0.60	0.71	0.68	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	274	208	115	80	251	117	1282	179	1714
v/c Ratio	0.70	0.47	0.49	0.37	0.59	0.47	0.46	0.58	0.60
Control Delay	69.6	30.4	69.7	67.5	28.8	68.3	20.4	68.5	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.6	30.4	69.7	67.5	28.8	68.3	20.4	68.5	21.6
Queue Length 50th (ft)	125	44	53	37	97	53	249	81	360
Queue Length 95th (ft)	172	83	85	65	182	85	327	119	460
Internal Link Dist (ft)		2529		360			1117		582
Turn Bay Length (ft)	300		225			275		250	
Base Capacity (vph)	453	683	269	455	490	261	2766	465	2845
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.30	0.43	0.18	0.51	0.45	0.46	0.38	0.60

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	353	446	65	179	272	342	1902	495	1331
v/c Ratio	0.99	0.59	0.45	0.53	0.43	0.71	0.94	0.78	0.60
Control Delay	98.8	26.0	66.6	57.4	14.1	57.8	46.1	55.6	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.8	26.0	66.6	57.4	14.1	57.8	46.1	55.6	26.0
Queue Length 50th (ft)	142	84	25	70	62	131	528	185	269
Queue Length 95th (ft)	#241	136	50	106	135	179	#666	251	344
Internal Link Dist (ft)		2340		360			1117		582
Turn Bay Length (ft)	300		225			275		250	
Base Capacity (vph)	357	878	143	530	640	494	2013	640	2226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.51	0.45	0.34	0.42	0.69	0.94	0.77	0.60

Intersection Summary

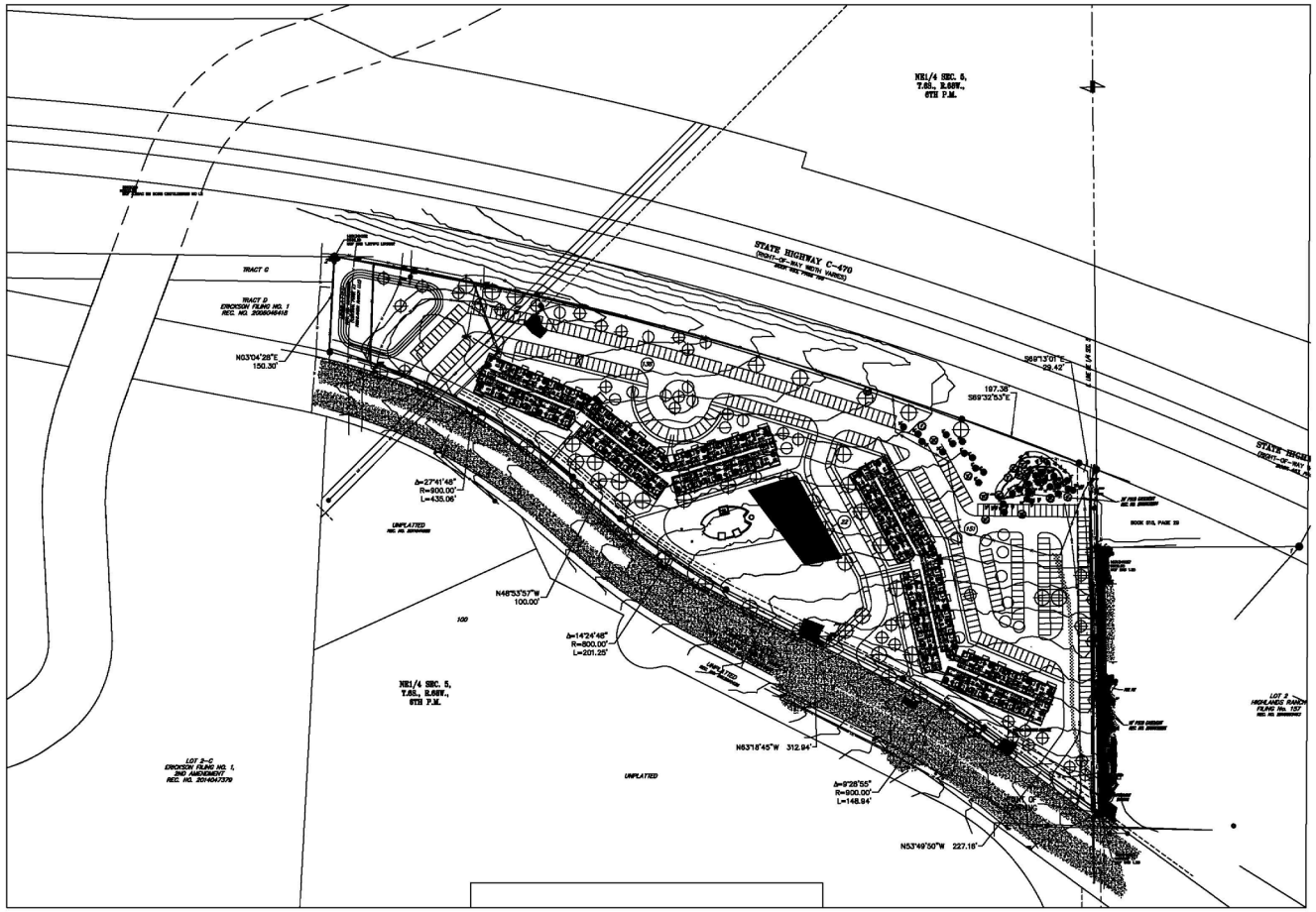
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	333	255	146	99	313	141	1589	224	2105
v/c Ratio	0.79	0.51	0.58	0.42	0.68	0.52	0.61	0.60	0.77
Control Delay	73.4	30.2	72.5	67.9	35.4	68.5	26.0	66.0	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	30.2	72.5	67.9	35.4	68.5	26.0	66.0	27.9
Queue Length 50th (ft)	152	53	67	46	155	64	364	102	539
Queue Length 95th (ft)	207	97	104	76	241	98	481	138	657
Internal Link Dist (ft)		2348		360			1117		582
Turn Bay Length (ft)	300		225			275		250	
Base Capacity (vph)	453	704	269	455	503	278	2602	480	2741
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.36	0.54	0.22	0.62	0.51	0.61	0.47	0.77

Intersection Summary

APPENDIX F

Conceptual Site Plan


STATE HIGHWAY C-470
TRACT G
N63°04'29"E
150.30'
Δ=27°41'48"
R=900.00'
L=435.06'
N48°33'57"W
100.00'
Δ=14°24'48"
R=900.00'
L=201.25'
N53°18'45"W 312.94'
Δ=9°26'55"
R=900.00'
L=148.94'
N53°49'50"W 227.18'
S89°13'01"E
29.42'
197.36'
S89°32'53"E
UNPLATTED

C-470 Bikeway
470
470
Fly'n'B Park
High Line Canal Trail
High Line Canal
Plaza Dr
Solana Lucent Station
Solana Lucent Station
Plaza Dr

HIGHLANDS RANCH FILING NO. 159

A PORTION OF PLANNING AREA 79
LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 6 SOUTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
9.686 ACRES – 1 LOT – SB2023-022

LEGAL DESCRIPTION

A PARCEL OF LAND SITUATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 6 SOUTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO; BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE EAST QUARTER CORNER OF SAID SECTION 5, AND CONSIDERING THE SOUTH LINE OF THE NORTHEAST QUARTER OF SAID SECTION 5 TO BEAR SOUTH 89°29'31" WEST, WITH ALL BEARINGS CONTAINED HEREIN RELATIVE THERETO;

THENCE ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, NORTH 00°35'26" WEST, A DISTANCE OF 958.54 TO A POINT ON THE NORTHERLY RIGHT-OF-WAY OF PLAZA DRIVE AS DESCRIBED IN THE OFFICIAL RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER, RECORDED UNDER RECEPTION NUMBER 2007050446, AND THE **POINT OF BEGINNING**;

THENCE, ALONG SAID NORTHERLY RIGHT-OF-WAY, THE FOLLOWING SIX (6) COURSES;

1. NORTH 53°49'50" WEST, A DISTANCE OF 227.16 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 900.00 FEET;
2. NORTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 09°28'55", AN ARC LENGTH OF 148.94 FEET;
3. TANGENT TO SAID CURVE, NORTH 63°18'45" WEST, A DISTANCE OF 312.94 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHEASTERLY HAVING A RADIUS OF 800.00 FEET;
4. NORTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 14°24'48", AN ARC LENGTH OF 201.25 FEET;
5. TANGENT TO SAID CURVE, NORTH 48°53'57" WEST, A DISTANCE OF 100.00 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 900.00 FEET;
6. NORTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 27°41'48", AN ARC LENGTH OF 435.06 FEET TO THE SOUTHWEST CORNER OF THAT PARCEL OF LAND DESCRIBED IN THE DOCUMENT RECORDED UNDER RECEPTION NUMBER 2015056862 IN SAID RECORDS;

THENCE DEPARTING SAID NORTHERLY RIGHT-OF-WAY, ALONG THE WESTERLY BOUNDARY OF SAID PARCEL, NORTH 03°04'28" EAST, A DISTANCE OF 150.30 FEET TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY OF STATE HIGHWAY C-470, AS DESCRIBED IN THE DOCUMENT RECORDED IN BOOK 483 AT PAGE 195 IN SAID RECORDS BEING A POINT ON A NON-TANGENT CURVE CONCAVE SOUTHERLY HAVING A RADIUS OF 5579.58 FEET, THE RADIUS POINT OF SAID CURVE BEARS SOUTH 09°16'43" WEST;

THENCE, ALONG SAID SOUTHERLY RIGHT-OF-WAY, THE FOLLOWING THREE (3) COURSES;

1. DEPARTING SAID WESTERLY BOUNDARY, EASTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 10°30'15", AN ARC LENGTH OF 1022.92 FEET;
2. NON-TANGENT TO SAID CURVE, SOUTH 69°32'53" EAST, A DISTANCE OF 197.38 FEET;
3. SOUTH 69°13'01" EAST, A DISTANCE OF 29.42 FEET TO A POINT ON SAID EAST LINE OF THE NORTHEAST QUARTER OF SECTION 5;

THENCE DEPARTING SAID SOUTHERLY RIGHT-OF-WAY, SOUTH 00°35'26" EAST, ALONG SAID EAST LINE, A DISTANCE OF 541.55 FEET TO THE **POINT OF BEGINNING**.

CONTAINING AN AREA OF 9.686 ACRES, (421,904 SQUARE FEET), MORE OR LESS.

DEDICATION STATEMENT

THE UNDERSIGNED, BEING ALL THE OWNERS, MORTGAGEES, BENEFICIARIES OF DEEDS OF TRUST AND HOLDERS OF OTHER INTERESTS IN THE LAND DESCRIBED HEREIN, HAVE LAID OUT, SUBDIVIDED AND PLATTED SAID LANDS INTO ONE LOT AND EASEMENTS, AS SHOWN HEREON UNDER THE NAME AND SUBDIVISION OF **HIGHLANDS RANCH FILING NO. 159.** THE UTILITY EASEMENTS SHOWN HEREON ARE HEREBY DEDICATED FOR PUBLIC UTILITIES AND CABLE COMMUNICATION SYSTEMS AND OTHER PURPOSES AS SHOWN HEREON. THE ENTITIES RESPONSIBLE FOR PROVIDING THE SERVICES FOR WHICH THE EASEMENTS ARE ESTABLISHED ARE HEREBY GRANTED THE PERPETUAL RIGHT OF INGRESS AND EGRESS FROM AND TO ADJACENT PROPERTIES FOR INSTALLATION, MAINTENANCE AND REPLACEMENT OF UTILITY LINES AND RELATED FACILITIES. THE UTILITY AND SIDEWALK EASEMENTS SHOWN HEREON ARE DEDICATED AND CONVEYED TO DOUGLAS COUNTY COLORADO, FOR PUBLIC USES AND PURPOSES.

CENTRAL PARK AT HIGHLANDS RANCH, LLC,
A COLORADO LIMITED LIABILITY COMPANY

BY: SHEA PROPERTIES MANAGEMENT COMPANY, INC., A DELAWARE CORPORATION, ITS MANAGER

BY: _____

NAME: _____

TITLE: _____

BY: _____

NAME: _____

TITLE: _____

STATE OF COLORADO)
) SS
COUNTY OF _____)

ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20___, BY _____,

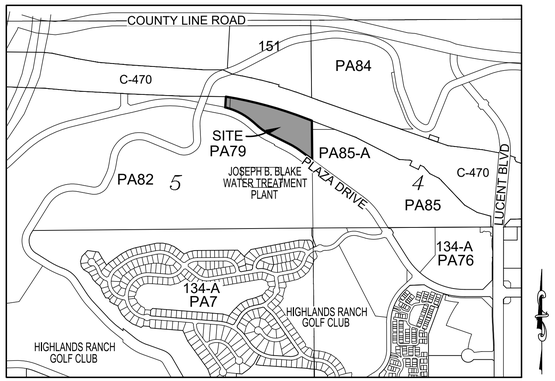
AS_____, AND _____, AS _____,

OF SHEA PROPERTIES MANAGEMENT COMPANY, INC., A DELAWARE CORPORATION, MANAGER OF CENTRAL PARK AT HIGHLANDS RANCH, LLC, A COLORADO LIMITED LIABILITY COMPANY.

WITNESS MY HAND AND OFFICIAL SEAL:

MY COMMISSION EXPIRES: _____

_____ _____
NOTARY PUBLIC DATE



PLANNED DEVELOPMENT & VICINITY MAP
SCALE: 1" = 1000'

SHEET INDEX:
SHEET 1: TITLE SHEET
SHEET 2: EXISTING CONDITIONS
SHEET 3, NEW EASEMENTS

GENERAL NOTES

1) FIDELITY NATIONAL TITLE INSURANCE COMPANY TITLE INSURANCE COMPANY COMMITMENT NO. 100-N0018336-020-JY, AMENDMENT NO. 2 DATED MARCH 22, 2023 AT 7:00 A.M. WAS RELIED UPON FOR RECORD INFORMATION REGARDING RIGHTS-OF-WAY, EASEMENTS AND ENCUMBRANCES. THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY AZTEC CONSULTANTS INC. TO DETERMINE OWNERSHIP, RIGHTS-OF-WAY, EASEMENTS OR OTHER MATTERS OF PUBLIC RECORD.

2) THE BEARINGS SHOWN HEREON ARE BASED UPON THE SOUTH LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 6 SOUTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING SOUTH 89°29'31" WEST, BETWEEN FOUND MONUMENTS AS SHOWN HEREON.

3) THE FLOOD ZONES SHOWN HEREON ARE APPROXIMATELY AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY, NATIONAL FLOOD INSURANCE PROGRAM, FLOOD INSURANCE RATE MAP FOR DOUGLAS COUNTY, COLORADO, MAP NUMBER 08035C0017F, DATED SEPTEMBER 30, 2005 AND MAP NUMBER 08035C0009F, DATED SEPTEMBER 30, 2005. OTHER AREAS, ZONE X IN THE LEGEND OF THE ABOVE MENTIONED MAPS IS DESCRIBED AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

4) NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVERED SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

5) ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT(S) OR LAND BOUNDARY MONUMENT(S), OR ACCESSORY COMMITS A CLASS TWO MISDEMEANOR PURSUANT TO 18-4-508 CRS.

6) DISTANCES ON THIS PLAT ARE GROUND DISTANCES EXPRESSED IN U.S. SURVEY FEET AND DECIMALS THEREOF. A U.S. SURVEY FOOT IS DEFINED AS EXACTLY 1200/3937 METERS.

7) THE PUBLIC SIDEWALK EASEMENT AS LOCATED WITHIN LOT 1 IS HEREBY DEDICATED TO DOUGLAS COUNTY FOR SIDEWALK IMPROVEMENTS.

SURVEYOR'S CERTIFICATE

I, MICHAEL J. NOFFSINGER, A DULY LICENSED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS PLAT TRULY AND CORRECTLY REPRESENTS THE RESULTS OF A SURVEY MADE ON MAY 19, 2022, BY ME OR UNDER MY DIRECT SUPERVISION AND THAT ALL MONUMENTS EXIST AS SHOWN HEREON; THAT MATHEMATICAL CLOSURE ERRORS ARE LESS THAN 1:50,000 (SECOND ORDER) AND THAT SAID PLAT HAS BEEN PREPARED IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS OF THE STATE OF COLORADO DEALING WITH MONUMENTS, SUBDIVISIONS OR SURVEYING OF LAND AND ALL APPLICABLE PROVISIONS OF THE DOUGLAS COUNTY SUBDIVISION RESOLUTION. THIS CERTIFICATION IS BASED ON MY KNOWLEDGE, INFORMATION AND BELIEF AND IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

I ATTEST THE ABOVE ON THIS ____ DAY OF _____, 2026.

_____
MICHAEL J. NOFFSINGER, LICENSED PROFESSIONAL LAND SURVEYOR
COLORADO P.L.S. NO. 38367
FOR AND ON BEHALF OF AZTEC CONSULTANTS, INC.

TITLE VERIFICATION

WE, _____ COMPANY, DO HEREBY CERTIFY THAT WE HAVE EXAMINED THE TITLE OF ALL LAND PLATTED HEREON AND THAT TITLE TO SUCH LAND IS IN THE DEDICATOR(S) FREE AND CLEAR OF ALL LIENS, TAXES AND ENCUMBRANCES.

_____ COMPANY

BY: _____

TITLE: _____

DATE: _____

STATE OF COLORADO)
)SS
COUNTY OF _____)

ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____ 2026

BY _____ AS _____

WITNESS MY HAND AND OFFICIAL SEAL

MY COMMISSION EXPIRES: _____

NOTARY PUBLIC _____

PLANNING COMMISSION CERTIFICATE

THE MINOR DEVELOPMENT FINAL PLAT FILE NO. _____ WAS REVIEWED BY THE PLANNING COMMISSION ON _____.

_____ _____
PLANNING DIRECTOR, DATE
ON BEHALF OF THE PLANNING COMMISSION

BOARD OF COUNTY COMMISSIONERS CERTIFICATE

THIS PLAT WAS APPROVED FOR FILING BY THE BOARD OF COUNTY COMMISSIONERS OF DOUGLAS COUNTY, COLORADO, ON THE _____ DAY OF _____ 2026, SUBJECT TO ANY CONDITIONS SPECIFIED HEREON. THE DEDICATION OF UTILITY AND SIDEWALK EASEMENTS ARE ACCEPTED.

ALL EXPENSES INCURRED WITH RESPECT TO IMPROVEMENTS FOR ALL UTILITY SERVICES, PAVING, GRADING, LANDSCAPING, CURBS, GUTTERS, SIDEWALKS, ROAD LIGHTING, ROAD SIGNS, FLOOD PROTECTION DEVICES, DRAINAGE STRUCTURES, AND ALL OTHER IMPROVEMENTS THAT MAY BE REQUIRED SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER AND NOT DOUGLAS COUNTY.

THIS ACCEPTANCE DOES NOT GUARANTEE THAT THE SOIL CONDITIONS, SUBSURFACE GEOLOGY, GROUNDWATER CONDITIONS OR FLOODING CONDITIONS OF THE LOT SHOWN HEREON ARE SUCH THAT A BUILDING PERMIT, WELL PERMIT OR SEWAGE DISPOSAL PERMIT WILL BE ISSUED.

_____
CHAIR, BOARD OF COUNTY COMMISSIONERS

LAST REVISED: 12/16/2025

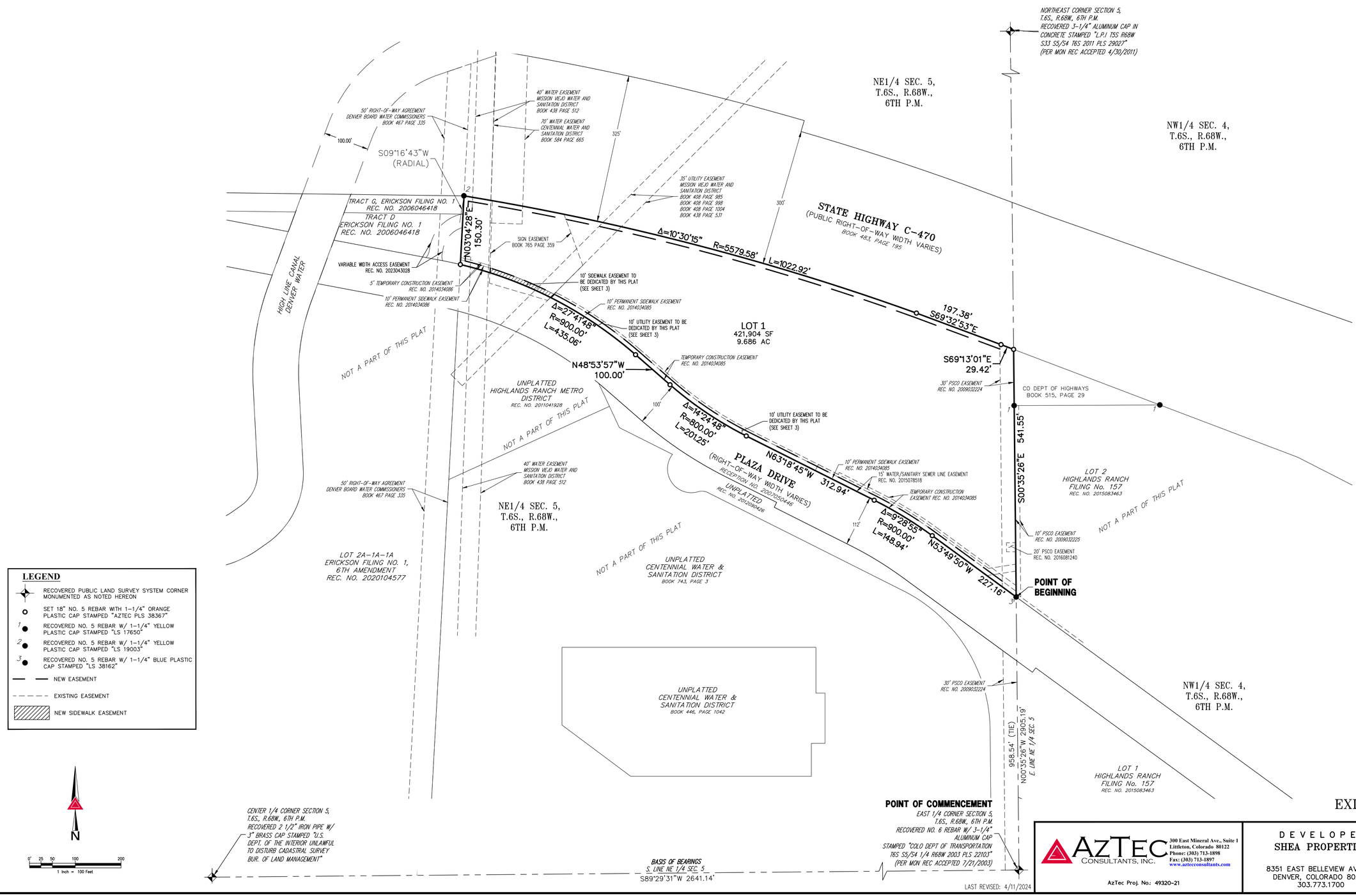
AZTEC CONSULTANTS, INC.
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com
AzTec Proj. No.: 49320-21

DEVELOPER
SHEA PROPERTIES
8351 EAST BELLEVIEW AVENUE
DENVER, COLORADO 80237
303.773.1700

DATE OF PREPARATION:	6/3/2022
SCALE:	N/A
SHEET 1 OF 3	

HIGHLANDS RANCH FILING NO. 159

A PORTION OF PLANNING AREA 79
LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 6 SOUTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
9.686 ACRES – 1 LOT – SB2023-022



EXISTING EASEMENTS

LAST REVISED: 4/11/2024

AzTec Consultants, Inc.
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

AzTec Proj. No.: 49320-21

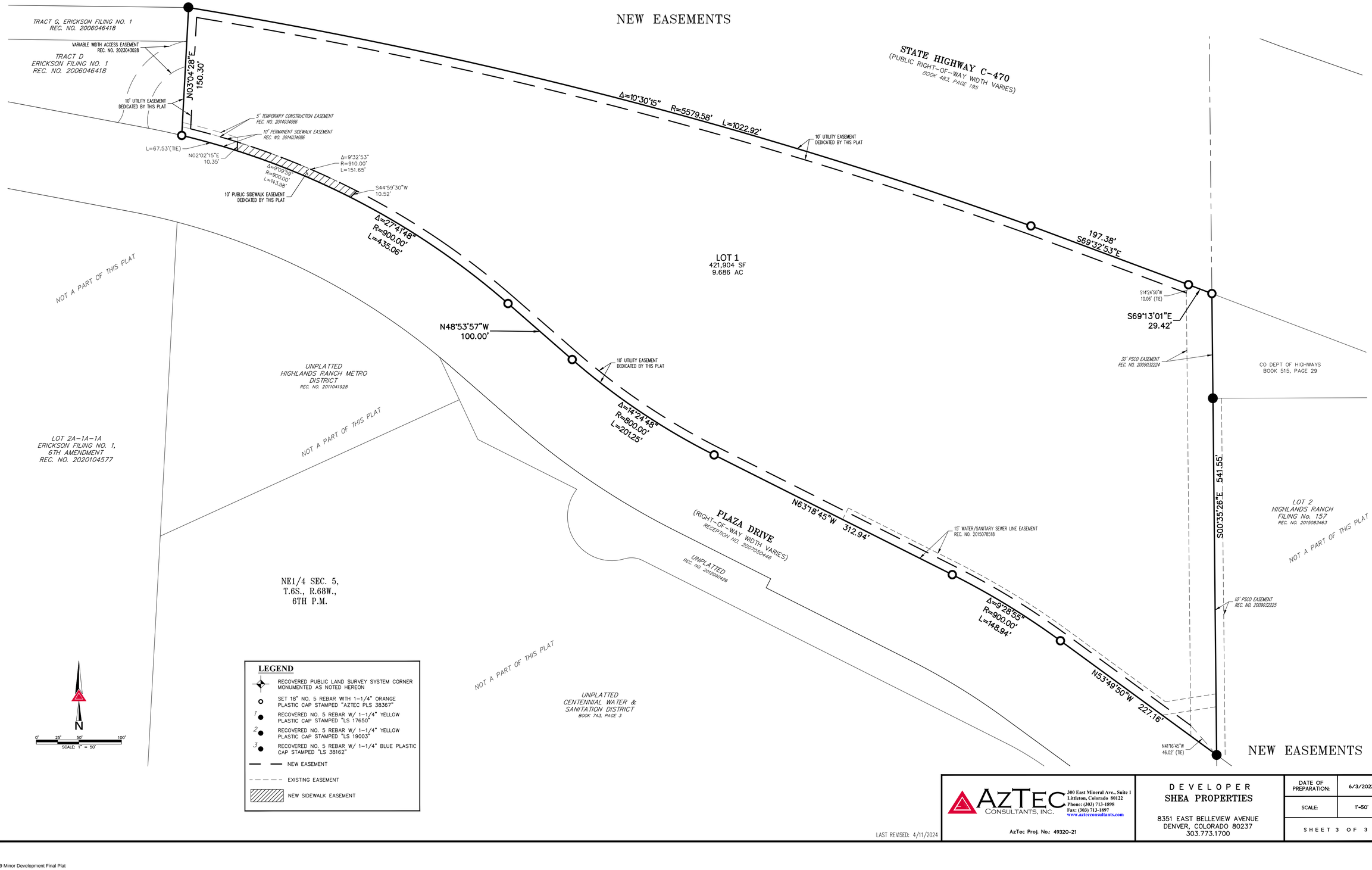
DEVELOPER
SHEA PROPERTIES
8351 EAST BELLEVIEW AVENUE
DENVER, COLORADO 80237
303.773.1700

DATE OF PREPARATION:	6/3/2022
SCALE:	1"=100'
SHEET 2 OF 3	

HIGHLANDS RANCH FILING NO. 159

A PORTION OF PLANNING AREA 79
LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 6 SOUTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
9.686 ACRES – 1 LOT – SB2023-022

NEW EASEMENTS



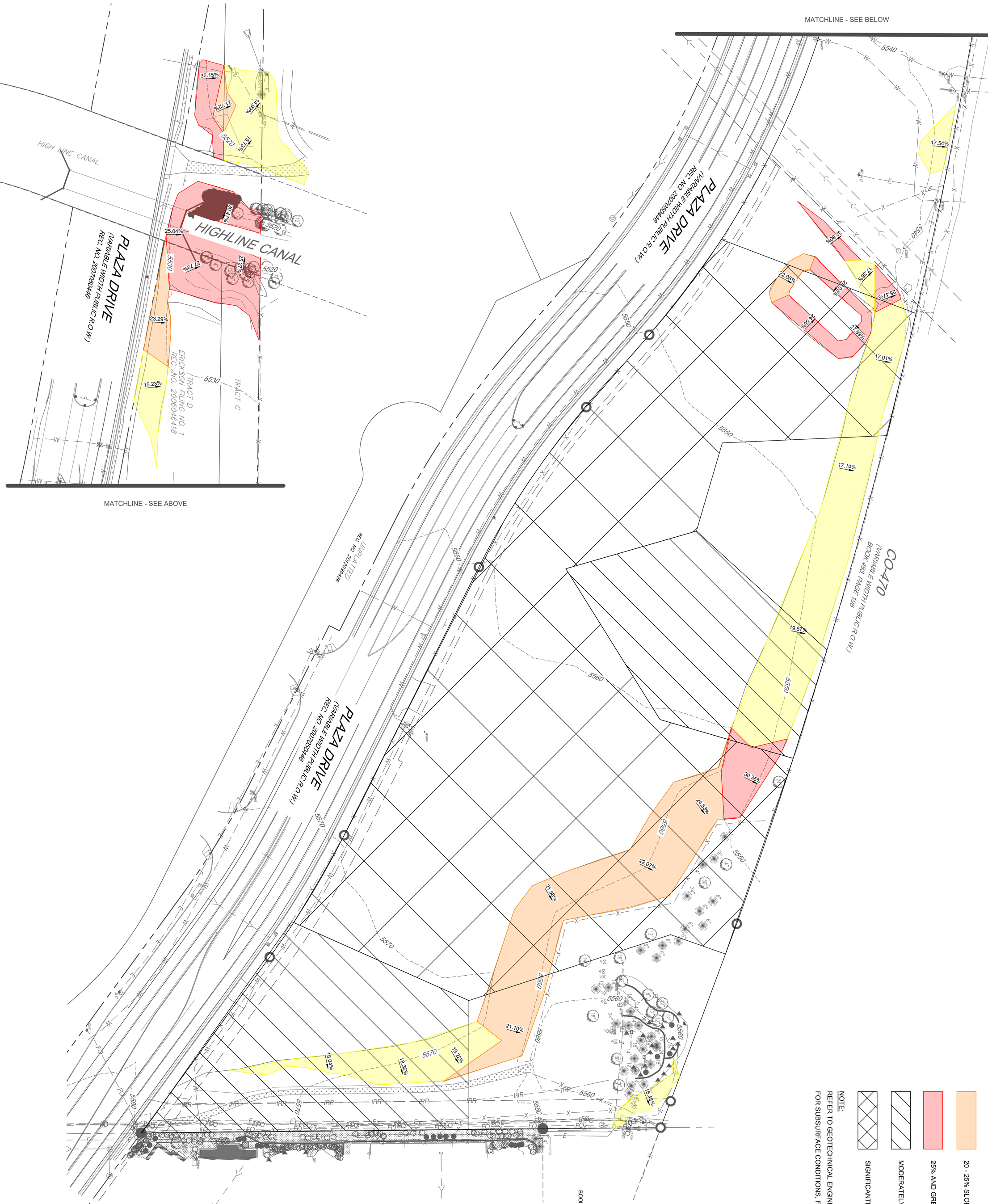
AzTec Consultants, Inc.
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com
AzTec Proj. No.: 49320-21

LAST REVISED: 4/11/2024

DEVELOPER
SHEA PROPERTIES
8351 EAST BELLEVIEW AVENUE
DENVER, COLORADO 80237
303.773.1700

DATE OF PREPARATION:	6/3/2022
SCALE:	1"=50'
SHEET 3 OF 3	

I:\2022\22029 – Kaos Apartments\CADD\Exhibits\22029 – Kaos Apartments – Supplemental Analysis Exhibit.dwg tab: Layout1 Mar 09, 2023 – 11:07am lludwig



LEGEND

- 15 - 20% SLOPES
- 20 - 25% SLOPES
- 25% AND GREATER SLOPES
- MODERATELY EXPANSIVE SOILS
- SIGNIFICANTLY EXPANSIVE SOILS

NOTE:
REFER TO GEOTECHNICAL ENGINEERING STUDY (HIGHLANDS RANCH WEST GEOTECHNICAL INVEST
FOR SUBSURFACE CONDITIONS, FIELD INVESTIGATION, AND SOIL CLASSIFICATIONS.

SHEET
EXH

HIGHLANDS RANCH - FILING NO. 159
EXHIBIT
SUPPLEMENTAL ANALYSIS

PROJECT NO:		22029
DATE	NO.	NOTES

DATE	NO.	NOTES

NOT FOR CONSTRUCTION

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 REDLAND.COM
▪ Land Planning ▪ Civil Engineering ▪ Landscape Architecture ▪ Construction Management

MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Trevor Bedford, AICP, Senior Planner

DESCRIPTION: Driskill Subdivision - Minor Development Final Plat - Project File: SB2025-042.

SUMMARY: The request is for approval of a minor development final plat for two single-family residential lots.

STAFF ASSESSMENT: Staff has evaluated the minor development final plat request in accordance with Article 6 of the Dougals County Subdivision Resolution. Should the Planning Commission find that the approval standards for the minor development final plat are met, the following proposed conditions should be considered for inclusion in the recommendation to the Board of County Commissioners.

1. Prior to recordation of the minor development final plat, the applicant shall provide payment in the amount of $500.00 to the Douglas County School District for cash-in-lieu fees.
2. Prior to recordation of the minor development final plat, the applicant shall provide payment in the amount of $250.00 to Douglas County for parks cash-in-lieu fees.
3. Prior to recordation of the minor development final plat, the applicant shall record a declaration of restrictive covenants for water as required by the Water Supply Overlay District.
4. During construction activity within the development, the applicant, its successors and assigns shall take all reasonable care to watch for historic resources, paleontological resources, and other cultural history resources and shall immediately notify Douglas County in the event of such a discovery.
5. Prior to recordation of the minor development final plat, technical corrections to the plat exhibit shall be made to the satisfaction of Douglas County.
6. All commitments and promises made by the applicant or applicant's representative during the public hearing and/or agreed to in writing and

included in the public record have been relied upon by the Board of County Commissioners in approving the application, therefore such approval is conditioned upon the applicant's full satisfaction of all such commitments and promises.

REVIEW:

Steven E Koster	Approve	2/19/2026
Samantha Hutchison - FYI	Notified - FYI	2/19/2026

ATTACHMENTS:

Cover Page
Staff Report - SB2025-042

MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Trevor Bedford, AICP, Senior Planner

DESCRIPTION: Driskill Subdivision - Minor Development Final Plat - Project File: SB2025-042.

SUMMARY: The request is for approval of a minor development final plat for two single-family residential lots.

STAFF ASSESSMENT: Staff has evaluated the minor development final plat request in accordance with Article 6 of the Dougals County Subdivision Resolution. Should the Planning Commission find that the approval standards for the minor development final plat are met, the following proposed conditions should be considered for inclusion in the recommendation to the Board of County Commissioners.

1. Prior to recordation of the minor development final plat, the applicant shall provide payment in the amount of $500.00 to the Douglas County School District for cash-in-lieu fees.
2. Prior to recordation of the minor development final plat, the applicant shall provide payment in the amount of $250.00 to Douglas County for parks cash-in-lieu fees.
3. Prior to recordation of the minor development final plat, the applicant shall record a declaration of restrictive covenants for water as required by the Water Supply Overlay District.
4. During construction activity within the development, the applicant, its successors and assigns shall take all reasonable care to watch for historic resources, paleontological resources, and other cultural history resources and shall immediately notify Douglas County in the event of such a discovery.
5. Prior to recordation of the minor development final plat, technical corrections to the plat exhibit shall be made to the satisfaction of Douglas County.
6. All commitments and promises made by the applicant or applicant's representative during the public hearing and/or agreed to in writing and

included in the public record have been relied upon by the Board of County Commissioners in approving the application, therefore such approval is conditioned upon the applicant's full satisfaction of all such commitments and promises.

REVIEW:

ATTACHMENTS:

Staff Report - SB2025-042

DOUGLAS COUNTY
COLORADO

Minor Development Final Plat Staff Report

Date: February 18, 2026

To: Douglas County Planning Commission

From: Trevor Bedford, AICP, Senior Planner TB
Jeanette Bare, AICP, Current Planning Manager SK for JB
Steve Koster, AICP, Deputy Director of Community Development SK

Subject: **Driskill Subdivision – Minor Development Final Plat**

Project File: **SB2025-042**

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

I. EXECUTIVE SUMMARY

The request is for approval of a minor development final plat for subdivision of a 30.16 acre parcel into two residential lots. The site is zoned Large Rural Residential (LRR) with proposed lot sizes of 10.16 acres and 20 acres. The site is located on the north side of Sand Creek Road in the Parker area.

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

II. APPLICATION INFORMATION

A. Applicant

William P. Driskill
9315 East Sand Creek Road
Parker, CO 80138

B. Request

The request is for approval of a minor development final plat for two single-family residential lots.

C. Process

A residential minor development application is processed pursuant to Article 6 of the Douglas County Subdivision Resolution (DCSR). Article 6 states the intent of the process is "to provide a streamlined review process for the creation of ten or fewer single-family residential lots."

Per Section 604.06 of the DCSR, "The Planning Commission shall evaluate the minor development final plat, staff report, referral agency comments, applicant responses,

and public comment and testimony, and make a recommendation to the Board to approve, approve with conditions, continue, table for further study, or deny the minor development request. The Planning Commission's decision shall be based on the evidence presented; compliance with adopted County standards, regulations, and policies; and other guidelines."

D. Location

The project is located on the north side of Sand Creek Road in the Parker area. The property is approximately 3,800 feet southeast of the intersection of Inspiration Drive and Woodland Trail.

E. Project Description

The applicant is requesting approval of a minor development final plat to subdivide a 30.16-acre parcel into two single-family residential lots. The property is zoned LRR, which is intended for densities between one dwelling unit per 34.9 acres and one dwelling per 10 acres. The lots are proposed to be 10.16 acres and 20 acres in size, conforming in size to the LRR zoning. An existing home is present on Lot 1 with access from East Sand Creek Road. Lot 2 will take access from East Sand Creek Road via a separately permitted driveway. The applicant has explained in the narrative that his plans are to keep Lot 2 as undeveloped pastureland for the foreseeable future. Lot 2 will be served by individual well and septic systems when developed.

Project Details

Zoning	Large Rural Residential
Gross Site Acreage	30.16 acres
Residential Lots	2
Gross Density	1 dwelling per 15.08 acres

III. CONTEXT

A. Background

The property is a metes and bounds lot that was rezoned from Agricultural One (A-1) to LRR in 2025. A single-family residence and a barn are located in the southwest corner of propped Lot 1 and are proposed to remain on site. The applicant provided an exhibit to demonstrate that the structures will continue to meet required setbacks if the subdivision is approved.

B. Adjacent Land Uses and Zoning

The subject property is surrounded by Agricultural One and Estate Residential properties. Directly to the east are utility lines. Surrounding land uses are single-family residential lots varying in size from approximately three acres to approximately 20 acres.

Zoning and Land Use

	Zoning	Land Use
North	Agricultural One	Single-Family Residential
South	Estate Residential	Single-Family Residential
East	Agricultural One	Utility Lines
West	Agricultural One	Single-Family Residential

IV. PHYSICAL SITE CHARACTERISTICS

A. Site Characteristics and Constraints

The site is developed with a single-family residence and a barn in the southwest portion of the property. The remainder of the property is used for grazing.

B. Access

The property is currently accessed via Sand Creek Road. The existing access will be used for Lot 1. Lot 2 will be accessed via a separately permitted driveway from Sand Creek Road.

C. Soils and Geology

The CMP Class 3 Hazards and Environmental Constraints map does not identify any Class 3 Hazards on the subject property. Colorado Geologic Survey (CGS) responded to the referral request with “no comment”. Site specific geologic conditions and soils will be evaluated during building permit process.

D. Drainage and Erosion

The applicant submitted a Phase III Drainage Report, which was accepted by Douglas County Public Works Engineering. The report indicates that drainage will follow existing natural drainages and that no future stormwater detention will be required. A Subdivision Improvements Agreement (SIA) is not required for the development. Drainage will continue to be evaluated at building permit through Drainage, Erosion and Sediment Control (DESC) Plans for any future buildings.

E. Floodplain

Lot 2 contains 100 year floodplain calculated by the applicant through a drainage. The exhibit shows the calculated floodplain and shows that there is sufficient room to construct a residence without impacting the floodplain.

F. Wildlife

The CMP Wildlife resources map identifies the site as having high habitat value. The site is not located within an overland connection, wildlife movement corridor, or wildlife crossing area. Colorado Parks and Wildlife (CPW) did not respond to the referral request.

G. Historic Preservation

Douglas County Historic Preservation responded to the referral request with no further recommendations at this time. Potential for buried archaeological resources was noted in the response along with procedures to follow should any artifacts be uncovered .

V. PROVISION OF SERVICES

A. Schools

The Douglas County School District (DCSD) did not respond to the referral request for this minor development final plat. However, when the property was rezoned in 2025, DCSD noted no objection and that a cash-in-lieu payment of $500 per new lot would be required if the property is subdivided into fewer than 10 lots. As indicated in proposed condition #1, cash-in-lieu in the amount of $500 will be required at the time of recordation of the minor development plat.

B. Fire Protection

South Metro Fire Rescue (SMFR) provides fire and emergency medical services to the site. SMFR responded to the referral request with no objection.

C. Sheriff Services

The Douglas County Sheriff's Office (DCSO) provides emergency services to the site. The Office of Emergency Management responded to the referral request with no comment. Responses were not received from DCSO or DCSO E911.

D. Water

The property and existing structures on site are currently served by a well. The applicant has provided an attorney's opinion showing ownership of sufficient water rights below the property. The Colorado Division of Water Resources (CDWR) reviewed the request and noted that the existing well will need to be re-permitted for Lot 1. Lot 2 will be served by a new well when the property is developed.

E. Sanitation

The property currently uses an on-site wastewater treatment system (OWTS). Lot 2 will also be served by OWTS. The Douglas County Health Department (DCHD) responded to the referral request with a favorable recommendation regarding the proposed method of wastewater disposal if Lot 2 has an OWTS permitted by DCHD and a well permitted by CDWR.

F. Utilities

Utility service is provided by CORE Electric and Xcel Energy. CORE noted facilities on site and requested a 20-foot general purpose utility easement be added along Sand Creek Road. Xcel Energy responded with no conflict and noted existing facilities along Sand Creek Road.

G. Dedications

A 20-foot general utility easement along the property frontage abutting Sand Creek Road is proposed.

H. Parks, Trails, and Open Space

As identified by proposed condition #2, a one-time cash-in-lieu payment of $250 is required per article 10, Section 1003.06 of the Subdivision Resolution.

I. Subdivision Improvements

The intent of the County's minor development process is "to provide a streamlined review process for the creation of ten or fewer single-family residential lots." Per the DCSR, specific engineering reports, studies, and construction plans are required to be submitted and finally accepted or approved by Public Works Engineering with a minor development application. Cost estimates for the public and private improvements are generated from the approved construction plans and incorporated into the subdivision improvements agreement (SIA) for the plat.

No public or private improvements are required for the Driskill Subdivision Minor Development. All engineering reports and studies have been reviewed by Public Works Engineering and found to be in compliance with required criteria. No SIA is required for this project as no public improvements are required.

VI. PUBLIC NOTICE AND INPUT

Courtesy notices were mailed to abutting property owners and no comments were received.

All referral agency comments are outlined in the Referral Agency Response Report attached to the staff report. All referral comments have been addressed.

Required public notice for the minor development final plat was accomplished in accordance with Section 608.02 of the DCSR.

VII. STAFF ANALYSIS

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

603.01: Conforms with the goals, objectives, and policies of the Master Plan.
Staff Comment: The subject property is located within the Northeast Subarea as identified by the Comprehensive Master Plan Nonurban Subareas Map 3.1. Policies related to nonurban subareas generally discuss compatibility with the rural area. Policy 3-3E.1 calls for a maximum density of one dwelling unit per 2.5 acres in the Northeast Subarea if approximately 50 percent of the property is adjacent to zoned lands or parcel sizes consistent with the proposed development, and where site characteristics can generally

support it. The property is adjacent on the south and east to properties zones Estate Residential and Rural Residential, which allow for densities as low as one dwelling unit per 2.5 acres and one dwelling unit per 5 acres, respectively. To the north and west are A-1 properties with lot sizes of approximately 10 acres to 20 acres, which is consistent with the proposed lot sizes. Policy 3-2A.1 is that "Design should be of a scale and character that complements the nonurban area." The proposed minor development creates two large rural properties with limited agricultural uses.

603.02: Addresses the design elements established in Article 4, Section 404.
Staff Comment: The minor development is in conformance with the design elements.

Per Section 404.01 – Lots are of an appropriate size and are capable of meeting minimum zone district standards such as minimum lot size, setbacks, and off-street parking.

Per Section 404.02 – Geotechnical conditions have been reviewed and there are no geologic hazards or unusual geotechnical constraints present that would preclude the proposed residential use and density.

Per Section 404.03 – Lots are oriented in a manner consistent with the surrounding subdivision and do not create conflicts with surrounding uses. Nearby lots are similar in size to the proposed minor development.

Per Section 404.04 – No roadway improvements are necessary. Both lots will be accessed via driveways from Sand Creek Road.

Per Section 404.05 – The site's natural terrain and vegetation will remain largely undisturbed given the proposed lot sizes.

Per Section 404.06 – Douglas County Historic Preservation responded to the referral request with no further recommendations at this time. The developer will notify Douglas County in the event of a discovery during construction activities.

Per Section 404.07 – The proposed lots will access Sand Creek Road via separate driveways. The property is rural in character and within this context, limited opportunities for pedestrian connections and other connections to shopping or employment are available.

Section 404.08 – Recommendations within technical studies will be implemented through the building permit process, specifically wildfire mitigation, site specific soil investigations, and foundation design.

603.03: Conforms with Section 18A, Water Supply Overlay District, of the Zoning Resolution.
Staff Comment: DCZR Section 1803A establishes approval standards to be used in the evaluation of land use applications reviewed under Section 18A. The CDWR has reviewed the minor development request and required water documentation and has determined

that the supply is adequate to serve the subdivision if the existing well is re-permitted. The applicant will record a declaration of restrictive covenants tying all Denver Basin groundwater beneath the property for future uses of the property (proposed condition #4).

1803A.01: The applicant has demonstrated that the water rights can be used for the proposed uses.
Staff Comment: The applicant has submitted a letter from an attorney stating ownership of sufficient water rights to adequately serve the subdivision. The CDWR reviewed the application and states the proposed water supply is adequate and can be provided without causing material injury to existing water rights.

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

1803A.03: The Water Plan is deemed adequate and feasible by the County to ensure that water supply shortage will not occur due to variations in the hydrologic cycle.
Staff Comment: The documentation provided is adequate to ensure that the proposed water supply can serve the proposed subdivision. Individual groundwater wells will serve the subdivision.

1803A.04: The Water Plan is sufficient to meet the demand applicable to the project based on the minimum water demand standards in Section 1805A herein.
Staff Comment: The documentation provided shows the applicant owns 4.9 acre feet of water in the Lower Dawson aquifer and 37.1 acre feet of water in other aquifers. Section 1805A.02.1 establishes the demand standard at 1 acre feet per year for a residence on an A-1 or LRR property. This demonstrates sufficient water rights to serve the proposed subdivision.

603.04: Provides for a public wastewater collection and treatment system and, if other methods of wastewater collection and treatment are proposed, such systems comply with State and local laws and regulations.
Staff Comment: Wastewater treatment will be provided by OWTS. DCHD provided a favorable recommendation for the method of wastewater disposal if Lot 2 is developed with a well permitted by CDWR and an OWTS permitted by DCHD. An approved septic design and septic use permit will be required at the time of building permit for Lot 2.

603.05 Identifies all areas of the proposed subdivision, which may involve soil or topographical conditions presenting hazards or requiring special precautions and the proposed uses of these areas are compatible with such conditions.
Staff Comment: The CGS reviewed the proposed subdivision and responded with no comment. No special mitigation or no build zones will be required. Standard geotechnical

explorations of individual building sites will be required as part of the building permit process.

603.06 Provides adequate drainage improvements.
Staff Comment: A Phase III Drainage Report was submitted by the applicant and reviewed by Public Works Engineering. The report notes that drainage will use existing drainage patterns and therefore no future stormwater detention will be required.

603.07 Provides adequate transportation improvements.
Staff Comment: Public Works Engineering has reviewed the subdivision for traffic impacts. The lots will take access from Sand Creek Road. No additional improvements are required.

603.08 Protects significant cultural, archaeological, natural, and historical resources and unique landforms.
Staff Comment: No unique landforms are associated within the property. The applicant will take care to look for any such items during development and construction of the site.

603.09 Demonstrates the extraction of any known commercial mining deposit shall not be impeded.
Staff Comment: There are no known commercial mining deposits on this property.

603.10 Has available all necessary services, including fire and police protection, recreation facilities, utility service facilities, streets, and open space to serve the proposed subdivision.
Staff Comment: All such services are available to the parcel. Fire protection is provided by SMFR, and DCSO provides police protection. Utility services facilities are provided by AT&T, CORE Electric Cooperative, Xcel Energy, Comcast, and CenturyLink.

VIII. STAFF ASSESSMENT

Staff has evaluated the minor development final plat request in accordance with Article 6 of the DCSR. Should the Planning Commission find that the approval standards for the minor development final plat are met, the following proposed conditions should be considered for inclusion in the recommendation to the Board of County Commissioners.

1. Prior to recordation of the minor development final plat, the applicant shall provide payment in the amount of $500.00 to the Douglas County School District for cash-in-lieu fees.

2. Prior to recordation of the minor development final plat, the applicant shall provide payment in the amount of $250.00 to Douglas County for parks cash-in-lieu fees.

3. Prior to recordation of the minor development final plat, the applicant shall record a declaration of restrictive covenants for water as required by the Water Supply Overlay District.

4. During construction activity within the development, the applicant, its successors and assigns shall take all reasonable care to watch for historic resources, paleontological resources, and other cultural history resources and shall immediately notify Douglas County in the event of such a discovery.

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ATTACHMENTS **PAGE**

Douglas County Land Use Application 10
Applicant's Narrative 11
CMP Map 14
Zoning Map 15
Aerial Map 16
Referral Response Report 17
Referral Response Letters 23
Phase III Drainage Report 70
Water Attorney Letter 125
Minor Development Supplemental Exhibit 129
Minor Development Exhibit 130

DOUGLAS COUNTY
COLORADO

Department of Community Development

www.douglas.co.us

LAND USE APPLICATION

Please complete, sign, and date this application. Return it with the required items listed on the Submittal Checklist to planningsubmittals@douglas.co.us. Submittals may also be mailed or submitted in person to Planning Services. *NOTE: The Planning Commission or the Board of County Commissioners should not be contacted regarding an open application.*

OFFICE USE ONLY
PROJECT TITLE:
PROJECT NUMBER: SB2025-042

PROJECT TYPE: Subdivide LRR Parcel into 2 Lots

MARKETING NAME: Sand Creek Road

PRESUBMITTAL REVIEW PROJECT NUMBER: PS2025-218

PROJECT SITE:

Address: 9315 East Sand Creek Road, Parker, CO 80138

State Parcel Number(s): 2235-070-00-007

Subdivision/Block#/Lot# *(if platted)*: Metes and Bounds, PTW½, 7, 6, 65

PROPERTY OWNER(S):

Name(s): William P. Driskill and Maria T. Driskill

Address: 9315 East Sand Creek Road, Parker, CO 80138

Phone: 832-236-1836

Email: [redacted]

AUTHORIZED REPRESENTATIVE: *(Notarized Letter of Authorization is required from the property owner, unless the owner is acting as the representative)*

Name: William P. Driskill

Address: 9315 East Sand Creek Road, Parker, CO 80138

Phone: 832-236-1836

Email: [redacted]

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

William P Driskill
Applicant Signature

10/20/2025
Date

William P. and Maria T. Driskill
9315 East Sand Creek Road
Parker, CO 80138

Project Number: PS 2025-218
October 20, 2025

Project Summary
Driskill Subdivide

General Project Concept: The property consists of 30.16 acres and is zoned Large Rural Residential, LLR. The owners seek approval to subdivide the property into 2 lots. Lot 1 to be 10.16 acres which will contain the existing house, outbuildings, structures, and well. Lot 2 to be 20.0 acres which will be undeveloped pasture land.

Landowner/Applicant: William P. Driskill and Maria T. Driskill
9315 East Sand Creek Road
Parker, CO 80138

Representative: William P. Driskill

Mineral Rights Owner: Landowner/Applicant

Water Rights Owner: Landowner/Applicant

Purpose of Request: To obtain subdivide approval.

Proposed Staging and Time Frame: Immediately after all approvals are obtained.

Relationship to Existing Land Uses: Adjoining land to the West is two 10 acre lots. Adjoining land to the North is one 10 acre lot and one 20.13 acre lot. All 4 lots are zoned residential and are part of the Metes and Boundes subdivision. Lots lying to the South, across Sand Creek Road, vary in size from approximately 2.75 acres to 3.25 acres, are zoned residential, and are part of the Ponderosa Hills subdivision. Adjoining land to the East is a 5.0 acre utility easement that is maintained by Public Service Company of Colorado. To the East of the easement is open space that is maintained by Ponderosa Summit HOA. Lots lying to the East of the open space vary in size from approximately 3.0 to 3.25 acres, are zoned residential, and are part of the Ponderosa Summit subdivision.

Public Service Availability: Given the relatively minor nature and location of the project, the availability and adequacy of public services should not be an issue. The property is served by Core Electric for electricity, Xcel Energy for natural gas, ATT/Direct TV and Rise Broadband for Internet. The property is served by the Douglas County School District. Fire protection is provided by South Metro Station #47 located 3.4 miles from the property. Water and Sewer is and will be provided by private well and septic systems as central water and sewer is not available in the area. Underground well water has been

determined to be more than adequate for the proposed subdivide (attachment). Sanitation service provided by
Republic Services.

Site Characteristics: There is an existing home, barn/shop, outbuildings, and corrals with water supply for livestock located on the West end of the property that will be located within the proposed 10.16 acre lot. The proposed 20.0 acre lot consists of open grass land and has a slight draw towards the East end that runs South to North. The property is fenced in its entirety with 4 and 5 string wire to accomodate livestock while allowing wildlife to pass over and through. The property is well maintained. There are no known natural or man- made hazards on the property. Vast views of open space are spectacular.

Impacts on existing Flora or Fauna: Impacts with be minimal given the large size of the proposed lots, property characteristics, and the minor nature of the proposal.

Compliance with the Douglas County Comprehensive Master Plan: The subdivide project lies within the Douglas County Northeast subarea and is in compliance with the policies discussed in the nonurban land use section of the Douglas County Comprehensive Master Plan. The project is also in compliance with Section 4 of the Douglas County Zoning Resolution, Large Rural Residential District.

Policy 3-3E.1- The LRR maximum gross density of one dwelling per 10 acres does not exceed the Master Plan maximum of 1 dwelling per 2.5 acres. The project lot sizes and site characteristics are consistent with adjacent and adjoining properties.
Policy 3-3E.2- The public infastructure is adequate to support the project.
Policy 3-3E.3- Central water and sewer systems are not available in the area.
Policy 3-3E.4- The site has no existing alluvial wells at this time and none are anticipated. No development is planned.
Policy 3-3E.5- The project will not remove any trees or vegetation. No development is planned but additional trees will be planted if necessary.
Policy 3-3E.6- The property will continue to be maintained. Open space is adjacent to the entire East side of the proposed 20.0 acre lot and is present in the surrounding area.
Policy 3-3E.7- No development is planned.

Entrance to Proposed lot 2: Douglas County Building Division, Permits has advised that an entrance permit should only be obtained until after Douglas County approves the proposal.

Existing Water Well Permit Amendment: The Colorado Division of Water Resources has advised that the existing well permit cannot be ammended to Lot 1 until after the proposal is approved by Douglas County.

Historic Preservation Cultural Resource Study: Brittany Cassell at bcassell@douglas.co.us advised that a study will not be required.

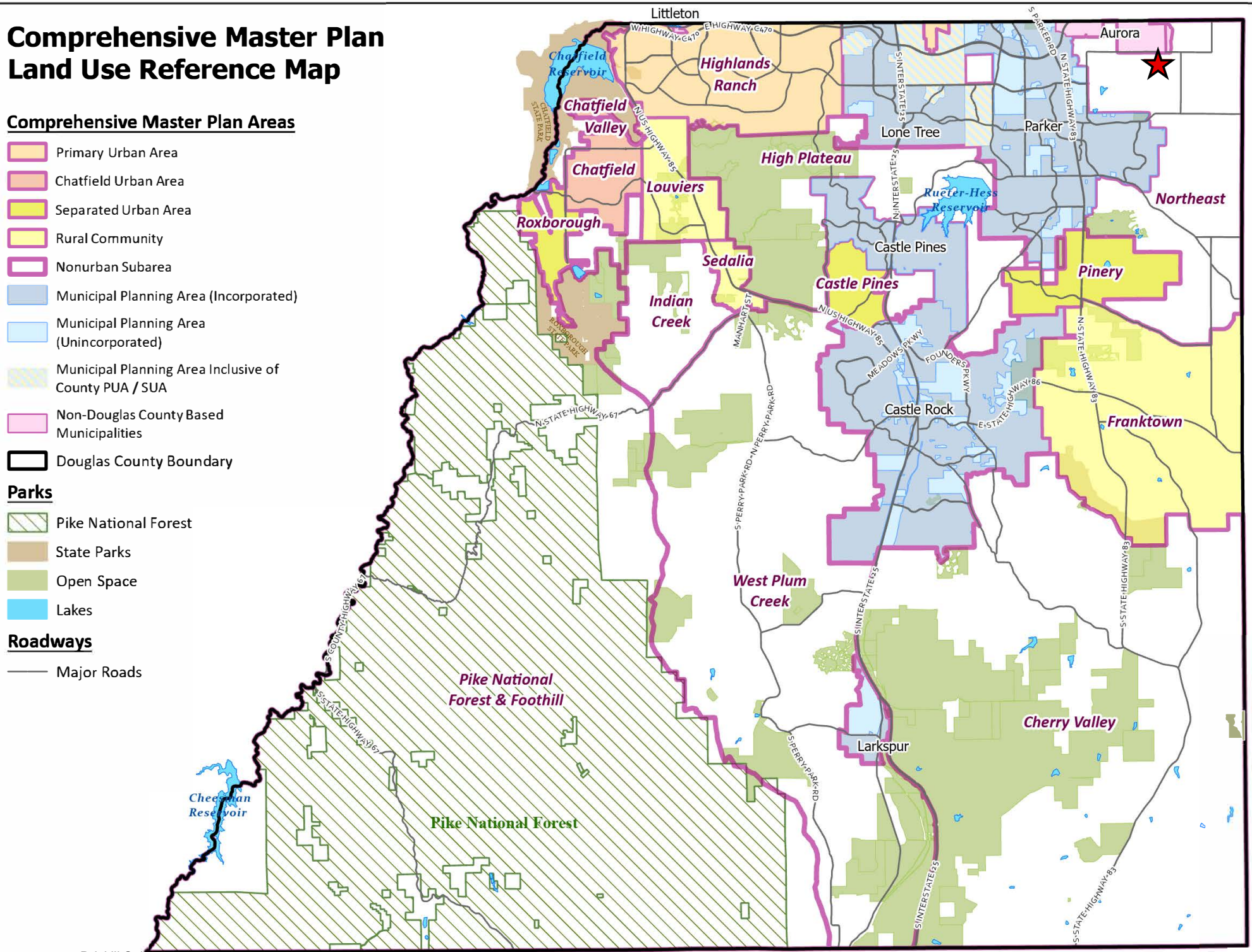
Drainage and Water Quality Study: Drawings from Kevin Archer and Associates submitted herewith.

Recreational Facilities: The Parker Recreation Center and Pathfinder Park are located within 3 miles. A public golf course within 5 miles.

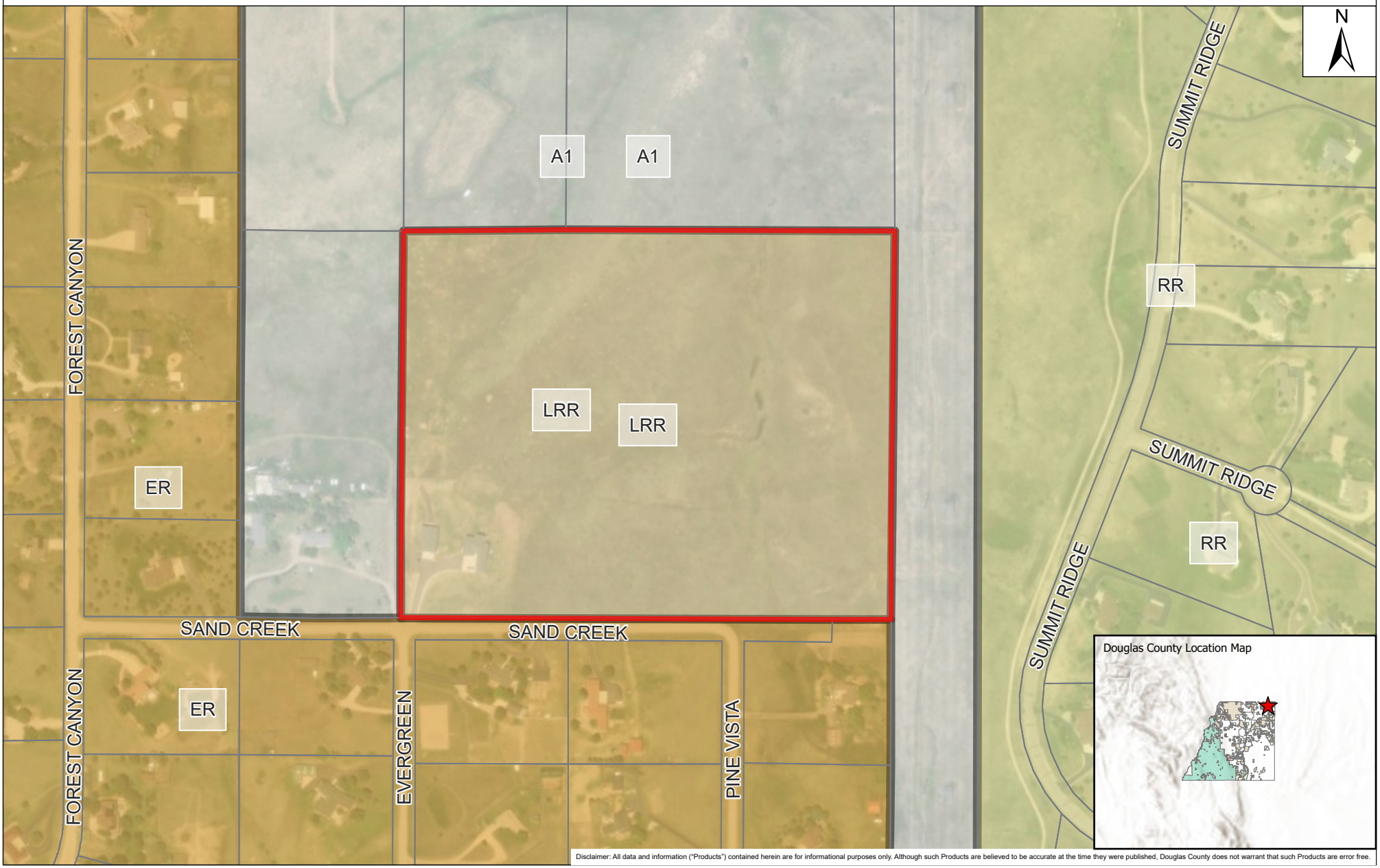
Changes in character of the Neighborhood: The Ponderosa Hills subdivision was developed around 1968. The Ponderosa Summit subdivision was developed around 1998. In 2025, Douglas County paved Sand Creek Road and all other county roads that serve the Ponderosa Hills and Metes and Bounds subdivisions.

Summary: As a reminder, there is no project, there are no engineers, there is no plan for development. I am simply dividing a 30 acre parcel into 2 lots for the purpose of selling the 10.16 acre lot and keeping the undeveloped 20.0 acre lot as a long term investment.

Comprehensive Master Plan Land Use Reference Map



Driskill Subdivision SB2025-042



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RR - RURAL RESIDENTIAL
ER - ESTATE RESIDENTIAL
A1 - AGRICULTURAL ONE
LRR - LARGE RURAL RESIDENTIAL

Driskill Subdivision SB2025-042

DOUGLAS COUNTY
COLORADO

Date Saved: 2/13/2026 11:14 AM

RR - RURAL RESIDENTIAL
ER - ESTATE RESIDENTIAL
A1 - AGRICULTURAL ONE
LRR - LARGE RURAL RESIDENTIAL

Project Name: Driskill Subdivision
Project File #: SB2025-042
Date Sent: 11/05/2025 **Date Due:** 12/08/2025

Agency	Date Received	Agency Response	Response Resolution
Addressing Analyst	11/06/2025	Received: Addresses may be determined after confirmation of a home and driveway location on each lot. Address Request Applications may be submitted directly to DCAddressing@douglas.co.us. Reach out with questions at 303.660.7411.	Applicant acknowledged.
Arapahoe County Engineering Services Division		No Response Received:	No response necessary
Arapahoe County PWD/ Planning		No Response Received:	No response necessary
Assessor		No Response Received:	No response necessary
AT&T Long Distance - ROW	11/19/2025	Received: This is in response to your eReferral with a utility map showing any buried AT&T Long Line/Core Fiber Optics near Driskill Subdivision, Parker, CO 80138 (Project # SB2025-042). The Earth map shows the project area in red. Based on the address and/or map you provided, there should be NO conflicts with the AT&T Long Line/Core Fiber Optics, as we do not have facilities in that area.	No response necessary
Bell Cross Ranch HOA		No Response Received:	No response necessary
Building Services	12/02/2025	Received: Please submit a site plan that clearly shows the location of all existing structures on the property, including dimensions indicating the distances from exterior walls to the new property line, for review.	This has been provided by the applicant.
CenturyLink		No Response Received:	No response necessary

Project Name: Driskill Subdivision
Project File #: SB2025-042
Date Sent: 11/05/2025 **Date Due:** 12/08/2025

Agency	Date Received	Agency Response	Response Resolution
Cherry Creek Basin Water Quality Authority	11/10/2025	Received: The Cherry Creek Basin Water Quality Authority (Authority) acknowledges notification from Douglas County that the proposed development plans for SB2025-042, Driskill Subdivision have been or will be reviewed by Douglas County for compliance with the applicable Regulation 72 construction and post-construction requirements. Based on the Authority's current policy, the Authority will no longer routinely conduct a technical review and instead the Authority will defer to Douglas County's review and ultimate determination that the proposed development plans comply with Regulation 72. If a technical review of the proposed development plan is needed, please contact LandUseReferral@ccbwqa.org. The review may include consultation with the Authority's Technical Manager to address specific questions or to conduct a more detailed Land Use Review, if warranted.	No response necessary
City of Aurora		No Response Received:	No response necessary
Colorado Division of Water Resources	11/19/2025	Received: See attached letters Summary: Water supply is adequate. Existing well should be repermitted for Lot 1.	Applicant acknowledged repermitting requirement.
Colorado Geological Survey	12/08/2025	No Comment:	No response necessary
Colorado Parks and Wildlife (East DC - Dist 549)		No Response Received:	No response necessary
Comcast		No Response Received:	No response necessary

CORE Electric Cooperative	12/08/2025	Received: CORE Electric Cooperative Review and Comments CORE Electric Cooperative has reviewed the contents of the above-referenced referral response packet. Our review focused on maintaining existing facilities, utility easements, electric loading, and service requirements. Based on this review, we provide the following comments and requirements: Existing Facilities and Easements CORE has existing overhead electric facilities on the subject property. These facilities and associated utility easements will remain in place unless the applicant requests modifications in accordance with CORE's current extension policies. Utility Easement Requirements CORE Electric Cooperative requires the applicant to provide: 1. A 20-foot utility easement, and 2. A formal subdivision dedication of utility easements in compliance with subdivision regulations adopted under section 30-28-101(9), C.R.S. Per these regulations, the subdivider must submit evidence to the commission that adequate provision has been made for facility sites, easements, and rights of access for electrical and natural gas utility service to ensure reliable and adequate service. A letter of agreement between the subdivider and the utility serving the site will be deemed sufficient to establish compliance. 3. Required Plat Note Language The following language must be added to the plat notes:	Applicant added requested easement and notes.

Agency	Date Received	Agency Response	Response Resolution
		No improvements that conflict with or interfere with construction, maintenance, or access to utilities shall be placed within the utility easements. Prohibited improvements include, but are not limited to: permanent structures, buildings, counter-forts, decks, attached porches, attached stairs, window wells, air conditioning units, retaining walls/components, and other objects that may interfere with utility facilities or access, use, and maintenance thereof. Prohibited improvements may be removed by the entities responsible for providing utility services. The utility easements as shown hereon are hereby dedicated for public utilities, cable communication systems, fiber, and other purposes as shown hereon. The entities responsible for providing the utility services for which the easements are established are hereby granted the perpetual right of ingress and egress from and to adjacent properties for installation, maintenance, and replacement of utility lines and related facilities.	
Douglas County Conservation District	12/01/2025	Received: See attached letter. Summary:Requested weed management plan. Provided information regarding soils and low impact development techniques.	Conservation district reviewed and approved applicant's weed management plan.
Douglas County Health Department	12/05/2025	Received: See attached letter. Summary: Favorable recommendation if Lot 2 is served by properly permitted well and septic systems.	Lot 2 will be served by well and septic systems. Applicant acknowledged future permitting requirements.
Douglas County Historic Preservation	11/26/2025	Received: Please see attached documents. Summary: Class II Cultural Resources Survey required prior to ground disturbance.	Applicant acknowledged future requirement.

Project Name: Driskill Subdivision
Project File #: SB2025-042
Date Sent: 11/05/2025 **Date Due:** 12/08/2025

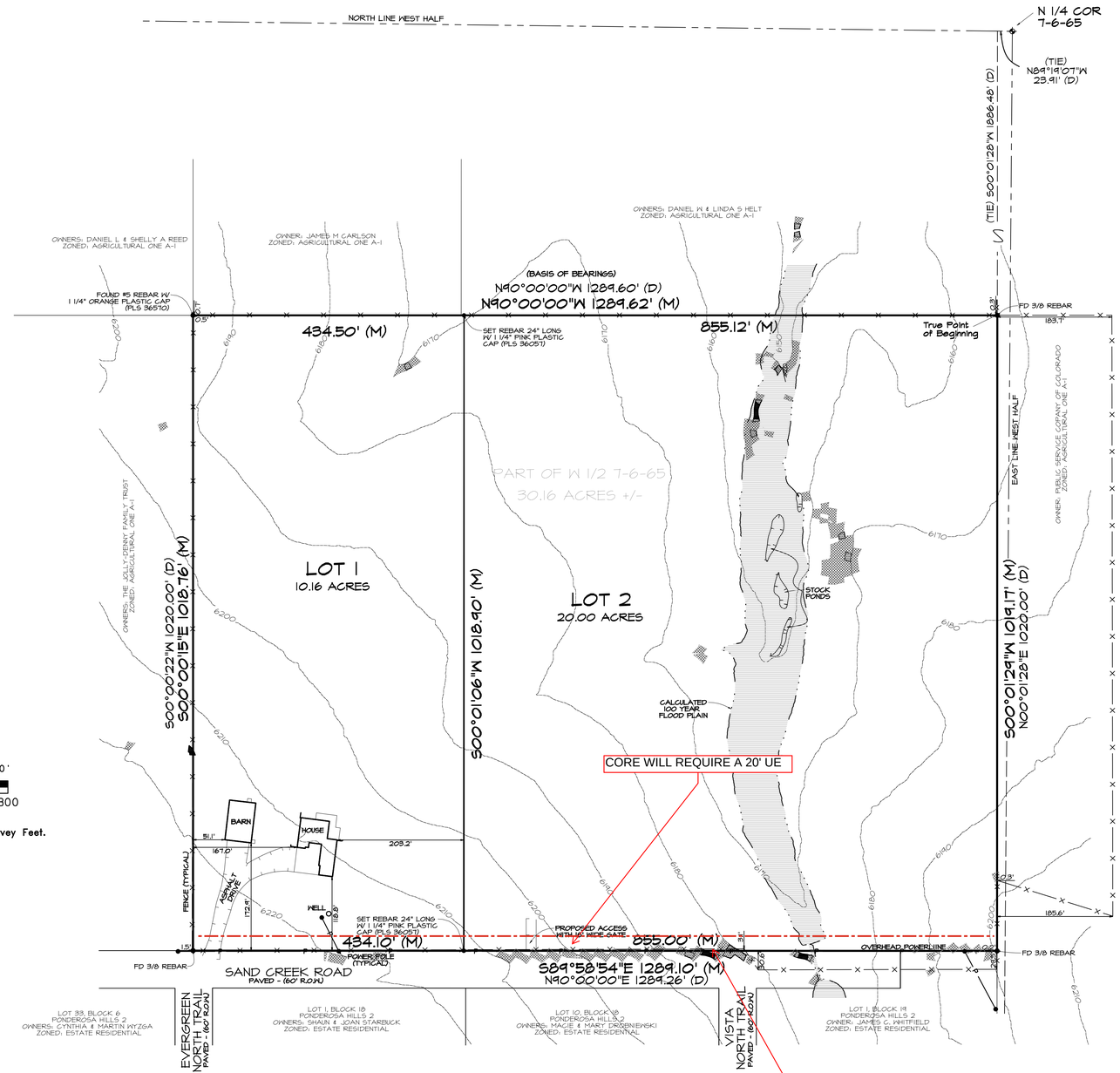
Agency	Date Received	Agency Response	Response Resolution
Douglas County Parks and Trails	12/08/2025	Received: This applicant would be responsible for park dedication requirements outlined in Article 10 of the Douglas County Subdivision Resolution.	Applicant acknowledged requirement to pay cash-in-lieu prior to recordation.
Douglas County School District RE 1		No Response Received:	At rezoning, DCSD provided cash-in-lieu requirements. Applicant will pay cash-in-lieu prior to recordation.
Engineering Services	12/03/2025	Received: Please submit a permanent access permit for the proposed access on the subdivided lot.	Applicant submitted requested access permit. Engineering confirmed comments are addressed.
Homestead Hills HOA		No Response Received:	No response necessary
Livengood Hills HOA		No Response Received:	No response necessary
Mile High Flood District	12/09/2025	Received: This letter is in response to the request for our comments concerning the referenced project. We have reviewed this referral only as it relates to an MHFD drainageway and for maintenance eligibility of storm drainage features, in this case: - Outfall to Baldwin Gulch We have no comments to the referenced project and do not need to see future submittals.	No response necessary
Office of Emergency Management	11/10/2025	No Comment:	No response necessary
Open Space and Natural Resources	11/05/2025	No Comment:	No response necessary
Ponderosa Hills Civic Association		No Response Received:	No response necessary
Rural Water Authority of Douglas County		No Response Received:	No response necessary
Sheriff's Office		No Response Received:	No response necessary
Sheriff's Office E911		No Response Received:	No response necessary
South Metro Fire Rescue	11/13/2025	Received: South Metro Fire Rescue (SMFR) has reviewed the provided documents and has no objection to the proposed minor development.	No response necessary
Town of Parker Development Review		No Response Received:	No response necessary
Town of Parker Public Works	11/17/2025	No Comment:	No response necessary

Project Name: Driskill Subdivision
Project File #: SB2025-042
Date Sent: 11/05/2025 **Date Due:** 12/08/2025

Agency	Date Received	Agency Response	Response Resolution
Wildfire Mitigation	12/01/2025	Received: Douglas County Wildfire Mitigation has reviewed the submitted materials. Based on the minimal presence of vegetative fuels and the low associated fire hazard, wildfire mitigation has no recommendations at this time.	No response necessary
Xcel Energy-Right of Way & Permits	12/03/2025	Received: Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the minor development to create two lots and currently has no conflicts. Please be aware PSCo owns and operates existing natural gas distribution facilities along East Sand Creek Road. The property owner/developer/contractor must complete the application process for any new natural gas service, or modification to existing facilities via xcelenergy.com/InstallAndConnect. It is then the responsibility of the developer to contact the Xcel Designer assigned to the project for approval of design details. If additional easements need to be acquired by separate PSCo document, a Right-of-Way Agent will need to be contacted by the Designer. As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 for utility locates prior to construction.	Applicant acknowledged information.

SUPPLEMENTAL PLAN EXHIBIT
DRISKILL SUBDIVISION
Located in the West 1/2, of Section 7, Township 6 South, Range 65 West of the 6th P.M., County of Douglas, State of Colorado.
30.16 Acres 2 Residential Lots SB2025-

CORE will require the following language be added to the plat notes.
No improvements that conflict with or interfere with construction, maintenance or access to utilities shall be placed within the utility easements. Prohibited improvements include, but are not limited to, permanent structures, buildings, counter-forts, decks, attached porches, attached stairs, window wells, air conditioning units, retaining walls/components and other objects that may interfere with the utility facilities or access, use and maintenance thereof.
The utility easements as shown hereon are hereby dedicated for public utilities, cable communication systems fiber and other purposes as shown hereon. The entities responsible for providing the utility services for which the easements are established are hereby granted the perpetual right of ingress and egress from and to adjacent properties for installation, maintenance and replacement of utility lines and related facilities.



BASIS OF BEARINGS
Bearings are assumed and based on the consideration that the North line of said Parcel bears N90°00'00"W as shown hereon between the identified monuments.

PROPERTY DESCRIPTION:

A PARCEL OF LAND IN THE W1/2 OF SECTION 7, TOWNSHIP 6 SOUTH, RANGE 65 WEST OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS: BEGINNING AT THE NORTHEAST CORNER OF THE W 1/2 OF SAID SECTION 7; THENCE N 89°19'07"W, 23.91 FEET TO A POINT ON THE NORTH LINE OF SAID W 1/2 OF SECTION 7; THENCE S 0°01'28"W, 1886.48 FEET TO THE TRUE POINT OF BEGINNING; THENCE WEST 1,289.60 FEET; THENCE S 0°00'22" W, A DISTANCE OF 1020 FEET; THENCE EAST 1,289.26 FEET; THENCE N 0°01'28" E, A DISTANCE OF 1020 FEET, TO THE TRUE POINT OF BEGINNING, CONTAINING 30 ACRES OR LESS, COUNTY OF DOUGLAS, STATE OF COLORADO.

SLOPES:
- 15-20% SLOPE =
- 20-25% SLOPE =
- 25% > SLOPE =

LEGENDS:
- EXISTING CONTOURS (10' INTERVAL)
- PLAT BOUNDARY LINES =
- PROPOSED LOT LINES =
- CALCULATED 100 YEAR FLOOD PLAIN =

GRAPHIC SCALE 1"=100'
0 100 200 300

All measurements shown hereon are U.S. Survey Feet.
Conflicting boundary evidence is as shown.

(M)=FIELD MEASURED
(D)=DEEDED DIMENSIONS

"NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon."

REVISIONS
Flood Plain 09-24-25
Misc 09-25-25
Slopes 10-20-25

DAVID E. ARCHER & ASSOCIATES, INC.
LAND DEVELOPMENT CONSULTING
SURVEYING & ENGINEERING
PHONE (303) 688-4642
105 WILCOX ST. CASTLE ROCK, COLORADO 80104

SCALE
DATE
DRN. DMH CKD.
APVD.

TITLE: SUPPLEMENTAL PLAN EXHIBIT
DRISKILL SUBDIVISION
Located in the West 1/2 of Section 7 Township 6 South, Range 65 West of the 6th P.M., Douglas County, Colorado.
CLIENT: BILL DRISKILL
Sheet 1 of 1
JOB NUMBER 20-1555

Mon Oct 20 16:51:36 2025
©:\Drawings\2020\20-1555\Plat\Minor Plat.pro

Trevor Bedford

From: Brooks Kaufman <BKaufman@core.coop>
Sent: Monday, January 26, 2026 12:45 PM
To: Kevin Archer; Trevor Bedford
Cc: Bill Driskill
Subject: RE: Driskill Subdivision
Attachments: Minor Plat.pdf

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

Good afternoon, Kevin and Trevor

CORE Electric Cooperative approves the attached plat.

Respectfully

Brooks Kaufman
Lands and Rights of Way Manager

800.332.9540 **MAIN**
720.733.5493 **DIRECT**
303.912.0765 **MOBILE**

www.core.coop.

ELECTRIC COOPERATIVE

The Energy to Thrive™

Book time to meet with me

From: Kevin Archer <karcher@davidearcher.com>
Sent: Monday, January 26, 2026 10:25 AM
To: Brooks Kaufman <BKaufman@core.coop>; Trevor Bedford <tbedford@douglas.co.us>
Cc: Bill Driskill <billpd1957@gmail.com>
Subject: Re: Driskill Subdivision

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

Brooks,
Here is the updated Plat showing the 20' easement.
If all is good can you send a note to Trevor Bedford (copied on this email) that you are good with it?
Thanks

Kevin

On Tue, Jan 6, 2026 at 3:21 PM Kevin Archer <karcher@davidearcher.com> wrote:

> Great Thanks
> Kevin
>
> On Tue, Jan 6, 2026 at 3:17 PM Brooks Kaufman <BKaufman@core.coop> wrote:
>
> > Kevin
> >
> > Thak you for updating, yes the a 20' UE can be dedicated via the plat. CORE will approve the dedication.
> >
> > Thanks
> >
> > **Brooks Kaufman**
> >
> > Lands and Rights of Way Manager
> >
> > 800.332.9540 **MAIN**
> >
> > 720.733.5493 **DIRECT**
> >
> > 303.912.0765 **MOBILE**
> >
> > www.**core**.coop.
> >
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> >
> >
> > Book time to meet with me

COLORADO
Division of Water Resources
Department of Natural Resources
Colorado Ground Water Commission

January 15, 2026

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

Re: Driskill Subdivision_2nd letter
Case Number: SB2025-042, Applicant: William and Maria Driskill
Part of the SE ¼ of the NW ¼ and NE ¼ of the SW ¼ of Sec. 7, Twp. 6S, Rng. 65W, 6th P.M., Douglas County
Water Division 1, Water District 8

Dear Trevor Bedford,

We have reviewed the additional information provided by the Applicant for a proposed subdivision on approximately 30.16 acres of land located in the SE ¼ of the NW ¼ and the NE ¼ of the SW ¼ of Sec. 7, Twp. 6S, Rng. 65W, 6th P.M., to create two lots of 10.16 acres (Lot 1) and 20 acres (Lot 2). We have previously reviewed the application for this project by our letter dated November 19, 2025. This letter supersedes the previous letter.

Water Supply Demand

Based on the Water Supply Information Summary provided the estimated annual water requirements total 1.2 acre-feet/year (1,071 gallons/day) for the two lots. This amount breaks down to 0.6 acre-feet/year (536 gallons/day) for household use, 0.525 acre-feet/year (468 gallons/day) for irrigation use of 0.24 acres (10,500 square-feet) and 0.075 acre-feet/day (67 gallons/day) for the watering of 6 heads of livestock.

Source of Water Supply

Based on a letter dated July 17, 2024 by Hayes Poznanovic Korver, LLC ("Letter") included with the originally application documents, the proposed water supply source is ground water from one of the Denver Basin bedrock aquifers underlying the parcel.

The Letter provided the amounts of water available underlying the 30.16-acre parcel, as shown in Table 1, below:

Table 1

Aquifer	Annual amount available for the 30.16-acre parcel based on 100 Year Allocation Approach (acre-feet)	Type
Lower Dawson	4.9	NT*
Denver	12.7	NT
Arapahoe	14.3	NT
Laramie-Fox Hills	10.1	NT

*Nontributary

The additional information provided clarified that the two lots will be supplied by individual on lot wells producing from the nontributary Lower Dawson aquifer, including the existing well no. 283445 for Lot 1 and a new well for Lot 2.

Unless the water in the nontributary Lower Dawson aquifer underlying the property is decreed in water court, well permits would ultimately be issued pursuant to C.R.S. 37-90-137(4) and findings of the State Engineer. Under those provisions only the quantity of water underlying the individual lots could be considered available for withdrawal by the existing well and the proposed new well. To the extent that the parcel sizes change from those currently proposed the amount of water available to the lots will also change.

The proposed source of water for this subdivision is a bedrock aquifer in the Denver Basin. The State Engineer's Office does not have evidence regarding the length of time for which this source will be a physically and economically viable source of water. According to 37-90-137(4)(b)(I), C.R.S., "Permits issued pursuant to this subsection (4) shall allow withdrawals on the basis of an aquifer life of one hundred years." Based on this **allocation** approach, the annual amounts of water shown in Table 1 are equal to one percent of the total amount, as determined by rules 8.A and 8.B of the Statewide Nontributary Ground Water Rules, 2 CCR 402-7. Therefore, the water may be withdrawn in those annual amounts for a maximum of 100 years.

We have previously identified well no. 283445 located on the subject property. Well permit no. 283445 was issued on June 30, 2010 pursuant to CRS 37-92-602(3)(b)(I) and policy of the State Engineer for a 30-acre parcel known as part of the W ½ of Sec. 7, Twp. 6 South, Rng. 65 West, 6th P.M., Douglas County for ordinary household purposes inside two (2) single family dwellings, the watering of the user's own non-commercial domestic animals, and the irrigation of not more than 1 acre of home gardens and lawns, with an annual withdrawal not to exceed 3 acre-feet.

Section 37-92-602(3)(b)(III) C.R.S., requires that the cumulative effect of all wells in a subdivision be considered when evaluating material injury to decreed water rights. **Therefore, as previously mentioned well no. 283445 must be re-permitted for pursuant to C.R.S. 37-90-137(4) since the provisions of section 37-92-602 which allowed for issuance of the well permits will no longer apply.**

The ability for the new lots to obtain a well permit(s) will be evaluated pursuant to applicable statutes, rules, and policies at the time that application(s) are submitted to and reviewed by this office.

State Engineer's Office Opinion

Based upon the above and pursuant to section 30-28-136(1)(h)(I), C.R.S., it is our opinion that the proposed water supply is adequate and can be provided without causing injury to decreed water rights, **provided well no. 283445 is re-permitted pursuant to C.R.S. 37-90-137(4).**

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

Our opinion that the water supply can be **provided without causing injury** is based on our determination that the amount of water that is legally available on an annual basis, according to the statutory **allocation** approach, for the proposed uses is greater than the annual amount of water required to supply existing water commitments and the demands of the proposed subdivision.

Our opinion is qualified by the following:

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

Please contact me at 303-866-3581 x8246 or at ioana.comaniciu@state.co.us with any questions.

Sincerely,

Ioana Comaniciu, P.E.
Water Resources Engineer

Ec: Referral no. 32617
Well Permit no. 283445

November 19, 2025

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

Re: Driskill Subdivision
Case Number: SB2025-042, Applicant: William and Maria Driskill
Part of the SE ¼ of the NW ¼ and NE ¼ of the SW ¼ of Sec. 7, Twp. 6S, Rng. 65W, 6th P.M., Douglas County
Water Division 1, Water District 8

Dear Trevor Bedford,

We have received the application for a proposed subdivision on approximately 30.16 acres of land located in the SE ¼ of the NW ¼ and the NE ¼ of the SW ¼ of Sec. 7, Twp. 6S, Rng. 65W, 6th P.M., to create two lots of 10.16 acres (Lot 1) and 20 acres (Lot 2). We have previously reviewed the rezoning application of this project by our letter dated December 31, 2024. This letter supersedes the previous letter.

Water Supply Demand

No estimated water requirements for this project were provided in the submittal. Therefore, the estimated water demands for this project are unknown.

Source of Water Supply

According to a letter dated July 17, 2024 by Hayes Poznanovic Korver, LLC ("Letter") included in the application documents, the proposed water supply source is ground water from one of the Denver Basin bedrock aquifers underlying the parcel. The application documents do not mention which aquifer source is desired, or the number of wells anticipated for the future subdivision.

Based on the information provided in the Letter the amounts of water are available underlying the 30.16-acre parcel, are shown in the following Table 1:

Table 1

Aquifer	Annual amount available for the 30.16-acre parcel based on 100 Year Allocation Approach (acre-feet)	Type
Lower Dawson	4.9	NT*
Denver	12.7	NT
Arapahoe	14.3	NT
Laramie-Fox Hills	10.1	NT

*Nontributary

Unless the water in any of the above sources underlying the property is decreed in water court, well permits would ultimately be issued pursuant to C.R.S. 37-90-137(4) and findings of the State Engineer. Under those provisions only the quantity of water underlying the individual lots could be considered available for withdrawal by the existing wells. To the extent that the parcel sizes change from those currently proposed the amount of water available to the lot will also change.

A review of our records indicates that well no. 283445 is located on the subject property. Well permit no. 283445 was issued on June 30, 2010 pursuant to CRS 37-92-602(3)(b)(I) and policy of the State Engineer for a 30-acre parcel known as part of the W ½ of Sec. 7, Twp. 6 South, Rng. 65 West, 6th P.M., Douglas County for ordinary household purposes inside two (2) single family dwellings, the watering of the user's own non-commercial domestic animals, and the irrigation of not more than 1 acre of home gardens and lawns, with an annual withdrawal not to exceed 3 acre-feet.

Section 37-92-602(3)(b)(III) C.R.S., requires that the cumulative effect of all wells in a subdivision be considered when evaluating material injury to decreed water rights. **Therefore, well no. 283445 must be re-permitted for pursuant to C.R.S. 37-90-137(4) since the provisions of section 37-92-602 which allowed for issuance of the well permits will no longer apply.**

The ability for the new lots to obtain a well permit(s) will be evaluated pursuant to applicable statutes, rules, and policies at the time that application(s) are submitted to and reviewed by this office.

State Engineer's Office Opinion

Pursuant to Section 30-28-136(1)(h)(II), C.R.S., the State Engineer's Office has not received enough information to render an opinion regarding the adequacy of the proposed water supply. Prior to further review the following information is required:

1. Provide a water supply plan that specifies the estimated water requirements, the proposed uses for the subdivision, and the proposed water source for the lots in the subdivision.

2. If well no. 283445 will be used for any of the lots in the subdivision, the well

must be re-permitted pursuant to C.R.S. 37-90-137(4) for the new lot or else be plugged and abandoned prior to final approval of the subdivision.

Please contact me at 303-866-3581 x8246 or at ioana.comaniciu@state.co.us with any questions.

Sincerely,

Ioana Comaniciu, P.E.
Water Resources Engineer

Ec: Referral no. 32617
Well Permit no. 283445

REFERRAL RESPONSE REQUEST

Date sent: November 5, 2025 Comments due by: **December 8, 2025**

Project Name:	Driskill Subdivision
Project File #:	SB2025-042
Project Summary:	This is a request for a minor development to create two lots on approximately 30.16 acres. The property is zoned Large Rural Residential and located on the north side of Sand Creek Road. The lots are proposed to be 10.16 acres and 20 acres in size.

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

☐ No Comment

☒ Please be advised of the following concerns:

Please submit a permanent access permit for the proposed access on the subdivided lot

☐ See letter attached for detail.

Agency: PW - Engineering	**Phone #:** (303) 660-7490
Your Name: Jacob Gabel	**Your Signature:**
(please print)	**Date:** 12/3/2025

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

Sincerely,

Trevor Bedford, Senior Planner

Enclosure

Trevor Bedford

From: Jacob Gabel
Sent: Wednesday, January 21, 2026 10:23 AM
To: Trevor Bedford
Subject: SB2025-042

Hey Trevor,

Engineering has everything that they need and we are actively working with the applicant on his permits. Our comments have been addressed at this time.

Sincerely,

Jacob

Jacob Gabel | Development Review Engineer
Douglas County Department of Public Works Engineering
Engineering Services
Address | 100 Third St., Castle Rock, CO 80104
Main | 303-660-7490
Email | jgabel@douglas.co.us

DOUGLAS COUNTY
HEALTH DEPARTMENT COLORADO

December 5, 2025

Trevor Bedford
100 Third St.
Castle Rock, CO 80104

RE: SB2025-042

Dear Mr. Bedford,

Thank you for the opportunity to review and comment on the request for a Minor Development. Douglas County Health Department (DCHD) staff have reviewed the application for compliance with pertinent environmental and public health regulations. After reviewing the application, DCHD has the following comment(s).

Future development of the proposed 20-acre parcel would require the installation of a permitted OWTS for DCHD to provide a favorable recommendation regarding the proposed method of wastewater disposal; along with a DWR permitted well for water supply.

Water Service
The Colorado Division of Water Resources (DWR) is the agency that regulates well permitting. More information can be found here https://dwr.colorado.gov/.

On-Site Wastewater Treatment System (OWTS)
DCHD has no objection to a property being served by an OWTS provided that the system is permitted, inspected and operated in accordance with DCHD's current OWTS Regulation. The applicant may contact DCHD at 720-907-4886 or EH@douglas.co.us. More information is available at https://www.douglas.co.us/health-department/environmental-health/.

Please feel free to contact me at 720-907-4888 or bfreyer@douglas.co.us if you have any questions about our comments.

Sincerely,

Brent Freyer
Environmental Health Specialist II
Douglas County Health Department

MILE HIGH FLOOD DISTRICT

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

www.mhfd.org

For MHFD staff use only.	
Project ID:	106664
Submittal ID:	10013870

December 9, 2025

To: Douglas County

Via email

Subject: MHFD Review Comments

Re: Driskill Subdivision (Partner Case No. SB2025-042)

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

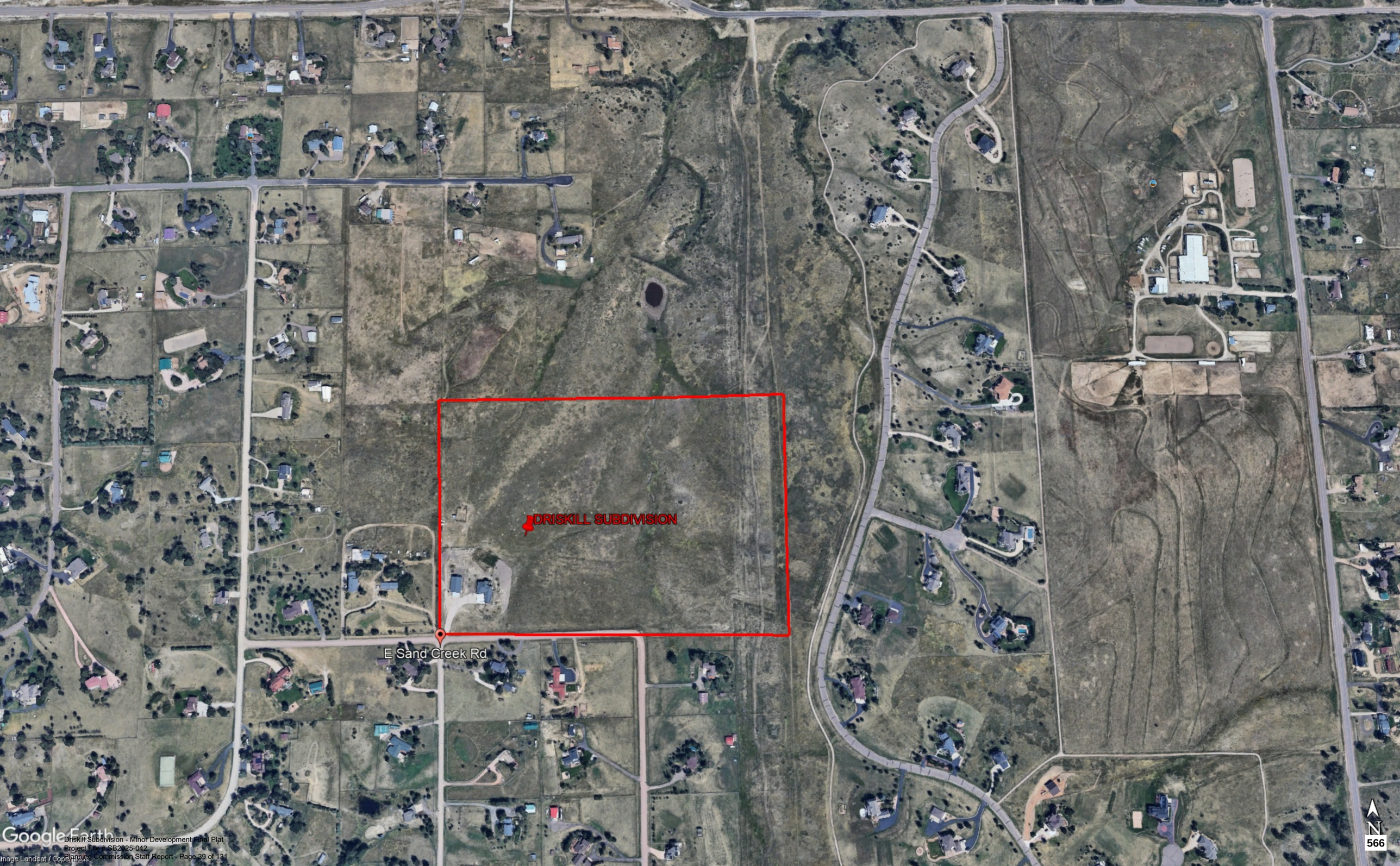
- Outfall to Baldwin Gulch

We have no comments to the referenced project and do not need to see future submittals.

Please feel free to contact me with any questions.

Sincerely,

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


DRISKILL SUBDIVISION
E Sand Creek Rd
Google Earth
Image Landsat / Copernicus
N
566

Right of Way & Permits

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

December 3, 2025

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

Attn: Trevor Bedford

RE: Driskill Subdivision, Case # SB2025-042

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the minor development to create two lots and currently has no conflicts. Please be aware PSCo owns and operates existing natural gas distribution facilities along East Sand Creek Road.

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

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

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

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

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

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

Project Name:	Driskill Subdivision
Project File #:	**SB2025-042**
S Metro Review #	REFRP25-00265
Review date:	November 13, 2025
Plan reviewer:	Aaron Miller 720.989.2246 aaron.miller@southmetro.org
Project Summary:	This is a request for a minor development to create two lots on approximately 30.16 acres. The property is zoned Large Rural Residential and located on the north side of Sand Creek Road. The lots are proposed to be 10.16 acres and 20 acres in size.
Code Reference:	Douglas County Fire Code, 2018 International Fire Code, and 2021 International Building Code with amendments as adopted by Douglas County.

South Metro Fire Rescue (SMFR) has reviewed the provided documents and has no objection to the proposed minor development.

November 26, 2025

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

Re: SB2025-042, Driskill Subdivision

Dear Mr. Bedford,

This letter provides comments regarding the request for approval for a minor development to create two lots on approximately 30.16 acres. The property is zoned Large Rural Residential and located on the north side of Sand Creek Road. The lots are proposed to be 10.16 acres and 20 acres in size.

At this time the Curator has no further recommendations. If there are future development plans that involve any ground disturbance a Class II survey will need to be performed to evaluate for cultural resources before any disturbance occurs.

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

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

Sincerely,

Brittany Cassell

Brittany Cassell, Curator

Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

REFERRAL RESPONSE REQUEST

Date sent: November 5, 2025 Comments due by: **December 8, 2025**

Project Name:	Driskill Subdivision
Project File #:	SB2025-042
Project Summary:	This is a request for a minor development to create two lots on approximately 30.16 acres. The property is zoned Large Rural Residential and located on the north side of Sand Creek Road. The lots are proposed to be 10.16 acres and 20 acres in size.

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

☐ No Comment	
☐ Please be advised of the following concerns:	
X☐ See letter attached for detail.	
Agency: Douglas County Conservation District	**Phone #:** 303 218 2622
Your Name: David Shohet, President	**Your Signature:** Signed by: David.Shohet 6E6057CEE3D2404...
(please print)	**Date:** 11/26/2025

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

Sincerely,

Trevor Bedford, Senior Planner

Enclosure

Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

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

DATE: December 8, 2025

RE: SB2025-042

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

According to U.S.D.A. Natural Resources Conservation Service (NRCS) soils survey (enclosed Pages 18-19), the KtE—Kutch sandy loam, 5 to 20 percent slopes located at the development site are somewhat limited for dwellings with and without basements, and small commercial buildings due to flooding, and roads due to shrink-swell soil properties, slope, and depth to hard bedrock. Due to the limitations of the above soils on the site, alternatives to mitigate the limitations of the soil will be required in your engineering design or construction techniques.

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

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

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

The District recommends using a phased grading approach. By limiting the area being graded to 15 acres or less and seeding with native grasses, the land area disturbed is minimized. The development site is 30.16 acres.

There is no Integrated Noxious Weed Control plan. An integrated weed management program needs to be proposed by the Applicant, and reviewed and approved by the Douglas County Weed Inspector and/or Weed Advisory board, the County Extension Agent, NRCS, or a qualified weed management professional prior to the land use authority approval.

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

The channels of many of the major streams are not stable and undergo substantial shifts in alignment during flood events. Upstream development increases the magnitude and frequency of local flooding. Floods that exceed the computed 100-year storm do regularly occur. Archer & Associates define the calculated 100 year Flood Plain running through the center of this parcel. The District does not support development proposals that are located in or near drainages or development that disturbs wetlands.

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

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

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

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Castle Rock Area, Colorado

SB2025-042

Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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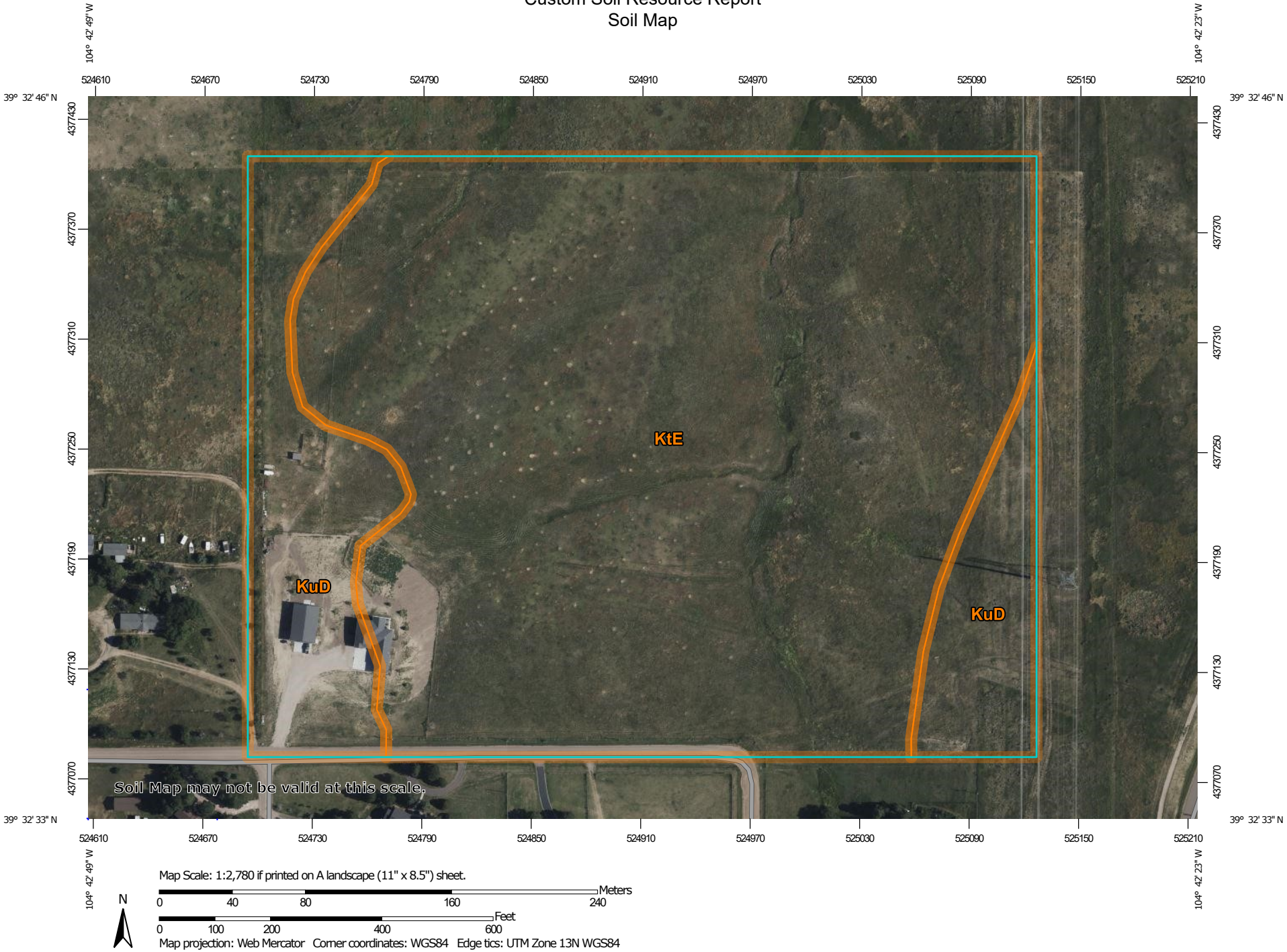
Soil Map

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

Custom Soil Resource Report
Soil Map



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MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Castle Rock Area, Colorado
Survey Area Data: Version 18, Aug 29, 2025

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KtE	Kutch sandy loam, 5 to 20 percent slopes	28.3	80.4%
KuD	Kutch clay loam, 4 to 8 percent slopes	6.9	19.6%
Totals for Area of Interest		**35.2**	**100.0%**

Map Unit Descriptions

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

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

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

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

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onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

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Castle Rock Area, Colorado

KtE—Kutch sandy loam, 5 to 20 percent slopes

Map Unit Setting

National map unit symbol: jqz5
Elevation: 5,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Kutch and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kutch

Setting

Landform: Valley sides, alluvial fans, drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous fine-loamy clayey shale

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 32 inches: clay
H3 - 32 to 36 inches: weathered bedrock

Properties and qualities

Slope: 5 to 20 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Bresser

Percent of map unit: 7 percent

Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

Hydric soil rating: No

Newlin

Percent of map unit: 7 percent
Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

KuD—Kutch clay loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: jqz6
Elevation: 5,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Kutch and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kutch

Setting

Landform: Hills, mesas, erosion remnants
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous fine-loamy clayey shale

Typical profile

H1 - 0 to 6 inches: clay loam
H2 - 6 to 32 inches: clay
H3 - 32 to 36 inches: weathered bedrock

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent

Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Minor Components

Fondis

Percent of map unit: 7 percent
Hydric soil rating: No

Loamy alluvial land

Percent of map unit: 7 percent
Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

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Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Dwellings With Basements (SB2025-042)

ENG - Engineering

Dwellings are single-family houses of three stories or less. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet.

The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification of the soil. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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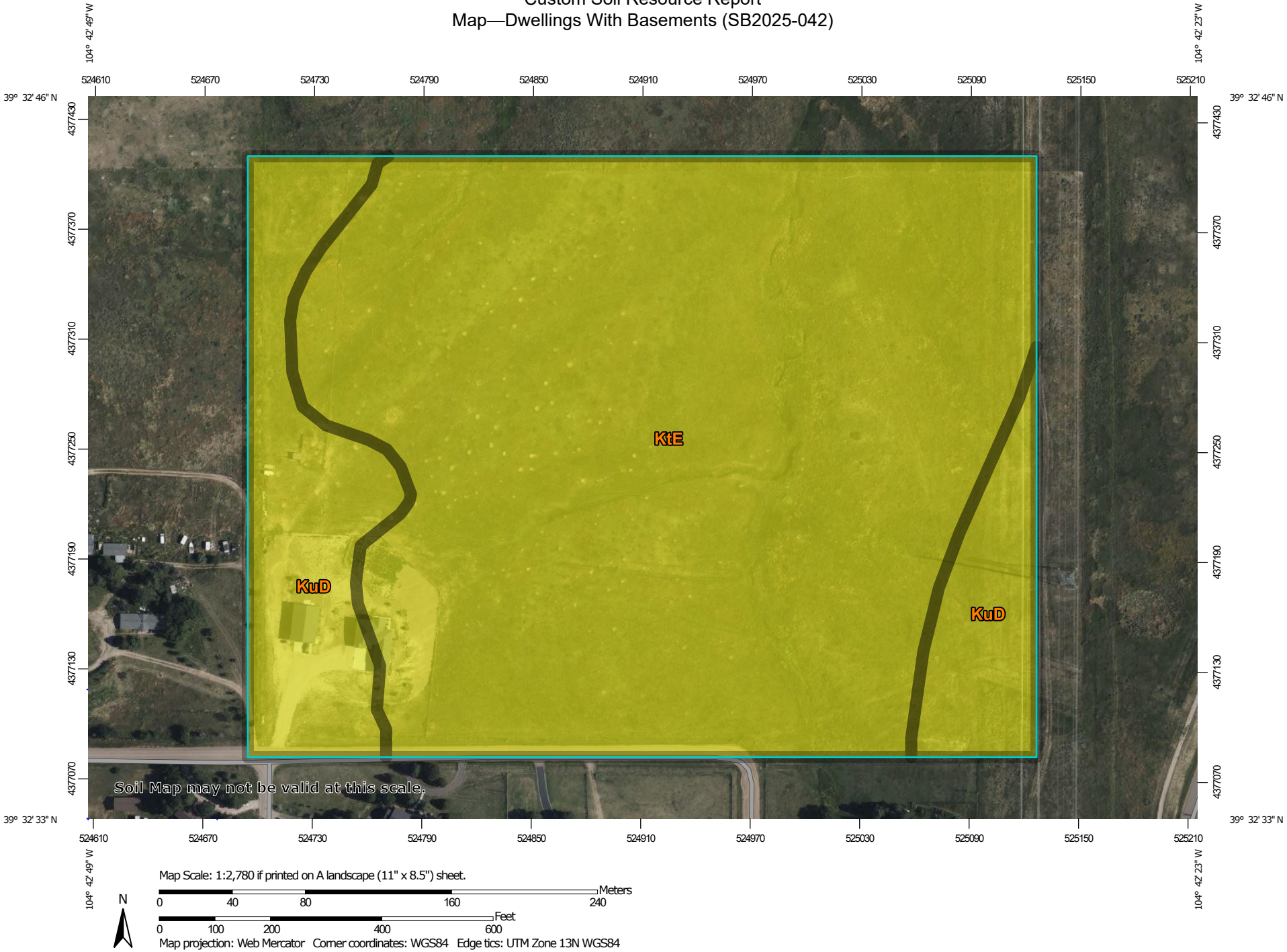
The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Dwellings With Basements (SB2025-042)



Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Castle Rock Area, Colorado
Survey Area Data: Version 18, Aug 29, 2025

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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

Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

Tables—Dwellings With Basements (SB2025-042)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
KtE	Kutch sandy loam, 5 to 20 percent slopes	Somewhat limited	Kutch (85%)	Slope (0.84)	28.3	80.4%
				Shrink-swell (0.50)		
				Depth to soft bedrock (0.29)		
KuD	Kutch clay loam, 4 to 8 percent slopes	Somewhat limited	Kutch (85%)	Shrink-swell (0.50)	6.9	19.6%
				Depth to soft bedrock (0.29)		
Totals for Area of Interest					**35.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Somewhat limited	35.2	100.0%
Totals for Area of Interest	**35.2**	**100.0%**

Rating Options—Dwellings With Basements (SB2025-042)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

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Docusign Envelope ID: ED1D1F92-9B06-4E51-8828-6DA153D251E4

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Trevor Bedford

From: Bill Driskill <billpd1957@gmail.com>
Sent: Wednesday, January 21, 2026 8:43 AM
To: Trevor Bedford
Subject: Re: Driskill Weed Control plan, Driskill Subdivide

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

Approved Weed Management plan.

Sent from my iPhone

> On Dec 18, 2025, at 7:57 AM, Bill Driskill <billpd1957@gmail.com> wrote:
>
> Looks like the weed control plan is approved.
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** Curtis Marshall <cmarshal@douglas.co.us>
> > **Date:** December 18, 2025 at 7:34:30 AM MST
> > **To:** Bill Driskill <billpd1957@gmail.com>
> > **Subject: RE: Driskill Weed Control plan, Driskill Subdivide**
> >
> > Mr. Driskill your plan looks great ,
> >
> > Curtis Marshall
> > Noxious Weed Supervisor
> > 303-660-7480
> > cmarshal@Douglas.co.us
> > <image001.png>
>
> **From:** Bill Driskill <billpd1957@gmail.com>
> **Sent:** Wednesday, December 17, 2025 12:01 PM
> **To:** Curtis Marshall <cmarshal@douglas.co.us>
> **Subject:** Driskill Weed Control plan, Driskill Subdivide
>
> Caution: This email originated outside the organization. Be cautious with links and attachments.

The plan I spoke to you about. Please let me know if this works. Thanks.
Bill 832-236-1836

Sent from my iPhone

PHASE III DRAINAGE REPORT

DRISKILL SUBDIVISION
PARKER, CO 80138
LOCATED IN W1/2 SECTION 7, TOWNSHIP 6 SOUTH, RANGE 65 WEST OF THE 6TH P.M.
DOUGLAS COUNTY

Prepared for
William P Driskill & Maria T Driskill
9315 E Sand Creek Road
Parker, CO 80138

Prepared by
David E. Archer & Associates, Inc.
105 North Wilcox Street
Castle Rock, Colorado 80104

Project No. 20-1555
September 2025

DAVID E. ARCHER & ASSOCIATES, INC.
LAND DEVELOPMENT CONSULTING
SURVEYING & ENGINEERING
PHONE (303) 688-4642
105 WILCOX ST., CASTLE ROCK, COLORADO 80104

David E. Archer & Assoc., Inc.
Job No. 20-1555

Date: September 2025
Project Name: Driskill Subdivision
Project No.: 20-1555

ENGINEER'S STATEMENT

This report and plan for the Phase III drainage design of Driskill Subdivision was prepared by me (or under my direct supervision) in accordance with the provisions of Douglas County Drainage Design and Technical Criteria for the owners thereof. I understand that Douglas County does not and will not assume liability for drainage facilities designed by others.

SIGNATURE: _____

Registered Professional Engineer
State of Colorado No. 64656

DEVELOPER CERTIFICATION

William P Driskill & Maria T Driskill hereby certifies that the drainage facilities for Driskill Subdivision shall be constructed according to the design presented in this report. I understand that Douglas County does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that Douglas County reviews drainage plans pursuant to Colorado Revised Statutes Title 30, Article 28; but cannot, on behalf of Driskill Subdivision, guarantee that final drainage design review will absolve *William P Driskill & Maria T Driskill* and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the Final Plat, Final Development Plan, and/or Subdivision Development Plan does not imply approval of my engineer's drainage design.

_____
Name of Developer

_____
Authorized Signature

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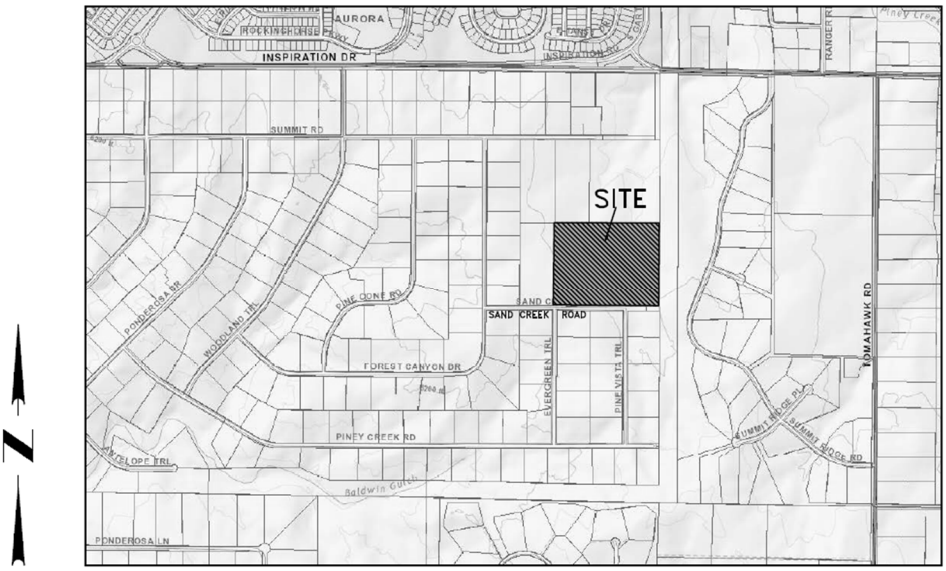
I. GENERAL LOCATION AND DESCRIPTION

A. Site Location

1. The site is located at 9315 Sand Creek Road, Parker, CO 80138 located in W1/2 of Section 7, Township 6 South, Range 65 West of the 6th P.M. See site Vicinity Map below.



VICINITY MAP

2. Township, Range, Section, and ¼ Section

a) W1/2 of Section 7, Township 6 South, Range 65 West of the 6th P.M.

3. Existing and proposed streets, roadways, and highways adjacent to and within the proposed development, or within the area served by the proposed drainage improvements

a) Sand Creek Road borders the property to the south. Summit Ridge Road lies to the east of the site, and East Summit Road to the north. There are no proposed streets within this subdivision.

4. Names of surrounding or adjacent developments, including land use or zoning information

a) The project site is located to the north and east of Ponderosa Hills 2 Subdivision.

b) The site is zoned Large Rural Residential District (LRR). The properties to the North, East, and West are zoned Agricultural One District (A1). The properties to the South are zoned Estate Residential District (ER).

B. Description of Property

1. Area in Acres

   a) The total site contains approximately 30.16 acres. The site will be subdivided into two lots. One lot of 10.16 acres and the other of 20.0 acres.

2. Ground cover, vegetation, site topography and slopes

   a) The existing site is currently developed with a residence and detached barn structure building. The areas of the property not developed are heavily vegetated. The site naturally slopes to the existing drainage way in the middle of the property.

3. NRCS Soils Classification Map and discussion

   a) The NRCS Soils classification for the site and the drainage way is a mix of Hydrologic Group A, B, and D. The majority of the soil composition is soil Hydrologic Soil Group D.

   b) The soil is comprised of Bresser sandy loam (BrD) with 5 to 9 percent slopes. This soil makes up approximately 3.9% of the site. The soil is also comprised of Kutch sandy loam (KtE) with 5 to 20 percent slopes. This soil makes up approximately 57.2% of the site. The soil is also comprised of Kutch clay loam (KuD) with 4 to 8 percent slopes. This soil makes up approximately 13.9% of the site. The remaining 25.1% of the site is Stapleton-Bresser (St). This soil is considered well drained with a low runoff classification.

4. Major and minor drainageways

   a) Piney Creek lies to the northeast of the property. The drainage from the project site drains into a tributary that goes through the site. Ultimate discharge of Piney Creek is into Cherry Creek.

5. Floodplains delineated by FHAD studies or on FEMA FIRM Maps

   a) There is no delineated 100-year flood plain or floodway of the Pine Creek Tributary on site per the FIRM Panel 08035C0087G with an effective date of 02/17/2017. See firm map in the appendices.

   b) The tributary that drains through the site carries the flows from an upstream basin of 96 acres. Although this floodway is not delineated within a previous study, the flowrates and flow area on site have been determined with this report.

6. Existing irrigation canals or ditches

   a) There are no canals or ditches on site.

7. Significant geologic features

a) There are no significant geologic features located on or near the subject site.

8. Proposed land use

a) The existing residential use of the site will not change.

II. DRAINAGE BASINS AND SUB-BASINS

A. Major Drainage Basins

1. On-site and off-site major drainage basin characteristics and flow patterns and paths

a) The major basin on this site is the basin for Piney Creek. A tributary for Piney Creek with a 96 acre basin drains through the site. The flow path from the site is in a northerly direction towards Piney Creek. This basin eventually discharges into Cherry Creek.

2. Existing and proposed land uses within the basins if known

a) The existing land uses within the major basin are agricultural, and large lot residential developments of lots of varying sizes.

3. Discussion of all drainage way planning or floodplain delineation studies that affect the major drainage ways, such as FHAD Studies and Master Planning studies

a) There is no delineated 100-year flood plain or floodway of the Pine Creek Tributary on site per the FIRM Panel 08035C0087G with an effective date of 02/17/2017. See firm map in the appendices.

b) The tributary that drains through the site carries the flows from an upstream basin of 96 acres. Although this floodway is not delineated within a previous study, the flowrates and flow area on site have been determined with this report.

4. Discussion of the condition of any channel within or adjacent to the development, including existing conditions, need for improvements, and impact on the proposed development

a) The existing channel that carries the flows within the proposed subdivision is vegetated and capable of handling the existing flows through the site. The flood area within the channel will be delineated on the plate to prevent disturbance within the flood area. No improvements to the channel are needed.

5. Discussion of the impacts of the off-site flow patterns and paths, under fully developed conditions

a) The off-site flows that enter this property travel overland into the channel. The basin consists of agricultural and large lot rural residential sites. These sites are excluded from the water quality and stormwater detention requirements with an imperviousness less than 10%. The flood area was calculated with a basin

imperviousness of 10%. All upstream imperviousness greater than 10% will require detention and shall not impact the site.

B. Minor Drainage Basins

1. On-site and off-site minor drainage basin characteristics and flow patterns and paths under historic and developed conditions

a) The site was divided into two onsite basins for analysis. Each basin represents each proposed lot within the subdivision. The basins were analyzed at a maximum of 10% imperviousness. The Basins are labeled "A" and "B" respectively.

b) The entirety of the tributary that flows through the site was also analyzed. This basin was calculated using the USGS Streamstats and the Rational Method to determine the largest flowrate. Ultimately the rational method was used for the 96 acre basin. This basin is labeled "Tributary".

Basin "A"
Basin A is the entire proposed western Lot 1. Existing flows from this basin travel overland. This basin contains the existing residence and barn. This lot was analyzed at 10% to account for potential future development.

Basin "B"
Basin B is the entire proposed eastern Lot 2. Existing flows from this basin travel overland into the existing tributary channel within the basin. This basin contains the existing residence and barn. This lot was analyzed at 10% to account for potential future development. The existing flow from this basin is within the tributary basin.

Tributary
The Piney Creek tributary basin consists of a 96± acre basin that includes a portion of the subject site. The existing flows from this basin travel overland into a channel that travels through the site. This entire tributary basin was analyzed at 10% imperviousness to account for future imperviousness within the basin.

Below is the complete design point table for all historic and offsite basins. See the historic drainage map in the appendices for design point and basin locations.

Flow Rate Table

Contributing Basin(s)	Area (AC.)	Q 5-YR	Q 100-YR
A	10.16	3.20	26.19
B	20.00	5.27	43.16
Tributary	96.00	20.90	171.25

2. Existing and proposed land uses within the basins

a) The site is currently developed with an existing residence and detached barn structure. The remaining site is undeveloped. The land use within the site and neighboring developments will not change. The agriculture and large lot residential zoning will remain with the proposed subdivision. These sites are

subject to the 10% imperviousness requirements of large lot residential sites within Douglas County.

3. Discussion of irrigation facilities that will influence or be impacted by the site drainage.

a) There are no irrigation facilities on the site.

4. Discussion of the impacts of the off-site flow patterns and paths, under fully developed conditions

a) Offsite flows enter the site. The flow rates of the off-site flows were calculated under the maximum assumed imperviousness of the tributary basin under fully developed conditions. Residential sites with imperviousness greater than 10% will require stormwater detention and water quality improvements.

III. DRAINAGE DESIGN CRITERIA

A. Regulations

1. County criteria and optional provisions selected, when applicable

a) The drainage design outlined in this report follows those regulations outlined in the Douglas County Storm Drainage Design and Technical Criteria Manual (DCDSSTCM) amended July 8, 2008.

2. *MHFD Manual* criteria and optional provisions selected, when applicable

a) The regulations outlined in the DCDSSTCM are consistent with the criteria outlined in the MHFD Urban Storm Drainage Criteria Manual Volumes 1-3.

B. Drainage Studies, Master Plans, Site Constraints

1. Discuss previous drainage studies or master plans for the site or project that influence the stormwater facility design

a) No previous drainage studies or master plans affect the Stormwater facility design for this site.

2. Discuss drainage studies for adjacent developments and how those developments affect the stormwater facility design

a) No drainage study was available for the subject property or the surrounding properties.

3. Discuss MHFD Outfall Systems Plans and how recommendations in those studies affect the design

a) Although Piney Creek lies to the north east of the site a review of the MHFD Outfall Systems Plans does not include this area. The site does not directly discharge into Piney Creek.

4. Discuss impacts to storm water management facility design caused by site constraints, such as streets, utilities, rapid transit, existing structures, etc

a) There are no site constraints that affect the storm water management on the site.

C. Hydrology

1. Runoff calculation method(s)

a) Runoff from the Basins were calculated using the rational method, as outlined in the DCDSSTCM section 6.3, and Chapter 2 of the MHFD USDCM Vol. 1. Time of concentration was calculated utilizing the UD Rational spreadsheet and NRCS conveyance were determined for each basin.

2. Design storm recurrence intervals

a) The design storm recurrence intervals used in this hydrologic analysis were 5 year and 100 year storm events. The 500 year storm event was calculated for the flood plain area of the tributary basin. The 500-year one-hour point rainfall data of the site was determined using the NOAA PFDS information of the site.

3. Design rainfall

a) The design rainfalls used in this analysis of the site are shown in the table below per the DCDSSTCM Section 6.1.1. The 500-year one-hour point rainfall data of the site was determined using the NOAA PFDS information of the site.

2-Year	5-Year	10-Year	50-Year	100-Year	500-Year
1.06	1.43	1.66	2.26	2.60	3.12

4. Detention storage calculation method(s)

a) There are no proposed detention requirements for the site. Both residential lots within the subdivision will be required to maintain an imperviousness below 10%.

5. Detention storage release rate calculation method

a) There are no proposed detention requirements for the site.

D. Hydraulics

1. Methods used to determine conveyance facility capacities

   a) The channel capacity for the tributary flood area within the site was calculated using the rational method and cross section analysis. The calculations are included in the Appendix of this report.

2. Hydraulic grade line calculation method and discussion of loss coefficients

   a) There are no hydraulic grade line calculations included with this report.

3. Methods used to calculate water surface profiles

   a) *Water surface profiles for the tributary flood area within the site were calculated using the rational method and cross section analysis. The calculations are included in the Appendix of this report.*

E. Water Quality Enhancement

1. Discuss proposed Best Management Practices

   a) There are no proposed BMPs for this site. Both lots on site will qualify for the Large Lot Single Family Site exemption. Both lots are greater than 2.5 acres and have an existing imperviousness below 10%. Post construction BMPs will not be required on either lot with a developed imperviousness below 10%.

2. Identify design procedures and WQCV

   a) Additional eater quality enhancement is not required for either lot within the subdivision.

3. Discuss proposed Source Controls for site activities

   a) Source controls will be implemented during the construction phase of either lot by following a future Storm Water Management Plan prepared prior to development within each lot.

IV. STORMWATER MANAGEMENT FACILITY DESIGN

A. Stormwater Conveyance Facilities

1. Discuss general conveyance concepts

    a) The general drainage path for the site is in a northeasterly direction. All flows travel overland to the tributary channel before entering Piney Creek north of the site.

2. Discuss proposed drainage paths and patterns

    a) There is to be no change to the existing drainage paths of the site.

3. Discuss storm sewer design, including inlet and pipe locations and sizes, tributary basins and areas, peak flow rates at design points, hydraulic grade lines, etc.

    a) There are no proposed storm sewers with this subdivision.

4. Discuss storm sewer outfall locations and design, including method of energy dissipation

    a) There are no storm sewer outfall locations with this project.

5. Discuss how runoff is conveyed from all outfalls to the nearest major drainageway, including a discussion of the flow path and capacity downstream of the outfall to the nearest major drainageway

    a) There are no outfall locations with this project. All runoff is to follow the existing conditions and travel overland to the tributary drainageway on site.

6. Discuss open channel and swale designs, including dimensions, alignments, tributary basins and areas, peak flow rates at design points, stabilization and grade control improvements, low flow or trickle channel capacities, water surface elevations, etc.

    a) The existing channel on site adequately conveys the tributary runoff through the site. No changes are proposed to the channel with this subdivision. Water surface elevations for the channel were calculated using the rational method and cross sections throughout the site.

7. Discuss allowable street capacities

    a) No streets are involved with the design of this project.

8. Discuss maintenance aspects of the design and easements and tracts that are required for stormwater conveyance purposes

a) The maintenance of the property will be that of the owner(s).

9. Discussion of the facilities needed off-site for the conveyance of minor and major flows to the major drainageway

a) There are no offsite facilities required.

B. Stormwater Storage Facilities

1. Discuss detention pond designs, including release rates, storage volumes and water surface elevations for the 2-year, 100-year and emergency overflow conditions, outlet structure design, emergency spillway design, etc.

a) There are no proposed detention ponds or storage facilities within the subdivision. Both lots will qualify for the Large Lot Single Family Site exclusions from post construction control measures per section 14.4 of the DCSDDTCM.

b) Site Impervious Areas:

Both proposed lots are currently less than 10% imperviousness. To meet the exclusion criteria, both lots are to remain under 10% imperviousness. Any developments that bring the imperviousness of the lot higher than 10% will require a new drainage report to meet the requirements of Douglas County.

c) Site Detention Storage Volume and Release Rates:

There are no proposed site detention storage requirements for the site.

2. Discuss pond outfall locations and design, including method of energy dissipation

a) *There are no proposed stormwater facilities and outfall locations with this subdivision.*

3. Discuss how runoff is conveyed from all pond outfalls and emergency spillways to the nearest major drainageway, including a discussion of the flow path and capacity downstream of the outfall to the nearest major drainageway

a) There are no proposed stormwater facilities with this subdivision.

4. Discuss maintenance aspects of the design and easements and tracts that are required for stormwater storage purposes

a) There are no proposed stormwater facilities that require maintenance. The properties themselves shall be maintained by the owners.

C. Water Quality Enhancement Best Management Practices

1. Discuss the design of all structural water quality Best Management Practices, including tributary areas, sizing, treatment volumes, design features, etc.

a) There are no proposed structural BMPs with this subdivision. Both sites qualify for the Large Lot Single Family Sites exclusion from Post-Construction Control Measures. Both sites are greater than 2.5 acres with an existing imperviousness of less than 10%. Any future developments that increase the imperviousness on either lot above 10% will require post construction BMPs.

2. Discuss how runoff is conveyed from all pond outfalls to the nearest major drainageway, including a discussion of the flow path and capacity downstream of the outfall to the nearest major drainageway

a) There are no proposed pond outfall locations or post construction BMPs with the subdivision.

3. Discuss the operation and maintenance aspects of the design and easements and tracts that are required for stormwater quality enhancement purposes

a) The maintenance of the property and drainage channel is that of the owner of the property.

4. Discuss the source controls that are necessary to prevent the potential for illicit discharge from site activities.

a) A Storm Water Management Plan will be required for future developments within the proposed subdivision.

D. Floodplain Modification

Undesignated Floodplain

1. Discuss resources and methodology for delineation of floodplain.

a) There is a calculated floodplain on site. The drainageway of the 96-acre tributary runs through the site. The flowrates were determined from this report using the rational method, the basin area was calculated using the Streamstat USGS procedures. Both items are included in the Appendix of this report.

Designated Floodplain

1. Discuss the source of the floodplain information and level of detail (Flood Hazard Area Delineation or FEMA Flood Insurance Rate Maps)

b) Piney Creek lies to the northeast of the site as indicated on the FIRM panel Map Number 08035C0087G with an effective date of 02/17/2017. There is a calculated floodplain on site. The drainageway of the 96-acre tributary runs through the site. The flowrates were determined from the rational method, the

basin area was calculated using the Streamstat USGS procedures. Both items are included in the Appendix of this report.

2. Discuss details of floodplain modifications, including level of encroachment, velocities, depths, stabilization measures, water surface elevations, etc.

a) There will be no floodplain modifications associated with this project.

3. Discuss Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) requirements

a) No CLOMR or LOMR are required with the development of this site.

4. Discuss County floodplain development regulations and Floodplain Development Permit

a) This project will not impact any floodplains. The calculated floodplain area of the site is shown on the drainage map of this report. A floodplain permit will not be required for this subdivision.

E. Additional Permitting Requirements

1. Section 404 of the Clean Water Act

a) No additional permitting is required with the development of the site

2. The Endangered Species Act

a) No additional permitting is required for the development of the site.

3. Other local, state, or federal requirements

a) No additional permitting is required with the development of the site

F. General

1. Discuss all tables, figures, charts, drawings, etc. that were used in design of stormwater management facilities and describe materials that are included in the appendix of the report

a) Workbooks and cross sections of the tributary drainage channel have been included in the Appendix of the report.

b) *UD Rational spreadsheets identifying the storm water runoff from each basin have been included in the Appendix of the report*.

V. CONCLUSIONS

A. Compliance with Standards

1. Douglas County Criteria

    a) The stormwater analysis of this site meets the county criteria, as outlined in the Douglas County Storm Drainage Design and Technical Criteria Manual.

2. MHFD Criteria

    a) The storm analysis of this site meets the MHFD criteria, as outlined in Urban Drainage and Flood Control District, Urban Drainage Criteria Manuals

3. Master Plans and MHFD Outfall System Plans

    a) *There are no MHFD Outfall system plans which impact 2096 S. Interstate 25.*

4. Cherry Creek Reservoir Control Regulation No. 72

    a) N/A

B. Variances

1. Identify provisions by section number for which a variance will be requested or has been approved by the County (final version of Drainage Report).

    a) A variance is not required for this project.

2. Provide justification for each variance request

    a) A variance is not required for this project.

C. Drainage Concept

1. Discuss overall effectiveness of stormwater management design to properly convey, store and treat stormwater

    a) *The proposed subdivision will not alter the existing drainage concepts on site. Each lot will drain to its historic point of discharge. Using the flowrates determined from this report, the drainage area of the tributary was determined and put on the plat. This area shall not be disturbed with the proposed subdivision.*

VI. REFERENCES

Douglas County, Colorado. "Douglas County Storm Drainage and Technical Criteria Manual." Drainage Criteria Manual, 2008.

Urban Drainage and Flood Control District. "Urban Storm Drainage Criteria Manual, Volumes 1-3." Drainage Criteria Manual, Denver, 2009.

VII. APPENDICES

A. Hydrologic / Hydraulic Computations

1. Peak Runoff using Rational Method
2. Streamstat Basin
3. Cross Section Worksheets

B. References

1. Soil Report
2. FIRM Map
3. NOAA Rainfall Data

C. Maps

1. Drainage Map

Appendices

Calculation of Peak Runoff using Rational Method

Designer: Zach Thatcher
Company: David E Archer & Assoc.
Date: 9/23/2025
Project: Driskill Subdivision
Location: Driskill Subdivision

Version 2.00 released May 2017

Cells of this color are for required user-input
Cells of this color are for optional override values
Cells of this color are for calculated results based on overrides

$t_i = \frac{0.395(1.1 - C_5)\sqrt{L_i}}{S_i^{0.33}}$

$t_t = \frac{L_t}{60K\sqrt{S_t}} = \frac{L_t}{60V_t}$

Computed $t_c = t_i + t_t$

Regional $t_c = (26 - 17i) + \frac{L_t}{60(14i + 9)\sqrt{S_t}}$

$t_{minimum} = 5$ (urban)
$t_{minimum} = 10$ (non-urban)

Selected $t_c = \max\{t_{minimum}, \min(\text{Computed } t_c, \text{Regional } t_c)\}$

Select UDFCD location for NOAA Atlas 14 Rainfall Depths from the pulldown list OR enter your own depths obtained from the NOAA website (click this link)

	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
1-hour rainfall depth, P1 (in) =	1.06	1.43	1.66		2.26	2.60	3.12

Rainfall Intensity Equation Coefficients =	a	b	c
	28.50	10.00	0.786

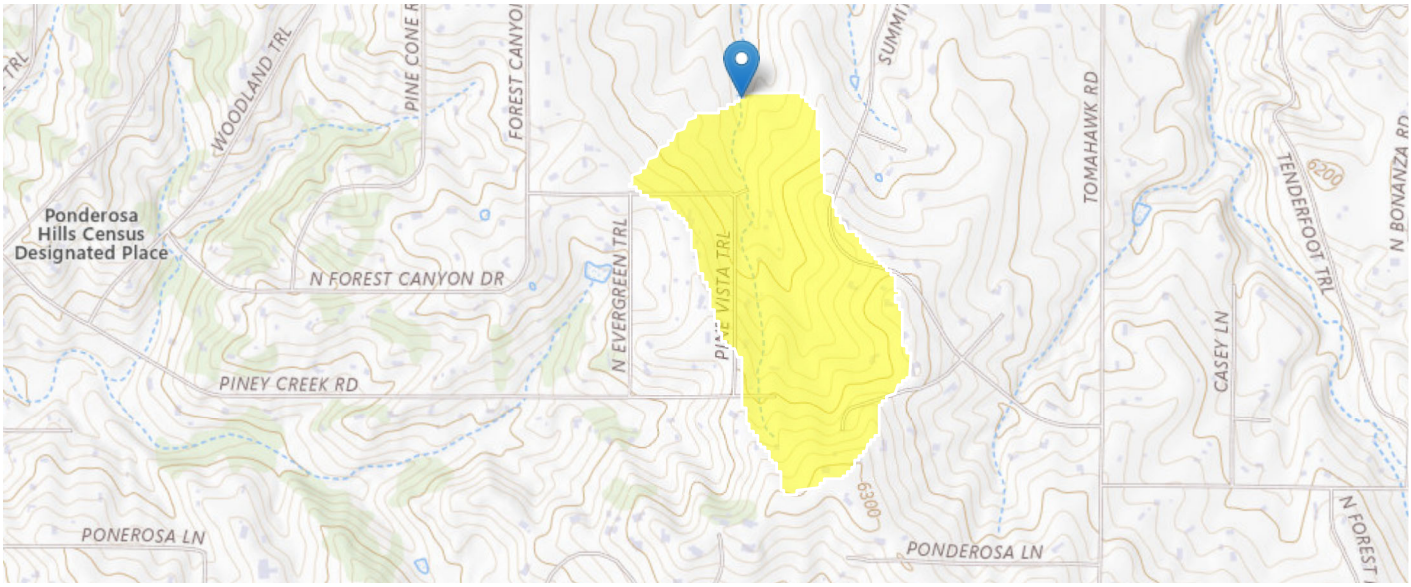
$I(in/hr) = \frac{a * P_1}{(b + t_c)^c}$

$Q(cfs) = CIA$

Subcatchment Name	Area (ac)	NRCS Hydrologic Soil Group	Percent Imperviousness	Runoff Coefficient, C							Overland (Initial) Flow Time					Channelized (Travel) Flow Time							Time of Concentration			Rainfall Intensity, I (in/hr)							Peak Flow, Q (cfs)						
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	Overland Flow Length L_t (ft)	U/S Elevation (ft) (Optional)	D/S Elevation (ft) (Optional)	Overland Flow Slope S_t (ft/ft)	Overland Flow Time t_t (min)	Channelized Flow Length L_t (ft)	U/S Elevation (ft) (Optional)	D/S Elevation (ft) (Optional)	Channelized Flow Slope S_t (ft/ft)	NRCS Conveyance Factor K	Channelized Flow Velocity V_t (ft/sec)	Channelized Flow Time t_t (min)	Computed t_c (min)	Regional t_c (min)	Selected t_c (min)	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
A	96.00	D	10.0	0.06	0.12	0.21	0.38	0.44	0.52	0.62	500.00			0.070	20.89	3107.00			0.070	10	2.65	19.57	40.46	43.12	40.46	1.39	1.87	2.17		2.95	3.40	4.08	8.38	20.90	42.80		125.46	171.25	242.53

Driskill Report

Region ID: CO
Workspace ID: CO20250923165952833000
Clicked Point (Latitude, Longitude): 39.54529, -104.70926
Time: 2025-09-23 11:00:17 -0600



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM10M	Mean basin slope computed from 10 m DEM	7	percent
CSL1085LFP	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 3D grid	189.1	feet per mi
DRNAREA	Area that drains to a point on a stream	0.15	square miles
EL7500	Percent of area above 7500 ft	0	percent
ELEV	Mean Basin Elevation	6226	feet
ELEVMAX	Maximum basin elevation	6310	feet
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	4.74	inches
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	1.95	inches
I6H100Y	6-hour precipitation that is expected to occur on average once in 100 years	3	inches
I6H2Y	Maximum 6-hour precipitation that occurs on average once in 2 years	1.31	inches
LAT_OUT	Latitude of Basin Outlet	39.545234	degrees
LC11BARE	Percentage of barren from NLCD 2011 class 31	0	percent
LC11CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2011	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	20.5	percent
LC11FOREST	Percentage of forest from NLCD 2011 classes 41-43	0	percent
LC11GRASS	Percent of area covered by grassland/herbaceous using 2011 NLCD	68.6	percent

Parameter Code	Parameter Description	Value	Unit
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	21.9	percent
LC11SHRUB	Percent of area covered by shrubland using 2011 NLCD	10.9	percent
LC11SNOIC	Percent snow and ice from NLCD 2011 class 12	0	percent
LC11WATER	Percent of open water, class 11, from NLCD 2011	0	percent
LC11WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2011	0	percent
LFPLENGTH	Length of longest flow path	0.69	miles
LONG_OUT	Longitude of Basin Outlet	-104.709217	degrees
MINBELEV	Minimum basin elevation	6160	feet
OUTLETELEV	Elevation of the stream outlet in feet above NAVD88	6161	feet
PRECIP	Mean Annual Precipitation	20.04	inches
RCN	Runoff-curve number as defined by NRCS (http://policy.nrcs.usda.gov/OpenNonWebContent.aspx?content=17758.wba)	77.79	dimensionless
RUNCO_CO	Soil runoff coefficient as defined by Verdin and Gross (2017)	0.27	dimensionless
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	4.26	percent
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	0	percent
SSURGOC	Percentage of area of Hydrologic Soil Type C from SSURGO	0	percent
SSURGOD	Percentage of area of Hydrologic Soil Type D from SSURGO	95.7	percent
STATSCLAY	Percentage of clay soils from STATSGO	28.5	percent
STORNHD	Percent storage (wetlands and waterbodies) determined from 1:24K NHD	0	percent
TOC	Time of concentration in hours	0.61	hours

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Foothills Region Peak Flow 2016 5099]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.15	square miles	0.6	2850
I6H100Y	6 Hour 100 Year Precipitation	3	inches	2.38	4.89
OUTLETELEV	Elevation of Gage	6161	feet	4290	8270
STATSCLAY	STATSGO Percentage of Clay Soils	28.5	percent	9.87	37.5

Peak-Flow Statistics Disclaimers [Foothills Region Peak Flow 2016 5099]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Foothills Region Peak Flow 2016 5099]

Statistic	Value	Unit
50-percent AEP flood	6.43	ft^3/s
20-percent AEP flood	19.2	ft^3/s
10-percent AEP flood	32.6	ft^3/s
4-percent AEP flood	55	ft^3/s
2-percent AEP flood	75.9	ft^3/s

Statistic	Value	Unit
1-percent AEP flood	102	ft^3/s
0.5-percent AEP flood	132	ft^3/s
0.2-percent AEP flood	180	ft^3/s

Peak-Flow Statistics Citations

Kohn, M.S., Stevens, M.R., Harden, T.M., Godaire, J.E., Klinger, R.E., and Mommandi, A.,2016, Paleoflood investigations to improve peak-streamflow regional-regression equations for natural streamflow in eastern Colorado, 2015: U.S. Geological Survey Scientific Investigations Report 2016–5099, 58 p. (http://dx.doi.org/10.3133/sir20165099)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.29.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Worksheet for Section1-100yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	172.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	6,192.15
1+14	6,184.88
1+65	6,183.02
2+55	6,174.34
3+03	6,174.34
3+68	6,181.45
4+26	6,187.35

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 6,192.15)	(1+65, 6,183.02)	0.040
(1+65, 6,183.02)	(2+55, 6,174.34)	0.035
(2+55, 6,174.34)	(3+03, 6,174.34)	0.030
(3+03, 6,174.34)	(3+68, 6,181.45)	0.035
(3+68, 6,181.45)	(4+26, 6,187.35)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	7.4 in
Roughness Coefficient	0.031
Elevation	6,174.96 ft
Elevation Range	6,174.3 to 6,192.2 ft
Flow Area	33.7 ft²
Wetted Perimeter	60.6 ft
Hydraulic Radius	6.7 in
Top Width	60.50 ft
Normal Depth	7.4 in
Critical Depth	8.4 in

Worksheet for Section1-100yr

Results	
Critical Slope	0.017 ft/ft
Velocity	5.11 ft/s
Velocity Head	0.41 ft
Specific Energy	1.02 ft
Froude Number	1.208
Flow Type	Supercritical

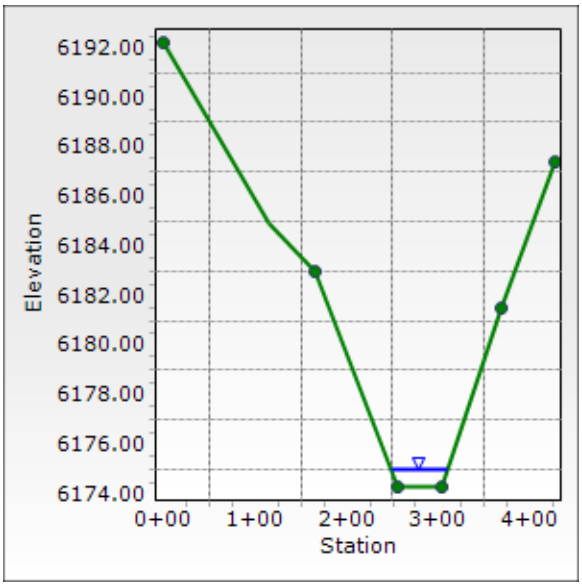
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	7.4 in
Critical Depth	8.4 in
Channel Slope	0.025 ft/ft
Critical Slope	0.017 ft/ft

Cross Section for Section1-100yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	7.4 in
Discharge	172.00 cfs



Worksheet for Section1-500yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	243.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	6,192.15
1+14	6,184.88
1+65	6,183.02
2+55	6,174.34
3+03	6,174.34
3+68	6,181.45
4+26	6,187.35

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 6,192.15)	(1+65, 6,183.02)	0.040
(1+65, 6,183.02)	(2+55, 6,174.34)	0.035
(2+55, 6,174.34)	(3+03, 6,174.34)	0.030
(3+03, 6,174.34)	(3+68, 6,181.45)	0.035
(3+68, 6,181.45)	(4+26, 6,187.35)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	9.1 in
Roughness Coefficient	0.031
Elevation	6,175.10 ft
Elevation Range	6,174.3 to 6,192.2 ft
Flow Area	42.3 ft²
Wetted Perimeter	63.3 ft
Hydraulic Radius	8.0 in
Top Width	63.21 ft
Normal Depth	9.1 in
Critical Depth	10.4 in

Worksheet for Section1-500yr

Results	
Critical Slope	0.016 ft/ft
Velocity	5.75 ft/s
Velocity Head	0.51 ft
Specific Energy	1.27 ft
Froude Number	1.239
Flow Type	Supercritical

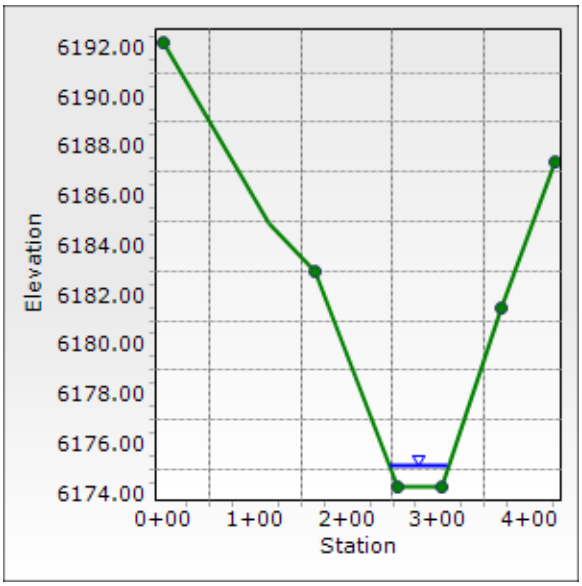
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	9.1 in
Critical Depth	10.4 in
Channel Slope	0.025 ft/ft
Critical Slope	0.016 ft/ft

Cross Section for Section1-500yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	9.1 in
Discharge	243.00 cfs



Worksheet for Section2-100yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	172.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+03	6,180.44
0+99	6,172.14
1+85	6,165.24
2+23	6,165.24
3+24	6,171.64
4+24	6,176.84

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+03, 6,180.44)	(0+99, 6,172.14)	0.040
(0+99, 6,172.14)	(1+85, 6,165.24)	0.035
(1+85, 6,165.24)	(2+23, 6,165.24)	0.030
(2+23, 6,165.24)	(3+24, 6,171.64)	0.035
(3+24, 6,171.64)	(4+24, 6,176.84)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	8.4 in
Roughness Coefficient	0.032
Elevation	6,165.94 ft
Elevation Range	6,165.2 to 6,180.4 ft
Flow Area	33.5 ft²
Wetted Perimeter	58.0 ft
Hydraulic Radius	6.9 in
Top Width	57.91 ft
Normal Depth	8.4 in
Critical Depth	9.3 in
Critical Slope	0.017 ft/ft

Worksheet for Section2-100yr

Results	
Velocity	5.13 ft/s
Velocity Head	0.41 ft
Specific Energy	1.11 ft
Froude Number	1.189
Flow Type	Supercritical

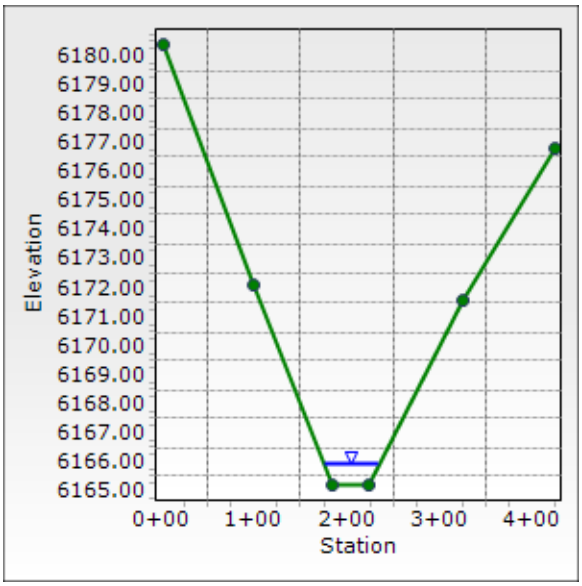
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.4 in
Critical Depth	9.3 in
Channel Slope	0.025 ft/ft
Critical Slope	0.017 ft/ft

Cross Section for Section2-100yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	8.4 in
Discharge	172.00 cfs



Worksheet for Section2-500yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	243.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+03	6,180.44
0+99	6,172.14
1+85	6,165.24
2+23	6,165.24
3+24	6,171.64
4+24	6,176.84

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+03, 6,180.44)	(0+99, 6,172.14)	0.040
(0+99, 6,172.14)	(1+85, 6,165.24)	0.035
(1+85, 6,165.24)	(2+23, 6,165.24)	0.030
(2+23, 6,165.24)	(3+24, 6,171.64)	0.035
(3+24, 6,171.64)	(4+24, 6,176.84)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	10.2 in
Roughness Coefficient	0.032
Elevation	6,166.09 ft
Elevation Range	6,165.2 to 6,180.4 ft
Flow Area	42.6 ft²
Wetted Perimeter	62.3 ft
Hydraulic Radius	8.2 in
Top Width	62.20 ft
Normal Depth	10.2 in
Critical Depth	11.4 in
Critical Slope	0.016 ft/ft

Worksheet for Section2-500yr

Results	
Velocity	5.70 ft/s
Velocity Head	0.50 ft
Specific Energy	1.35 ft
Froude Number	1.214
Flow Type	Supercritical

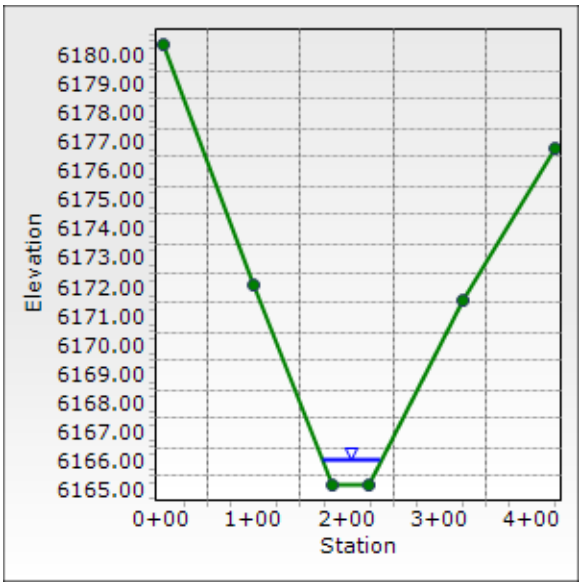
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	10.2 in
Critical Depth	11.4 in
Channel Slope	0.025 ft/ft
Critical Slope	0.016 ft/ft

Cross Section for Section2-500yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	10.2 in
Discharge	243.00 cfs



Worksheet for Section3-100yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	172.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+38	6,172.65
1+19	6,165.02
2+13	6,157.41
2+98	6,159.24
3+67	6,167.91
4+27	6,168.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+38, 6,172.65)	(1+19, 6,165.02)	0.040
(1+19, 6,165.02)	(2+13, 6,157.41)	0.035
(2+13, 6,157.41)	(2+98, 6,159.24)	0.030
(2+98, 6,159.24)	(3+67, 6,167.91)	0.035
(3+67, 6,167.91)	(4+27, 6,168.80)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	13.0 in
Roughness Coefficient	0.031
Elevation	6,158.49 ft
Elevation Range	6,157.4 to 6,172.7 ft
Flow Area	34.3 ft²
Wetted Perimeter	63.5 ft
Hydraulic Radius	6.5 in
Top Width	63.44 ft
Normal Depth	13.0 in
Critical Depth	14.0 in
Critical Slope	0.017 ft/ft

Worksheet for Section3-100yr

Results	
Velocity	5.01 ft/s
Velocity Head	0.39 ft
Specific Energy	1.47 ft
Froude Number	1.200
Flow Type	Supercritical

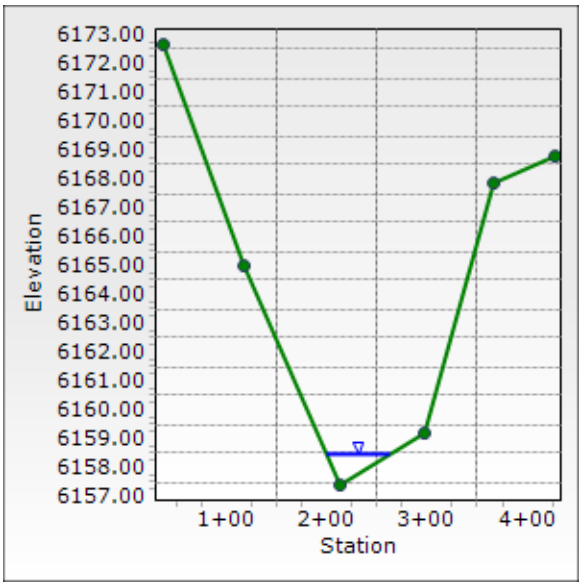
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	13.0 in
Critical Depth	14.0 in
Channel Slope	0.025 ft/ft
Critical Slope	0.017 ft/ft

Cross Section for Section3-100yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	13.0 in
Discharge	172.00 cfs



Worksheet for Section3-500yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	243.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+38	6,172.65
1+19	6,165.02
2+13	6,157.41
2+98	6,159.24
3+67	6,167.91
4+27	6,168.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+38, 6,172.65)	(1+19, 6,165.02)	0.040
(1+19, 6,165.02)	(2+13, 6,157.41)	0.035
(2+13, 6,157.41)	(2+98, 6,159.24)	0.030
(2+98, 6,159.24)	(3+67, 6,167.91)	0.035
(3+67, 6,167.91)	(4+27, 6,168.80)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	14.8 in
Roughness Coefficient	0.031
Elevation	6,158.64 ft
Elevation Range	6,157.4 to 6,172.7 ft
Flow Area	44.5 ft²
Wetted Perimeter	72.3 ft
Hydraulic Radius	7.4 in
Top Width	72.22 ft
Normal Depth	14.8 in
Critical Depth	16.0 in
Critical Slope	0.016 ft/ft

Worksheet for Section3-500yr

Results	
Velocity	5.46 ft/s
Velocity Head	0.46 ft
Specific Energy	1.70 ft
Froude Number	1.226
Flow Type	Supercritical

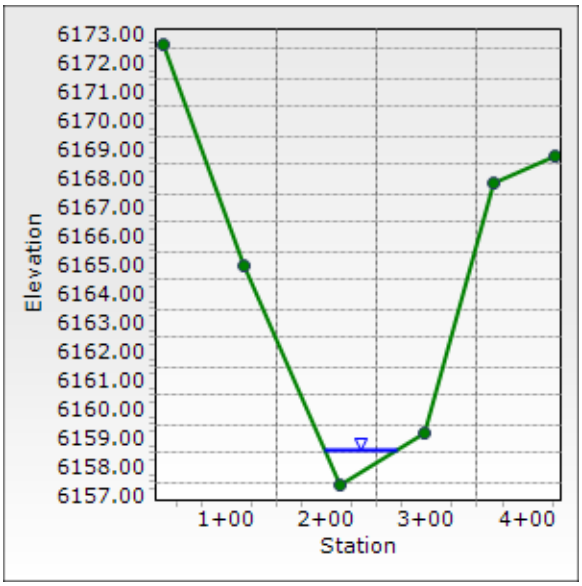
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	14.8 in
Critical Depth	16.0 in
Channel Slope	0.025 ft/ft
Critical Slope	0.016 ft/ft

Cross Section for Section3-500yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	14.8 in
Discharge	243.00 cfs



Worksheet for Section4-100yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	172.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+06	6,166.63
2+07	6,154.28
2+77	6,148.00
3+01	6,148.10
3+59	6,151.33
4+26	6,153.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+06, 6,166.63)	(2+07, 6,154.28)	0.040
(2+07, 6,154.28)	(2+77, 6,148.00)	0.035
(2+77, 6,148.00)	(3+01, 6,148.10)	0.030
(3+01, 6,148.10)	(3+59, 6,151.33)	0.035
(3+59, 6,151.33)	(4+26, 6,153.60)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	11.1 in
Roughness Coefficient	0.033
Elevation	6,148.93 ft
Elevation Range	6,148.0 to 6,166.6 ft
Flow Area	31.9 ft²
Wetted Perimeter	49.2 ft
Hydraulic Radius	7.8 in
Top Width	49.13 ft
Normal Depth	11.1 in
Critical Depth	12.1 in
Critical Slope	0.018 ft/ft

Worksheet for Section4-100yr

Results	
Velocity	5.39 ft/s
Velocity Head	0.45 ft
Specific Energy	1.38 ft
Froude Number	1.179
Flow Type	Supercritical

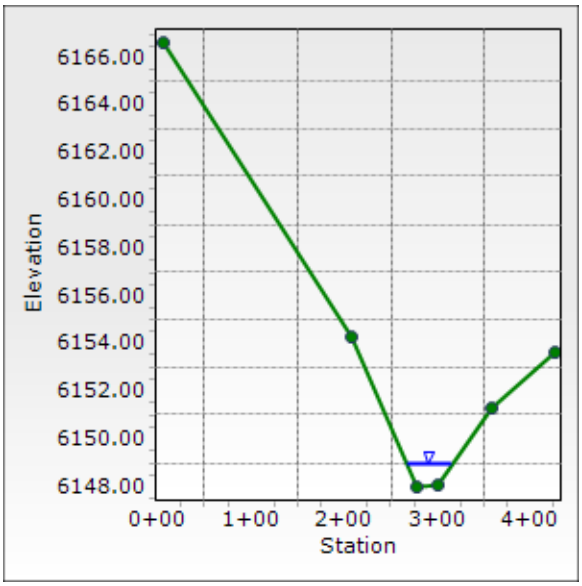
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	11.1 in
Critical Depth	12.1 in
Channel Slope	0.025 ft/ft
Critical Slope	0.018 ft/ft

Cross Section for Section4-100yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	11.1 in
Discharge	172.00 cfs



Worksheet for Section4-500yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	243.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+06	6,166.63
2+07	6,154.28
2+77	6,148.00
3+01	6,148.10
3+59	6,151.33
4+26	6,153.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+06, 6,166.63)	(2+07, 6,154.28)	0.040
(2+07, 6,154.28)	(2+77, 6,148.00)	0.035
(2+77, 6,148.00)	(3+01, 6,148.10)	0.030
(3+01, 6,148.10)	(3+59, 6,151.33)	0.035
(3+59, 6,151.33)	(4+26, 6,153.60)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	13.2 in
Roughness Coefficient	0.033
Elevation	6,149.10 ft
Elevation Range	6,148.0 to 6,166.6 ft
Flow Area	41.0 ft²
Wetted Perimeter	54.3 ft
Hydraulic Radius	9.1 in
Top Width	54.27 ft
Normal Depth	13.2 in
Critical Depth	14.6 in
Critical Slope	0.017 ft/ft

Worksheet for Section4-500yr

Results	
Velocity	5.92 ft/s
Velocity Head	0.55 ft
Specific Energy	1.65 ft
Froude Number	1.201
Flow Type	Supercritical

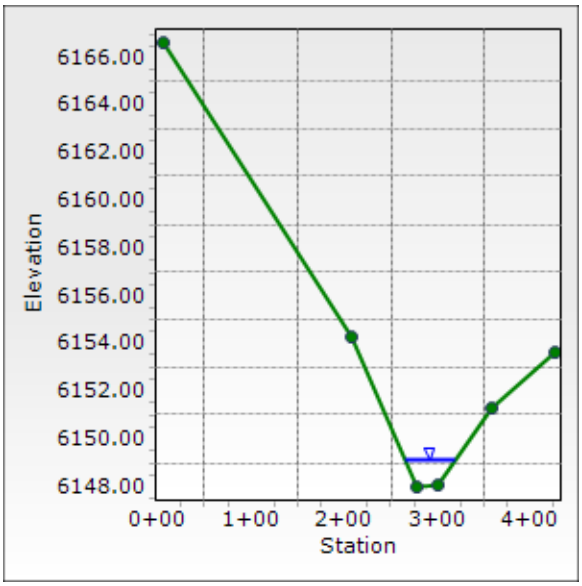
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	13.2 in
Critical Depth	14.6 in
Channel Slope	0.025 ft/ft
Critical Slope	0.017 ft/ft

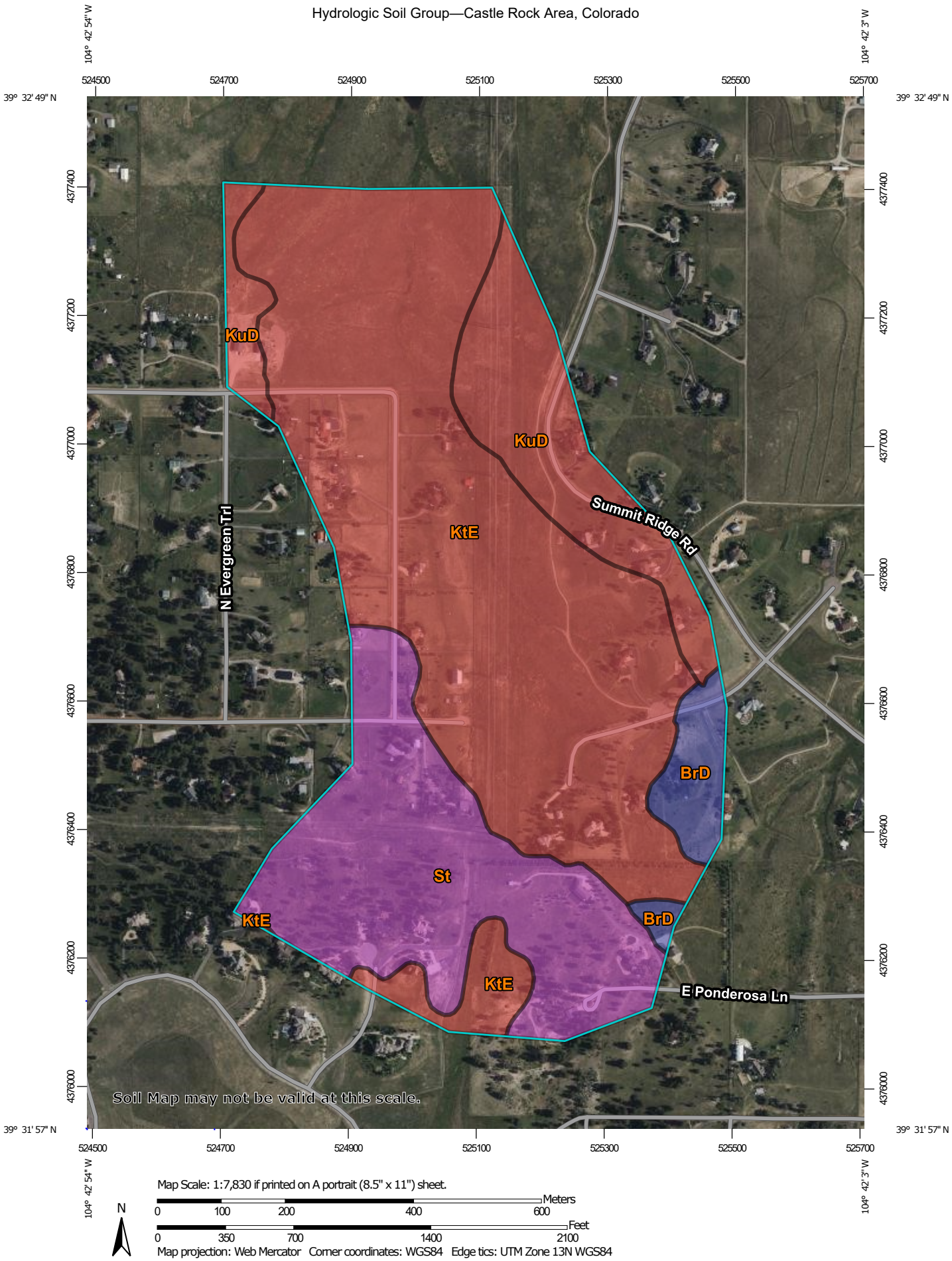
Cross Section for Section4-500yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	13.2 in
Discharge	243.00 cfs



Hydrologic Soil Group—Castle Rock Area, Colorado



USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

9/23/2025
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Castle Rock Area, Colorado
Survey Area Data: Version 17, Aug 29, 2024

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BrD	Bresser sandy loam, cool, 5 to 9 percent slopes	B	6.8	3.9%
KtE	Kutch sandy loam, 5 to 20 percent slopes	D	101.5	57.2%
KuD	Kutch clay loam, 4 to 8 percent slopes	D	24.7	13.9%
St	Stapleton-Bresser association	A	44.5	25.1%
Totals for Area of Interest			**177.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

National Flood Hazard Layer FIRMette

FEMA

104°42'56"W 39°32'51"N

104°42'19"W 39°32'23"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/23/2025 at 10:57 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

NOAA Atlas 14, Volume 8, Version 2
Location name: Parker, Colorado, USA*
Latitude: 39.5441°, Longitude: -104.7105°
Elevation: 6184 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.228 (0.186-0.282)	0.287 (0.234-0.354)	0.386 (0.314-0.478)	0.474 (0.382-0.588)	0.600 (0.470-0.774)	0.702 (0.536-0.915)	0.809 (0.596-1.08)	0.922 (0.650-1.26)	1.08 (0.731-1.50)	1.20 (0.791-1.69)
10-min	0.334 (0.273-0.412)	0.420 (0.342-0.518)	0.566 (0.459-0.700)	0.693 (0.560-0.861)	0.878 (0.688-1.13)	1.03 (0.785-1.34)	1.18 (0.873-1.58)	1.35 (0.952-1.84)	1.58 (1.07-2.20)	1.76 (1.16-2.48)
15-min	0.408 (0.333-0.503)	0.512 (0.417-0.632)	0.690 (0.560-0.854)	0.846 (0.683-1.05)	1.07 (0.839-1.38)	1.25 (0.957-1.64)	1.44 (1.06-1.92)	1.65 (1.16-2.24)	1.93 (1.30-2.69)	2.15 (1.41-3.02)
30-min	0.528 (0.431-0.652)	0.664 (0.541-0.820)	0.897 (0.729-1.11)	1.10 (0.888-1.37)	1.39 (1.09-1.80)	1.63 (1.24-2.13)	1.88 (1.38-2.50)	2.14 (1.51-2.92)	2.50 (1.63-3.45)	2.79 (1.83-3.92)
60-min	0.660 (0.539-0.815)	0.819 (0.668-1.01)	1.10 (0.890-1.36)	1.34 (1.08-1.67)	1.70 (1.34-2.21)	2.00 (1.53-2.62)	2.32 (1.71-3.09)	2.65 (1.87-3.62)	3.12 (2.12-4.36)	3.50 (2.30-4.92)
2-hr	0.792 (0.650-0.971)	0.974 (0.799-1.19)	1.30 (1.06-1.59)	1.58 (1.29-1.95)	2.02 (1.60-2.60)	2.37 (1.83-3.08)	2.76 (2.05-3.65)	3.17 (2.25-4.29)	3.74 (2.56-5.19)	4.21 (2.79-5.88)
3-hr	0.891 (0.733-1.09)	1.08 (0.890-1.32)	1.43 (1.17-1.74)	1.74 (1.42-2.14)	2.21 (1.76-2.84)	2.61 (2.02-3.38)	3.04 (2.26-4.01)	3.50 (2.50-4.72)	4.15 (2.85-5.74)	4.68 (3.12-6.50)
6-hr	1.09 (0.904-1.32)	1.31 (1.09-1.59)	1.71 (1.41-2.08)	2.07 (1.70-2.53)	2.62 (2.10-3.34)	3.08 (2.40-3.95)	3.57 (2.68-4.68)	4.11 (2.96-5.50)	4.86 (3.36-6.66)	5.48 (3.67-7.54)
12-hr	1.34 (1.12-1.61)	1.61 (1.34-1.94)	2.09 (1.73-2.51)	2.51 (2.07-3.03)	3.13 (2.51-3.94)	3.64 (2.84-4.62)	4.18 (3.16-5.41)	4.76 (3.44-6.30)	5.57 (3.87-7.54)	6.21 (4.20-8.48)
24-hr	1.64 (1.37-1.95)	1.95 (1.63-2.33)	2.48 (2.07-2.97)	2.95 (2.44-3.54)	3.62 (2.92-4.50)	4.17 (3.27-5.23)	4.74 (3.60-6.07)	5.34 (3.89-7.00)	6.18 (4.32-8.28)	6.84 (4.65-9.25)
2-day	1.95 (1.64-2.31)	2.28 (1.92-2.70)	2.84 (2.38-3.38)	3.33 (2.78-3.97)	4.04 (3.27-4.97)	4.61 (3.64-5.73)	5.20 (3.97-6.60)	5.83 (4.27-7.56)	6.69 (4.72-8.89)	7.37 (5.06-9.88)
3-day	2.12 (1.79-2.49)	2.47 (2.09-2.92)	3.08 (2.59-3.64)	3.60 (3.01-4.27)	4.34 (3.53-5.32)	4.94 (3.92-6.11)	5.56 (4.26-7.01)	6.20 (4.56-8.00)	7.08 (5.01-9.35)	7.77 (5.36-10.4)
4-day	2.24 (1.90-2.63)	2.62 (2.22-3.08)	3.26 (2.75-3.84)	3.81 (3.19-4.50)	4.59 (3.73-5.59)	5.21 (4.14-6.41)	5.85 (4.49-7.35)	6.51 (4.80-8.36)	7.42 (5.26-9.75)	8.12 (5.61-10.8)
7-day	2.56 (2.18-2.99)	2.97 (2.53-3.47)	3.67 (3.11-4.30)	4.27 (3.60-5.02)	5.12 (4.18-6.20)	5.79 (4.63-7.09)	6.49 (5.01-8.09)	7.21 (5.35-9.20)	8.19 (5.85-10.7)	8.96 (6.23-11.8)
10-day	2.86 (2.44-3.32)	3.29 (2.80-3.83)	4.02 (3.42-4.69)	4.64 (3.92-5.44)	5.53 (4.54-6.67)	6.24 (5.01-7.61)	6.98 (5.41-8.67)	7.74 (5.76-9.83)	8.78 (6.30-11.4)	9.60 (6.70-12.6)
20-day	3.76 (3.23-4.34)	4.25 (3.64-4.91)	5.06 (4.33-5.86)	5.76 (4.90-6.70)	6.76 (5.58-8.07)	7.55 (6.09-9.11)	8.36 (6.53-10.3)	9.21 (6.91-11.6)	10.4 (7.48-13.3)	11.3 (7.92-14.6)
30-day	4.54 (3.91-5.21)	5.11 (4.40-5.88)	6.07 (5.21-6.99)	6.87 (5.86-7.94)	7.99 (6.61-9.47)	8.86 (7.17-10.6)	9.75 (7.63-11.9)	10.7 (8.02-13.3)	11.9 (8.60-15.2)	12.8 (9.05-16.6)
45-day	5.53 (4.78-6.33)	6.28 (5.42-7.19)	7.49 (6.45-8.59)	8.47 (7.26-9.76)	9.81 (8.12-11.5)	10.8 (8.77-12.9)	11.8 (9.26-14.3)	12.8 (9.65-15.9)	14.1 (10.2-17.8)	15.0 (10.7-19.4)
60-day	6.38 (5.54-7.28)	7.32 (6.34-8.36)	8.80 (7.60-10.1)	9.99 (8.58-11.5)	11.5 (9.56-13.5)	12.7 (10.3-15.0)	13.8 (10.8-16.6)	14.9 (11.2-18.3)	16.2 (11.8-20.4)	17.2 (12.2-22.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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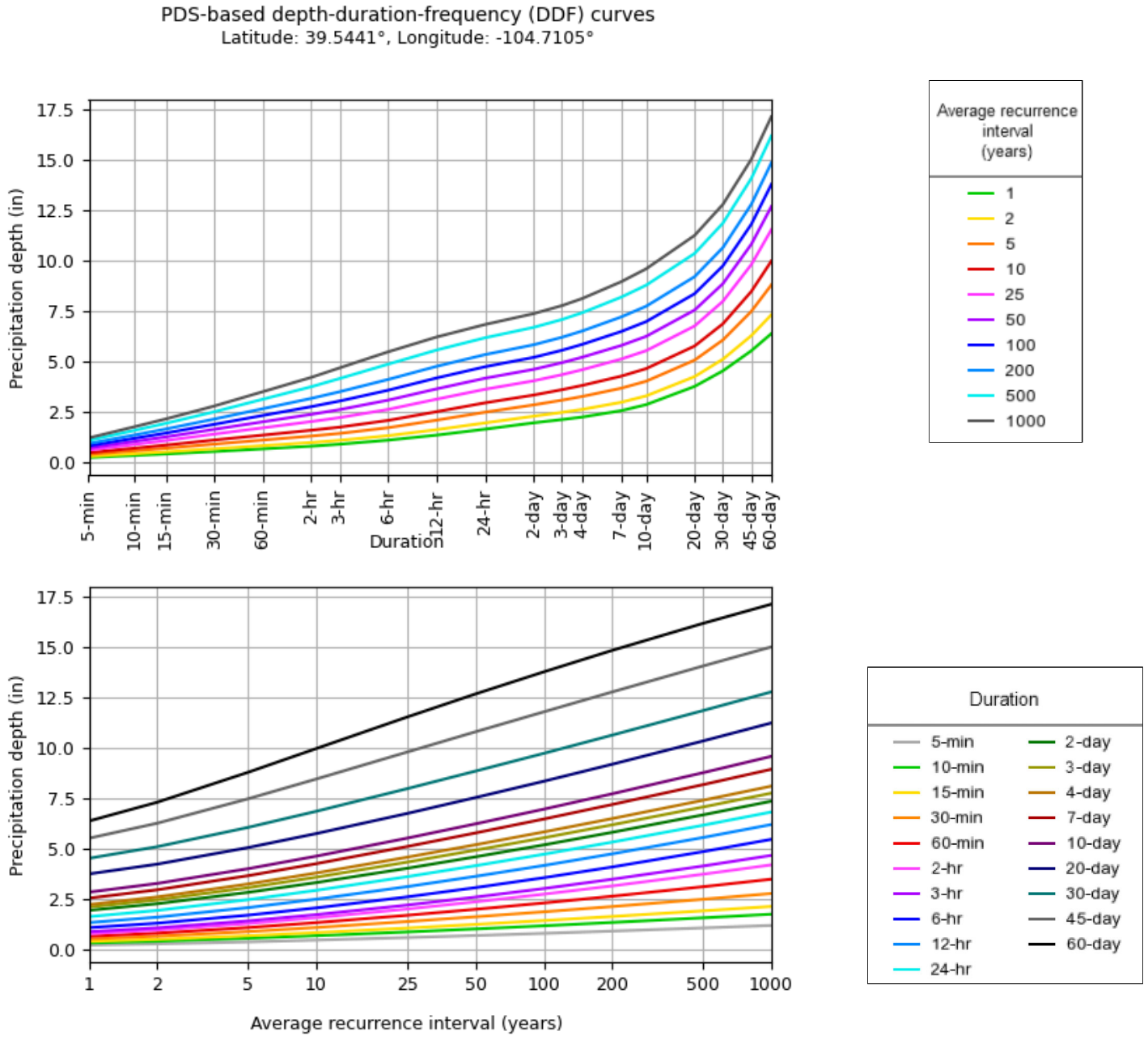
PF graphical



NOAA Atlas 14, Volume 8, Version 2 Created (GMT): Tue Sep 23 19:26:58 2025

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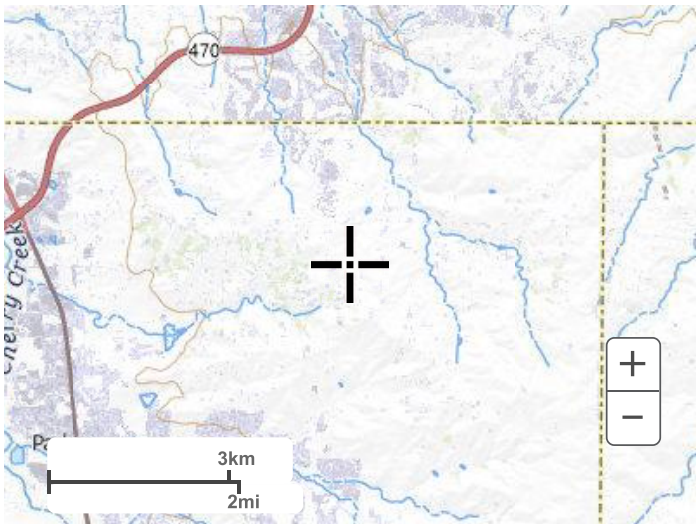
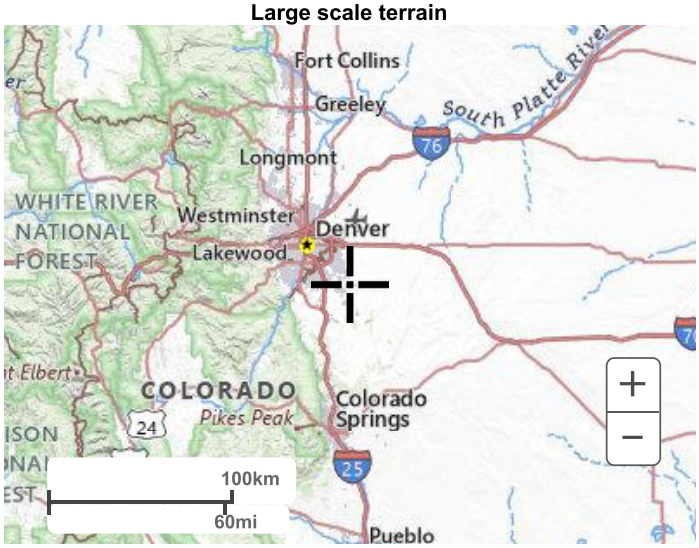
Maps & aerials

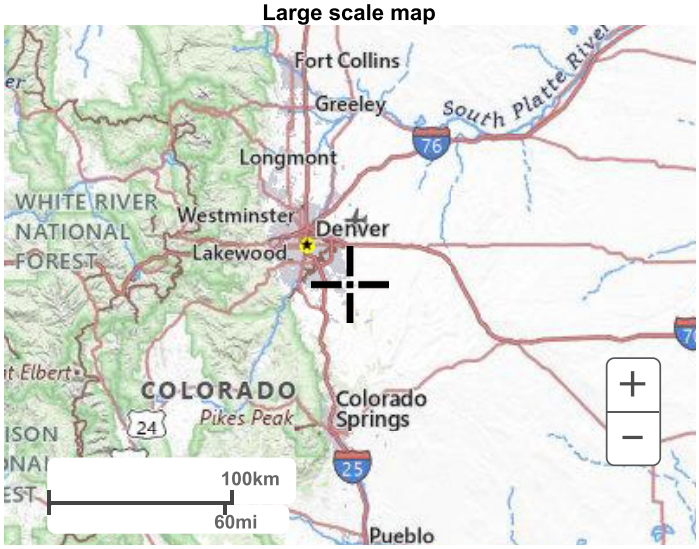
Small scale terrain



Large scale terrain



Large scale map

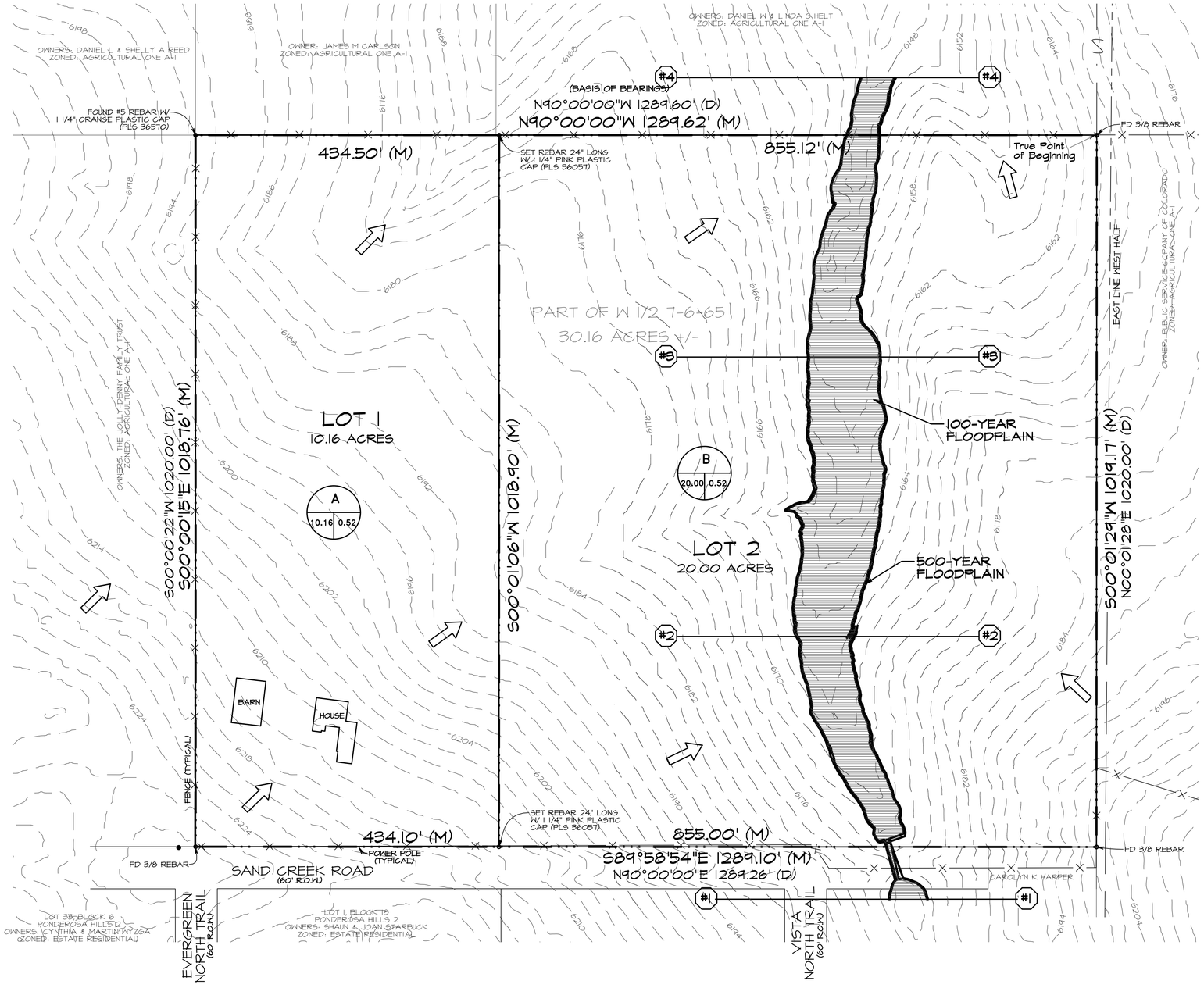


Large scale aerial

Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer



LEGEND

- EXISTING COUNTOUR PER DOUGLAS COUNTY (2' INTERVALS)
- = BASIN LINE
- 100-YEAR FLOOD ZONE (CALCULATED)
- 500-YEAR FLOOD ZONE (CALCULATED)
- CROSS SECTION
- = EXISTING DRAINAGE DIRECTION
- A-1 | 0.33 | 0.53 — BASIN; = BASIN INFORMATION; RUNOFF COEFFICIENT C100; AREA (ACRES)

FLOODPLAIN NOTES

1. THE PINEY CREEK TRIBUTARY FLOWRATE WAS CALCULATED USING THE USGS STREAMSTATS AND THE RATIONAL METHOD FOR THE 96 ACRE BASIN.
   Q100 = 172 CFS
   Q500 = 243 CFS
2. THIS IS NOT A STANDALONE DOCUMENT. ALL ADDITIONAL CALCULATIONS AND DESIGN INFORMATION CAN BE FOUND WITHIN THE DRAINAGE REPORT FOR THIS SUBDIVISION.
3. THE TOPOGRAPHY AND CONTOURS USED FOR THE ANALYSIS SHOWN ON THIS EXHIBIT ARE OF DOUGLAS COUNTY GIS OPEN DATA.
4. THE SITE DOES NOT LIE WITHING A FEMA FLOOD ZONE, PER MAP NUMBER 08035C0087G DATED 02/17/2017.

GRAPHIC SCALE 1"=80'
0 80 160 240

DAVID E. ARCHER & ASSOCIATES, INC.
LAND DEVELOPMENT CONSULTING
SURVEYING & ENGINEERING
PHONE (303) 688-4642
105 WILCOX ST. CASTLE ROCK, COLORADO 80104

REVISIONS

DRISKILL SUBDIVISION
DRAINAGE MAP
LOT 1 & LOT 2 DRISKILL SUBDIVISION

SCALE	1"=80'
DATE	09/24/25
DR'N. ZET	CK'D. –
AP'VD.	–
JOB NUMBER	20-1555
Sheet	1 of 1

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HAYES POZNANOVIC KORVER LLC
ATTORNEYS AT LAW

1999 BROADWAY, SUITE 3200
DENVER, COLORADO 80202

TELEPHONE (303) 825-1980

FACSIMILE (303) 825-1983

February 3, 2024

Douglas County Department of Community Development
100 Third Street
Castle Rock Colorado 80124

Re: CORRECTION to July 17 2024 Water Supply Report Case PS 2024-097, Rezoning, Large rural residential, 30 acres SE ¼ NW ¼ Section 7 T6S R65 W William T Driskill and Maria Driskill, Applicants.

The Lower Dawson well permit referenced in the July 17 2024 report previously submitted, was incorrectly identified as permit number 83445. The correct permit number for the Driskill well is 283445. There are 2 references to the incorrect permit number in paragraph 3 of the report. All other information in the prior report is correct.

HAYES POZNANOVIC KORVER LLC

James J. Petrock

Copy- Bill Driskill billpd1957@gmail .com

HAYES POZNANOVIC KORVER LLC
ATTORNEYS AT LAW

700 17TH STREET, SUITE 1800
DENVER, COLORADO 80202

TELEPHONE (303) 825-1980 FACSIMILE (303) 825-1983

July 17, 2024

Douglas County Department of Community Development
100 Third Steet
Castle Rock CO 80124

Re: Available Water Rights- Case number PS 2024-097 , Rezoning, Large rural residential, 30 acres, SE ¼ NW ¼ Sec 7 T6SR65W, William P Driskill and Maria T Driskill, Applicants.

1. Property Description.

SE ¼ NW1/4 Section 7 T 6S R 65 W. County of Douglas, State of Colorado. 30 acres.

2. Ownership

William P Driskill and Maria T. Driskill

3. Water Rights appurtenant to Described Property

(a) Well permit 83445 – 3 acre feet Lower Dawson non tributary groundwater.
(b) Non tributary groundwater underlying the Property:

Aquifer	Annual Appropriation
Lower Dawson (NT)	4.9 acre feet*
Denver (NT)	12.7 acre feet
Arapahoe (NT)	14.3 acre feet
Laramie Fox Hills(NT)	10.1 acre feet

*less 3 acre feet under well permit 83445.

4. Adequacy of Water Supply for Large Rural Residential Zoning

Douglas County zoning requires 1 acre foot/year/ per residential unit. 3 acre feet of non-tributary Lower Dawson groundwater is legally available There is also 12.7 acre feet of non-tributary Denver aquifer and 14.3 acre feet of Arapahoe aquifer groundwater available .

HAYES POZNANOVIC KORVER LLC

James J. Petrock.

Copy- Bill Driskill billpd1957@gmail.com

COLORADO
Division of Water Resources
Department of Natural Resources

WELL PERMIT NUMBER 283455-
RECEIPT NUMBER 3646148

ORIGINAL PERMIT APPLICANT(S)
DIREZZA LIMITED FAMILY PARTENRSHIP

APPROVED WELL LOCATION
Water Division: 2 Water District: 67
Designated Basin: N/A
Management District: N/A
County: KIOWA
Parcel Name: N/A
Physical Address: 0 EAST SAND CREEK ROAD PARKER, CO 80138

NW 1/4 NW 1/4 Section 15 Township 19.0 S Range 49.0 W Sixth P.M.

UTM COORDINATES (Meters, Zone: 13, NAD83)
Easting: 683933.8 Northing: 4253387.1

ISSUANCE OF THIS PERMIT DOES NOT CONFER A WATER RIGHT
CONDITIONS OF APPROVAL

1) This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of this permit does not ensure that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.

2) The construction of this well shall be in compliance with the Water Well Construction Rules 2 CCR 402-2, unless approval of a variance has been granted by the State Board of Examiners of Water Well Construction and Pump Installation Contractors in accordance with Rule 18.

3) Approved pursuant to CRS 37-92-602(3)(b)(II)(A) as the only well on a tract of land of 40.00 acres described as the NW 1/4 of the NW 1/4, Sec. 15, Twp. 19 S, Rng. 49 W, Sixth P.M., Kiowa County.

4) The use of ground water from this well is limited to fire protection, ordinary household purposes inside not more than three (3) single family dwellings, the watering of poultry, domestic animals and livestock on a farm or ranch and the irrigation of not more than one (1) acre of home gardens and lawns.

5) The pumping rate of this well shall not exceed 15 GPM.

6) The return flow from the use of this well must be through an individual waste water disposal system of the non-evaporative type where the water is returned to the same stream system in which the well is located.

7) Pursuant to Rule 6.2.3 of the Water Well Construction Rules, the well construction contractor shall submit the as-built well location on work reports required by Rule 17.3 within 60 days of completion of the well. The measured location must be accurate to 200 feet of the actual location. The location information must include a GPS location (UTM coordinates) pursuant to the Division of Water Resources' guidelines.

NOTE: This permit will expire on the expiration date unless the well is constructed by that date. A Well Construction and Test Report (GWS-31) must be submitted to the Division of Water Resources to verify the well has been constructed. An extension of the expiration date may be available. Contact the DWR for additional information or refer to the extension request form (GWS-64) available at: http://www.water.state.co.us/pubs/forms.asp

See Original Permit
Issued By

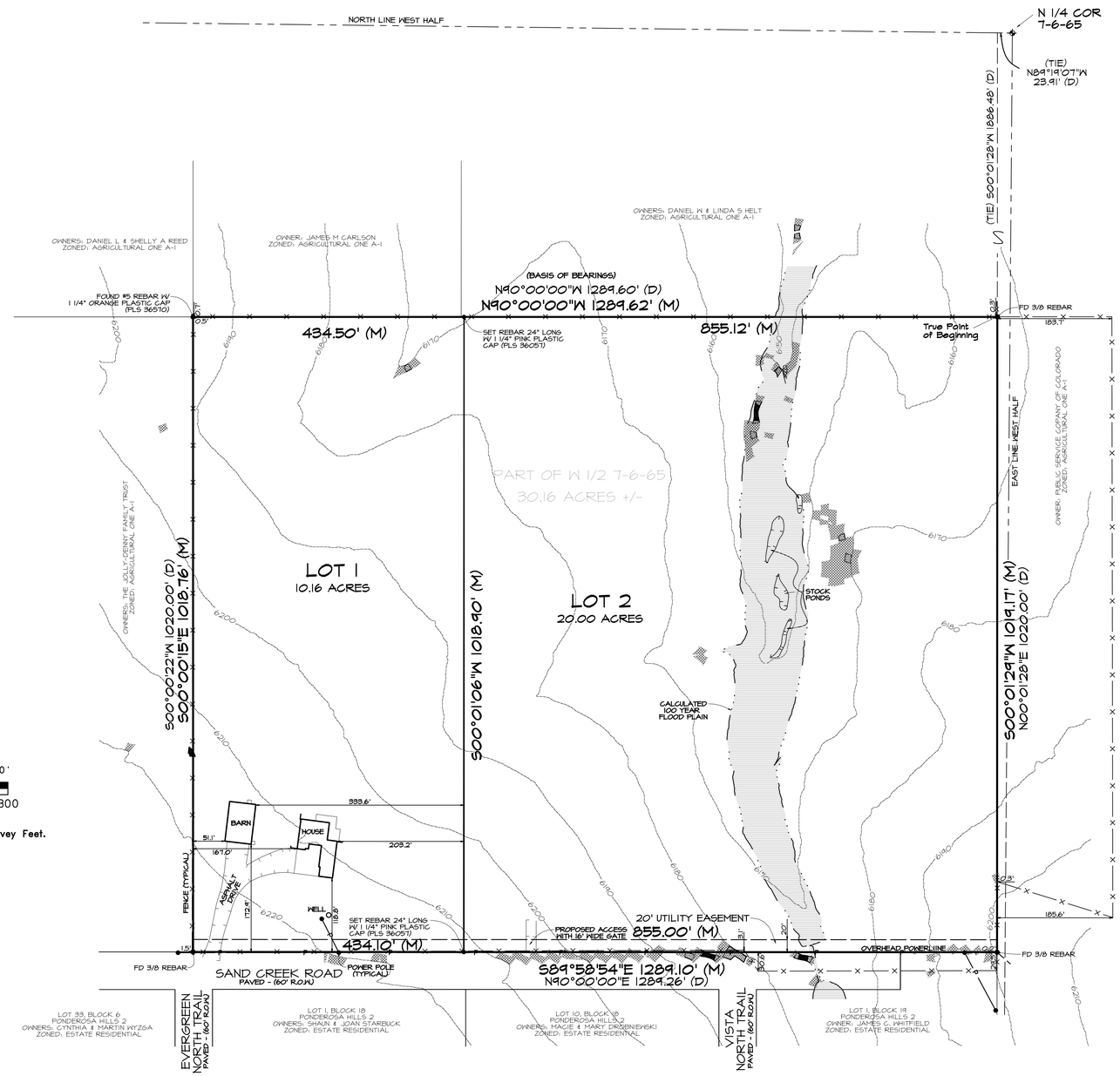
Date Issued: 7/1/2010
Expiration Date: 7/1/2012

PERMIT HISTORY

01-15-2021	CHANGE IN OWNER NAME/MAILING ADDRESS. CHANGED TO WILLIAM DISKILL
01-15-2021	CHANGE IN OWNER NAME/MAILING ADDRESS. CHANGED TO TERESA DISKILL

Well Permit number is a misprint. The correct number is 283445. Verified 10/20/25. Bill Diskill

SUPPLEMENTAL PLAN EXHIBIT
DRISKILL SUBDIVISION
Located in the West 1/2, of Section 7, Township 6 South, Range 65 West of the 6th P.M., County of Douglas, State of Colorado.
30.16 Acres 2 Residential Lots SB2025-042



GRAPHIC SCALE 1"=100'

0 100 200 300

All measurements shown hereon are U.S. Survey Feet.

Conflicting boundary evidence is as shown.

(M)=FIELD MEASURED
(D)=DEEDED DIMENSIONS

BASIS OF BEARINGS
Bearings are assumed and based on the consideration that the North line of said Parcel bears N90°00'00"W as shown hereon between the identified monuments.

PROPERTY DESCRIPTION:

A PARCEL OF LAND IN THE W1/2 OF SECTION 7, TOWNSHIP 6 SOUTH, RANGE 65 WEST OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS: BEGINNING AT THE NORTHEAST CORNER OF THE W 1/2 OF SAID SECTION 7; THENCE N 89°19'07"W, 23.91 FEET TO A POINT ON THE NORTH LINE OF SAID W 1/2 OF SECTION 7; THENCE S 0°01'28"W, 1886.48 FEET TO THE TRUE POINT OF BEGINNING; THENCE WEST 1,289.60 FEET; THENCE S 0°00'22" W, A DISTANCE OF 1020 FEET; THENCE EAST 1,289.26 FEET; THENCE N 0°01'28" E, A DISTANCE OF 1020 FEET, TO THE TRUE POINT OF BEGINNING, CONTAINING 30 ACRES OR LESS, COUNTY OF DOUGLAS, STATE OF COLORADO.

SLOPES:

15-20% SLOPE =

20-25% SLOPE =

25% > SLOPE =

LEGENDS:

EXISTING CONTOURS (10' INTERVAL)

PLAT BOUNDARY LINES =

PROPOSED LOT LINES =

CALCULATED 100 YEAR FLOOD PLAIN =

"NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon."

REVISIONS
Flood Plain 09-24-25
Misc 09-25-25
Slopes 10-20-25
Referral Comments 01-23-26
Referral Comments 01-29-26

DAVID E. ARCHER & ASSOCIATES, INC.
LAND DEVELOPMENT CONSULTING
SURVEYING & ENGINEERING
PHONE (303) 688-4642
105 WILCOX ST. CASTLE ROCK, COLORADO 80104

SCALE
DATE
DRN. DMH CKD.
APVD.

TITLE: SUPPLEMENTAL PLAN EXHIBIT
DRISKILL SUBDIVISION
Located in the West 1/2 of Section 7 Township 6 South, Range 65 West of the 6th P.M., Douglas County, Colorado.

CLIENT: BILL DRISKILL

Sheet 1 of 1

JOB NUMBER 20-1555

Fri Jan 30 07:56:22 2026
©:Drawings\2025\20-1555\Plat\Minor Plat.pro

DRISKILL SUBDIVISION

Located in the West 1/2, of Section 7, Township 6 South, Range 65 West of the 6th P.M., County of Douglas, State of Colorado.

30.16 Acres 2 Residential Lots SB2025-042

N

VICINITY MAP

SCALE: 1"=1000'

GRAPHIC SCALE 1"=1000'

0 1000 2000 3000

LEGAL DESCRIPTION:

A PARCEL OF LAND IN THE W1/2 OF SECTION 7, TOWNSHIP 6 SOUTH, RANGE 65 WEST OF THE 6TH P.M., RECORDED JANUARY 19, 2021 AT REC NO. 2021006962 MORE PARTICULARLY DESCRIBED AS:
BEGINNING AT THE NORTHEAST CORNER OF THE W1/2 OF SAID SECTION 7; THENCE N 89°19'07"W, 23.91 FEET TO A POINT ON THE NORTH LINE OF SAID W 1/2 OF SECTION 7; THENCE S 0°01'28"W, 1886.48 FEET TO THE TRUE POINT OF BEGINNING; THENCE WEST 1,289.60 FEET; THENCE S 0°00'22" W, A DISTANCE OF 1020 FEET; THENCE EAST 1,289.26 FEET; THENCE N 0°01'28" E, A DISTANCE OF 1020 FEET, TO THE TRUE POINT OF BEGINNING, CONTAINING 30 ACRES OR LESS, COUNTY OF DOUGLAS, STATE OF COLORADO.

DEDICATION STATEMENT:

The undersigned, being all the owners, mortgagees, beneficiaries of deeds of trust and holders of other interests in the land described herein, have laid out, subdivided and platted said lands into two lots, as shown hereon under the name and subdivision of Driskill Subdivision. The utility easements shown hereon are hereby dedicated for public utilities and cable communication systems and other purposes as shown hereon. The entities responsible for providing the services for which the easements are established are hereby granted the perpetual right of ingress and egress from and to adjacent properties for installation, maintenance and replacement of utility lines and related facilities.

Owners:

_____ _____
William P Driskill Maria T. Driskill

State of Colorado }
County of Douglas } SS.

Acknowledged before me this _____ day of _____, 2025, by William P. Driskill.

My commission expires: _____

Witness my hand and seal

_____
Notary Public

State of Colorado }
County of Douglas } SS.

Acknowledged before me this _____ day of _____, 2025, by Maria T. Driskill.

My commission expires: _____

Witness my hand and seal

_____
Notary Public

BOARD OF COUNTY COMMISSIONERS:

This plat was approved for filing by the Board of County Commissioners of Douglas County, CO, on the _____day of_____ , 20____, subject to any conditions specified hereon. The dedication of the utility easement are accepted .

All expenses incurred with respect to improvements for all utility services, paving, grading, landscaping, curbs, gutters, sidewalks, road lighting, road signs, flood protection devices, drainage structures, and all other improvements that may be required shall be the responsibility of the subdivider and not Douglas County.

This acceptance does not guarantee that the soil conditions, subsurface geology, groundwater conditions or flooding conditions of any lot shown hereon are such that a building permit, well permit, or sewage disposal permit will be issued.

_____
Chair, Board of Douglas County Commissioners

APPLICANT INFORMATION:

BILL DRISKILL
9315 SAND CREEK ROAD
PARKER, CO 80138

"NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon."

TITLE VERIFICATION:

We Land Title Guarantee Company do hereby certify that we have examined the title of all land platted hereon and that title to such land is in the dedicator(s) free and clear of all liens, taxes and encumbrances:

Land Title Guarantee Company

By: _____ Date: _____

Title: _____

State of Colorado }
County of Douglas } SS.

Acknowledged before me this _____ day of _____, 2025, by _____ as _____.

My commission expires: _____

Witness my hand and seal

_____
Notary Public

NOTES:

1. BASIS OF BEARINGS
   Bearings are assumed and based on the consideration that the North line of said Parcel bears N90°00'00"W as shown hereon between the identified monuments.
   Northwest corner is #5 Rebar with a 1-1/4" diameter orange plastic cap stamped PLS 36570:
   Northeast corner is #3 Rebar.
2. The purpose of this plat is to create 2 Parcels out of an existing parcel recorded at reception 2021006962.
   One Parcel containing the existing house & structures, and a 20 acre Parcel for a separate future residence.
3. All Denver Basin Aquifer water beneath this property is dedicated through a Declaration of Restrictive Covenants recorded in the Douglas County Clerk and Recorders Office.
4. No improvements that conflict with or interfere with construction, maintenance, or access to utilities shall be placed within the utility easements.
   Prohibited improvements include, but are not limited to: permanent structures, buildings, counter-forts, decks, attached porches, attached stairs, window wells, air conditioning units, retaining walls/components, and other objects that may interfere with utility facilities or access, use, and maintenance therof.
   Prohibited improvements may be removed by the entities responsible for providing utility services.
   The utility easements as shown hereon are hereby dedicated for public utilities, cable communication systems, fiber, and other purposes as shown hereon.
   The entities responsible for providing the utility services for which the easements are established are hereby granted the perpetual right of ingress and egress from and to adjacent properties for installation, maintenance, and replacement of utility lines and related facilities.

PLANNING COMMISSION:

The minor development final plat SB2025-042 was reviewed by the Planning

Commission on _____.

_____ _____
Planning Director, on behalf of the Planning Commission Date

SURVEYOR:

I, Darrell Eugene Roberts, a duly registered Professional Land Surveyor in the State of Colorado, do hereby certify that this plat truly and correctly represents the results of a survey made on January 2, 2025, by me or under my direct supervision and that all monuments exist as shown hereon; that mathematical closure errors are less than 1:50,000 (second order); and that said plat has been prepared in full compliance with all applicable laws of the State of Colorado dealing with monuments, subdivisions or surveying of land and all applicable provisions of the Douglas County Subdivision Resolution. This certification is based on my knowledge, information, and belief and is not a guaranty or warranty, either express or implied.

I attest the above on this _____ day of _____, 2025

_____
Darrell Eugene Roberts for and on behalf of David E. Archer & Assoc. Inc.,
Colorado Registered Professional Land Surveyor # 36057

CLERK AND RECORDER:

STATE OF COLORADO
COUNTY OF DOUGLAS

I hereby certify that this plat was filed in my office on this _____ day

of _____, 2025 A.D., at _____ a.m./p.m., and was recorded at

Reception Number _____.

_____
Douglas County Clerk and Recorder

REVISIONS
Flood Plain 09-24-25
Utility Easement 01-07-25
Referral Comments 01-23-26
Referral Comments 01-24-26

DAVID E. ARCHER & ASSOCIATES, INC.
LAND DEVELOPMENT CONSULTING
SURVEYING & ENGINEERING
PHONE (303) 688-4642
105 WILCOX ST. CASTLE ROCK, COLORADO 80104

SCALE 1"=100'
DATE 09-16-25
DR'N. dmh CKD.
APP'VD.

TITLE: MINOR DEVELOPMENT PLAT
DRISKILL SUBDIVISION
Located in the West 1/2 of Section 7 Township 6 South, Range 65 West of the 6th P.M., Douglas County, Colorado.

CLIENT: BILL DRISKILL

Sheet 1 of 2

JOB NUMBER 20-1555

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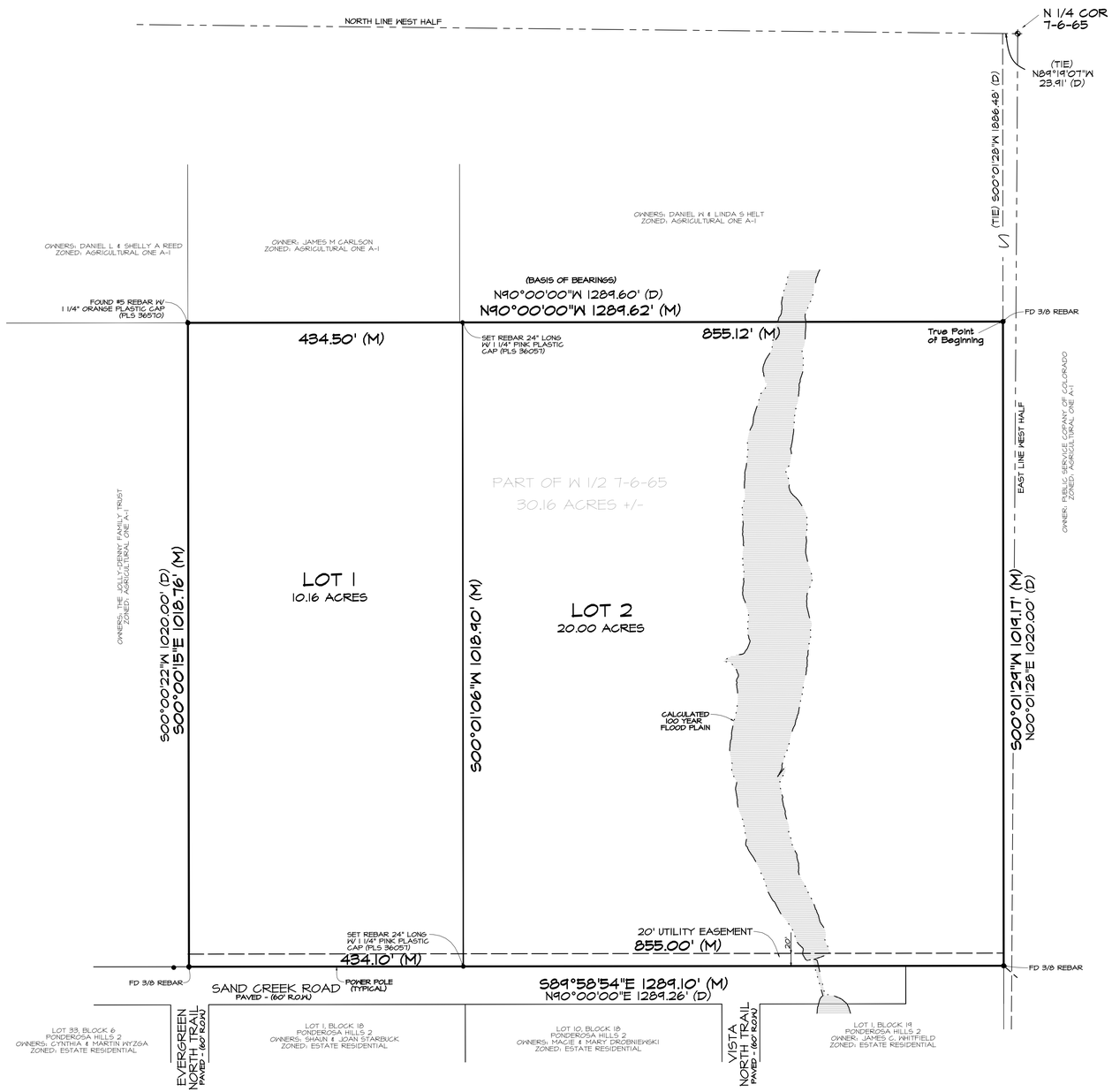
Fri Jan 30 07:53:54 2026

DRISKILL SUBDIVISION

Located in the West 1/2, of Section 7, Township 6 South, Range 65 West of the 6th P.M., County of Douglas, State of Colorado.

30.16 Acres 2 Residential Lots SB2025-042



GRAPHIC SCALE 1"=100'

0 100 200 300

(P) = PLATTED DIMENSION
(M) = FIELD MEASURED DIMENSION

LEGEND:

⊙ = SET 24" LONG #5 REBAR W/ 1 3/8" PINK PLASTIC CAP PLS 36057

"NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon."

REVISIONS
Flood Plain 09-24-25
Referral Comments 01-23-26
Referral Comments 01-29-26

DAVID E. ARCHER & ASSOCIATES, INC.
LAND DEVELOPMENT CONSULTING
SURVEYING & ENGINEERING
PHONE (303) 688-4642
105 WILCOX ST. CASTLE ROCK, COLORADO 80104

SCALE 1"=100'
DATE 09-16-25
DR'N. clmh
CK'D.
AP'VD.

TITLE MINOR DEVELOPMENT PLAT
DRISKILL SUBDIVISION
Located in the West 1/2 of Section 7 Township 6 South, Range 65 West of the 6th P.M., Douglas County, Colorado.

CLIENT BILL DRISKILL

Sheet 2 of 2

JOB NUMBER 20-1555

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Tue Feb 03 10:13:09 2026

MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Mike Pesicka, AICP, Principal Planner

DESCRIPTION: Pinery Village Filing 2 - Minor Development Final Plat - Project File: SB2021-049.

SUMMARY: The request is for approval of a minor development final plat consisting of 3 lots and 7 tracts within the Pinery Planned Development.

STAFF ASSESSMENT: Staff has evaluated the minor development final plat request in accordance with Article 6A of the Douglas County Subdivision Resolution. Should the Planning Commission find that the approval standards for the minor development final plat are met, the following proposed conditions should be considered for inclusion in the recommendation to the Board:

1. Prior to approval of the minor development final plat, the associated Subdivision Improvements Agreement for the subdivision shall be approved by the Board.
2. Prior to recordation of the final plat, the applicant shall provide a copy of an executed license agreement with Xcel Energy.
3. During construction activity within the development, the applicant, its successors and assigns shall conduct a burrowing owl study if any earth moving will take place between March 15th and October 31st.
4. During construction activity within the development, the applicant, its successors and assigns shall take all reasonable care to watch for historic resources, paleontological resources, and other cultural history resources and shall immediately notify Douglas County and complete appropriate Colorado Office of Archaeology and Historic Preservation Data management forms in the event of such discovery.
5. Prior to recordation of the final plat, technical corrections to the final plat exhibit shall be made to the satisfaction of Douglas County.

REVIEW:

Steven E Koster	Approve	2/19/2026
Samantha Hutchison - FYI	Notified - FYI	2/19/2026

ATTACHMENTS:

Cover Page
Staff Report - SB2021-049

MEETING DATE: March 2, 2026

STAFF PERSON RESPONSIBLE: Mike Pesicka, AICP, Principal Planner

DESCRIPTION: Pinery Village Filing 2 - Minor Development Final Plat - Project File: SB2021-049.

SUMMARY: The request is for approval of a minor development final plat consisting of 3 lots and 7 tracts within the Pinery Planned Development.

STAFF ASSESSMENT: Staff has evaluated the minor development final plat request in accordance with Article 6A of the Douglas County Subdivision Resolution. Should the Planning Commission find that the approval standards for the minor development final plat are met, the following proposed conditions should be considered for inclusion in the recommendation to the Board:

1. Prior to approval of the minor development final plat, the associated Subdivision Improvements Agreement for the subdivision shall be approved by the Board.
2. Prior to recordation of the final plat, the applicant shall provide a copy of an executed license agreement with Xcel Energy.
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5. Prior to recordation of the final plat, technical corrections to the final plat exhibit shall be made to the satisfaction of Douglas County.

REVIEW:

ATTACHMENTS:

Staff Report - SB2021-049

DOUGLAS COUNTY
COLORADO

Minor Development Final Plat Staff Report

Date: February 18, 2026

To: Douglas County Planning Commission

From: Mike Pesicka, Principal Planner MP
Jeanette Bare, AICP, Current Planning Manager SK for JB
Steven E. Koster, AICP, Assistant Director of Planning Services SK

Subject: **Pinery Village Filing 2, Minor Development Final Plat**

Project File: **SB2021-049**

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

I. EXECUTIVE SUMMARY

The request is for approval of Pinery Village Filing 2, a minor development final plat to create three new commercial lots for future development and seven tracts for drainage, open space, and public right-of-way on 87.85 acres. Further Replats and Site Improvement Plan applications are anticipated in the near future.

The project site is located northwest of the intersection of State Highway 83 (SH 83) and Wellspring Drive. The site is zoned Planned Development (PD) within the Pinery PD and is part of the Pinery Separated Urban Area (SUA) of the 2040 Comprehensive Master Plan. The property is served by the Pinery Water and Wastewater District with access from an extension of Pinery Center Boulevard.

The application has been in process since 2021. During this time the applicant has been addressing drainage and utility issues, and working with the Piney Water and Wastewater District to establish a location for a lift station and force mains to provide sanitary service to the northern area of the project site.

II. APPLICATION INFORMATION

A. Applicant

Pinery Owner, LLC
1919 14th St., Ste 700
Boulder, CO 80302

B. Applicant's Representative

Craig Campbell
1919 14th St., Ste 700
Boulder, CO 80302

C. Request

Approval of a minor development final plat consisting of 3 lots and 7 tracts within the Pinery PD.

D. Process

A minor development final plat application for commercial use is processed pursuant to Article 6A of the Douglas County Subdivision Resolution (DCSR). Article 6A states that the intent of the process is "To provide a streamlined review process for nonresidential and multifamily subdivisions."

Section 604A.06 of the DCSR states: "The Planning Commission shall evaluate the minor development final plat, staff report, referral agency comments, applicant responses, and public comment and testimony, and make a recommendation to the Board to approve, approve with conditions, continue, table for further study, or deny the minor development final plat. The Planning Commission's decision shall be based on the evidence presented; compliance with adopted County standards, regulations, and policies; and guidelines."

E. Location

The site is generally located northwest of the intersection of State Highway 83 (SH 83) and Wellspring Drive. A vicinity map, zoning map, and aerial map are attached to the staff report and show the general location of the project area.

F. Project Description

The applicant proposes 3 new lots and 7 tracts within the Pinery Village subdivision of the Pinery PD. The proposed lots are being platted for future commercial and light industrial development. The project includes the extension of Pinery Center Boulevard to the project's northern boundary and a possible future connection with the Town of Parker. The project area is located within Planning Areas 41, 42, 43, and H-1 of the Pinery PD.

III. CONTEXT

A. Background

The site was rezoned to Planned Development (PD) with approval of the Pinery PD by the Board of County Commissioners in 1982. The PD has since the original approval anticipated commercial, business, and light industrial uses in the area around the wastewater treatment plant. By 1987, the plan had been modified to preserve the Cherry Creek floodplain as open space (rather than a golf course as previously anticipated) but continued to depict the land on the west side of SH 83 for commercial uses.

In 2019, the 27th Amendment changed the boundaries and roadway configurations associated with PAs 38, 41, 42, and 43. PAs 41, 42, and 43 were reconfigured by

realigning the proposed configuration of "Collector Road B." PA 38 was modified to remove a previously anticipated loop road.

In 2021, the 28th Amendment approved changes to the Pinery PD map to revise the boundaries of PAs 41, 42, and 43 (Business Park), and revise associated language in the Pinery PD Development Guide to add additional uses and clean up existing text. In addition, PA 44 (Uplands Commercial) was eliminated and converted to Open Space, and the Uplands Commercial development standards text was removed from the Pinery PD Development Guide. Finally, the applicant proposed modifications to the existing access points from SH 83, and realignment of a previously approved drainageway.

In 2025, the 32nd Amendment was approved to allow mini warehouse uses in Business Park Planning Areas 38 and 41 where it was currently only allowed in Business Park Planning Areas 42 and 43.

There have been several replat applications approved for the area south of Wellspring Drive (Pinery Village Filing 1) that subdivided the area into buildable lots, one of which will be for a new King Soopers grocery store. The northern portion of Pinery Village is the subject of the current minor development plat request.

B. Adjacent Land Uses and Zoning

The project site is zoned PD within the Pinery PD with properties to the south, east, and west also within the Pinery PD. Properties to the north are zoned Agricultural One (A-1) or located within the Town of Parker.

Zoning and Land Use

	Zoning	Land Use
North	Agricultural One (A-1), Town of Parker	Open Space, agricultural uses
South	Pinery PD	Commercial
East	Pinery PD, Reata South PD	Open Space, golf course, elementary school
West	Pinery PD	Open Space, wastewater treatment facility

IV. PHYSICAL SITE CHARACTERISTICS

A. Site Characteristics and Constraints

The project site consists of rolling terrain that generally slopes down from east to west towards Cherry Creek, and includes native grasses, shrubs, and various species of trees along Cherry Creek. The site is currently undeveloped. A Pinery Water and Wastewater treatment facility is located just west of the project area. No physical characteristics of the land would preclude development of the property.

B. Access

The project site is accessible from SH 83 via Wellspring Drive (which is now constructed) and Pinery Center Boulevard which is now open from N. Pinery Parkway to Wellspring Drive. Pinery Center Boulevard will be extended north to the Town of Parker as part of this minor development application. This road will be a public road, dedicated to the County via the minor development plat. Additional right-of-way (ROW) will be dedicated to Douglas County as Tract F for future expansion of SH 83. Engineering Services has reviewed and approved the Traffic Impact Study.

C. Soils and Geology

The Colorado Geological Survey (CGS) reviewed the request and stated that there are no geologic hazards or unusual geotechnical constraints known or suspected to be present that would preclude the proposed minor development final plat from being approved. CGS stated that additional soil analysis will be needed at the time of site design and building permit when building locations and loads are known.

D. Drainage and Erosion

A Phase III Drainage Report and Grading Erosion Sediment Control Plan (GESC) have been reviewed and accepted by Engineering Services. Regional drainage is available for the entire project area.

E. Floodplain

There is mapped 100-year floodplain within the bounds of the minor development plat, but it is not proposed to be developed and lies within open space planning areas of the Pinery PD.

F. Wildlife

The 2040 CMP Wildlife Resources map identifies this site as being of low wildlife habitat value with the exception of the Cherry Creek riparian areas, which are identified as moderate habitat value. Those portions of the site are contained within Tract H, which is conveyed to the Pinery Commercial Metro Districts 1 and 2 for ownership and maintenance as an open space and drainage tract. Colorado Parks and Wildlife reviewed the referral request and stated that they have no objections to the application moving forward as proposed and they advise the applicant to refer to a previous comment letter from CPW dated February 11, 2020, for additional wildlife concerns and development recommendations for this area. The letter included a recommendation that a burrowing owl survey be performed if any earth moving activity occurs between March 15th and October 31st. This has been added as a condition of approval with this minor development application.

G. Historic Preservation

The Douglas County Curator recommended a Class II cultural resource survey for the site which was subsequently submitted by the applicant. The results of the survey noted that the site has no identified cultural resources.

V. PROVISION OF SERVICES

A. Schools

No land dedication or capital mitigation is required for this application as it does not create any new residential lots.

B. Fire Protection

South Metro Fire Rescue (SMFR) provides fire and emergency medical services to the site. SMFR had no objections to the proposed minor development final plat.

C. Sheriff Services

The Douglas County Sheriff's Office (DCSO) provides emergency services to the site. DCSO had no comments on the proposed minor development final plat. No response was received from DCSO E011 or the Office of Emergency Management.

D. Water

Water service is provided by the Pinery Water and Wastewater District (PWWD), which indicated its willingness and ability to provide water service to the project site within a letter dated January 5, 2026.

The Colorado Division of Water Resources (CDWR) provided correspondence indicating that the proposed water supply is adequate and can be provided without causing injury to decreed water rights.

E. Sanitation

Sanitation will be provided by the Pinery Water and Sanitation District (PWWD). The January 6, 2026, letter indicates the District's willingness and ability to serve the project with sanitary services. In October of 2022, the applicant received approval of a Location and Extent to construct a lift station and force mains to provide service to the north part of the project area. The lift station and force main will be owned and maintained by the Pinery Commercial Metro District No. 1 and 2. The Tri-County Health Department provided a favorable recommendation regarding the proposed method of sanitary service.

F. Utilities

Utility service providers are AT&T , CenturyLink, Comcast, CORE (electric), and Xcel (gas). AT&T indicated that there may be a conflict with existing facilities along SH 83 and requested additional information. AT&T did not respond to follow-up correspondence. CORE is requesting additional utility easements be added to the plat exhibit and they have been added by the applicant. Xcel made the applicant aware of an existing high-pressure gas line in the project area and requested that a note be added to the plat, regarding existing easements and that additional easements may need to be granted to Xcel. The applicant has added the requested note to the plat exhibit. Xcel has also requested that the applicant enter into a license agreement prior to any final approval of the plat.

G. Dedications

A sanitary sewer easement will be dedicated to the Pinery Commercial Metro District No. 2 for a sanitary force main. Drainage easements will be dedicated to the Pinery Commercial Metro District No 2 for the drainage and stormwater facilities within proposed Lots 1 and 2. A back-up easement over the subdivision is also granted to Douglas County for the purpose of accessing and maintaining these improvements.

Pinery Center Boulevard will be dedicated to Douglas County for public right-of-way and will extend to the north property line for a possible future connection into the Town of Parker. A temporary access easement will be dedicated at the north end of Pinery Center Boulevard Area until a connection to the north is established. Tract F will dedicate ROW to the County for future expansion of SH 83. Tract D will be dedicated to RTD for a future park-n-ride facility.

A number of existing easements are present throughout the site, including water, sewer, drainage and utility easements within proposed Lots 1, 2 and 3 and along Pinery Center Blvd. CDOT slope easements along Parker Road right-of-way are within proposed Tract E and Lot 3. A 50-foot-wide Xcel high pressure gas easement is present within Tracts A, D, and G, and Lots 1, 2, and 3, and the Pinery Center Boulevard right-of-way.

Public Right-of-way	Tract F will be dedicated to Douglas County as public right-of-way for SH 83. Pinery Center Blvd will be dedicated to Douglas County.
Utility Easements	Utility easements for utility purposes, including but not limited to gas, electricity, telephone, and cable communication services.
Drainage and Blanket Access Easements	To Douglas County for access to drainage facilities in the event that the system owner fails to maintain the improvements.
Tracts A, B, C, D, and E	Dedicated to the Pinery Commercial Metro District No. 2 for open space and drainage purposes.
Tract G	Dedicated to the Pinery Commercial Metro District No. 2 for a sanitary lift station, building, operation, and maintenance purposes.
Landscape Easement	20’ landscape easement along SH 83 shall be owned and maintained by the Pinery Commercial Metro District No. 1 and 2.
Tract D	Dedicated to RTD for a future park-n-ride facility.

H. Parks and Trails, and Open Space

No park dedication is necessary as this requirement has previously been met for the Pinery PD. A new trail head and tot lot were conditions of approval as part of Pinery Village Filing 1 and are currently under construction.

I. Subdivision Improvements

The intent of the County's minor development process is "to provide a streamlined review process for nonresidential and multifamily subdivision." Per the DCSR, specific engineering reports, studies, and construction plans are required to be submitted and finally accepted or approved by Public Works Engineering with a minor development application. Cost estimates for the public and private improvements are generated from the approved construction plans and incorporated into the subdivision improvements agreement-intergovernmental agreement (SIA) for the plat. Per Section 604.07, the SIA must be approved by the County prior to the Board hearing on the minor development final plat.

Required improvements for Pinery Village Filing 2 include subdivision drainage facilities and wet and dry utilities, and grading and drainage facilities for the construction of Pinery Center Boulevard. All required engineering reports, studies, and construction plans for the plat have been reviewed by Public Works Engineering with only minor technical corrections remaining. It is anticipated that the construction plans will be approved prior to the Board hearing on the final plat. The SIA is scheduled for Board consideration on the same agenda as the minor development.

VI. PUBLIC NOTICE AND INPUT

In accordance with Section 608A of the DCSR, public notice is required to be published in the Douglas County News-Press and posted on the site by the applicant. Adjacent landowners were also mailed courtesy notices at the beginning of the referral period.

All referral agency comments are outlined in the Referral Agency Response Report, as well as the Referral Response letters, attached to this staff report. Staff received no written public comments for this application. The Pinery HOA did not respond to the referral request. The applicant's response letter to referral responses is included as an attachment to this staff report.

VII. STAFF ANALYSIS

A minor development final plat may be approved upon the findings by the Board of County Commissioners that the following standards have been met:

603A.01: Conforms with the goals, objectives, and polices of the Master Plan:
Staff Comment: The property is located within the Pinery Separated Urban Area (SUA) as identified in Section 2 of the 2040 CMP. The 2040 CMP states that while approval criteria for land use applications require a finding of compliance with the 2040 CMP, "…the competing values of the Plan must be balanced through the public review process to achieve the larger vision of the community." As such, the 2040 CMP acknowledges its own competing values and that implementation can only be achieved through the balancing of community values during the review process. The proposed minor development

application is consistent, on balance, with the goals and objectives of the 2040 CMP for urban development within this part of the County.

Consistent with the objectives and policies of Urban Land Use Goal 2-1, the request proposes urban development in a designated urban area, specifically the Pinery SUA. Objective 2-15A supports the logical buildout of the SUAs. This site has been zoned for nonresidential development within the Pinery PD since 1982.

Consistent with the objectives and policies of Urban Land Use Goal 2-9, the request proposed urban development within an area that has existing and planned capacity in services and infrastructure. The site is located in and will be served by an existing water and sanitary sewer district, and nearby roads to serve the development have been constructed.

603A.02: Addresses the design elements established in Section 404 – Preliminary Plan, herein:
Staff Comment: The minor development final plat has addressed all applicable subdivision design elements as noted herein"

Per Section 404.01 – Each of the proposed lots meets the applicable requirements for minimum lot size, and setbacks.

Per Section 404.02 - Geotechnical conditions have been reviewed and determined acceptable. Floodplain areas are preserved as open space.

Per Section 404.03 – In accordance with commitments within the Pinery PD specific to this area, commercial development will be screened from SH 83 by landscaping within tracts and easements to be owned and maintained by the metropolitan district. Additional landscape buffering will be installed at the time of future replat or SIP applications.

Per Section 404.04 – Drainage and grading designs have been reviewed and accepted by Engineering Services.

Per Section 404.05 – Drainage design has been incorporated into the site's infrastructure construction plans.

Per Section 404.06 – No know archaeological or historic resources are present on site.

Per Section 404.07 – Roadway design will provide for additional vehicular and pedestrian connections through the subdivision.

Per Section 404.08 – Recommendations within the technical studies, including the geotechnical report and drainage report, will be further implemented through SIP, building permit, and construction plan processes.

603A.03: Conforms with Section 18A, Water Supply Overlay District Section of the Zoning Resolution.

1803A.01: The applicant has demonstrated that the water rights can be used for the proposed uses.
Staff Comment: PWWD has indicated that it has sufficient water rights that may be legally used to provide water service to this commercial subdivision.

The CDWR reviewed the application and indicated that the amount of water needed for the subdivision can be provided without affecting existing decreed water rights.

1804A.02: The reliability of a renewable right has been analyzed and is deemed sufficient by the County based on its priority date within the Colorado System of Water Rights Administration.
Staff Comment: All Denver Basin Groundwater beneath the property will be dedicated to PWWD. PWWD provided all required water documentation relative to its existing water portfolio and reserves the right to utilize any of its conjunctive use water supplies to serve the subdivision. This water portfolio has been fully evaluated with previous development applications served by PWWD.

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

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

603A.04: Provides for a public wastewater collection and treatment system, and, if other methods of wastewater collection and treatment are proposed, such systems shall comply with State and local laws and regulations.
Staff Comment: PWWD will provide wastewater services to the property. Tri-County Health Department provided a favorable recommendation regarding proposed sanitary service.

603A.05: Identifies all areas of the proposed subdivision, which may involve soil or topographical conditions presenting hazards or requiring special precautions have been identified by the subdivider and that the proposed uses of these areas are compatible with such conditions.
Staff Comment: Soils present on the site do not preclude development and CGS has no objections to the subdivision.

603A.06: Provides adequate drainage improvements.
Staff Comment: A Phase III Drainage Report was submitted by the applicant and accepted by Engineering Services.

603A.07: Provides adequate transportation improvements.
Staff Comment: The applicant's traffic analysis has been reviewed and by Engineering Services and found to be acceptable with the roadway improvements identified and secured in the SIA.

603A.08: Protects significant cultural, archaeological, natural, and historical resources, and unique landforms.
Staff Comment: The Douglas County Historic Preservation Board indicated that there are no known significant cultural, archaeological, natural, historical, or unique landforms on the site.

603A.09: Demonstrates the extraction of any known commercial mining deposit shall not be impeded.
Staff Comment: No known commercially viable mining deposits will be interfered with by this application.

603A.10: Has available necessary services, including fire and police protection, recreation facilities, utility service facilities, streets, and open space to serve the proposed subdivision.
Staff Comment: The proposed subdivision will be served by South Metro Fire Rescue, the DCSO, CORE electric, Comcast, CenturyLink, and Xcel. Roads are to be public and dedicated to Douglas County.

VIII. STAFF ASSESSMENT

Staff has evaluated the minor development final plat request in accordance with Article 6A of the DCSR. Should the Planning Commission find that the approval standards for the minor development final plat are met, the following proposed conditions should be considered for inclusion in the recommendation to the Board:

1. Prior to approval of the minor development final plat, the associated SIA for the subdivision shall be approved by the Board.

2. Prior to recordation of the final plat, the applicant shall provide a copy of an executed license agreement with Xcel Energy.

3. During construction activity within the development, the applicant, its successors and assigns shall conduct a burrowing owl study if any earth moving will take place between March 15th and October 31st.

4. During construction activity within the development, the applicant, its successors and assigns shall take all reasonable care to watch for historic resources, paleontological resources, and other cultural history resources and shall immediately notify Douglas County and complete appropriate Colorado

Office of Archaeology and Historic Preservation Data management forms in the event of such discovery.

5. Prior to recordation of the final plat, technical corrections to the final plat exhibit shall be made to the satisfaction of Douglas County.

ATTACHMENTS **PAGE**

Douglas County Land Use Application 12
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Zoning Map 18
Aerial Map 19
Referral Agency Response Report 20
Referral Agency Response Letters 27
Applicant Response Letter to Referral Comments 84
Pinery Water and Wastewater District Will Serve Letter 111
Traffic Report 120
Minor Development Exhibit 276

DOUGLAS COUNTY
COLORADO

Department of Community Development

www.douglas.co.us

Planning Services

LAND USE APPLICATION

Please fill in this application form completely. An incomplete application will not be processed.

Note: Neither the Planning Commission nor the Board of County Commissioners should be contacted regarding an open application.

OFFICE USE ONLY

PROJECT FILE #:

PROJECT NAME: File #SB2021-049/Name: Pinery Village Filing 2, Minor Development

PROJECT TYPE: Minor Development Plat

MARKETING NAME: Pinery Village Filing No 2

SITE ADDRESS: NWC of Wellspring Drive and Parker Road (Hwy 83)

OWNER(S):

Name(s): Pinery Owner, LLC

Address: 1919 14th Street, Suite 700, Boulder, CO 80302

Phone: 303-720-4436

Email: craig@cairnrealestateinvestments.com

AUTHORIZED REPRESENTATIVE *(requires notarized letter of authorization if other than owner)*

Name: Craig Campbell

Address: same

Phone: same

Email: same

PLANNING FEES:

ENGINEERING FEES:

TOTAL FEES:

RELATED PROJECTS:

LEGAL DESCRIPTION:

Subdivision Name: Pinery Village

Filing #: 2 Lot #: _____ Block #: _____ Section #: 3 & 10 Township: 7 South Range: 66 West

STATE PARCEL NUMBER(S): _____

ZONING:

Present Zoning: Commercial Proposed Zoning: _____ Gross Acreage: 87.848

Gross Site Density (DU per AC): _____ # of Lots or Units Proposed: _____

SERVICE PROVIDERS:

Fire District: South Metro Metro District: Pinery Commercial MD Gas: Xcel

Water: PWWD Sewer: PWWWD Electric: CORE

Roads: ☐ Public ☐ Private (please explain): _____

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

Applicant Signature

2/2/2026
Date

Pinery Village Filing No. 2 Minor Development

PROJECT NARRATIVE

General Project Concept

TF Pinery West, LP is planning and engineering the northern 77 acres of Pinery Village in the Pinery West PD. The property is currently zoned Planned Development (PD) and is part of The Pinery 28th Amendment. The Minor Development includes the extension of Pinery Center Boulevard to the north property line, channelizing North Pinery Creek which bisects the property, and creates three (3) commercial/industrial lots for future development, and a lot for a planned RTD Park-N-Ride facility. Six (6) new tracts have also been created through this Minor Development. Tracts A, B, and E are owned and maintained by the Pinery Commercial Metro District and are for the purposes of drainage and open space. Tracts C, D, and F will be dedicated to Douglas County as right of way. It is anticipated that the building square footage for these new lots will range from 360,000-480,000 square feet. This is based on the calculation of 55 Acres of developable land at a 1.5 to 2.0 F.A.R.

Proposed Development Timeframe

Development is anticipated to begin in 2022 and will proceed over the course of the next 10 years.

ARTICLE 6A MINOR DEVELOPMENT NONRESIDENTIAL AND MULTI-FAMILY | 603A APPROVAL STANDARDS

A minor development final plat may be approved upon the finding by the Board that the minor development final plat:

603A.01 *Conforms with the goals, objectives, and policies of the Master Plan.*

This Minor Development Application does not propose anything that conflicts with the overall vision of the approved Master Plan. Lots and major infrastructure are laid out according to the planning areas and uses outlined by the plan and allow for flexibility of future planned development.

603A.02 *Addresses the design elements established in Section 404 - Preliminary Plan, herein.*

This Minor Development Application addresses the design elements established in Section 404 – Preliminary Plan, as further expanded upon below.

603A.03 *Conforms with Section 18A, Water Supply - Overlay District section of the Zoning Resolution.*

This Minor Development Application conforms with Section 18A, Water Supply-Overlay District section of the Zoning Resolution. The property is within the Pinery Water and Wastewater District and an updated will-serve letter is being provided by the District.

603A.04 *Provides for a public wastewater collection and treatment system, and, if other methods of wastewater collection and treatment are proposed, such systems shall comply with State and local laws and regulations.*

This Minor Development Application provides for a public wastewater collection and treatment system that complies with State, and local laws and regulations. The property is within the Pinery Water and Wastewater District and a will-serve letter is being provided by the District.

603A.05 *Identifies all areas of the proposed subdivision which may involve soil or topographical conditions presenting hazards or requiring special precautions have been identified by the subdivider and that the proposed uses of these areas are compatible with such conditions.*

This Minor Development Application identifies all areas of the proposed subdivision which may involve soil or topographical conditions presenting hazards or requiring special precautions. All proposed uses are compatible with such conditions. An integral part of this design is the management of the existing drainage channel to Cherry Creek, which is now being consolidated to one discharge point from two.

603A.06 *Provides adequate drainage improvements.*

This Minor Development Application provides adequate drainage improvements. Stormwater management improvements are being proposed in accordance with the County's Storm Drainage Design and Technical Criteria Manual as documented in the *Final Drainage Report for Pinery Village Filing No. 2* prepared by Redland and submitted with this application.

603A.07 *Provides adequate transportation improvements.*

This Minor Development Application provides adequate transportation improvements according to those envisioned in the Master Plan, including a planned RTD Park-N-Ride center.

603A.08 *Protects significant cultural, archaeological, natural, and historical resources, and unique landforms.*

This Minor Development Application for Filing 02 does not include any significant natural and unique landforms. There are no known significant cultural, archaeological or historical resources on this property. An integral part of this design is the management of the existing drainage channel to Cherry Creek, which is now being consolidated to one discharge point from two. All proposed uses are compatible with the existing conditions of the site.

603A.09 *Demonstrates the extraction of any known commercial mining deposit shall not be impeded.*

This Minor Development Application demonstrates the extraction of any known commercial mining deposit shall not be impeded. There are no known mining deposits located on site.

603A.10 *Has available necessary services, including fire and police protection, recreation facilities, utility service facilities, streets, and open space to serve the proposed subdivision.*

This Minor Development Application has available necessary services, including fire and police protection, recreation facilities, utility service facilities, streets, and open space to serve the proposed subdivision. This is clearly defined and evidenced by the information in this Minor Development application and the 28th amendment to the Pinery Planned Development.

ARTICLE 4 PRELIMINARY PLAN, SECTION 404 DESIGN ELEMENTS

The following shall be considered in reviewing the subdivision design, as appropriate to the urban, nonurban, or other community context:

404.01 Lots are of an appropriate size and configuration for the site's characteristics and intended uses, and otherwise capable of meeting minimum zone district standards such as lot size, setbacks, and off-street parking.

Lots have been laid out and sized with reference to the approved Master Plan and allow for flexibility with future development of site.

404.02 Geologic hazards, floodplains, wildfire, or other hazardous conditions are mitigated or avoided.

Any known potential hazardous conditions have been taken into account in the designing of this Minor Development. Existing slopes have been flattened along SH 83, North Pinery Creek has been channelize to eliminate the shallow flooding across the property, a roadway is being provided interior to the property to provide fire protection access, and the developable areas are located outside of the floodplain.

404.03 Conflicts between proposed and surrounding land uses are minimized through lot and tract orientation, setbacks, landscaping, or other buffering techniques.

Filing 02 Plat is consistent with the requirements of the Pinery Planned Development and allowed uses. Platted ROW included in this filing provides vehicular connectivity with planned and future land uses to the north.

Highway 83 (Parker Rd) is located along the eastern edge of the property, which has been appropriately buffered through existing (and expanded) Open Space H-1 and added landscape improvements.

This filing is also fronted by Wellspring Drive to the south, within Filing 01 of the Pinery Planned Development, and will provide vehicular and pedestrian access into and through future lots in Filing 02.

Pinery Center Blvd is continued from Filing 01 into Filing 02 and provides buffering from the Pinery Water and Sanitation property (similar to Filing 01), and pedestrian trail connectivity to the Cherry Creek Trail network further to the west.

Filing 02 is a continuation of the direction established with the Filing 01 Minor Development Plat.

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

Streets and stormwater facilities have been laid out in accordance with these resources and meet all County requirements.

404.05 Elements of the site's natural terrain, drainageways, riparian areas, and vegetation are preserved or integrated into the subdivision layout.

Site's natural drainage has been integrated into the subdivision layout and managed through major infrastructure. Minor Development follows natural topography and features of the site and drainage follows the existing flow across the site.

404.06 Archeological and historical resources of special significance are protected.

No known archeological or historical resources are located within the proposed Minor Development area.

404.07 Opportunities for safe and convenient vehicular, pedestrian, and other connections within the subdivision and adjacent neighborhoods, shopping, employment, and recreational areas are provided.

Vehicular, pedestrian, and other connections throughout the subdivision are laid out according to the approved Master Plan and provide safe and convenient access to the site's offerings.

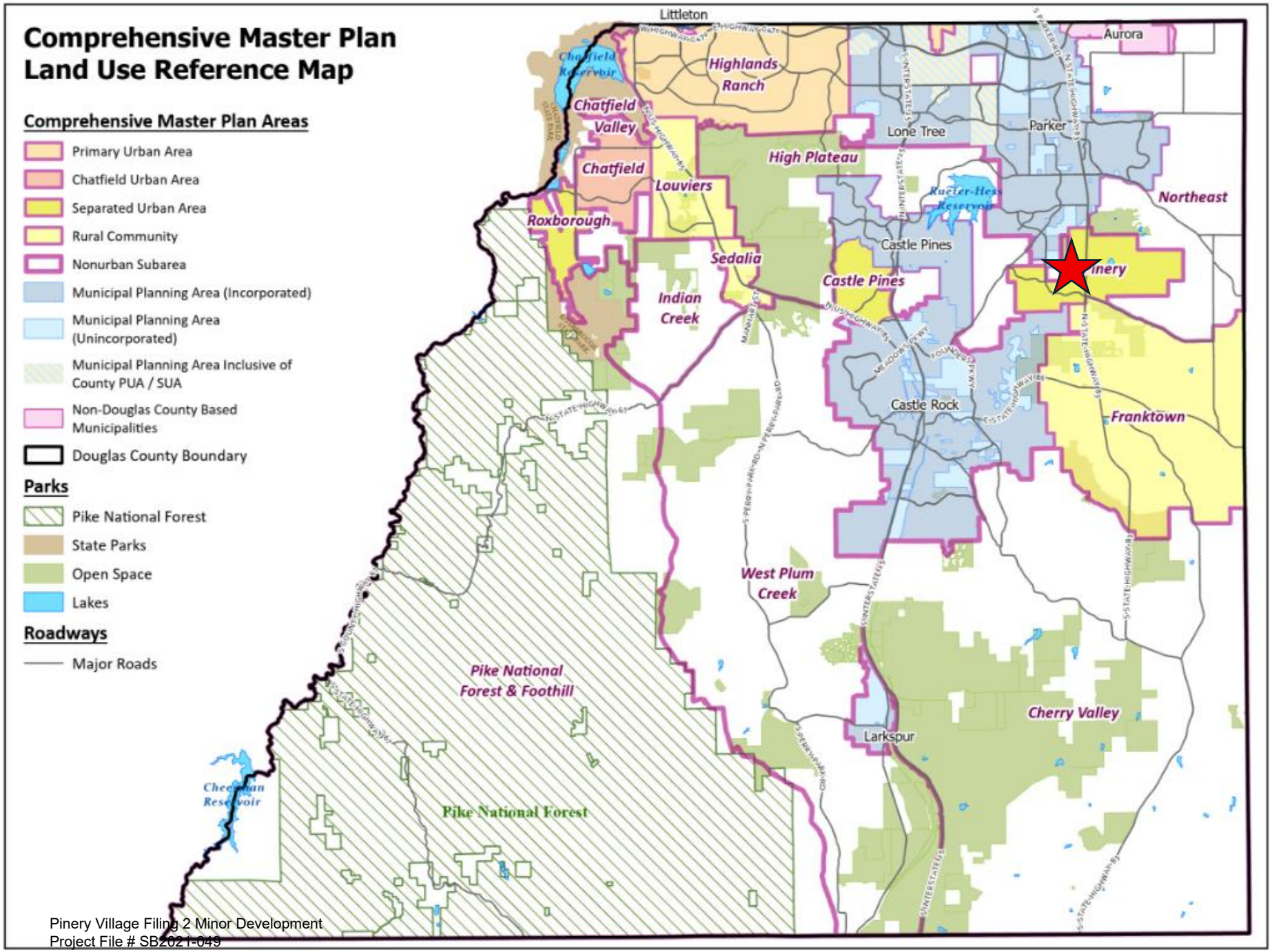
404.08 Specific recommendations of other required development reports or technical studies are implemented.

Any pertinent development or technical studies, such as the Drainage and Traffic studies, were referenced when laying out this Minor Development and utilized as appropriate and necessary.

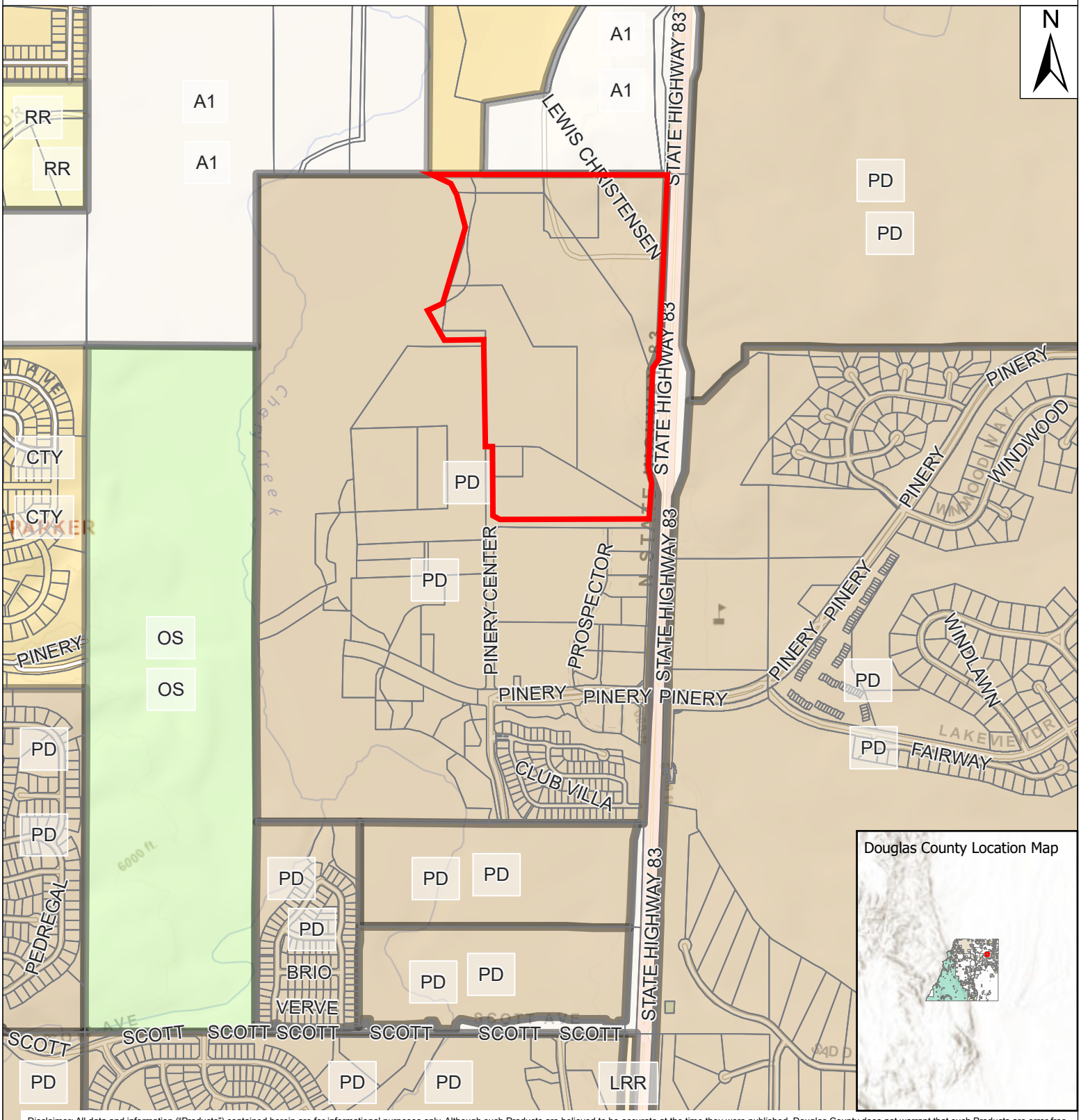
Additional Items to Note:

There were three approved CDOT access points that have been approved for the project along Highway 83. The first being North Pinery Parkway, which exists today and the future access of Wellspring Drive, which was platted with Filing 1. The third access point was eliminated (Road C), which was eliminated due to topography constraints of this access. There is no approved CDOT access for Lewis Christianson on the north side of the project and this access was never a part of any approved PD. Access will continue north from Pinery Center Blvd when the adjacent property owner develops. Other means of access and circulation for lots 2 and 4 will be a part of future Site Plans

Any park-related land requirements associated with Pinery Planned Development have been fulfilled through previous land use approvals, including the 2-acre dog park, the .21 acre tot-lot, and other Cherry Creek land use requirements.


Comprehensive Master Plan
Land Use Reference Map
Comprehensive Master Plan Areas
Primary Urban Area
Chatfield Urban Area
Separated Urban Area
Rural Community
Nonurban Subarea
Municipal Planning Area (Incorporated)
Municipal Planning Area (Unincorporated)
Municipal Planning Area Inclusive of County PUA / SUA
Non-Douglas County Based Municipalities
Douglas County Boundary
Parks
Pike National Forest
State Parks
Open Space
Lakes
Roadways
Major Roads
Littleton
Aurora
Highlands Ranch
Chatfield Reservoir
Chatfield Valley
Chatfield
Louviers
Roxborough
Lone Tree
Parker
High Plateau
Ruetter-Hess Reservoir
Northeast
Castle Pines
Sedalia
Indian Creek
Castle Pines
Castle Rock
Franktown
West Plum Creek
Pike National Forest & Foothill
Cherry Valley
Larkspur
Cheesman Reservoir
Pike National Forest

Pinery Village Filing 2, SB2021-049



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Date Saved: 2/17/2026 9:02 AM

- A1 - AGRICULTURAL ONE
- LRR - LARGE RURAL RESIDENTIAL
- RR - RURAL RESIDENTIAL
- PD - PLANNED DEVELOPMENT
- OS - OPEN SPACE CONSERVATION
- PARCELS

Piney Village Filing 2, SB2021-049

DOUGLAS COUNTY COLORADO

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Date Saved: 2/17/2026 8:37 AM

A1 - AGRICULTURAL ONE

PD - PLANNED DEVELOPMENT

OS - OPEN SPACE CONSERVATION

Project Name: Pinery Village Filing 2
Project File #: SB2021-049
Date Sent: 11/04/2021 **Date Due:** 12/02/2021

Agency	Date Received	Agency Response	Response Resolution
Addressing Analyst	11/04/2021	No Comment:	No Response Required.
Assessor		Received: Please be aware of the following comments and concerns: 1. Lot 2 & Tract E Pinery Village Filing 1 are being replatted by this subdivision. They should be listed in the legal description and plat sub-title. 2. Pinery Commercial Metro District 1 & 2 are the current owners of existing Tract E Pinery Village Filing 1 per plat dedication. They need to sign the plat as an owner. 2a. As platted, Lot 4 will be setup with mixed ownership and taxable status, which is very difficult for our office to track. Please clear title on Lot 4 via deed to eliminate the mixed ownership and taxable status. 3. There is a discrepancy regarding Tract C. The acceptance certificate, Land Use Table and Plat note 8 say dedication to the Pinery Commercial Metro 2, whereas Additional Tract Note 3 says dedication to Douglas County. 4. The vicinity map does not match the area being platted. 5. There is a missing dimension on the subdivision boundary on Sheet 2, the southeastern-most call 316.60 ft call is not dimensioned. -Per an email from the Assessor dated July 8, 2023, their comments have been addressed.	The applicant has provided updated documents to the Assessor, and their comments have been addressed.
AT&T Long Distance - ROW	11/04/2021	Received: I have attached an Earth map showing the project area in read and the buried AT&T Long Line Fiber Optics in yellow. As shown, there is a possibility of conflict along State HWY 83. Any other information you could provide about the projects would be appreciated in determining if a conflict will exist. On February 12, 2026, AT&T provided an updated response indicating that their facilities are location on the east side of SH 83 and there should be no conflict. Per an email from AT&T dated February 12, 2026, the long lines are located on the east side of SH 83 so there will be no conflicts.	No Response Required.
Black Hills Energy	11/04/2021	No Comment.	No Response Required.
Building Services	11/05/2021	No Comment.	No Response Required.
CenturyLink	11/15/2021	Received: Our engineer has reviewed this plat and their comments are: "I have no objections to this plat".	No Response Required.

Project Name: Pinery Village Filing 2
Project File #: SB2021-049
Date Sent: 11/04/2021 **Date Due:** 12/02/2021

Agency	Date Received	Agency Response	Response Resolution
Cherry Creek Basin Water Quality Authority	12/02/2021	Received: 1.The Authority's Control Regulation 72 requires construction and post-construction Best Management Practices (BMPs). 2. No exceptions taken with the proposed post construction BMPs using full spectrum detention. However please note this development appears to also be within the stream preservation area. Development in the stream preservation area requires additional post construction BMPs. Please see the control regulation document Chapter VI for additional guidance. Please provide additional information or justification in future submittals on how this is being met. 3. Provide construction BMP plan when available for our review and comment. 4. The Authority reserves the right to review and comment on future referrals for this project.	The applicant has acknowledged the comments. Any future referrals will be provided to the Authority.
Colorado Department of Transportation CDOT-Region 1	12/02/2021	Received: Following is a summary of comments received from CDOT. For details, please reference the letter dated December 2, 2021. -CDOT had comments related to the offsite flows and storm sewer design in the drainage report, traffic comments related to proposed traffic mitigation on Parker Road, proposed points of access on Parker Road, and accel and decel lanes at Wellspring Drive. -The applicant will need to adhere to the Access Control Plan for State Highway 83. CDOT does not object to removal of what was Collector Road "C". Extending the North-South collector to Stroh Rd is acceptable, but opportunity is lost in not providing a connection to Lewis Christensen Rd. -Applicant needs to review Figures 10 and 11 in the traffic study that project less traffic will occur on the SB to EB left turn movement between 2030-40. -Douglas County needs to ensure sufficient ROW is dedicated along State Highway 83 per the Corridor Optimization Plan to ensure auxiliary lanes, and room for multi-use pathways and utilities can occupy the ROW.	Revised documents were provided to CDOT for review. A response has not been received. -The applicant is dedicating Tract F to Douglas County for future ROW along SH 83.

Project Name: Pinery Village Filing 2
Project File #: SB2021-049
Date Sent: 11/04/2021 **Date Due:** 12/02/2021

Agency	Date Received	Agency Response	Response Resolution
Colorado Division of Water Resources	11/04/2021	Received: Following is a summary of comments received from the Division of Water Resources (DWR). For details, please reference their review letters dated July 29, 2022. -DWR provided a summary of the existing water portfolio from the Piney Water and Wastewater District (PWWD). -DWR also stated that is their opinion that the water supply for the development can be provided without causing injury to decreed water rights.	No Response Required.
Colorado Geological Survey	12/01/2021	Received: Following is a summary of comments received from the Colorado Geological Survey (CGS). For details please reference their review letter dated December 1, 2021. -CGS stated that no geologic hazards or unusual geotechnical constraints are known or suspected to be present that would preclude the proposed non-residential use and density. -Provided the recommendations in the study conducted by CTL are adhered to, and additional investigation and analysis are conducted once building locations and loads are known, CGS has no objection to approval of SB2021-049.	The applicant has acknowledged comments from CGS and will provide further analysis as the site develops.
Colorado Parks and Wildlife (Northeast DC)	11/30/2021	Received: Following is a summary of comments received from Colorado Parks and Wildlife. For details please reference their review letter dated November 30, 2021 Upon review of the proposed referral request, Colorado Parks and Wildlife (CPW) has no objections to the application moving forward as planned for approval. Please refer to the previous comment letter from CPW dated February 11, 2020 to Mr. Dan Avery for additional wildlife concerns and development recommendations.	The applicant has acknowledged comments from CPW and will coordinate with them on future earth moving activities to limit disturbance of burrowing owls
Comcast		No Response Received	No Response Required.
CORE Electric	12/01/2021	Received: CORE will require additional utility easements as shown on the attached markup.	The applicant has worked with CORE to add easements and CORE has acknowledged that dedication of additional easements will come with future replat and site plan applications.

Project Name: Pinery Village Filing 2
Project File #: SB2021-049
Date Sent: 11/04/2021 **Date Due:** 12/02/2021

Agency	Date Received	Agency Response	Response Resolution
Douglas County Historic Preservation	12/02/2021	Received: Upon researching the cultural resources on the property and the surrounding area, the Douglas County Curator recommends a Class II cultural resource survey of the project area. - In an email dated March 29, 2022, Douglas County Historic Preservation stated they had no comments on the Class II Cultural Resource Survey and there is nothing eligible to be listed on the National Register.	As requested by the Douglas County Curator, the applicant provided a Class II Cultural Resource Survey.
Douglas County Parks and Trails		No Response Received	No Response Required.
Douglas County School District		No Response Received	No Response Required.
Engineering Services	12/02/2021	Received: Following is a summary of comments from Engineering Services, for full details please reference the letter dated December 2, 2021. Engineering Services had comments related to plat notes, certificates, drainage easements, tracts for ROW, a requirement for a Subdivision Improvement Agreement, GESC comments, Construction Plan comments and Landscaping comments.	The applicant has provided revised plans and reports to address comments from Engineering Services. An SIA has also been provided for review and approval. The SIA needs to be approved by the BCC with the minor development final plat.
High Prairie Farms HOA		No Response Received	No Response Required.
Mile High Flood District		No Response Received	No Response Required.
Office of Emergency Management		No Response Received	No Response Required.
Open Space and Natural Resources		No Response Received	No Response Required.
Pinery Commercial Metro District		No Response Received	No Response Required.

Project Name: Pinery Village Filing 2
Project File #: SB2021-049
Date Sent: 11/04/2021 **Date Due:** 12/02/2021

Agency	Date Received	Agency Response	Response Resolution
Pinery Water and Wastewater District	11/18/2021	Received: Pinery Water and Wastewater District (PWWD) takes no exception to establish 4 commercial lots. The District is working with the developer to identify solutions for possible wastewater treatment and the associated collection system as gravity flow for the entirety of the project is not possible.	-In October 2022, the applicant received approval of a Location and Extent for a future lift station and force mains to address the comment from PWWD regarding gravity flow not being available for the entire site. The lift station and force mains will be owned and maintained by the Pinery Commercial Metro District No. 1 and 2.
RTD		No Response Received	No Response Required.
Sheriff's Office	11/22/2021	No Comment.	No Response Required.
Sheriff's Office E911		No Response Received	No Response Required.
South Metro Fire Rescue	11/22/2021	Received: South Metro Fire Rescue (SMFR) has reviewed the provided documents and has no objections to the proposed minor development. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project.	No Response Required.
The Pinery HOA		No Response Received	No Response Required.
Town of Castle Rock	11/12/2021	Received: No concerns from the Town reviewers.	No Response Required.

Project Name: Pinery Village Filing 2
Project File #: SB2021-049
Date Sent: 11/04/2021 **Date Due:** 12/02/2021

Agency	Date Received	Agency Response	Response Resolution
Town of Parker Development Review	12/06/2021	Received: Following is a summary of comments received from the Town of Parker Development Review. For details please reference their letter dated December 6, 2021. The Town had comments related to future uses on the site, landscape buffering and design standards for future development, and incorporating pedestrian friendly infrastructure along Pinery Center Blvd. The Town would like to discuss possible annexation with the applicant.	-Development on future lots will address landscaping and buffering design standards. -Pinery Center Blvd will contain detached sidewalks to provide pedestrian friendly infrastructure. -The applicant has decided to not pursue annexation into the Town. -The Pinery PD and Douglas County Zoning Resolution contain development standards to address site and building design, as well as pedestrian connectivity.
Town of Parker Public Works		No Response Received	No Response Required.
Tri-County Health Department	11/29/2021	Received: Following is a summary of comments from the Tri-County Health Department (TCHD). For full details please reference the letter dated November 29, 2021. -A will-serve letter has been provided by Pinery Water and Wastewater District. Based on this letter, THCD is providing a favorable recommendation regarding the proposed method of sewage disposal.	No Response Required.
Wildfire Mitigation	11/08/2021	No Comment.	No Response Required.

Project Name: Pinery Village Filing 2
Project File #: SB2021-049
Date Sent: 11/04/2021 **Date Due:** 12/02/2021

Agency	Date Received	Agency Response	Response Resolution
Xcel Energy-Right of Way & Permits	12/09/2021	Received: Following is a summary of comments received from Xcel Energy. For details please reference their review letter dated December 9, 2021. -Xcel/PSCo requests that 10-foot wide dry utility easements are dedicated around the perimeter of each lot, and 15-feet abutting all major rights-of-way. PSCo also requested a specific note be added to the plat exhibit. -PSCo has an existing high-pressure natural gas transmission pipeline including a regulator station and associated land rights as shown within this property and it has been determined that an engineering review is necessary. -PSCo is requesting that the applicant enter into a license agreement prior to final approval of the final plat.	The applicant acknowledges Xcel's comments. -The requested note and easements have been added to the plat exhibit. -The applicant is required to provide staff with an executed license agreement with Xcel prior to recordation of the final plat.

From: Jeremy Hirsch
To: Michael Pesicka
Subject: RE: Pinery Village Filing 2 Minor Development-SB2021-049
Date: Friday, July 8, 2022 3:03:13 PM

Hello Mike,

I believe this resolves our previous comments.

Thanks,
Jeremy

Jeremy Hirsch
GIS Specialist II | Douglas County Assessor
301 Wilcox Street | Castle Rock, CO 80104
303-660-7450 ext. 4228 | 303-479-9751 Fax

From: Michael Pesicka <mpesicka@douglas.co.us>
Sent: Thursday, July 7, 2022 4:18 PM
To: Jeremy Hirsch <JHirsch@douglas.co.us>
Subject: RE: Pinery Village Filing 2 Minor Development-SB2021-049

Jeremy,

Attached for your review are the revised documents for Pinery Village Filing 2 Minor Development, Project No. SB2021-049. The response to your comments is on page 6 of the attached Comment Response Letter.

Thanks,

Mike Pesicka | Principal Planner
Douglas County Department of Community Development
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303-814-4367 **Main** | 303-660-7460
Email | mpesicka@douglas.co.us

From: Jeremy Hirsch <JHirsch@douglas.co.us>
Sent: Thursday, May 12, 2022 11:14 AM
To: Michael Pesicka <mpesicka@douglas.co.us>
Subject: RE: Pinery Village Filing 2 Minor Development-SB2021-049

Hello Mike,

Please be aware of the following comments and concerns:

1. As noted on previous reviews, Pinery Commercial Metro District 1 & 2 are the current owners

of existing Tract E Pinery Village Filing 1 per plat dedication. Only Pinery Commercial Metro District No. 2 is singing on the plat as an owner, Pinery Commercial Metro District No. 1 needs to listed as well.

2. Also as noted in a previous review, as platted, Lot 3 will be setup with mixed ownership and taxable status (per the ownership of existing Tract E), which is very difficult for our office to track. Please clear title on Lot 3 via deed to eliminate the mixed ownership and taxable status.
3. There is an acreage discrepancy. The subtitle lists 87.85 acres, however the legal and land use summary both indicate 87.484 acres.

Regards,
Jeremy

Jeremy Hirsch
GIS Specialist II | Douglas County Assessor
301 Wilcox Street | Castle Rock, CO 80104
303-660-7450 ext. 4228 | 303-479-9751 Fax

From: Michael Pesicka <mpesicka@douglas.co.us>
Sent: Monday, May 9, 2022 10:04 AM
To: Jeremy Hirsch <JHirsch@douglas.co.us>
Subject: Pinery Village Filing 2 Minor Development-SB2021-049

Jeremy,

Attached is the revised Pinery Village Filing 2 Minor Development plat for your review. Project No. is SB2021-049.

Thank you,

Mike Pesicka | Principal Planner
Douglas County Department of Community Development
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303-814-4367 **Main** | 303-660-7460
Email | mpesicka@douglas.co.us

From: annb cwc64.com
To: Michael Pesicka
Cc: Rob Williamson (rw7517@att.com); duanew cwc64.com; jt cwc64.com; danab cwc64.com
Subject: Pinery Center Blvd Parker, Colorado Douglas County eReferral #SB2021-049
Date: Thursday, November 4, 2021 4:24:12 PM

Hi Mike,

RE: Project No SB2021-049

This is in response to your eReferral for a utility map showing the buried AT&T Long Line Fiber Optics near Pinery Center Blvd Parker, Colorado. I attached an Earth map showing the project area in red and the buried AT&T Long Line Fiber Optics in yellow. As shown, there is a possibility of conflict along State HWY 83. Any other information you could provide about the projects would be appreciated in determining if a conflict will exist. Please pass on our contact information as well.

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

Ann Barnowski
Clearwater Consulting Group Inc
120 9th Avenue South
Suite 140
Nampa, ID 83651
Annb@cwc64.com

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

-----Original Message-----
From: mpesicka@douglas.co.us <mpesicka@douglas.co.us>
Sent: Thursday, November 4, 2021 8:52 AM
To: annb cwc64.com <annb@cwc64.com>
Subject: Douglas County eReferral (Project Number SB2021-049) Is Ready For Review

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

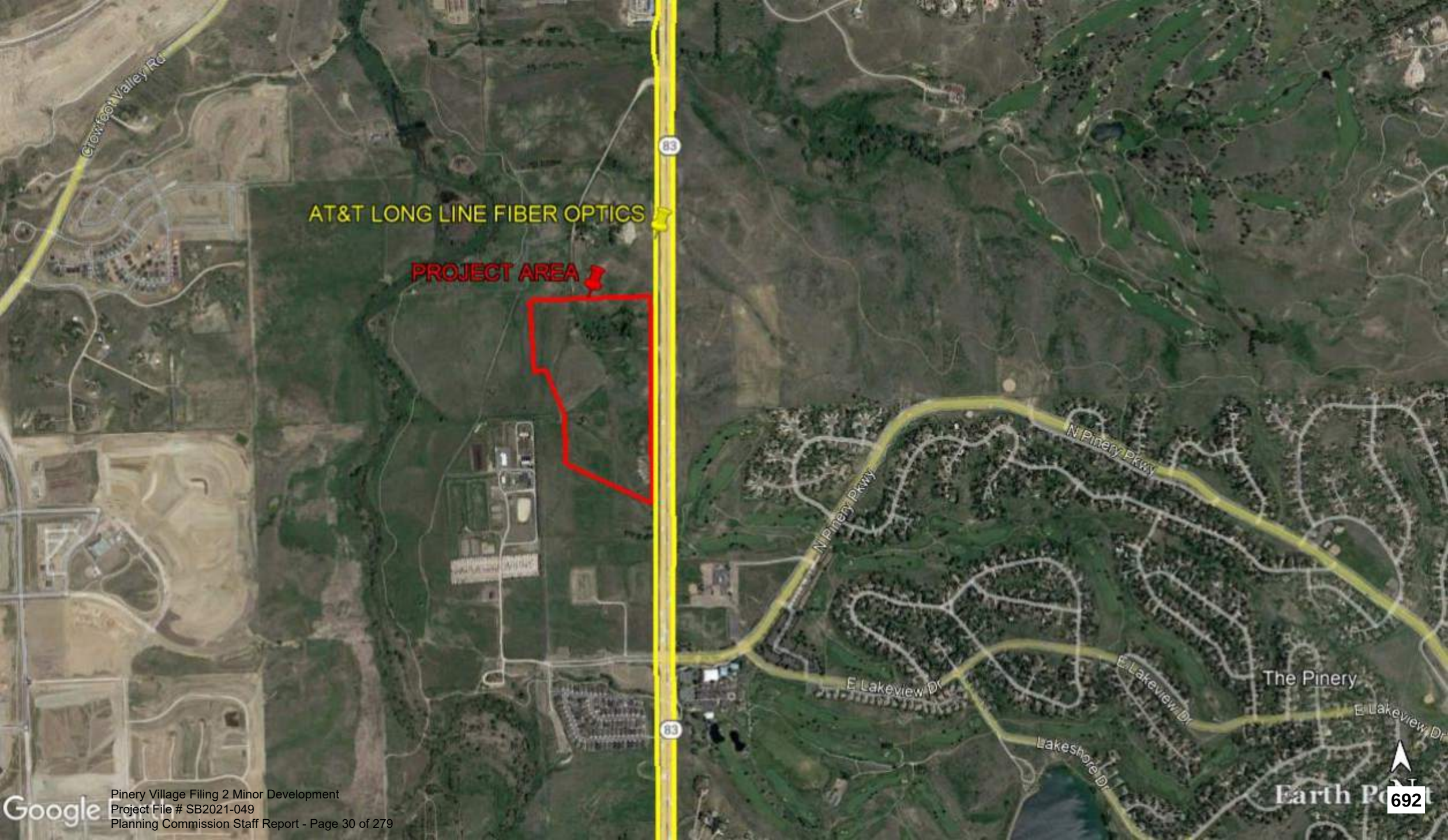
Project Number SB2021-049, Pinery Village Filing 2 Minor Development. The applicant proposes a Minor Development to subdivide 77.32 acres into 4 non-residential lots and 6 tracts and the extension of Pinery Center Blvd to the north property line. The property is zoned Planned Development and is located in the northeast portion of the County, approximately one-quarter mile north of North Pinery Parkway and west of State Highway 83 and partially bordered on the north by the Town of Parker.

This referral will close on Thursday, December 2, 2021.

If you have any questions, please contact me.

Sincerely,

Mike Pesicka, Principal Planner
Planning Services
100 Third Street


AT&T LONG LINE FIBER OPTICS
PROJECT AREA
Crowfoot Valley Rd
83
N Pinery Pkwy
E Lakeview Dr
Lakeshore Dr
The Pinery
Google

From: Michael Pesicka
To: Michael Pesicka
Subject: FW: Piney Center Blvd Parker, Colorado Douglas County eReferral #SB2021-049
Date: Thursday, February 12, 2026 12:59:30 PM

-----Original Message-----
From: annb cwc64.com <annb@cwc64.com>
Sent: Thursday, February 12, 2026 12:54 PM
To: Michael Pesicka <mpesicka@douglas.co.us>
Subject: Piney Center Blvd Parker, Colorado Douglas County eReferral #SB2021-049

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

Hi Mike,

I am attaching an updated map, our lines moved to the east of HWY 83. Thank you for reaching out! It does not look like there will be a conflict.

Ann Barnowski
Clearwater Consulting Group Inc
120 9th Avenue South
Suite 140
Nampa, ID 83651
Annb@cwc64.com

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

Cherry Creek
Kinney Creek
PROJECT AREA
AT&T LONG LINE FIBER OPTICS
Rebel Cookie Dough and Confections
Cherry Creek
Cherry Creek
Cherry Creek Trail Pinery Trailhead
Cherry Creek
Northeast Elementary
N Pinery Pkwy
Windrood Way
Windrood West
N Pinery Pkwy
Aurora Residential Al
Windrora
E Windrow Dr
E Windrow Dr
The Pinery Country Club
E Lakeview Dr
Lakecliff Way
Google Earth
Image Landsat / Copernicus

STATE OF COLORADO

Traffic & Safety
Region 1
2829 W. Howard Place
Denver, Colorado 80204

COLORADO
Department of Transportation

Project Name: **Pinery Village in Pinery West**

		Highway:	Mile Marker:
Print Date:	12/2/2021	083	55.355

Drainage Comments:

11-15-21 - Tanner

After reviewing the drainage report, I have the following comment:

The site primarily drains away from CDOT ROW and flows are conveyed, ultimately, to Cherry Creek via the proposed realigned North Pinery Creek. My primary concern is in regards to the calculations and documentation included in Appendix 7 which provides information on the offsite flows that impact the site from the East side of Parker Road. The proposed design shows a storm sewer that will intersect the three existing culverts that convey flows under Parker Road, the system is shown on Profiles STORM-8 and STORM-9 on page C6.7. There is documentation inlcuded in the Appendix that shows capacity calculations of the pipes in the system, however, as this system will have immediate impacts to the infrastructure within Parker Road I would like to see the HGL's for the Minor and Major storms included on these profiles to verify that there is no surcharging within CDOT ROW.

Traffic Comments:

Scherner 3-22-21

After review of the TIS, the proposed mitigation at the intersections on Parker Rd at Stroh Rd and Pinery West is maximiized to the most reasonable extent possible and therefore is an acceptable strategy.

The distance between Parker Rd and Access "C" needs to be, at a minimum, 550 ft from PC (Parker Rd) to PC (Access "C") Thi

s is not stated in the TIS. If this distance is not met, then the signal cannot be installed and full movement designation will likely require re-designation to a more restricted condition. It is also unclear why Access "C" is signalized when the primary access appears to be Pinery Center Blvd.

The Wellspring Dr RIRO will require both accel and decel auxiliary lanes meeting the requirements stated in the Access Code

Scherner 11-29-21

Previous comments still apply, Access C shall not be signalized if the 550 ft separation from Parker Rd is not met.

There are no plans showing the necessary modifications of Stroh Rd and Parker Rd to review. It is also unclear how the Access C intersection geometric design influences the Parker Rd/Stroh Rd intersection design.

The required addition of a NB left lane on Parker Rd at Stroh Rd needs to occur and be included in the roadway plans required for permit approval. Traffic signal modification may also be necessary

Right of Way Comments:

11/10/21 - SDH - No ROW comments except to reiterate the need for sufficient ROW to be dedicated to the County

along SH-83 as related to the Corridor Optimization Plan.

Resident Engineer Comments:

11/17/2021 MAK

If an intersection or sidewalks will be modified/constructed on Parker Rd Roadway plans will need to be submitted for review.

4/2/21 MAK

No Comments at this time.

Permits Comments:

There was no referral responses to CDOT previous remarks. We had mentioned in an earlier meeting the need to adhere to the Access Control Plan (ACP) for SH 83. We *assume* that the Town of Parker has reviewed this proposed development plan and has made comments in regards to the ACP and local plans as there are off-site connections to be made to the north. If there are any deviations or changes to the ACP, the Town of Parker must approve of those revisions as outlined in the IGA.

It will be important for the alternative N-S roadways, their functional design/cross sections, and timing to be in alignment with those planned by the Town of Parker. These provide essential access connections without the need to use the highway for short trips. Town of Parker has recently updated their Transportation vision/plan for SH 83.

Intersection improvements (including new auxiliary lanes) and those with > 20% traffic will require new Access permits. Any work in CDOT RoW including landscaping, signal upgrades and utilities is by permit.

The 2004 Corridor Optimization Plan calls for a 175-ft RoW profile for SH 83 in this area, half of which would come from the centerline (87.5-ft) . The plat does not show this to exist along the length of the property. Additional RoW should be dedicated to the county, to in-turn deed to CDOT at the time it is needed. Please call out the RoW for SH 83 along the length of theis property.

- RS 11-23-21

We have no issues with the removal of what was Collector Road “C". However, on the north end of this property, cross- property connections will be necessary. Extending the N-S collector to Stroh is acceptable, but opportunity is lost in not providing a connection into Lewis Christensen Rd Neither the maps provided or the TIS show enough context to the SH 83 corridor and existing local roadway rights-of-way on the north end of this project (and not consistent with Douglas County Assessor property lines/info)

With the removal of the ¾ turn movement previously permitted, a double NB to WB left turn should go into Pinery Parkway intersection – by 2030. That un-built ¾ Access permit shall be officially 'retired'.

I do not believe less traffic will occur on the SB to EB Left urn movement between 2030-40. The study's figure 10 &

11 is peculiar showing a drop from of peak hour left turns from 405 to 330.

County needs to ensure sufficient RoW is dedicated along SH 83 per the Corridor Optimization Plan to ensure auxiliary lanes, and room for multi-use pathways and utilities can occupy the RoW.

See Attached Red-line

RS 03-30-21

Other Comments:

3-31-2021

A State Highway access permit, 119094 was issued for the proposed Right-in, Right-out access and is still valid. It is currently extended to 8/29/2021. This permit may need to be either revised or repermitted to reflect the change in traffic due to the redistribution with the elimination of the 3/4 access to this development. Douglas county is the issuing authority for State Highway Access permits within their jurisdiciton. Contact at the County for access permits is Chris Martin.

The proposed improvements at Pinery Parkway and Parker Road will require new State Highway Access Permits. Improvements include a second NB left turn lane. Since Pinery Pkwy is a County Roadway, Douglas County must be the Permittee for the permit. If improvements are proposed on both the east and west side, then separate permit applications will be needed for each side.

We will want to review the drainage report for this development to insure there will be no negative impact to the State Highway.

All signing for this development that is visible to or advertises to State Highway 83 must be on-premise and must comply with any applicable rules governing outdoor advertising in Colorado per State of Colorado Rules **2 CCR 601-3**

--Steve Loeffler, 3-31-2021

From: PlatReview
To: Michael Pesicka
Cc: Benson, William
Subject: RE: Douglas County eReferral (Project Number SB2021-049) Is Ready For Review
Date: Monday, November 15, 2021 7:17:36 AM

Requester,

Our engineer has reviewed this plat and their comments are: "I have no objections to this plat"
If you require signatures, you can contact the engineer CC'd on this email and if you have any further questions, please don't hesitate to reach out.

Thank you!

-----Original Message-----
From: mpesicka@douglas.co.us <mpesicka@douglas.co.us>
Sent: Thursday, November 4, 2021 9:52 AM
To: PlatReview <PlatReview@lumen.com>
Subject: Douglas County eReferral (Project Number SB2021-049) Is Ready For Review

There is an eReferral for your review. Please use the following link to log on to your account: https://imss91-ctp.trendmicro.com:443/wis/clicktime/v1/query?url=https%3a%2f%2fapps.douglas.co.us%2fplanning%2fprojects%2fLogin.aspx&umid=B837CF1F-CFF7-B205-AE20-1EC4BA6A4238&auth=19120be9529b25014b618505cb01789c5433dae7-7de8ecbaa03f4c076da1622e26bf21d24e5a7fc2

Project Number SB2021-049, Pinery Village Filing 2 Minor Development. The applicant proposes a Minor Development to subdivide 77.32 acres into 4 non-residential lots and 6 tracts and the extension of Pinery Center Blvd to the north property line. The property is zoned Planned Development and is located in the northeast portion of the County, approximately one-quarter mile north of North Pinery Parkway and west of State Highway 83 and partially bordered on the north by the Town of Parker.

This referral will close on Thursday, December 2, 2021.

If you have any questions, please contact me.

Sincerely,

Mike Pesicka, Principal Planner
Planning Services
100 Third Street
Castle Rock, CO 80104
303-660-7460 (main)

This communication is the property of Lumen Technologies and may contain confidential or privileged information. Unauthorized use of this communication is strictly prohibited and may be unlawful. If you have received this communication in error, please immediately notify the sender by reply e-mail and destroy all copies of the communication and any attachments.

STATE OF COLORADO

Traffic & Safety
Region 1
2829 W. Howard Place
Denver, Colorado 80204

COLORADO
Department of Transportation

Project Name: **Pinery Village in Pinery West**

		Highway:	Mile Marker:
Print Date:	12/2/2021	083	55.355

Drainage Comments:

11-15-21 - Tanner

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Traffic Comments:

Scherner 3-22-21

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The Wellspring Dr RIRO will require both accel and decel auxiliary lanes meeting the requirements stated in the Access Code

Scherner 11-29-21

Previous comments still apply, Access C shall not be signalized if the 550 ft separation from Parker Rd is not met.

There are no plans showing the necessary modifications of Stroh Rd and Parker Rd to review. It is also unclear how the Access C intersection geometric design influences the Parker Rd/Stroh Rd intersection design.

The required addition of a NB left lane on Parker Rd at Stroh Rd needs to occur and be included in the roadway plans required for permit approval. Traffic signal modification may also be necessary

Right of Way Comments:

11/10/21 - SDH - No ROW comments except to reiterate the need for sufficient ROW to be dedicated to the County

along SH-83 as related to the Corridor Optimization Plan.

Resident Engineer Comments:

11/17/2021 MAK

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4/2/21 MAK

No Comments at this time.

Permits Comments:

There was no referral responses to CDOT previous remarks. We had mentioned in an earlier meeting the need to adhere to the Access Control Plan (ACP) for SH 83. We *assume* that the Town of Parker has reviewed this proposed development plan and has made comments in regards to the ACP and local plans as there are off-site connections to be made to the north. If there are any deviations or changes to the ACP, the Town of Parker must approve of those revisions as outlined in the IGA.

It will be important for the alternative N-S roadways, their functional design/cross sections, and timing to be in alignment with those planned by the Town of Parker. These provide essential access connections without the need to use the highway for short trips. Town of Parker has recently updated their Transportation vision/plan for SH 83.

Intersection improvements (including new auxiliary lanes) and those with > 20% traffic will require new Access permits. Any work in CDOT RoW including landscaping, signal upgrades and utilities is by permit.

The 2004 Corridor Optimization Plan calls for a 175-ft RoW profile for SH 83 in this area, half of which would come from the centerline (87.5-ft) . The plat does not show this to exist along the length of the property. Additional RoW should be dedicated to the county, to in-turn deed to CDOT at the time it is needed. Please call out the RoW for SH 83 along the length of theis property.

- RS 11-23-21

We have no issues with the removal of what was Collector Road “C". However, on the north end of this property, cross- property connections will be necessary. Extending the N-S collector to Stroh is acceptable, but opportunity is lost in not providing a connection into Lewis Christensen Rd Neither the maps provided or the TIS show enough context to the SH 83 corridor and existing local roadway rights-of-way on the north end of this project (and not consistent with Douglas County Assessor property lines/info)

With the removal of the ¾ turn movement previously permitted, a double NB to WB left turn should go into Pinery Parkway intersection – by 2030. That un-built ¾ Access permit shall be officially 'retired'.

I do not believe less traffic will occur on the SB to EB Left urn movement between 2030-40. The study's figure 10 &

11 is peculiar showing a drop from of peak hour left turns from 405 to 330.

County needs to ensure sufficient RoW is dedicated along SH 83 per the Corridor Optimization Plan to ensure auxiliary lanes, and room for multi-use pathways and utilities can occupy the RoW.

See Attached Red-line

RS 03-30-21

Other Comments:

3-31-2021

A State Highway access permit, 119094 was issued for the proposed Right-in, Right-out access and is still valid. It is currently extended to 8/29/2021. This permit may need to be either revised or repermitted to reflect the change in traffic due to the redistribution with the elimination of the 3/4 access to this development. Douglas county is the issuing authority for State Highway Access permits within their jurisdiciton. Contact at the County for access permits is Chris Martin.

The proposed improvements at Pinery Parkway and Parker Road will require new State Highway Access Permits. Improvements include a second NB left turn lane. Since Pinery Pkwy is a County Roadway, Douglas County must be the Permittee for the permit. If improvements are proposed on both the east and west side, then separate permit applications will be needed for each side.

We will want to review the drainage report for this development to insure there will be no negative impact to the State Highway.

All signing for this development that is visible to or advertises to State Highway 83 must be on-premise and must comply with any applicable rules governing outdoor advertising in Colorado per State of Colorado Rules **2 CCR 601-3**

--Steve Loeffler, 3-31-2021

From: Doyle - DNR, Katie
To: Michael Pesicka
Subject: Re:Douglas County eReferral (Project Number SB2021-049) Is Ready For Review
Date: Tuesday, November 30, 2021 8:59:24 AM

Dear Mr. Pesicka,

Thank you for the opportunity to comment on the Pinery Village Filing 2 Minor Development under Project #SB2021-049. Our goal in responding to land use proposals such as this is to provide complete, consistent, and timely information to all entities who request comment on matters within our statutory authority.

Upon review of the proposed referral request, Colorado Parks and Wildlife (CPW) has no objections to the application moving forward as planned for approval. Please refer to the previous comment letter from CPW dated February 11, 2020 to Mr. Dan Avery for additional wildlife concerns and development recommendations.

Please do not hesitate to contact us about ways to continue developing and managing your properties in order to maximize wildlife value while minimizing potential conflicts. If you have any further questions, please contact me at (303) 291-7114.

Thank you,

Katie Doyle
District Wildlife Manager - Parker/Castle Rock East

Field Services

Denver Office 303.291.7227
C 720.930.8039 | P 303.291.7114
6060 Broadway, Denver, CO 80216
katie.doyle@state.co.us | www.cpw.state.co.us

`

February 11, 2026

Douglas County Department of Community Development
100 Third Street
Castle Rock, Colorado 80104

Attn: Mr. Mike Pesicka
Principal Planner

Subject: Review of Water Demand and Water Supply Availability for The Pinery Village Filing 2, File No. SB2021-049.

Project No. 24822

Dear Mike,

Moore Engineering, Inc., dba Lytle Water Solutions, LLC ("LWS"), has reviewed the pertinent documents related to the proposed minor development at the Pinery Village Filing 2, File No. SB2021-041. This property encompasses 77 acres ("ac") and is proposed to be developed with four commercial lots and water service for this area is to be by the Pinery Water and Wastewater District ("Pinery").

There was an undated, anonymous narrative of the proposed development in Pinery Village Filing 2 provided. However, there were no specific land development plans in this narrative, therefore, we have had to evaluate the proposed demand in Filing 2 based on the will-serve letter provided by the Pinery.

A January 5, 2026 will-serve letter was provided by the Pinery relative to the commitment of service to this property. According to the January 5 will-serve letter, the Pinery is prepared to serve this property. While no specifics were provided in the Pinery will-serve letter, it was estimated that the annual demand would be 95 acre-feet per year ("ac-ft/yr").

Attached to the Pinery January 5 will-serve letter was a February 2018 summary of present and future water sources, as well as current and build out demands, prepared by HRS Water Consultants, Inc. ("HRS"). The HRS analysis has been updated by Pinery staff in September 2025. According to the most recent Pinery summary, the Pinery has four types of water available to it, (a) senior tributary ditch rights diverted through alluvial groundwater wells, as well as junior tributary alluvial well water rights, (b) nontributary Denver Basin aquifer groundwater rights, (c) reusable water stored in Walker Reservoir, and (d) water contracted for through the Water Infrastructure Supply Efficiency ("WISE") project and the Cherry Creek Project Water Authority ("CCPWA"). The Pinery also has adjudicated augmentation plans which allow it to claim return flow credits from reusable water sources.

According to information provided in the updated Pinery summary, the Pinery has 1,220 ac-ft/yr of senior Harrison and Haley Ditch water rights which are diverted through alluvial wells, as well as 13,954 ac-ft/yr of nontributary Denver Basin aquifer water. These senior ditch rights and the Denver Basin aquifer water rights (located in the Central Basin) are considered firm water supplies. The Pinery's interest in the CCPWA is a 20.489 percent share, which includes Denver Basin aquifer and alluvial water. It was estimated that the yield from CCPWA water is 1,570 ac-ft/yr, with 1,530 ac-ft/yr associated with Denver Basin aquifer water and 40 ac-ft/yr associated with senior tributary alluvial water rights. It is unclear how this water will be developed for use in the Pinery or if it has been developed for use. As such, the Pinery has 15,174 ac-ft/yr of firm first-use water supplies, and 16,704 ac-ft/yr if the CCPWA supplies are considered. While the Pinery has a subscription for 500 ac-ft/yr of WISE water, this is an interruptible supply and, therefore, cannot be relied upon as a firm yield.

The amount of reusable return flow credits from the Pinery's current augmentation plans was quantified as approximately 47 ac-ft/yr, after meeting all of the augmentation plan requirements. This water is exchanged from the Pinery's wastewater effluent up to Walker Reservoir and stored for future use.

Information was also provided in the updated summary on current and projected buildout demands within the Pinery service area. The most recent data from 2024 indicates an annual demand of 3,098 ac-ft/yr, with a maximum annual historical demand of 3,861 ac-ft/yr in 2022. While not provided in the updated water rights summary, the previous HRS buildout demand estimate for the Pinery was 4,200 ac-ft/yr. Assuming the Pinery's estimated buildout demand has not appreciably changed, the available firm water supply for the Pinery is approximately 11,000 ac-ft/yr in excess of the projected buildout demand.

Based on the overall water supply (15,174 to 16,704 ac-ft/yr) and demand estimates (4,200 ac-ft/yr at buildout) for the Pinery service area, while specific details of the water demands in Filing 2 were not provided, it is our opinion that there is a sufficient water supply to serve the proposed demand associated with the Pinery Village, Filing 2 (95 ac-ft/yr).

If you have questions regarding our review of the water supply availability and demand to serve the proposed development in the Pinery Village, Filing 2, please do not hesitate to give us a call.

Yours truly,

Bruce A. Lytle, P.E.
Senior Project Manager

July 29, 2022

Mike Pesicka, Principal Planner
Douglas County Planning Services
Transmission via email: mpesicka@douglas.co.us

Re: **Pinery Village Minor Development (Filing 2)** – 2nd Letter
Case No. SB2020-004
Part of the SE ¼ of Sec. 3 and part of the NE ¼ of Sec. 10, T 7S, R 66W, 6th P.M.
Water Division 1, Water District 8

Dear Mike Pesicka:

We have reviewed the July 19, 2022 re-referral concerning the proposal to subdivide a 77-acre parcel located within the Pinery West Commercial Development ("Development") and part of The Pinery 28th Amendment. The proposal is to divide the parcel into 3 commercial/industrial lots and 6 open space/drainage/right-of-way tracts. Proposed land uses are industrial, office, retail, and other commercial uses. This office previously commented on Filing 1 of the planned development on October 28, 2018 and February 4, 2020 (project no. SB2018-079).

Water Supply Demand

According to the March 8, 2022 letter from the Pinery Water & Wastewater District ("District"), the estimated water demand is 117 acre-feet/year for domestic service and 14 acre-feet per year for irrigation service, for a total estimated water demand of 131 acre-feet per year.

Source of Water Supply

The proposed water supply for the subdivision is service provided by the District. According to the March 8, 2022 letter, the District is willing and able to provide domestic and irrigation service to the proposed subdivision.

According to the "Present and Future Water Sources" report dated May 2014 and updated February 2018 prepared by HRS Consultants Inc. ("Report"), the Pinery Water & Wastewater District has a total of 15,037 acre-feet per year of water rights. This amount consists of 13,466 acre-feet of nontributary water rights, 1,220 acre-feet of senior tributary water rights, an additional 351 acre-feet of nontributary water rights that are dedicated to development of the Broe property, and as a member of the WISE Authority the District has subscribed to 500 acre-feet per year on average of renewable and reusable water. In addition, the District has two existing augmentation plans, decreed in Division 1 Water Court Case nos. W-6268 and 11CW198. Under those augmentation plans, return flows from the use of nontributary water, along with other replacement sources, are used to offset out-of-priority depletions from pumping of junior wells.

As of 2017, the District's water requirements from existing commitments totaled 3,098 acre-feet. Projected commitments at full build out are estimated at 4,200 acre-feet.

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

State Engineer's Office Opinion

Based upon the above and pursuant to sections 30-28-136(1)(h)(I) and 30-28-136(1)(h)(II), C.R.S., it is our opinion that the proposed water supply is adequate and can be provided without causing injury to decreed water rights.

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

Our opinion that the water supply can be **provided without causing injury** is based on our determination that the amount of water that is legally available on an annual basis, according to the statutory **allocation** approach, for the proposed uses is greater than the annual amount of water required to supply existing water commitments and the demands of the proposed subdivision.

Our opinion is qualified by the following:

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

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

Additional Comments

The application materials indicate that storm water detention structure(s) will be constructed as a part of this project. The applicant should be aware that unless the structure(s) can meet the requirements of a "storm water detention and infiltration facility" as defined in section 37-92-602(8), C.R.S., the structure may be subject to administration by this office. The applicant should review the Division of Water Resources' *Administrative Statement Regarding the Management of Storm Water Detention Facilities and Post-Wildland Fire Facilities in Colorado*, attached, to ensure that the notification, construction and operation of the proposed structure meets statutory and administrative requirements. The applicant is encouraged to use *Colorado Stormwater Detention and Infiltration Facility Notification Portal* to meet the notification requirements, located at https://maperture.digitaldataservices.com/gvh/?viewer=cswdif.

If you or the applicant have any questions, please contact Wenli Dickinson at 303-866-3581 x8206 or at wenli.dickinson@state.co.us.

Sincerely,

Joanna Williams, P.E.
Water Resources Engineer

Attachment: *Administrative Statement Regarding the Management of Storm Water Detention Facilities and Post-Wildland Fire Facilities in Colorado*

Ec: Subdivision file no. 26980
Pinery Water & Wastewater Treatment District file
William Conway (wconway@redland.com); Mark Cevaal (mcevaal@redland.com)

PINERY VILLAGE FILING NO. 2

A PORTION OF PLANNING AREAS 41, 42, 43, & OPEN SPACE H-1
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10,
TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
77.320 ACRES - 4 COMMERCIAL LOTS - 6 TRACTS SB2021-049

LEGAL DESCRIPTION

A PARCEL OF LAND SITUATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10, TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS;

COMMENCING AT THE CENTER-SOUTH ONE-SIXTEENTH CORNER OF SAID SECTION 3, WHENCE THE NORTH LINE OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF SAID SECTION 3 BEARS NORTH 89°32'31"EAST, A DISTANCE OF 2635.68 FEET WITH ALL BEARINGS HEREON REFERENCED TO SAID LINE;

THENCE ALONG SAID NORTH LINE, NORTH 89°32'31"EAST, A DISTANCE OF 40.73 FEET TO THE NORTHEAST CORNER OF PINERY VILLAGE FILING NO. 1 AS RECORDED AT RECEPTION NO. 2020006468 IN THE OFFICIAL RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER'S OFFICE, AND THE **POINT OF BEGINNING**;

THENCE CONTINUING ALONG SAID NORTH LINE, NORTH 89°32'31" EAST, A DISTANCE OF 1,817.24 FEET TO THE WESTERLY RIGHT-OF-WAY OF PARKER ROAD, RECORDED IN BOOK 1805 AT PAGE 1143, OF SAID RECORDS;

THENCE ALONG SAID WESTERLY RIGHT-OF-WAY THE FOLLOWING FOUR (4) COURSES:

1. SOUTH 01°44'50" WEST, A DISTANCE OF 1,329.43 FEET;
2. SOUTH 19°39'08" WEST, A DISTANCE OF 211.40 FEET;
3. SOUTH 01°44'27" WEST, A DISTANCE OF 749.39 FEET;
4. SOUTH 18°46'51" EAST, A DISTANCE OF 86.02 FEET TO THE BOUNDARY OF SAID PINERY VILLAGE FILING NO. 1;

THENCE ALONG SAID BOUNDARY THE FOLLOWING SIXTEEN (16) COURSES;

1. SOUTH 01°44'50" WEST, A DISTANCE OF 316.60 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE NORTHERLY HAVING A RADIUS OF 35.00 FEET, THE RADIUS POINT OF SAID CURVE BEARS NORTH 23°37'47" WEST;
2. SOUTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 23°34'56", AN ARC LENGTH OF 14.41 FEET;
3. SOUTH 89°57'09" WEST, A DISTANCE OF 1,163.73 FEET;
4. NORTH 45°19'53" WEST, A DISTANCE OF 42.44 FEET;
5. NORTH 00°37'01" WEST, A DISTANCE OF 528.99 FEET;
6. SOUTH 89°45'03" WEST, A DISTANCE OF 66.50 FEET;
7. NORTH 00°37'01" WEST, A DISTANCE OF 780.33 FEET;
8. NORTH 00°36'54" WEST, A DISTANCE OF 116.93 FEET;
9. SOUTH 89°39'16" WEST, A DISTANCE OF 330.91 FEET;
10. NORTH 06°01'28" EAST, A DISTANCE OF 235.83 FEET;
11. NORTH 17°28'32" EAST, A DISTANCE OF 468.15 FEET;
12. NORTH 03°50'12" EAST, A DISTANCE OF 121.74 FEET;
13. NORTH 16°22'12" WEST, A DISTANCE OF 279.83 FEET;
14. NORTH 37°38'54" WEST, A DISTANCE OF 83.00 FEET;
15. NORTH 68°29'08" WEST, A DISTANCE OF 133.11 FEET;
16. NORTH 00°32'20" WEST, A DISTANCE OF 24.94 FEET TO THE **POINT OF BEGINNING**.

CONTAINING AN AREA OF 87.848 ACRES, (3,826,658 SQUARE FEET), MORE OR LESS.

DEDICATION STATEMENT

THE UNDERSIGNED, BEING ALL THE OWNERS, MORTGAGEES, BENEFICIARIES OF DEEDS OF TRUST AND HOLDERS OF OTHER INTERESTS IN THE LANDS DESCRIBED HEREIN, HAVE LAID OUT, SUBDIVIDED AND PLATTED SAID LANDS INTO LOTS, TRACTS, STREETS AND EASEMENTS AS SHOWN HEREON UNDER THE NAME AND SUBDIVISION OF **PINERY VILLAGE FILING NO. 2.** THE UTILITY EASEMENTS SHOWN HEREON ARE HEREBY DEDICATED FOR PUBLIC UTILITIES AND CABLE COMMUNICATION SYSTEMS AND OTHER PURPOSES AS SHOWN HEREON. THE ENTITIES RESPONSIBLE FOR PROVIDING THE SERVICES FOR WHICH THE EASEMENTS ARE ESTABLISHED ARE HEREBY GRANTED THE PERPETUAL RIGHT OF INGRESS AND EGRESS FROM AND TO ADJACENT PROPERTIES FOR INSTALLATION, MAINTENANCE AND REPLACEMENT OF UTILITY LINES AND RELATED FACILITIES. TRACT D, KNOWN AS PINERY CENTER BOULEVARD, AND TRACT F RIGHTS-OF-WAY, AS SHOWN HEREON ARE DEDICATED AND CONVEYED TO DOUGLAS COUNTY, COLORADO, IN FEE SIMPLE ABSOLUTE, WITH MARKETABLE TITLE, FOR PUBLIC USES AND PURPOSES. UTILITY EASEMENTS, DRAINAGE AND BLANKET ACCESS EASEMENTS, SIGHT DISTANCE EASEMENTS, ACCESS EASEMENT, AND DRAINAGE EASEMENTS ARE DEDICATED AND CONVEYED TO DOUGLAS COUNTY, COLORADO, FOR PUBLIC USES AND PURPOSES.

OWNER

TF PINERY WEST, L.P., A DELAWARE LIMITED PARTNERSHIP

BY: _____

STATE OF COLORADO)
)SS
COUNTY OF DOUGLAS)

ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____, 20__
BY _____, AS _____
OF TF PINERY WEST, L.P., A DELAWARE LIMITED PARTNERSHIP

WITNESS MY HAND
AND OFFICIAL SEAL

MY COMMISSION
EXPIRES: _____ _____
NOTARY PUBLIC

ACCEPTANCE CERTIFICATE

THE DEDICATION OF TRACTS A, B, C, E, AND LOT 3 ARE HEREBY ACCEPTED FOR OWNERSHIP AND MAINTENANCE BY THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2

THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2:

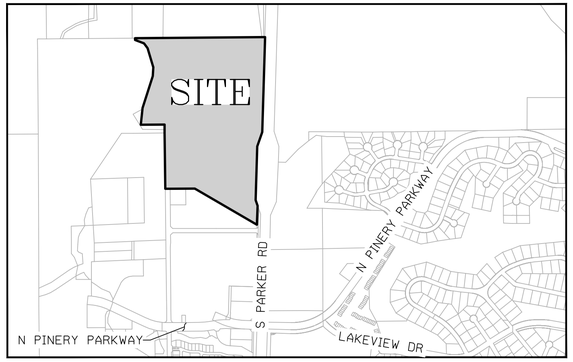
BY: _____

STATE OF COLORADO)
)SS
COUNTY OF DOUGLAS)

ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____, 20__
BY _____, AS _____
OF THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO.'S 1 AND 2

WITNESS MY HAND
AND OFFICIAL SEAL

MY COMMISSION
EXPIRES: _____ _____
NOTARY PUBLIC



VICINITY MAP
SCALE 1" = 1,000'

NORTH

TITLE VERIFICATION

WE, FIRST AMERICAN TITLE INSURANCE COMPANY, DO HEREBY CERTIFY THAT WE HAVE EXAMINED THE TITLE OF ALL LAND PLATTED HEREON AND THAT TITLE TO SUCH LAND IS IN THE DEDICATOR(S) FREE AND CLEAR OF ALL LIENS, TAXES AND ENCUMBRANCES.

FIRST AMERICAN TITLE INSURANCE COMPANY

BY: _____

TITLE: _____

DATE: _____

STATE OF COLORADO)
)SS
COUNTY OF _____)

ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20__

BY _____ AS _____

OF FIRST AMERICAN TITLE INSURANCE COMPANY

WITNESS MY HAND AND OFFICIAL SEAL

MY COMMISSION EXPIRES: _____ _____
NOTARY PUBLIC

BOARD OF COUNTY COMMISSIONERS CERTIFICATE

THIS PLAT WAS APPROVED FOR FILING BY THE BOARD OF COUNTY COMMISSIONERS OF DOUGLAS COUNTY,

COLORADO, ON THE _____DAY OF _____ , 20___, SUBJECT TO ANY CONDITIONS SPECIFIED HEREON.

TRACT D, KNOWN AS PINERY CENTER BOULEVARD, AND TRACT F, UTILITY EASEMENTS, AND DRAINAGE AND BLANKET ACCESS EASEMENTS ARE ACCEPTED.

ALL EXPENSES INCURRED WITH RESPECT TO IMPROVEMENTS FOR ALL UTILITY SERVICES, PAVING, GRADING, LANDSCAPING, CURBS, GUTTER, SIDEWALKS, ROAD LIGHTING, ROAD SIGNS, FLOOD PROTECTION DEVICES, DRAINAGE STRUCTURES, AND ALL OTHER IMPROVEMENTS THAT MAY BE REQUIRED SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER AND NOT DOUGLAS COUNTY.

THIS ACCEPTANCE DOES NOT GUARANTEE THAT SOIL CONDITIONS, SUBSURFACE GEOLOGY, GROUNDWATER CONDITIONS OR FLOODING CONDITIONS OF ANY LOTS SHOWN HEREON ARE SUCH THAT A BUILDING PERMIT, WELL PERMIT OR SEWAGE DISPOSAL PERMIT WILL BE ISSUED.

_____
CHAIR, BOARD OF COUNTY COMMISSIONERS

LAND USE TABLE

TRACT	AREA (SQ.FT)	AREA (AC ±)	USE	OWNED BY / MAINTAINED BY
LOT 1	215,107	4.938	COMMERCIAL	OWNER
LOT 2	641,506	14.727	COMMERCIAL	OWNER
LOT 3	128,796	2.957	REGIONAL TRANSPORTATION DISTRICT (RTD)	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
LOT 4	1,411,946	32.414	COMMERCIAL	OWNER
TRACT A	162,913	3.740	OPEN SPACE / DRAINAGE	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT B	113,415	2.604	OPEN SPACE / DRAINAGE	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT C	537	0.012	OPEN SPACE / DRAINAGE	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT D	139,327	3.199	RIGHT-OF-WAY	DOUGLAS COUNTY
TRACT E	1,010,903	23.207	OPEN SPACE / DRAINAGE	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT F	2,208	0.051	RIGHT-OF-WAY	DOUGLAS COUNTY
LOT TOTAL	2,397,355	55.036		
TRACT TOTAL	1,429,303	32.812		
TOTAL	3,826,658	87.848		

(SEE ADDITIONAL TRACT NOTES THIS SHEET)

SHEET INDEX

SHEET 1 COVER SHEET

SHEET 2 OVERALL SHEET

SHEETS 3-4 LOT AND EASEMENT DETAIL SHEETS

PLANNING COMMISSIONERS CERTIFICATE

THE MINOR DEVELOPMENT FINAL PLAT (SB2021-049) WAS REVIEWED BY THE PLANNING COMMISSION ON _____ __, 20__.

_____ _____
PLANNING DIRECTOR, ON BEHALF OF THE PLANNING COMMISSION DATE

GENERAL NOTES

1. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR LAND BOUNDARY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, COLORADO REVISED STATUTE.
2. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY."
3. THE FIELD WORK FOR THIS SURVEY WAS PERFORMED BY AN AZTEC CONSULTANTS, INC. SURVEY CREW AND COMPLETED ON APRIL 01, 2021.
4. BASIS OF BEARINGS – BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM GPS OBSERVATION BASED UPON THE COLORADO COORDINATE SYSTEM OF 1983 CENTRAL ZONE (NAD 83, 2011) REFERENCED TO THE NORTH LINE OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF SECTION 3, TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN BEING MONUMENTED AS SHOWN HEREON, TAKEN TO BEAR NORTH 89°32'31" EAST, A DISTANCE OF 2,635.68 FEET.
5. FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-927312-CO, EFFECTIVE 10/21/2020 AT 5:00 P.M. WAS RELIED UPON FOR RECORD INFORMATION REGARDING RIGHTS-OF-WAY, EASEMENTS AND ENCUMBRANCES. THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY AZTEC CONSULTANTS INC. TO DETERMINE OWNERSHIP, RIGHTS-OF-WAY, EASEMENTS OR OTHER MATTERS OF PUBLIC RECORD.
6. BASED ON A GRAPHICAL REPRESENTATION OF FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) NO. 08035C0184G, WITH AN EFFECTIVE DATE OF MARCH 16, 2016, THE SUBJECT PROPERTY LIES WITHIN ZONE "AE" AREAS WHERE BASE FLOOD ELEVATIONS HAVE BEEN DETERMINED, WITHIN ZONE "X" OTHER AREAS, AND WITHIN "ZONE X" BEING DEFINED AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
7. PARCEL IS BEING SUBDIVIDED INTO 4 COMMERCIAL LOTS AND 6 TRACTS.
8. TRACTS A, B, C, & E SHALL BE OWNED AND MAINTAINED BY THE METROPOLITAN DISTRICT, ITS SUCCESSORS AND ASSIGNS, FOR OPEN SPACE.
9. TRACTS D & F SHALL BE OWNED AND MAINTAINED BY DOUGLAS COUNTY, ITS SUCCESSORS AND ASSIGNS, FOR RIGHT-OF-WAY.

ADDITIONAL TRACT AND EASEMENTS NOTES:

1. TRACT A, AS SHOWN HEREON IS DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR OPEN SPACE AND DRAINAGE PURPOSES.
2. TRACT B, AS SHOWN HEREON IS DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR OPEN SPACE AND DRAINAGE PURPOSES.
3. TRACT C, AS SHOWN HEREON IS DEDICATED TO DOUGLAS COUNTY FOR RIGHT-OF-WAY, ACCESS, AND UTILITY PURPOSES. THIS TO BE WRITTEN BY SEPARATE DOCUMENT.
4. TRACT D, KNOWN AS PINERY CENTER BOULEVARD, AS SHOWN HEREON IS DEDICATED TO DOUGLAS COUNTY FOR RIGHT-OF-WAY, ACCESS, AND UTILITY PURPOSES.
5. TRACT E, AS SHOWN HEREON IS DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR OPEN SPACE AND DRAINAGE PURPOSES.
6. TRACT F, AS SHOWN HEREON IS DEDICATED TO DOUGLAS COUNTY FOR RIGHT-OF-WAY, ACCESS, AND UTILITY PURPOSES.

SURVEYOR'S CERTIFICATE

I, MICHAEL J. NOFFSINGER, A DULY REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS PLAT TRULY AND CORRECTLY REPRESENTS THE RESULTS OF A SURVEY MADE ON APRIL 28, 2021, BY ME OR UNDER MY DIRECT SUPERVISION AND THAT ALL MONUMENTS EXIST AS SHOWN HEREON; THAT MATHEMATICAL CLOSURE ERRORS ARE LESS THAN 1:50,000 (SECOND ORDER); AND THAT SAID PLAT HAS BEEN PREPARED IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS OF THE STATE OF COLORADO DEALING WITH MONUMENTS, SUBDIVISIONS OR SURVEYING OF LAND, ALL SURVEYING REGULATORY RULES, REQUIREMENTS, AND STANDARDS OF PRACTICE, AND ALL APPLICABLE PROVISIONS OF THE DOUGLAS COUNTY SUBDIVISION RESOLUTION. THIS CERTIFICATION IS BASED ON MY KNOWLEDGE, INFORMATION AND BELIEF AND IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

I ATTEST THE ABOVE ON THIS _____ DAY OF _____, 20__

FOR REVIEW

_____
MICHAEL J. NOFFSINGER, LICENSED PROFESSIONAL LAND SURVEYOR COLORADO P.L.S. NO. 38367
FOR AND ON BEHALF OF AZTEC CONSULTANTS, INC.

NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

NOTICE: PER THE STATE OF COLORADO BOARD OF LICENSURE FOR ARCHITECTS, PROFESSIONAL ENGINEERS, AND PROFESSIONAL LAND SURVEYORS RULE 1.6.B.2 THE WORD "CERTIFY" AS USED HEREON MEANS AN EXPRESSION OF PROFESSIONAL OPINION AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED. THE SURVEY REPRESENTED HEREON HAS BEEN PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE AND IS BASED UPON MY KNOWLEDGE, INFORMATION AND BELIEF.

CLERK AND RECORDERS CERTIFICATE

STATE OF COLORADO)
COUNTY OF DOUGLAS)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE ON THIS __ DAY OF _____ 2021,

A.D., AT _____ A.M./P.M. AND WAS RECORDED AT RECEPTION NO. _____

_____
DOUGLAS COUNTY CLERK AND RECORDER

AzTEC CONSULTANTS, INC.
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

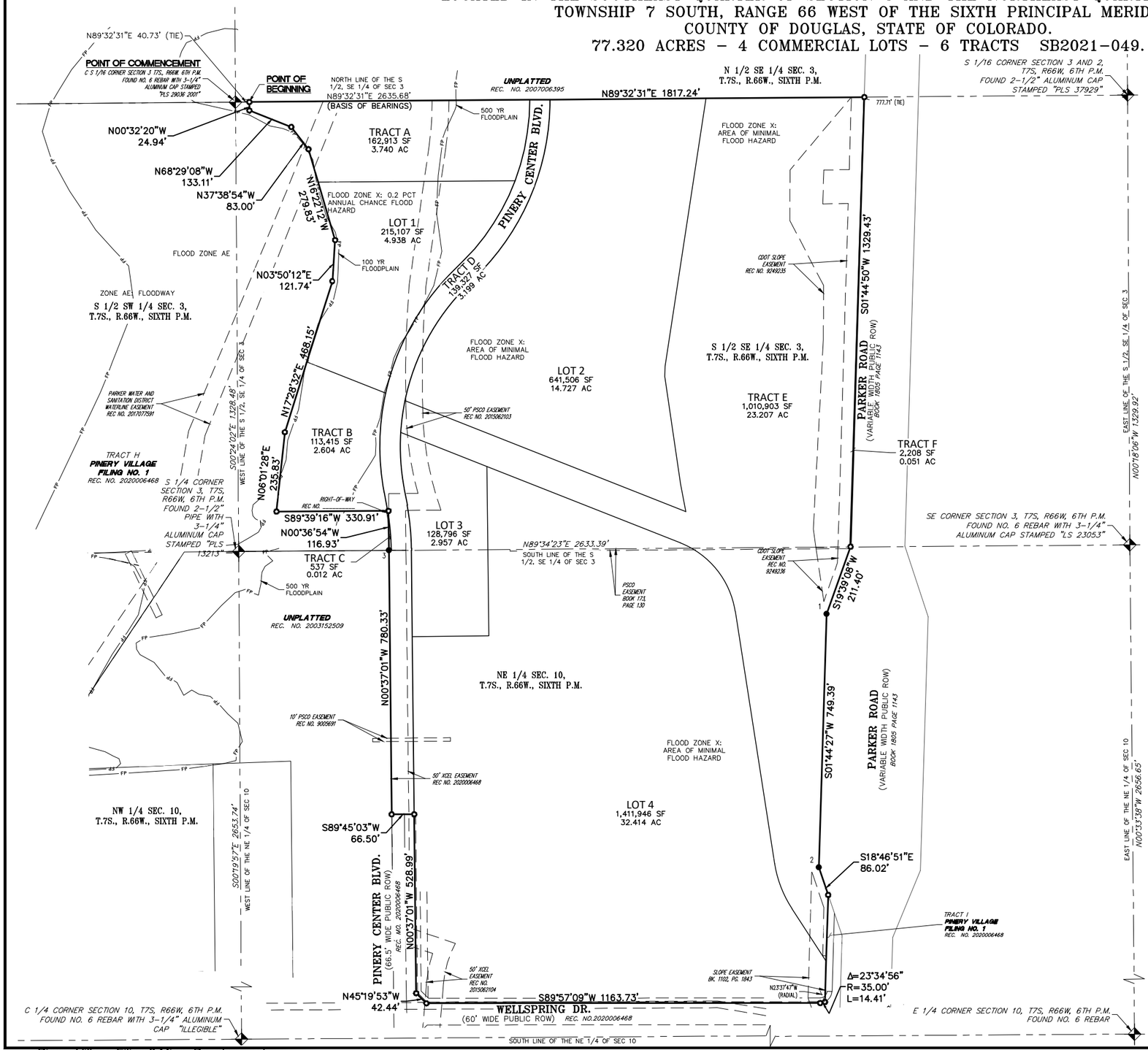
AzTec Proj. No.: 54820-23 Drawn By: RDR

DEVELOPER
STARWOOD LAND
1500 W. CANAL COURT
LITTLETON, COLORADO 80120

DATE OF PREPARATION:	07-12-2021
SCALE:	NA
SHEET 1 OF 4	

PINERY VILLAGE FILING NO. 2

A PORTION OF PLANNING AREAS 41, 42, 43, & OPEN SPACE H-1
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10,
TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
77.320 ACRES - 4 COMMERCIAL LOTS - 6 TRACTS SB2021-049.



MONUMENT SYMBOL LEGEND

- SET NO. 5 X 18" REBAR WITH 1-1/4" ORANGE PLASTIC CAP STAMPED "AZTEC LS 38367"
- 1 FOUND 4"X4" CONCRETE WITH NO. 5
- 2 FOUND 5" DIAMETER CONCRETE WITH 3" BRASS CAP STAMPED "CDOT ROW"
- 3 FOUND NO. 5 REBAR WITH 1-1/4" YELLOW PLASTIC CAP STAMPED "LS5112"
- (ROW) RIGHT-OF-WAY
- LIMITS OF FLOOD PLAIN

N

0' 75' 150' 300'
SCALE: 1" = 150'

FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC

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300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

AzTec Proj No 54820-23 Drawn By RDR

DEVELOPER
STARWOOD LAND
1500 W. CANAL COURT
LITTLETON, COLORADO 80120

DATE OF PREPARATION	07-12-2021
SCALE	1"=150'
SHEET 2 OF 4	

PINERY VILLAGE FILING NO. 2

A PORTION OF PLANNING AREAS 41, 42, 43, & OPEN SPACE H-1
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10,
TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
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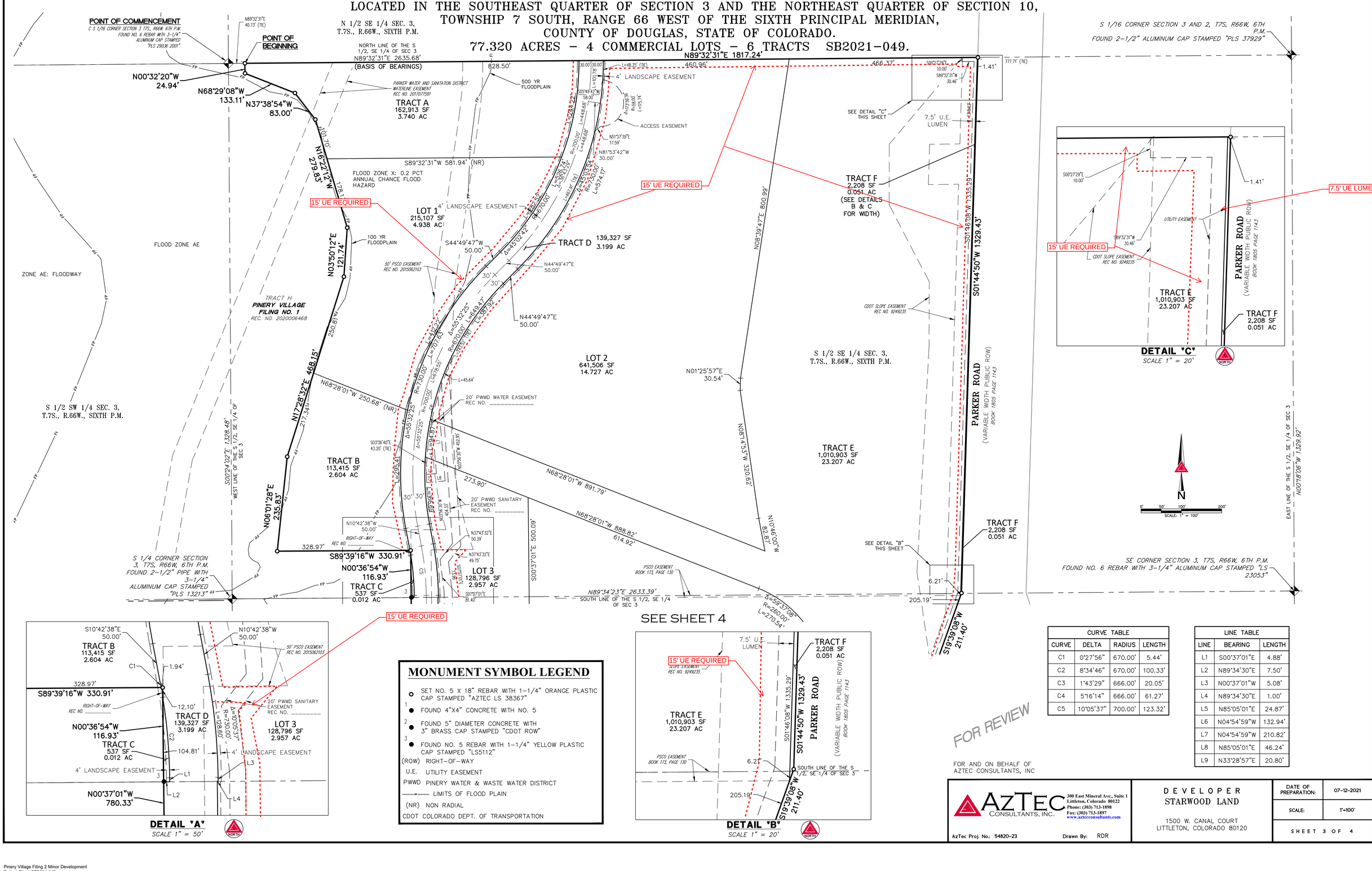

15' UE REQUIRED

MONUMENT SYMBOL LEGEND

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- 3 ● FOUND NO. 5 REBAR WITH 1-1/4" YELLOW PLASTIC CAP STAMPED "LS5112"

(ROW) RIGHT-OF-WAY
U.E. UTILITY EASEMENT
PWWD PINERY WATER & WASTE WATER DISTRICT
—//— LIMITS OF FLOOD PLAIN
(NR) NON RADIAL
CDOT COLORADO DEPT. OF TRANSPORTATION

SEE SHEET 4

CURVE TABLE			
CURVE	DELTA	RADIUS	LENGTH
C1	0°27'56"	670.00'	5.44'
C2	8°34'46"	670.00'	100.33'
C3	1°43'29"	666.00'	20.05'
C4	5°16'14"	666.00'	61.27'
C5	10°05'37"	700.00'	123.32'

LINE TABLE		
LINE	BEARING	LENGTH
L1	S00°37'01"E	4.88'
L2	N89°34'30"E	7.50'
L3	N00°37'01"W	5.08'
L4	N89°34'30"E	1.00'
L5	N85°05'01"E	24.87'
L6	N04°54'59"W	132.94'
L7	N04°54'59"W	210.82'
L8	N85°05'01"E	46.24'
L9	N33°28'57"E	20.80'

FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC

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AzTec Proj. No.: 54820-23 Drawn By: RDR

DEVELOPER
STARWOOD LAND
1500 W. CANAL COURT
LITTLETON, COLORADO 80120

DATE OF PREPARATION:	07-12-2021
SCALE:	1"=100'
SHEET 3 OF 4	

PINERY VILLAGE FILING NO. 2

A PORTION OF PLANNING AREAS 41, 42, 43, & OPEN SPACE H-1
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10,
TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
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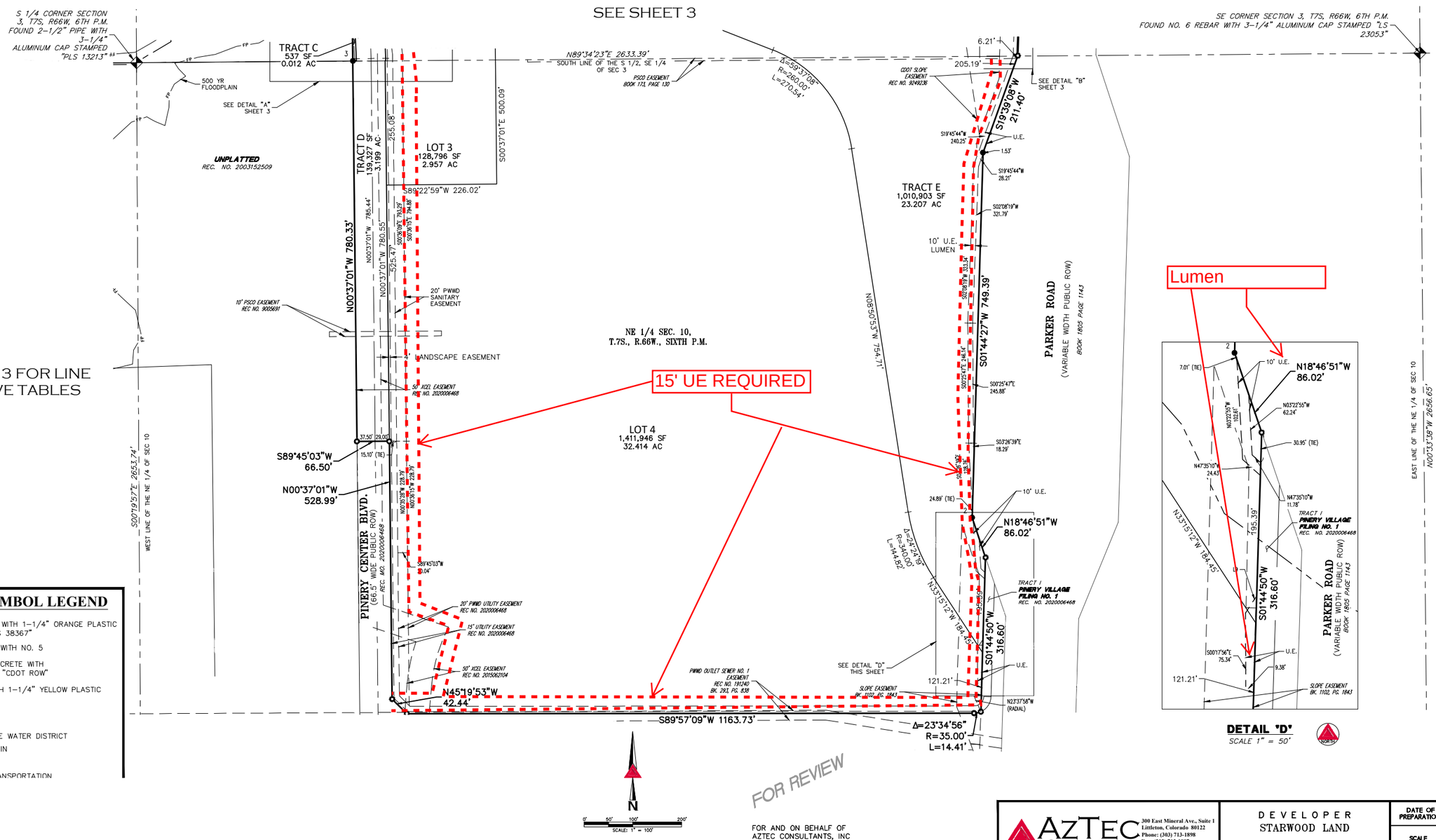
77.320 ACRES - 4 COMMERCIAL LOTS - 6 TRACTS SB2021-049.



SEE SHEET 3 FOR LINE AND CURVE TABLES

MONUMENT SYMBOL LEGEND

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- (ROW) RIGHT-OF-WAY
- U.E. UTILITY EASEMENT
- PWWD PINERY WATER & WASTE WATER DISTRICT
- ——"—— LIMITS OF FLOOD PLAIN
- (NR) NON RADIAL
- CDOT COLORADO DEPT. OF TRANSPORTATION

DETAIL "D"
SCALE 1" = 50'

FOR REVIEW

FOR AND ON BEHALF OF
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AzTec Proj No 54820-23 | Drawn By RDR

DEVELOPER
STARWOOD LAND
1500 W. CANAL COURT
LITTLETON, COLORADO 80120

DATE OF PREPARATION	07-12-2021
SCALE	1"=100'
SHEET 4 OF 4	

From: Brooks Kaufman
To: Michael Pesicka
Cc: Craig Campbell
Subject: RE: Pinery Village Filing No. 2 Minor Development Pinery Village Filing 2-SB2021-049
Date: Friday, February 13, 2026 11:32:18 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png
Pinery Village Filing No. 2 - Final Plat_8th Submittal_12-17-25.pdf

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

Good morning, Michael

CORE Electric Cooperative and the applicant met this morning pertaining to Pinery Village Filing 2- (SB2021-049)

CORE Electric Cooperative approves and agrees to the applicant's responses below.

CORE Electric Cooperative
1. CORE will require additional utility easements as shown on the attached markup.
Response: A 15' Utility Easement has been added along Pinery Center Boulevard except for areas where a retaining wall is proposed. Perimeter lot easements will be deferred until the lots are subdivision for specific development.

Respectfully

Brooks Kaufman
Lands and Rights of Way Manager

800.332.9540 **MAIN**
720.733.5493 **DIRECT**
303.912.0765 **MOBILE**

www.core.coop.

ELECTRIC COOPERATIVE

The Energy to Thrive™

Book time to meet with me

From: Michael Pesicka <mpesicka@douglas.co.us>
Sent: Thursday, February 12, 2026 8:16 AM

To: Brooks Kaufman <BKaufman@core.coop>
Subject: RE: Pinery Village Filing No. 2 Minor Development

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

Brooks, thanks for the response. I have notified the applicant to contact you.

Mike Pesicka | Principal Planner
Douglas County Department of Community Development
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303-814-4367 **Main** | 303-660-7460
Email | mpesicka@douglas.co.us

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

---

From: Brooks Kaufman <BKaufman@core.coop>
Sent: Thursday, February 12, 2026 6:13 AM
To: Michael Pesicka <mpesicka@douglas.co.us>
Subject: RE: Pinery Village Filing No. 2 Minor Development

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

Good morning, Michael

The applicant did not address our comments, CORE will require a meeting with the applicant on this matter.

Respectfully

Brooks Kaufman
Lands and Rights of Way Manager

800.332.9540 **MAIN**
720.733.5493 **DIRECT**
303.912.0765 **MOBILE**

www.**core**.coop.

Book time to meet with me

From: Michael Pesicka <mpesicka@douglas.co.us>
Sent: Wednesday, February 11, 2026 11:22 AM
To: Brooks Kaufman <BKaufman@core.coop>
Subject: Pinery Village Filing No. 2 Minor Development

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

Brooks,

Its been awhile since you have reviewed this project (Pinery Village Filing 2-SB2021-049) but I wanted to verify that the applicant's response addresses your comments, see below. Updated plat exhibit attached.

Core Electric Cooperative
1. CORE will require additional utility easements as shown on the attached markup.
Response: A 15' Utility Easement has been added along Pinery Center Boulevard except for areas where a retaining wall is proposed. Perimeter lot easements will be deferred until the lots are subdivision for specific development.

Thank you,

Mike Pesicka | Principal Planner
Douglas County Department of Community Development
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303-814-4367 **Main** | 303-660-7460
Email | mpesicka@douglas.co.us

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From: Doyle - DNR, Katie
To: Michael Pesicka
Subject: Re:Douglas County eReferral (Project Number SB2021-049) Is Ready For Review
Date: Tuesday, November 30, 2021 8:59:24 AM

Dear Mr. Pesicka,

Thank you for the opportunity to comment on the Pinery Village Filing 2 Minor Development under Project #SB2021-049. Our goal in responding to land use proposals such as this is to provide complete, consistent, and timely information to all entities who request comment on matters within our statutory authority.

Upon review of the proposed referral request, Colorado Parks and Wildlife (CPW) has no objections to the application moving forward as planned for approval. Please refer to the previous comment letter from CPW dated February 11, 2020 to Mr. Dan Avery for additional wildlife concerns and development recommendations.

Please do not hesitate to contact us about ways to continue developing and managing your properties in order to maximize wildlife value while minimizing potential conflicts. If you have any further questions, please contact me at (303) 291-7114.

Thank you,

Katie Doyle
District Wildlife Manager - Parker/Castle Rock East

Field Services

Denver Office 303.291.7227
C 720.930.8039 | P 303.291.7114
6060 Broadway, Denver, CO 80216
katie.doyle@state.co.us | www.cpw.state.co.us

December 2, 2021

Craig Campbell
West Region President
Starwood Land Advisors, LLC
385 Inverness Parkway, Suite 310
Englewood, CO 80112

DV 2021-332

Subject: Pinery Village Filing No. 2 – Minor Development Plat

Dear Craig,

Plan Review Summary:

Submitted to Engineering	-	11/4/21
Comments Sent Out	-	12/2/21

Engineering has reviewed the above referenced submittal and have the following comments:

Final Plat Comments

Comment #1-On sheet 1, it appears the Dedication Statement and Board of County Commissioners Certification are missing information. There is right-of-way being dedicated, easements, etc.

Comment #2-On sheet 2, please clarify why the extension of Pinery Center Blvd. is in a Tract.

Comment #3-The plat should provide a Tract for the North Piney Creek channel and the following language should be included for both the channel and the detention facilities: “Drainage Easements are hereby granted to Douglas County across Tracts _____& _____ in Pinery Village Filing No. 2 (the “Subdivision”) for the purpose of accessing, maintaining and repairing storm water management improvements, including but not limited to inlets, pipes, culverts, channels, ditches, hydraulic structures, riprap, detention basins, forebays, micropools and water quality facilities (collectively, the “Facilities”). In the event the Pinery Commercial Metropolitan District, its successors, and assigns (“System Owner”) fails to satisfactorily maintain said facilities, a blanket access easement over the subdivision is also granted to Douglas County, but only for the purpose of accessing the facilities in the event that the drainage easements do not provide adequate access. The maintenance and repair of the facilities located in the subdivision, as shown on the construction plans accepted by Douglas County or on the plat for the subdivision, shall be the responsibility of the system owner in the event such maintenance and repair are not performed by the system owner to the satisfaction of

Douglas County, then Douglas County shall have the right, but not the obligation to enter said subdivision after ten (10) prior written notice to the system owner. Unless there is an emergency, in which case Douglas County shall give notice as soon as practicable, to perform all necessary work, the cost of which shall be paid by the system owner upon billing. In the event the system owner fails to reimburse Douglas County within thirty (30) days after submission of the bill for the costs incurred, Douglas County shall have the right to enforce such obligation by appropriate legal action. It is the system owner's responsibility to construct, maintain, and repair the facilities in a manner consistent with all applicable plans approved or accepted by Douglas County".

Comment #4-The drainage channels/swales along the north & east side of the development should also be included in drainage easements.

Comment #5-Additional right-of-way for North State Highway 83 may be required. This portion of the corridor requires a minimum right-of-way width of 175-ft.

Comment #6-A Subdivision Improvements Agreement (SIA) will be required for this project. The applicant can get a copy of this document from our office or from the Douglas County website. When submitting this document, please provide us with 1-copy with original signatures. Please include a "letter of authorization" for whoever signs the agreement, and the cost estimate exhibits need to be signed by this individual as well. This document will need to be submitted and approved prior to the approval of the final plat.

GESC Comments

Comment #1-On sheet G0.0, please revise the wording of the Douglas County Acceptance Block as follows, "…Douglas County for GESC improvements only". This is a typical comment for all sheets with our signature block.

Comment #2-On sheet G0.1, please remove the Douglas County Acceptance Block from this sheet.

Comment #3-On sheet G0.2, please remove this sheet from the GESC package. The notes are included with our standard notes/detail sheets.

Comment #4-On sheet G1.1, rather than installing the silt fence across the future drainage channel, please look at another option of containing the sediment (check dam, etc.).

Comment #5-On sheets G1.1 – G1.10, please include the length for each segment of silt fence as well as each length of construction fence.

Comment #6-On sheet G1.2, the plans show “JB” (jersey barrier) within the proposed diversion ditches. Our standard details don’t include a detail for a jersey barrier. Please reference BMP’s that are included with our standard notes/detail sheets.

Comment #7-On sheets G1.2, G1.4, & G1.6 please specify the pipe diameter and riprap size for the proposed temporary slope drains.

Comment #8-On sheet G1.5, the proposed silt fence is shown crossing slopes steeper than 5%. Please stager the silt fence to keep from exceeding the 5% slope.

Comment #9-On sheet G1.8, a “temporary construction access” permit may be required for the access onto North Pinery Parkway.

Comment #10-On sheets G2.1 – G2.10, please specify the type and quantity for each area of erosion control blanket.

Comment #11-On sheet G2.3, please include cross sections for the proposed drainage swales.

Comment #12-On sheets G2.5 & G2.7, please show the grades along the easterly bank.

Comment #13-On sheet G2.8, please clarify the surface treatment at the northwesterly corner of the disturbance.

Construction Plan Comments

Comment #1-On sheets C1.1 & C1.2, please remove the Douglas County Acceptance Block from these sheets.

Comment #2-On sheet C1.2, it appears that the Douglas County Storm Sewer Notes are included in the Douglas County Standard Notes.

Comment #3-On sheet C1.2, please remove the pavement thickness from the details. The thickness will be determined by the pavement design report.

Comment #4-On sheet C1.2, please include the centerline stationing that coordinates with the proposed street cross sections.

Comment #5-On sheet C1.2, please relocate the proposed trench drain to the back of sidewalk.

Comment #6-On sheets C4.0 – C4.9, please remove these sheets from this construction package since the grading plans are included in a separate GESC package.

Comment #7-The detention pond calculations for the north pond shows a “depth to invert of outlet pipe” difference of 1.5-ft. (Outlet pipe w/ flow restriction plate). The plans show an elevation difference of 2-ft. Please revise.

Comment #8-On sheet C4.10, please clarify the 20-ft. driveway along the north side of the detention pond.

Comment #9-On sheet C4.10, please provide cross sections for the forebay and include the structural design. Also, please include the structural information for the connections between the baffle blocks and the forebay.

Comment #10-On sheet C4.10, please provide and dimension control joints for the forebay.

Comment #11-On sheet C4.11, please include the structural design for the outlet structure in Section D-D.

Comment #12-On sheet C4.11, please lower the front wall of the outlet structure to within 3 to 4-inches of the bottom of the micropool and the orifice plate needs to extend to the bottom of the micropool in Section D-D.

Comment #13-On sheet C4.11, please include the dimensions for the trash rack and orifice plate.

Comment #14-Please review the following information from the detention pond calculations for the south pond:

- Depth at top of Zone using Orifice Plate – shows 6.42-ft which doesn’t appear to be correct
- Clarify the number of orifices (we try and minimize the number to 3)
- Overflow Weir Front Edge Height – shows 6.42-ft. which doesn’t appear to be correct
- Depth to Invert of Outlet Pipe – shows 0.5-ft. which doesn’t appear to be correct
- Spillway invert Stage – shows 7.9-ft. which doesn’t appear to be correct

Comment #15-On sheet C4.12, please provide a cross section though Pinery Center Blvd. showing the road in relationship to the retaining wall.

Comment #16-On sheet C4.12, please provide cross sections for the forebay and include the structural design. Also, please include the structural information for the connections between the baffle blocks and the forebay.

Comment #17-On sheet C4.12, please provide and dimension control joints for the forebay.

Comment #18-On sheet C4.13, please include the structural design for the outlet structure in Section D-D.

Comment #19-On sheet C4.13, please lower the front wall of the outlet structure to within 3 to 4-inches of the bottom of the micropool and the orifice plate needs to extend to the bottom of the micropool in Section D-D.

Comment #20-On sheet C4.13, please include the dimensions for the trash rack and orifice plate.

Comment #21-On sheets C4.15 – C4.18, please verify the proposed handrail/guardrail meets AASHTO Roadside Design Guide for clear zone and crash criteria.

Comment #22-On sheets C4.15 – C4.18, a License Agreement will be required for the landscaping and retaining walls within the public right-of-way. I will provide you with our standard License Agreement document.

Comment #23-On sheet C4.19, please remove the Douglas County Acceptance Block from this sheet.

Comment #24-Engineering is not familiar with the hydraulic model that was used for this project and will request that the project engineer provide a comparison between this model and the UD-Sewer modeling supported by Urban Drainage & Flood Control District.

Comment #25-On sheet C6.1, please include the flowline transition profiles per Figure 4-6 of our road design manual (typical comment for all sump conditions).

Comment #26-On sheet C6.2, please clarify why manholes A7 & A8 are labeled twice in the profile.

Comment #27-On sheet C6.2, engineering has concerns regarding the proposed cover over the box culvert in regard to the future pavement section. Please look at lowering this box to account for the future pavement section (should be consistent with the storm sewer depths 3.5 to 4-ft.).

Comment #28-On sheet C6.3, the proposed Pinery Center Blvd. roadway improvements need to extend to the northerly property line.

Comment #29-On sheets C6.3 & C6.4, the depth of the proposed storm sewer is a concern (depth needs to be a minimum of 3.5 – 4-ft. without a preliminary pavement design).

Comment #30-On sheet C6.5, our drainage manual requires a 6-ft. manhole for a 48-in. pipe. Please revise.

Comment #31-On sheet C6.7, please clarify that the existing 36-in. pipe will be removed near manhole F4-A. Also, please include the invert information at both manholes.

Comment #32-On sheets C7.1 – C7.14, Douglas County is meeting with Mile High Flood District on Friday to discuss the proposed channel improvements. We will provide comments on the channel re-alignment within the next couple of weeks.

Comment #33-On sheets C7.15 & C7.16, the proposed open channel swales need to be designed per Chapter 8 (Volume 1) of the Mile High Flood Control Districts criteria manual. Please include their figures in the drainage report that applies to each channel section.

Comment #34-On sheets C11.1 & C11.2, our traffic group will be reviewing the signage & striping plans and once I get their comments, I will forward them to you.

Comment #35-Our traffic group has reviewed the traffic analysis and overall, there were no significant changes in the findings of the original traffic study. The purpose of the proposed updated traffic analysis was to incorporate two changes:

- Removal of a roadway connection to Hwy 83 (known as Access A, a 3/4 movement access).
- Changes to Land Use projection and trip generation at the north end of the project. 50,000 square feet of office use was added to the trip generation to replace the previously planned charter school. This results in a decrease of AM peak hour trips and a minor change to the PM peak hour trips.

<u>Required Improvements to accommodate the project are:</u>

- Access Permit for the project Access to US 83 – Right-in/Right-out – the currently issued State Hwy Access Permit for the RI/RO access to SH 83 north of North Pinery Parkway may need to be re-issued due to the increase in trips proposed to use this access (because of the elimination

of Access A which causes volumes using the access to exceed the original (original: 345 vph, new: 515 vph) – Access Permit for the Access at North Pinery Parkway & State Highway 83

- 2030 – US83/North Pinery Parkway – 2nd northbound left-turn lane & Modify the east leg of the median to include a new exclusive westbound left turn lane.
- North Pinery Parkway/Access C – Traffic signal – check warrants at build-out of project
- 2040 – North Pinery Parkway/Pinery Center Blvd. (J Morgan Blvd) – traffic signal
- Auxiliary Lane Evaluation – Access B & Parker Road (with initial development) – Southbound right-turn deceleration lane (378-ft. + 222-ft. taper, 600-ft. total length) – Southbound right-turn acceleration lane (tie into the exiting southbound right-turn deceleration lane approaching North Pinery Parkway, approximately 370-ft. south of Access B)
- Parker Road and Pinery Parkway (short-term) – Second northbound left-turn lane (build parallel to the existing 600-ft. total lane length)
- Parker Road and Pinery Parkway (long-term) – New eastbound left-turn lane (110-ft. lane + 60-ft. taper)

Landscaping Comments

Comment #1-On sheet L-01, please add the Douglas County Acceptance Block to this sheet.

Comment #2-On sheets L-05, please clarify the purpose of the driveway onto Pinery Center Blvd.

We cannot recommend approval of this final plat and/or construction plans until these comments have been addressed. If you have any questions, please give me a call.

Sincerely,

Chuck Smith
Development Review Engineer

cc: Matt Williams, P.E.; Assistant Director of Development Review & Stormwater
Mike Pesicka, AICP, Principal Planner

DV21332

December 2, 2021

Mike Pesicka
Principal Planner
Douglas County Community Development
100 Third Street
Castle Rock, CO 80104

Re: SB202-049 Pinery Village Filing No. 2 Minor Development

Dear Mr. Pesicka:

The letter provides comments regarding the Pinery Village Filing 2 Minor Development project to subdivide 77.32 acres into 4 non-residential lots and 6 tracts and the extension of Pinery Center Blvd to the north property line in Douglas County.

Upon researching the cultural resources on the property and the surrounding area the Douglas County Curator recommends a Class II cultural resource survey of the project area.

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

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

Sincerely,

Brittany Cassell

Brittany Cassell, Curator

From: Brittany Cassell
To: Michael Pesicka
Subject: RE: Cultural Resource Survey for Project No. SB2021-049
Date: Tuesday, March 29, 2022 8:18:27 AM

Hi Mike,

I have no questions or concerns on the report. Sounds like this property had a lot of activity in the past but nothing eligible to be listed on the National Register.

Thank you!
Brittany

From: Michael Pesicka <mpesicka@douglas.co.us>
Sent: Tuesday, March 29, 2022 8:02 AM
To: Brittany Cassell <bcassell@douglas.co.us>
Subject: RE: Cultural Resource Survey for Project No. SB2021-049

Hi Brittany, do you have any questions or concerns for the applicant about the Cultural Resource Survey for SB2021-049?

Thanks,

Mike Pesicka | Principal Planner
Douglas County Department of Community Development
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303-814-4367 **Main** | 303-660-7460
Email | mpesicka@douglas.co.us

From: Brittany Cassell <bcassell@douglas.co.us>
Sent: Thursday, March 17, 2022 2:33 PM
To: Michael Pesicka <mpesicka@douglas.co.us>
Subject: RE: Cultural Resource Survey for Project No. SB2021-049

Hi Mike,

Thank you for sharing this with me. I am glad the got the survey completed.

Thank you!
Brittany

From: Michael Pesicka <mpesicka@douglas.co.us>
Sent: Thursday, March 17, 2022 2:27 PM
To: Brittany Cassell <bcassell@douglas.co.us>
Subject: Cultural Resource Survey for Project No. SB2021-049

Hi Brittany,

During the referral process for Project No. SB2021-049, DC Historic Preservation recommended submittal of a Cultural Resource Survey. Attached is that survey from the applicant. Please let me know if you have any comments.

Thank you,

Mike Pesicka | Principal Planner
Douglas County Department of Community Development
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303-814-4367 **Main** | 303-660-7460
Email | mpesicka@douglas.co.us

From: Chuck Smith
To: Mark Cevaal; Laura Hinds
Cc: Michael Pesicka; Craig Campbell; William Conway; Jim Watt; Mary Powell
Subject: RE: Pinery Village Filing No. 2 - Vegetation Management Plan
Date: Friday, February 17, 2023 11:01:46 AM
Attachments: image002.png
image007.png
MEP - 109059 - Pinery Village F2 Design Approval Letter.msg

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Good Morning All,

Attached is the email from MHFD on the design approval for Pinery Village #2 – I thought I had send this out. However their approval is attached

Thanks

From: Mark Cevaal <mcevaal@redland.com>
Sent: Monday, January 9, 2023 5:06 PM
To: 'Laura Hinds' <lhinds@mhfd.org>
Cc: Michael Pesicka <mpesicka@douglas.co.us>; Chuck Smith <CSmith@douglas.co.us>; Craig Campbell <ccampbell@starwoodland.com>; William Conway <wconway@redland.com>; 'Jim Watt' <jwatt@mhfd.org>; 'mpowell@mhfd.org' <mpowell@mhfd.org>
Subject: Pinery Village Filing No. 2 - Vegetation Management Plan

Laura,
Please find attached a revised Vegetation Management Plan for Pinery Village Filing No. 2 along with our responses to the comments. We have incorporated Mary's recommendations into the Plan.

Let us know if you have any questions.

Thanks,

MARK CEVAAL, P.E.
Sr. Project Manager
Associate Principal

signature_931543734

1500 West Canal Court
Littleton, CO 80120
Office: (720) 283-6783 x136
Cell: (303) 517-2464

mcevaal@redland.com
www.redland.com

From: Chuck Smith <CSmith@douglas.co.us>
Sent: Thursday, December 22, 2022 12:51 PM
To: Mark Cevaal <mcevaal@redland.com>; Craig Campbell <ccampbell@starwoodland.com>
Cc: Michael Pesicka <mpesicka@douglas.co.us>
Subject: [External] FW: Pinery Commercial - Drainage

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Good Afternoon All,

Attached are a couple of comments from MHFD regarding the weed management plan

Hope you all have a Merry Christmas!!

From: Laura Hinds < >
Sent: Thursday, December 22, 2022 12:08 PM
To: Chuck Smith <CSmith@douglas.co.us>
Cc: Jim Watt < >; Mary Powell < >
Subject: RE: Pinery Commercial - Drainage

Hi Chuck,
Please see attached - the MHFD Environmental Manager, Mary Powell, review the Vegetation Management plan and provided her feedback. There were a few recommendations on the values in the tables but overall felt it was a well thought out plan.

Please let us know if there are any questions or concerns.

Thank you,

Laura

Laura Hinds, P.E.
MILE HIGH FLOOD DISTRICT

From: Chuck Smith <CSmith@douglas.co.us>
Sent: Thursday, December 15, 2022 12:48 PM
To: Jim Watt <jwatt@mhfd.org>
Cc: Laura Hinds <lhinds@mhfd.org>

Subject: RE: Pinery Commercial - Drainage

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hi Jim & Laura

Attached is the applicants vegetation management plan and a response to comments (I highlighted MHFD response in yellow). If you need anything else, please let me know

Thanks

From: Jim Watt <jwatt@mhfd.org>
Sent: Tuesday, November 8, 2022 10:24 AM
To: Chuck Smith <CSmith@douglas.co.us>
Cc: Laura Hinds <lhinds@mhfd.org>
Subject: RE: Pinery Commercial - Drainage

Chuck,

Thanks for coordinating the Pinery meeting today. I wanted to reshare this attached email with the vegetation management plan template that we discussed. Let me know if there is a need for any follow up outside of the direct coordination with the developer.

Could you help me to understand if the county has other processes or report products that may overlap with a revegetation management plan? Outside of the SWMP are there any other weed management plans that the County already requires?

Thanks,
Jim

Jim Watt, P.E., CFM
Watershed Manager
MILE HIGH FLOOD DISTRICT
2480 W. 26th Ave. Suite 156-B | Denver, CO 80211
Office: 303-455-6277 | **Direct:** 303-749-5455 | www.mhfd.org

Protecting People, Property, and our Environment

From: Jim Watt
Sent: Thursday, October 27, 2022 2:59 PM
To: Chuck Smith <CSmith@douglas.co.us>
Cc: Laura Hinds <lhinds@mhfd.org>
Subject: RE: Pinery Commercial - Drainage

Hi Chuck – Thanks for reaching out to coordinate on this topic.

Is the current request from Starwood to forego this Vegetation Management Plan altogether or just for the exclusion area that they highlighted?

The only outstanding comment that MHFD has for this project is to provide a vegetation management plan for the low flow channel and the spill floodplain channel associated with North Piney Creek. This request and the template for the plan were provided with our 6/1/22 comments. Ultimately, for this to reach final acceptance we will look for these areas to be established with planned native vegetation and be reasonably weed free. We have found from past projects that proper establishment of native vegetation and weed control took a signification additional effort after construction to reach establishment, so as a result, we will be looking to have this vegetation management plan in place for these types of larger MEP efforts. The goal is to have a guidance document for the developer / contractor to follow which will result in the vegetation community required by the design team. The upfront costs of this vegetation management plan will likely save money over the duration of the project by guiding proactive management of the revegetation process.

Not long ago, we had a meeting with the development team to discuss the vegetation management plan comment and I had thought we cleared up the work area to exclude the Cherry Creek floodplain on only focus on the North Piney Creek floodplain. Apologies that the County was not in attendance for that meeting. This project is very unusual in the that the active channel and the floodplain diverge, so I can understand how this island exclusion area is presenting issues. I have attached a figure that shows the specific MHFD area of interest for the vegetation management plan. While MHFD will not focus on the areas that Starwood has highlighted, we do think that a proactive management of this area should be encouraged if not required by the County. I have not seen the condition of the Starwood exclusion area, so it is difficult to determine if issues in this exclusion area will spill over into the adjacent North Piney Creek areas that we are considering for MEP. Work performed on for development by ERO has documented weed issues with the area, so at a minimum, MHFD reserves the right to comment on the condition of the vegetation in this area once we reach the final establishment phases of the MEP process. I recognize and agree with Starwood that managing weeds and reestablishing a native vegetation community in this upland Cherry Creek and N. Piney Creek floodplain area is going to be difficult. However, I believe that it is achievable and that this change in land use / management responsibilities is the appropriate time to address the issue.

Let me know if a follow up conversation is needed.

Sincerely,

Jim

From: Laura Hinds <lhinds@mhfd.org>
Sent: Wednesday, October 26, 2022 9:36 AM
To: Jim Watt <jwatt@mhfd.org>
Subject: FW: Pinery Commercial - Drainage

Laura Hinds, P.E.
Project Engineer
MILE HIGH FLOOD DISTRICT
2480 W. 26th Ave Suite 156-B | Denver, CO 80211
Office: 303-455-6277 | **Direct:** 303-929-8342 | www.mhfd.org

Protecting People, Property, and our Environment

From: Chuck Smith <CSmith@douglas.co.us>
Sent: Tuesday, October 25, 2022 11:36 AM
To: Laura Hinds <lhinds@mhfd.org>
Subject: Pinery Commercial - Drainage

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Good Morning Laura,

I had a conversation with Craig Campbell from Starwood Land regarding MHFD's comments regarding the vegetation of the floodplain. I talked with Brad Robenstein this morning to get his thoughts and I know the owner is willing to provide weed control for their property, however they are not comfortable to try and get significant coverage within the shaded area (see attached exhibit). There point is they are not disturbing this area and since it will be dry the majority of the time, it would be difficult to get much to grow.

Just wanted to see if there was a way to work around this requirement and not hold up maintenance eligibility.

Thanks for your time

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

MILE HIGH FLOOD DISTRICT

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

www.mhfd.org

For MHFD staff use only.	
MHFD Project ID:	109059
Design Approval:	01/13/2023
Construction Approval:	Not yet completed
Final Acceptance:	Not yet completed

Date: January 13, 2023
To: Chuck Smith (Douglas)
Via email
Subject: Approval of Design for Maintenance Eligibility Features

Project Name:	Pinery Village Filing 2 (PVF2)
Date of Plans:	08/15/2022 (C1.0, C4.1-C4.4, C6.12, C7.1, C7.2, C12.4, C12.6)
Description of MEP Features:	North detention pond outfall and spillway to Cherry Creek South detention pond outfall and spillway to North Pinery Creek North Pinery Creek channel and floodplain

The construction plans and specifications for maintenance eligible features in the referenced project are hereby approved. The project will be eligible for District maintenance assistance upon satisfactory construction per the approved design and certification of maintenance eligibility (final acceptance) as determined by the District. **Construction must begin within two years of the date of this memorandum, or the design approval will expire.** This project may require federal, state, or local permits in addition to this design approval. The District will follow the procedure listed below to ascertain the acceptability of the construction effort. Your assistance with this procedure will be necessary to qualify the project for District maintenance assistance. The District staff, or consultants retained by the District, will observe construction activities.

1) The District or its consultant may conduct site visits during project construction as deemed necessary to observe construction activities for conformance with the approved design. All grouted boulder installations must receive a pre-grout sign-off. Construction deficiencies should be reported to your contact, who will take the necessary actions to correct deficiencies. Such visits will not relieve the local government, the owner (developer), or the contractor of the obligation to construct the project per the approved design. The design consultant should maintain a presence during the construction phase to clarify the design intent and verify construction surveys and layout.
2) Upon completion of the project, representatives from the District or its consultant, local government, contractor, design consultant, and the owner (developer) shall conduct a walk-through inspection of the project and prepare a list of deficiencies (punch list) to be corrected. The local government is responsible for arranging the inspection.
3) When the punch list items have been addressed, the local government should notify the District to inspect the project again. If the project is adequate, written notice of construction acceptance for maintenance eligibility will be sent to you (MEP Step 2 of 3).
4) Grass-lined facilities will be eligible for maintenance assistance after an adequate vegetative cover is established.
5) Changes to approved designs can only be made using the "Notice of Change to Approved Design" form (enclosed).

We look forward to working with you on this project.

Sincerely,

Jim Watt, P.E., CFM
Watershed Manager, Mile High Flood District
jwatt@mhfd.org

Enclosed: MHFD Project Contact Information Request (*To be filled out and returned with approved plans)*
Notice of Change to Approved Design (Blank Form)
Design Approval Exhibit (MEP ID: #109059)

MILE HIGH FLOOD DISTRICT
2480 W. 26th Ave Suite 156-B | Denver, CO 80211
TEL 303 455 6277 | FAX 303 455 7880
www.mhfd.org

MAINTENANCE ELIGIBILITY PROGRAM (MEP)

Notice of Change to Approved Design

MEP ID:	
Change No.	
Change Date:	
Design Approval Date:	

Project Name:

Description of changes made to Approved Design (attach appropriate drawings, specifications, or calculations):

Justification:

Impact of change on function of the facility, channel or features:

APPROVALS REQUIRED

CONTACT	PRINTED	SIGNED	DATE
Design Consultant			
Owner/Developer			
Local Government			
Contractor			
MHFD			

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

Mike Pesicka, Principal Planner
Douglas County Department of Community Development, Planning Services
100 Third St
Castle Rock Co 80104
303.660.7460
303.660.9550 Fax

Project Name:	Pinery Village Filing No. 2 – Minor Development
Project File #:	**SB2021-049**
S Metro Review #	REFRP21-00240
Review date:	November 22, 2021
Plan reviewer:	Aaron Miller 720.989.2246 aaron.miller@southmetro.org
Project Summary:	Proposed Minor Development to subdivide 77.32 acres into 4 non-residential lots and 6 tracts and the extension of Pinery Center Blvd to the north property line. The property is zoned Planned Development and is located in the northeast portion of the County, approximately one-quarter mile north of North Pinery Parkway and west of State Highway 83 and partially bordered on the north by the Town of Parker.
Code Reference:	Douglas County Fire Code, 2018 International Fire Code, and 2018 International Building Code with amendments as adopted by Douglas County.

South Metro Fire Rescue (SMFR) has reviewed the provided documents and has no objections to the proposed minor development. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project.

November 29, 2021

Mike Pesicka
Douglas County Department of Community Development
Planning Services Division
100 Third Street
Castle Rock, CO 80104

RE: Pinery Village Filing 2, SB2021-049
TCHD Case No. 7349

Dear Mr. Pesicka,

Thank you for the opportunity to review and comment on the Minor Development to subdivide 77.32 acres into 4 non-residential lots and 6 tracts and the extension of Pinery Center Blvd to the north property line, located in Pinery West. Tri-County Health Department (TCHD) staff has reviewed the application for compliance with applicable environmental and public health regulations and principles of healthy community design. After reviewing the application, TCHD has the following comments.

Water and Sewer Service
A will-serve letter has been provided by Pinery Water and Wastewater District. Based on this letter, TCHD is providing a favorable recommendation regarding the proposed method of sewage disposal.

Community design to support walking and bicycling
Because chronic diseases related to physical inactivity and obesity now rank among the country's greatest public health risks, TCHD encourages community designs that make it easy for people to include regular physical activity, such as walking and bicycling, in their daily routines. Because research shows that the way we design our communities can encourage regular physical activity, TCHD strongly supports community plans that incorporate pedestrian and bicycle amenities that support the use of a broader pedestrian and bicycle network. Increasing multi-modal transportation has additional co-benefits including improved air quality, which can reduce contributions to climate change and exposure to pollutants associated with a number of health problems including asthma, lung cancer, and heart disease.

In order to promote walking and bicycling through this development, TCHD encourages the applicant to consider the inclusion of the following as they design the community.

- A system of sidewalks, bike paths and open space trail networks that are well-designed and well-lit, safe, and attractive so as to promote bicycle and pedestrian use.

- Bicycle and pedestrian networks that provide direct connections between destinations in and adjacent to the community.

- Where public transportation systems exist, direct pedestrian access should be provided to increase transit use and reduce unnecessary vehicle trips, and related vehicle emissions. The pedestrian/bicycle networks should be integrated with the existing and future transit plans for the area.

- Streets that are designed to be pedestrian/bike friendly and to reduce vehicle and pedestrian/bicycle fatalities.

- Bicycle facilities and racks are provided in convenient locations.

Please feel free to contact me at 720-200-1575 or kboyer@tchd.org if you have any questions on TCHD's comments.

Sincerely,

Kathy Boyer, REHS
Land Use and Built Environment Specialist III

cc: Sheila Lynch, Keith Homersham, TCHD

External Referral Comments

TO: Mike Pesicka, Douglas County Planning

FROM: Pam Hall, Planner I Development Services Department

DATE: November 12, 2021

SUBJECT: COU21-0029, Case No. SB2021-049

Thank you for the opportunity to review and respond to the Pinery Village Filing 2, Minor Development. The application was reviewed by various Town Departments with no concerns from the Town reviewers. Please keep us informed of any changes to the proposal. Thank you.

DEVELOPMENT SERVICES
100 North Wilcox Street, Castle Rock, CO 80104. P: 720.733.2205 F: 720.733.2217 E: phall@crgov.com

REFERRAL RESPONSE REQUEST

Date sent: November 4, 2021

Comments due by: **December 2, 2021**
Fax: 303.660.9550

Project Name:	Pinery Village Filing No. 2 - Minor Development
Project File #:	SB2021-049
Project Summary:	Proposed Minor Development to subdivide 77.32 acres into 4 non-residential lots and 6 tracts and the extension of Pinery Center Blvd to the north property line. The property is zoned Planned Development and is located in the northeast portion of the County, approximately one-quarter mile north of North Pinery Parkway and west of State Highway 83 and partially bordered on the north by the Town of Parker.

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

☐ No Comment	
☐ Please be advised of the following concerns:	
☒ See letter attached for detail.	
Agency: Town of Parker	**Phone #:** (303) 805-3331
Your Name: Carson Byerhof	**Your Signature:**
(please print)	**Date:** December 3, 2021

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

Sincerely,

Mike Pesicka, Principal Planner

PARKER COLORADO

Your kind of place.

TO:	Mike Pesicka, Principal Planner Douglas County Department of Community Development 100 Third St. Castle Rock, Colorado 80104
FROM:	Carson Byerhof Planner I
DATE:	December 3, 2021
SUBJECT:	SB2021-049 | Pinery Village Filing No. 2 – Minor Development

Dear Mike,

Thank you for the opportunity to review the SB2021-049 | Pinery Village Filing No. 2 – Minor Development. At this time, the Town of Parker Community Development Department has the following comments on this case:

1. The Town has platted the lot just north of what is proposed as Tract A, multi-family. Please be sensitive with uses, landscape buffering, and design standards for proposed lots 1 and 2 (PA 42 and PA 43).

2. Please incorporate pedestrian-friendly infrastructure between RTD and the Town along Pinery Center Blvd.

3. Please reference the attached documents which redline these comments.

In addition to the comments above, please reference the following comments from a previous referral for this site:

Referral Response Comments: *from ZR2018-038, December 10, 2018*

1. The Pinery Village Minor Development is located within the Town's 2035 Master Plan Planning Area and Three-Mile Plan map, and qualifies for annexation into the Town of Parker. The Town supports and welcomes discussions for annexation and rezoning of this property into the Town of Parker.

2. The Concept Site Plan from the project Traffic Impact Study, dated December 13, 2018, shows a site plan with commercial/retail development located adjacent to Parker Road. The Town encourages primary building frontages to front or side with Parker Road, to create a consistent

setback, street wall, and streetscape. Buildings that side with Parker Road are encourage to have enhanced architectural design. To minimize the view of parking lots from Parker Road, parking lots are encouraged to be located away from view of Parker Road, on the sides or rear of buildings.

3. Each proposed retail site is encouraged to provide pedestrian/bicycle connectivity from the primary façade of each building, as well as along Parker Road. Enhanced landscaping along Parker Road is also encouraged.

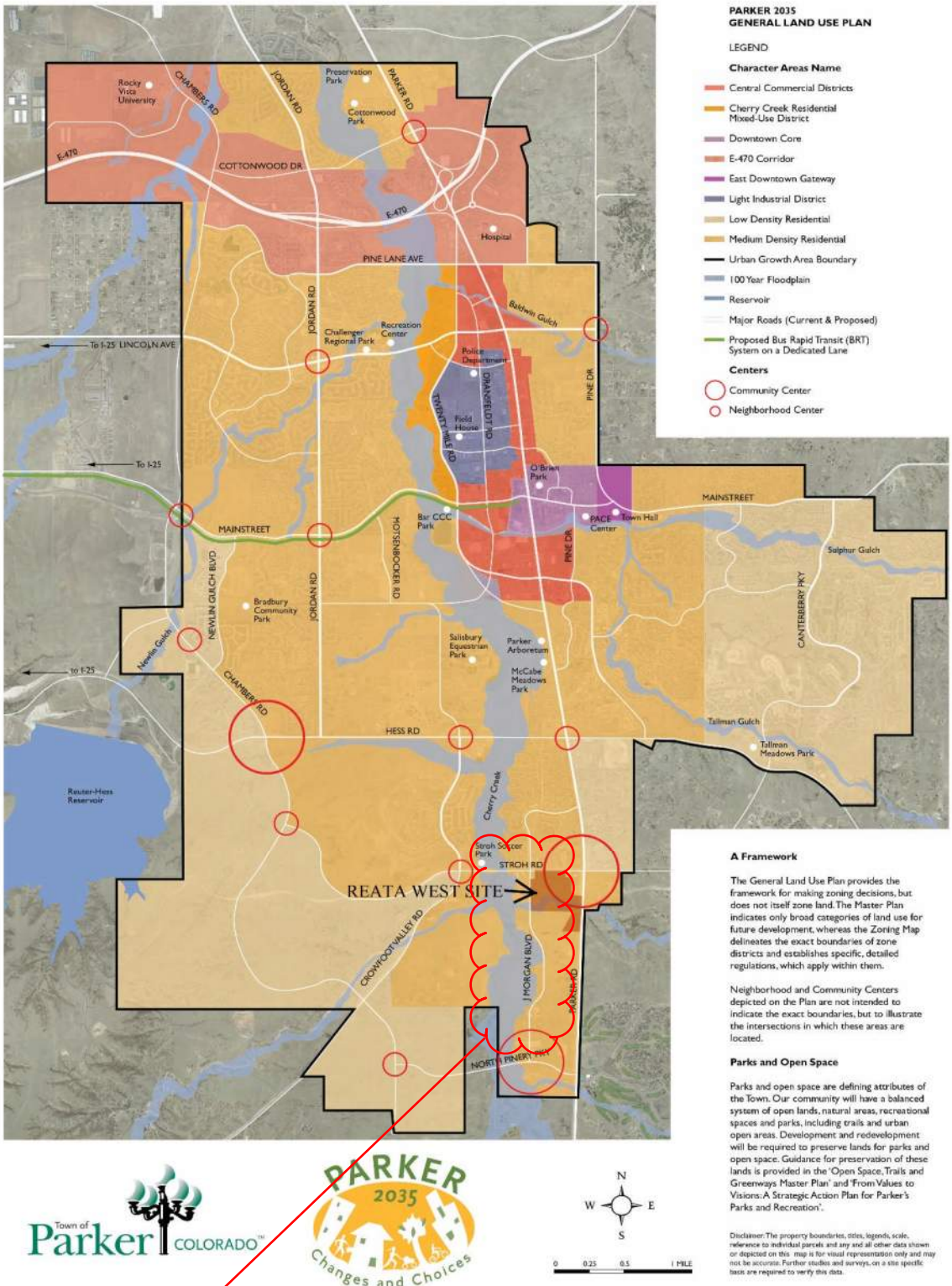
End of Town of Parker comments. Please feel free to contact me at 303-805-3331 or cbyerhof@parkeronline.org if you have any questions.

Sincerely,

Carson Byerhof
Planner I

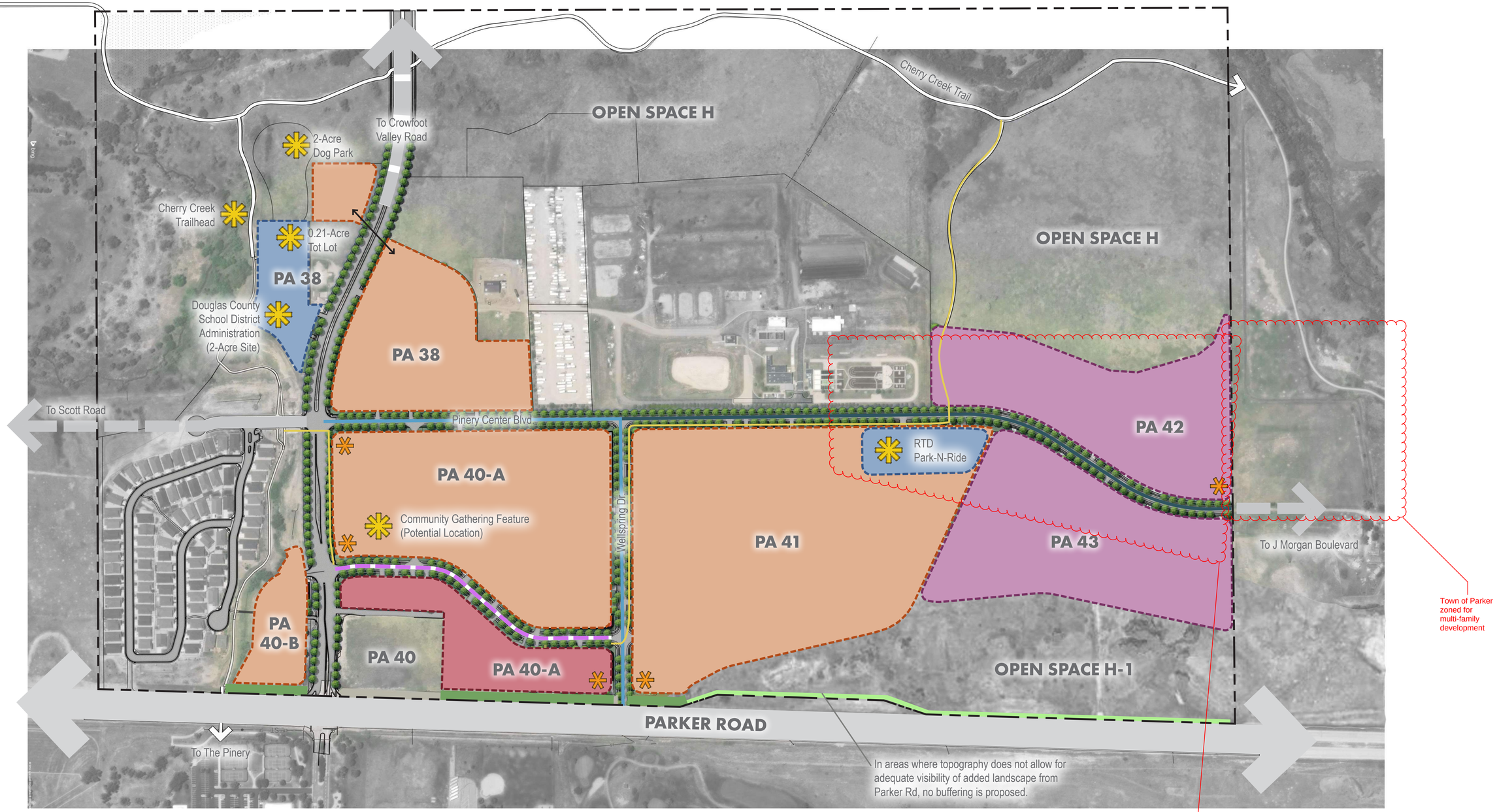
Signature

December 3, 2021
Date



Note plans to expand J Morgan Blvd. to N. Pinery Pkwy (See Reata West Plan Report for more details)

Illustration 2. – Parker General Land Use Plan (with site identified)



LEGEND

Proposed Improvements
- Collector Roadway (Detached Sidewalk)
- Collector Roadway (Attached Sidewalk)
- Parker Road Landscape Buffer
- Site Improvement Plan Related Landscape Buffer
- Pedestrian circulation to Cherry Creek Trail

Future Development
- Roadway Extension
- Internal Pedestrian-Oriented Roadway
- Site Improvement Amenity/Commitment
- Monumentation (Proposed)

Potential Land Uses
- Public Services
- Community Mixed-Use Commercial
- Community-Serving Retail
- Mixed-Use Industrial

PINERY WEST | MASTER LANDSCAPE AND PEDESTRIAN FRAMEWORK PLAN

10/15/2021

NORTH

NOT TO SCALE

NORRIS DESIGN
Planning | Landscape Architecture | Branding

Right of Way & Permits

1123 West 3rd Avenue
Denver, Colorado 80223
Telephone: **303.571.3306**
Facsimile: 303. 571. 3284
donna.l.george@xcelenergy.com

December 8, 2021

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

Attn: Mike Pesicka

Re: Pinery Village Filing No. 2 Minor Development, Case # SB2021-049

Public Service Company of Colorado's (PSCo) Right of Way and Permits Referral Desk has reviewed the documentation for **Pinery Village F2** and requests that 10-foot-wide dry utility easements are dedicated around the perimeter of each lot, and 15-feet abutting all major rights-of-way.

PSCo requests that the following language or plat note is added to the preliminary and final plats for the subdivision:

> *Permanent structures, improvements, objects, buildings, wells, water meters and other objects that may interfere with the utility facilities or use thereof (Interfering Objects) shall not be permitted within said utility easements and the utility providers, as grantees, may remove any Interfering Objects at no cost to such grantees, including, without limitation, vegetation. Public Service Company of Colorado (PSCo) and its successors reserve the right to require additional easements and to require the property owner to grant PSCo an easement on its standard form.*

Public Service Company has an existing high-pressure natural gas transmission pipeline including a regulator station and associated land rights as shown within this property and it has determined that an **engineering review** is necessary. Any activity including grading, proposed landscaping, erosion control or similar activities involving our existing right-of-way will require Public Service Company approval. Encroachments across PSCo's easements must be reviewed for safety standards, operational and maintenance clearances, liability issues, and acknowledged with a Public Service Company License Agreement to be executed with the property owner. PSCo is requesting that, prior to any final approval of the plat, it is the responsibility of the property owner/developer/contractor to contact PSCo's Encroachment Team for development plan review and execution of a License Agreement (upload all files in PDF format) at: https://www.xcelenergy.com/encroachment_application (click *Colorado* if necessary). An engineer will then be in contact to request specific plan sheets.

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

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

All easement labels referenced as "XCEL" must be changed to "PSCO". Although "branded" as Xcel Energy, the legal owner and operator of the utility facilities in Colorado is Public Service Company of

Colorado. All utility facilities and related land rights, including fee property, easements, permits, etc., are owned by, operated by and held in the name of Public Service Company of Colorado, a Colorado Corporation.

As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 to have all utilities located prior to any construction.

Donna George
Right of Way and Permits
Public Service Company of Colorado / Xcel Energy
Office: 303-571-3306 – Email: donna.l.george@xcelenergy.com

Right of Way & Permits

1123 West 3rd Avenue
Denver, Colorado 80223
Telephone: **303.571.3306**
Facsimile: 303.571.3284
Donna.L.George@xcelenergy.com

February 12, 2026

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

Attn: Mike Pesicka

Re: * AMENDED RESPONSE
Pinery Village Filing No. 2 Minor Development, Case # SB2021-049

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the plan for **Pinery Village F2**. Please note that all easement labels referenced as "XCEL" must be changed to "PSCO". Although "branded" as Xcel Energy, the legal owner and operator of the utility facilities in Colorado is Public Service Company of Colorado. All utility facilities and related land rights, including fee property, easements, permits, etc., are owned by, operated by and held in the name of Public Service Company of Colorado, a Colorado Corporation.

Public Service Company has an existing high-pressure natural gas transmission pipeline including a regulator station and associated land rights as shown within this property and it has determined that an **engineering review** is necessary. Any activity including grading, proposed landscaping, erosion control or similar activities involving our existing right-of-way will require Public Service Company approval. Encroachments across PSCo's easements must be reviewed for safety standards, operational and maintenance clearances, liability issues, and acknowledged with a Public Service Company License Agreement to be executed with the property owner. PSCo is requesting that, prior to any final approval of the plat, it is the responsibility of the property owner/developer/contractor to contact PSCo's Encroachment Team for development plan review and execution of a License Agreement (upload all files in PDF format) at: cloud.marketing.xcelenergy.com/encroachment.

The property owner/developer/contractor must complete the application process for any new natural gas service, or modification to existing facilities via Building and Remodeling | Partner Resources | Xcel Energy. It is then the responsibility of the developer to contact the Xcel Designer assigned to the project for approval of design details.

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

Contact Colorado 811 for utility locates prior to construction.

Donna George
Right of Way and Permits
Public Service Company of Colorado dba Xcel Energy
Office: 303-571-3306 – Email: donna.l.george@xcelenergy.com

Redland
WHERE GREAT PLACES BEGIN
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February 25, 2022

Mr. Mike Pesicka
Douglas County
100 Third Street #220
Castle Rock, CO 80104

Re: Pinery Village Filing No. 2 – Minor Development Plat
2nd submittal – Final Plat and Construction Documents
Response to Comments

Dear Mr. Pesicka,

Please accept this letter on behalf of TF Pinery West, LP, the applicant for Pinery Village Filing No.2. We received your comments and referral comments on December 02, December 06, December 14 and December 16, 2021, regarding the application and we offer the following responses:

Douglas County – Development Review Engineer

Final Plat Comments

1. *On sheet 1, it appears the Dedication Statement and Board of County Commissioners Certification are missing information. There is right-of-way being dedicated, easements, etc.*
   Response: Both statements: Dedication and Board of County Commissioners have been added to the Cover Sheet.

2. *On sheet 2, please clarify why the extension of Pinery Center Blvd. is in a Tract.*
   Response: The future right-of-way for Pinery Center Boulevard is now shown at Right-of-way on the revised Plat.

3. *The plat should provide a Tract for the North Piney Creek channel and the following language should be included for both the channel and the detention facilities: "Drainage Easements are hereby granted to Douglas County across Tracts ____&_____ in Pinery Village Filing No. 2 (the "Subdivision") for the purpose of accessing, maintaining and repairing storm water management improvements, including but not limited to inlets, pipes, culverts, channels, ditches, hydraulic structures, riprap, detention basins, forebays, micropools and water quality facilities (collectively, the "Facilities"). In the event the Pinery Commercial Metropolitan District, its successors, and assigns ("System Owner") fails to satisfactorily maintain said facilities, a blanket access easement over the subdivision is also granted to Douglas County, but only for the purpose of accessing the facilities in the event that*

the drainage easements do not provide adequate access. The maintenance and repair of the facilities located in the subdivision, as shown on the construction plans accepted by Douglas County or on the plat for the subdivision, shall be the responsibility of the system owner in the event such maintenance and repair are not performed by the system owner to the satisfaction of Douglas County, then Douglas County shall have the right, but not the obligation to enter said subdivision after ten (10) prior written notice to the system owner. Unless there is an emergency, in which case Douglas County shall give notice as soon as practicable, to perform all necessary work, the cost of which shall be paid by the system owner upon billing. In the event the system owner fails to reimburse Douglas County within thirty (30) days after submission of the bill for the costs incurred, Douglas County shall have the right to enforce such obligation by appropriate legal action. It is the system owner's responsibility to construct, maintain, and repair the facilities in a manner consistent with all applicable plans approved or accepted by Douglas County".
Response: The note has been added. Tracts A, B, C and E have drainage improvements within the Tract.

4. *The drainage channels/swales along the north & east side of the development should also be included in drainage easements.*
Response: The drainage easements have been added.

5. *Additional right-of-way for North State Highway 83 may be required. This portion of the corridor requires a minimum right-of-way width of 175-ft.*
Response: A 2.5' width of additional ROW is being dedicated to the County in Tract F which will provide the required half ROW width of 87.5'.

6. *A Subdivision Improvements Agreement (SIA) will be required for this project. The applicant can get a copy of this document from our office or from the Douglas County website. When submitting this document, please provide us with 1-copy with original signatures. Please include a "letter of authorization" for whoever signs the agreement, and the cost estimate exhibits need to be signed by this individual as well. This document will need to be submitted and approved prior to the approval of the final plat.*
Response: Acknowledged.

GESC Comments

1. *On sheet G0.0, please revise the wording of the Douglas County Acceptance Block as follows, "…Douglas County for GESC improvements only". This is a typical comment for all sheets with our signature block.*
Response: Block revised with note

2. *On sheet G0.1, please remove the Douglas County Acceptance Block from this sheet.*
Response: Block has been removed

3. *On sheet G0.2, please remove this sheet from the GESC package. The notes are included with our standard notes/detail sheets.*
   Response: Sheet has been removed

4. *On sheet G1.1, rather than installing the silt fence across the future drainage channel, please look at another option of containing the sediment (check dam, etc.).*
   Response: Check dam has been added to plans.

5. *On sheets G1.1 – G1.10, please include the length for each segment of silt fence as well as each length of construction fence.*
   Response: Lengths added to each segment of silt fence and Construction Fence.

6. *On sheet G1.2, the plans show "JB" (jersey barrier) within the proposed diversion ditches. Our standard details don't include a detail for a jersey barrier. Please reference BMP's that are included with our standard notes/detail sheets.*
   Response: Jersey Barriers have been removed and erosion control material added to diversion ditches.

7. *On sheets G1.2, G1.4, & G1.6 please specify the pipe diameter and riprap size for the proposed temporary slope drains.*
   Response: Pipe Diameter and Riprap size added to plans.

8. *On sheet G1.5, the proposed silt fence is shown crossing slopes steeper than 5%. Please stager the silt fence to keep from exceeding the 5% slope.*
   Response: Silt Fences adjusted to account for crossing slopes exceeding 5%.

9. *On sheet G1.8, a "temporary construction access" permit may be required for the access onto North Pinery Parkway.*
   Response: Acknowledged.

10. *On sheets G2.1 – G2.10, please specify the type and quantity for each area of erosion control blanket.*
    Response: Added Erosion Control Specifications.

11. *On sheet G2.3, please include cross sections for the proposed drainage swales.*
    Response: Reference Drainage Report for Swale Design.

12. *On sheets G2.5 & G2.7, please show the grades along the easterly bank.*
    Response: Grades are displayed on sheets G2.5 & G2.7.

13. *On sheet G2.8, please clarify the surface treatment at the northwesterly corner of the disturbance.*
    Response: Added the surface treatment in affected area.

Construction Plan Comments

1. *On sheets C1.1 & C1.2, please remove the Douglas County Acceptance Block from these sheets.*
   Response: Approval block has been removed from these sheets.

2. *On sheet C1.2, it appears that the Douglas County Storm Sewer Notes are included in the Douglas County Standard Notes.*
   Response: Douglas County Storm Sewer notes have been removed from C1.2.

3. *On sheet C1.2, please remove the pavement thickness from the details. The thickness will be determined by the pavement design report.*
   Response: Pavement thickness has been removed from the details.

4. *On sheet C1.2, please include the centerline stationing that coordinates with the proposed street cross sections.*
   Response: Centerline stationing has been added to the street cross sections.

5. *On sheet C1.2, please relocate the proposed trench drain to the back of sidewalk.*
   Response: Proposed trench drain has been relocated to the back of the sidewalk.

6. *On sheets C4.0 – C4.9, please remove these sheets from this construction package since the grading plans are included in a separate GESC package.*
   Response: Sheets C4.0 – C4.9 have been removed from the CD package.

7. *The detention pond calculations for the north pond shows a "depth to invert of outlet pipe" difference of 1.5-ft. (Outlet pipe w/ flow restriction plate). The plans show an elevation difference of 2-ft. Please revise.*
   Response: Pond spreadsheet has been revised to properly show the top of the micropool to be 5931.50. Pond outfall has been lowered to lowest possible location that allows the pond outfall to drain 2.10' below the trickle channel.

8. *On sheet C4.10, please clarify the 20-ft. driveway along the north side of the detention pond.*
   Response: Maintenance access road has been labeled.

9. *On sheet C4.10, please provide cross sections for the forebay and include the structural design. Also, please include the structural information for the connections between the baffle blocks and the forebay.*
   Response: Structural design for pond infrastructure to follow after approval of CDs and Drainage Report.

10. *On sheet C4.10, please provide and dimension control joints for the forebay.*
    Response: Structural design for pond infrastructure to follow after approval of CDs and Drainage Report.

11. *On sheet C4.11, please include the structural design for the outlet structure in Section D-D.*
Response: Structural design for pond infrastructure to follow after approval of CDs and Drainage Report.

12. *On sheet C4.11, please lower the front wall of the outlet structure to within 3 to 4-inches of the bottom of the micropool and the orifice plate needs to extend to the bottom of the micropool in Section D-D.*
Response: Pond outfall has been lowered to lowest possible location that allows the pond outfall to drain 2.10' below the trickle channel. Pond outfall and outflow pipe to be revised further with downstream channel redesign.

13. *On sheet C4.11, please include the dimensions for the trash rack and orifice plate.*
Response: Refer to Water Quality Orifice Plate, Section H-H, and Section I-I detail for dimensions. Section I-I details has been updated.

14. *Please review the following information from the detention pond calculations for the south pond:*
    - *Depth at top of Zone using Orifice Plate – shows 6.42-ft which doesn't appear to be correct*
    - *Clarify the number of orifices (we try and minimize the number to 3)*
    - *Overflow Weir Front Edge Height – shows 6.42-ft. which doesn't appear to be correct*
    - *Depth to Invert of Outlet Pipe – shows 0.5-ft. which doesn't appear to be correct*
    - *Spillway invert Stage – shows 7.9-ft. which doesn't appear to be correct*

    Response:
    - Depth at top of Zone using Orifice Plate has been updated to reflect UD-Detention. Overflow weir is located at stage 4.17, or 6.67 above front end of micropool. At the orifice plate and trash rack, the depth is 6.93'.
    - Number Orifices has been reduced to three
    - Overflow weir front edge height has been updated to reflect UD-Detention
    - Depth to invert of orifice plate is 2.10'. This has been updated in UD-Detention spreadsheet.
    - UD-Detention has been updated with the correct Top of Micropool elevation of 5931.50. The spillway invert is at stage 5.00 at elevation of 5936.50. The top of the berm is situated at 5939.10 and with a flow depth of 1.05', provides over 1' of freeboard.

15. *On sheet C4.12, please provide a cross section though Pinery Center Blvd. showing the road in relationship to the retaining wall.*
Response: Cross section is available on page C1.2 that displays the relationship of the roadway and the retaining wall.

16. *On sheet C4.12, please provide cross sections for the forebay and include the structural design. Also, please include the structural information for the connections between the baffle blocks and the forebay.*
Response: Structural design for pond infrastructure to follow after approval of CDs and Drainage Report.

17. *On sheet C4.12, please provide and dimension control joints for the forebay.*
Response: Structural design for pond infrastructure to follow after approval of CDs and Drainage Report.

18. *On sheet C4.13, please include the structural design for the outlet structure in Section D-D.*
Response: Structural design for pond infrastructure to follow after approval of CDs and Drainage Report.

19. *On sheet C4.13, please lower the front wall of the outlet structure to within 3 to 4-inches of the bottom of the micropool and the orifice plate needs to extend to the bottom of the micropool in Section D-D.*
Response: Due to grade constraints, the outlet pipe cannot be lowered below its current elevation. The outlet pipe is current running a 0.57% slope into the proposed drainage channel which cannot be lowered any further. Pond outfall and outflow pipe to be revised further with downstream channel redesign.

20. *On sheet C4.13, please include the dimensions for the trash rack and orifice plate.*
Response: Trash rack and orifice plate dimensions have been updated and are show in the Water Quality Orifice plate detail as well as Section views H-H and I-I.

21. *On sheets C4.15 – C4.18, please verify the proposed handrail/guardrail meets AASHTO Roadside Design Guide for clear zone and crash criteria.*
Response: Yes. Guardrail will be designed by structural engineer to meet the same standards as a CDOT Type 3 W-Beam Guardrail.

22. *On sheets C4.15 – C4.18, a License Agreement will be required for the landscaping and retaining walls within the public right-of-way. I will provide you with our standard License Agreement document.*
Response: Acknowledged. License agreement will be included with resubmittal.

23. *On sheet C4.19, please remove the Douglas County Acceptance Block from this sheet.*
Response: Douglas County Acceptance block has been removed from sheet.

24. *Engineering is not familiar with the hydraulic model that was used for this project and will request that the project engineer provide a comparison between this model and the UD-Sewer modeling supported by Urban Drainage & Flood Control District.*
Response: The hydraulic model Hydraflow is a part of the AutoCAD drainage package and is comparable to StormCAD. The UD-Sewer program was run for the storm systems on this development and is included with this submittal. See the revised drainage report narrative for discussion on the UD-Sewer versus Hydraflow comparison.

25. *On sheet C6.1, please include the flowline transition profiles per Figure 4-6 of our road design manual (typical comment for all sump conditions).*
Response: Flowline transition profiles have been added to the plans for all sump conditions.

26. *On sheet C6.2, please clarify why manholes A7 & A8 are labeled twice in the profile.*
Response: Duplicate labels have been removed from profile view.

27. *On sheet C6.2, engineering has concerns regarding the proposed cover over the box culvert in regard to the future pavement section. Please look at lowering this box to account for the future pavement section (should be consistent with the storm sewer depths 3.5 to 4-ft.).*
Response: The drainage channel has been revised in order to provide cover over the pipes

28. *On sheet C6.3, the proposed Pinery Center Blvd. roadway improvements need to extend to the northerly property line.*
Response: The developer is requesting that the completion of the road to the north property line at the time when the road is extended from the north will be the developer's obligation in the SIA.

29. *On sheets C6.3 & C6.4, the depth of the proposed storm sewer is a concern (depth needs to be a minimum of 3.5 – 4-ft. without a preliminary pavement design).*
Response: Storm sewer has been lowered wherever possible to provide the most cover over the pipes.

30. *On sheet C6.5, our drainage manual requires a 6-ft. manhole for a 48-in. pipe. Please revise.*
Response: Storm manhole has been revised appropriately.

31. *On sheet C6.7, please clarify that the existing 36-in. pipe will be removed near manhole F4-A. Also, please include the invert information at both manholes.*
Response: Plan has been refined to reflect 36-in pipe tie-in. Demolition plans have been updated as well. Invert information has been added to both manholes.

32. *On sheets C7.1 – C7.14, Douglas County is meeting with Mile High Flood District on Friday to discuss the proposed channel improvements. We will provide comments on the channel re-alignment within the next couple of weeks.*
Response: Acknowledged.

33. *On sheets C7.15 & C7.16, the proposed open channel swales need to be designed per Chapter 8 (Volume 1) of the Mile-High Flood Control Districts criteria manual. Please include their figures in the drainage report that applies to each channel section.*
Response: Channel swales A, B, and D have been redesigned based on MHFCD Volume 1, Chapter 8, Section 6. Slope of swale C has been adjusted to 5:1 side slope to follow MHFCD design guide lines but due to the channel slope has been designed using Hydraflow.

34. *On sheets C11.1 & C11.2, our traffic group will be reviewing the signage & striping plans and once I get their comments, I will forward them to you.*
Response: Acknowledged.

35. *Our traffic group has reviewed the traffic analysis and overall, there were no significant changes in the findings of the original traffic study. The purpose of the proposed updated traffic analysis was to incorporate two changes:*
    - *Removal of a roadway connection to Hwy 83 (known as Access A, a 3/4 movement access).*
    - *Changes to Land Use projection and trip generation at the north end of the project. 50,000 square feet of office use was added to the trip generation to replace the previously planned charter school. This results in a decrease of AM peak hour trips and a minor change to the PM peak hour trips.*

    Required Improvements to accommodate the project are:
    - *Access Permit for the project Access to US 83 – Right-in/Right-out – the currently issued State Hwy Access Permit for the RI/RO access to SH 83 north of North Pinery Parkway may need to be re-issued due to the increase in trips proposed to use this access (because of the elimination of Access A which causes volumes using the access to exceed the original (original: 345 vph, new: 515 vph) – Access Permit for the Access at North Pinery Parkway & State Highway 83*
    - *2030 – US83/North Pinery Parkway – 2nd northbound left-turn lane & Modify the east leg of the median to include a new exclusive westbound left turn lane.*
    - *North Pinery Parkway/Access C – Traffic signal – check warrants at build-out of project*
    - *2040 – North Pinery Parkway/Pinery Center Blvd. (J Morgan Blvd) – traffic signal*
    - *Auxiliary Lane Evaluation – Access B & Parker Road (with initial development) – Southbound right-turn deceleration lane (378-ft. + 222-ft. taper, 600-ft. total length) – Southbound right-turn acceleration lane (tie into the exiting southbound right-turn deceleration lane approaching North Pinery Parkway, approximately 370-ft. south of Access B)*

- *Parker Road and Pinery Parkway (short-term) – Second northbound left-turn lane (build parallel to the existing 600-ft. total lane length)*
- *Parker Road and Pinery Parkway (long-term) – New eastbound left-turn lane (110-ft. lane + 60-ft. taper)*
  Response: Refer to traffic comments section for responses.

Landscaping Comments

1. *On sheet L-01, please add the Douglas County Acceptance Block to this sheet.*
   Response: Douglas County Acceptance Block has been added to the sheet.

2. *On sheets L-05, please clarify the purpose of the driveway onto Pinery Center Blvd.*
   Response: Label has been added to plans identifying lift station access drive.

Douglas County – Development Review Engineer (Additional)

Drainage Report & Construction Plan Comments

1. *Please clarify/correlate the narrative on Page 2 of the drainage report regarding offsite basins with the information present in Table 3-4. Discussion of Subbasin 206 is not included in Section 3.7 or Table 3-4. Identify which culvert crossing is associated with the V3 subbasins. What is the relation of the OSP North Pinery Subbasin areas and the V3 Hydrologic Exhibit areas in Table 3-4?*
   Response: Please see the revised narrative for additional explanation. In summary, Subbasin 206 revised boundaries are not likely to result in an appreciable change to the OSP flowrates going to the 96-in diameter Parker Road culvert and therefore, the OSP rates with respect to Subbasin 206 are maintained and used in the channel analysis (DP 1062). The OSP North Pinery Subbasin Areas are updated with respect to drainage boundaries and drainage area using updated Douglas County GIS topographic contours. The flows from the revised drainage areas are scaled from the OSP flow rates (Table 3-4) for use in evaluation of the three tributary culverts and flows entering the Parker Road median structure. Please see the narrative for additional detail.

2. *The drainage swale designs, and selection of treatment should be based on the Urban Storm Drainage Criteria Manual, Volume 1, Chapter 8, Open Channel, Section 6.0 – Swales, rather than the Hydraflow channel analysis or pipe simulations.*
   Response: Channel swales A, B, and D have been redesigned based on MHFCD Volume 1, Chapter 8, Section 6. Slope of swale C has been adjusted to 5:1 side slope to follow MHFCD design guide lines but due to the channel slope has been designed using Hydraflow.

3. *Please clarify how this project will address the 59-cfs overflow (over State Highway 83) at the existing North Pinery Creek crossing.*
   Response: The 59 cfs overflow will be captured in curb and gutter along the west side of Parker Road and a series of Type R inlets. The flows will be conveyed via storm sewers to the relocated North Pinery Creek channel pipes.

4. *Please remove any references to using internal energy dissipation (grouted boulders) within the proposed reinforced concrete box culverts.*
   Response: Comments are removed and narrative has been revised.

5. *Regarding the use of Hydraflow Storm Sewer Extension (Hydraflow) for hydraulic grade line calculations, consult Modeling Hydraulic and Energy Gradients in Storm Sewers: A Comparison of Computational Methods, prepared for UDFCD and available on their website. It appears that Hydraflow uses the Standard Method for determination of junction loss coefficients, the method that was recommended when using StormCAD. Loss coefficients provided in Table 2 must be manually entered in Hydraflow for the standard situations with a bend in the main line or laterals on a straight main line. For other junction configurations, Equation 13 must be solved for eth Standard Method head loss coefficient (K) to input into Hydraflow.*
   Response: Please see response to above comment 24 (Construction Plan Comments).

6. *Please include all design calculations, for the grouted sloping boulder drop structures, as required, and outlined in the Urban Storm Drainage Criteria Manual, Volume 2, Chapter 9 – Hydraulic Structures, Section 2.0 – Grade Control Structures.*
   Response: The Grouted Sloping Boulder Drop structures have been removed.

7. *On sheets C4.2, please provide us with a copy of the 30-ft. access easement from Parker Water & Sanitation District and verify that this property has the right to use this easement out to Parker Road.*
   Response: The developer had received verbal approval from Parker Water and Sanitation District contingent upon approval of a prospective buyer for the Parker Water and Sanitation District property. The prospective buyer is no longer under contract to purchase the land; therefore, the developer has reinitiated discussion with Parker Water and Sanitation District to get the easement granted.

8. *On sheets C6.2 & C6.6, engineering has concerns regarding the design of the proposed box culvert under Pinery Center Blvd. Our recommendation is to extend the box on both sides of the road to avoid the vertical drop-off and construct the standard headwall/wingwalls. Also, it is unclear on how the reinforced box culvert will integrate or interface with the proposed retaining wall design. Please provide additional details or clarification.*
   Response: The box culvert has been replaced by dual 72-inch pipes and a headwall.

9. *On sheets C7.1 – C7.5, please show the water surface in the profiles.*
   Response: Water surface profiles for the 5-year and 100-year storm events are provided.

10. *On sheets C7.1 – C7.5, please specify the surface treatment for the proposed maintenance access road.*
    Response: Please reference maintenance access road detail on sheet C4.1

11. *On sheets C7.1 & C7.2, the channel design for North Pinery Creek downstream of Pinery Center Blvd. to Cherry Creek does not appear to incorporate High Function Low Maintenance stream design principles. Typically, there is some determination of the extent of the tributary (North Pinery Creek) floodplain, independent of the Cherry Creek floodplain.*
Response: Please see the revised narrative and supplemental documentation for additional information. In summary, there is no channel for the intermittent North Pinery Creek flows within the Quaternary Terrace floodplain of Cherry Creek. A proposed channel for this floodplain terrace incorporates High Function Low Maintenance principles through inclusion of riffle-pool meander complexes for bankfull flows.

12. *On sheets C7.1 & C7.2, please extend the maintenance access along this westerly reach to Cherry Creek.*
Response: Maintenance Road has been extended along the new downstream side of the drainage channel.

13. *On sheets C7.3 & C7.5, the County won't accept the concept of a modified grouted sloping boulder (GSB) drop structure within the RCBC's.*
Response: Acknowledge and redesigned. Please see the new design.

14. *On sheets C7.7 – C7.13, detailed profiles must be developed for all GSB drop structures to show cutoff walls, still basins, grout lines, interface with upstream and downstream channels, slopes, elevations, flow spreads, crest lengths, etc.*
Response: Plans have been revised to remove drop structures and open channel.

15. *On sheet C7.13, please show the pipe connection to the RCBC. Also, please provide details for this junction.*
Response: RCBC has been detailed out. Structural design to follow upon approval of plans.

16. *On sheet C7.14, additional details need to be provided for the channel cross-sections, including elevations, treatment types and limits, toe depths, bedding, riprap sizes, etc.*
Response: Plans have been revised to remove drop structures and open channel.

17. *On sheets C7.15 & C7.16, additional details must be provided for treatment of the swales.*
Response: Additional details have been added to the swales.

18. *Grouted boulder placement details and associated material and grout placement notes, subgrade preparation specifications and weep drain details must be provided. Required mandatory County inspection intervals or stages must be clearly defined by the contractor.*
Response: The Grouted Sloping Boulder Drop structures have been removed.

19. *On sheets C12.5 & C12.6, please use the Douglas County headwall and wingwall details.*
Response: Douglas County headwall and wingwall details have been added to the plans.

20. *The signage and striping comments should be available in the next few days and once I receive them, I will forward them to you.*
Response: Acknowledged.

Douglas County – Planning

General Comments

1. *The submitted will-serve letter from the Pinery Water and Wastewater District is from December of 2018. Please provide an updated will serve letter and water supply report from the District. Response noted, an updated will serve letter will be required prior to scheduling for public hearings.*
Response: Acknowledged. An updated Will Serve letter has been requested and will be provided when received.

2. *A Class II Cultural Resource Survey, as recommended by Douglas County Historic Preservation, needs to be included with the next resubmittal.*
Response: Acknowledged. Cultural Resource survey will be included with next resubmittal.

Minor Development Exhibit

1. *Thank you for providing the PD Vicinity Map. Please reduce the map and include it on the cover page of the minor development plat exhibit.*
Response: The PD Vicinity Map has been added to the Cover Sheet.

2. *Label adjacent properties as "not a part of this replat."*
Response: The labels have been added.

3. *See redlines for additional corrections.*
Response: Acknowledged.

4. *Please refer to comments from Xcel Energy as it may impact landscaping along Pinery Center Blvd due to the existence of a 50-foot easement.*
Response: Acknowledged. We have already had Xcel conduct a preliminary review of the Plans and will be applying for a License Agreement for work within their easement.

5. *I apologize for any confusion on the right-of-way dedication for Pinery Center Blvd, but in the Land Use Table, Tracts D and F should be labeled as ROW, and under the Use column listed as Pinery Center Blvd ROW, see redlines.*
Response: The table has been updated as requested.

6. *Provide distances for all property and tract lines. See redlines*
   Response: The labels have been added

7. *As stated previously, the following conditions of approval will be included with the PC and BCC staff reports:*
   a. *Prior to approval of the any site improvement plan with Lots 1, 2, or 4, buffers with Tract E shall be designed and secured through the Site Improvement Plan Improvements Agreement (SIPIA) or through an accompanying Subdivision Improvement Agreement (SIA).*
      Response: Acknowledged.

8. *The response letter notes that the North Pinery Watercourse is marked on the plat, but it is not, or I was unable to locate it.*
   Response: North Pinery Creek has been labeled on the Plat.

Landscape Plans

1. *Provide several cross-sections showing the landscape buffer along Parker Road including the slope to the west.*
   Response: Cross sections have been provided.

2. *It is noted on the plans that certain areas will be landscaped at the time of site plan submittal, and there is a note stating the steep slopes may not be landscaped, but there are long stretches of the landscape buffer that are left blank, please explain.*
   Response: All but a small portion of Filing No. 2 Parker Road frontage is Tract E (Open Space). The intent is to keep this Tract in a condition as similar to its natural state as possible. The majority of the landscape buffer along Parker Road is therefore handled only through native seed reestablishment following any grading activity. Some additional plantings are provided occasionally to enhance this edge and provide some additional native plant material. The portion of Filing No. 2 fronting Parker Road that will have future development (Lot 3) will provide the associated landscape buffer at the time of its site plan.

3. *Is the plan to leave most of Tract E as native seed and not landscaped or will more landscaping be provided at time of future site plans?*
   Response: The intent is to maintain Tract E as natural open space, utilizing native seed and existing vegetation for its coverage. There is no additional landscaping planned for the future aside from reseeding areas following grading activity and construction of the maintenance path and trail along the drainage channel.

4. *Please label on the landscape plans the twenty percent of the Highway 83 landscape buffer that is required to be 40-feet wide.*
   Response: The entirety of Tract E is remaining as open space with native seed coverage and therefore exceeds the twenty percent 40-feet wide requirement.

Lumen Technologies

General Comments:

1. *Our engineer has reviewed this plat and their comments are: "I have no objections to this plat"*
   Response: Acknowledged.

State of Colorado – Traffic & Safety

Drainage Comments:

1. *The site primarily drains away from CDOT ROW and flows are conveyed, ultimately, to Cherry Creek via the proposed realigned North Pinery Creek. My primary concern is in regards to the calculations and documentation included in Appendix 7 which provides information on the offsite flows that impact the site from the East side of Parker Road. The proposed design shows a storm sewer that will intersect the three existing culverts that convey flows under Parker Road, the system is shown on Profiles STORM-8 and STORM-9 on page C6.7. There is documentation included in the Appendix that shows capacity calculations of the pipes in the system, however, as this system will have immediate impacts to the infrastructure within Parker Road I would like to see the HGL's for the Minor and Major storms included on these profiles to verify that there is no surcharging within CDOT ROW.*
   Response: HGL Calculations have been added to the storm profiles. The calculations show no surcharging within the CDOT ROW.

Traffic Comments:

1. *After review of the TIS, the proposed mitigation at the intersections on Parker Rd at Stroh Rd and Pinery West is maximized to the most reasonable extent possible and therefore is an acceptable strategy. The distance between Parker Rd and Access "C" needs to be, at a minimum, 550 ft from PC (Parker Rd) to PC (Access "C") This is not stated in the TIS. If this distance is not met, then the signal cannot be installed and full movement designation will likely require re-designation to a more restricted condition. It is also unclear why Access "C" is signalized when the primary access appears to be Pinery Center Blvd. The Wellspring Dr RIRO will require both accel and decel auxiliary lanes meeting the requirements stated in the Access Code*
   Response: (Per our recent call with CDOT staff, we understand that this comment was meant to refer to North Pinery Parkway not Stroh Road.) A variance request to Section 13.2.4 of the Douglas County Roadway Design and Construction Standards was previously prepared and approved (see attached letter dated April 21, 2021) for this existing full-movement access and future signal. Note that this access, with a future signal proposed, was previously approved and the intersection has been constructed based on the 2008 Traffic Impact Stud, which the current TIS is consistent with. The spacing from Parker Road is approximately 450' from PC to PC and 640' centerline to centerline. This exceeds or is similar to spacing from existing signals adjacent to similar locations along the SH 83 corridor (examples are Cottonwood Drive/Brompton Way, E. Broncos Parkway, E. Orchard Parkway, S. Chambers Road, E. Quincy Ave, S. Peoria St.

See attached variance memo for additional information.

2. *Previous comments still apply, Access C shall not be signalized if the 550 ft separation from Parker Rd is not met. There are no plans showing the necessary modifications of Stroh Rd and Parker Rd to review. It is also unclear how the Access C intersection geometric design influences the Parker Rd/Stroh Rd intersection design. The required addition of a NB left lane on Parker Rd at Stroh Rd needs to occur and be included in the roadway plans required for permit approval. Traffic signal modification may also be necessary*
Response: See response #1 re: Access C spacing. Per our recent call with CDOT staff, we understand that this comment was meant to refer to Pinery Parkway not Stroh Road. Per page 39 of the TIS, improvements to the Parker Road & Pinery Parkway intersections are planned to occur with later development stages. Improvements to Parker Road and North Pinery Parkway intersection were previously approved with Filing 1 of this project. The timing of those improvements is outlined with the Pinery Village Filing 1 approvals.

Right of Way Comments:

1. *No ROW comments except to reiterate the need for sufficient ROW to be dedicated to the County.*
Response: Acknowledged. We are dedicating ROW with the Plat with Tract F to provide the required ½ ROW of 87.5'

Resident Engineer Comments:

1. *If an intersection or sidewalks will be modified/constructed on Parker Rd Roadway plans will need to be submitted for review.*
Response: Acknowledged. A set of Construction Plans showing the modification to the previously approved improvements with Pinery Village Filing No. 1 are included with this submittal.

Permits Comments:

1. *There was no referral responses to CDOT previous remarks. We had mentioned in an earlier meeting the need to adhere to the Access Control Plan (ACP) for SH 83. We assume that the Town of Parker has reviewed this proposed development plan and has made comments in regards to the ACP and local plans as there are off-site connections to be made to the north. If there are any deviations or changes to the ACP, the Town of Parker must approve of those revisions as outlined in the IGA.*
Response: Responses to referral comments were prepared following a meeting with CDOT staff to review these comments in April 2021, but appear not to have been received by CDOT. No changes to the ACP to increase or relocate any access is proposed, with only the removal of the previously proposed "Access A" (northernmost 3/4-access along SH 83). Per our recent meeting with CDOT staff, we understand that this ¾ access will thus be removed from the future ACP update.

2. *It will be important for the alternative N-S roadways, their functional design/cross sections, and timing to be in alignment with those planned by the Town of Parker. These provide essential access connections without the need to use the highway for short trips. Town of Parker has recently updated their Transportation vision/plan for SH 83.*
   Response: As discussed at our meeting with CDOT staff in December 2021, the proposed Pinery Center Blvd. (collector) roadway connection between Stroh Road and Pinery Parkway will provide alternative north-south access parallel to SH 83 and accommodates future plans for the Town of Parker to the north.

3. *Intersection improvements (including new auxiliary lanes) and those with > 20% traffic will require new Access permits. Any work in CDOT RoW0 including landscaping, signal upgrades and utilities is by permit.*
   Response: Acknowledged. This will apply to renewal of the "Access B" permit (expired 8/29/21) and Pinery Parkway at SH 83.

4. *The 2004 Corridor Optimization Plan calls for a 175-ft RoW profile for SH 83 in this area, half of which would come from the centerline (87.5-ft). The plat does not show this to exist along the length of the property. Additional RoW should be dedicated to the county, to in-turn deed to CDOT at the time it is needed. Please call out the RoW for SH 83 along the length of this property.*
   Response: We are dedicating ROW with the Plat to provide the required ½ ROW of 87.5'

5. *We have no issues with the removal of what was Collector Road "C". However, on the north end of this property, cross- property connections will be necessary. Extending the N-S collector to Stroh is acceptable, but opportunity is lost in not providing a connection into Lewis Christensen Rd Neither the maps provided or the TIS show enough context to the SH 83 corridor and existing local roadway rights-of-way on the north end of this project (and not consistent with Douglas County Assessor property lines/info)*
   Response: As discussed in the December 2021 meeting w/ CDOT, Pinery Center Blvd is extended to the north boundary of the property with the expectation development to the north will tie into this connection, either via extension of J Morgan Blvd or Lewis Christensen Rd.

6. *With the removal of the ¾ turn movement previously permitted, a double NB to WB left turn should go into Pinery Parkway intersection – by 2030. That un-built ¾ Access permit shall be officially 'retired'.*
   Response: This is consistent with the recommendations of Pinery Village Filing No. 1 on page 39 of the TIS which states that the 2nd NB left-turn lane should be constructed by project build out, assumed Year 2030. The timing of the need for this improvement is both dependent on the built out of the project and the extension of North Pinery Parkway to the west, which would attract background (non-project) traffic to this movement. The plans for the second left-bound turn lane were included in the previously approved Pinery Village Filing No. 1 Construction

Plans.

7. *I do not believe less traffic will occur on the SB to EB Left urn movement between 2030-40. The study's figure 10 & 11 is peculiar showing a drop from of peak hour left turns from 405 to 330.*
   Response: When North Pinery Parkway is extended to the west to Crowfoot Valley Road, as well as when the project is developed and attracts retail/commercial trips that are currently to/from the north towards the Town of Parker, some traffic from the Pinery (east of the project) is anticipated to redistribute from Parker Road to this connection, resulting in decreases to some movements (including the SB left-turn).

8. *County needs to ensure sufficient RoW is dedicated along SH 83 per the Corridor Optimization Plan to ensure auxiliary lanes, and room for multi-use pathways and utilities can occupy the RoW.*
   Response: Acknowledged.

9. *A State Highway access permit, 119094 was issued for the proposed Right-in, Right-out access and is still valid. It is currently extended to 8/29/2021. This permit may need to be either revised or repermitted to reflect the change in traffic due to the redistribution with the elimination of the 3/4 access to this development. Douglas county is the issuing authority for State Highway Access permits within their jurisdiction. Contact at the County for access permits is Chris Martin.*
   Response: Acknowledged. The Access B permit application will include volumes from the July 31, 2020 TIS, with was updated to reflect the removal of the ¾-access on SH 83 ("Access A").

10. *The proposed improvements at Pinery Parkway and Parker Road will require new State Highway Access Permits. Improvements include a second NB left turn lane. Since Pinery Pkwy is a County Roadway, Douglas County must be the Permittee for the permit. If improvements are proposed on both the east and west side, then separate permit applications will be needed for each side.*
    Response: Acknowledged.

11. *We will want to review the drainage report for this development to insure there will be no negative impact to the State Highway.*
    Response: Acknowledged. The updated Drainage Report is included in this submittal.

12. *All signing for this development that is visible to or advertises to State Highway 83 must be on-premise and must comply with any applicable rules governing outdoor advertising in Colorado per State of Colorado Rules 2 CCR 601-3*
    Response: Acknowledged.

Colorado Department of Transportation CDOT – Region # 1

1. *Following is a summary of comments received from CDOT. Full details please reference the letter dated December 2, 2021.*
   Response: Acknowledged.

2. *CDOT had comments related to the offsite flows and storm sewer design in the drainage report, traffic comments related to proposed traffic mitigation on Parker Road, proposed points of access on Parker Road, and accel and decel lanes at Wellspring Drive.*
   Response: Acknowledged

3. *The applicant will need to adhere to the Access Control Plan for State Highway 83. CDOT does not object to removal of what was Collector Road "C". Extending the North-South collector to Stroh Rd is acceptable, but opportunity is lost in not providing a connection to Lewis Christensen Rd.*
   Response: Collector Road Access C is not feasible due to significant grade difference between Parker Road and Pinery Center Blvd.

4. *Applicant needs to review Figures 10 and 11 in the traffic study that project less traffic will occur on the SB to EB left turn movement between 2030-40.*
   Response: When Pinery Parkway is extended to the west to Crowfoot Valley Road, as well as when the project is developed and attracts retail/commercial trips that are currently to/from the north towards the Town of Parker, some traffic from the Pinery (east of the project) is anticipated to redistribute from Parker Road to this connection, resulting in decreases to some movements (including the SB left-turn).

5. *Douglas County needs to ensure sufficient ROW is dedicated along State Highway 83 per the Corridor Optimization Plan to ensure auxiliary lanes, and room for multi-use pathways and utilities can occupy the ROW.*
   Response: Acknowledged. We are dedicating ROW with the Plat to provide the required ½ ROW of 87.5'

Colorado Parks and Wildlife (Northeast DC)

General Comments:

1. *Upon review of the proposed referral request, Colorado Parks and Wildlife (CPW) has no objections to the application moving forward as planned for approval. Please refer to the previous comment letter from CPW dated February 11, 2020 to Mr. Dan Avery for additional wildlife concerns and development recommendations.*
   Response: Acknowledged.

South Metro Fire Rescue

General Comments:

1. *South Metro Fire Rescue (SMFR) has reviewed the provided documents and has no objections to the proposed minor development. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project.*
   Response: Acknowledged.

Tri-County Health Department

Water and Sewer Service Comments

1. *A will-serve letter has been provided by Pinery Water and Wastewater District. Based on this letter, TCHD is providing a favorable recommendation regarding the proposed method of sewage disposal.*
   Response: Acknowledged.
2. *Because chronic diseases related to physical inactivity and obesity now rank among the country's greatest public health risks, TCHD encourages community designs that make it easy for people to include regular physical activity, such as walking and bicycling, in their daily routines. Because research shows that the way we design our communities can encourage regular physical activity, TCHD strongly supports community plans that incorporate pedestrian and bicycle amenities that support the use of a broader pedestrian and bicycle network. Increasing multi-modal transportation has additional co-benefits including improved air quality, which can reduce contributions to climate change and exposure to pollutants associated with a number of health problems including asthma, lung cancer, and heart disease.*

   In order to promote walking and bicycling through this development, TCHD encourages the applicant to consider the inclusion of the following as they design the community.

   - *A system of sidewalks, bike paths and open space trail networks that are well-designed and well-lit, safe, and attractive so as to promote bicycle and pedestrian use.*
   - *Bicycle and pedestrian networks that provide direct connections between destinations in and adjacent to the community.*
   - *Where public transportation systems exist, direct pedestrian access should be provided to increase transit use and reduce unnecessary vehicle trips, and related vehicle emissions. The pedestrian/bicycle networks should be integrated with the existing and future transit plans for the area.*
   - *Streets that are designed to be pedestrian/bike friendly and to reduce vehicle and pedestrian/bicycle fatalities.*
   - *Bicycle facilities and racks are provided in convenient locations.*
     Response: Acknowledged. A bike and pedestrian trail system is being proposed

throughout the development.

Town of Castle Rock

1. *Thank you for the opportunity to review and respond to the Pinery Village Filing 2, Minor Development. The application was reviewed by various Town Departments with no concerns from the Town reviewers. Please keep us informed of any changes to the proposal. Thank you.*
   Response: Acknowledged.

Town of Parker – Planning

General Comments:

1. *The Town has platted the lot just north of what is proposed as Tract A, multi-family. Please be sensitive with uses, landscape buffering, and design standards for proposed lots 1 and 2 (PA 42 and PA 43).*
   Response: Acknowledged.

2. *Please incorporate pedestrian-friendly infrastructure between RTD and the Town along Pinery Center Blvd.*
   Response: A bike and pedestrian trail system is being proposed throughout the development.

3. *Please reference the attached documents which redline these comments.*
   Response: Acknowledged.

Previous Comments

1. *The Pinery Village Minor Development is located within the Town's 2035 Master Plan Planning Area and Three-Mile Plan map, and qualifies for annexation into the Town of Parker. The Town supports and welcomes discussions for annexation and rezoning of this property into the Town of Parker.*
   Response: Acknowledged.

2. *The Concept Site Plan from the project Traffic Impact Study, dated December 13, 2018, shows a site plan with commercial/retail development located adjacent to Parker Road. The Town encourages primary building frontages to front or side with Parker Road, to create a consistent setback, street wall, and streetscape. Buildings that side with Parker Road are encourage to have enhanced architectural design. To minimize the view of parking lots from Parker Road, parking lots are encouraged to be located away from view of Parker Road, on the sides or rear of buildings.*
   Response: Acknowledged.

3. *Each proposed retail site is encouraged to provide pedestrian/bicycle connectivity from the primary façade of each building, as well as along Parker Road. Enhanced landscaping along Parker Road is also encouraged.*
   Response: Acknowledged.

Douglas County – History Repository

General Comments

1. *Upon researching the cultural resources on the property and the surrounding area the Douglas County Curator recommends a Class II cultural resource survey of the project area.*
   Response: Acknowledged. Cultural Resource survey will be submitted when finalized.

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

Referral Agency Response Report

Addressing Analyst Comments

1. *No Comment*
   Response: Acknowledged.

Assessor Comments

1. *Lot 2 & Tract E Pinery Village Filing 1 are being replatted by this subdivision. They should be listed in the legal description and plat sub-title.*
   Response: Lot 2 & Tract E Pinery Village Filing 1 have been added to the Legal Description and shown as being vacated via the Filing No. 2 Plat.

2. *Pinery Commercial Metro District 1 & 2 are the current owners of existing Tract E Pinery Village Filing 1 per plat dedication. They need to sign the plat as an owner.*
   Response: Tract E of Pinery Village Filing No. 1 will be deeded back to TF Pinery West LP prior to the recording of this Plat so they will be the only Owner.

   a. *As platted, Lot 4 will be setup with mixed ownership and taxable status, which is very difficult for our office to track. Please clear title on Lot 4 via deed to eliminate the mixed ownership and taxable status.*
      Response: See response to Item #2 above. Pinery Commercial Metro District 1 & 2 will no longer have partial ownership of Lot 3 of Pinery Village Filing No. 2.

3. *There is a discrepancy regarding Tract C. The acceptance certificate, Land Use Table and Plat note 8 say dedication to the Pinery Commercial Metro 2, whereas Additional Tract Note 3 says dedication to Douglas County.*
   Response: Tract C will be dedicated to Pinery Commercial Metro District No. 2 for Open Space and Drainage purposes. The table has been updated accordingly.

4. *The vicinity map does not match the area being platted.*
   Response: The Vicinity Map has been corrected.

5. *There is a missing dimension on the subdivision boundary on Sheet 2, the southeastern-most call 316.60 ft call is not dimensioned.*
   Response: The missing callout has been added.

AT&T Long Distance - ROW Comments

1. *This is in response to your eReferral for a utility map showing the buried AT&T Long Line Fiber Optics near Pinery Center Blvd Parker, Colorado. I attached an Earth map showing the project area in read and the buried AT&T Long Line Fiber Optics in yellow. As shown, there is a possibility of conflict along State HWY 83. Any other information you could provide about the projects would be appreciated in determining if a conflict will exist. Please pass on our contact information as well.*
   Response: Acknowledged. Our understanding is the AT&T Long Line Fiber Optics is located on the east side of Parker Road. This project is on the west side of Parker Road.

Black Hills Comments

1. *No Comment*
   Response: Acknowledged.

Building Services Comments

1. *No Comment*
   Response: Acknowledged.

CenturyLink Comments

1. *Our engineer has reviewed this plat and their comments are: "I have no objections to this plat". If you require signatures, you can contact the engineer CC'd on this email and if you have any further questions, please don't hesitate to reach out.*
   Response: Acknowledged.

Cherry Creek Basin Water Quality Authority

1. *The Authority's Control Regulation 72 requires construction and post-construction Best Management Practices (BMPs).*
   Response: Acknowledged. BMPs are shown on GESC plan and discussed in the GESC Report.

2. *No exceptions taken with the proposed post construction BMPs using full spectrum detention. However please note this development appears to also be within the stream preservation area. Development in the stream preservation area requires additional post construction BMPs. Please see the control regulation document Chapter VI for additional guidance. Please provide additional information or justification in future submittals on how this is being met.*
Response: Acknowledged. BMPs are shown on GESC plan and discussed in the GESC Report.

3. *Provide construction BMP plan when available for our review and comment.*
Response: Acknowledged. BMPs are shown on GESC plan and discussed in the GESC Report.

4. *The Authority reserves the right to review and comment on future referrals for this project.*
Response: Acknowledged.

Colorado Division of Water Resources

1. *No Comment*
Response: Acknowledged.

Colorado Geological Survey

1. *No geologic hazards or unusual geotechnical constraints are known or suspected to be present that would preclude the proposed non-residential use and density. CGS previously reviewed a geotechnical report relevant to the subject site: Preliminary Geotechnical Investigation, Pinery West Preliminary Plan #3 (CTL|Thompson Project No. DN49,579-115-R1, September 10, 2018). CTL makes appropriate preliminary recommendations for mitigating the site's variable subsurface conditions, which include low density/low strength and expansive soils, and shallow, expansive claystone bedrock.*
Response: Acknowledged.

2. *Provided CTL's recommendations are adhered to, and additional investigation and analysis are conducted once building locations and loads are known, for use in design of subgrade preparation, foundations, floor systems, pavements, etc., Colorado Geological Survey has no objection to approval of SB2021-049. Jill Carlson, Colorado Geological Survey, 303-384-2643 or carlson@mines.edu*
Response: Acknowledged.

Comcast

1. *No Response Received*
Response: Acknowledged.

Core Electric Cooperative

1. *CORE will require additional utility easements as shown on the attached markup.*
   Response: A 15' Utility Easement has been added along Pinery Center Boulevard except for areas where a retaining wall is proposed. Perimeter lot easements will be deferred until the lots are subdivision for specific development.

Douglas County Parks and Trails

1. *No Response Received*
   Response: Acknowledged.

Douglas County School District RE 1

1. *No Response Received*
   Response: Acknowledged.

Engineering Services

1. *Engineering Services had comments related to plat notes, certificates, drainage easements, tracts for ROW, a requirement for a Subdivision Improvement Agreement, GESC comments, Construction Plan comments and Landscaping comments.*
   Response: Acknowledged.

High Prairie Farms HOA

1. *No Response Received*
   Response: Acknowledged.

Office of Emergency Management

1. *No Response Received*
   Response: Acknowledged.

Pinery Commercial Metro Districts #1 & 2

1. *No Response Received*
   Response: Acknowledged.

Pinery Water and Wastewater District

1. *Pinery Water District takes no exception to establish 4 commercial lots. The District is working with the developer to identify solutions for possible wastewater treatment and the associated collection system as gravity flow for the entirety of the project is not possible*.
   Response: Acknowledged.

RTD – Planning & Development Dept

1. *No Response Received*
   Response: Acknowledged.

Sheriff's Office

1. *No Comment*
   Response: Acknowledged.

Sheriff's Office E911

1. *No Response Received*
   Response: Acknowledged.

The Pinery HOA

1. *No Response Received*
   Response: Acknowledged.

Town of Parker Public Works

1. *No Response Received*
   Response: Acknowledged.

Urban Drainage & Flood Control – District Floodplain

1. *No Response Received*
   Response: Acknowledged.

Wildfire Mitigation

1. *No Comment*
   Response: Acknowledged.

Xcel Energy-Right of Way & Permits

1. *Public Service Company of Colorado's (PSCo) Right of Way and Permits Referral Desk has reviewed the documentation for Pinery Village F2 and requests that 10-foot wide dry utility easements are dedicated around the perimeter of each lot, and 15-feet abutting all major rights-of-way.*
   Response: A 15' Utility Easement has been added along Pinery Center Boulevard except for areas where a retaining wall is proposed. Perimeter lot easements will be deferred until the lots are subdivision for specific development.

2. *PSCo requests that the following language or plat note is added to the preliminary and final plats for the subdivision: Permanent structures, improvements, objects, buildings, wells, water meters and other objects that may interfere with the utility facilities or use thereof (Interfering Objects) shall not be permitted within said utility*

easements and the utility providers, as grantees, may remove any Interfering Objects at not cost to such grantees, including, without limitation, vegetation. PSCo and its successors reserve the right to require additional easements and to require the property owner to grant PSCo an easement on its standard form.
Response: Notes has been added to Plat, see general note no. 10

3. *PSCo has an existing high-pressure natural gas transmission pipeline including a regulator station and associated land rights as shown within this property and it has been determined that an engineering review is necessary. Any activity including grading, proposed landscaping, erosion control or similar activities involving our existing right-of-way will require PSCo approval. Encroachments across PSCo's easement must be reviewed for safety standards, operational and maintenance clearances, liability issues, and acknowledged with a PSCo License Agreement to be executed with the property owner. PSCo is requesting that, prior to any final approval of the plat, it is the responsibility of the property owner/developer/contractor to contact PSCo's Encroachment Team for development plan review and execution of a License Agreement (upload all files in PDF format) at : https://www.xcelenergy.com/encroachment_application (click Colorado if necesssary). An engineer will then be in contact to request specific plan sheets.*
Response: An encroachment request was made in September 2020. An updated request will be made once the utility design is complete.

4. *The property owner/developer/contractor must complete the application process for any new gas service or modification to existing facilities via xcelenergy.com/InstallAndConnect. It is then the responsibility of the developer to contact the Designer assigned to the project for approval of design details.*
Response: Acknowledged.

5. *If additional easements need to be acquired by separate PSCo document, a Right-of-Way Agent will need to be contacted. All easement labels referenced as "XCEL" must be changed to "PSCO". Although "branded" as Xcel Energy, the legal owner and operator of the utility facilities in Colorado is Public Service Company of Colorado. All utility facilities and related land rights, including fee property, easements, permits, etc., are owned by, operated by, and held in the name of PSCo, a Colorado Corporation.*
Response: Acknowledged.

6. *As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 to have all utilities located prior to any construction.*
Response: Acknowledged.

Redland
WHERE GREAT PLACES BEGIN

If you have any questions regarding the above response to comments, please contact me at 720-283-6783 ext. 136 or at mcevaal@redland.com.

Sincerely,

Mark D. Cevaal, P.E.
Sr. Project Manager

Cc: Mr. Chuck Smith – Douglas County
Mr. Craig Campbell – Starwood Land Advisors

PINERY
WATER AND WASTEWATER DISTRICT
Quality Water for Life

January 5, 2026
Mr. Craig Campbell
Starwood Land

RE: Pinery Village Filing 2

Dear Mr. Campbell,

Pursuant to Section 1805a.01.3 of the Douglas County Zoning Resolution, the Pinery Water & Wastewater District (the "District") acknowledges its willingness and ability to serve the proposed subdivision, Pinery Village Filing 2. The land where the proposed subdivision is located was included within the District boundaries when the District was formed on July 12, 1965.

Water Demand

Based on the proposed development plan, this project will require an average day demand of 84,749 gpd for domestic service (95 AF/YR).

Water Supply

Please find enclosed a copy of our District's Present and Future Water Sources report that the District has provided the State Division of Water Resources as required by Section 30-28-136(1)(h)(ii), C.R.S.

Water Quality

The District is in compliance with the Colorado Department of Public Health and Environment testing and quality requirements.

Sincerely,
Pinery Water & Wastewater District

Heather Beasley
District Manager

Present and Future Water Sources
Denver Southeast Suburban Water & Sanitation District

Prepared by HRS Water Consultants, Inc. in consultation with Denver Southeast Suburban Water & Sanitation District
Previous Versions: May 2014 and February 2018
Updated by DSSWSD staff in September 2025

A. General

The Denver Southeast Suburban Water and Sanitation District, dba Pinery Water and Wastewater District (DSSWSD), has four types or sources of water for present and future water supply. These are its tributary shallow wells constructed in the Cherry Creek alluvium, its deep non-tributary Denver Basin Aquifer wells, its reusable water stored in Walker Reservoir, and wholesale water supply through either WISE or CCPWA. The shallow alluvial wells withdraw senior Harrison and Haley Ditch rights along with junior water rights, both of which are covered under existing plans for augmentation in Cases No. W-6862 and No. 11CW198. The annual appropriation for the deep Denver Basin aquifer wells is derived from: 1) Pre-Senate Bill 213 wells; 2) District decrees; and 3) Decrees from others that have been included in the District. In total, DSSWSD has firm water rights of 15,221 acre-feet per year (af/yr), with average and wet years being higher. In addition, the District owns a 20.489% share of the Cherry Creek Project Water Authority alluvial and Denver Basin water rights, providing another 1,570 af/yr of dry year supply and greater average or wet year supply. Finally, the District is a member of the WISE Authority and has subscribed to 500 af/yr of this renewable and reusable water, although this is not considered part of the dry year supply.

B. Water Rights Considerations

The pumping of the shallow wells constructed in the Cherry Creek alluvium is covered by the District's existing plans for augmentation (W-6268 and 11CW198). The augmentation plan in Case No. W-6268 allows for tributary pumping using three sources:

1. In-priority pumping based upon the historic consumptive use from the senior Harrison and Haley ditch rights totaling 1,220 acre-feet per year;
2. Infrequent in-priority pumping under the junior well water rights; and
3. Out-of-priority pumping derived from return flow credits from the District use of non-tributary (pre-S.B. 213) wells, pursuant to the plan for augmentation.

The augmentation plan in Case No. 11CW198 includes additional alluvial wells, non-tributary water rights not included in the W-6268 augmentation plan, and additional water sources. These sources include:

1. Infrequent in-priority pumping under new alluvial well water rights;
2. Additional non-tributary water rights and wells;
3. Water available from the Cherry Creek Project Water Authority (CCPWA);
4. Water available through the WISE project; and
5. Out-of-priority alluvial well pumping to be allowed under the new plan for augmentation and derived from return flow credits and/or direct releases and exchanges from the above sources.

The District has acquired a substantial amount of non-tributary groundwater through adjudications (by the District or Senior Corp.), through inclusions into the District, or by direct purchase. The attached Table 2 includes a summary of the various decreed tributary, non-tributary, and not non-tributary rights and annual appropriations.

The primary source of non-tributary groundwater currently in use by the District is from the original set of Pre-Senate Bill 213 (Pre-S.B. 213) wells, which are referenced in the augmentation plan in Case No. W-6268 and three associated decrees (W-6265, W-6267 and W-7241). These are the wells designated as A through M. Because part of the original appropriations for Wells A, B, C and J have been reduced, and Well C has been abandoned, the present total availability of non-tributary water for this set of wells is 1,865 acre-feet per year (af/yr).

The District acquired water rights from Senior Corp., initially for property east of Highway 83, and then for property west of the highway. These rights were originally filed together under applications for each of the four Denver Basin aquifers but were then separated into two sets of decrees based on lands east and west of Highway 83. Non-tributary rights acquired from Senior Corp. for the District total 2,261 af/yr for the area east of the highway, and 3,051 af/yr for the west area. Although the decrees were separated based on geography, Colorado water law allows the District to combine Denver Basin water rights within a contiguous well field and produce these rights from any well in the same aquifer.

The District also acquired the non-tributary water rights associated with the Gondolier Farms which were decreed in Case No. 84CW208. These rights total 885 af/yr.

In Case No. 85CW203, the District adjudicated all remaining water underlying District lands east of Highway 83 which had not previously been adjudicated in any of the above-described decrees. This decree also recovered a portion of the water made available by the reduction in appropriations for Pre-S.B. 213 wells A, B, C and J. The total non-tributary ground water made available under this decree is 2,466 af/yr.

The District has also obtained additional decreed groundwater rights by inclusion of the Reata South (1,608 af/yr), Vistancia/Scott Road (184 af/yr), Cross Creek (40 af/yr), 6793 Scott Avenue (47.9 af/yr), and Pinery Meadows (49.4 af/yr) developments. In addition, the District purchased decreed groundwater rights from the Evans Ranch in the amount of 1,146 af/yr. These rights total 3,075 af/yr.

The water listed in Table 2 under the Broe Aug Plan and Rosie Wells decree (Broe) can only be used for development of the Broe property. The District began service to the development on the Broe property in 2019. These rights total 351 af/yr.

The above-described decrees provide additional non-tributary groundwater for District use beyond the amount originally included in the District augmentation plan. The total of these additional rights is 12,089 af/yr. When combined with the original Pre-S.B. 213 well appropriations, the District has a total non-tributary and not non-tributary groundwater supply of about 13,954 af/yr. It should be noted that several of the listed decrees include provisions where the final ground water appropriation may be changed based on site-specific data at the time wells are drilled. Based on past experience, such data is not likely to change the decreed appropriations more than plus or minus five percent.

The decree in Case No. W-6268 also includes changes in use for the District's 5/9 interest in the Harrison Ditch and the 85% interest in the Haley Ditch. The decree made findings that a combined total of 1,220 af/yr may be pumped through certain District alluvial wells as alternate points of diversion and used directly for municipal purposes. With priorities of May 30, 1874, and July 1, 1873, respectively,

these are some of the most senior water rights on Cherry Creek and provide a firm yield of 1,220 af/yr.

Under the existing augmentation plan in Case No. W-6268, the District can utilize return flows from municipal use of non-tributary water supplied by the District's Denver Basin aquifer wells as credits against out-of-priority tributary well pumping. Under the augmentation plan, depletions from tributary well pumping are calculated by multiplying out-of-priority pumping by the monthly consumptive use percentages included in Paragraph 22 of the decree. Return flow credits from non-tributary pumping are calculated based on the complement of the monthly consumptive use percentages. The credits for return flows are then applied to offset the calculated depletions on an annual basis. As long as the total non-tributary return flows equal or exceed the total tributary well depletions at the end of the year, the District's augmentation plan is in compliance and no injury to other water rights will occur.

Under the plan for augmentation in Case No. 11CW198, additional non-tributary water rights and associated return flow credits are included as augmentation sources to allow for additional tributary well pumping. Up to eight additional alluvial wells (two currently in use and one under construction) can be added under the plan. Depletions from out-of-priority pumping from the alluvial wells are offset by return flows from non-tributary well pumping under the plan, as well as other sources. These other sources include water available to the District through its participation in the Cherry Creek Project Water Authority and the WISE project, a plan by which excess water from the Cities of Denver and Aurora is made available via pipeline for use by several south metro area water providers. The augmentation plan also includes provisions to maximize use and flexibility for the various water sources via exchanges and storage, including aquifer storage and recovery.

C. Demand Requirements

The water requirements of DSSWSD have varied over the years with development and variations in weather. Although overall water demand has increased with additional customers, the per capita residential water demand has decreased due to the District's water conservation efforts. Tables 3 and 4 show the recorded demand over the past 43 years. As can be noted, the system use has tripled since 1982 to a total of 3,613 af in 2024. Projected buildout water use for the District is estimated to be 4,493 af/yr.

D. Summary of Uses and Projected Dry Year and Average Year Yields

The tabulation in Table 1 below shows water used in the system from 2002 – 2024. Even at buildout, water demand falls within the 17,291 af/yr the District has of firm water rights.

The yield of the District's Denver Basin water rights will not be affected by a dry year. Thus, the dry year and average year yield will be the same and will be as decreed, with a total of up to 15,484 af/yr of decreed rights available – 13,954 af/yr of District Denver Basin water rights and 1,530 af/yr of CCPWA Denver Basin water rights.

The District's Cherry Creek alluvial water rights can be impacted by a dry year in terms of both physical supply and water available through the administration of water rights. The most senior water rights for the Haley and Harrison ditches have a firm yield of 1,220 af/yr. When both the junior and senior alluvial water rights are combined with Denver Basin water under the District augmentation plans, the actual yield of the alluvial wells is greater. The expected average year yield of the alluvial water rights is about 2,150 af/yr.

The alluvial water rights owned by CCPWA are administered similarly to the District's alluvial water

rights. The three senior water rights owned by CCPWA are more senior than the District's ditch rights and therefore can also be relied upon in drought years. The District's share of the dry year yield for these alluvial water rights is 40 af/yr.

The anticipated reusable supply available to the District in dry years is 47 af. This is the volume available after return flows are used to meet augmentation plan requirements. It is exchanged up to and stored in Walker Reservoir for later use by the District.

The District's subscription to WISE is for an average annual delivery of 500 af. However, it is expected that deliveries will be reduced during times of drought and therefore are not considered in dry year supplies.

The current and proposed uses of the District's water rights are the same and are for all uses. These uses correspond to the existing decreed water rights of the District.

Table 1. Proportion of Tributary and Non-Tributary Water Use by Year

Year	Tributary (af/yr)	Non-Tributary (af/yr)	Total
2002	2,002	832	2,834
2003	1,730	687	2,417
2004	1,852	360	2,212
2005	2,088	652	2,740
2006	2,704	811	3,515
2007	2,474	613	3,087
2008	2,450	1,021	3,471
2009	1,928	608	2,536
2010	2,160	1,150	3,310
2011	2,536	769	3,305
2012	2,198	1,273	3,471
2013	1,704	1,195	2,899
2014	1,801	896	2,697
2015	2,036	741	2,777
2016	2,015	962	2,977
2017	2,155	943	3,098
2018	2,312	1,241	3,553
2019	2,149	1,230	3,379
2020	2,015	1,810	3,824
2021	2,107	1,297	3,405
2022	2,054	1,807	3,861
2023	2,026	668	2,694
2024	2,183	1,430	3,613

TABLE 2

Denver Southeast Suburban Water & Sanitation District
Water Rights Summary

Case No.	Description	Decreed Amount (af/yr)	Subtotals (af/yr)
A. Tributary Water Rights			
W-6268	Harrison & Haley Ditches	1,220	
W-6268, 11CW198	Junior Water Rights	Variable	
	Total Tributary Water:		**1,220 +**
B. Non-tributary (NT) and Not Non-tributary (NNT) Water Rights			
W-6265	Wells A, B and C	243	
W-6267	Well J	103	
W-7241	Wells F, G, H, I, K, L and M	1,519	
	Pre-S.B. 213 Wells Subtotal:		1,865
83CW087E	Senior Corp. East Side - Arapahoe	1,202	
83CW088E	Senior Corp. East Side - Denver	240	
83CW089E	Senior Corp. East Side - Dawson	305	
83CW090E	Senior Corp. East Side - LFH	514	
	Senior Corp East Side Subtotal:		2,261
82CW087W	Senior Corp. West Side - Arapahoe	1,823	
83CW088W	Senior Corp. West Side - Denver	396	
83CW089W	Senior Corp. West Side - Dawson	154	
83CW090W	Senior Corp. West Side - LFH	678	
	Senior Corp West Side Subtotal:		3,051
84CW208	Gondolier Farms Decree	885	
85CW203	DSSWSD Non-tributary Determination	2,466	
89CW086, 087, 088, and 089	Reata South	1,608	
93CW146 & 2003CW344	Evans Ranch	1,146	
85CW139	Wolf/Vistancia/Scott Road	184	
23CW3065	Cross Creek	40	
22CW3093	Pinery Meadows	49.4	
23CW3146	6793 Scott Ave.	47.9	
	Additional NT and NNT Subtotal:		6,426
Non-tributary Water Assigned to Broe Aug Plan (87CW338)			
82CW418	Rosie Wells Decree (Broe)	351	351
	Total NT and NNT Water:		**13,954**
C. Wholesale Water			
	CCPWA Denver Basin Rights	1,530	
	CCPWA Alluvial Rights (Senior)	40	
	CCPWA Alluvial Rights (Junior)	Variable	
	WISE Water	500	
	Total Wholesale Water:		**2,070 +**
D. Reuse Water			
	Reuse Water in Walker Reservoir	47 +	**47 +**
E. Total Water Sources			**17,291 +**

TABLES 3 and 4

Water Use by Water Year

Table 3. Tributary vs. Non-Tributary Volumes

Year	Tributary (af/yr)	Non-Tributary (af/yr)	Total
1982	1,080	12	1,091
1983	1,123	-	1,123
1984	1,258	-	1,258
1985	1,292	91	1,384
1986	1,511	103	1,614
1987	1,324	179	1,504
1988	1,422	127	1,549
1989	1,527	250	1,777
1990	1,225	271	1,496
1991	1,282	344	1,626
1992	1,407	156	1,563
1993	1,379	265	1,644
1994	1,184	574	1,758
1995	1,351	178	1,529
1996	1,601	303	1,904
1997	1,477	254	1,731
1998	1,537	257	1,795
1999	1,588	326	1,914
2000	1,838	533	2,371
2001	1,839	669	2,508
2002	2,002	832	2,834
2003	1,730	687	2,417
2004	1,852	360	2,212
2005	2,088	652	2,740
2006	2,704	811	3,515
2007	2,474	613	3,087
2008	2,450	1,021	3,471
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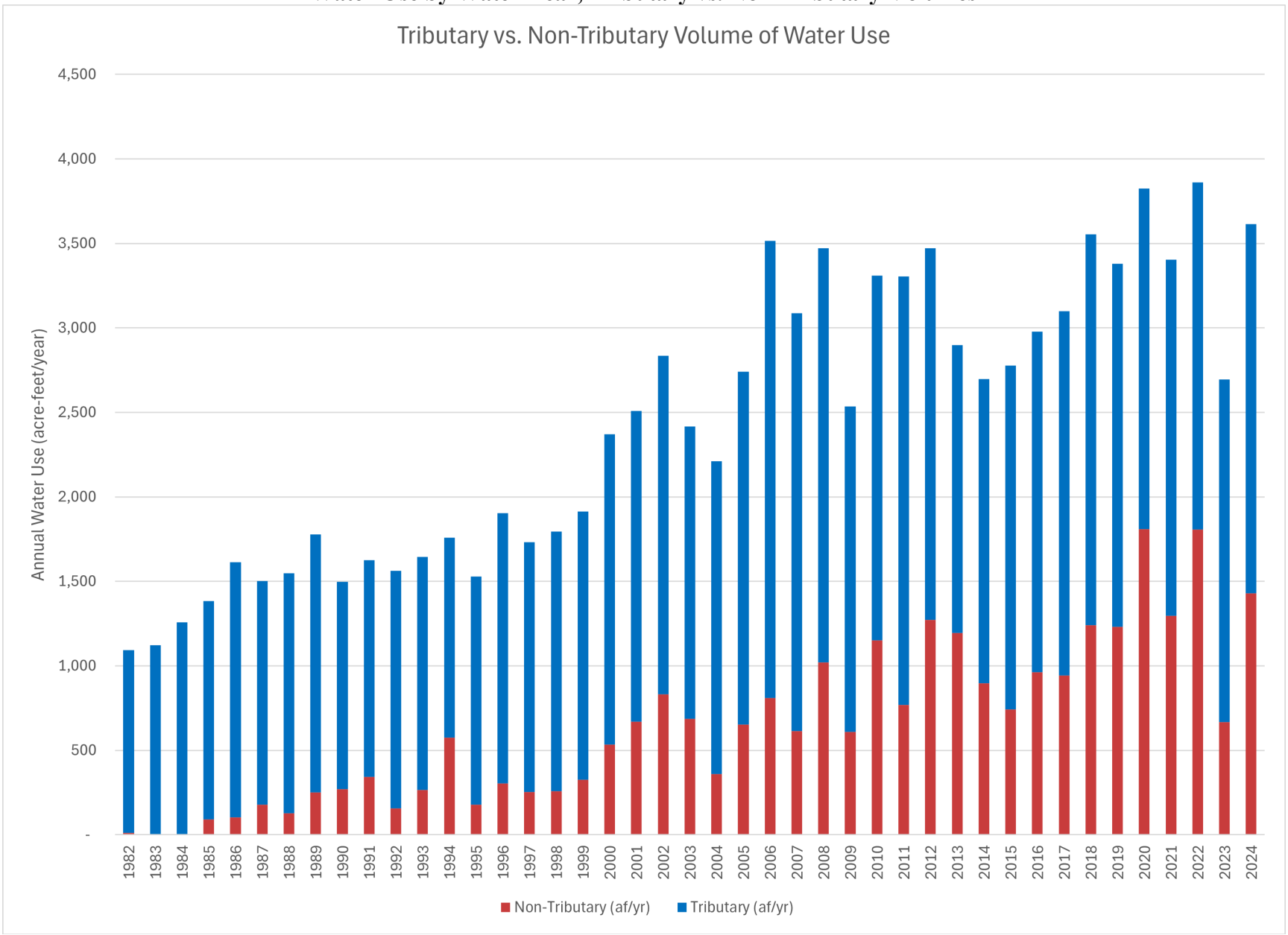
2020	2,015	1,810	3,824
2021	2,107	1,297	3,405
2022	2,054	1,807	3,861
2023	2,026	668	2,694
2024	2,183	1,430	3,613

Table 4. Tributary vs. Non-Tributary Percents

Year	Tributary	Non-Tributary
1982	99%	1%
1983	100%	0%
1984	100%	0%
1985	93%	7%
1986	94%	6%
1987	88%	12%
1988	92%	8%
1989	86%	14%
1990	82%	18%
1991	79%	21%
1992	90%	10%
1993	84%	16%
1994	67%	33%
1995	88%	12%
1996	84%	16%
1997	85%	15%
1998	86%	14%
1999	83%	17%
2000	78%	22%
2001	73%	27%
2002	71%	29%
2003	72%	28%
2004	84%	16%
2005	76%	24%
2006	77%	23%
2007	80%	20%
2008	71%	29%
2009	76%	24%
2010	65%	35%
2011	77%	23%
2012	63%	37%
2013	59%	41%
2014	67%	33%
2015	73%	27%
2016	68%	32%
2017	70%	30%
2018	65%	35%
2019	64%	36%
2020	53%	47%
2021	62%	38%
2022	53%	47%
2023	75%	25%
2024	60%	40%

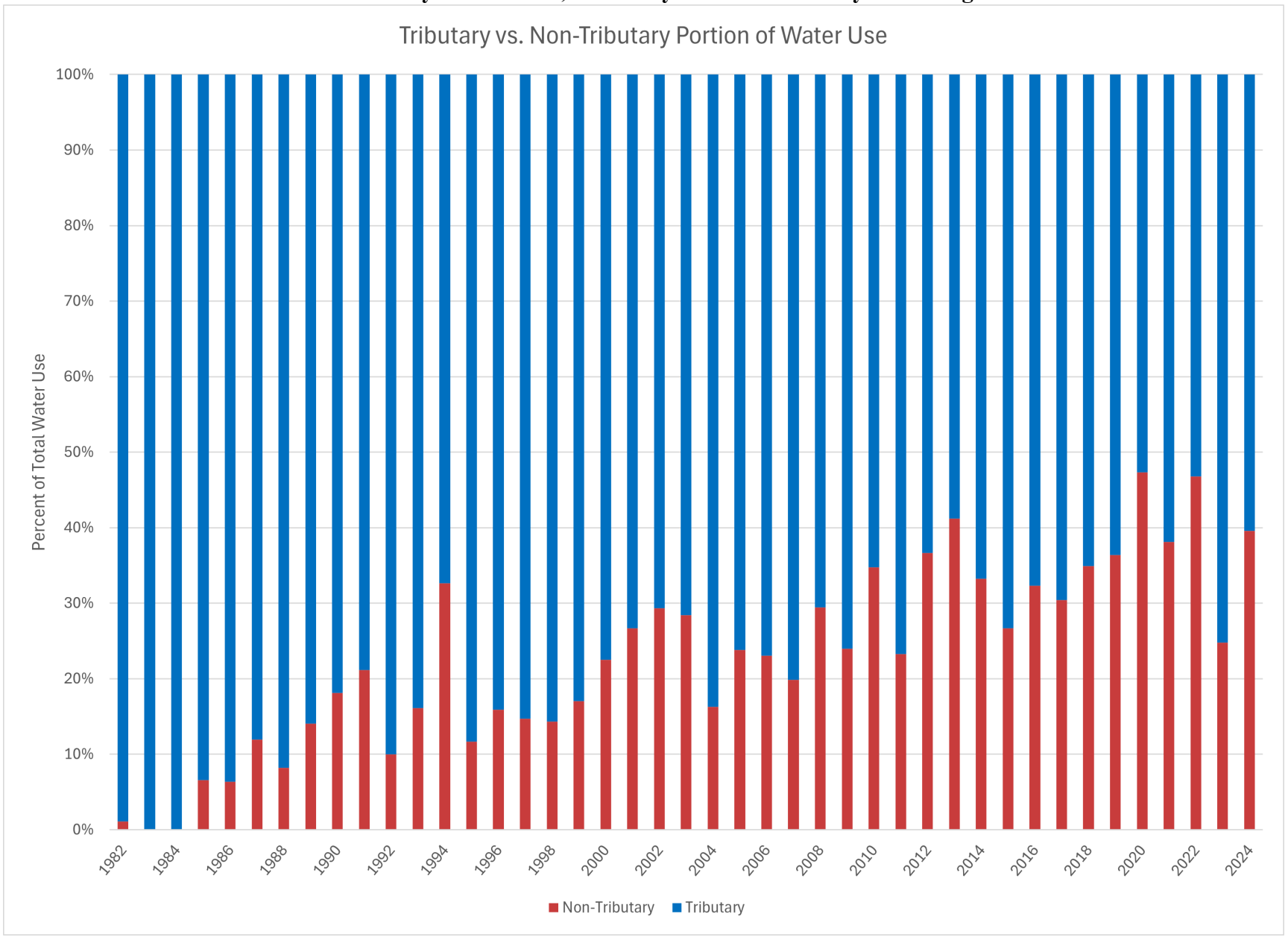
GRAPH 1

Water Use by Water Year, Tributary vs. Non-Tributary Volumes



GRAPH 2

Water Use by Water Year, Tributary vs. Non-Tributary Percentages



FOX TUTTLE

MEMORANDUM

To: Douglas County Development Review

From: Steve Tuttle, PE, PTOE

Date: July 31, 2020

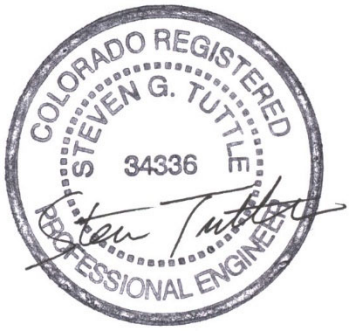
Project: Pinery West Traffic Impact Study Update

Subject: Summary of Changes to Traffic Impact Study

The Fox Tuttle Transportation Group has completed an update to the Pinery West Traffic Impact Study, previously accepted by Douglas County staff (dated April 15, 2019). The attached traffic impact study *update* incorporates the following changes to the project, with the resulting outcomes also summarized:

- **Removal of "Access A", which was a previously proposed ¾-movement, unsignalized intersection located along Parker Road (SH 83)**. The removal of this access is anticipated to result in some, redistribution of site traffic: increased access traffic at the remaining right-in, right-out access ("Access B") along Parker Road, and increases in traffic also to the Parker Road/Access C intersection. As shown in the updated traffic analysis, the redistribution of traffic does not result in degradation of intersection Level of Service at any location and the findings and recommendations of the original traffic impact study are still valid.
- **Changes to Land Use Projections and Trip Generation at the north end of the project.** With the removal of Access A, the land use plan has been updated at the north end of the project. The previously planned charter elementary school land use is now assumed as light industrial or flex office space. 50,000 square feet of office use was added to the trip generation estimates to conservatively estimate this change in projected use, with removal of the charter school from the trip generation calculations. The change in land use results in a decrease in AM peak hour trip generation for the project, with minor changes in the PM peak hour. There were no changes to the findings and recommendations of the original traffic study with this change in land use projections.

/SGT



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Pinery West
Traffic Impact Study UPDATE

Date: *Revised* July 31, 2020

Submitted To:
Starwood Land Advisors, LLC
385 Inverness Parkway, Suite 310
Englewood, CO 80112

Submitted By:
Fox Tuttle Transportation Group
1624 Market Street, Suite 202
Denver, Colorado 80202

FOX TUTTLE

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Existing Traffic Data

Level of Service Definitions

Intersection Capacity Worksheets and Time-Space (Signal Progression) Diagrams

PINERY WEST DEVELOPMENT

TRAFFIC IMPACT STUDY *UPDATE*

1.0 INTRODUCTION

The Fox Tuttle Transportation Group has prepared this traffic impact study for the Pinery West development project in Douglas County, Colorado. The project site is located at the northwest corner of the Parker Road (Highway 83) and N. Pinery Parkway intersection. The project proposes to develop 144± acres with a mix of employment, commercial, and light industrial uses.

The purpose of this study is to assist in identifying potential traffic impacts within the study area as a result of this project. The traffic study addresses existing, site-build out (Year 2030), and long-term, 20-year (Year 2040) peak hour intersection and roadway conditions in the study area with and without the project generated traffic. The information contained in this study is anticipated to be used by the Douglas County staff in identifying any intersection or roadway deficiencies and potential improvements for the build-out year and long-term future scenarios. This study focused on the weekday AM and PM peak hours which represents the periods of highest trip generation for the proposed uses and adjacent roadway traffic. It also includes an evaluation of roadway laneage needs, auxiliary lane requirements, and intersection traffic controls.

The study is consistent with the requirements listed in Douglas County's *Roadway Design and Construction Standards, Appendix B for Traffic Impact Study Criteria*.

2.0 PROJECT DESCRIPTION

The Pinery West project proposes to construct a mix of employment, commercial, and light industrial uses on a largely vacant 144± acre property. Based on conceptual site planning, it is anticipated that there will be a grocery marketplace, office space, flex office space, commercial plats for shops, restaurants, and services, daycare services, a hote, RTD park-n-ride station, recreational space, and light industrial uses.

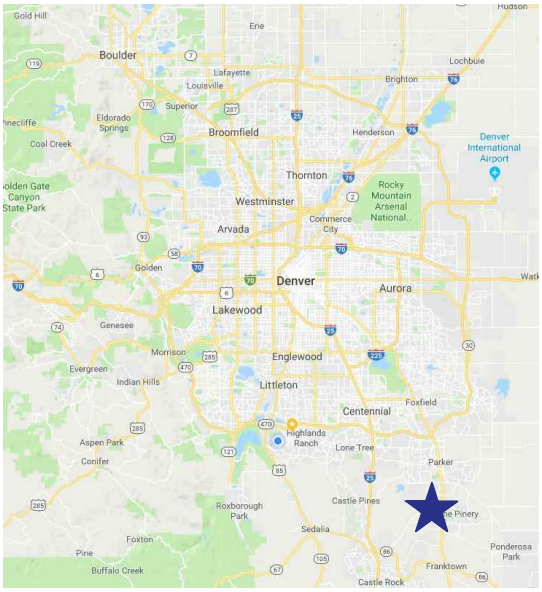
The project proposes to have two full-movement accesses on N. Pinery Parkway, a ¾-movement access along N. Pinery Parkway, and a right-in, right-out access on Parker Road. The curb-cuts on Pinery Parkway already exist and will be extended into the subject property to service the proposed land uses. In the short-term, trips from the Pinery West project will travel along Parker Road to get to/from their regional destinations.

In the long-term, Pinery Parkway is anticipated to be extended to the west to Crowfoot Valley Road and Pinery Center Boulevard is anticipated to be extended to the north to Stroh Road at J Morgan Boulevard. The County also anticipates that Pinery Center Blvd. will be extended as a collector roadway south to Scott Road in the long-term future, pending development north of Scott Road that would complete this connection.

The internal roadway network will include constructing Pinery Center Boulevard and Prospector Way as collector streets.

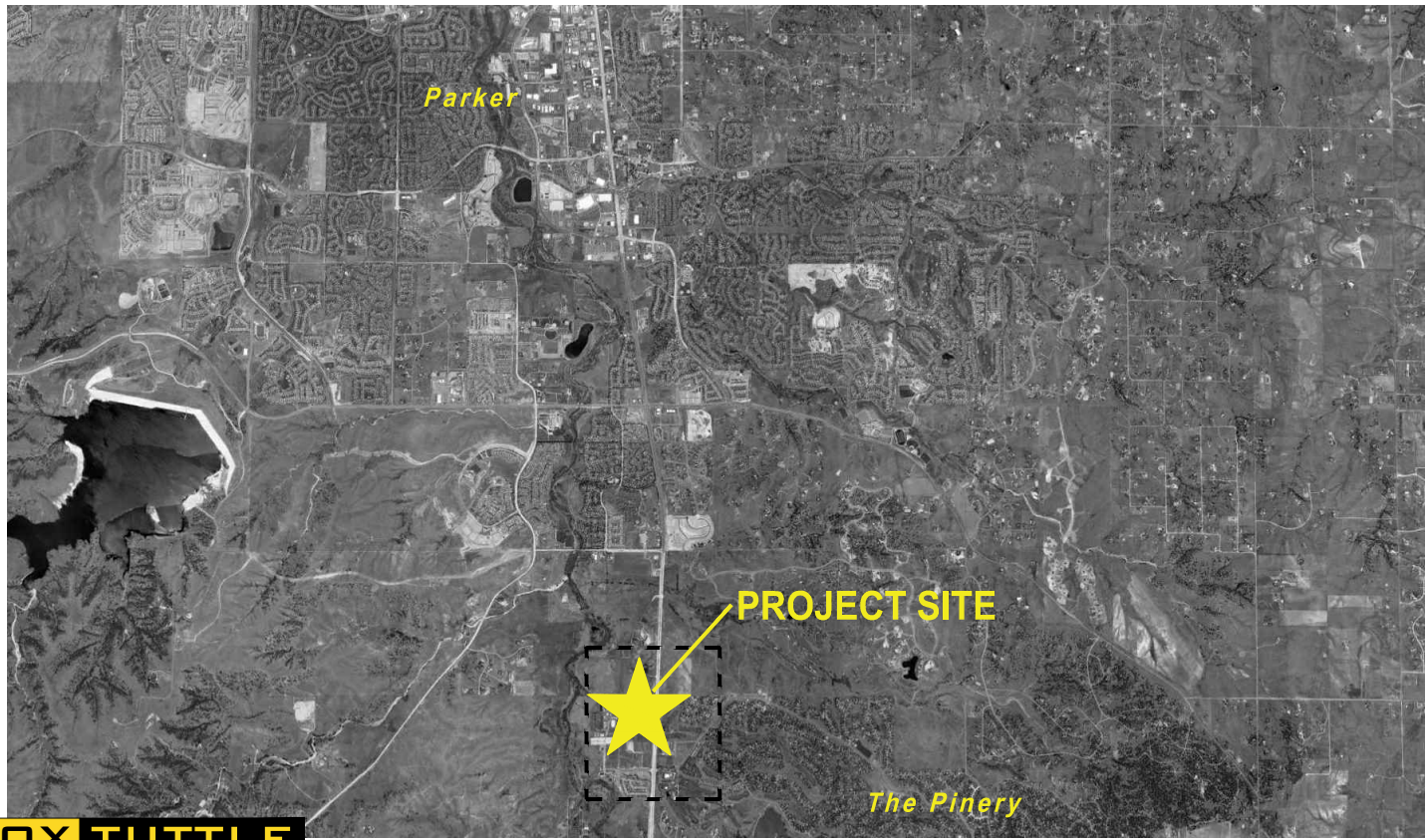
A vicinity map is shown on **Figure 1**. The site and access plan is provided on **Figure 2**.

Location Map



Project Site

Vicinity Map



FOX TUTTLE
TRANSPORTATION GROUP

PINERY WEST TRAFFIC IMPACT STUDY UPDATE

VICINITY MAP

FT #	20049	Filing/Phase	03 Minor Development	Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	1

FOX TUTTLE TRANSPORTATION GROUP

PINERY WEST TRAFFIC IMPACT STUDY UPDATE

CONCEPT SITE PLAN

FT #	20049	Filing	03 Minor Development	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	2

3.0 STUDY CONSIDERATIONS

3.1 Data Collection

Intersection turning movement volumes were collected in October 2018 at three existing intersections during the weekday AM and PM peak hours. Average daily traffic (ADT) counts were also collected for 24-hours on N. Pinery Parkway west of Parker Road and on Stroh Road east of J. Morgan Boulevard. Historic daily volumes along Parker Road were gathered from the Colorado Department of Transportation's (CDOT) Transportation Data Management System (TDMS) and Online Transportation Information System (OTIS) as well as from Denver Regional Council of Government (DRCOG) resources. The existing traffic volumes are illustrated on **Figure 3**. The existing intersection geometry and traffic control are also shown on this figure.

Signal-related information for the existing intersections were provided by the Town of Parker and CDOT. Count data sheets are provided in the **Appendix**.

3.2 Evaluation Methodology

The traffic operations analysis addressed the signalized and unsignalized intersection operations using the procedures and methodologies set forth by the *Highway Capacity Manual (HCM)*[1]*.* Existing peak hour factor was applied to the intersections for the existing scenarios. Study intersections were evaluated using Synchro software.

3.3 Level of Service Definitions

A level of service analysis was conducted to determine the existing and future performance of the study area intersection and to determine the most appropriate traffic control device and need for auxiliary lanes for the study intersections.

To measure and describe the operational status of the study intersections, transportation engineers and planners commonly use a grading system referred to as "Level of Service" (LOS) that is defined by the *HCM.* LOS characterizes the operational conditions of an intersections traffic flow, ranging from LOS A (indicating very good, free flow operations) and LOS F (indicating congested and sometimes oversaturated conditions). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with traveling through the intersections. The intersection LOS is represented as a delay in seconds per vehicle for the

[1] Highway Capacity Manual, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 2010 and 6th Edition (2016).

intersection as a whole and for each turning movement. A more detailed discussion of LOS methodology is contained in the **Appendix** for reference.

Typically, LOS A through C is considered to be good for the overall intersection operations and the desired standard for overall intersection performance is LOS D or better. Individual movements may be allowed to fall to LOS E/F depending on the circumstances, such as a low-volume sidestreet approach to a major arterial or a protected-only left-turn on a major arterial.

4.0 EXISTING CONDITIONS

4.1 Roadways

The study area boundaries are based on the amount of traffic to be generated by the project and potential impact to the existing roadway network. The existing study area street network consists of a major arterial and two collectors. The primary public roadways that serve the project site are discussed in the following text and illustrated on **Figure 1**.

Parker Road (State Highway 83) is a north-south six-lane major arterial that provides local and regional access beyond the Pinery. The highway travels from Aurora (to the north), through the Town of Parker and beyond Franktown (to the south). Parker Road is a CDOT facility classified as NR-A (Non-Rural Principal Highway). North of the project site, the roadway intersects with and provides access to E-470. The posted speed limit on Parker Road is 55 miles per hour (mph) adjacent to the site. This roadway has limited access for pedestrians and bicyclists (see **Section 4.3** for discussion on existing facilities for pedestrian and bicyclist). Parker Road currently serves approximately 32,000 vehicles per day (vpd) north of N. Pinery Parkway and approximately 23,900 vpd south of N. Pinery Parkway. This roadway is the eastern boundary of the proposed site. Parker Road is between 76-feet and 112-feet wide adjacent to the Pinery West property, which includes 12-foot travel lanes, three per direction; 12-foot right-turn deceleration and acceleration lanes; varying widths of shoulders; and a 30-foot center left-turn lane/median.

Stroh Road is an east-west, collector that extends from Motsenbocker Road to Parker Road. Stroh Road ends east of Parker Road within a rural neighborhood. It provides access to existing residential neighborhoods and commercial businesses. The posted speed limit is 40 mph within the study area. Stroh Road currently serves approximately 8,800 vpd west of Parker Road. This roadway is 102-feet east of J. Morgan Boulevard (two lanes per direction) and narrows to 28-feet west of J. Morgan Boulevard (one lane

per direction); including 12-foot travel lanes; 12-foot deceleration lanes; and a center median. This roadway is the northern boundary of the study area.

Pinery Parkway is circuitous, four-lane collector roadway that serves The Pinery community with two connections to Parker Road. Within The Pinery, the parkway provides access to neighborhoods, the country club, four schools, and recreational areas. West of Parker Road, Pinery Parkway provides access to a small residential neighborhood, The Pinery RV Lot, Pinery Wastewater Treatment Plant, and a trailhead for the Cherry Creek Trail. The posted speed limit is 25 mph. In the long-term, it is proposed that this roadway be extended west to access Crowfoot Valley Road.

4.2 Intersections

The study area includes three intersections that are listed below with the current traffic control and were analyzed for existing and future background year traffic operations:

1. Parker Road at N. Pinery Parkway (signalized)
2. Parker Road at Stroh Road (signalized)
3. Stroh Road at J. Morgan Boulevard (side-street stop-controlled)

The existing lane configuration at each of the study locations is illustrated on **Figure 3**. Additional intersections were analyzed for the scenarios with the addition of project-added traffic.

4.3 Pedestrian and Bicycle

Currently, there are sidewalks on both sides of Pinery Parkway (west of Parker Road) and on Stroh Road. There is a detached multi-use path on the south side of Pinery Parkway that connects the Cherry Creek Trail to The Pinery country club and community. Along Pinery Parkway there is a multi-use path that is designated as a regional trail that links to the Cherry Creek Trail.

There are no on-street bike lanes on the study roadways. Currently bicyclists are permitted to ride within the wide shoulders on Parker Road or with traffic on Stroh Road and Pinery Parkway.

Just west of the project boundary is a trailhead for the Cherry Creek Trail. This multi-use path starts south of this trailhead and travel north through the Town of Parker and City of Centennial into the Cherry Creek Reservoir State Park. The trail continues along the Cherry Creek into downtown Denver ending at Confluence Park.

4.4 Transit

Currently, there is the Pinery park-n-ride on the north side of N. Pinery Parkway just east of Parker Road. It has 79 parking spaces and is served by Route P (Parker / Denver). The bus route links The Pinery to Parker and Downtown Denver via Parker Road, E-470, I-25, and Broadway. There is limited service to the near-by park-n-ride that only operates in peak times at 30-minute headways.

4.4.1 Existing Intersection Capacity Analysis

The existing volumes, lane configuration, and traffic control are illustrated on **Figure 3**. The results of the LOS calculations for the intersections are summarized in **Table 1**. The intersection level of service worksheets and queue reports are attached in the **Appendix**.

All project intersections are shown to be operating at LOS C or better overall in the AM and PM peak hours, which meets Douglas County requirements for overall intersection operations. There are several individual movements that are operating at LOS E or F, as noted below:

- Parker Road & N. Pinery Parkway: This signalized intersection operates overall at LOS C/B in the AM/PM peak hours, respectively. The westbound right-turn movement is calculated to operate at LOS F in the AM peak hour, with just under 400 vehicles per hour (vpd) exiting the Pinery and turning right onto northbound Parker Road. The 95th percentile queue[2] for this movement is calculated at 328 feet in the AM peak hour.

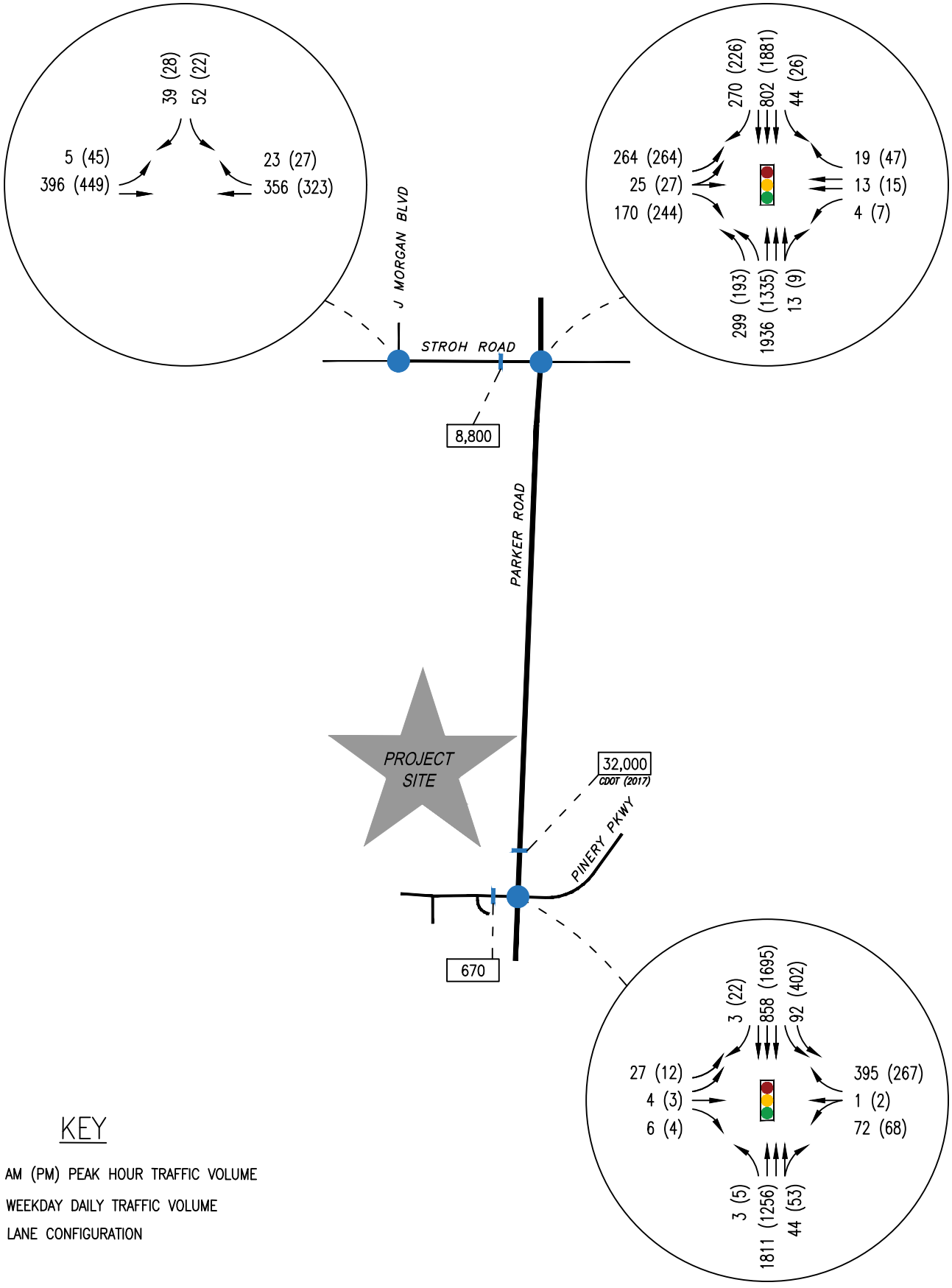
  To mitigate this existing deficiency, a northbound right-turn acceleration lane would need to be constructed on Parker Road to allow this movement to function as a "free right" turn movement, which would significantly reduce the delays and queuing. An acceleration lane would typically be installed for these volumes. This improvement would not be related to development of the Pinery West project but would be necessary to mitigate an existing deficiency. This improvement was not assumed to be installed for future scenarios with project development, to provide a more conservative estimate of site traffic impacts.

- Parker Road & Stroh Road: This signalized intersection operates overall at LOS C both peak hours. The southbound left-turn movement is calculated to operate at LOS E in the

[2] It should be noted that the 95th percentile queue length is a theoretical queue that is 1.65 standard deviations above the average queue length. In theory, the 95th percentile queue would be exceeded 5% of the time based on the average queue length, but it is also possible that a queue this long may not occur.

PM peak hour. The 95th percentile queue for this movement is calculated at 55 feet in the AM peak hour (less than 3 vehicles).

This delay is due to the protected-only left-turn operation of this movement and is common where a lower volume left-turn is protected along a major arterial. As the protected-only operation is due to safety concerns with left-turns across a major, three-lane arterial, no changes are recommended to mitigate this delay.



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PINERY WEST TRAFFIC IMPACT STUDY UPDATE

EXISTING TRAFFIC VOLUMES (YEAR 2018)

FT #	20049	Pinery Village Filing 3 Minor Development	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	3

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Table 1A - Signalized Intersection Level of Service Summary

Intersection and Lanes Groups	2018 Existing AM Peak Delay	2018 Existing AM Peak LOS	2018 Existing PM Peak Delay	2018 Existing PM Peak LOS	2030 Background AM Peak Delay	2030 Background AM Peak LOS	2030 Background PM Peak Delay	2030 Background PM Peak LOS	2030 Background + Project AM Peak Delay	2030 Background + Project AM Peak LOS	2030 Background + Project PM Peak Delay	2030 Background + Project PM Peak LOS	2040 Background without Connections AM Peak Delay	2040 Background without Connections AM Peak LOS	2040 Background without Connections PM Peak Delay	2040 Background without Connections PM Peak LOS	2040 Total with Connections AM Peak Delay	2040 Total with Connections AM Peak LOS	2040 Total with Connections PM Peak Delay	2040 Total with Connections PM Peak LOS
SIGNAL CONTROL																				
Parker Rd & N. Pinery Pkwy	**34.6**	**C**	**15.7**	**B**	**41.8**	**D**	**22.7**	**C**	**42.3**	**D**	**44.5**	**D**	**58.2**	**E**	**23.9**	**C**	**36.7**	**D**	**40.2**	**D**
Eastbound Left	45.2	D	29.9	C	45.5	D	28.8	C	48.0	D	70.0	E	44.6	D	29.7	C	27.6	C	44.0	D
Eastbound Through	30.3	C	29.6	C	30.3	C	28.4	C	39.1	D	30.6	C	29.9	C	29.3	C	23.4	C	30.9	C
Eastbound Right	0.0	A	0.0	A	0.0	A	0.0	A	0.1	A	0.3	A	0.0	A	0.0	A	0.1	A	0.2	A
Westbound Left									62.6	E	70.6	E					46.8	D	53.2	D
Westbound Left+Through	45.9	D	33.3	C	46.6	D	42.4	D					50.0	D	45.4	D				
Westbound Through									50.5	D	53.0	D					48.3	D	52.8	D
Westbound Right	<120	F	23.3	C	<120	F	26.8	C	> 120	F	46.8	D	<120	F	27.8	C	45.8	D	40.4	D
Northbound Left	54.4	D	41.1	D	54.4	D	48.7	D	53.3	D	70.3	E	53.5	D	48.7	D	52.5	D	54.4	D
Northbound Through+Right	23.1	C	16.9	B	39.2	D	26.7	C	23.5	C	33.9	C	67.2	E	28.5	C	39.7	D	27.6	C
Southbound Left	40.2	D	31.7	C	40.4	D	38.3	D	54.0	D	58.9	E	41.1	D	38.3	D	51.5	D	54.6	D
Southbound Through	9.7	A	8.9	A	10.3	B	15.2	B	17.4	B	47.3	D	11.3	B	16.6	B	27.5	C	49.7	D
Southbound Right	0.0	A	0.0	A	0.0	A	0.0	A	0.2	A	0.3	A	0.0	A	0.0	A	0.1	A	20.5	C
Parker Rd & Stroh Rd	**25.2**	**C**	**20.9**	**C**	**32.1**	**C**	**26.4**	**C**	**31.1**	**C**	**34.8**	**C**	**32.6**	**C**	**30.2**	**C**	**25.7**	**C**	**36.5**	**D**
Eastbound Left	53.6	D	45.5	D	43.7	D	40.8	D	43.0	D	61.5	E	43.4	D	46.4	D	48.7	D	54.8	D
Eastbound Left+Through	52.2	D	45.3	D	42.7	D	42.8	D	41.9	D	48.9	D	42.1	D	46.8	D	42.4	D	43.6	D
Eastbound Right	0.2	A	0.2	A	0.3	A	0.3	A	0.3	A	0.3	A	0.2	A	0.3	A	0.1	A	0.2	A
Westbound Left	49.1	D	47.5	D	50.4	D	49.4	D	50.9	D	50.2	D	50.7	D	54.2	D	51.3	D	50.4	D
Westbound Through	49.1	D	46.7	D	53.0	D	52.2	D	53.1	D	53.7	D	53.3	D	57.1	E	53.4	D	52.8	D
Westbound Right	0.0	A	0.0	A	0.1	A	0.1	A	0.1	A	0.1	A	0.0	A	0.1	A	0.0	A	0.1	A
Northbound Left	46.2	D	46.7	D	48.7	D	48.4	D	52.1	D	60.6	E	52.8	D	62.2	E	51.1	D	51.4	D
Northbound Through	24.8	C	14.4	B	17.9	B	16.9	B	37.3	D	18.5	B	39.4	D	17.7	B	25.6	C	19.0	B
Northbound Right	11.9	B	9.7	A	10.7	B	10.4	B	10.8	B	8.9	A	10.8	B	10.4	B	11.0	B	10.7	B
Southbound Left	48.8	D	55.2	E	57.3	E	57.2	E	64.1	E	54.7	D	70.9	E	81.3	F	59.6	E	59.7	E
Southbound Through	20.2	C	24.1	C	47.5	D	35.1	D	22.6	C	50.0	D	21.0	C	40.0	D	20.5	C	52.4	D
Southbound Right	0.3	A	0.2	A	0.3	A	0.3	A	0.3	A	0.3	A	0.4	A	0.3	A	0.4	A	0.3	A
Pinery Pkwy & Access C									**15.5**	**B**	**26.7**	**C**					**20.3**	**C**	**16.5**	**B**
Eastbound Left									7.3	A	18.7	B					5.0	A	11.0	B
Eastbound Through									7.8	A	23.1	C					7.9	A	12.7	B
Eastbound Right									7.3	A	18.7	B					10.3	B	6.4	A
Westbound Left									3.8	A	18.4	B					14.4	B	9.2	A
Westbound Through									3.6	A	14.1	B					16.8	B	8.8	A
Westbound Right									3.9	A	14.6	B					51.9	D	5.8	A
Northbound Left+Through+Right									35.7	D	15.9	B					43.5	D	30.9	C
Southbound Left									54.4	D	48.6	D					45.8	D	42.4	D
Southbound Through+Right									34.8	C	15.1	B					40.1	D	29.4	C
Stroh Road & J Morgan Blvd																	**16.1**	**B**	**16.7**	**B**
Eastbound Left																	5.2	A	6.8	A
Eastbound Through																	9.0	A	11.2	B
Eastbound Right																	6.0	A	6.8	A
Westbound Left																	4.8	A	6.5	A
Westbound Through																	7.2	A	8.4	A
Westbound Right																	4.8	A	5.9	A
Northbound Left																	48.9	D	43.0	D
Northbound Through																	43.1	D	35.7	D
Northbound Right																	43.0	D	35.7	D
Southbound Left																	47.7	D	45.3	D
Southbound Through																	43.2	D	44.0	D
Southbound Right																	43.2	D	43.7	D
Pinery Pkwy & Pinery Center Blvd																	**18.6**	**B**	**22.8**	**C**
Eastbound Left																	7.6	A	10.5	B
Eastbound Through																	7.1	A	10.5	B
Eastbound Right																	6.6	A	8.8	A
Westbound Left																	10.9	B	19.6	B
Westbound Through																	12.5	B	17.9	B
Westbound Right																	13.2	B	31.3	C
Northbound Left																	38.3	D	34.6	C
Northbound Through+Right																	38.3	D	33.4	C
Southbound Left																	37.8	D	45.6	D
Southbound Through+Right																	37.1	D	36.8	D

Note: Delay represented in average seconds per vehicle.

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Table 1B - Stop Controlled Intersection Level of Service Summary

Intersection and Lanes Groups	2018 Existing				2030 Background				2030 Background + Project				2038 Background without Connections				2038 Total with Connections			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
STOP SIGN CONTROL																				
Stroh Rd & J. Morgan Blvd																				
Eastbound Left	8.2	A	8.2	A	8.4	A	8.5	A	8.4	A	8.6	A	8.6	A	8.7	A				
Southbound Left	21.1	C	19.0	C	29.4	D	25.9	D	31.9	D	31.8	D	38.9	E	33.1	D				
Southbound Right	11.1	B	10.6	B	11.8	B	11.2	B	11.8	B	11.5	B	12.5	B	11.8	B				
Parker Rd & Wellspring Dr																				
Eastbound Right									0.0	A	0.0	A					12.3	B	33.0	D
Pinery Pkwy & Pinery Center Blvd																				
Eastbound Left									7.6	A	7.7	A								
Westbound Left									7.4	A	7.5	A								
Northbound Left									0.0	A	0.0	A								
Northbound Through+Right									8.7	A	8.7	A								
Southbound Left									11.1	B	18.9	C								
Southbound Through+Right									0.0	A	18.9	C								
Pinery Pkwy & Access D																				
Westbound Left									8.6	A	7.3	A					8.4	A	9.2	A
Northbound Right									7.4	A	8.6	A					9.9	A	11.4	B

Note: Delay represented in average seconds per vehicle.

20049_LOS.xlsx

5.0 FUTURE CONDITIONS

5.1 Annual Growth Factor and Future Volume Methodology

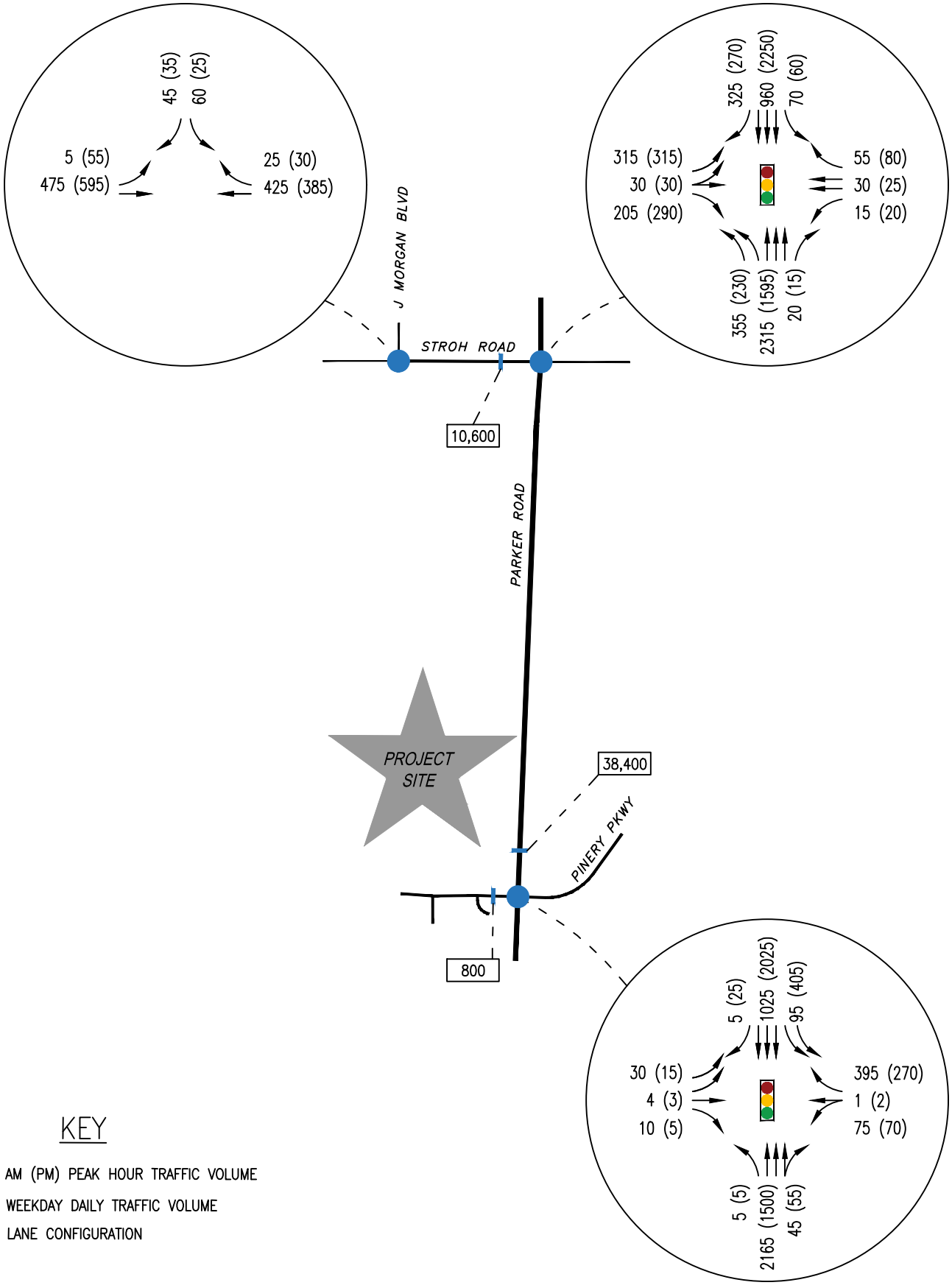
In order to forecast the future peak hour traffic volumes, background traffic growth assumptions were estimated based on various resources: DRCOG regional model, CDOT historic traffic volumes and 20-year factor, and previous traffic studies[3]. Based on this data, it is assumed there will be an annual growth rate of 1.5% throughout the study area which is consistent with CDOT data. Additional traffic was assumed for the east leg of the Parker Road & Stroh Road intersection to account for recent residential development in that area. Additionally, it was assumed that since the Pinery is largely built out that projected traffic growth along N. Pinery Parkway east of Parker Road would not be as high as the 1.5% annual growth assumed elsewhere in the study area.

The project is anticipated take 10 years to be fully permitted, constructed and occupied. On this basis, the Year 2030 was analyzed as the site "build out" year.

Future traffic connections (long-term) include the extension of Pinery Parkway to the west as a minor arterial roadway and the extension of Pinery Center Blvd. as a collector roadway north to Stroh Road and south to Scott Road. The future background traffic projections include a shift of some local traffic from Parker Road to this new north-south collector. These volumes were based on traffic studies provided by Douglas County for planned development to the south near Scott Road. The projections for future traffic with the connections also assumes a shift of traffic from Stroh Road (and future north) to Pinery Parkway to the west, as the future roadway network will provide alternatives to Parker Road in this area.

Using these assumptions, the 2030 background traffic is summarized on **Figure 4**; the 2040 background traffic without the Pinery Parkway and Pinery Center Blvd. connections is summarized on **Figure 5;** and the 2040 background traffic with these connections is summarized on **Figure 6**.

[3] Referenced: Pinery West Development Traffic Impact Study. Krager and Associates, Inc. September 2008.



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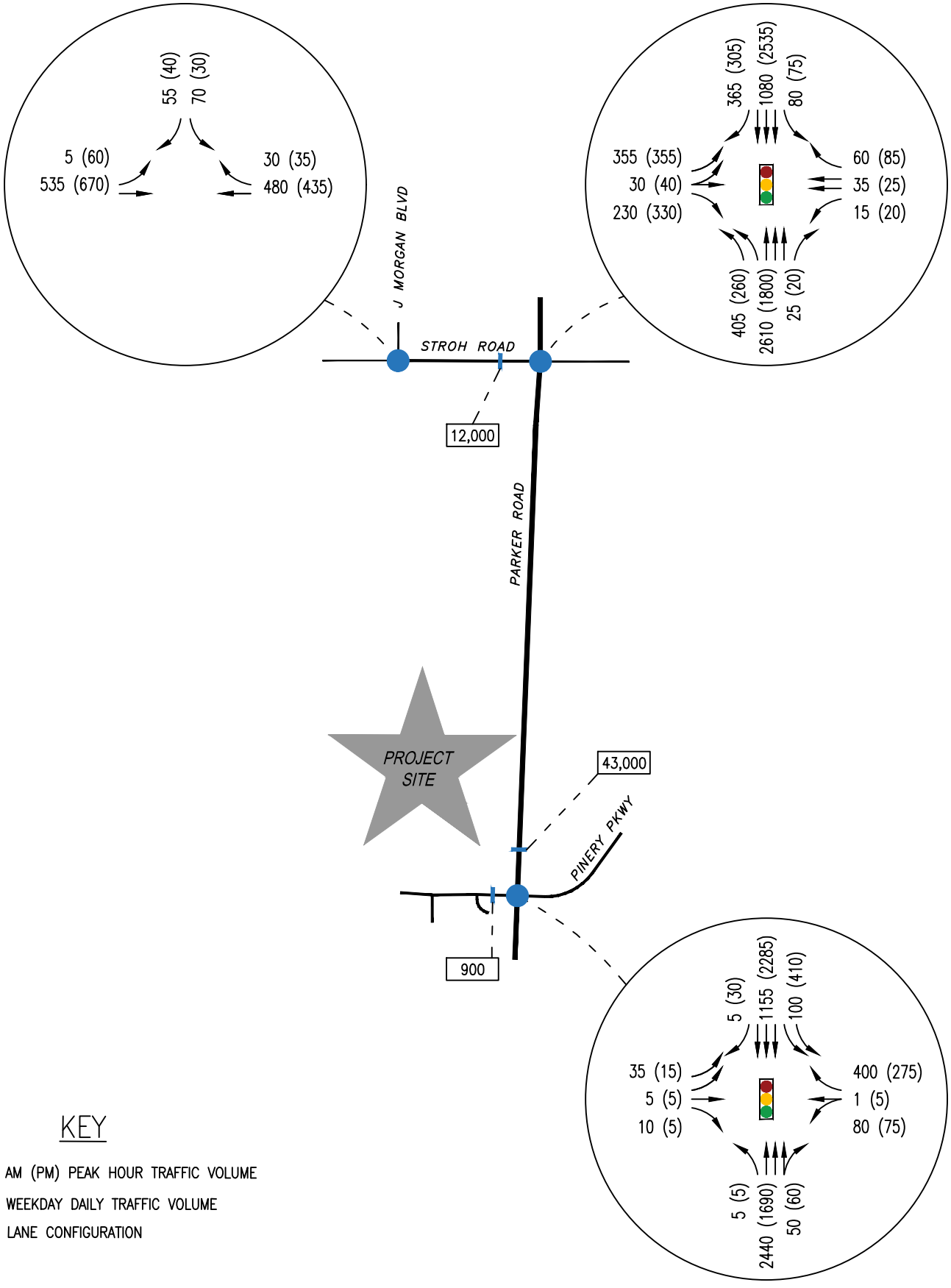
PINERY WEST TRAFFIC IMPACT STUDY UPDATE

YEAR 2030 BACKGROUND TRAFFIC VOLUMES

FT #	20049	Pinery Village Filing 3 Minor Development	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	4



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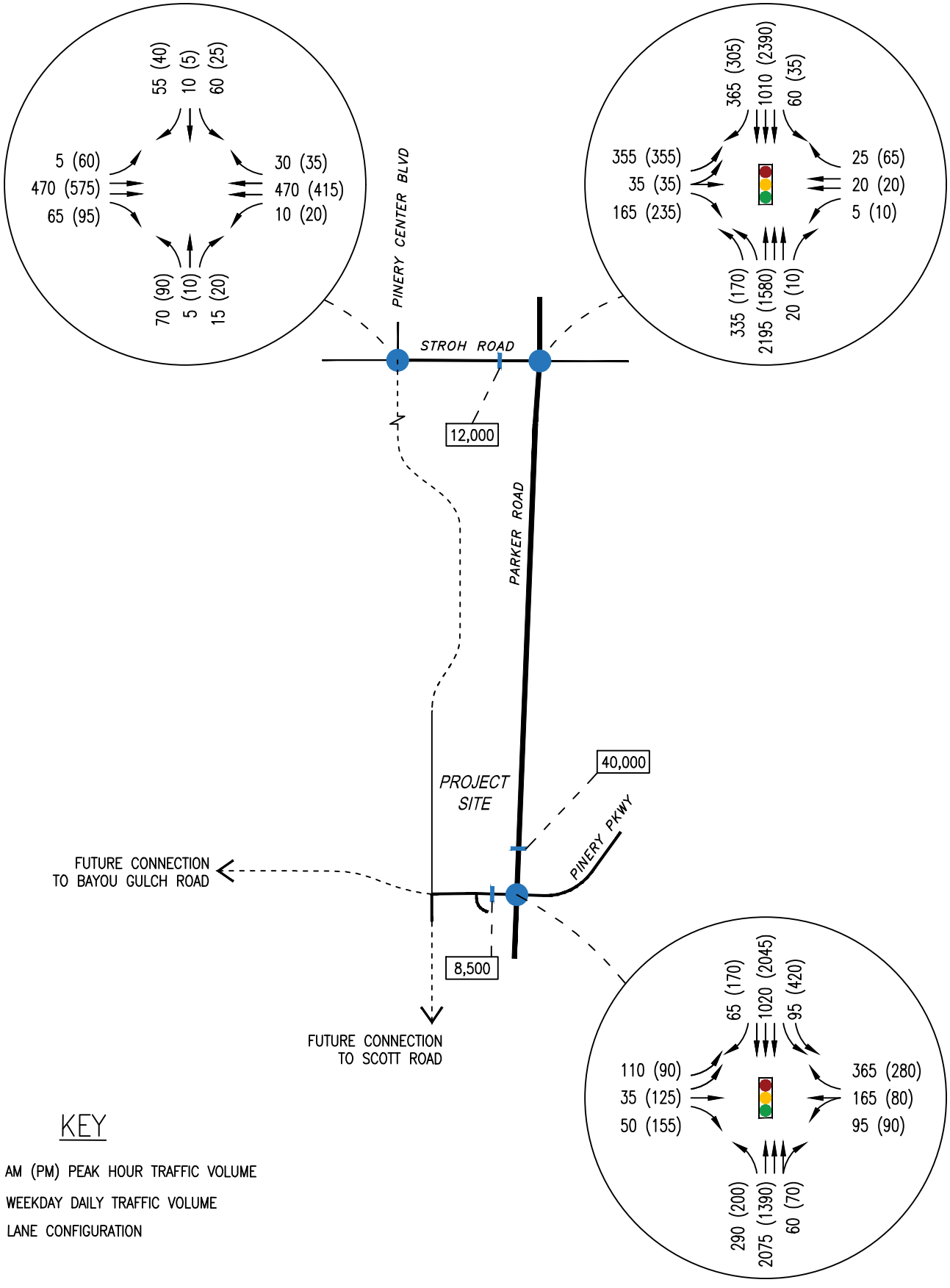
PINERY WEST TRAFFIC IMPACT STUDY UPDATE

YEAR 2040 BACKGROUND TRAFFIC VOLUMES (WITHOUT CONNECTIONS)

FT #	2004g	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	5



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PINERY WEST TRAFFIC IMPACT STUDY UPDATE

YEAR 2040 BACKGROUND TRAFFIC VOLUMES (WITH CONNECTIONS)

FT #	2004g	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	6

5.1.1 Year 2030 Background Intersection Capacity Analysis

The study area intersections were evaluated to determine baseline operations for the 2030 background scenario and to identify any capacity constraints associated with background traffic. The background volumes, lane configuration, and traffic control are illustrated on **Figure 4**.

The level of service criteria discussed previously was applied to the study area intersections to determine the impacts with the short-term background volumes. The results of the LOS calculations for the intersections are summarized in **Table 1A** and **Table 1B**. The intersection level of service worksheets and queue reports are attached in the **Appendix**. The Year 2030 background analysis assumed the existing lane configuration and signal phasing would remain the same at the study intersections.

All project intersections are shown to operate at LOS D or better overall in the AM and PM peak hours, which meets Douglas County requirements for overall intersection operations. There are several individual movements that are operating at LOS E or F, as noted below:

- Parker Road & N. Pinery Parkway: As noted with the existing conditions analysis, the westbound right-turn movement is calculated to operate at LOS F in the AM peak hour Parker Road with long queueing.

  To mitigate this existing deficiency, a northbound right-turn acceleration lane would need to be constructed on Parker Road to allow this movement to function as a “free right” turn movement, which would significantly reduce the delays and queuing. An acceleration lane would typically be installed for these volumes. This improvement would not be related to development of the Pinery West project but would be necessary to mitigate an existing deficiency. This improvement was not assumed to be installed for scenarios with project development to provide a conservative estimate of site traffic impacts.

- Parker Road & Stroh Road: This signalized intersection is projected to operate overall at LOS D and LOS C in the AM and PM hours, respectively, but with background (non-project) related improvements installed. Several side-street and left-turn movements are anticipated to operate at LOS E and/or LOS F in at least one peak hour.

  Widening of the east departure from the intersection is necessary to provide a dedicated westbound through lane and westbound dual left-lanes. This would remove the existing westbound shared left + through lane condition which requires split phasing of the signal, which is highly inefficient and would result in the intersection operating at LOS F in the

Year 2030 with background (non-project) traffic growth. This improvement is assumed in place for the Year 2030 background scenario.

5.1.2 Year 2040 Background Intersection Capacity Analysis

The study area intersections were evaluated to determine baseline operations for the Year 2040 background scenario and to identify any capacity constraints associated with background traffic in the long-term scenario with the project and without the Pinery Parkway and Pinery Center Blvd. extensions in place. Approach peak hour factors were adjusted, where appropriate, to account for peak hour spreading that will occur with traffic volume growth. The Year 2040 background volumes, lane configuration, and traffic control are illustrated on **Figure 5**.

The results of the LOS calculations for the intersections are summarized in **Table 1A** and **Table 1B**. The intersection level of service worksheets and queue reports are attached in the **Appendix**.

All project intersections are shown to be operate at LOS D or better overall in the AM and PM peak hours, with the following exceptions:

- Parker Road & N. Pinery Parkway: This signalized intersection is calculated to operate at LOS E overall in the AM peak hour. In addition to the continued delays for the westbound right-turn movement, which will increase with traffic growth on Parker Road, the northbound through movement is projected to operate at LOS E in the AM peak hour.

  To mitigate the existing westbound right-turn deficiency, a northbound right-turn acceleration lane would need to be constructed on Parker Road (as previously discussed). To mitigate the northbound approach delays, a northbound right-turn deceleration lane into the Pinery would need to be installed. Both are either existing or future-background growth deficiencies not related to development of the project. These improvements were not assumed to be installed for future scenarios with project development to provide a conservative estimate of site traffic impacts. As discussed further in this report, improvements needed to be installed to support both background and project-added traffic with site development will provide benefit to this intersection such that the intersection can be mitigated to acceptable Levels of Service.

- Parker Road & Stroh Road: This signalized intersection is calculated to operate acceptably overall at LOS C/D in the AM and PM peak hours, respectively. Some left-turn movements are projected to operate at LOS E or F, though all 95th percentile queues are calculated to be well within available storage lengths.

As discussed with the Year 2030 background scenario, widening of the east departure from the intersection is necessary to provide a dedicated eastbound through lane and eastbound dual left-lanes. This would remove the existing eastbound shared left + through lane condition which requires split phasing of the signal, which is highly inefficient and would result in the intersection operating at LOS F in the long-term with background (non-project) traffic growth. This improvement is assumed in place for the Year 2040 background scenario.

Left-turn delays shown at worse than LOS D are due to the protected-only left-turn operation of these movements and is common where a left-turn is protected along a major arterial. As the protected-only operation is due to safety concerns with left-turns across a major, three-lane arterial, no changes are recommended to mitigate these left-turn delays.

- J. Morgan Blvd. & Stroh Road: With the proposed future connection of Pinery Center Blvd. as a collector roadway south of Stroh Road to Scott Road, as well as potential development on the south side of Stroh Road, it is anticipated that a signal will be needed based on background (non-project) traffic that would be anticipated to shift from Parker Road to utilize this connection or access future development at this intersection.

6.0 FUTURE CONDITIONS WITH PINERY WEST DEVELOPMENT

6.1 Trip Generation

A trip generation estimate was performed to determine the traffic characteristics of the Pinery West development. Pinery West proposes to be an employment/commercial area will be a mix of retail, office, restaurants, hotel, recreation, and light industrial. The trip rates contained in the *Institute of Transportation Engineers (ITE) Trip Generation Manual*[4] were applied to estimate the traffic for the proposed land uses:

Specific land uses and tenants for most parcels is unknown at this time and will evolve based on market conditions. Within the existing zoning designations, it is anticipated that there will be variety of commercial uses, offices, flex space, pad retail, restaurants, lodging, day care, recreational and light industrial uses. There is also an RTD park-N-ride and Douglas County School District office proposed on the site. In order to estimate the site auto trips, land use designations within the ITE Trip Generation Manual were utilized. For the majority of commercial/retail land use on the site, the "Shopping Center" (ITE #820) land use category was applied as the data for this land use code is described as follows:

> *Shopping centers, including neighborhood centers, community centers, regional centers, and super regional centers, were surveyed for this land use. Some of these centers contained non-merchandising facilities, such as office buildings, movie theaters, restaurants, post offices, banks, health clubs, and recreational facilities (for example, ice skating rinks or indoor miniature golf courses). Many shopping centers, in addition to the integrated unit of shops in one building or enclosed around a mall, include outparcels (peripheral buildings or pads located on the perimeter of the center adjacent to the streets and major access points). These buildings are typically drive-in banks, retail stores, restaurants, or small offices.*

Given the applicability of the "Shopping Center" land use description to the majority of the site uses, these rates were applied to a large portion of the site. ITE trip generation rates for "General Light Industrial" (#110), "General Office Building" (#710), "Day Care Center" (#565), "Drive Thru Bank" (#912), "Hotel (#310), and "Park-and-Ride with Bus Service" (#090) were also utilized, where applicable.

[4] Trip Generation 10th Edition, Institute of Transportation Engineers, 2017.

The trip generation estimates using these rates are summarized on **Table 2** for the southwest, southeast, and north (main) portions of the site, with Pinery Parkway as the dividing line between these trip generation subareas.

The site is expected to experience the four basic trip types as discussed below:

Primary Trips. These trips are made specifically to visit the site and are considered "new" trips. Primary trips would not have been made if the proposed project did not exist. Therefore, this is the only trip type that increases the total number of trips made on a regional basis. It is expected that the proposed project will experience most primary trips.

Pass-By Trips. Pass-by trips are those that are already occurring on the adjacent roadway network but will divert into the site to visit a site use, typically retail/restaurant/services. An example would be a vehicle trip already occurring on Parker Road that would turn into the site to visit a bank, but the bank visit was not the primary purpose of the trip. Pass-by trips do not create any increase in the traffic volumes within the primary impact area. The only impact of the pass-by trips is at the site driveways and adjacent intersections where through movements become turning movements into and out of the site. Therefore, pass-by trips have no additional impact on the road system beyond the site's driveways or immediately adjacent intersections.

Pass-by was applied to the commercial portions of the Pinery West site. These land uses historically have shown to have pass-by trips as indicated by the national data in the *ITE Trip Generation Handbook*, which are those vehicles that utilize one of the adjacent roadways to travel between their origin and destination and choose to make a stop within the development site before they continue on route. This is not a reduction of trips, but a redirect of existing/background trips that will become a customer of the new businesses. The *ITE Trip Generation Handbook* defines pass-by as "trips made as intermediate stops on the way from an origin to primary trip destination without a route diversion". The pass-by trips percentages used for this analysis are shown on **Table 3.**

Multi-Use (Internal) Trips. These internal trips occur from one land use or building to another within the site boundaries. For example, a person that works in one of the offices may shop in the new retail center or one customer may visit several stores during one visit. Multi-use or multi-purpose trips typically do not affect the exterior site access points, nor add any additional traffic volumes to the adjacent street network. The multi-use factors applied are shown on **Table 2**.

Non-Auto Trips. These trips are those that are completed by walking, bicycling, or riding transit. The existing transit, pedestrian, and bicycle amenities will encourage residents, employees, and customers to make non-auto trips to/from the Pinery West site. The non-auto trips are assumed to be accounted for within the multi-use (internal) trips.

Table 3 provides the trip type breakdown estimate for the Pinery West development, to include both “primary” (unique) and “pass-by” trip types.

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Table 2. Trip Generation Estimate

Land Use	Size	Unit	Multi-Use Factor[1]	Average Daily Trips				A.M. Peak Hour Trips				P.M. Peak Hour Trips			
				Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
South of Pinery Parkway - West															
#565 Day Care Center	12.0	1,000 SF	0.0	47.62	571	286	285	11.00	132	70	62	11.12	133	63	70
#710 General Office Building	17.4	1,000 SF	0.0	9.74	169	85	84	1.16	20	17	3	1.15	20	3	17
South of Pinery Parkway - West - SUBTOTAL					740	371	369		152	87	65		153	66	87
South of Pinery - East															
#820 Shopping Center	5.3	1,000 SF	0.0	Used Fitted Equations	200	100	100	Used Fitted Equations	154	95	59	Used Fitted Equations	62	30	32
#912 Drive Thru Bank	7.0	1,000 SF	0.0	100.03	700	350	350	9.5	67	39	28	20.45	143	71	72
South of Pinery Parkway - East - SUBTOTAL					900	450	450		221	134	87		205	101	104
North of Pinery Parkway															
#820 Shopping Center	532.5	1,000 SF	0.1	Used Fitted Equations	16871	8436	8435	Used Fitted Equations	376	233	143	Used Fitted Equations	1686	809	877
#110 General Light Industrial	169.8	1,000 SF	0.0	Used Fitted Equations	702	351	351	Used Fitted Equations	66	58	8	Used Fitted Equations	53	7	46
#310 Hotel	150	Occupied Rooms	0.1	12.23	1651	826	825	0.62	84	49	35	0.73	99	49	50
#565 Day Care Center	12.0	1,000 SF	0	47.62	571	286	285	11.00	132	70	62	11.12	133	63	70
#710 General Office Building	50.0	1,000 SF	0.0	9.74	487	244	243	1.16	58	50	8	1.15	58	9	49
#090 Park-and-Ride with Bus Service	150	Parking Spaces	0	2.81	422	211	211	0.42	63	50	13	0.43	65	16	49
North of Pinery Parkway - SUBTOTAL					20704	10354	10350		779	510	269		2094	953	1141
TOTAL PROJECT					22344	11175	11169		1152	731	421		2452	1120	1332

Source: ITE Trip Generation 10th Edition. 2017.

[1] Accounts for auto and non-auto multi-use trips between two or more uses on site (ie: someone visits a coffee shop on their way to their office or walks to a restaurant from work for lunch, thus only one unique auto trip to the site was generated in these instances). This is separate from the internal trip distribution, which is a unique auto trip with an origin and destination within the site. Neither results in a new, unique auto trip to the external area roadway network.

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Table 3. Trip Type Breakdown

Land Use	Trip Type %[1]		PRIMARY Trips						PASS-BY Trips					
	Primary	Pass-By	Daily In	Daily Out	AM In	AM Out	PM In	PM Out	Daily In	Daily Out	AM In	AM Out	PM In	PM Out
South of Pinery Parkway - West														
#565 Day Care Center	100%	0%	286	285	70	62	63	70	0	0	0	0	0	0
#710 General Office Building	100%	0%	85	84	17	3	3	17	0	0	0	0	0	0
South of Pinery Parkway - West - SUBTOTAL			**371**	**369**	**87**	**65**	**66**	**87**	**0**	**0**	**0**	**0**	**0**	**0**
South of Pinery - East														
#820 Shopping Center	66%	34%	66	66	63	39	20	21	34	34	32	20	10	11
#912 Drive Thru Bank	70%	30%	245	245	27	20	50	50	105	105	12	8	21	22
South of Pinery Parkway - East - SUBTOTAL			**311**	**311**	**90**	**59**	**70**	**72**	**139**	**139**	**44**	**28**	**32**	**32**
North of Pinery Parkway														
#820 Shopping Center	66%	34%	5568	5567	154	94	534	579	2868	2868	79	49	275	298
#110 General Light Industrial	100%	0%	351	351	58	8	7	46	0	0	0	0	0	0
#310 Hotel	100%	0%	826	825	49	35	49	50	0	0	0	0	0	0
#565 Day Care Center	100%	0%	286	285	70	62	63	70	0	0	0	0	0	0
#710 General Office Building	100%	0%	244	243	50	8	9	49	0	0	0	0	0	0
#090 Park-and-Ride with Bus Service	100%	0%	211	211	50	13	16	49	0	0	0	0	0	0
North of Pinery Parkway - SUBTOTAL			**7486**	**7482**	**431**	**220**	**678**	**843**	**2868**	**2868**	**79**	**49**	**275**	**298**
TOTAL PROJECT			**8168**	**8162**	**608**	**344**	**813**	**1001**	**3007**	**3007**	**123**	**77**	**307**	**331**

Source: ITE Trip Generation Handbook, 10th Edition. 2017.

[1] Per ITE average data for each land use or comparable land use.

6.2 Trip Distribution and Assignment

The estimated trip volumes were distributed onto the study area street network based on existing traffic characteristics, land uses, and traffic patterns in the area, as well as regional growth and future roadway infrastructure. The overall assumed distribution percentages are listed below with and without the future extensions of Pinery Parkway to the west and Pinery Center Boulevard to the north:

Without Connections:

- 55% to/from north Parker Road north of Stroh Road
- 30% to/from south Parker Road
- 3% to/from west Stroh Road
- 2% to/from north J. Morgan Boulevard
- 0% to/from west Pinery Parkway
- 5% to/from east Pinery Parkway
- 5% internal capture

With Connections:

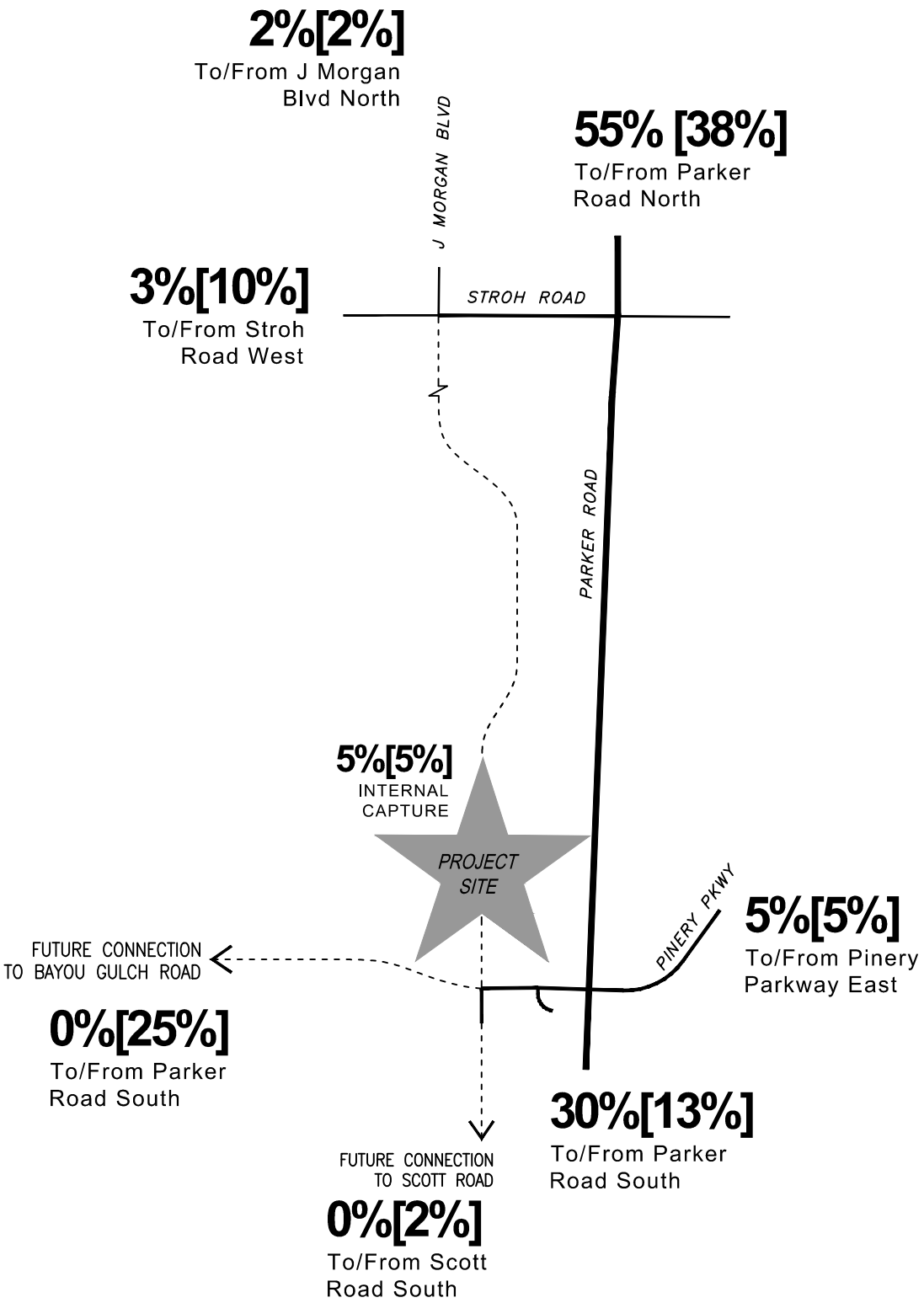
- 38% to/from north Parker Road north of Stroh Road
- 13% to/from south Parker Road
- 10% to/from west Stroh Road
- 2% to/from north J. Morgan Boulevard to Stroh Road
- 2% to/from south Pinery Center Boulevard to Scott Road
- 25% to/from west Pinery Parkway
- 5% to/from east Pinery Parkway
- 5% internal capture

Figure 7 summarizes the trip distribution assumptions. Using these distribution assumptions, the projected site traffic was assigned to the study area roadway network for the weekday AM and PM peak hours. In Year 2030 with project build out, it is assumed that Pinery Parkway and Pinery Center Boulevard are not extended. These connections are assumed to be in place in the long-term, Year 2040 scenario. The site-generated volumes without the new roadway connections are shown on **Figure 8** and the site-generated volumes with the new roadway connections are shown on **Figure 9.**

KEY

XX% DISTRIBUTION WITHOUT CONNECTIONS

[XX%] DISTRIBUTION WITH CONNECTIONS



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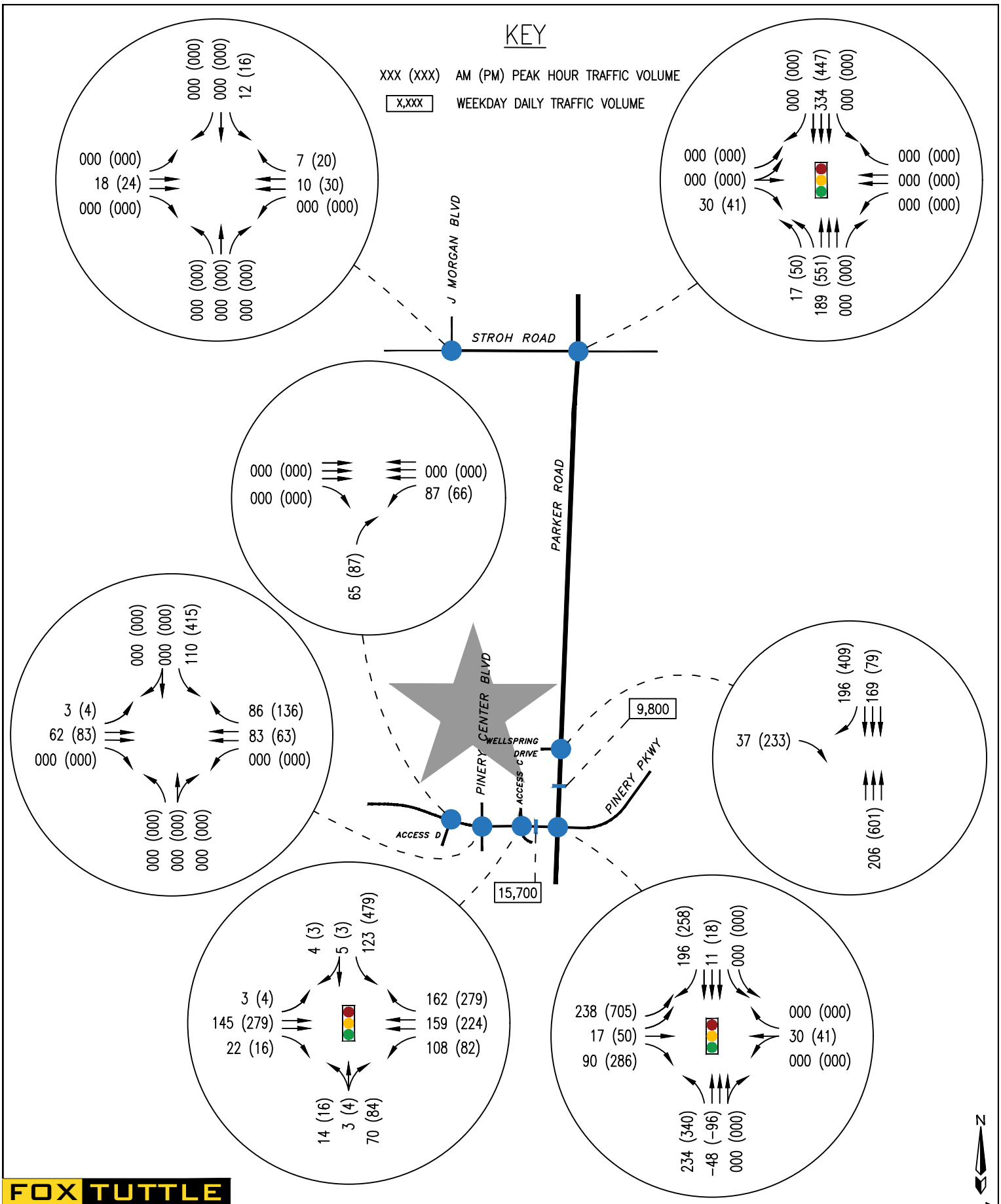
PINERY WEST TRAFFIC IMPACT STUDY UPDATE

SITE TRIP DISTRIBUTION

FT #	20049	Filing	03 Minor Development	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	7



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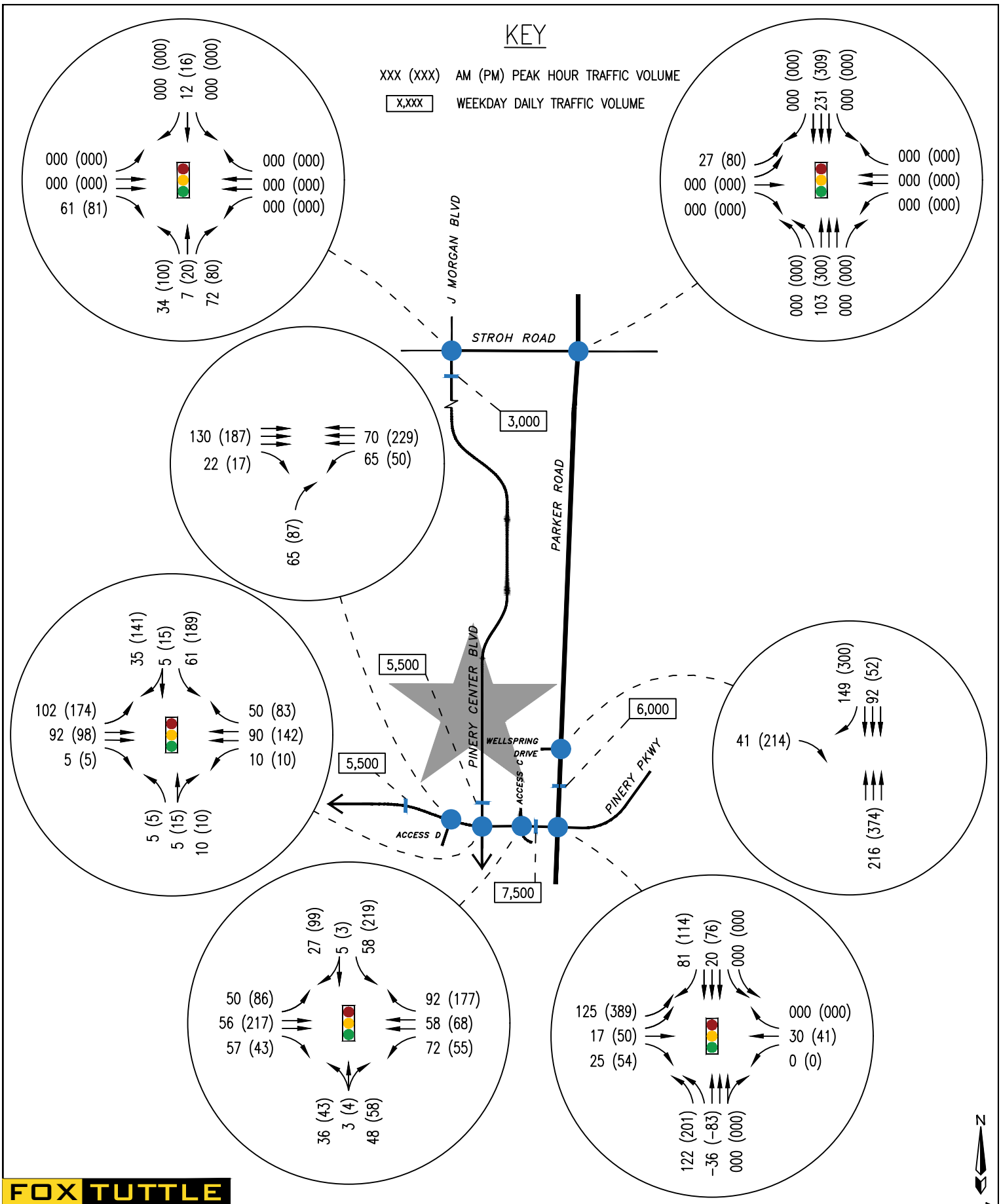
PINERY WEST TRAFFIC IMPACT STUDY UPDATE

SITE-GENERATED TRAFFIC VOLUMES (WITHOUT CONNECTIONS)

FT #	2004g	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	8



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PINERY WEST TRAFFIC IMPACT STUDY UPDATE

SITE-GENERATED TRAFFIC VOLUMES (WITH CONNECTIONS)

FT #	20049	Filing	03 Major Development	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	9

6.2.1 Year 2030 Background + Project Intersection Capacity Analysis

This section discusses impacts associated with the addition of the Pinery West development trips in the build out scenario with the project fully built out and fully occupied.

The projected 2030 background volumes were added to the site-generated volumes and are illustrated on **Figure 10**. This figure also illustrates the necessary traffic control and lane configurations for all of the proposed accesses. The results of the LOS calculations for the intersections are summarized on **Table 1A** and **Table 1B** (signalized and stop-controlled, respectively). The intersection level of service worksheets and queue reports are attached in the **Appendix**.

As shown on the Level of Service summary tables, all study area intersections are projected to operate acceptably overall (LOS D or better) and with the following improvements in place prior to full build out and site occupancy:

- Parker Road & N. Pinery Parkway:
    - Construct a 2nd northbound left-turn lane. This improvement is necessary to due to the projected high PM peak left-turn volumes vs. a high volume of southbound through traffic on Parker Road in the PM peak hour, which compete for allocation of the available cycle length. Roughly half of the projected left-turn volume is due to background traffic that is anticipated to shift to the Pinery Parkway extension. The width in the existing median is available to create this lane. This lane should be built to CDOT Access Code standards (see Section 7.0 for dimensions). The existing raised median on the west leg is planned to be narrowed to 4' to provide the width for a second accepting lane for the dual left-turn.
    - Reconfigure the westbound approach to include a new, exclusive westbound left-turn lane exiting the Pinery (cut into the existing median), with the existing left+through lane reconfigured as the westbound through lane and the existing westbound right-turn lane to remain as is. This will allow for more capacity for the westbound approach to address both existing and future capacity constraints.
- Pinery Parkway & Access C:
    - Install a traffic signal. The signal is warranted based on the projected volumes and is necessary to allow the intersection to operate at acceptable Levels of Service in at full build out and occupancy.

As shown on **Table 1A** and **Table 1B**, some individual movements are anticipated to operate at LOS E or F in the peak hours with short-term build out of the site that were not operating at this level with background conditions.

Some additional notes relative to the Year 2030, project build out capacity and queuing analysis are as follows:

- As shown on the queue reports, the 95th-percentile queues for the eastbound approach at the Parker Road & Pinery Parkway intersection are not shown to extend west to the Access C intersection.

- At Access C & Pinery Parkway, in the PM peak hour the southbound left-turn is anticipated to experience a 50%-percentile queue of 250' and a 95%-percentile queue of 481' (roughly 19 vehicles) and will operate acceptably at LOS D. Future site access and site design along Access C to the north should anticipate queue extending north up to this distance from Pinery Parkway.

- At Pinery Center Boulevard & Pinery Parkway, in the PM peak hour the southbound left-turn is anticipated to experience a 95th-percentile queue of roughly 5 vehicles. The southbound approach will operate acceptable at LOS C.

6.2.2 Year 2040 Background + Project Intersection Capacity Analysis

This section discusses impacts associated with the addition of the Pinery West development trips in the long-term, 20-year scenario with full build out and occupancy of the project.

The site-generated volumes were added to the projected 2040 background volumes and are illustrated on **Figure 11**. For the Year 2040 site build out scenario, the Pinery Parkway west connection and Pinery Center Blvd. connection are assumed to be constructed.

The results of the LOS calculations for the intersections are summarized in **Table 1A** and **Table 1B** (signalized and stop-controlled, respectively). The intersection level of service worksheets and queue reports are attached in the **Appendix**.

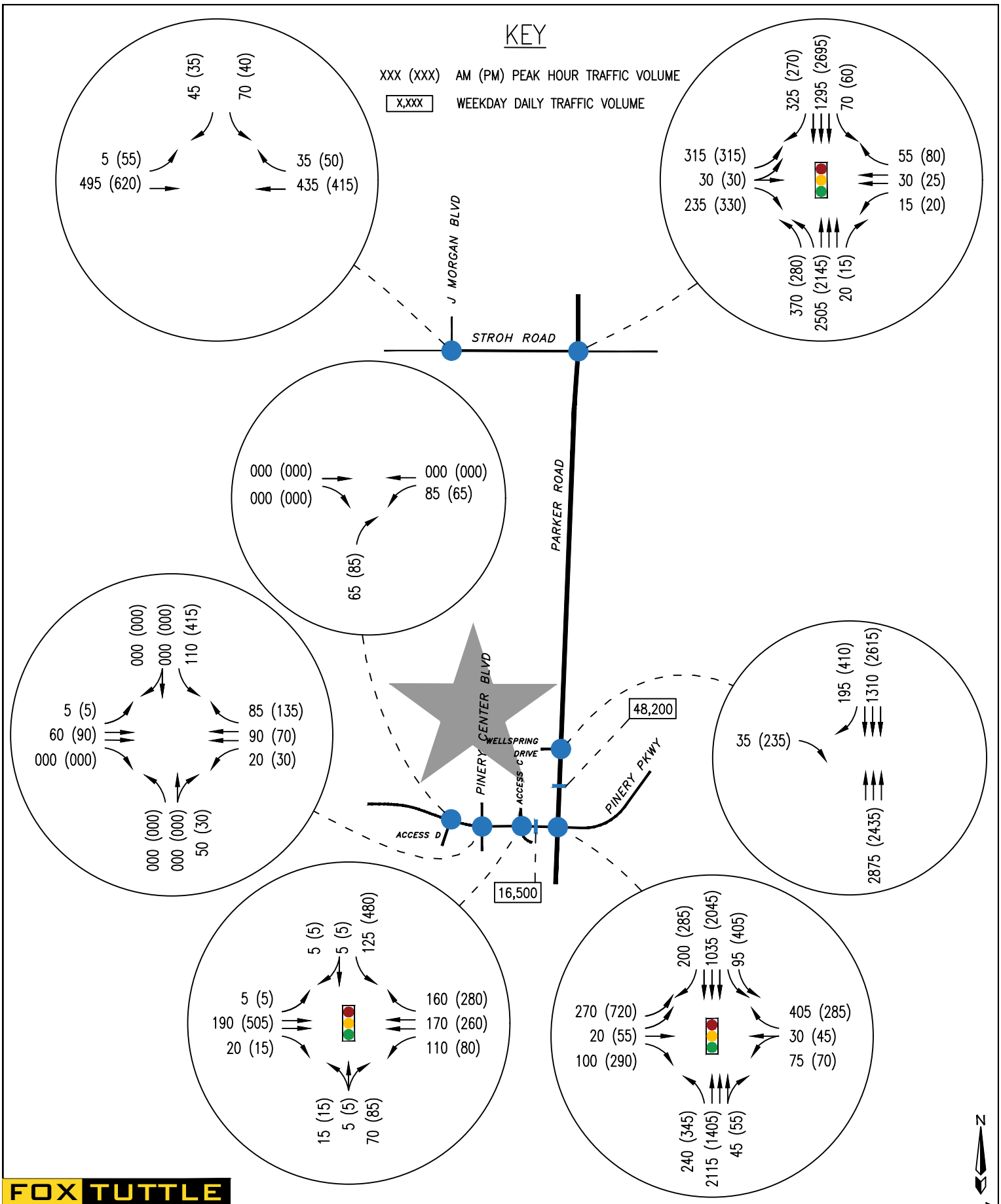
As shown on the Level of Service summary tables, all study area intersections are projected to operate acceptably overall (LOS D or better) and with the improvements identified in Section 6.2.1 in place, as well as the following long-term improvements:

- Pinery Parkway & J. Morgan Blvd.:
    - Install a traffic signal, when warranted. This signal may be needed to allow the intersection to operate at acceptable Levels of Service in the long-term planning scenario. The need for this signal will be dependent on background traffic shifts to Pinery Center Blvd. if connected from Stroh Road to Scott Road (as anticipated by the County), background traffic shifts to Pinery Parkway west of Parker Road when the connection to the west is in place, project traffic growth, and additional developments in the area that will utilize the Pinery Center Blvd. extension for access.

Some additional notes relative to the long-term, project build out capacity and queuing analysis are as follows:

- As shown on the queue reports, the 95th-percentile queues for the eastbound approach at the Parker Road & Pinery Parkway intersection are not shown to extend west to the Access C intersection.

Traffic signal warrant analysis was performed using criteria contained in the Manual on Uniform Traffic Control Devices (MUTCD). For planning-level purposes, the Peak Hour Signal Warrant was applied to this project since only peak hour volumes are projected for future development using ITE rates. The signal warrant analysis is summarized on **Figure 11**.



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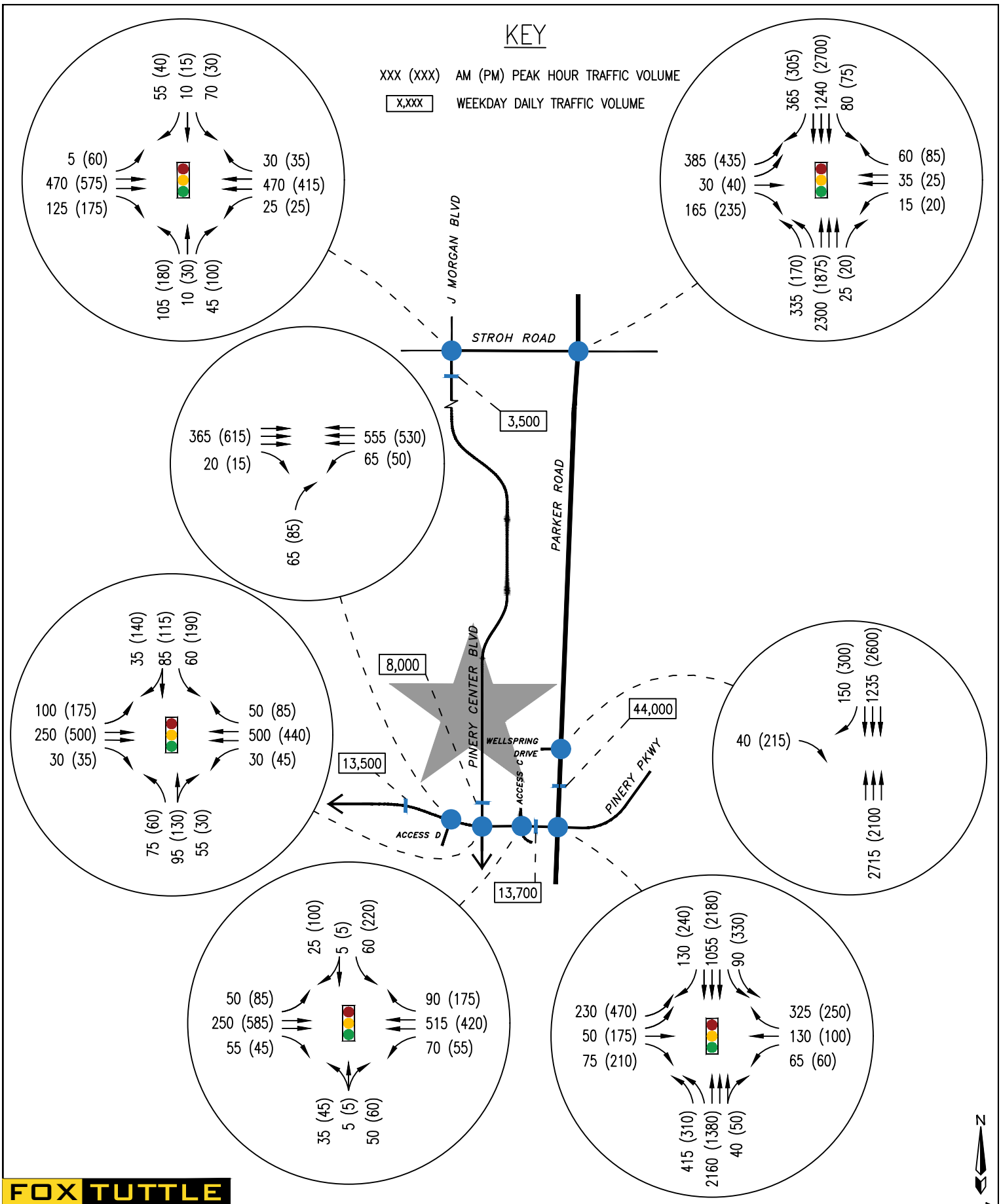
PINERY WEST TRAFFIC IMPACT STUDY UPDATE

YEAR 2030 TOTAL TRAFFIC VOLUMES

FT #	20049	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	10



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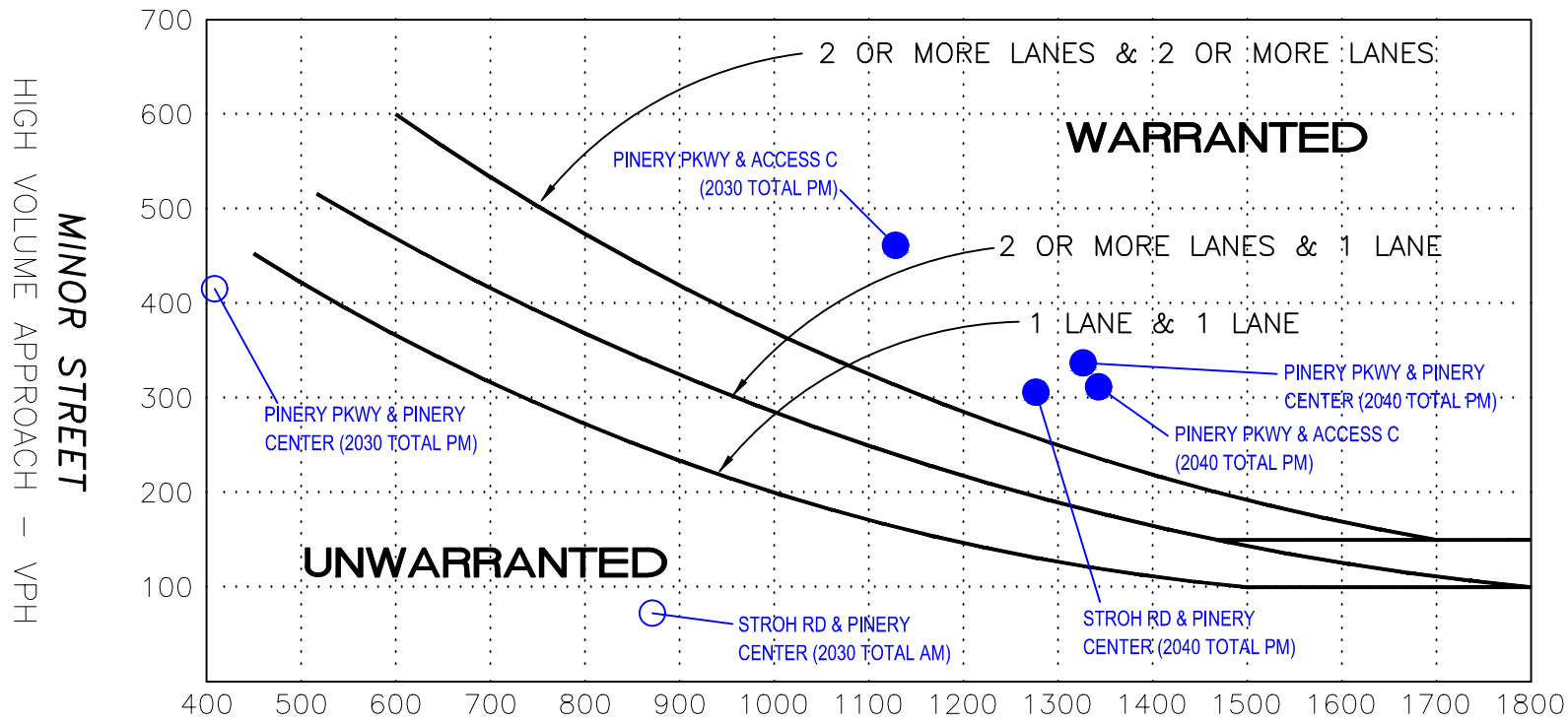
PINERY WEST TRAFFIC IMPACT STUDY UPDATE

YEAR 2040 TOTAL TRAFFIC VOLUMES

FT #	20049	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	11

PEAK HOUR VOLUME WARRANT

KEY
- ● = VOLUME EXCEEDS WARRANT THRESHOLD
- ○ = VOLUME DOES NOT EXCEED WARRANT THRESHOLD



NOTE: THE HIGHEST VOLUME PEAK HOUR IS SHOWN FOR EACH PLANNING HORIZON/SCENARIO

NOTE: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

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PINERY WEST TRAFFIC IMPACT STUDY
PEAK HOUR SIGNAL WARRANT

FT Project #	20049	Original Scale	NTS	Date	7/30/20	Drawn by	SGT	Figure #	12

7.0 AUXILIARY LANE EVALUATION

Auxiliary lanes were evaluated using the Level of Service results, queuing results, and auxiliary lane designs consistent with the State Highway Access Code for each roadway category and posted speed and based on an assume 12' lane width.

Direct access to the site is planned via the following access points:

- Access B: Right-In, right-out restricted access along Parker Road
- Access C: Full-movement, signalized access
- Pinery Center Blvd. at Pinery Parkway

All of these intersections are either fully or partially built today, with some existing auxiliary lanes in place that can remain. New or modified auxiliary lanes to be constructed with the project are summarized as follows for the short-term and long-term planning horizons:

- Access B & Parker Road (with Initial Development):
    - Southbound right-turn deceleration lane (378' lane + 222' taper, 600' total length)
    - Southbound right-turn acceleration lane (tie into the existing southbound right-turn deceleration lane approaching N. Pinery Parkway, approximately 370' south of Access B)
- Parker Road and Pinery Parkway (Short-Term):
    - Second northbound left-turn lane (build parallel to the existing 600' total lane length)
- Parker Road and Pinery Parkway (Long-Term):
    - New eastbound left-turn lane (110' lane + 60' taper)

8.0 CONCLUSIONS

The Pinery West project proposes to construct a mix of employment, commercial, and light industrial uses on a largely vacant 144± acre property. Based on conceptual site planning, it is anticipated that there will be a grocery marketplace, office space, flex office space, commercial plats for shops, restaurants, and services, daycare services, a hotel, RTD park-n-ride station, recreational space, and light industrial uses.

The project proposes to have two full-movement accesses on N. Pinery Parkway, a ¾-movement access along N. Pinery Parkway, and a right-in, right-out access on Parker Road. The curb-cuts on Pinery Parkway already exist and will be extended into the subject property to service the proposed land uses. In the short-term, trips from the Pinery West project will travel along Parker Road to get to/from their regional destinations. In the long-term, Pinery Parkway is anticipated to be extended to the west to Crowfoot Valley Road and Pinery Center Boulevard is anticipated to be extended to the north to Stroh Road and south to Scott Road (pending other development).

The project is anticipated to generate approximately 22,344 daily, 1,152 AM peak hour and 2,452 PM peak hour driveway trips at buildout within the site. Approximately 16,330 daily, 952 AM and 1,814 PM trips are projected to be unique (new) trips within the study area that are not already traveling on the adjacent roadway network.

It was determined that the existing and proposed roadway and intersection can adequately accommodate the projected traffic volumes for buildout conditions.

The following mitigation measures are recommended:

Recommended Background Improvements (Not Related to Project):

These improvements are recommended to mitigate existing and future background deficiencies (with non-project traffic) and would need to be implemented by the County, CDOT, or other developer(s) to mitigate non-project traffic impacts independent of development of the project site:

- Parker Road & N. Pinery Parkway:
    - Add a northbound right-turn acceleration lane on Parker Road to create a "free right" turn condition to mitigate existing and projected future delays for traffic exiting the Pinery in the AM peak hour
    - Add a northbound right-turn deceleration lane on Parker Road approaching N. Pinery Parkway to mitigate projected delays for northbound traffic in the long-term
- Parker Road & Stroh Road:
    - Widen the east departure from the intersection to provide a dedicated westbound through lane and westbound dual left-lanes. This would remove

the existing westbound shared left + through lane condition which requires split phasing of the signal and allow the intersection to operate more effectively to service long-term background traffic growth projections. This should be accomplished with development of the southeast corner of this intersection which may also need to provide right-of-way to accommodate the widening.

- Stroh Road & J. Morgan Blvd.: Install a traffic signal, if warranted (long-term, with extension of Pinery Center Blvd. to Pinery Parkway and ultimately south to Scott Road). The need for this signal will be dependent on background traffic shifts to Pinery Center Blvd. as a local alternative to Parker Road for north-south travel, background traffic shifts to Pinery Parkway west of Parker Road when the connection to the west is in place, project traffic growth, and additional developments adjacent to the intersection that will utilize the Pinery Center Blvd. extension for access.

Recommended Project-Related Improvements

These improvements are recommended to be in place by either project build out and full occupancy (Year 2030) or the long-term, 20-year planning horizon (Year 2040):

- Parker Road & N. Pinery Parkway:
    - Construct a 2nd northbound left-turn lane (installed by project build out, assumed Year 2030). The need for this lane is for project traffic accessing the site from Parker Road to the south, as well as projected long-term background (non-project) growth and a shift of traffic from Parker Road when the Pinery Parkway connection to the west is in place. This improvement will require narrowing of the existing raised median to create the 2nd accepting land on the westbound departure.
    - Add a new eastbound left-turn lane (cut into the existing median on the east leg) and reconfigure the existing westbound left+through lane as a through lane. The need for these improvements is to provide adequate level of service for motorists exiting The Pinery when the project is fully built and occupied, as well as to mitigate existing deficiencies (primarily the existing westbound right-turn delays that are incurred by the existing lane geometry and lack of a right-turn acceleration lane onto northbound Parker Road).

- Pinery Parkway & Access C: Install a traffic signal (installed by project build out, assumed in Year 2030).

- Pinery Parkway & Pinery Center Blvd.: Install a traffic signal, if warranted (long-term, with extension of Pinery Center Blvd. to Stroh Road). The need for this signal will be dependent on background traffic shifts to Pinery Center Blvd. as a local alternative to Parker Road for north-south travel, background traffic shifts to Pinery Parkway west of Parker Road when the connection to the west is in place, project traffic growth, and additional developments in the area that will utilize the Pinery Center Blvd. extension for access.
- Parker Road & Access B: Construct southbound right-turn deceleration and southbound acceleration lanes.

Appendix:

Existing Traffic Data

Level of Service Definitions

Intersection Capacity Worksheets and Time-Space (Progression) Diagrams

Existing Traffic Data

RDC
Ridgeview Data Collection

Parker, CO
Pinery West
AM Peak
Parker Rd and Pinery Parkway

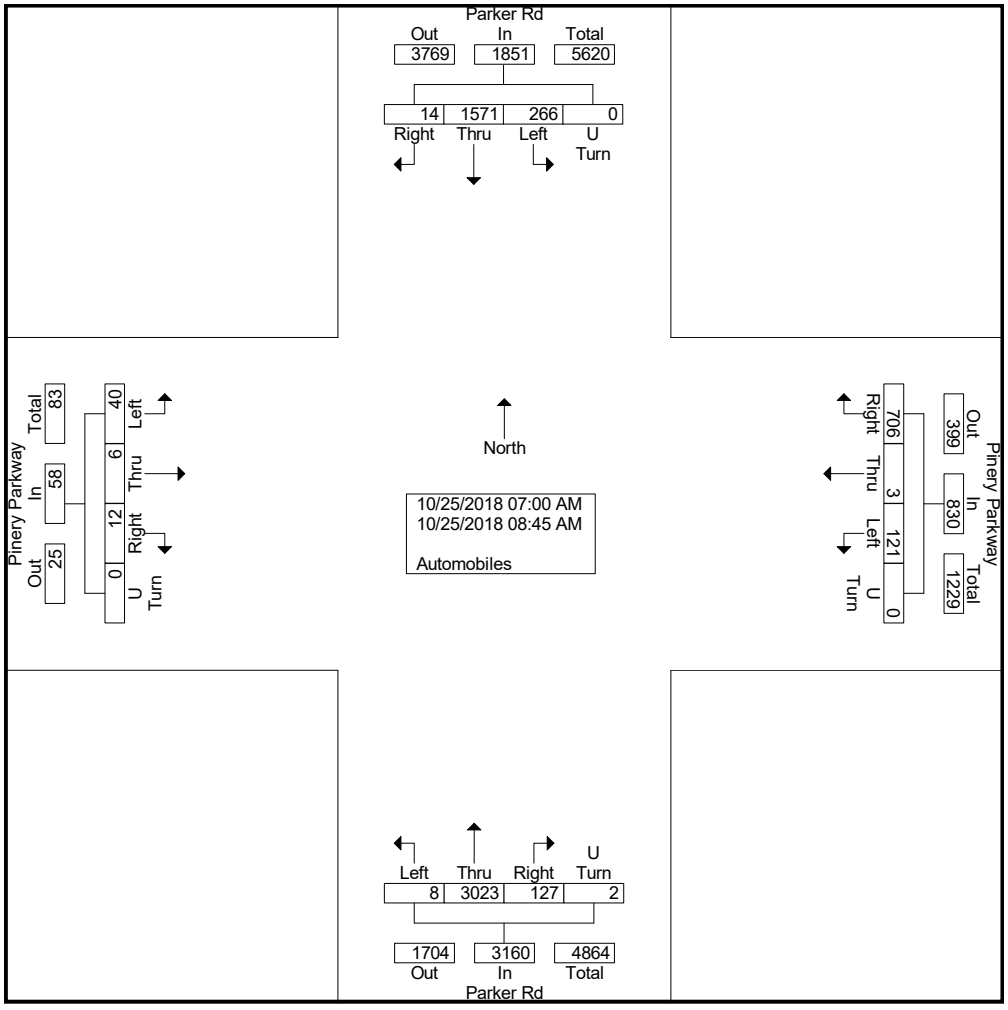
File Name : Parker and Pinery AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 1

Groups Printed- Automobiles

	Pinery Parkway Eastbound					Pinery Parkway Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
07:00 AM	10	1	0	0	11	14	0	80	0	94	1	392	2	0	395	17	223	1	0	241	741
07:15 AM	3	0	2	0	5	10	0	101	0	111	0	499	10	0	509	11	188	2	0	201	826
07:30 AM	11	2	1	0	14	21	0	112	0	133	2	518	14	1	535	31	212	0	0	243	925
07:45 AM	3	1	3	0	7	27	1	102	0	130	0	402	18	1	421	33	235	0	0	268	826
Total	27	4	6	0	37	72	1	395	0	468	3	1811	44	2	1860	92	858	3	0	953	3318
08:00 AM	5	0	2	0	7	31	0	83	0	114	1	330	24	0	355	49	197	3	0	249	725
08:15 AM	4	1	2	0	7	8	1	86	0	95	2	295	6	0	303	38	185	1	0	224	629
08:30 AM	3	1	2	0	6	6	0	69	0	75	0	275	18	0	293	39	171	4	0	214	588
08:45 AM	1	0	0	0	1	4	1	73	0	78	2	312	35	0	349	48	160	3	0	211	639
Total	13	2	6	0	21	49	2	311	0	362	5	1212	83	0	1300	174	713	11	0	898	2581
Grand Total	40	6	12	0	58	121	3	706	0	830	8	3023	127	2	3160	266	1571	14	0	1851	5899
Apprch %	69	10.3	20.7	0		14.6	0.4	85.1	0		0.3	95.7	4	0.1		14.4	84.9	0.8	0		
Total %	0.7	0.1	0.2	0	1	2.1	0.1	12	0	14.1	0.1	51.2	2.2	0	53.6	4.5	26.6	0.2	0	31.4	

Parker, CO
Pinery West
AM Peak
Parker Rd and Pinery Parkway

File Name : Parker and Pinery AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 2

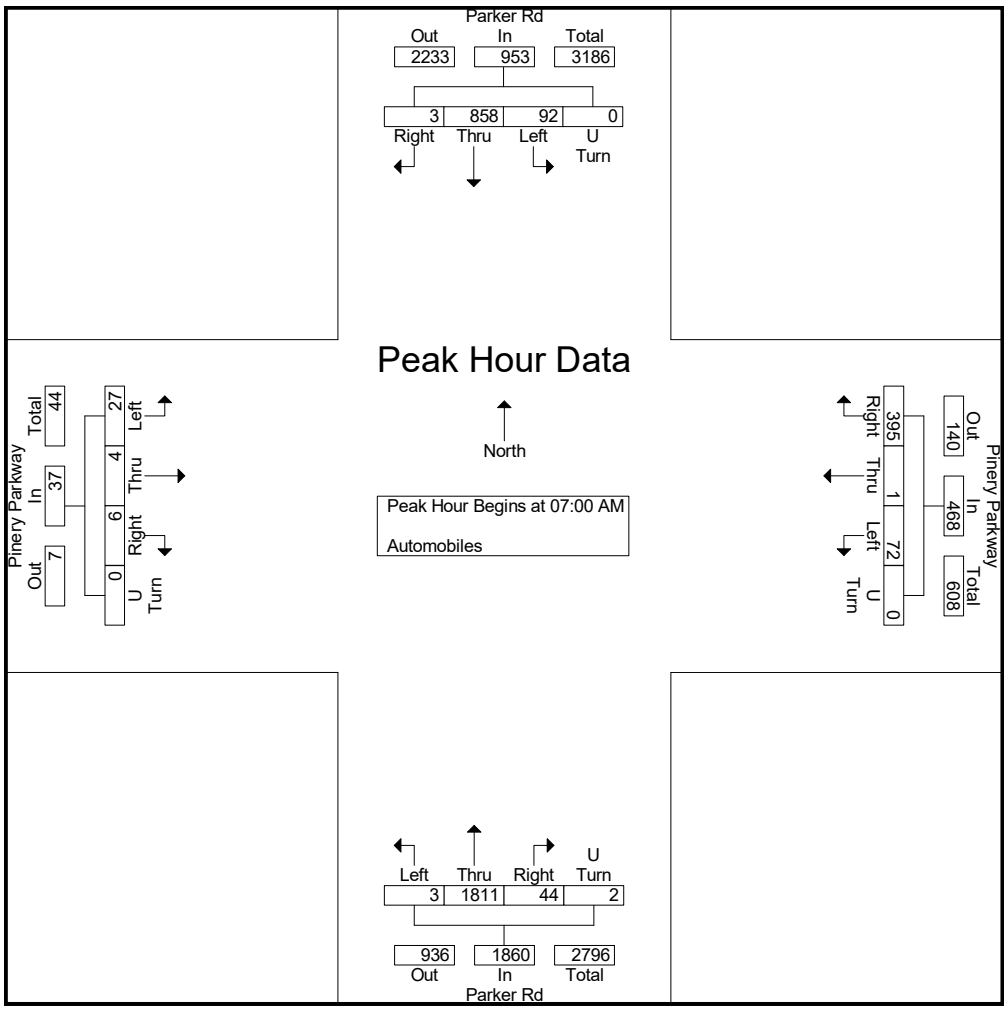


RDC
Ridgeview Data Collection

Parker, CO
Pinery West
AM Peak
Parker Rd and Pinery Parkway

File Name : Parker and Pinery AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 3

	Pinery Parkway Eastbound					Pinery Parkway Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	10	1	0	0	11	14	0	80	0	94	1	392	2	0	395	17	223	1	0	241	741
07:15 AM	3	0	2	0	5	10	0	101	0	111	0	499	10	0	509	11	188	**2**	0	201	826
07:30 AM	**11**	**2**	1	0	**14**	21	0	**112**	0	**133**	**2**	**518**	14	**1**	**535**	31	212	0	0	243	**925**
07:45 AM	3	1	**3**	0	7	**27**	**1**	102	0	130	0	402	**18**	1	421	**33**	**235**	0	0	**268**	826
Total Volume	27	4	6	0	37	72	1	395	0	468	3	1811	44	2	1860	92	858	3	0	953	3318
% App. Total	73	10.8	16.2	0		15.4	0.2	84.4	0		0.2	97.4	2.4	0.1		9.7	90	0.3	0		
PHF	.614	.500	.500	.000	.661	.667	.250	.882	.000	.880	.375	.874	.611	.500	.869	.697	.913	.375	.000	.889	.897



RDC
Ridgeview Data Collection

Parker, CO
Pinery West
PM Peak
Parker Rd and Pinery Parkway

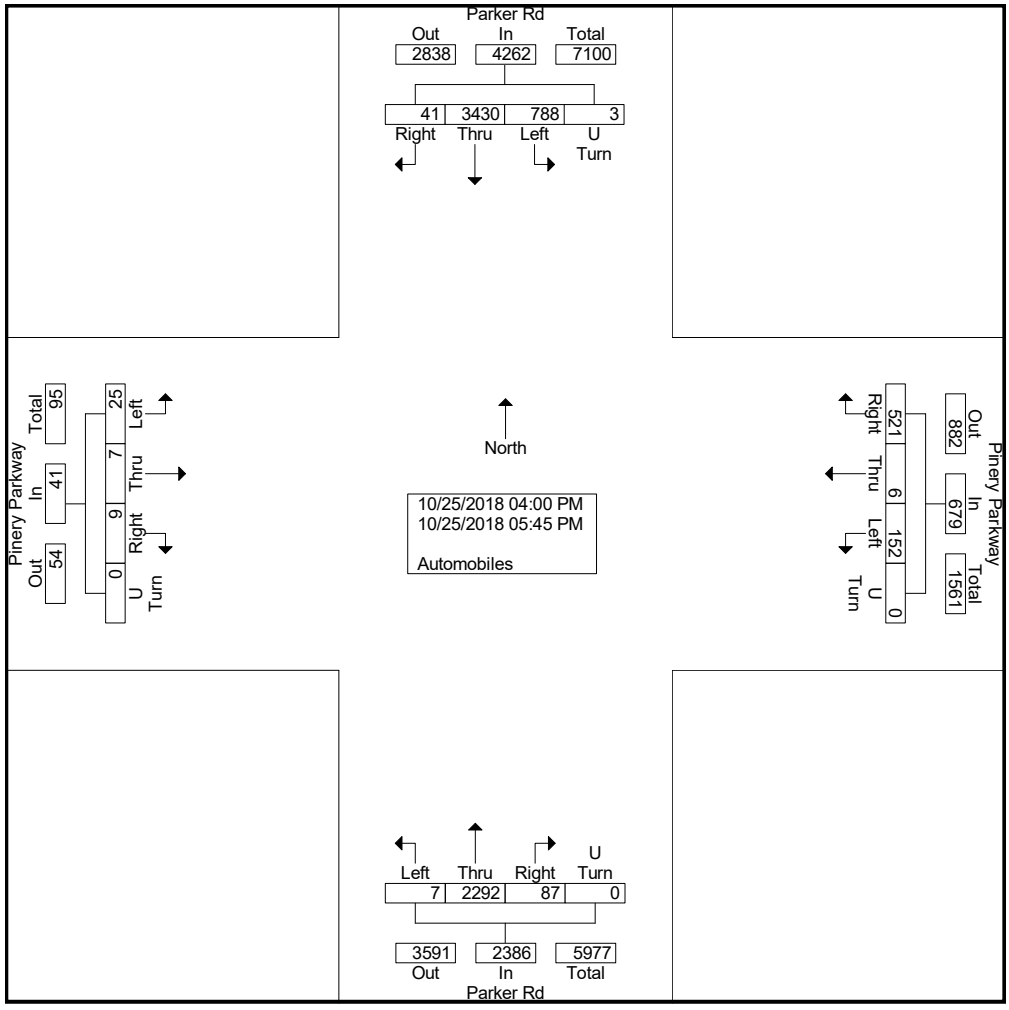
File Name : Parker and Pinery PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 1

Groups Printed- Automobiles

	Pinery Parkway Eastbound					Pinery Parkway Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
04:00 PM	3	2	4	0	9	50	3	86	0	139	0	254	7	0	261	77	390	3	1	471	880
04:15 PM	2	1	1	0	4	19	1	73	0	93	0	284	12	0	296	100	417	3	2	522	915
04:30 PM	6	2	3	0	11	14	0	63	0	77	2	324	13	0	339	109	403	12	0	524	951
04:45 PM	4	0	0	0	4	12	1	64	0	77	3	342	12	0	357	90	439	1	0	530	968
Total	15	5	8	0	28	95	5	286	0	386	5	1204	44	0	1253	376	1649	19	3	2047	3714
05:00 PM	0	0	0	0	0	23	0	67	0	90	0	306	16	0	322	103	436	6	0	545	957
05:15 PM	3	2	0	0	5	20	0	56	0	76	2	259	7	0	268	90	462	9	0	561	910
05:30 PM	6	0	1	0	7	11	1	55	0	67	0	271	10	0	281	99	454	3	0	556	911
05:45 PM	1	0	0	0	1	3	0	57	0	60	0	252	10	0	262	120	429	4	0	553	876
Total	10	2	1	0	13	57	1	235	0	293	2	1088	43	0	1133	412	1781	22	0	2215	3654
Grand Total	25	7	9	0	41	152	6	521	0	679	7	2292	87	0	2386	788	3430	41	3	4262	7368
Apprch %	61	17.1	22	0		22.4	0.9	76.7	0		0.3	96.1	3.6	0		18.5	80.5	1	0.1		
Total %	0.3	0.1	0.1	0	0.6	2.1	0.1	7.1	0	9.2	0.1	31.1	1.2	0	32.4	10.7	46.6	0.6	0	57.8	

Parker, CO
Pinery West
PM Peak
Parker Rd and Pinery Parkway

File Name : Parker and Pinery PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 2

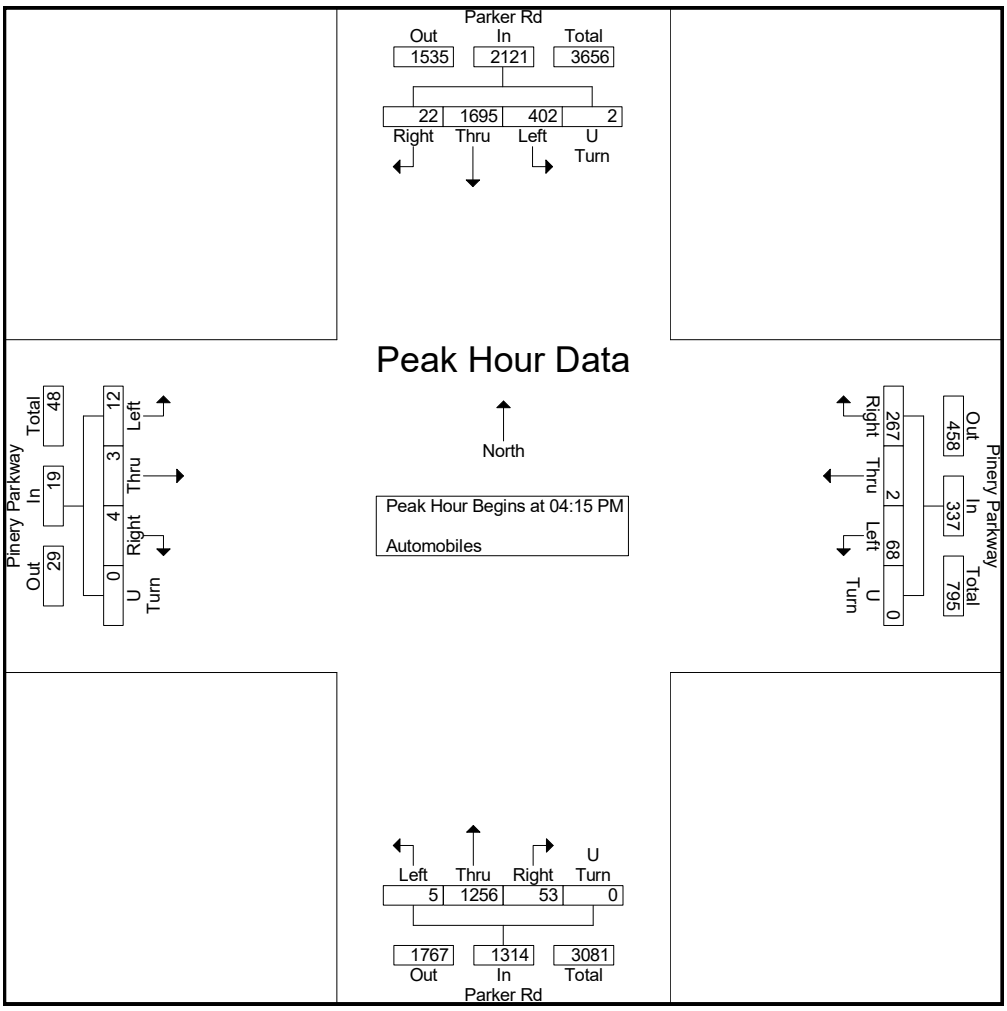


RDC
Ridgeview Data Collection

Parker, CO
Pinery West
PM Peak
Parker Rd and Pinery Parkway

File Name : Parker and Pinery PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 3

	Pinery Parkway Eastbound					Pinery Parkway Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	2	1	1	0	4	19	**1**	**73**	0	**93**	0	284	12	0	296	100	417	3	**2**	522	915
04:30 PM	**6**	**2**	**3**	0	**11**	14	0	63	0	77	2	324	13	0	339	**109**	403	**12**	0	524	951
04:45 PM	4	0	0	0	4	12	1	64	0	77	**3**	**342**	12	0	**357**	90	**439**	1	0	530	**968**
05:00 PM	0	0	0	0	0	**23**	0	67	0	90	0	306	**16**	0	322	103	436	6	0	**545**	957
Total Volume	12	3	4	0	19	68	2	267	0	337	5	1256	53	0	1314	402	1695	22	2	2121	3791
% App. Total	63.2	15.8	21.1	0		20.2	0.6	79.2	0		0.4	95.6	4	0		19	79.9	1	0.1		
PHF	.500	.375	.333	.000	.432	.739	.500	.914	.000	.906	.417	.918	.828	.000	.920	.922	.965	.458	.250	.973	.979



RDC
Ridgeview Data Collection

Parker, CO
Pinery West
AM Peak
Parker Rd and Stroh Rd

File Name : Parker and Stroh AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 1

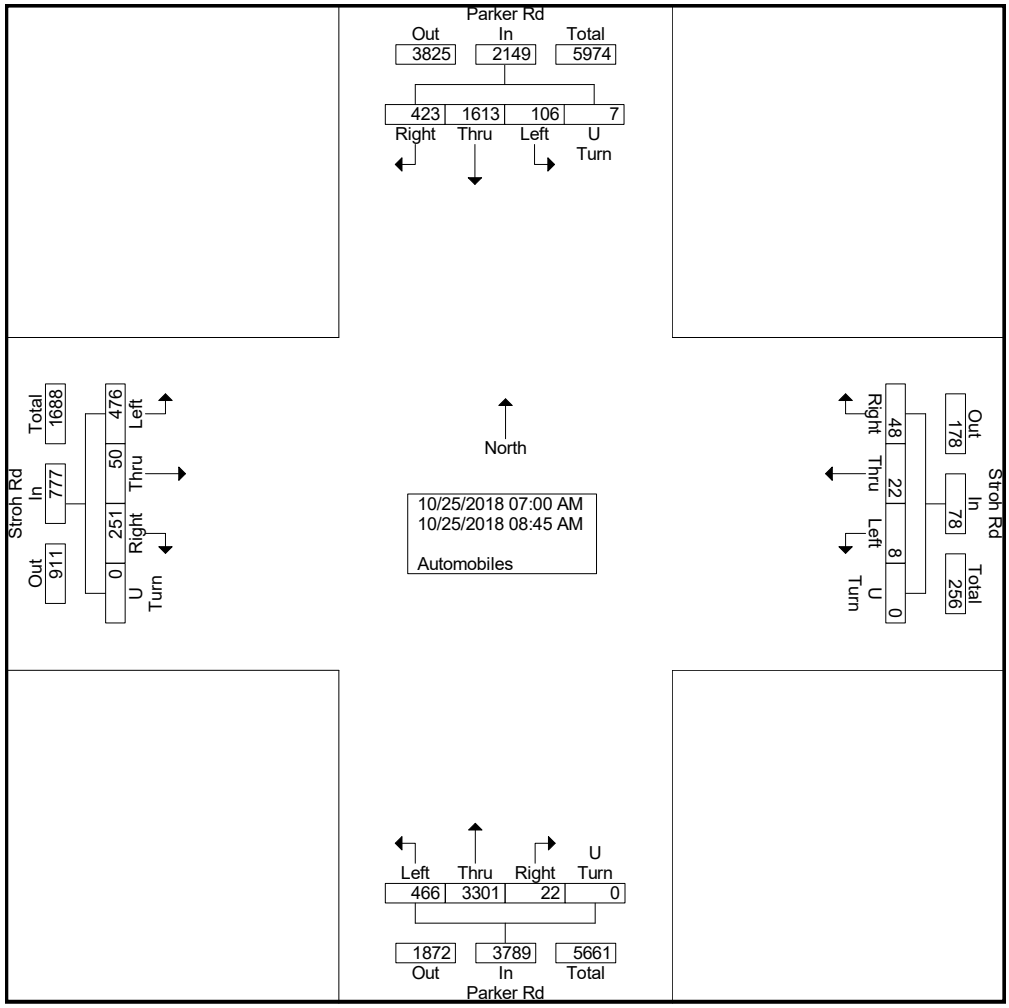
Groups Printed- Automobiles

	Stroh Rd Eastbound					Stroh Rd Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
07:00 AM	42	6	45	0	93	0	0	5	0	5	49	443	3	0	495	11	197	48	0	256	849
07:15 AM	47	4	28	0	79	2	2	3	0	7	67	535	2	0	604	13	186	50	1	250	940
07:30 AM	84	5	53	0	142	2	5	8	0	15	81	554	4	0	639	11	216	85	1	313	1109
07:45 AM	91	10	44	0	145	0	6	3	0	9	102	404	4	0	510	9	203	87	0	299	963
Total	264	25	170	0	459	4	13	19	0	36	299	1936	13	0	2248	44	802	270	2	1118	3861
08:00 AM	77	6	30	0	113	1	1	8	0	10	57	357	2	0	416	10	197	41	1	249	788
08:15 AM	49	9	15	0	73	0	4	8	0	12	35	352	4	0	391	17	214	38	0	269	745
08:30 AM	34	5	18	0	57	0	1	5	0	6	41	316	1	0	358	13	206	42	1	262	683
08:45 AM	52	5	18	0	75	3	3	8	0	14	34	340	2	0	376	22	194	32	3	251	716
Total	212	25	81	0	318	4	9	29	0	42	167	1365	9	0	1541	62	811	153	5	1031	2932
Grand Total	476	50	251	0	777	8	22	48	0	78	466	3301	22	0	3789	106	1613	423	7	2149	6793
Apprch %	61.3	6.4	32.3	0		10.3	28.2	61.5	0		12.3	87.1	0.6	0		4.9	75.1	19.7	0.3		
Total %	7	0.7	3.7	0	11.4	0.1	0.3	0.7	0	1.1	6.9	48.6	0.3	0	55.8	1.6	23.7	6.2	0.1	31.6	

RDC
Ridgeview Data Collection

Parker, CO
Pinery West
AM Peak
Parker Rd and Stroh Rd

File Name : Parker and Stroh AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 2

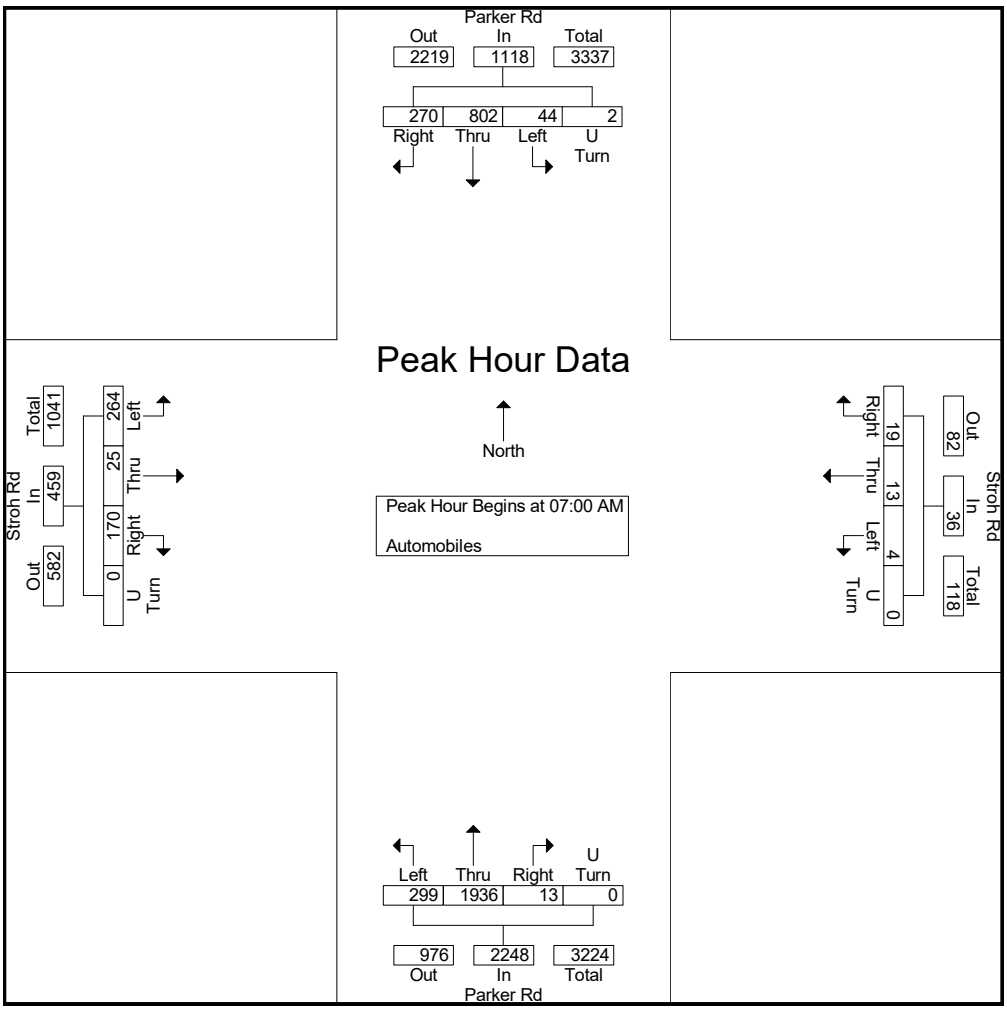


RDC
Ridgeview Data Collection

Parker, CO
Pinery West
AM Peak
Parker Rd and Stroh Rd

File Name : Parker and Stroh AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 3

	Stroh Rd Eastbound					Stroh Rd Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	42	6	45	0	93	0	0	5	0	5	49	443	3	0	495	11	197	48	0	256	849
07:15 AM	47	4	28	0	79	**2**	2	3	0	7	67	535	2	0	604	**13**	186	50	**1**	250	940
07:30 AM	84	5	**53**	0	142	2	5	**8**	0	**15**	81	**554**	**4**	0	**639**	11	**216**	85	1	**313**	**1109**
07:45 AM	**91**	**10**	44	0	**145**	0	**6**	3	0	9	**102**	404	4	0	510	9	203	**87**	0	299	963
Total Volume	264	25	170	0	459	4	13	19	0	36	299	1936	13	0	2248	44	802	270	2	1118	3861
% App. Total	57.5	5.4	37	0		11.1	36.1	52.8	0		13.3	86.1	0.6	0		3.9	71.7	24.2	0.2		
PHF	.725	.625	.802	.000	.791	.500	.542	.594	.000	.600	.733	.874	.813	.000	.879	.846	.928	.776	.500	.893	.870



RDC
Ridgeview Data Collection

Parker, CO
Pinery West
PM Peak
Parker Rd and Stroh Rd

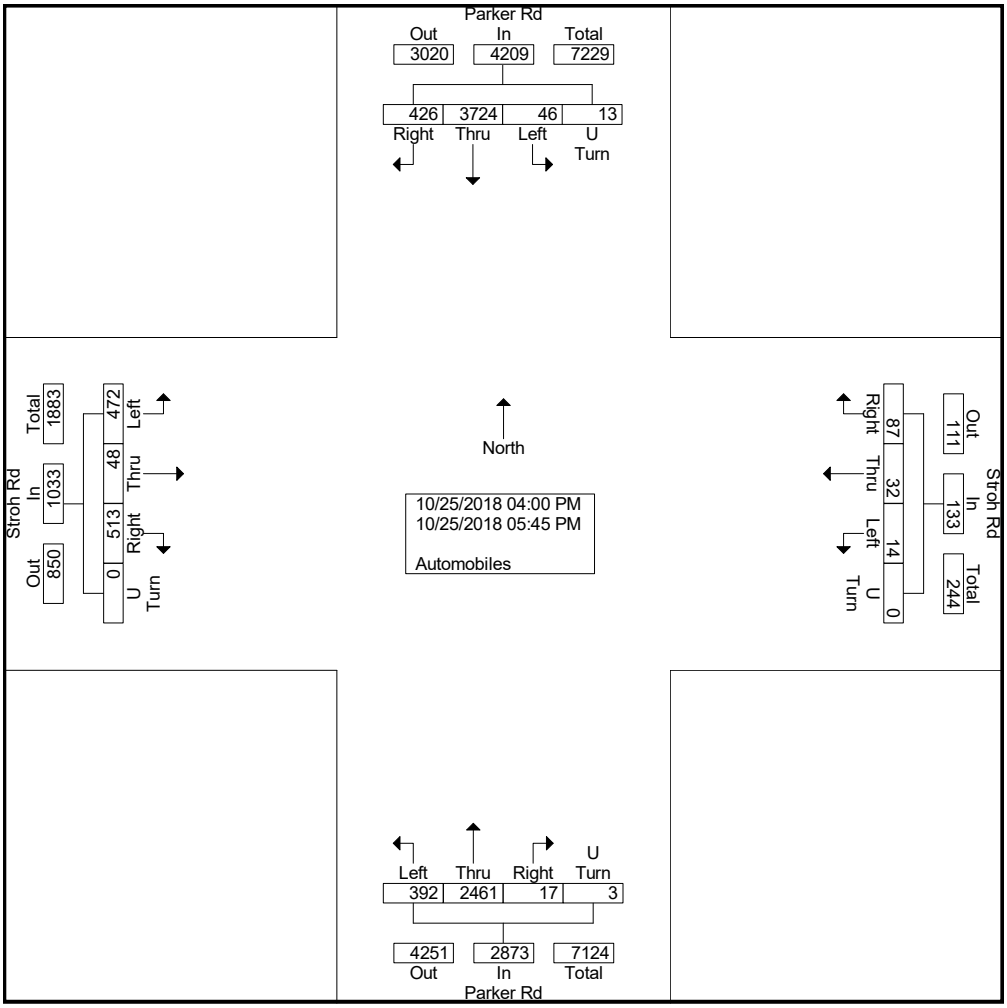
File Name : Parker and Stroh PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 1

Groups Printed- Automobiles

	Stroh Rd Eastbound					Stroh Rd Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
04:00 PM	47	4	58	0	109	4	5	14	0	23	50	306	3	1	360	5	393	46	1	445	937
04:15 PM	70	2	72	0	144	3	3	13	0	19	47	302	3	0	352	7	462	46	1	516	1031
04:30 PM	66	11	65	0	142	1	4	13	0	18	52	334	3	1	390	7	446	63	1	517	1067
04:45 PM	71	7	56	0	134	1	3	8	0	12	45	370	2	0	417	5	472	53	2	532	1095
Total	254	24	251	0	529	9	15	48	0	72	194	1312	11	2	1519	24	1773	208	5	2010	4130
05:00 PM	57	7	51	0	115	2	5	13	0	20	49	329	1	0	379	7	501	64	2	574	1088
05:15 PM	56	7	75	0	138	1	8	8	0	17	46	263	0	0	309	5	497	53	2	557	1021
05:30 PM	49	6	69	0	124	1	1	7	0	9	49	298	2	0	349	6	489	45	0	540	1022
05:45 PM	56	4	67	0	127	1	3	11	0	15	54	259	3	1	317	4	464	56	4	528	987
Total	218	24	262	0	504	5	17	39	0	61	198	1149	6	1	1354	22	1951	218	8	2199	4118
Grand Total	472	48	513	0	1033	14	32	87	0	133	392	2461	17	3	2873	46	3724	426	13	4209	8248
Apprch %	45.7	4.6	49.7	0		10.5	24.1	65.4	0		13.6	85.7	0.6	0.1		1.1	88.5	10.1	0.3		
Total %	5.7	0.6	6.2	0	12.5	0.2	0.4	1.1	0	1.6	4.8	29.8	0.2	0	34.8	0.6	45.2	5.2	0.2	51	

Parker, CO
Pinery West
PM Peak
Parker Rd and Stroh Rd

File Name : Parker and Stroh PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 2

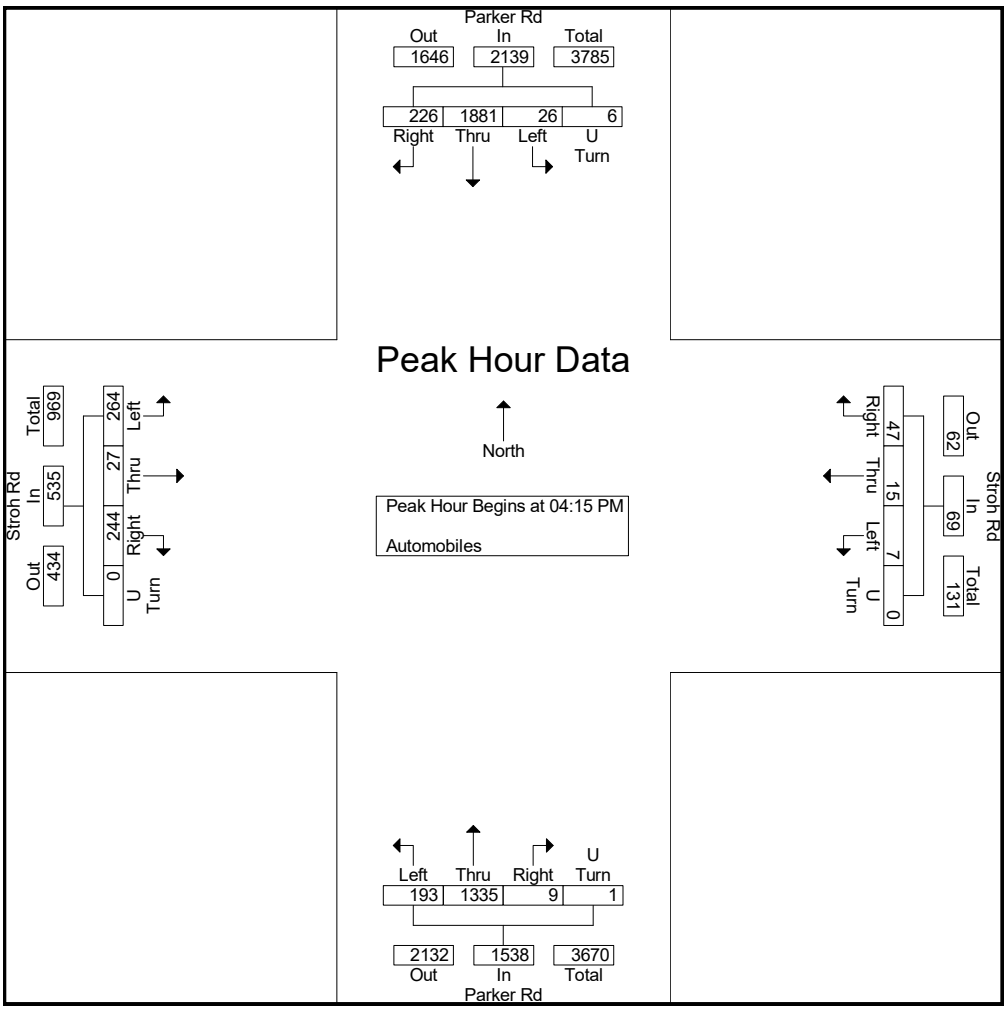


RDC
Ridgeview Data Collection

Parker, CO
Pinery West
PM Peak
Parker Rd and Stroh Rd

File Name : Parker and Stroh PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 3

	Stroh Rd Eastbound					Stroh Rd Westbound					Parker Rd Northbound					Parker Rd Southbound					
Start Time	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Left	Thru	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	70	2	**72**	0	**144**	**3**	3	**13**	0	19	47	302	**3**	0	352	**7**	462	46	1	516	1031
04:30 PM	66	**11**	65	0	142	1	4	13	0	18	**52**	334	3	**1**	390	7	446	63	1	517	1067
04:45 PM	**71**	7	56	0	134	1	3	8	0	12	45	**370**	2	0	**417**	5	472	53	**2**	532	**1095**
05:00 PM	57	7	51	0	115	2	**5**	13	0	**20**	49	329	1	0	379	7	**501**	**64**	2	**574**	1088
Total Volume	264	27	244	0	535	7	15	47	0	69	193	1335	9	1	1538	26	1881	226	6	2139	4281
% App. Total	49.3	5	45.6	0		10.1	21.7	68.1	0		12.5	86.8	0.6	0.1		1.2	87.9	10.6	0.3		
PHF	.930	.614	.847	.000	.929	.583	.750	.904	.000	.863	.928	.902	.750	.250	.922	.929	.939	.883	.750	.932	.977



RDC
Ridgeview Data Collection

Parker, CO
Pinery West
AM Peak
Stroh Rd and J. Morgan Blvd

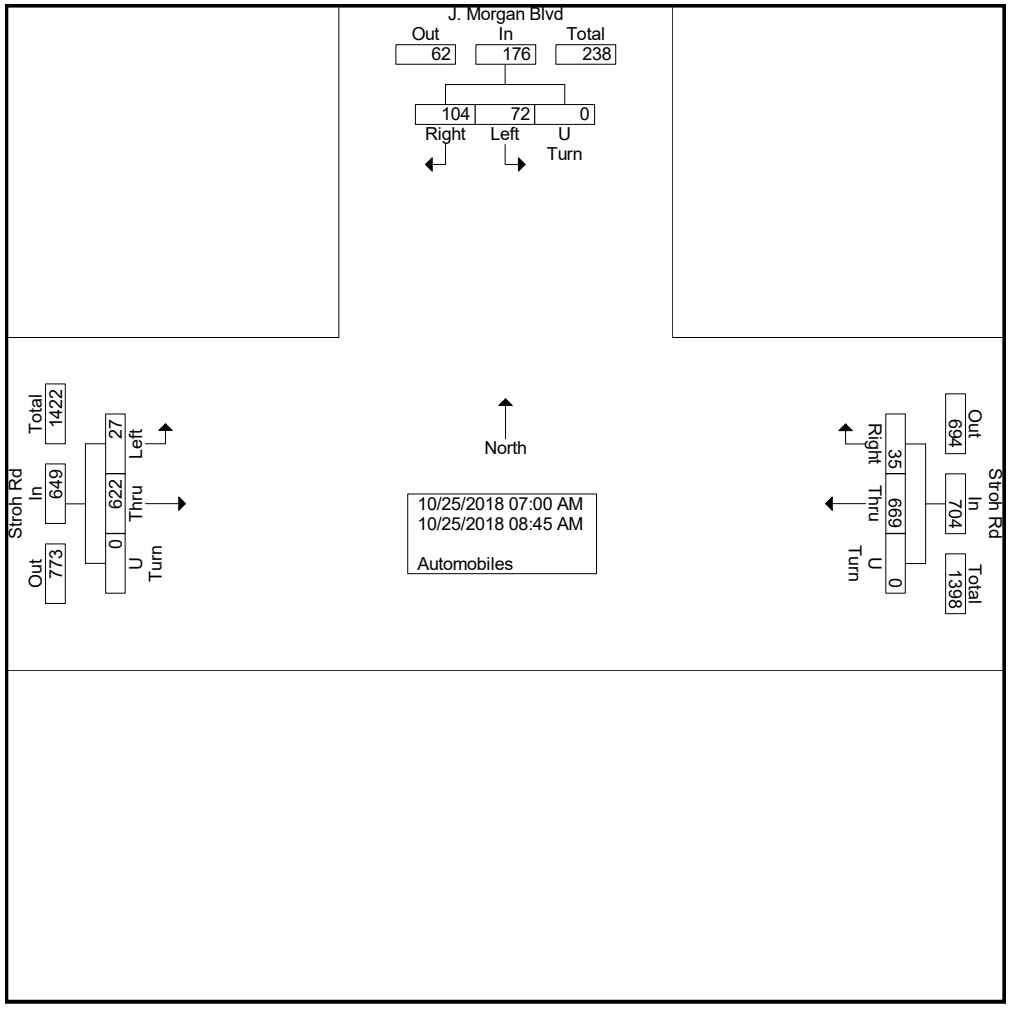
File Name : Stroh and J Morgan AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 1

Groups Printed- Automobiles

	Stroh Rd Eastbound				Stroh Rd Westbound				J. Morgan Blvd Southbound				
Start Time	Left	Thru	U Turn	App. Total	Thru	Right	U Turn	App. Total	Left	Right	U Turn	App. Total	Int. Total
07:00 AM	0	74	0	74	57	1	0	58	8	6	0	14	146
07:15 AM	1	81	0	82	81	4	0	85	9	13	0	22	189
07:30 AM	1	114	0	115	106	6	0	112	21	15	0	36	263
07:45 AM	3	127	0	130	112	12	0	124	14	5	0	19	273
Total	5	396	0	401	356	23	0	379	52	39	0	91	871
08:00 AM	5	68	0	73	113	7	0	120	4	18	0	22	215
08:15 AM	6	50	0	56	71	1	0	72	4	22	0	26	154
08:30 AM	9	57	0	66	66	3	0	69	7	9	0	16	151
08:45 AM	2	51	0	53	63	1	0	64	5	16	0	21	138
Total	22	226	0	248	313	12	0	325	20	65	0	85	658
Grand Total	27	622	0	649	669	35	0	704	72	104	0	176	1529
Apprch %	4.2	95.8	0		95	5	0		40.9	59.1	0		
Total %	1.8	40.7	0	42.4	43.8	2.3	0	46	4.7	6.8	0	11.5	

Parker, CO
Pinery West
AM Peak
Stroh Rd and J. Morgan Blvd

File Name : Stroh and J Morgan AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 2

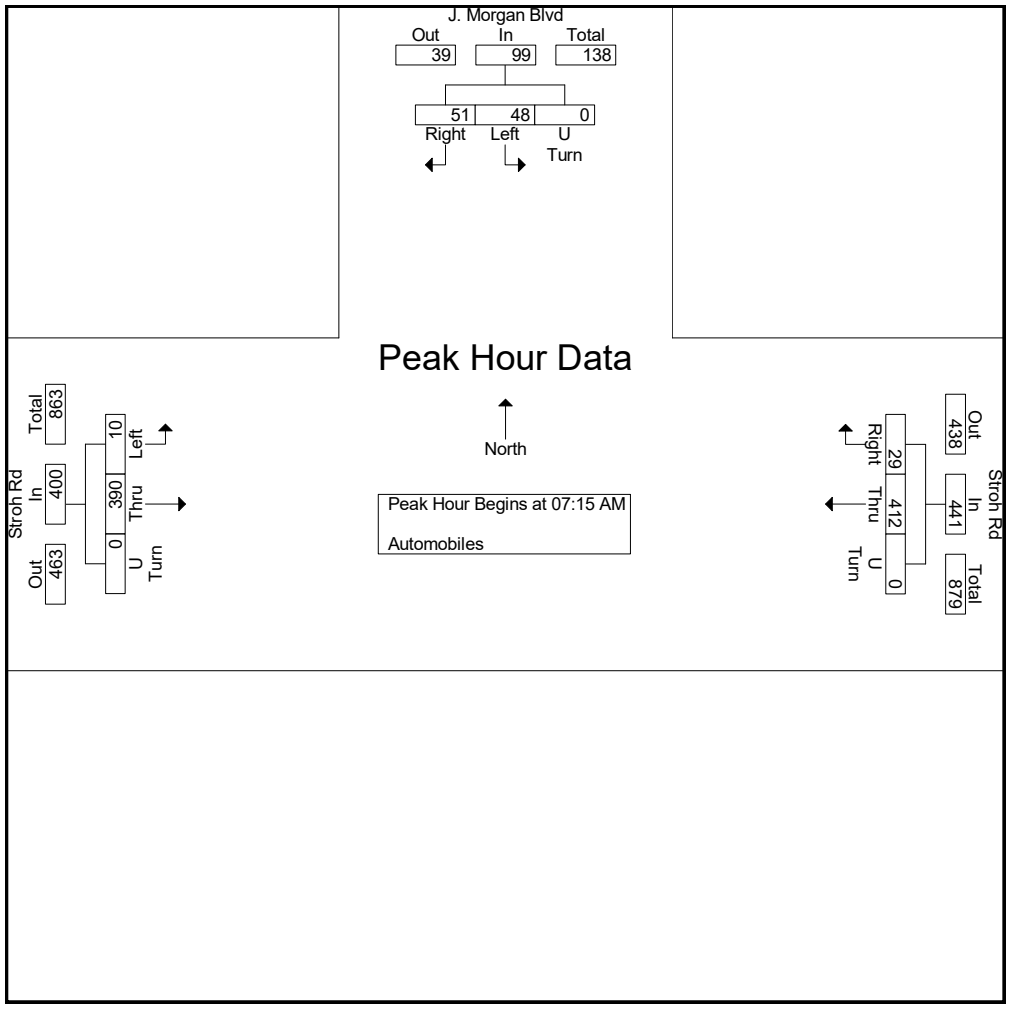


RDC
Ridgeview Data Collection

Parker, CO
Pinery West
AM Peak
Stroh Rd and J. Morgan Blvd

File Name : Stroh and J Morgan AM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 3

	Stroh Rd Eastbound				Stroh Rd Westbound				J. Morgan Blvd Southbound				
Start Time	Left	Thru	U Turn	App. Total	Thru	Right	U Turn	App. Total	Left	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	1	81	0	82	81	4	0	85	9	13	0	22	189
07:30 AM	1	114	0	115	106	6	0	112	**21**	15	0	**36**	263
07:45 AM	3	**127**	0	**130**	112	**12**	0	**124**	14	5	0	19	**273**
08:00 AM	**5**	68	0	73	**113**	7	0	120	4	**18**	0	22	215
Total Volume	10	390	0	400	412	29	0	441	48	51	0	99	940
% App. Total	2.5	97.5	0		93.4	6.6	0		48.5	51.5	0		
PHF	.500	.768	.000	.769	.912	.604	.000	.889	.571	.708	.000	.688	.861



RDC
Ridgeview Data Collection

Parker, CO
Pinery West
PM Peak
Stroh Rd and J. Morgan Blvd

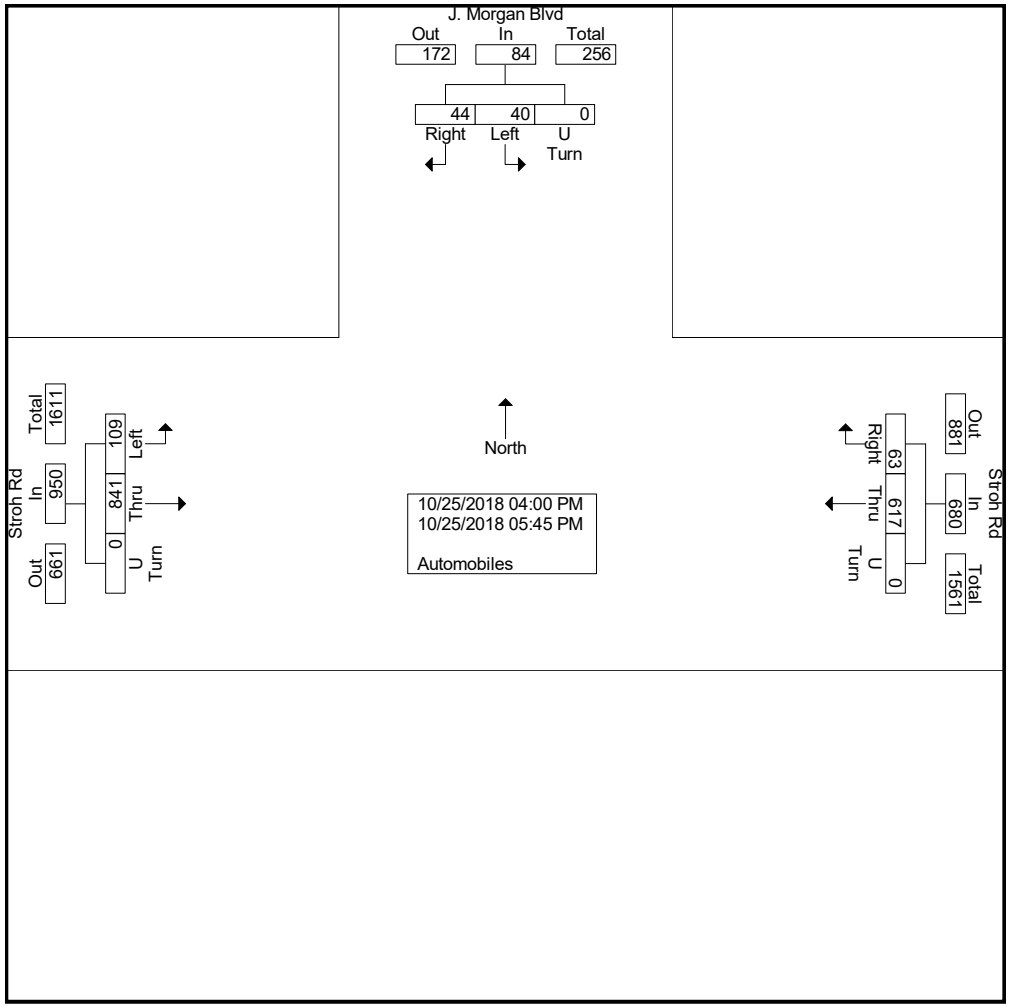
File Name : Stroh and J Morgan PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 1

Groups Printed- Automobiles

	Stroh Rd Eastbound				Stroh Rd Westbound				J. Morgan Blvd Southbound				
Start Time	Left	Thru	U Turn	App. Total	Thru	Right	U Turn	App. Total	Left	Right	U Turn	App. Total	Int. Total
04:00 PM	24	96	0	120	76	9	0	85	3	6	0	9	214
04:15 PM	15	114	0	129	78	7	0	85	7	7	0	14	228
04:30 PM	13	104	0	117	83	9	0	92	7	9	0	16	225
04:45 PM	9	116	0	125	75	8	0	83	6	6	0	12	220
Total	61	430	0	491	312	33	0	345	23	28	0	51	887
05:00 PM	8	115	0	123	87	3	0	90	2	6	0	8	221
05:15 PM	12	104	0	116	76	11	0	87	5	2	0	7	210
05:30 PM	16	104	0	120	66	6	0	72	3	2	0	5	197
05:45 PM	12	88	0	100	76	10	0	86	7	6	0	13	199
Total	48	411	0	459	305	30	0	335	17	16	0	33	827
Grand Total	109	841	0	950	617	63	0	680	40	44	0	84	1714
Apprch %	11.5	88.5	0		90.7	9.3	0		47.6	52.4	0		
Total %	6.4	49.1	0	55.4	36	3.7	0	39.7	2.3	2.6	0	4.9	

Parker, CO
Pinery West
PM Peak
Stroh Rd and J. Morgan Blvd

File Name : Stroh and J Morgan PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 2

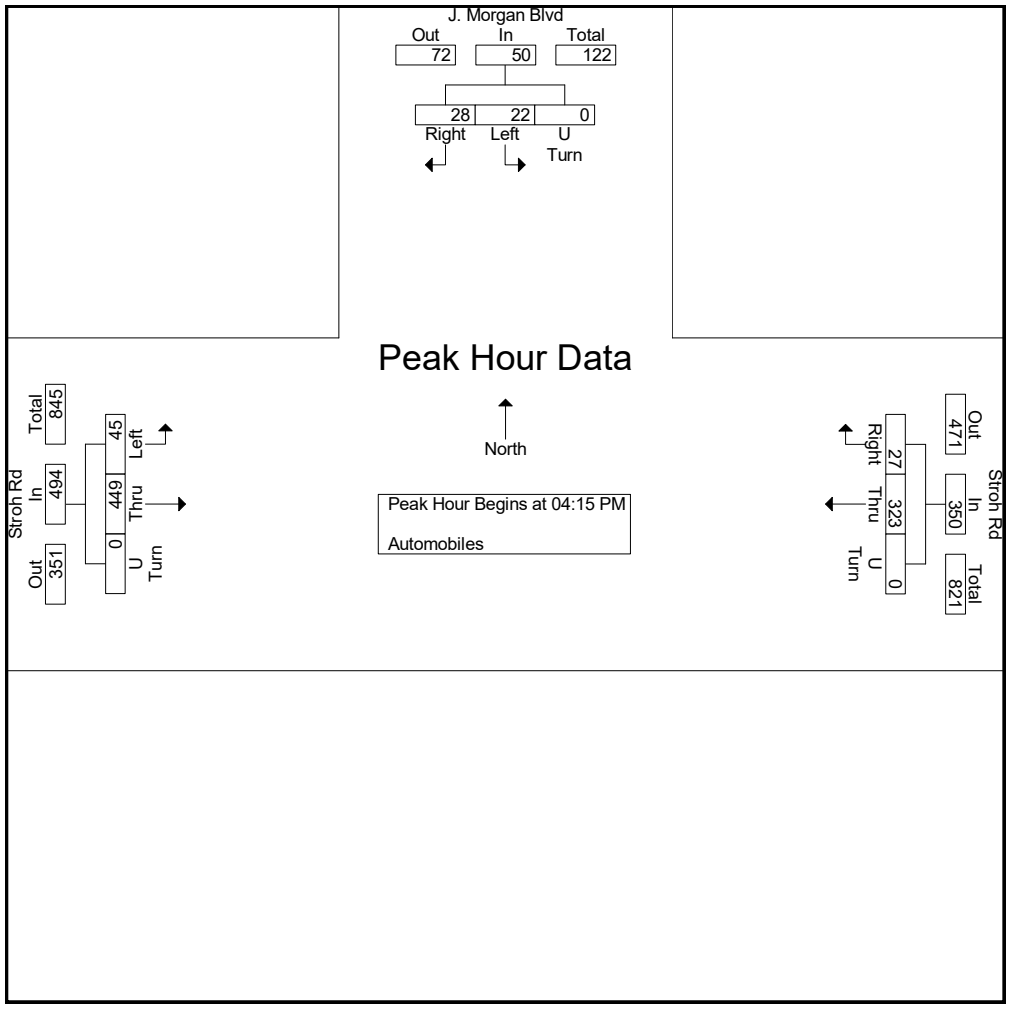


RDC
Ridgeview Data Collection

Parker, CO
Pinery West
PM Peak
Stroh Rd and J. Morgan Blvd

File Name : Stroh and J Morgan PM
Site Code : IPO 25
Start Date : 10/25/2018
Page No : 3

	Stroh Rd Eastbound				Stroh Rd Westbound				J. Morgan Blvd Southbound				
Start Time	Left	Thru	U Turn	App. Total	Thru	Right	U Turn	App. Total	Left	Right	U Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	**15**	114	0	**129**	78	7	0	85	**7**	7	0	14	**228**
04:30 PM	13	104	0	117	83	**9**	0	**92**	7	**9**	0	**16**	225
04:45 PM	9	**116**	0	125	75	8	0	83	6	6	0	12	220
05:00 PM	8	115	0	123	**87**	3	0	90	2	6	0	8	221
Total Volume	45	449	0	494	323	27	0	350	22	28	0	50	894
% App. Total	9.1	90.9	0		92.3	7.7	0		44	56	0		
PHF	.750	.968	.000	.957	.928	.750	.000	.951	.786	.778	.000	.781	.980



Daily Vehicle Volume Report

Study Date: Thursday, 10/25/2018 / Friday, 10/26/2018
Unit ID: RDC 16
Location: Stroh Rd, Parker, CO
Comments: East of J. Morgan Blvd

	Westbound Volume	Eastbound Volume	Total Volume
05:00 - 05:59	49	53	**102**
06:00 - 06:59	151	130	**281**
07:00 - 07:59	408	464	**872**
08:00 - 08:59	315	252	**567**
09:00 - 09:59	220	224	**444**
10:00 - 10:59	224	214	**438**
11:00 - 11:59	241	255	**496**
12:00 - 12:59	215	244	**459**
13:00 - 13:59	244	268	**512**
14:00 - 14:59	276	333	**609**
15:00 - 15:59	413	460	**873**
16:00 - 16:59	332	493	**825**
17:00 - 17:59	339	434	**773**
18:00 - 18:59	290	332	**622**
19:00 - 19:59	166	188	**354**
20:00 - 20:59	127	106	**233**
21:00 - 21:59	90	76	**166**
22:00 - 22:59	55	34	**89**
23:00 - 23:59	22	16	**38**
00:00 - 00:59	8	15	**23**
01:00 - 01:59	2	7	**9**
02:00 - 02:59	7	7	**14**
03:00 - 03:59	7	6	**13**
04:00 - 04:59	8	4	**12**
Totals	**4209**	**4615**	**8824**
AM Peak Time	**07:20 - 08:19**	**07:00 - 07:59**	**07:12 - 08:11**
AM Peak Volume	**459**	**464**	**910**
PM Peak Time	**14:46 - 15:45**	**16:11 - 17:10**	**14:49 - 15:48**
PM Peak Volume	**415**	**511**	**878**

Level of Service Definitions

LEVEL OF SERVICE DEFINITIONS

In rating roadway and intersection operating conditions with existing or future traffic volumes, "Levels of Service" (LOS) A through F are used, with LOS A indicating very good operation and LOS F indicating poor operation. Levels of service at signalized and unsignalized intersections are closely associated with vehicle delays experienced in seconds per vehicle. More complete level of service definitions and delay data for signal and stop sign controlled intersections are contained in the following table for reference.

Level of Service Rating	Delay in seconds per vehicle *(a)*		Definition
	Signalized	Unsignalized	
A	0.0 to 10.0	0.0 to 10.0	Low vehicular traffic volumes; primarily free flow operations. Density is low and vehicles can freely maneuver within the traffic stream. Drivers are able to maintain their desired speeds with little or no delay.
B	10.1 to 20.0	10.1 to 15.0	Stable vehicular traffic volume flow with potential for some restriction of operating speeds due to traffic conditions. Vehicle maneuvering is only slightly restricted. The stopped delays are not bothersome and drivers are not subject to appreciable tension.
C	20.1 to 35.0	15.1 to 25.0	Stable traffic operations, however the ability for vehicles to maneuver is more restricted by the increase in traffic volumes. Relatively satisfactory operating speeds prevail, but adverse signal coordination or longer vehicle queues cause delays along the corridor.
D	35.1 to 55.0	25.1 to 35.0	Approaching unstable vehicular traffic flow where small increases in volume could cause substantial delays. Most drivers are restricted in ability to maneuver and selection of travel speeds due to congestion. Driver comfort and convenience are low, but tolerable.
E	55.1 to 80.0	35.1 to 50.0	Traffic operations characterized by significant approach delays and average travel speeds of one-half to one-third the free flow speed. Vehicular flow is unstable and there is potential for stoppages of brief duration. High signal density, extensive vehicle queuing, or corridor signal progression/timing are the typical causes of vehicle delays at signalized corridors.
F	> 80.0	> 50.0	Forced vehicular traffic flow and operations with high approach delays at critical intersections. Vehicle speeds are reduced substantially, and stoppages may occur for short or long periods of time because of downstream congestion.

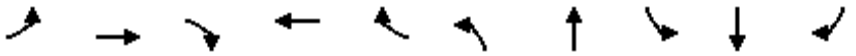
(a) Delay ranges based on Highway Capacity Manual (6th Edition, 2016) criteria.

Intersection Capacity Worksheets and Time-Space (Progression) Diagrams

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	27	4	6	72	1	395	5	1826	92	858	3
Future Volume (vph)	27	4	6	72	1	395	5	1826	92	858	3
Turn Type	Prot	NA	Free	Perm	NA	pm+ov	Prot	NA	Prot	NA	Free
Protected Phases	7	4			8	1	5	2	1	6	
Permitted Phases			Free	8		8					Free
Detector Phase	7	4		8	8	1	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		12.0	12.0	8.0	1.0	20.0	8.0	20.0	
Minimum Split (s)	10.0	39.0		39.0	39.0	13.0	6.0	27.0	13.0	27.0	
Total Split (s)	12.0	36.0		24.0	24.0	14.0	11.0	50.0	14.0	53.0	
Total Split (%)	12.0%	36.0%		24.0%	24.0%	14.0%	11.0%	50.0%	14.0%	53.0%	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0			6.0	5.0	5.0	7.0	5.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Max	None	Max	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 86.4
Natural Cycle: 110
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Parker Road & Pinery Parkway



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	41	6	9	83	449	6	2150	103	964	3
v/c Ratio	0.16	0.03	0.01	0.40	0.89	0.05	0.85	0.29	0.29	0.00
Control Delay	43.0	32.8	0.0	43.1	45.1	43.8	25.4	42.0	9.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	32.8	0.0	43.1	45.1	43.8	25.4	42.0	9.7	0.0
Queue Length 50th (ft)	11	3	0	46	200	3	428	29	92	0
Queue Length 95th (ft)	21	9	0	91	#328	16	#568	57	172	0
Internal Link Dist (ft)		553		790			779		6252	
Turn Bay Length (ft)	220		100			340		500		685
Base Capacity (vph)	285	663	1583	288	506	126	2538	366	3360	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.01	0.01	0.29	0.89	0.05	0.85	0.28	0.29	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

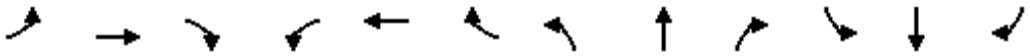
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	4	6	72	1	395	5	1826	44	92	858	3
Future Volume (vph)	27	4	6	72	1	395	5	1826	44	92	858	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	4.0		6.0	5.0	5.0	7.0		5.0	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	1.00	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1775	1583	1770	4972		3433	4988	1583
Flt Permitted	0.95	1.00	1.00		0.73	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1350	1583	1770	4972		3433	4988	1583
Peak-hour factor, PHF	0.66	0.66	0.66	0.88	0.88	0.88	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	41	6	9	82	1	449	6	2099	51	103	964	3
RTOR Reduction (vph)	0	0	0	0	0	78	0	2	0	0	0	0
Lane Group Flow (vph)	41	6	9	0	83	371	6	2148	0	103	964	3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	Prot	NA	Free	Perm	NA	pm+ov	Prot	NA		Prot	NA	Free
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases			Free	8		8						Free
Actuated Green, G (s)	3.7	18.7	94.1		10.0	19.0	1.1	48.4		9.0	56.3	94.1
Effective Green, g (s)	3.7	18.7	94.1		10.0	19.0	1.1	48.4		9.0	56.3	94.1
Actuated g/C Ratio	0.04	0.20	1.00		0.11	0.20	0.01	0.51		0.10	0.60	1.00
Clearance Time (s)	5.0	6.0			6.0	5.0	5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	134	370	1583		143	319	20	2557		328	2984	1583
v/s Ratio Prot	c0.01	0.00				c0.11	0.00	c0.43		0.03	0.19	
v/s Ratio Perm			0.01		0.06	0.12						0.00
v/c Ratio	0.31	0.02	0.01		0.58	1.16	0.30	0.84		0.31	0.32	0.00
Uniform Delay, d1	44.0	30.3	0.0		40.1	37.5	46.1	19.5		39.7	9.4	0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.0	0.0		5.9	102.0	8.3	3.5		0.6	0.3	0.0
Delay (s)	45.2	30.3	0.0		45.9	139.5	54.4	23.1		40.2	9.7	0.0
Level of Service	D	C	A		D	F	D	C		D	A	A
Approach Delay (s)		36.4			124.9			23.2			12.6	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	23.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	25	170	4	13	19	299	1936	13	46	802	270
Future Volume (vph)	264	25	170	4	13	19	299	1936	13	46	802	270
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			Free			Free			2			Free
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	19.0	19.0	6.0	19.0	
Minimum Split (s)	37.2	37.2		37.5	37.5		16.2	35.0	35.0	12.2	35.0	
Total Split (s)	25.0	25.0		18.0	18.0		27.0	58.0	58.0	19.0	50.0	
Total Split (%)	20.8%	20.8%		15.0%	15.0%		22.5%	48.3%	48.3%	15.8%	41.7%	
Yellow Time (s)	3.2	3.2		3.5	3.5		3.2	5.0	5.0	3.2	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 100
Natural Cycle: 150
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Parker Road & Stroh Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	184	182	215	7	22	32	340	2200	15	52	901	303
v/c Ratio	0.72	0.71	0.14	0.06	0.09	0.02	0.67	0.82	0.02	0.36	0.41	0.19
Control Delay	58.7	57.5	0.2	50.5	49.5	0.0	48.4	25.7	0.0	54.1	21.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	57.5	0.2	50.5	49.5	0.0	48.4	25.7	0.0	54.1	21.7	0.3
Queue Length 50th (ft)	126	125	0	5	7	0	114	493	0	34	158	0
Queue Length 95th (ft)	184	183	0	13	14	0	162	#665	0	76	219	0
Internal Link Dist (ft)		589			1174			1592			712	
Turn Bay Length (ft)				315		155	350		285	530		560
Base Capacity (vph)	338	342	1583	225	450	1564	727	2699	914	230	2217	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.53	0.14	0.03	0.05	0.02	0.47	0.82	0.02	0.23	0.41	0.19

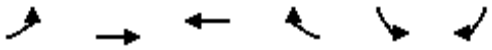
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	25	170	4	13	19	299	1936	13	46	802	270
Future Volume (vph)	264	25	170	4	13	19	299	1936	13	46	802	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.0	5.5	5.5	4.0	6.2	7.0	7.0	6.2	7.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1700	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Flt Permitted	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1700	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Peak-hour factor, PHF	0.79	0.79	0.79	0.60	0.60	0.60	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	334	32	215	7	22	32	340	2200	15	52	901	303
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	7	0	0	0
Lane Group Flow (vph)	184	182	215	7	22	32	340	2200	8	52	901	303
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			Free			Free			2			Free
Actuated Green, G (s)	15.2	15.2	103.7	3.8	3.8	103.7	14.8	54.1	54.1	6.7	46.0	103.7
Effective Green, g (s)	15.2	15.2	103.7	3.8	3.8	103.7	14.8	54.1	54.1	6.7	46.0	103.7
Actuated g/C Ratio	0.15	0.15	1.00	0.04	0.04	1.00	0.14	0.52	0.52	0.06	0.44	1.00
Clearance Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		2.5	5.0	5.0	2.5	5.0	
Lane Grp Cap (vph)	246	249	1583	64	129	1564	489	2602	825	114	2212	1583
v/s Ratio Prot	c0.11	0.11		0.00	0.01		c0.10	c0.44		0.03	0.18	
v/s Ratio Perm			0.14			0.02			0.00			c0.19
v/c Ratio	0.75	0.73	0.14	0.11	0.17	0.02	0.70	0.85	0.01	0.46	0.41	0.19
Uniform Delay, d1	42.4	42.3	0.0	48.3	48.4	0.0	42.3	21.2	11.9	46.7	19.6	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.2	9.9	0.2	0.8	0.6	0.0	3.9	3.6	0.0	2.1	0.6	0.3
Delay (s)	53.6	52.2	0.2	49.1	49.1	0.0	46.2	24.8	11.9	48.8	20.2	0.3
Level of Service	D	D	A	D	D	A	D	C	B	D	C	A
Approach Delay (s)		33.4			23.3			27.6			16.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	103.7	Sum of lost time (s)	23.9
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	396	356	23	52	39
Future Volume (Veh/h)	5	396	356	23	52	39
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.90	0.90	0.69	0.69
Hourly flow rate (vph)	6	514	396	26	75	57
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	423				923	397
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	423				923	397
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				75	91
cM capacity (veh/h)	1135				298	652

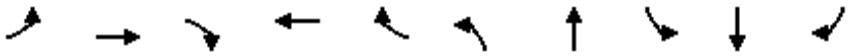
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	6	514	396	26	75	57
Volume Left	6	0	0	0	75	0
Volume Right	0	0	0	26	0	57
cSH	1135	1700	1700	1700	298	652
Volume to Capacity	0.01	0.30	0.23	0.02	0.25	0.09
Queue Length 95th (ft)	0	0	0	0	24	7
Control Delay (s)	8.2	0.0	0.0	0.0	21.1	11.1
Lane LOS	A				C	B
Approach Delay (s)	0.1		0.0		16.8	
Approach LOS					C	

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	12	3	4	68	2	267	5	1256	404	1695	22
Future Volume (vph)	12	3	4	68	2	267	5	1256	404	1695	22
Turn Type	Perm	NA	Free	Perm	NA	pm+ov	Prot	NA	Prot	NA	Free
Protected Phases		4			8	1	5	2	1	6	
Permitted Phases	4		Free	8		8					Free
Detector Phase	4	4		8	8	1	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		12.0	12.0	8.0	1.0	20.0	8.0	20.0	
Minimum Split (s)	39.0	39.0		39.0	39.0	13.0	6.0	27.0	13.0	27.0	
Total Split (s)	30.0	30.0		30.0	30.0	23.0	11.0	37.0	23.0	49.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%	25.6%	12.2%	41.1%	25.6%	54.4%	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	5.0	5.0	7.0	5.0	7.0	
Lead/Lag						Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Max	None	Max	

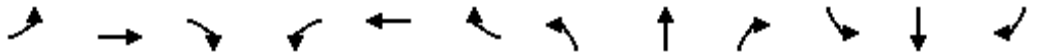
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 70.8
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Parker Road & Pinery Parkway



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	28	7	9	77	293	5	1423	416	1747	23
v/c Ratio	0.08	0.03	0.01	0.32	0.45	0.03	0.66	0.62	0.50	0.01
Control Delay	28.2	27.7	0.0	32.7	14.4	34.2	19.6	31.2	8.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	27.7	0.0	32.7	14.4	34.2	19.6	31.2	8.2	0.0
Queue Length 50th (ft)	5	3	0	32	73	2	192	91	130	0
Queue Length 95th (ft)	8	6	0	74	131	13	275	138	267	0
Internal Link Dist (ft)		553		790			779		6252	
Turn Bay Length (ft)	220		100			340		500		685
Base Capacity (vph)	888	647	1583	471	747	154	2161	895	3510	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.01	0.01	0.16	0.39	0.03	0.66	0.46	0.50	0.01

Intersection Summary



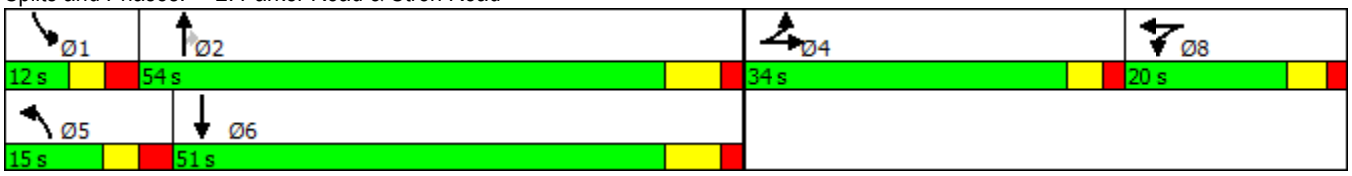
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	3	4	68	2	267	5	1256	53	404	1695	22
Future Volume (vph)	12	3	4	68	2	267	5	1256	53	404	1695	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0		6.0	5.0	5.0	7.0		5.0	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	1.00	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1776	1583	1770	4961		3433	4988	1583
Flt Permitted	0.71	1.00	1.00		0.73	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2555	1863	1583		1354	1583	1770	4961		3433	4988	1583
Peak-hour factor, PHF	0.43	0.43	0.43	0.91	0.91	0.91	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	28	7	9	75	2	293	5	1365	58	416	1747	23
RTOR Reduction (vph)	0	0	0	0	0	33	0	4	0	0	0	0
Lane Group Flow (vph)	28	7	9	0	77	260	5	1419	0	416	1747	23
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	Perm	NA	Free	Perm	NA	pm+ov	Prot	NA		Prot	NA	Free
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		Free	8		8						Free
Actuated Green, G (s)	9.3	9.3	76.3		9.3	23.2	1.1	35.1		13.9	47.9	76.3
Effective Green, g (s)	9.3	9.3	76.3		9.3	23.2	1.1	35.1		13.9	47.9	76.3
Actuated g/C Ratio	0.12	0.12	1.00		0.12	0.30	0.01	0.46		0.18	0.63	1.00
Clearance Time (s)	6.0	6.0			6.0	5.0	5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	311	227	1583		165	481	25	2282		625	3131	1583
v/s Ratio Prot		0.00				c0.10	0.00	c0.29		c0.12	0.35	
v/s Ratio Perm	0.01		0.01		0.06	0.07						0.01
v/c Ratio	0.09	0.03	0.01		0.47	0.54	0.20	0.62		0.67	0.56	0.01
Uniform Delay, d1	29.7	29.5	0.0		31.2	22.1	37.2	15.6		29.0	8.1	0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.0		2.1	1.2	3.9	1.3		2.7	0.7	0.0
Delay (s)	29.9	29.6	0.0		33.3	23.3	41.1	16.9		31.7	8.9	0.0
Level of Service	C	C	A		C	C	D	B		C	A	A
Approach Delay (s)		23.7			25.4			17.0			13.1	
Approach LOS		C			C			B			B	

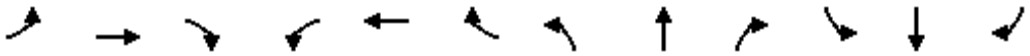
Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	76.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	27	244	7	15	47	193	1335	9	32	1881	226
Future Volume (vph)	264	27	244	7	15	47	193	1335	9	32	1881	226
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			Free			Free			2			Free
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	19.0	19.0	6.0	19.0	
Minimum Split (s)	37.2	37.2		37.5	37.5		16.2	35.0	35.0	12.2	35.0	
Total Split (s)	34.0	34.0		20.0	20.0		15.0	54.0	54.0	12.0	51.0	
Total Split (%)	28.3%	28.3%		16.7%	16.7%		12.5%	45.0%	45.0%	10.0%	42.5%	
Yellow Time (s)	3.2	3.2		3.5	3.5		3.2	5.0	5.0	3.2	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 89.9
Natural Cycle: 150
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Parker Road & Stroh Road

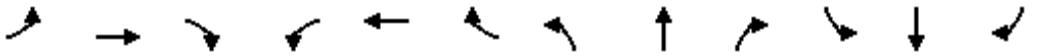




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	156	157	262	8	17	55	210	1451	10	34	2023	243
v/c Ratio	0.62	0.62	0.17	0.06	0.06	0.04	0.62	0.49	0.01	0.30	0.82	0.15
Control Delay	48.2	47.9	0.2	44.3	43.3	0.0	49.7	14.5	0.0	50.8	24.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	47.9	0.2	44.3	43.3	0.0	49.7	14.5	0.0	50.8	24.6	0.2
Queue Length 50th (ft)	82	82	0	4	4	0	56	166	0	18	303	0
Queue Length 95th (ft)	166	167	0	19	16	0	#121	313	0	55	#583	0
Internal Link Dist (ft)		589			1174			1592			712	
Turn Bay Length (ft)				315		155	350		285	530		560
Base Capacity (vph)	545	551	1583	288	577	1564	340	2936	983	115	2471	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.28	0.17	0.03	0.03	0.04	0.62	0.49	0.01	0.30	0.82	0.15

Intersection Summary

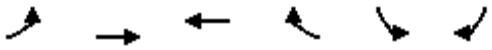
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	27	244	7	15	47	193	1335	9	32	1881	226
Future Volume (vph)	264	27	244	7	15	47	193	1335	9	32	1881	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.0	5.5	5.5	4.0	6.2	7.0	7.0	6.2	7.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1700	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Flt Permitted	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1700	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	284	29	262	8	17	55	210	1451	10	34	2023	243
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	4	0	0	0
Lane Group Flow (vph)	156	157	262	8	17	55	210	1451	6	34	2023	243
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	Split	NA	Free	Split	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			Free			Free			2			Free
Actuated Green, G (s)	13.4	13.4	96.0	2.5	2.5	96.0	8.9	52.9	52.9	3.3	47.3	96.0
Effective Green, g (s)	13.4	13.4	96.0	2.5	2.5	96.0	8.9	52.9	52.9	3.3	47.3	96.0
Actuated g/C Ratio	0.14	0.14	1.00	0.03	0.03	1.00	0.09	0.55	0.55	0.03	0.49	1.00
Clearance Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		2.5	5.0	5.0	2.5	5.0	
Lane Grp Cap (vph)	234	237	1583	46	92	1564	318	2748	872	60	2457	1583
v/s Ratio Prot	c0.09	0.09		0.00	0.00		c0.06	c0.29		0.02	c0.41	
v/s Ratio Perm			c0.17			0.04			0.00			0.15
v/c Ratio	0.67	0.66	0.17	0.17	0.18	0.04	0.66	0.53	0.01	0.57	0.82	0.15
Uniform Delay, d1	39.2	39.2	0.0	45.7	45.8	0.0	42.1	13.6	9.7	45.6	20.8	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	6.1	0.2	1.8	1.0	0.0	4.6	0.7	0.0	9.6	3.3	0.2
Delay (s)	45.5	45.3	0.2	47.5	46.7	0.0	46.7	14.4	9.7	55.2	24.1	0.2
Level of Service	D	D	A	D	D	A	D	B	A	E	C	A
Approach Delay (s)		24.8			14.7			18.4			22.0	
Approach LOS		C			B			B			C	

Intersection Summary					
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	23.9		
Intersection Capacity Utilization	74.7%	ICU Level of Service	D		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	449	323	27	22	28
Future Volume (Veh/h)	45	449	323	27	22	28
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.95	0.95	0.78	0.78
Hourly flow rate (vph)	47	468	340	28	28	36
Pedestrians					15	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	383				917	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	383				917	355
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				90	95
cM capacity (veh/h)	1159				286	679

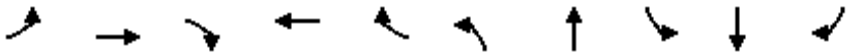
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	47	468	340	28	28	36
Volume Left	47	0	0	0	28	0
Volume Right	0	0	0	28	0	36
cSH	1159	1700	1700	1700	286	679
Volume to Capacity	0.04	0.28	0.20	0.02	0.10	0.05
Queue Length 95th (ft)	3	0	0	0	8	4
Control Delay (s)	8.2	0.0	0.0	0.0	19.0	10.6
Lane LOS	A				C	B
Approach Delay (s)	0.8		0.0		14.3	
Approach LOS					B	

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	30	4	10	75	1	395	5	2165	95	1025	5
Future Volume (vph)	30	4	10	75	1	395	5	2165	95	1025	5
Turn Type	Prot	NA	Free	Perm	NA	pm+ov	Prot	NA	Prot	NA	Free
Protected Phases	7	4			8	1	5	2	1	6	
Permitted Phases			Free	8		8					Free
Detector Phase	7	4		8	8	1	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		12.0	12.0	8.0	1.0	20.0	8.0	20.0	
Minimum Split (s)	10.0	39.0		39.0	39.0	13.0	6.0	27.0	13.0	27.0	
Total Split (s)	12.0	36.0		24.0	24.0	14.0	11.0	50.0	14.0	53.0	
Total Split (%)	12.0%	36.0%		24.0%	24.0%	14.0%	11.0%	50.0%	14.0%	53.0%	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0			6.0	5.0	5.0	7.0	5.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Max	None	Max	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 86.5
Natural Cycle: 140
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Parker Road & Pinery Parkway

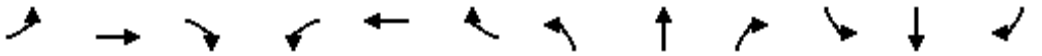


Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	45	6	15	86	449	6	2541	107	1152	6
v/c Ratio	0.18	0.03	0.01	0.41	0.89	0.05	1.00	0.30	0.34	0.00
Control Delay	43.2	32.8	0.0	43.4	44.9	44.0	43.3	42.2	10.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	32.8	0.0	43.4	44.9	44.0	43.3	42.2	10.2	0.0
Queue Length 50th (ft)	13	3	0	48	201	3	~639	30	116	0
Queue Length 95th (ft)	23	9	0	94	#325	16	#756	59	214	0
Internal Link Dist (ft)		553		790			779		6252	
Turn Bay Length (ft)	220		100			340		500		685
Base Capacity (vph)	284	662	1583	288	507	125	2538	366	3357	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.01	0.01	0.30	0.89	0.05	1.00	0.29	0.34	0.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



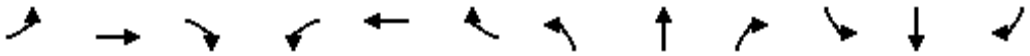
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	4	10	75	1	395	5	2165	45	95	1025	5
Future Volume (vph)	30	4	10	75	1	395	5	2165	45	95	1025	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	4.0		6.0	5.0	5.0	7.0		5.0	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	1.00	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1775	1583	1770	4974		3433	4988	1583
Flt Permitted	0.95	1.00	1.00		0.72	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1350	1583	1770	4974		3433	4988	1583
Peak-hour factor, PHF	0.66	0.66	0.66	0.88	0.88	0.88	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	45	6	15	85	1	449	6	2489	52	107	1152	6
RTOR Reduction (vph)	0	0	0	0	0	78	0	2	0	0	0	0
Lane Group Flow (vph)	45	6	15	0	86	371	6	2539	0	107	1152	6
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	Prot	NA	Free	Perm	NA	pm+ov	Prot	NA		Prot	NA	Free
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases			Free	8		8						Free
Actuated Green, G (s)	3.7	18.8	94.2		10.1	19.1	1.1	48.4		9.0	56.3	94.2
Effective Green, g (s)	3.7	18.8	94.2		10.1	19.1	1.1	48.4		9.0	56.3	94.2
Actuated g/C Ratio	0.04	0.20	1.00		0.11	0.20	0.01	0.51		0.10	0.60	1.00
Clearance Time (s)	5.0	6.0			6.0	5.0	5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	134	371	1583		144	320	20	2555		327	2981	1583
v/s Ratio Prot	c0.01	0.00				c0.11	0.00	c0.51		0.03	0.23	
v/s Ratio Perm			0.01		0.06	0.12						0.00
v/c Ratio	0.34	0.02	0.01		0.60	1.16	0.30	0.99		0.33	0.39	0.00
Uniform Delay, d1	44.1	30.3	0.0		40.1	37.5	46.2	22.7		39.8	9.9	0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.0	0.0		6.5	100.7	8.3	16.4		0.6	0.4	0.0
Delay (s)	45.5	30.3	0.0		46.6	138.2	54.4	39.2		40.4	10.3	0.0
Level of Service	D	C	A		D	F	D	D		D	B	A
Approach Delay (s)		33.8			123.5			39.2			12.8	
Approach LOS		C			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	41.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	94.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	30	290	20	25	80	230	1595	15	60	2250	270
Future Volume (vph)	315	30	290	20	25	80	230	1595	15	60	2250	270
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	19.0	19.0	6.0	19.0	
Minimum Split (s)	37.2	37.2		37.5	37.5		16.2	35.0	35.0	12.2	35.0	
Total Split (s)	19.0	26.0		11.0	18.0		27.0	67.0	67.0	16.0	56.0	
Total Split (%)	15.8%	21.7%		9.2%	15.0%		22.5%	55.8%	55.8%	13.3%	46.7%	
Yellow Time (s)	3.2	3.2		3.5	3.5		3.2	5.0	5.0	3.2	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 106.7
Natural Cycle: 150
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Parker Road & Stroh Road

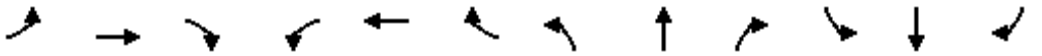


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	399	38	367	33	42	133	261	1813	17	67	2528	303
v/c Ratio	0.75	0.18	0.23	0.20	0.17	0.09	0.60	0.63	0.02	0.48	1.00	0.19
Control Delay	48.5	46.0	0.3	39.5	51.8	0.1	51.5	18.1	0.0	61.8	46.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	46.0	0.3	39.5	51.8	0.1	51.5	18.1	0.0	61.8	46.3	0.3
Queue Length 50th (ft)	131	25	0	19	15	0	95	346	0	48	~730	0
Queue Length 95th (ft)	156	51	0	31	23	0	132	402	0	94	#870	0
Internal Link Dist (ft)		589			1174			1592			712	
Turn Bay Length (ft)				315		155	350		285	530		560
Base Capacity (vph)	550	367	1583	162	419	1564	676	2894	992	164	2523	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.10	0.23	0.20	0.10	0.09	0.39	0.63	0.02	0.41	1.00	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

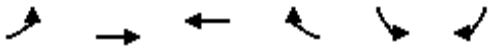
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	30	290	20	25	80	230	1595	15	60	2250	270
Future Volume (vph)	315	30	290	20	25	80	230	1595	15	60	2250	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.0	5.5	5.5	4.0	6.2	7.0	7.0	6.2	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Flt Permitted	0.41	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1490	1863	1583	1774	3539	1564	3433	4988	1583	1770	4988	1583
Peak-hour factor, PHF	0.79	0.79	0.79	0.60	0.60	0.60	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	399	38	367	33	42	133	261	1812	17	67	2528	303
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	7	0	0	0
Lane Group Flow (vph)	399	38	367	33	42	133	261	1813	10	67	2528	303
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Actuated Green, G (s)	23.1	14.5	110.4	7.3	4.2	110.4	13.4	61.9	61.9	7.0	55.5	110.4
Effective Green, g (s)	23.1	14.5	110.4	7.3	4.2	110.4	13.4	61.9	61.9	7.0	55.5	110.4
Actuated g/C Ratio	0.21	0.13	1.00	0.07	0.04	1.00	0.12	0.56	0.56	0.06	0.50	1.00
Clearance Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		2.5	5.0	5.0	2.5	5.0	
Lane Grp Cap (vph)	547	244	1583	117	134	1564	416	2796	887	112	2507	1583
v/s Ratio Prot	c0.09	0.02		0.01	0.01		c0.08	c0.36		0.04	c0.51	
v/s Ratio Perm	c0.06		0.23	0.01		0.09			0.01			0.19
v/c Ratio	0.73	0.16	0.23	0.28	0.31	0.09	0.63	0.65	0.01	0.60	1.01	0.19
Uniform Delay, d1	39.2	42.5	0.0	49.1	51.7	0.0	46.1	16.7	10.7	50.3	27.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5	0.2	0.3	1.3	1.3	0.1	2.6	1.2	0.0	7.0	20.0	0.3
Delay (s)	43.7	42.7	0.3	50.4	53.0	0.1	48.7	17.9	10.7	57.3	47.5	0.3
Level of Service	D	D	A	D	D	A	D	B	B	E	D	A
Approach Delay (s)		23.9			18.8			21.7			42.8	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	23.9
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	475	425	25	60	45
Future Volume (Veh/h)	5	475	425	25	60	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.90	0.90	0.69	0.69
Hourly flow rate (vph)	6	617	472	28	87	65
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	501				1102	473
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	501				1102	473
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				63	89
cM capacity (veh/h)	1062				233	591

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	6	617	472	28	87	65
Volume Left	6	0	0	0	87	0
Volume Right	0	0	0	28	0	65
cSH	1062	1700	1700	1700	233	591
Volume to Capacity	0.01	0.36	0.28	0.02	0.37	0.11
Queue Length 95th (ft)	0	0	0	0	41	9
Control Delay (s)	8.4	0.0	0.0	0.0	29.4	11.8
Lane LOS	A				D	B
Approach Delay (s)	0.1		0.0		21.9	
Approach LOS					C	

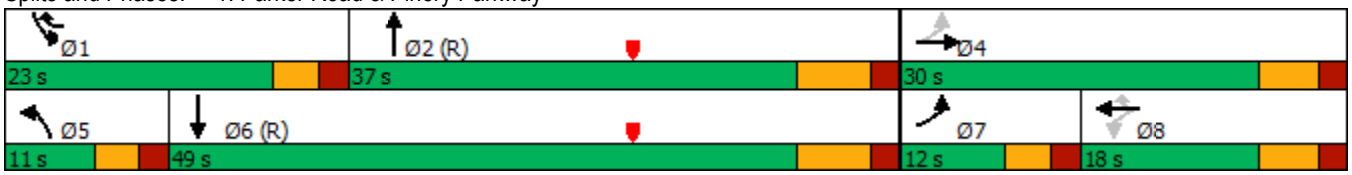
Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

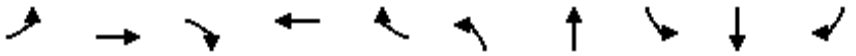
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	15	3	5	70	2	270	5	1500	405	2025	25
Future Volume (vph)	15	3	5	70	2	270	5	1500	405	2025	25
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA	Prot	NA	Free
Protected Phases	7	4			8	1	5	2	1	6	
Permitted Phases	4		Free	8		8					Free
Detector Phase	7	4		8	8	1	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		12.0	12.0	8.0	1.0	20.0	8.0	20.0	
Minimum Split (s)	10.0	39.0		39.0	39.0	13.0	6.0	27.0	13.0	27.0	
Total Split (s)	12.0	30.0		18.0	18.0	23.0	11.0	37.0	23.0	49.0	
Total Split (%)	13.3%	33.3%		20.0%	20.0%	25.6%	12.2%	41.1%	25.6%	54.4%	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0			6.0	5.0	5.0	7.0	5.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Max	None	C-Max	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 68 (76%), Referenced to phase 2:NBT and 6:SBT, Start of FDW or yellow
Natural Cycle: 110
Control Type: Actuated-Coordinated

Splits and Phases: 1: Parker Road & Pinery Parkway





Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	35	7	12	79	297	5	1690	418	2088	26
v/c Ratio	0.11	0.04	0.01	0.44	0.47	0.04	0.75	0.69	0.62	0.02
Control Delay	33.3	31.7	0.0	44.4	11.3	40.4	27.1	41.0	13.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	31.7	0.0	44.4	11.3	40.4	27.1	41.0	13.5	0.0
Queue Length 50th (ft)	9	4	0	42	51	3	338	114	277	0
Queue Length 95th (ft)	8	6	0	87	113	14	#472	160	459	0
Internal Link Dist (ft)		553		790			779		6252	
Turn Bay Length (ft)	220		100			340		500		685
Base Capacity (vph)	334	496	1583	180	672	118	2250	686	3367	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.01	0.01	0.44	0.44	0.04	0.75	0.61	0.62	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

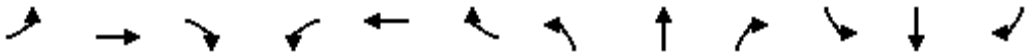
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	3	5	70	2	270	5	1500	55	405	2025	25
Future Volume (vph)	15	3	5	70	2	270	5	1500	55	405	2025	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	4.0		6.0	5.0	5.0	7.0		5.0	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	1.00	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1776	1583	1770	4964		3433	4988	1583
Flt Permitted	0.46	1.00	1.00		0.73	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1677	1863	1583		1354	1583	1770	4964		3433	4988	1583
Peak-hour factor, PHF	0.43	0.43	0.43	0.91	0.91	0.91	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	35	7	12	77	2	297	5	1630	60	418	2088	26
RTOR Reduction (vph)	0	0	0	0	0	116	0	3	0	0	0	0
Lane Group Flow (vph)	35	7	12	0	79	181	5	1687	0	418	2088	26
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA		Prot	NA	Free
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases	4		Free	8		8						Free
Actuated Green, G (s)	18.6	18.6	90.0		9.6	25.4	1.2	37.6		15.8	52.2	90.0
Effective Green, g (s)	18.6	18.6	90.0		9.6	25.4	1.2	37.6		15.8	52.2	90.0
Actuated g/C Ratio	0.21	0.21	1.00		0.11	0.28	0.01	0.42		0.18	0.58	1.00
Clearance Time (s)	5.0	6.0			6.0	5.0	5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	424	385	1583		144	446	23	2073		602	2893	1583
v/s Ratio Prot	c0.00	0.00				0.07	0.00	c0.34		c0.12	c0.42	
v/s Ratio Perm	0.01		0.01		c0.06	0.04						0.02
v/c Ratio	0.08	0.02	0.01		0.55	0.41	0.22	0.81		0.69	0.72	0.02
Uniform Delay, d1	28.8	28.4	0.0		38.1	26.2	43.9	23.1		34.8	13.7	0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	0.0		4.2	0.6	4.7	3.6		3.5	1.6	0.0
Delay (s)	28.8	28.4	0.0		42.4	26.8	48.7	26.7		38.3	15.2	0.0
Level of Service	C	C	A		D	C	D	C		D	B	A
Approach Delay (s)		22.4			30.1			26.8			18.9	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	30	290	20	25	80	230	1595	15	60	2250	270
Future Volume (vph)	315	30	290	20	25	80	230	1595	15	60	2250	270
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	19.0	19.0	6.0	19.0	
Minimum Split (s)	37.2	37.2		37.5	37.5		16.2	35.0	35.0	12.2	35.0	
Total Split (s)	19.0	26.0		11.0	18.0		27.0	67.0	67.0	16.0	56.0	
Total Split (%)	15.8%	21.7%		9.2%	15.0%		22.5%	55.8%	55.8%	13.3%	46.7%	
Yellow Time (s)	3.2	3.2		3.5	3.5		3.2	5.0	5.0	3.2	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 105.9
Natural Cycle: 150
Control Type: Semi Act-Uncoord

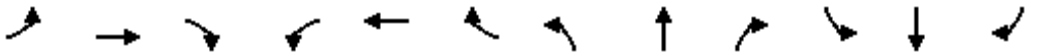
Splits and Phases: 2: Parker Road & Stroh Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	339	32	312	23	29	93	250	1734	16	65	2419	290
v/c Ratio	0.65	0.15	0.20	0.14	0.12	0.06	0.60	0.59	0.02	0.47	0.94	0.18
Control Delay	44.7	45.6	0.3	38.0	51.4	0.1	51.5	17.2	0.0	61.0	35.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	45.6	0.3	38.0	51.4	0.1	51.5	17.2	0.0	61.0	35.1	0.3
Queue Length 50th (ft)	109	21	0	13	10	0	91	322	0	46	619	0
Queue Length 95th (ft)	155	51	0	34	25	0	131	385	0	93	#811	0
Internal Link Dist (ft)		589			1174			1592			712	
Turn Bay Length (ft)				315		155	350		285	530		560
Base Capacity (vph)	553	370	1583	163	422	1564	682	2918	999	165	2560	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.09	0.20	0.14	0.07	0.06	0.37	0.59	0.02	0.39	0.94	0.18

Intersection Summary

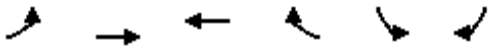
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	30	290	20	25	80	230	1595	15	60	2250	270
Future Volume (vph)	315	30	290	20	25	80	230	1595	15	60	2250	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.0	5.5	5.5	4.0	6.2	7.0	7.0	6.2	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Flt Permitted	0.42	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1522	1863	1583	1863	3539	1564	3433	4988	1583	1770	4988	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	339	32	312	23	29	93	250	1734	16	65	2419	290
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	7	0	0	0
Lane Group Flow (vph)	339	32	312	23	29	93	250	1734	9	65	2419	290
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Actuated Green, G (s)	22.4	13.8	109.6	7.1	4.0	109.6	12.9	62.0	62.0	6.8	55.9	109.6
Effective Green, g (s)	22.4	13.8	109.6	7.1	4.0	109.6	12.9	62.0	62.0	6.8	55.9	109.6
Actuated g/C Ratio	0.20	0.13	1.00	0.06	0.04	1.00	0.12	0.57	0.57	0.06	0.51	1.00
Clearance Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		2.5	5.0	5.0	2.5	5.0	
Lane Grp Cap (vph)	535	234	1583	118	129	1564	404	2821	895	109	2544	1583
v/s Ratio Prot	c0.07	0.02		0.01	0.01		c0.07	c0.35		0.04	c0.49	
v/s Ratio Perm	c0.05		0.20	0.01		0.06			0.01			0.18
v/c Ratio	0.63	0.14	0.20	0.19	0.22	0.06	0.62	0.61	0.01	0.60	0.95	0.18
Uniform Delay, d1	38.6	42.6	0.0	48.6	51.3	0.0	46.0	15.8	10.4	50.1	25.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.2	0.3	0.8	0.9	0.1	2.4	1.0	0.0	7.1	9.6	0.3
Delay (s)	40.8	42.8	0.3	49.4	52.2	0.1	48.4	16.9	10.4	57.2	35.1	0.3
Level of Service	D	D	A	D	D	A	D	B	B	E	D	A
Approach Delay (s)		22.4			18.3			20.8			32.0	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	109.6	Sum of lost time (s)	23.9
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	595	385	30	25	35
Future Volume (Veh/h)	55	595	385	30	25	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.95	0.95	0.78	0.78
Hourly flow rate (vph)	57	620	405	32	32	45
Pedestrians					15	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	452				1154	420
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	452				1154	420
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				84	93
cM capacity (veh/h)	1093				204	624

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	57	620	405	32	32	45
Volume Left	57	0	0	0	32	0
Volume Right	0	0	0	32	0	45
cSH	1093	1700	1700	1700	204	624
Volume to Capacity	0.05	0.36	0.24	0.02	0.16	0.07
Queue Length 95th (ft)	4	0	0	0	14	6
Control Delay (s)	8.5	0.0	0.0	0.0	25.9	11.2
Lane LOS	A				D	B
Approach Delay (s)	0.7		0.0		17.3	
Approach LOS					C	

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	270	20	100	75	30	405	240	2115	95	1035	200
Future Volume (vph)	270	20	100	75	30	405	240	2115	95	1035	200
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA	Prot	NA	Free
Protected Phases	7	4			8	1	5	2	1	6	
Permitted Phases	4		Free	8		8					Free
Detector Phase	7	4		8	8	1	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		12.0	12.0	8.0	1.0	20.0	8.0	20.0	
Minimum Split (s)	10.0	39.0		39.0	39.0	13.0	6.0	27.0	13.0	27.0	
Total Split (s)	12.0	36.0		24.0	24.0	14.0	31.0	70.0	14.0	53.0	
Total Split (%)	10.0%	30.0%		20.0%	20.0%	11.7%	25.8%	58.3%	11.7%	44.2%	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0		6.0	6.0	5.0	5.0	7.0	5.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	19.7	18.6	120.0	13.9	13.9	21.3	14.6	70.7	9.0	65.0	120.0
Actuated g/C Ratio	0.16	0.16	1.00	0.12	0.12	0.18	0.12	0.59	0.08	0.54	1.00
v/c Ratio	0.78	0.04	0.07	0.53	0.16	1.19	0.64	0.82	0.40	0.42	0.14
Control Delay	58.4	37.2	0.1	61.8	48.4	138.1	57.0	24.1	57.9	18.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	37.2	0.1	61.8	48.4	138.1	57.0	24.1	57.9	18.5	0.2
LOS	E	D	A	E	D	F	E	C	E	B	A
Approach Delay		42.3			121.6			27.4		18.6	
Approach LOS		D			F			C		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 16 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 36.8	Intersection LOS: D
Intersection Capacity Utilization 88.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Parker Road & Pinery Parkway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	307	23	114	85	34	460	267	2400	103	1125	217
v/c Ratio	0.78	0.04	0.07	0.53	0.16	1.19	0.64	0.82	0.40	0.42	0.14
Control Delay	58.4	37.2	0.1	61.8	48.4	138.1	57.0	24.1	57.9	18.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	37.2	0.1	61.8	48.4	138.1	57.0	24.1	57.9	18.5	0.2
Queue Length 50th (ft)	106	7	0	64	24	~303	103	538	39	189	0
Queue Length 95th (ft)	138	17	0	111	54	#471	142	681	69	266	0
Internal Link Dist (ft)		553			790			779		1277	
Turn Bay Length (ft)	220		100	100			340		500		
Base Capacity (vph)	396	884	1583	207	279	385	743	2931	257	2702	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.03	0.07	0.41	0.12	1.19	0.36	0.82	0.40	0.42	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

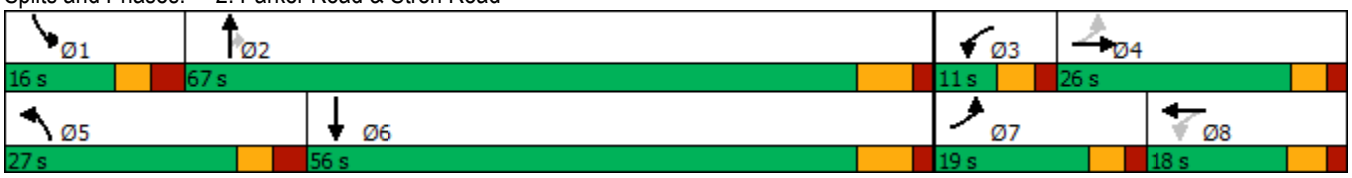
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	20	100	75	30	405	240	2115	45	95	1035	200
Future Volume (vph)	270	20	100	75	30	405	240	2115	45	95	1035	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	4.0	6.0	6.0	5.0	5.0	7.0		5.0	7.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	0.97	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	1863	1583	3433	4974		3433	4988	1583
Flt Permitted	0.51	1.00	1.00	0.74	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1851	3539	1583	1381	1863	1583	3433	4974		3433	4988	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	307	23	114	85	34	460	267	2350	50	103	1125	217
RTOR Reduction (vph)	0	0	0	0	0	105	0	2	0	0	0	0
Lane Group Flow (vph)	307	23	114	85	34	355	267	2398	0	103	1125	217
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA		Prot	NA	Free
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases	4		Free	8		8						Free
Actuated Green, G (s)	23.5	23.5	120.0	11.5	11.5	20.5	14.6	69.5		9.0	63.9	120.0
Effective Green, g (s)	23.5	23.5	120.0	11.5	11.5	20.5	14.6	69.5		9.0	63.9	120.0
Actuated g/C Ratio	0.20	0.20	1.00	0.10	0.10	0.17	0.12	0.58		0.08	0.53	1.00
Clearance Time (s)	5.0	6.0		6.0	6.0	5.0	5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	454	693	1583	132	178	270	417	2880		257	2656	1583
v/s Ratio Prot	c0.04	0.01			0.02	c0.10	0.08	c0.48		0.03	0.23	
v/s Ratio Perm	0.09		0.07	0.06		0.13						0.14
v/c Ratio	0.68	0.03	0.07	0.64	0.19	1.31	0.64	0.83		0.40	0.42	0.14
Uniform Delay, d1	44.0	39.1	0.0	52.3	50.0	49.8	50.2	20.5		52.9	16.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	0.0	0.1	10.3	0.5	165.0	3.3	3.0		1.0	0.5	0.2
Delay (s)	48.0	39.1	0.1	62.6	50.5	214.8	53.5	23.5		54.0	17.4	0.2
Level of Service	D	D	A	E	D	F	D	C		D	B	A
Approach Delay (s)		35.2			182.8			26.5			17.4	
Approach LOS		D			F			C			B	

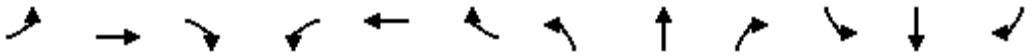
Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	30	235	15	30	55	370	2505	20	70	1295	325
Future Volume (vph)	315	30	235	15	30	55	370	2505	20	70	1295	325
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	19.0	19.0	6.0	19.0	
Minimum Split (s)	37.2	37.2		37.5	37.5		16.2	35.0	35.0	12.2	35.0	
Total Split (s)	19.0	26.0		11.0	18.0		27.0	67.0	67.0	16.0	56.0	
Total Split (%)	15.8%	21.7%		9.2%	15.0%		22.5%	55.8%	55.8%	13.3%	46.7%	
Yellow Time (s)	3.2	3.2		3.5	3.5		3.2	5.0	5.0	3.2	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	
Act Effct Green (s)	20.6	14.0	107.1	9.7	7.3	107.1	16.9	62.2	62.2	8.6	51.0	107.1
Actuated g/C Ratio	0.19	0.13	1.00	0.09	0.07	1.00	0.16	0.58	0.58	0.08	0.48	1.00
v/c Ratio	0.73	0.15	0.18	0.12	0.17	0.05	0.75	0.95	0.02	0.54	0.59	0.22
Control Delay	47.6	43.7	0.3	37.7	51.9	0.1	53.1	32.6	0.1	64.0	23.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	43.7	0.3	37.7	51.9	0.1	53.1	32.6	0.1	64.0	23.3	0.3
LOS	D	D	A	D	D	A	D	C	A	E	C	A
Approach Delay		28.2			21.3			35.0			20.6	
Approach LOS		C			C			D			C	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 107.1		
Natural Cycle: 150		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.95		
Intersection Signal Delay: 29.4	Intersection LOS: C	
Intersection Capacity Utilization 84.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: Parker Road & Stroh Road



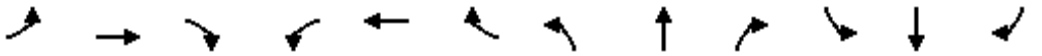


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	384	37	287	20	40	73	407	2753	22	76	1408	353
v/c Ratio	0.73	0.15	0.18	0.12	0.17	0.05	0.75	0.95	0.02	0.54	0.59	0.22
Control Delay	47.6	43.7	0.3	37.7	51.9	0.1	53.1	32.6	0.1	64.0	23.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	43.7	0.3	37.7	51.9	0.1	53.1	32.6	0.1	64.0	23.3	0.3
Queue Length 50th (ft)	127	22	0	12	15	0	149	~813	0	54	284	0
Queue Length 95th (ft)	157	51	0	27	27	0	200	#918	0	105	355	0
Internal Link Dist (ft)		589			1174			1592			712	
Turn Bay Length (ft)				315		155	350		285	530		560
Base Capacity (vph)	547	383	1583	160	417	1564	673	2897	993	163	2374	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.10	0.18	0.13	0.10	0.05	0.60	0.95	0.02	0.47	0.59	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	30	235	15	30	55	370	2505	20	70	1295	325
Future Volume (vph)	315	30	235	15	30	55	370	2505	20	70	1295	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.0	5.5	5.5	4.0	6.2	7.0	7.0	6.2	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Flt Permitted	0.41	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1490	1863	1583	1774	3539	1564	3433	4988	1583	1770	4988	1583
Peak-hour factor, PHF	0.82	0.82	0.82	0.75	0.75	0.75	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	384	37	287	20	40	73	407	2753	22	76	1408	353
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	10	0	0	0
Lane Group Flow (vph)	384	37	287	20	40	73	407	2753	12	76	1408	353
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Actuated Green, G (s)	23.1	15.6	110.8	6.2	4.2	110.8	16.9	62.2	62.2	7.1	52.4	110.8
Effective Green, g (s)	23.1	15.6	110.8	6.2	4.2	110.8	16.9	62.2	62.2	7.1	52.4	110.8
Actuated g/C Ratio	0.21	0.14	1.00	0.06	0.04	1.00	0.15	0.56	0.56	0.06	0.47	1.00
Clearance Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		2.5	5.0	5.0	2.5	5.0	
Lane Grp Cap (vph)	545	262	1583	99	134	1564	523	2800	888	113	2358	1583
v/s Ratio Prot	c0.09	0.02		0.00	0.01		c0.12	c0.55		0.04	0.28	
v/s Ratio Perm	c0.06		0.18	0.01		0.05			0.01			0.22
v/c Ratio	0.70	0.14	0.18	0.20	0.30	0.05	0.78	0.98	0.01	0.67	0.60	0.22
Uniform Delay, d1	39.2	41.7	0.0	49.9	51.9	0.0	45.1	23.8	10.7	50.7	21.4	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.2	0.3	1.0	1.3	0.1	6.9	13.5	0.0	13.4	1.1	0.3
Delay (s)	43.0	41.9	0.3	50.9	53.1	0.1	52.1	37.3	10.8	64.1	22.6	0.3
Level of Service	D	D	A	D	D	A	D	D	B	E	C	A
Approach Delay (s)		25.6			23.7			39.0			20.0	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	23.9
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	495	435	30	70	45
Future Vol, veh/h	5	495	435	30	70	45
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	77	80	93	90	69	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	619	468	33	101	65

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	502	0	-	0	1100	469
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	631	-
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	1062	-	-	-	235	594
Stage 1	-	-	-	-	630	-
Stage 2	-	-	-	-	530	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1061	-	-	-	233	593
Mov Cap-2 Maneuver	-	-	-	-	233	-
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	529	-

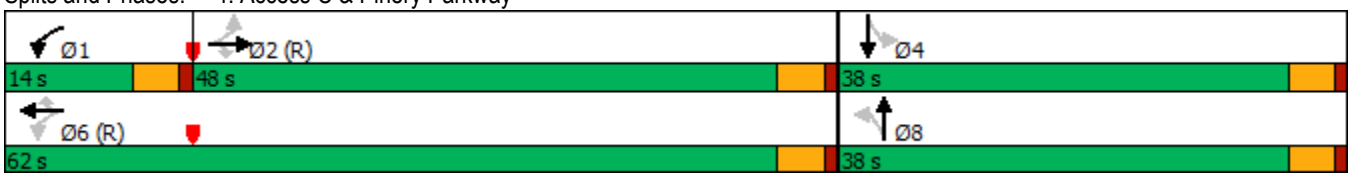
Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	24
HCM LOS			C

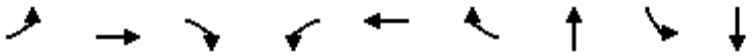
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1061	-	-	-	233	593
HCM Lane V/C Ratio	0.006	-	-	-	0.435	0.11
HCM Control Delay (s)	8.4	-	-	-	31.9	11.8
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	2.1	0.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	190	20	110	170	160	15	5	125	5
Future Volume (vph)	5	190	20	110	170	160	15	5	125	5
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	48.0	48.0	48.0	14.0	62.0	62.0	38.0	38.0	38.0	38.0
Total Split (%)	48.0%	48.0%	48.0%	14.0%	62.0%	62.0%	38.0%	38.0%	38.0%	38.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead						
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	62.0	62.0	62.0	74.2	74.2	74.2		16.8	16.8	16.8
Actuated g/C Ratio	0.62	0.62	0.62	0.74	0.74	0.74		0.17	0.17	0.17
v/c Ratio	0.01	0.10	0.02	0.15	0.08	0.15		0.32	0.75	0.04
Control Delay	10.2	9.0	0.1	4.9	4.3	1.1		13.6	61.5	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	10.2	9.0	0.1	4.9	4.3	1.1		13.6	61.5	23.3
LOS	B	A	A	A	A	A		B	E	C
Approach Delay		8.2			3.3			13.6		58.6
Approach LOS		A			A			B		E

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 14 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 36.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Access C & Pinery Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	6	224	24	129	200	188	106	147	12
v/c Ratio	0.01	0.10	0.02	0.15	0.08	0.15	0.32	0.75	0.04
Control Delay	10.2	9.0	0.1	4.9	4.3	1.1	13.6	61.5	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	9.0	0.1	4.9	4.3	1.1	13.6	61.5	23.3
Queue Length 50th (ft)	1	27	0	19	15	0	13	90	3
Queue Length 95th (ft)	8	52	0	44	31	17	49	137	16
Internal Link Dist (ft)		575			553		284		431
Turn Bay Length (ft)	80		80	160				150	
Base Capacity (vph)	722	2194	1005	856	2625	1223	589	391	581
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.10	0.02	0.15	0.08	0.15	0.18	0.38	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	190	20	110	170	160	15	5	70	125	5	5
Future Volume (vph)	5	190	20	110	170	160	15	5	70	125	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.90		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1654		1770	1723	
Flt Permitted	0.63	1.00	1.00	0.57	1.00	1.00		0.96		0.63	1.00	
Satd. Flow (perm)	1166	3539	1583	1063	3539	1583		1596		1170	1723	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	6	224	24	129	200	188	18	6	82	147	6	6
RTOR Reduction (vph)	0	0	9	0	0	49	0	68	0	0	5	0
Lane Group Flow (vph)	6	224	15	129	200	139	0	38	0	147	7	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	62.0	62.0	62.0	74.2	74.2	74.2		16.8		16.8	16.8	
Effective Green, g (s)	62.0	62.0	62.0	74.2	74.2	74.2		16.8		16.8	16.8	
Actuated g/C Ratio	0.62	0.62	0.62	0.74	0.74	0.74		0.17		0.17	0.17	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	722	2194	981	843	2625	1174		268		196	289	
v/s Ratio Prot		0.06		c0.01	0.06						0.00	
v/s Ratio Perm	0.01		0.01	c0.10		0.09		0.02		c0.13		
v/c Ratio	0.01	0.10	0.02	0.15	0.08	0.12		0.14		0.75	0.02	
Uniform Delay, d1	7.3	7.7	7.3	3.7	3.5	3.7		35.5		39.6	34.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1	0.0	0.1	0.1	0.2		0.2		14.8	0.0	
Delay (s)	7.3	7.8	7.3	3.8	3.6	3.9		35.7		54.4	34.8	
Level of Service	A	A	A	A	A	A		D		D	C	
Approach Delay (s)		7.7			3.7			35.7			53.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	60	0	20	90	85	0	0	50	110	0	0
Future Vol, veh/h	5	60	0	20	90	85	0	0	50	110	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	65	0	22	98	92	0	0	54	120	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	190	0	0	65	0	0	168	309	33	185	217	49
Stage 1	-	-	-	-	-	-	75	75	-	142	142	-
Stage 2	-	-	-	-	-	-	93	234	-	43	75	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1381	-	-	1535	-	-	780	604	1033	759	680	1009
Stage 1	-	-	-	-	-	-	926	832	-	846	778	-
Stage 2	-	-	-	-	-	-	904	710	-	966	832	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1381	-	-	1535	-	-	769	593	1033	709	668	1009
Mov Cap-2 Maneuver	-	-	-	-	-	-	769	593	-	709	668	-
Stage 1	-	-	-	-	-	-	922	829	-	843	767	-
Stage 2	-	-	-	-	-	-	891	700	-	912	829	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.8	8.7	11.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1033	1381	-	-	1535	-	-	709	-
HCM Lane V/C Ratio	-	0.053	0.004	-	-	0.014	-	-	0.169	-
HCM Control Delay (s)	0	8.7	7.6	-	-	7.4	-	-	11.1	0
HCM Lane LOS	A	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	-	0.2	0	-	-	0	-	-	0.6	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	35	0	2875	1310	195
Future Vol, veh/h	0	35	0	2875	1310	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Free
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	38	0	3125	1424	212

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	-	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	-	-	0
Stage 1	0	0	0	-	-	0
Stage 2	0	0	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection	
Int Delay, s/veh	7.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	85	0	0	65
Future Vol, veh/h	0	0	85	0	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	92	0	0	71

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	-	1
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	1620	-	0	1083
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1620	-	-	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

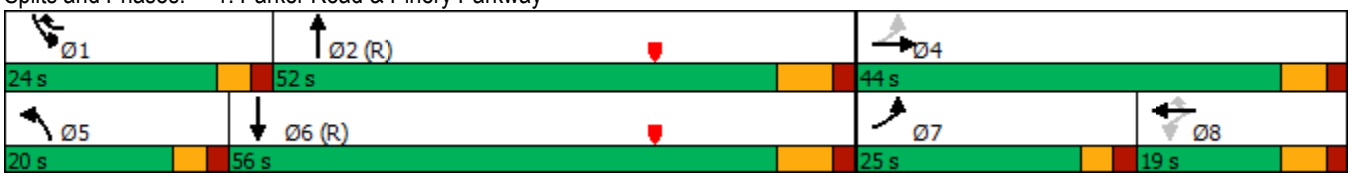
Approach	EB	WB	NB
HCM Control Delay, s	0	7.4	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1083	-	-	1620	-
HCM Lane V/C Ratio	0.065	-	-	0.057	-
HCM Control Delay (s)	8.6	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	720	55	290	70	45	285	345	1405	405	2045	285
Future Volume (vph)	720	55	290	70	45	285	345	1405	405	2045	285
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA	Prot	NA	Free
Protected Phases	7	4			8	1	5	2	1	6	
Permitted Phases	4		Free	8		8					Free
Detector Phase	7	4		8	8	1	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		12.0	12.0	8.0	1.0	20.0	8.0	20.0	
Minimum Split (s)	10.0	39.0		39.0	39.0	13.0	6.0	27.0	13.0	27.0	
Total Split (s)	25.0	44.0		19.0	19.0	24.0	20.0	52.0	24.0	56.0	
Total Split (%)	20.8%	36.7%		15.8%	15.8%	20.0%	16.7%	43.3%	20.0%	46.7%	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0		6.0	6.0	5.0	5.0	7.0	5.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None		None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	34.8	31.2	120.0	12.4	12.4	32.8	14.9	50.2	18.0	53.2	120.0
Actuated g/C Ratio	0.29	0.26	1.00	0.10	0.10	0.27	0.12	0.42	0.15	0.44	1.00
v/c Ratio	0.99	0.07	0.20	0.56	0.25	0.64	0.88	0.76	0.81	0.95	0.19
Control Delay	70.3	29.5	0.3	67.3	53.0	32.9	73.8	34.2	62.6	44.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	29.5	0.3	67.3	53.0	32.9	73.8	34.2	62.6	44.3	0.3
LOS	E	C	A	E	D	C	E	C	E	D	A
Approach Delay		49.2			41.2			41.7		42.5	
Approach LOS		D			D			D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of FDW or yellow	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 43.4	Intersection LOS: D
Intersection Capacity Utilization 91.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Parker Road & Pinery Parkway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	783	60	315	77	49	313	375	1587	418	2108	294
v/c Ratio	0.99	0.07	0.20	0.56	0.25	0.64	0.88	0.76	0.81	0.95	0.19
Control Delay	70.3	29.5	0.3	67.3	53.0	32.9	73.8	34.2	62.6	44.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	29.5	0.3	67.3	53.0	32.9	73.8	34.2	62.6	44.3	0.3
Queue Length 50th (ft)	275	17	0	58	36	149	148	403	161	~633	0
Queue Length 95th (ft)	#389	33	0	110	75	243	#231	473	219	#738	0
Internal Link Dist (ft)		553			790			779		1277	
Turn Bay Length (ft)	220		100	100			340		500		
Base Capacity (vph)	787	1120	1583	144	201	505	429	2078	543	2213	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.05	0.20	0.53	0.24	0.62	0.87	0.76	0.77	0.95	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

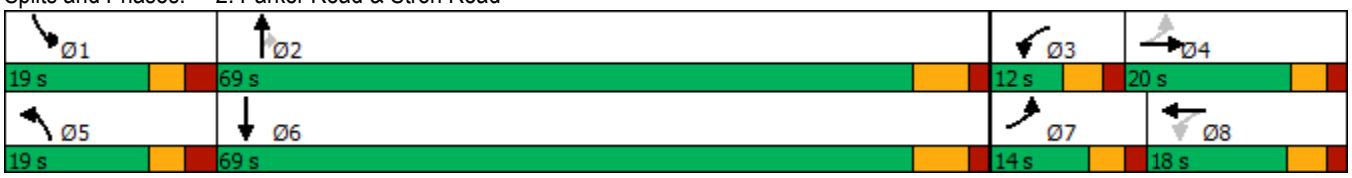
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	720	55	290	70	45	285	345	1405	55	405	2045	285
Future Volume (vph)	720	55	290	70	45	285	345	1405	55	405	2045	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	4.0	6.0	6.0	5.0	5.0	7.0		5.0	7.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	0.97	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	1863	1583	3433	4963		3433	4988	1583
Flt Permitted	0.48	1.00	1.00	0.72	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1747	3539	1583	1333	1863	1583	3433	4963		3433	4988	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	783	60	315	77	49	313	375	1527	60	418	2108	294
RTOR Reduction (vph)	0	0	0	0	0	63	0	4	0	0	0	0
Lane Group Flow (vph)	783	60	315	77	49	250	375	1583	0	418	2108	294
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA		Prot	NA	Free
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases	4		Free	8		8						Free
Actuated Green, G (s)	35.0	35.0	120.0	10.0	10.0	28.0	14.9	49.0		18.0	52.1	120.0
Effective Green, g (s)	35.0	35.0	120.0	10.0	10.0	28.0	14.9	49.0		18.0	52.1	120.0
Actuated g/C Ratio	0.29	0.29	1.00	0.08	0.08	0.23	0.12	0.41		0.15	0.43	1.00
Clearance Time (s)	5.0	6.0		6.0	6.0	5.0	5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	790	1032	1583	111	155	369	426	2026		514	2165	1583
v/s Ratio Prot	c0.17	0.02			0.03	0.10	0.11	0.32		c0.12	c0.42	
v/s Ratio Perm	c0.12		c0.20	0.06		0.06						0.19
v/c Ratio	0.99	0.06	0.20	0.69	0.32	0.68	0.88	0.78		0.81	0.97	0.19
Uniform Delay, d1	40.3	30.6	0.0	53.5	51.8	41.9	51.7	30.8		49.4	33.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.7	0.0	0.3	17.1	1.2	4.9	18.6	3.1		9.5	14.1	0.3
Delay (s)	70.0	30.6	0.3	70.6	53.0	46.8	70.3	33.9		58.9	47.3	0.3
Level of Service	E	C	A	E	D	D	E	C		E	D	A
Approach Delay (s)		49.0			51.7			40.9			44.1	
Approach LOS		D			D			D			D	

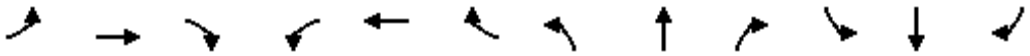
Intersection Summary			
HCM 2000 Control Delay	44.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	30	330	20	25	80	280	2145	15	60	2695	270
Future Volume (vph)	315	30	330	20	25	80	280	2145	15	60	2695	270
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	19.0	19.0	6.0	19.0	
Minimum Split (s)	37.2	37.2		37.5	37.5		16.2	35.0	35.0	12.2	35.0	
Total Split (s)	14.0	20.0		12.0	18.0		19.0	69.0	69.0	19.0	69.0	
Total Split (%)	11.7%	16.7%		10.0%	15.0%		15.8%	57.5%	57.5%	15.8%	57.5%	
Yellow Time (s)	3.2	3.2		3.5	3.5		3.2	5.0	5.0	3.2	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	
Act Effct Green (s)	14.3	8.5	109.2	10.6	7.1	109.2	12.4	68.3	68.3	9.0	62.2	109.2
Actuated g/C Ratio	0.13	0.08	1.00	0.10	0.07	1.00	0.11	0.63	0.63	0.08	0.57	1.00
v/c Ratio	0.95	0.22	0.22	0.13	0.13	0.06	0.78	0.75	0.02	0.45	1.02	0.18
Control Delay	82.4	52.8	0.3	41.2	51.7	0.1	62.8	18.9	0.0	58.5	46.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.4	52.8	0.3	41.2	51.7	0.1	62.8	18.9	0.0	58.5	46.8	0.3
LOS	F	D	A	D	D	A	E	B	A	E	D	A
Approach Delay		41.0			16.9			23.8			42.9	
Approach LOS		D			B			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.2	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 34.6	Intersection LOS: C
Intersection Capacity Utilization 91.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Parker Road & Stroh Road



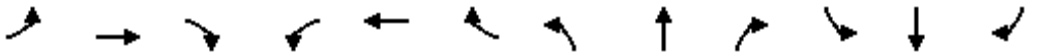


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	339	32	355	23	29	93	304	2332	16	65	2898	290
v/c Ratio	0.95	0.22	0.22	0.13	0.13	0.06	0.78	0.75	0.02	0.45	1.02	0.18
Control Delay	82.4	52.8	0.3	41.2	51.7	0.1	62.8	18.9	0.0	58.5	46.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.4	52.8	0.3	41.2	51.7	0.1	62.8	18.9	0.0	58.5	46.8	0.3
Queue Length 50th (ft)	117	22	0	14	11	0	114	477	0	47	~870	0
Queue Length 95th (ft)	#190	55	0	36	25	0	#180	598	0	90	#967	0
Internal Link Dist (ft)		589			1174			1592			712	
Turn Bay Length (ft)				315		155	350		285	530		560
Base Capacity (vph)	355	253	1583	174	406	1564	403	3119	1038	208	2842	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.13	0.22	0.13	0.07	0.06	0.75	0.75	0.02	0.31	1.02	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	30	330	20	25	80	280	2145	15	60	2695	270
Future Volume (vph)	315	30	330	20	25	80	280	2145	15	60	2695	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.0	5.5	5.5	4.0	6.2	7.0	7.0	6.2	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Flt Permitted	0.43	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1571	1863	1583	1817	3539	1564	3433	4988	1583	1770	4988	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	339	32	355	23	29	93	304	2332	16	65	2898	290
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	6	0	0	0
Lane Group Flow (vph)	339	32	355	23	29	93	304	2332	10	65	2898	290
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Actuated Green, G (s)	18.0	9.2	112.8	7.8	4.1	112.8	12.4	68.3	68.3	7.7	63.6	112.8
Effective Green, g (s)	18.0	9.2	112.8	7.8	4.1	112.8	12.4	68.3	68.3	7.7	63.6	112.8
Actuated g/C Ratio	0.16	0.08	1.00	0.07	0.04	1.00	0.11	0.61	0.61	0.07	0.56	1.00
Clearance Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		2.5	5.0	5.0	2.5	5.0	
Lane Grp Cap (vph)	395	151	1583	124	128	1564	377	3020	958	120	2812	1583
v/s Ratio Prot	c0.07	0.02		0.01	0.01		c0.09	c0.47		0.04	c0.58	
v/s Ratio Perm	c0.07		0.22	0.01		0.06			0.01			0.18
v/c Ratio	0.86	0.21	0.22	0.19	0.23	0.06	0.81	0.77	0.01	0.54	1.03	0.18
Uniform Delay, d1	45.0	48.4	0.0	49.5	52.8	0.0	49.0	16.5	8.8	50.8	24.6	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.4	0.5	0.3	0.7	0.9	0.1	11.6	2.0	0.0	3.9	25.4	0.3
Delay (s)	61.5	48.9	0.3	50.2	53.7	0.1	60.6	18.5	8.9	54.7	50.0	0.3
Level of Service	E	D	A	D	D	A	E	B	A	D	D	A
Approach Delay (s)		31.0			18.8			23.2			45.7	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	112.8	Sum of lost time (s)	23.9
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	620	415	50	40	35
Future Vol, veh/h	55	620	415	50	40	35
Conflicting Peds, #/hr	0	0	0	15	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	95	95	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	646	437	53	51	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	505	0	-	0	1212	452
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	760	-
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	1060	-	-	-	201	608
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	462	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1045	-	-	-	185	599
Mov Cap-2 Maneuver	-	-	-	-	185	-
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	456	-

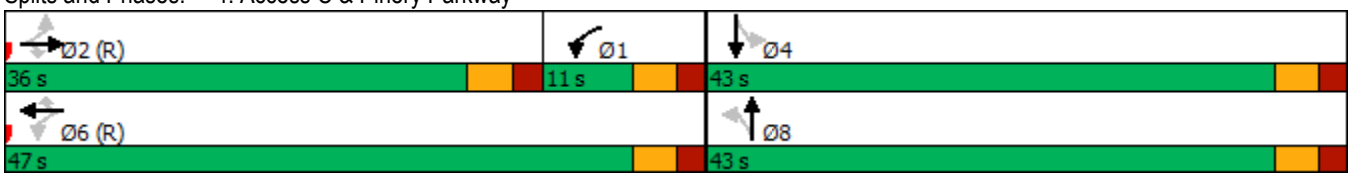
Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	22.3
HCM LOS			C

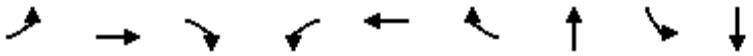
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1045	-	-	-	185	599
HCM Lane V/C Ratio	0.055	-	-	-	0.277	0.075
HCM Control Delay (s)	8.6	-	-	-	31.8	11.5
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.1	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	505	15	80	260	280	15	5	480	5
Future Volume (vph)	5	505	15	80	260	280	15	5	480	5
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	23.5	10.5	23.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	36.0	36.0	36.0	11.0	47.0	47.0	43.0	43.0	43.0	43.0
Total Split (%)	40.0%	40.0%	40.0%	12.2%	52.2%	52.2%	47.8%	47.8%	47.8%	47.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	33.2	33.2	33.2	42.0	42.0	42.0		38.0	38.0	38.0
Actuated g/C Ratio	0.37	0.37	0.37	0.47	0.47	0.47		0.42	0.42	0.42
v/c Ratio	0.01	0.42	0.03	0.22	0.17	0.34		0.15	0.93	0.01
Control Delay	19.6	23.2	0.1	16.8	14.3	2.9		5.6	50.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	19.6	23.2	0.1	16.8	14.3	2.9		5.6	50.7	11.8
LOS	B	C	A	B	B	A		A	D	B
Approach Delay		22.5			9.4			5.6		49.9
Approach LOS		C			A			A		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 24.6	Intersection LOS: C
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Access C & Pinery Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	5	549	16	87	283	304	113	522	10
v/c Ratio	0.01	0.42	0.03	0.22	0.17	0.34	0.15	0.93	0.01
Control Delay	19.6	23.2	0.1	16.8	14.3	2.9	5.6	50.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	23.2	0.1	16.8	14.3	2.9	5.6	50.7	11.8
Queue Length 50th (ft)	2	125	0	27	47	0	7	275	2
Queue Length 95th (ft)	9	173	0	53	71	42	38	#481	11
Internal Link Dist (ft)		575			553		284		431
Turn Bay Length (ft)	80		80	160				150	
Base Capacity (vph)	396	1305	637	396	1651	900	734	562	730
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.42	0.03	0.22	0.17	0.34	0.15	0.93	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	505	15	80	260	280	15	5	85	480	5	5
Future Volume (vph)	5	505	15	80	260	280	15	5	85	480	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.89		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1646		1770	1723	
Flt Permitted	0.58	1.00	1.00	0.37	1.00	1.00		0.97		0.72	1.00	
Satd. Flow (perm)	1077	3539	1583	697	3539	1583		1613		1333	1723	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	549	16	87	283	304	16	5	92	522	5	5
RTOR Reduction (vph)	0	0	10	0	0	162	0	53	0	0	3	0
Lane Group Flow (vph)	5	549	6	87	283	142	0	60	0	522	7	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	32.2	32.2	32.2	42.0	42.0	42.0		38.0		38.0	38.0	
Effective Green, g (s)	32.2	32.2	32.2	42.0	42.0	42.0		38.0		38.0	38.0	
Actuated g/C Ratio	0.36	0.36	0.36	0.47	0.47	0.47		0.42		0.42	0.42	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	385	1266	566	382	1651	738		681		562	727	
v/s Ratio Prot		c0.16		0.01	0.08						0.00	
v/s Ratio Perm	0.00		0.00	0.09		c0.09		0.04		c0.39		
v/c Ratio	0.01	0.43	0.01	0.23	0.17	0.19		0.09		0.93	0.01	
Uniform Delay, d1	18.6	22.0	18.6	18.1	13.9	14.1		15.6		24.7	15.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.1	0.0	0.3	0.2	0.6		0.3		23.9	0.0	
Delay (s)	18.7	23.1	18.7	18.4	14.1	14.6		15.9		48.6	15.1	
Level of Service	B	C	B	B	B	B		B		D	B	
Approach Delay (s)		22.9			14.9			15.9			48.0	
Approach LOS		C			B			B			D	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	10.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	90	0	30	70	135	0	0	30	415	0	0
Future Vol, veh/h	5	90	0	30	70	135	0	0	30	415	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	150	-	150	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	98	0	33	76	147	0	0	33	451	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	223	0	0	98	0	0	212	397	49	201	250	38
Stage 1	-	-	-	-	-	-	108	108	-	142	142	-
Stage 2	-	-	-	-	-	-	104	289	-	59	108	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1343	-	-	1493	-	-	726	539	1009	739	652	1026
Stage 1	-	-	-	-	-	-	886	805	-	846	778	-
Stage 2	-	-	-	-	-	-	890	672	-	946	805	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1343	-	-	1493	-	-	711	525	1009	701	635	1026
Mov Cap-2 Maneuver	-	-	-	-	-	-	711	525	-	701	635	-
Stage 1	-	-	-	-	-	-	882	802	-	843	761	-
Stage 2	-	-	-	-	-	-	870	657	-	912	802	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	1	8.7	18.9
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1009	1343	-	-	1493	-	-	701	-
HCM Lane V/C Ratio	-	0.032	0.004	-	-	0.022	-	-	0.643	-
HCM Control Delay (s)	0	8.7	7.7	-	-	7.5	-	-	18.9	0
HCM Lane LOS	A	A	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	-	0.1	0	-	-	0.1	-	-	4.7	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	235	0	2435	2615	410
Future Vol, veh/h	0	235	0	2435	2615	410
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Free
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	95	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	255	0	2647	2753	446

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	-	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	-	-	0
Stage 1	0	0	0	-	-	0
Stage 2	0	0	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection	
Int Delay, s/veh	8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	65	0	0	85
Future Vol, veh/h	0	0	65	0	0	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	71	0	0	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	-	1
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	1620	-	0	1083
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1620	-	-	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1083	-	-	1620	-
HCM Lane V/C Ratio	0.085	-	-	0.044	-
HCM Control Delay (s)	8.6	-	-	7.3	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	230	50	75	65	130	325	415	2160	90	1055	130
Future Volume (vph)	230	50	75	65	130	325	415	2160	90	1055	130
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA	Prot	NA	Free
Protected Phases	7	4			8	1	5	2	1	6	
Permitted Phases	4		Free	8		8					Free
Detector Phase	7	4		8	8	1	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		12.0	12.0	8.0	1.0	20.0	8.0	20.0	
Minimum Split (s)	10.0	39.0		39.0	39.0	13.0	6.0	27.0	13.0	27.0	
Total Split (s)	13.0	37.0		24.0	24.0	16.0	31.0	67.0	16.0	52.0	
Total Split (%)	10.8%	30.8%		20.0%	20.0%	13.3%	25.8%	55.8%	13.3%	43.3%	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	5.0	3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0		6.0	6.0	5.0	5.0	7.0	5.0	7.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		Ped	Ped	None	None	C-Max	None	C-Max	
Act Effct Green (s)	27.2	25.9	120.0	18.0	18.0	30.0	20.9	60.0	11.0	50.1	120.0
Actuated g/C Ratio	0.23	0.22	1.00	0.15	0.15	0.25	0.17	0.50	0.09	0.42	1.00
v/c Ratio	0.51	0.07	0.05	0.35	0.51	0.72	0.75	0.96	0.31	0.55	0.09
Control Delay	32.0	23.8	0.1	51.4	54.0	29.3	55.3	40.1	53.9	28.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	23.8	0.1	51.4	54.0	29.3	55.3	40.1	53.9	28.3	0.1
LOS	C	C	A	D	D	C	E	D	D	C	A
Approach Delay		24.1			38.3			42.6		27.2	
Approach LOS		C			D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 24 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 36.6	Intersection LOS: D
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Parker Road & Pinery Parkway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	54	82	71	141	353	451	2391	98	1147	141
v/c Ratio	0.51	0.07	0.05	0.35	0.51	0.72	0.75	0.96	0.31	0.55	0.09
Control Delay	32.0	23.8	0.1	51.4	54.0	29.3	55.3	40.1	53.9	28.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	23.8	0.1	51.4	54.0	29.3	55.3	40.1	53.9	28.3	0.1
Queue Length 50th (ft)	52	11	0	50	102	127	172	631	37	242	0
Queue Length 95th (ft)	74	23	0	98	169	216	219	#770	64	310	0
Internal Link Dist (ft)		553			790			779		1277	
Turn Bay Length (ft)	220		100	100			340		500		
Base Capacity (vph)	486	914	1583	201	279	491	743	2488	314	2081	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.06	0.05	0.35	0.51	0.72	0.61	0.96	0.31	0.55	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

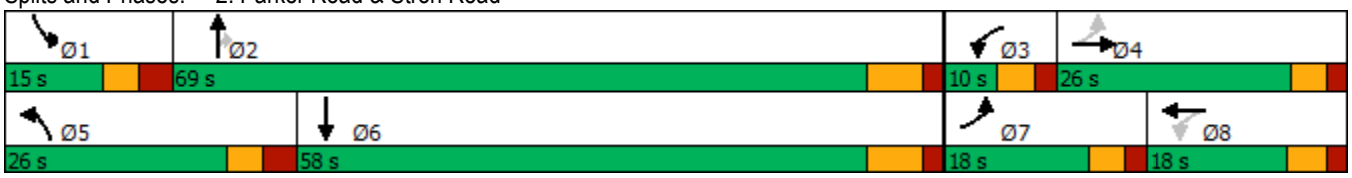
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	50	75	65	130	325	415	2160	40	90	1055	130
Future Volume (vph)	230	50	75	65	130	325	415	2160	40	90	1055	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	4.0	6.0	6.0	5.0	5.0	7.0		5.0	7.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	0.97	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	1863	1583	3433	4976		3433	4988	1583
Flt Permitted	0.44	1.00	1.00	0.72	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1607	3539	1583	1341	1863	1583	3433	4976		3433	4988	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	54	82	71	141	353	451	2348	43	98	1147	141
RTOR Reduction (vph)	0	0	0	0	0	96	0	2	0	0	0	0
Lane Group Flow (vph)	250	54	82	71	141	257	451	2390	0	98	1147	141
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA		Prot	NA	Free
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases	4		Free	8		8						Free
Actuated Green, G (s)	31.0	31.0	120.0	18.0	18.0	29.0	20.9	60.0		11.0	50.1	120.0
Effective Green, g (s)	31.0	31.0	120.0	18.0	18.0	29.0	20.9	60.0		11.0	50.1	120.0
Actuated g/C Ratio	0.26	0.26	1.00	0.15	0.15	0.24	0.17	0.50		0.09	0.42	1.00
Clearance Time (s)	5.0	6.0		6.0	6.0	5.0	5.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	536	914	1583	201	279	382	597	2488		314	2082	1583
v/s Ratio Prot	c0.03	0.02			0.08	c0.06	0.13	c0.48		0.03	0.23	
v/s Ratio Perm	0.09		0.05	0.05		0.10						0.09
v/c Ratio	0.47	0.06	0.05	0.35	0.51	0.67	0.76	0.96		0.31	0.55	0.09
Uniform Delay, d1	35.9	33.5	0.0	45.8	46.9	41.2	47.1	28.9		51.0	26.4	0.0
Progression Factor	0.75	0.70	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.0	0.1	1.1	1.4	4.6	5.4	10.9		0.6	1.1	0.1
Delay (s)	27.6	23.4	0.1	46.8	48.3	45.8	52.5	39.7		51.5	27.5	0.1
Level of Service	C	C	A	D	D	D	D	D		D	C	A
Approach Delay (s)		21.2			46.6			41.8			26.4	
Approach LOS		C			D			D			C	

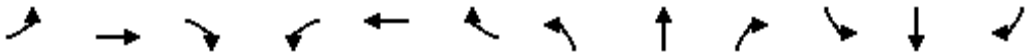
Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	385	30	165	15	35	60	335	2300	25	80	1240	365
Future Volume (vph)	385	30	165	15	35	60	335	2300	25	80	1240	365
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	19.0	19.0	6.0	19.0	
Minimum Split (s)	37.2	37.2		37.5	37.5		16.2	35.0	35.0	12.2	35.0	
Total Split (s)	18.0	26.0		10.0	18.0		26.0	69.0	69.0	15.0	58.0	
Total Split (%)	15.0%	21.7%		8.3%	15.0%		21.7%	57.5%	57.5%	12.5%	48.3%	
Yellow Time (s)	3.2	3.2		3.5	3.5		3.2	5.0	5.0	3.2	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	
Act Effct Green (s)	20.2	13.9	109.2	8.7	7.3	109.2	15.8	62.3	62.3	8.3	54.8	109.2
Actuated g/C Ratio	0.18	0.13	1.00	0.08	0.07	1.00	0.14	0.57	0.57	0.08	0.50	1.00
v/c Ratio	0.83	0.14	0.11	0.11	0.16	0.04	0.72	0.86	0.03	0.64	0.53	0.25
Control Delay	56.0	43.8	0.1	38.3	51.9	0.1	53.7	25.0	0.0	72.3	20.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	43.8	0.1	38.3	51.9	0.1	53.7	25.0	0.0	72.3	20.8	0.4
LOS	E	D	A	D	D	A	D	C	A	E	C	A
Approach Delay		39.5			21.8			28.4			18.8	
Approach LOS		D			C			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.2	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Parker Road & Stroh Road

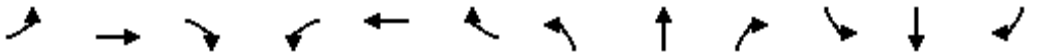




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	418	33	179	16	38	65	356	2447	27	85	1319	388
v/c Ratio	0.83	0.14	0.11	0.11	0.16	0.04	0.72	0.86	0.03	0.64	0.53	0.25
Control Delay	56.0	43.8	0.1	38.3	51.9	0.1	53.7	25.0	0.0	72.3	20.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	43.8	0.1	38.3	51.9	0.1	53.7	25.0	0.0	72.3	20.8	0.4
Queue Length 50th (ft)	141	19	0	9	14	0	130	568	0	62	247	0
Queue Length 95th (ft)	193	52	0	29	32	0	177	662	0	#133	315	0
Internal Link Dist (ft)		589			1174			1592			712	
Turn Bay Length (ft)				315		155	350		285	530		560
Base Capacity (vph)	504	370	1583	141	406	1564	625	2844	978	143	2502	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.09	0.11	0.11	0.09	0.04	0.57	0.86	0.03	0.59	0.53	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	385	30	165	15	35	60	335	2300	25	80	1240	365
Future Volume (vph)	385	30	165	15	35	60	335	2300	25	80	1240	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.0	5.5	5.5	4.0	6.2	7.0	7.0	6.2	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Flt Permitted	0.41	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1490	1863	1583	1774	3539	1564	3433	4988	1583	1770	4988	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	418	33	179	16	38	65	356	2447	27	85	1319	388
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	12	0	0	0
Lane Group Flow (vph)	418	33	179	16	38	65	356	2447	15	85	1319	388
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Actuated Green, G (s)	22.5	15.3	111.5	5.9	4.2	111.5	15.8	62.3	62.3	8.3	54.8	111.5
Effective Green, g (s)	22.5	15.3	111.5	5.9	4.2	111.5	15.8	62.3	62.3	8.3	54.8	111.5
Actuated g/C Ratio	0.20	0.14	1.00	0.05	0.04	1.00	0.14	0.56	0.56	0.07	0.49	1.00
Clearance Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		2.5	5.0	5.0	2.5	5.0	
Lane Grp Cap (vph)	523	255	1583	93	133	1564	486	2787	884	131	2451	1583
v/s Ratio Prot	c0.09	0.02		0.00	0.01		c0.10	c0.49		0.05	0.26	
v/s Ratio Perm	c0.07		0.11	0.01		0.04			0.01			0.25
v/c Ratio	0.80	0.13	0.11	0.17	0.29	0.04	0.73	0.88	0.02	0.65	0.54	0.25
Uniform Delay, d1	40.6	42.2	0.0	50.5	52.2	0.0	45.8	21.3	11.0	50.2	19.6	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.2	0.1	0.9	1.2	0.0	5.3	4.3	0.0	9.4	0.9	0.4
Delay (s)	48.7	42.4	0.1	51.3	53.4	0.0	51.1	25.6	11.0	59.6	20.5	0.4
Level of Service	D	D	A	D	D	A	D	C	B	E	C	A
Approach Delay (s)		34.6			24.0			28.7			18.0	
Approach LOS		C			C			C			B	

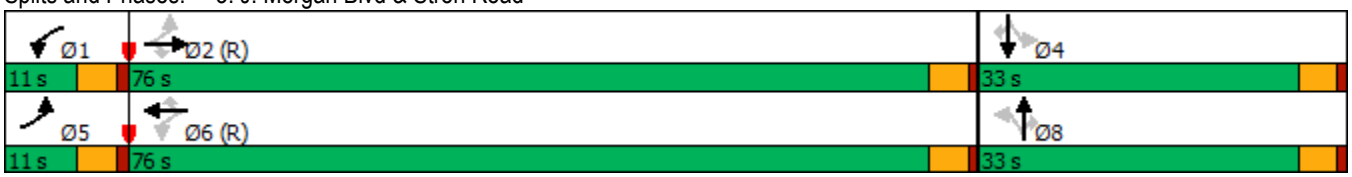
Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	111.5	Sum of lost time (s)	23.9
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

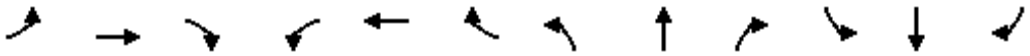
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	470	125	25	470	30	105	10	45	70	10	55
Future Volume (vph)	5	470	125	25	470	30	105	10	45	70	10	55
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	11.0	76.0	76.0	11.0	76.0	76.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	9.2%	63.3%	63.3%	9.2%	63.3%	63.3%	27.5%	27.5%	27.5%	27.5%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Ped	Ped	Ped	Ped	Ped	Ped
Act Effct Green (s)	89.3	85.9	85.9	91.5	90.2	90.2	18.7	18.7	18.7	18.7	18.7	18.7
Actuated g/C Ratio	0.74	0.72	0.72	0.76	0.75	0.75	0.16	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.01	0.44	0.13	0.05	0.36	0.03	0.53	0.04	0.17	0.47	0.05	0.25
Control Delay	3.6	9.2	1.8	3.7	6.6	0.8	55.9	42.7	11.0	53.5	42.9	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.6	9.2	1.8	3.7	6.6	0.8	55.9	42.7	11.0	53.5	42.9	11.5
LOS	A	A	A	A	A	A	E	D	B	D	D	B
Approach Delay		7.6			6.1			42.4			35.5	
Approach LOS		A			A			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 46.0%	ICU Level of Service A
Analysis Period (min) 15	

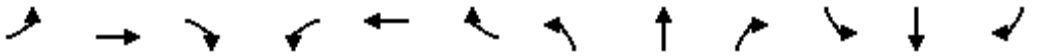
Splits and Phases: 3: J. Morgan Blvd & Stroh Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	6	588	156	27	505	32	114	11	49	101	14	80
v/c Ratio	0.01	0.44	0.13	0.05	0.36	0.03	0.53	0.04	0.17	0.47	0.05	0.25
Control Delay	3.6	9.2	1.8	3.7	6.6	0.8	55.9	42.7	11.0	53.5	42.9	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.6	9.2	1.8	3.7	6.6	0.8	55.9	42.7	11.0	53.5	42.9	11.5
Queue Length 50th (ft)	1	188	4	4	101	0	83	7	0	73	9	0
Queue Length 95th (ft)	4	244	20	12	234	5	141	24	30	94	22	20
Internal Link Dist (ft)		1161			1370			528			716	
Turn Bay Length (ft)	240		150	150		150	150		150	150		
Base Capacity (vph)	670	1333	1172	576	1400	1175	330	442	417	331	442	436
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.44	0.13	0.05	0.36	0.03	0.35	0.02	0.12	0.31	0.03	0.18

Intersection Summary



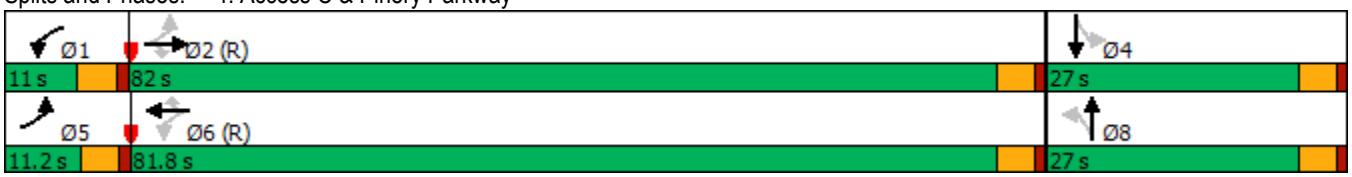
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	470	125	25	470	30	105	10	45	70	10	55
Future Volume (vph)	5	470	125	25	470	30	105	10	45	70	10	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1546	1770	1863	1583	1770	1863	1583
Flt Permitted	0.44	1.00	1.00	0.36	1.00	1.00	0.75	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	827	1863	1583	678	1863	1546	1394	1863	1583	1398	1863	1583
Peak-hour factor, PHF	0.80	0.80	0.80	0.93	0.93	0.93	0.92	0.92	0.92	0.69	0.69	0.69
Adj. Flow (vph)	6	588	156	27	505	32	114	11	49	101	14	80
RTOR Reduction (vph)	0	0	41	0	0	9	0	0	41	0	0	68
Lane Group Flow (vph)	6	588	115	27	505	23	114	11	8	101	14	12
Confl. Peds. (#/hr)						1						
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	85.3	84.1	84.1	90.3	86.6	86.6	18.7	18.7	18.7	18.7	18.7	18.7
Effective Green, g (s)	85.3	84.1	84.1	90.3	86.6	86.6	18.7	18.7	18.7	18.7	18.7	18.7
Actuated g/C Ratio	0.71	0.70	0.70	0.75	0.72	0.72	0.16	0.16	0.16	0.16	0.16	0.16
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	597	1305	1109	543	1344	1115	217	290	246	217	290	246
v/s Ratio Prot	0.00	c0.32		c0.00	0.27			0.01			0.01	
v/s Ratio Perm	0.01		0.07	0.04		0.01	c0.08		0.00	0.07		0.01
v/c Ratio	0.01	0.45	0.10	0.05	0.38	0.02	0.53	0.04	0.03	0.47	0.05	0.05
Uniform Delay, d1	5.2	7.8	5.8	4.8	6.4	4.7	46.6	43.0	43.0	46.1	43.1	43.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	1.1	0.2	0.0	0.8	0.0	2.3	0.1	0.1	1.6	0.1	0.1
Delay (s)	5.2	9.0	6.0	4.8	7.2	4.8	48.9	43.1	43.0	47.7	43.2	43.2
Level of Service	A	A	A	A	A	A	D	D	D	D	D	D
Approach Delay (s)		8.3			6.9			46.8			45.5	
Approach LOS		A			A			D			D	

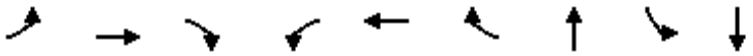
Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	50	250	55	70	515	90	35	5	60	5
Future Volume (vph)	50	250	55	70	515	90	35	5	60	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	11.2	82.0	82.0	11.0	81.8	81.8	27.0	27.0	27.0	27.0
Total Split (%)	9.3%	68.3%	68.3%	9.2%	68.2%	68.2%	22.5%	22.5%	22.5%	22.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	84.9	79.7	79.7	84.9	79.7	79.7		22.5	22.5	22.5
Actuated g/C Ratio	0.71	0.66	0.66	0.71	0.66	0.66		0.19	0.19	0.19
v/c Ratio	0.10	0.13	0.06	0.10	0.26	0.31		0.33	0.32	0.11
Control Delay	4.2	8.0	2.8	11.6	17.0	14.1		27.7	46.7	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	4.2	8.0	2.8	11.6	17.0	14.1		27.7	46.7	17.8
LOS	A	A	A	B	B	B		C	D	B
Approach Delay		6.7			16.1			27.7		37.2
Approach LOS		A			B			C		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 59 (49%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 42.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Access C & Pinery Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	59	294	65	82	606	90	106	71	35
v/c Ratio	0.10	0.13	0.06	0.10	0.26	0.31	0.33	0.32	0.11
Control Delay	4.2	8.0	2.8	11.6	17.0	14.1	27.7	46.7	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	8.0	2.8	11.6	17.0	14.1	27.7	46.7	17.8
Queue Length 50th (ft)	12	47	3	28	119	22	40	48	4
Queue Length 95th (ft)	18	63	14	m54	158	m55	86	89	30
Internal Link Dist (ft)		575			553		284		431
Turn Bay Length (ft)	80		80	160				150	
Base Capacity (vph)	583	2350	1073	791	2350	294	321	223	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.13	0.06	0.10	0.26	0.31	0.33	0.32	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

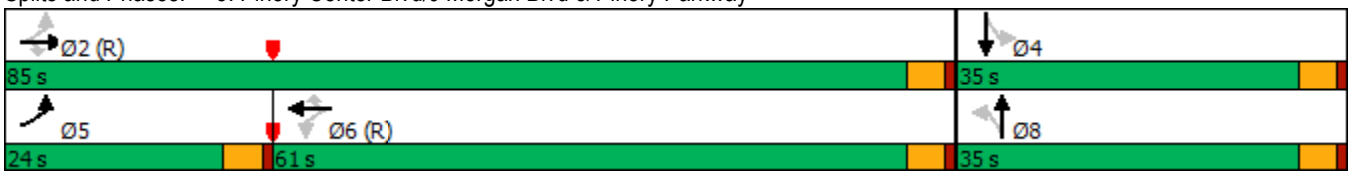
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	250	55	70	515	90	35	5	50	60	5	25
Future Volume (vph)	50	250	55	70	515	90	35	5	50	60	5	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.25		1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.92		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	398		1690		1770	1631	
Flt Permitted	0.40	1.00	1.00	0.57	1.00	1.00		0.88		0.64	1.00	
Satd. Flow (perm)	744	3539	1583	1066	3539	398		1515		1194	1631	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	1.00	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	59	294	65	82	606	90	41	6	59	71	6	29
RTOR Reduction (vph)	0	0	22	0	0	31	0	37	0	0	24	0
Lane Group Flow (vph)	59	294	43	82	606	59	0	69	0	71	11	0
Confl. Peds. (#/hr)						515						
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	84.0	78.8	78.8	84.0	78.8	78.8		22.5		22.5	22.5	
Effective Green, g (s)	84.0	78.8	78.8	84.0	78.8	78.8		22.5		22.5	22.5	
Actuated g/C Ratio	0.70	0.66	0.66	0.70	0.66	0.66		0.19		0.19	0.19	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	565	2323	1039	776	2323	261		284		223	305	
v/s Ratio Prot	0.00	0.08		c0.00	c0.17						0.01	
v/s Ratio Perm	0.07		0.03	0.07		0.15		0.05		c0.06		
v/c Ratio	0.10	0.13	0.04	0.11	0.26	0.23		0.24		0.32	0.04	
Uniform Delay, d1	5.7	7.7	7.3	5.7	8.5	8.3		41.5		42.1	39.9	
Progression Factor	0.87	1.01	1.41	2.52	1.94	6.03		1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1	0.1	0.1	0.2	1.8		2.0		3.7	0.2	
Delay (s)	5.0	7.9	10.3	14.4	16.8	51.9		43.5		45.8	40.1	
Level of Service	A	A	B	B	B	D		D		D	D	
Approach Delay (s)		7.9			20.6			43.5			44.0	
Approach LOS		A			C			D			D	

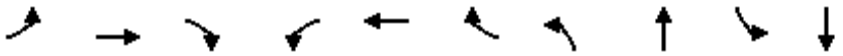
Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	100	250	30	30	500	50	75	95	60	85
Future Volume (vph)	100	250	30	30	500	50	75	95	60	85
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	85.0	85.0	61.0	61.0	61.0	35.0	35.0	35.0	35.0
Total Split (%)	20.0%	70.8%	70.8%	50.8%	50.8%	50.8%	29.2%	29.2%	29.2%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	80.5	80.5	80.5	67.9	67.9	67.9	30.5	30.5	30.5	30.5
Actuated g/C Ratio	0.67	0.67	0.67	0.57	0.57	0.57	0.25	0.25	0.25	0.25
v/c Ratio	0.20	0.11	0.03	0.05	0.27	0.06	0.28	0.35	0.25	0.28
Control Delay	7.8	7.2	2.3	11.5	12.8	3.8	39.1	33.8	38.7	33.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	7.2	2.3	11.5	12.8	3.8	39.1	33.8	38.7	33.0
LOS	A	A	A	B	B	A	D	C	D	C
Approach Delay		7.0			11.9			35.6		34.9
Approach LOS		A			B			D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 17.5	Intersection LOS: B
Intersection Capacity Utilization 46.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Pinery Center Blvd/J Morgan Blvd & Pinery Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	109	272	33	33	543	54	82	163	65	130
v/c Ratio	0.20	0.11	0.03	0.05	0.27	0.06	0.28	0.35	0.25	0.28
Control Delay	7.8	7.2	2.3	11.5	12.8	3.8	39.1	33.8	38.7	33.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	7.2	2.3	11.5	12.8	3.8	39.1	33.8	38.7	33.0
Queue Length 50th (ft)	27	35	0	8	73	0	51	88	40	70
Queue Length 95th (ft)	48	52	11	18	86	13	98	152	82	126
Internal Link Dist (ft)		446			575			367		49
Turn Bay Length (ft)	150		150	150		150	150		150	
Base Capacity (vph)	655	2374	1072	615	2003	919	293	464	264	465
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.11	0.03	0.05	0.27	0.06	0.28	0.35	0.25	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	250	30	30	500	50	75	95	55	60	85	35
Future Volume (vph)	100	250	30	30	500	50	75	95	55	60	85	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1760		1770	1781	
Flt Permitted	0.39	1.00	1.00	0.58	1.00	1.00	0.62	1.00		0.56	1.00	
Satd. Flow (perm)	723	3539	1583	1088	3539	1583	1153	1760		1042	1781	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	272	33	33	543	54	82	103	60	65	92	38
RTOR Reduction (vph)	0	0	11	0	0	23	0	17	0	0	13	0
Lane Group Flow (vph)	109	272	22	33	543	31	82	146	0	65	117	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	80.5	80.5	80.5	67.9	67.9	67.9	30.5	30.5		30.5	30.5	
Effective Green, g (s)	80.5	80.5	80.5	67.9	67.9	67.9	30.5	30.5		30.5	30.5	
Actuated g/C Ratio	0.67	0.67	0.67	0.57	0.57	0.57	0.25	0.25		0.25	0.25	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	555	2374	1061	615	2002	895	293	447		264	452	
v/s Ratio Prot	c0.01	0.08			c0.15			c0.08			0.07	
v/s Ratio Perm	0.12		0.01	0.03		0.02	0.07			0.06		
v/c Ratio	0.20	0.11	0.02	0.05	0.27	0.03	0.28	0.33		0.25	0.26	
Uniform Delay, d1	7.4	7.0	6.6	11.7	13.4	11.5	35.9	36.4		35.6	35.7	
Progression Factor	1.00	1.00	1.00	0.92	0.91	1.14	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1	0.0	0.2	0.3	0.1	2.4	1.9		2.2	1.4	
Delay (s)	7.6	7.1	6.6	10.9	12.5	13.2	38.3	38.3		37.8	37.1	
Level of Service	A	A	A	B	B	B	D	D		D	D	
Approach Delay (s)		7.2			12.5			38.3			37.4	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	40	0	2715	1235	150
Future Vol, veh/h	0	40	0	2715	1235	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	43	0	2951	1342	163

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	-	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	-	-	-
Stage 1	0	0	0	-	-	-
Stage 2	0	0	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	315	20	65	550	0	65
Future Vol, veh/h	315	20	65	550	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	342	22	71	598	0	71

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	364	0	-	182
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	1191	-	0	829
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1191	-	-	829
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

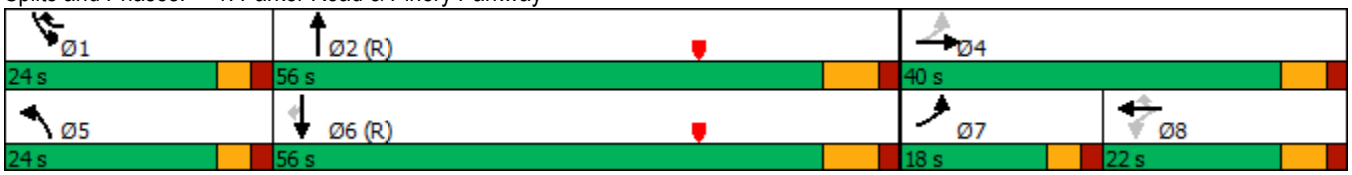
Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	829	-	-	1191	-
HCM Lane V/C Ratio	0.085	-	-	0.059	-
HCM Control Delay (s)	9.7	-	-	8.2	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	470	175	210	60	100	250	310	1380	330	2180	240
Future Volume (vph)	470	175	210	60	100	250	310	1380	330	2180	240
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA	Prot	NA	Perm
Protected Phases	7	4			8	1	5	2	1	6	
Permitted Phases	4		Free	8		8					6
Detector Phase	7	4		8	8	1	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		12.0	12.0	8.0	1.0	20.0	8.0	20.0	20.0
Minimum Split (s)	10.0	39.0		39.0	39.0	13.0	6.0	27.0	13.0	27.0	27.0
Total Split (s)	18.0	40.0		22.0	22.0	24.0	24.0	56.0	24.0	56.0	56.0
Total Split (%)	15.0%	33.3%		18.3%	18.3%	20.0%	20.0%	46.7%	20.0%	46.7%	46.7%
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0		6.0	6.0	5.0	5.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	None	None		None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.3	31.3	120.0	13.3	13.3	35.9	16.2	54.1	16.6	54.5	54.5
Actuated g/C Ratio	0.27	0.26	1.00	0.11	0.11	0.30	0.14	0.45	0.14	0.45	0.45
v/c Ratio	0.80	0.21	0.14	0.50	0.53	0.51	0.70	0.67	0.72	0.99	0.30
Control Delay	44.5	31.1	0.2	63.6	59.8	26.8	58.0	28.3	58.1	50.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	31.1	0.2	63.6	59.8	26.8	58.0	28.3	58.1	50.2	8.6
LOS	D	C	A	E	E	C	E	C	E	D	A
Approach Delay		30.9			40.2			33.6		47.5	
Approach LOS		C			D			C		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 12 (10%), Referenced to phase 2:NBT and 6:SBT, Start of FDW or yellow	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 40.2	Intersection LOS: D
Intersection Capacity Utilization 93.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Parker Road & Pinery Parkway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	511	190	228	65	109	272	326	1506	340	2247	247
v/c Ratio	0.80	0.21	0.14	0.50	0.53	0.51	0.70	0.67	0.72	0.99	0.30
Control Delay	44.5	31.1	0.2	63.6	59.8	26.8	58.0	28.3	58.1	50.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	31.1	0.2	63.6	59.8	26.8	58.0	28.3	58.1	50.2	8.6
Queue Length 50th (ft)	153	54	0	49	82	121	125	325	130	613	35
Queue Length 95th (ft)	185	71	0	94	138	193	171	414	178	#819	97
Internal Link Dist (ft)		553			790			779		1277	
Turn Bay Length (ft)	220		100	100			340		500		
Base Capacity (vph)	642	1002	1583	156	248	560	543	2240	543	2265	810
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.19	0.14	0.42	0.44	0.49	0.60	0.67	0.63	0.99	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

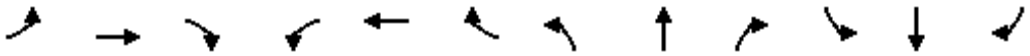
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	175	210	60	100	250	310	1380	50	330	2180	240
Future Volume (vph)	470	175	210	60	100	250	310	1380	50	330	2180	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	4.0	6.0	6.0	5.0	5.0	7.0		5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	0.97	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	1863	1583	3433	4965		3433	4988	1583
Flt Permitted	0.47	1.00	1.00	0.63	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1685	3539	1583	1178	1863	1583	3433	4965		3433	4988	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95	0.97	0.97	0.97
Adj. Flow (vph)	511	190	228	65	109	272	326	1453	53	340	2247	247
RTOR Reduction (vph)	0	0	0	0	0	62	0	3	0	0	0	91
Lane Group Flow (vph)	511	190	228	65	109	210	326	1503	0	340	2247	156
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	Perm	NA	pm+ov	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8	1	5	2		1	6	
Permitted Phases	4		Free	8		8						6
Actuated Green, G (s)	31.3	31.3	120.0	13.3	13.3	29.9	16.2	54.1		16.6	54.5	54.5
Effective Green, g (s)	31.3	31.3	120.0	13.3	13.3	29.9	16.2	54.1		16.6	54.5	54.5
Actuated g/C Ratio	0.26	0.26	1.00	0.11	0.11	0.25	0.13	0.45		0.14	0.45	0.45
Clearance Time (s)	5.0	6.0		6.0	6.0	5.0	5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	628	923	1583	130	206	394	463	2238		474	2265	718
v/s Ratio Prot	c0.09	0.05			0.06	0.07	0.09	0.30		c0.10	c0.45	
v/s Ratio Perm	c0.12		c0.14	0.06		0.06						0.10
v/c Ratio	0.81	0.21	0.14	0.50	0.53	0.53	0.70	0.67		0.72	0.99	0.22
Uniform Delay, d1	39.7	34.6	0.0	50.2	50.4	39.0	49.6	26.0		49.5	32.5	19.8
Progression Factor	0.92	0.89	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	0.1	0.2	3.0	2.4	1.4	4.8	1.6		5.1	17.1	0.7
Delay (s)	44.0	30.9	0.2	53.2	52.8	40.4	54.4	27.6		54.6	49.7	20.5
Level of Service	D	C	A	D	D	D	D	C		D	D	C
Approach Delay (s)		30.5			45.3			32.4			47.7	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	435	40	235	20	25	85	170	1875	20	75	2700	305
Future Volume (vph)	435	40	235	20	25	85	170	1875	20	75	2700	305
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	19.0	19.0	6.0	19.0	
Minimum Split (s)	37.2	37.2		37.5	37.5		16.2	35.0	35.0	12.2	35.0	
Total Split (s)	18.0	25.0		13.0	20.0		16.0	65.0	65.0	17.0	66.0	
Total Split (%)	15.0%	20.8%		10.8%	16.7%		13.3%	54.2%	54.2%	14.2%	55.0%	
Yellow Time (s)	3.2	3.2		3.5	3.5		3.2	5.0	5.0	3.2	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	2.0	2.0	3.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	Max	Max	None	Max	
Act Effct Green (s)	20.0	12.7	107.6	11.2	7.1	107.6	9.8	62.7	62.7	9.0	59.2	107.6
Actuated g/C Ratio	0.19	0.12	1.00	0.10	0.07	1.00	0.09	0.58	0.58	0.08	0.55	1.00
v/c Ratio	0.89	0.19	0.15	0.12	0.12	0.06	0.57	0.68	0.02	0.53	1.03	0.20
Control Delay	61.1	45.7	0.2	37.1	50.6	0.1	55.7	19.2	0.1	61.5	49.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.1	45.7	0.2	37.1	50.6	0.1	55.7	19.2	0.1	61.5	49.3	0.3
LOS	E	D	A	D	D	A	E	B	A	E	D	A
Approach Delay		40.1			15.5			22.0			44.8	
Approach LOS		D			B			C			D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 107.6		
Natural Cycle: 150		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 1.03		
Intersection Signal Delay: 35.7	Intersection LOS: D	
Intersection Capacity Utilization 94.9%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 2: Parker Road & Stroh Road

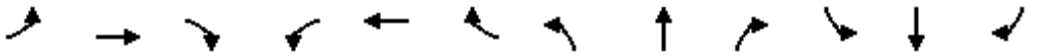


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	453	42	245	22	27	92	179	1974	21	78	2813	318
v/c Ratio	0.89	0.19	0.15	0.12	0.12	0.06	0.57	0.68	0.02	0.53	1.03	0.20
Control Delay	61.1	45.7	0.2	37.1	50.6	0.1	55.7	19.2	0.1	61.5	49.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.1	45.7	0.2	37.1	50.6	0.1	55.7	19.2	0.1	61.5	49.3	0.3
Queue Length 50th (ft)	151	24	0	13	10	0	65	394	0	55	~831	0
Queue Length 95th (ft)	#218	63	0	35	25	0	103	469	0	105	#926	0
Internal Link Dist (ft)		589			1174			1592			712	
Turn Bay Length (ft)				315		155	350		285	530		560
Base Capacity (vph)	510	361	1583	192	478	1564	313	2905	975	178	2744	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.12	0.15	0.11	0.06	0.06	0.57	0.68	0.02	0.44	1.03	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	435	40	235	20	25	85	170	1875	20	75	2700	305
Future Volume (vph)	435	40	235	20	25	85	170	1875	20	75	2700	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.0	5.5	5.5	4.0	6.2	7.0	7.0	6.2	7.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	3539	1564	3433	4988	1583	1770	4988	1583
Flt Permitted	0.42	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1506	1863	1583	1817	3539	1564	3433	4988	1583	1770	4988	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	453	42	245	22	27	92	179	1974	21	78	2812	318
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	9	0	0	0
Lane Group Flow (vph)	453	42	245	22	27	92	179	1974	12	78	2813	318
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	4%	2%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free			2			Free
Actuated Green, G (s)	22.4	14.1	111.2	6.9	4.1	111.2	9.8	62.7	62.7	7.7	60.6	111.2
Effective Green, g (s)	22.4	14.1	111.2	6.9	4.1	111.2	9.8	62.7	62.7	7.7	60.6	111.2
Actuated g/C Ratio	0.20	0.13	1.00	0.06	0.04	1.00	0.09	0.56	0.56	0.07	0.54	1.00
Clearance Time (s)	5.2	5.2		5.5	5.5		6.2	7.0	7.0	6.2	7.0	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		2.5	5.0	5.0	2.5	5.0	
Lane Grp Cap (vph)	525	236	1583	111	130	1564	302	2812	892	122	2718	1583
v/s Ratio Prot	c0.10	0.02		0.00	0.01		c0.05	0.40		0.04	c0.56	
v/s Ratio Perm	c0.07		0.15	0.01		0.06			0.01			c0.20
v/c Ratio	0.86	0.18	0.15	0.20	0.21	0.06	0.59	0.70	0.01	0.64	1.03	0.20
Uniform Delay, d1	41.2	43.4	0.0	49.5	52.0	0.0	48.8	17.5	10.7	50.4	25.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.6	0.3	0.2	0.9	0.8	0.1	2.6	1.5	0.0	9.3	27.1	0.3
Delay (s)	54.8	43.6	0.2	50.4	52.8	0.1	51.4	19.0	10.7	59.7	52.4	0.3
Level of Service	D	D	A	D	D	A	D	B	B	E	D	A
Approach Delay (s)		36.1			18.0			21.6			47.4	
Approach LOS		D			B			C			D	

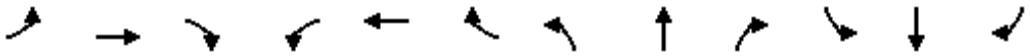
Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	111.2	Sum of lost time (s)	23.9
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	575	175	25	415	35	180	30	100	30	15	40
Future Volume (vph)	60	575	175	25	415	35	180	30	100	30	15	40
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	77.0	77.0	77.0	77.0	77.0	77.0	20.0	43.0	43.0	23.0	23.0	23.0
Total Split (%)	64.2%	64.2%	64.2%	64.2%	64.2%	64.2%	16.7%	35.8%	35.8%	19.2%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							Lag			Lead	Lead	Lead
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	Ped	Ped	Ped	Ped	Ped
Act Effct Green (s)	82.7	82.7	82.7	82.7	82.7	82.7	28.3	28.3	28.3	18.0	18.0	18.0
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69	0.24	0.24	0.24	0.15	0.15	0.15
v/c Ratio	0.13	0.56	0.19	0.07	0.35	0.04	0.57	0.08	0.24	0.21	0.08	0.20
Control Delay	7.1	11.6	2.4	6.8	8.6	0.9	48.1	36.0	8.0	47.8	44.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	11.6	2.4	6.8	8.6	0.9	48.1	36.0	8.0	47.8	44.9	13.1
LOS	A	B	A	A	A	A	D	D	A	D	D	B
Approach Delay		9.3			7.9			34.0			30.9	
Approach LOS		A			A			C			C	

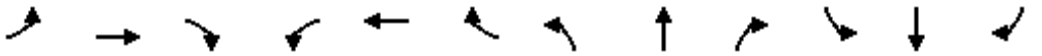
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 62.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: J. Morgan Blvd & Stroh Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	75	719	219	27	446	38	196	33	109	43	22	58
v/c Ratio	0.13	0.56	0.19	0.07	0.35	0.04	0.57	0.08	0.24	0.21	0.08	0.20
Control Delay	7.1	11.6	2.4	6.8	8.6	0.9	48.1	36.0	8.0	47.8	44.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	11.6	2.4	6.8	8.6	0.9	48.1	36.0	8.0	47.8	44.9	13.1
Queue Length 50th (ft)	18	252	13	6	126	0	132	20	0	30	15	0
Queue Length 95th (ft)	32	298	30	17	188	7	203	47	46	49	30	20
Internal Link Dist (ft)		1161			1370			528			716	
Turn Bay Length (ft)	240		150	150		150	150		150	150		
Base Capacity (vph)	586	1283	1140	379	1283	1082	488	597	581	211	287	293
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.56	0.19	0.07	0.35	0.04	0.40	0.06	0.19	0.20	0.08	0.20

Intersection Summary



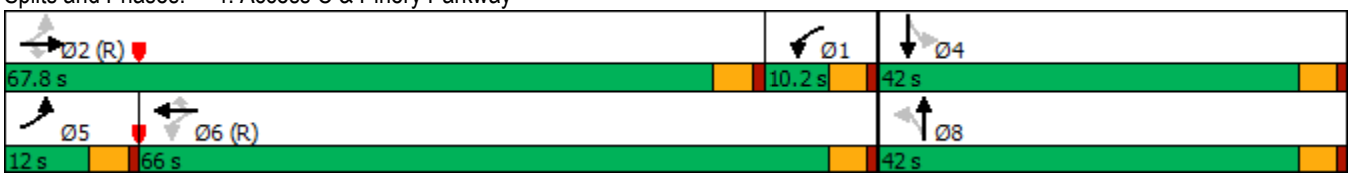
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	575	175	25	415	35	180	30	100	30	15	40
Future Volume (vph)	60	575	175	25	415	35	180	30	100	30	15	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1546	1770	1863	1583	1770	1863	1583
Flt Permitted	0.46	1.00	1.00	0.30	1.00	1.00	0.74	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	852	1863	1583	551	1863	1546	1384	1863	1583	1370	1863	1583
Peak-hour factor, PHF	0.80	0.80	0.80	0.93	0.93	0.93	0.92	0.92	0.92	0.69	0.69	0.69
Adj. Flow (vph)	75	719	219	27	446	38	196	33	109	43	22	58
RTOR Reduction (vph)	0	0	50	0	0	12	0	0	83	0	0	49
Lane Group Flow (vph)	75	719	169	27	446	26	196	33	26	43	22	9
Confl. Peds. (#/hr)						1						
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	82.7	82.7	82.7	82.7	82.7	82.7	28.3	28.3	28.3	18.0	18.0	18.0
Effective Green, g (s)	82.7	82.7	82.7	82.7	82.7	82.7	28.3	28.3	28.3	18.0	18.0	18.0
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69	0.24	0.24	0.24	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	587	1283	1090	379	1283	1065	345	439	373	205	279	237
v/s Ratio Prot		c0.39			0.24		c0.03	0.02			0.01	
v/s Ratio Perm	0.09		0.11	0.05		0.02	c0.11		0.02	0.03		0.01
v/c Ratio	0.13	0.56	0.15	0.07	0.35	0.02	0.57	0.08	0.07	0.21	0.08	0.04
Uniform Delay, d1	6.4	9.4	6.5	6.1	7.6	5.9	40.8	35.7	35.6	44.8	43.9	43.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.8	0.3	0.4	0.7	0.0	2.1	0.1	0.1	0.5	0.1	0.1
Delay (s)	6.8	11.2	6.8	6.5	8.4	5.9	43.0	35.7	35.7	45.3	44.0	43.7
Level of Service	A	B	A	A	A	A	D	D	D	D	D	D
Approach Delay (s)		9.9			8.1			39.9			44.3	
Approach LOS		A			A			D			D	

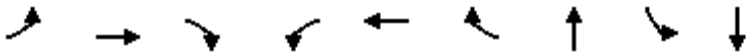
Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	85	585	45	55	420	175	45	5	220	5
Future Volume (vph)	85	585	45	55	420	175	45	5	220	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	12.0	67.8	67.8	10.2	66.0	66.0	42.0	42.0	42.0	42.0
Total Split (%)	10.0%	56.5%	56.5%	8.5%	55.0%	55.0%	35.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	65.3	65.3	65.3	61.8	61.8	61.8		37.5	37.5	37.5
Actuated g/C Ratio	0.54	0.54	0.54	0.52	0.52	0.52		0.31	0.31	0.31
v/c Ratio	0.19	0.33	0.06	0.14	0.25	0.21		0.24	0.62	0.20
Control Delay	11.8	12.7	1.6	10.0	8.9	1.3		18.7	43.4	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	11.8	12.7	1.6	10.0	8.9	1.3		18.7	43.4	7.1
LOS	B	B	A	B	A	A		B	D	A
Approach Delay		11.9			6.9			18.7		31.6
Approach LOS		B			A			B		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 50.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Access C & Pinery Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	92	636	49	60	457	190	119	239	114
v/c Ratio	0.19	0.33	0.06	0.14	0.25	0.21	0.24	0.62	0.20
Control Delay	11.8	12.7	1.6	10.0	8.9	1.3	18.7	43.4	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	12.7	1.6	10.0	8.9	1.3	18.7	43.4	7.1
Queue Length 50th (ft)	33	125	3	10	40	0	37	157	3
Queue Length 95th (ft)	m47	143	m7	m25	72	11	85	249	45
Internal Link Dist (ft)		575			553		284		431
Turn Bay Length (ft)	80		80	160				150	
Base Capacity (vph)	480	1926	887	441	1821	906	494	387	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.33	0.06	0.14	0.25	0.21	0.24	0.62	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	585	45	55	420	175	45	5	60	220	5	100
Future Volume (vph)	85	585	45	55	420	175	45	5	60	220	5	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.93		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1691		1770	1596	
Flt Permitted	0.41	1.00	1.00	0.41	1.00	1.00		0.85		0.66	1.00	
Satd. Flow (perm)	767	3539	1583	764	3539	1583		1466		1238	1596	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	636	49	60	457	190	49	5	65	239	5	109
RTOR Reduction (vph)	0	0	23	0	0	92	0	36	0	0	75	0
Lane Group Flow (vph)	92	636	26	60	457	98	0	83	0	239	39	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	64.4	64.4	64.4	61.8	61.8	61.8		37.5		37.5	37.5	
Effective Green, g (s)	64.4	64.4	64.4	61.8	61.8	61.8		37.5		37.5	37.5	
Actuated g/C Ratio	0.54	0.54	0.54	0.51	0.51	0.51		0.31		0.31	0.31	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	471	1899	849	432	1822	815		458		386	498	
v/s Ratio Prot	0.01	c0.18		0.01	c0.13						0.02	
v/s Ratio Perm	0.09		0.02	0.07		0.06		0.06		c0.19		
v/c Ratio	0.20	0.33	0.03	0.14	0.25	0.12		0.18		0.62	0.08	
Uniform Delay, d1	14.0	15.7	13.1	15.3	16.2	15.0		30.1		35.2	29.1	
Progression Factor	0.78	0.78	0.48	0.59	0.52	0.36		1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5	0.1	0.1	0.3	0.3		0.9		7.3	0.3	
Delay (s)	11.0	12.7	6.4	9.2	8.8	5.8		30.9		42.4	29.4	
Level of Service	B	B	A	A	A	A		C		D	C	
Approach Delay (s)		12.1			8.0			30.9			38.2	
Approach LOS		B			A			C			D	

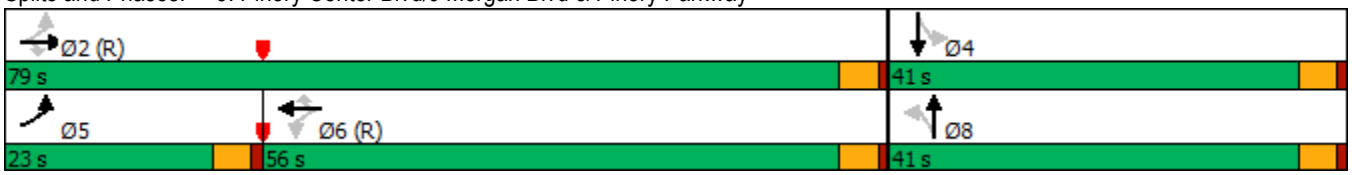
Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	175	500	35	45	440	85	60	130	190	115
Future Volume (vph)	175	500	35	45	440	85	60	130	190	115
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	79.0	79.0	56.0	56.0	56.0	41.0	41.0	41.0	41.0
Total Split (%)	19.2%	65.8%	65.8%	46.7%	46.7%	46.7%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	74.5	74.5	74.5	59.0	59.0	59.0	36.5	36.5	36.5	36.5
Actuated g/C Ratio	0.62	0.62	0.62	0.49	0.49	0.49	0.30	0.30	0.30	0.30
v/c Ratio	0.34	0.25	0.04	0.12	0.27	0.11	0.28	0.31	0.64	0.50
Control Delay	11.5	10.5	2.8	21.2	18.4	7.3	35.7	32.1	46.8	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	10.5	2.8	21.2	18.4	7.3	35.7	32.1	46.8	31.1
LOS	B	B	A	C	B	A	D	C	D	C
Approach Delay		10.4			17.0			33.1		37.8
Approach LOS		B			B			C		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 46 (38%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 21.2	Intersection LOS: C
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Pinery Center Blvd/J Morgan Blvd & Pinery Parkway



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	190	543	38	49	478	92	65	174	207	277
v/c Ratio	0.34	0.25	0.04	0.12	0.27	0.11	0.28	0.31	0.64	0.50
Control Delay	11.5	10.5	2.8	21.2	18.4	7.3	35.7	32.1	46.8	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	10.5	2.8	21.2	18.4	7.3	35.7	32.1	46.8	31.1
Queue Length 50th (ft)	58	92	0	14	72	0	38	97	139	142
Queue Length 95th (ft)	92	121	13	42	132	36	79	160	228	228
Internal Link Dist (ft)		446			575			367		49
Turn Bay Length (ft)	150		150	150		150	150		150	
Base Capacity (vph)	624	2197	997	410	1739	825	236	557	322	556
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.25	0.04	0.12	0.27	0.11	0.28	0.31	0.64	0.50

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	500	35	45	440	85	60	130	30	190	115	140
Future Volume (vph)	175	500	35	45	440	85	60	130	30	190	115	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1810		1770	1709	
Flt Permitted	0.40	1.00	1.00	0.45	1.00	1.00	0.42	1.00		0.57	1.00	
Satd. Flow (perm)	753	3539	1583	837	3539	1583	776	1810		1059	1709	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	190	543	38	49	478	92	65	141	33	207	125	152
RTOR Reduction (vph)	0	0	14	0	0	47	0	7	0	0	36	0
Lane Group Flow (vph)	190	543	24	49	478	45	65	167	0	207	241	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	74.5	74.5	74.5	59.0	59.0	59.0	36.5	36.5		36.5	36.5	
Effective Green, g (s)	74.5	74.5	74.5	59.0	59.0	59.0	36.5	36.5		36.5	36.5	
Actuated g/C Ratio	0.62	0.62	0.62	0.49	0.49	0.49	0.30	0.30		0.30	0.30	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	560	2197	982	411	1740	778	236	550		322	519	
v/s Ratio Prot	c0.03	0.15			0.14			0.09			0.14	
v/s Ratio Perm	c0.18		0.01	0.06		0.03	0.08			c0.20		
v/c Ratio	0.34	0.25	0.02	0.12	0.27	0.06	0.28	0.30		0.64	0.46	
Uniform Delay, d1	10.2	10.2	8.8	16.5	17.9	16.0	31.7	32.0		36.1	33.8	
Progression Factor	1.00	1.00	1.00	1.15	0.98	1.95	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.3	0.0	0.6	0.4	0.1	2.9	1.4		9.5	3.0	
Delay (s)	10.5	10.5	8.8	19.6	17.9	31.3	34.6	33.4		45.6	36.8	
Level of Service	B	B	A	B	B	C	C	C		D	D	
Approach Delay (s)		10.4			20.0			33.7			40.6	
Approach LOS		B			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	214	0	2100	2600	300
Future Vol, veh/h	0	214	0	2100	2600	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	233	0	2211	2737	316

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	-	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	-	-	-
Stage 1	0	0	0	-	-	-
Stage 2	0	0	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

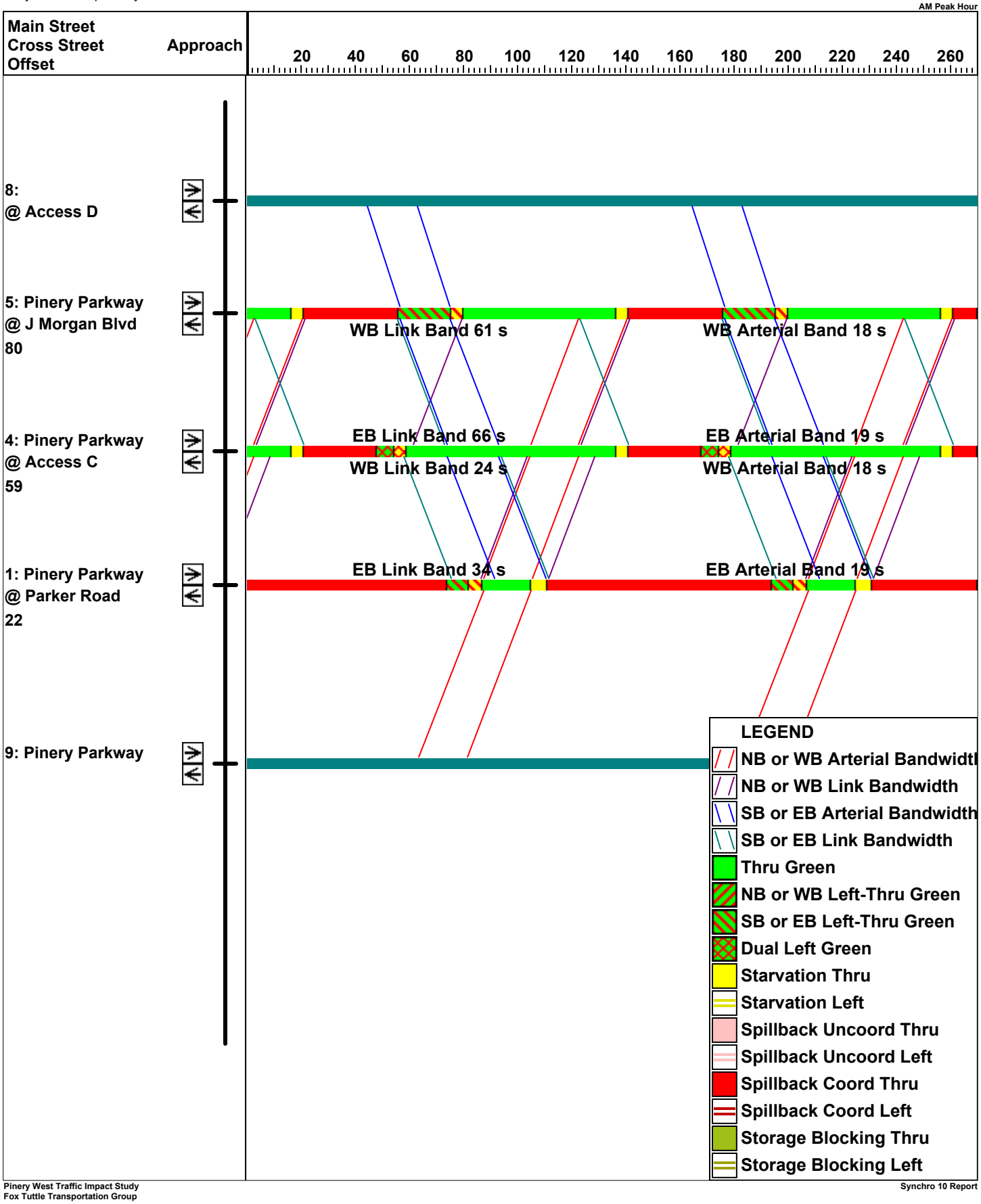
Intersection	
Int Delay, s/veh	1

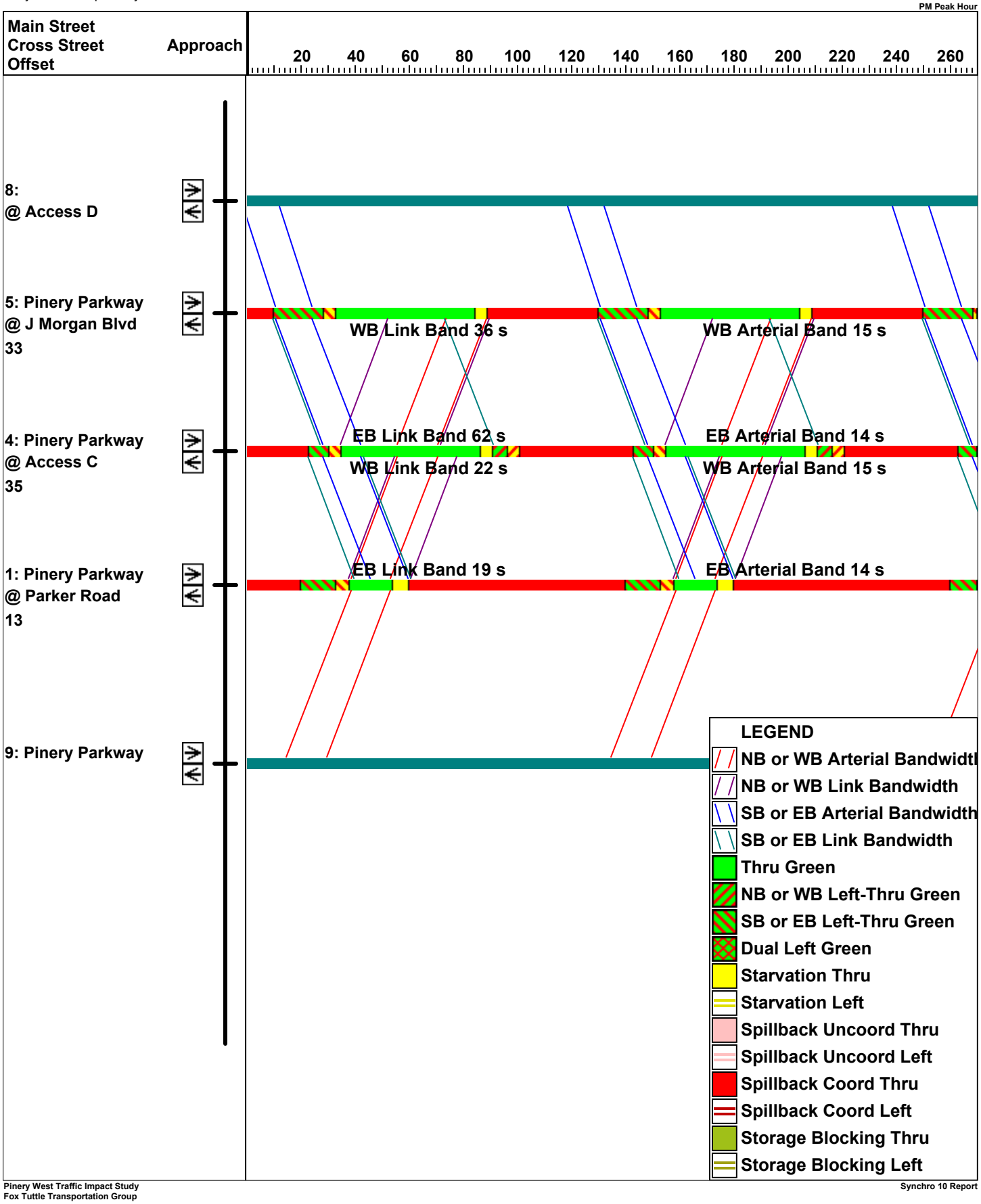
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	625	15	50	600	0	85
Future Vol, veh/h	625	15	50	600	0	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	679	16	54	652	0	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	695	0	-	348
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	897	-	0	648
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	897	-	-	648
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	648	-	-	897	-
HCM Lane V/C Ratio	0.143	-	-	0.061	-
HCM Control Delay (s)	11.5	-	-	9.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-


Main Street
Cross Street
Offset
Approach
20
40
60
80
100
120
140
160
180
200
220
240
260
8:
@ Access D
5: Pinery Parkway
@ J Morgan Blvd
80
WB Link Band 61 s
WB Arterial Band 18 s
4: Pinery Parkway
@ Access C
59
EB Link Band 66 s
WB Link Band 24 s
EB Arterial Band 19 s
WB Arterial Band 18 s
1: Pinery Parkway
@ Parker Road
22
EB Link Band 34 s
EB Arterial Band 19 s
9: Pinery Parkway
LEGEND
NB or WB Arterial Bandwidth
NB or WB Link Bandwidth
SB or EB Arterial Bandwidth
SB or EB Link Bandwidth
Thru Green
NB or WB Left-Thru Green
SB or EB Left-Thru Green
Dual Left Green
Starvation Thru
Starvation Left
Spillback Uncoord Thru
Spillback Uncoord Left
Spillback Coord Thru
Spillback Coord Left
Storage Blocking Thru
Storage Blocking Left


Main Street
Cross Street
Offset
Approach
20
40
60
80
100
120
140
160
180
200
220
240
260
8:
@ Access D
5: Pinery Parkway
@ J Morgan Blvd
33
WB Link Band 36 s
WB Arterial Band 15 s
4: Pinery Parkway
@ Access C
35
EB Link Band 62 s
WB Link Band 22 s
EB Arterial Band 14 s
WB Arterial Band 15 s
1: Pinery Parkway
@ Parker Road
13
EB Link Band 19 s
EB Arterial Band 14 s
9: Pinery Parkway
LEGEND
NB or WB Arterial Bandwidth
NB or WB Link Bandwidth
SB or EB Arterial Bandwidth
SB or EB Link Bandwidth
Thru Green
NB or WB Left-Thru Green
SB or EB Left-Thru Green
Dual Left Green
Starvation Thru
Starvation Left
Spillback Uncoord Thru
Spillback Uncoord Left
Spillback Coord Thru
Spillback Coord Left
Storage Blocking Thru
Storage Blocking Left

PINERY VILLAGE FILING NO. 2

A PORTION OF PLANNING AREAS 41, 42, 43, & OPEN SPACE H-1, AND LOT 2 & TRACT E, PINERY VILLAGE FILING NO. 1
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10,
TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
87.848 ACRES - 3 COMMERCIAL LOTS - 7 TRACTS SB2021-049

LEGAL DESCRIPTION

A PARCEL OF LAND SITUATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10, TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS;

COMMENCING AT THE CENTER-SOUTH ONE-SIXTEENTH CORNER OF SAID SECTION 3, WHENCE THE NORTH LINE OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF SAID SECTION 3 BEARS NORTH 89°32'31"EAST, A DISTANCE OF 2635.68 FEET WITH ALL BEARINGS HEREON REFERENCED TO SAID LINE;

THENCE ALONG SAID NORTH LINE, NORTH 89°32'31"EAST, A DISTANCE OF 40.73 FEET TO THE NORTHEAST CORNER OF PINERY VILLAGE FILING NO. 1 AS RECORDED AT RECEPTION NO. 2020006468 IN THE OFFICIAL RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER'S OFFICE, AND THE **POINT OF BEGINNING**;

THENCE CONTINUING ALONG SAID NORTH LINE, NORTH 89°32'31" EAST, A DISTANCE OF 1,817.24 FEET TO THE WESTERLY RIGHT-OF-WAY OF PARKER ROAD, RECORDED IN BOOK 1805 AT PAGE 1143, OF SAID RECORDS;

THENCE ALONG SAID WESTERLY RIGHT-OF-WAY THE FOLLOWING FOUR (4) COURSES:

1. SOUTH 01°44'50" WEST, A DISTANCE OF 1,329.43 FEET;
2. SOUTH 19°39'08" WEST, A DISTANCE OF 211.40 FEET;
3. SOUTH 01°44'27" WEST, A DISTANCE OF 749.39 FEET;
4. SOUTH 18°46'51" EAST, A DISTANCE OF 86.02 FEET TO THE BOUNDARY OF SAID PINERY VILLAGE FILING NO. 1;

THENCE ALONG SAID BOUNDARY THE FOLLOWING SIXTEEN (16) COURSES;

1. SOUTH 01°44'50" WEST, A DISTANCE OF 316.60 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE NORTHERLY HAVING A RADIUS OF 35.00 FEET, THE RADIUS POINT OF SAID CURVE BEARS NORTH 23°37'47" WEST;
2. SOUTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 23°34'56", AN ARC LENGTH OF 14.41 FEET;
3. SOUTH 89°57'09" WEST, A DISTANCE OF 1,163.73 FEET;
4. NORTH 45°19'53" WEST, A DISTANCE OF 42.44 FEET;
5. NORTH 00°37'01" WEST, A DISTANCE OF 528.99 FEET;
6. SOUTH 89°45'03" WEST, A DISTANCE OF 66.50 FEET;
7. NORTH 00°37'01" WEST, A DISTANCE OF 780.33 FEET;
8. NORTH 00°36'54" WEST, A DISTANCE OF 116.93 FEET;
9. SOUTH 89°39'16" WEST, A DISTANCE OF 330.91 FEET;
10. NORTH 06°01'28" EAST, A DISTANCE OF 235.83 FEET;
11. NORTH 17°28'32" EAST, A DISTANCE OF 468.15 FEET;
12. NORTH 03°50'12" EAST, A DISTANCE OF 121.74 FEET;
13. NORTH 16°22'12" WEST, A DISTANCE OF 279.83 FEET;
14. NORTH 37°38'54" WEST, A DISTANCE OF 83.00 FEET;
15. NORTH 68°29'08" WEST, A DISTANCE OF 133.51 FEET;
16. NORTH 00°32'20" WEST, A DISTANCE OF 24.94 FEET TO THE **POINT OF BEGINNING**.

CONTAINING AN AREA OF 87.848 ACRES, (3,826,658 SQUARE FEET), MORE OR LESS.

DEDICATION STATEMENT

THE UNDERSIGNED, BEING ALL THE OWNERS, MORTGAGEES, BENEFICIARIES OF DEEDS OF TRUST AND HOLDERS OF OTHER INTERESTS IN THE LANDS DESCRIBED HEREIN, HAVE LAID OUT, SUBDIVIDED AND PLATTED SAID LANDS INTO LOTS, TRACTS, STREETS AND EASEMENTS AS SHOWN HEREON UNDER THE NAME AND SUBDIVISION OF **PINERY VILLAGE FILING NO. 2**. THE UTILITY EASEMENTS SHOWN HEREON ARE HEREBY DEDICATED FOR PUBLIC UTILITIES AND CABLE COMMUNICATION SYSTEMS AND OTHER PURPOSES AS SHOWN HEREON. THE ENTITIES RESPONSIBLE FOR PROVIDING THE SERVICES FOR WHICH THE EASEMENTS ARE ESTABLISHED ARE HEREBY GRANTED THE PERPETUAL RIGHT OF INGRESS AND EGRESS FROM AND TO ADJACENT PROPERTIES FOR INSTALLATION, MAINTENANCE AND REPLACEMENT OF UTILITY LINES AND RELATED FACILITIES. THE RIGHT-OF-WAY DEDICATION KNOWN AS PINERY CENTER BOULEVARD, AND TRACT F RIGHTS-OF-WAY, AS SHOWN HEREON ARE DEDICATED AND CONVEYED TO DOUGLAS COUNTY, COLORADO, IN FEE SIMPLE ABSOLUTE, WITH MARKETABLE TITLE, FOR PUBLIC USES AND PURPOSES. UTILITY EASEMENTS, DRAINAGE AND BLANKET ACCESS EASEMENTS, TEMPORARY ACCESS EASEMENT, AND DRAINAGE EASEMENTS ARE DEDICATED AND CONVEYED TO DOUGLAS COUNTY, COLORADO, FOR PUBLIC USES AND PURPOSES.

OWNER

PINERY OWNER, LLC, A COLORADO LIMITED LIABILITY COMPANY

BY: _____

STATE OF COLORADO)
)SS
COUNTY OF DOUGLAS)

ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____, 20__
BY _____ AS _____
OF PINERY OWNER, LLC, A COLORADO LIMITED LIABILITY COMPANY

WITNESS MY HAND
AND OFFICIAL SEAL

MY COMMISSION
EXPIRES: _____ _____
NOTARY PUBLIC

OWNER

PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 1,

BY: _____

STATE OF COLORADO)
)SS
COUNTY OF DOUGLAS)

ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____, 20__
BY _____ AS _____
OF PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 1,

WITNESS MY HAND
AND OFFICIAL SEAL

MY COMMISSION
EXPIRES: _____ _____
NOTARY PUBLIC

OWNER

PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2,

BY: _____

STATE OF COLORADO)
)SS
COUNTY OF DOUGLAS)

ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____
BY _____ AS _____
OF PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2,

WITNESS MY HAND
AND OFFICIAL SEAL

MY COMMISSION
EXPIRES: _____ _____
NOTARY PUBLIC

ACCEPTANCE CERTIFICATE

THE DEDICATION OF TRACTS A, B, C, D, E, AND G ARE HEREBY ACCEPTED FOR OWNERSHIP AND MAINTENANCE BY THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2;

THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2:

BY: _____

STATE OF COLORADO)
)SS
COUNTY OF DOUGLAS)

ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____, 20__
BY _____, AS _____
OF THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2

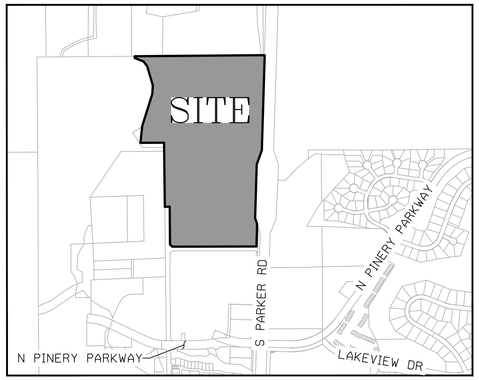
WITNESS MY HAND
AND OFFICIAL SEAL

MY COMMISSION
EXPIRES: _____ _____
NOTARY PUBLIC

PLANNING COMMISSIONERS CERTIFICATE

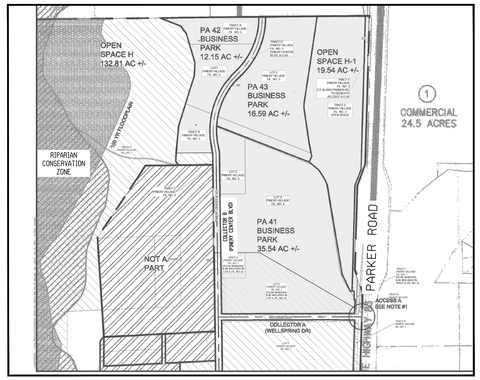
THE MINOR DEVELOPMENT FINAL PLAT (SB2021-049) WAS REVIEWED BY THE PLANNING COMMISSION ON _____ __, 20__

_____ _____
PLANNING DIRECTOR, ON BEHALF OF THE PLANNING COMMISSION DATE



VICINITY MAP

SCALE 1" = 1,000'



PLANNED DEVELOPMENT

SCALE = NOT TO SCALE

TITLE VERIFICATION

WE, FIRST AMERICAN TITLE INSURANCE COMPANY, DO HEREBY CERTIFY THAT WE HAVE EXAMINED THE TITLE OF ALL LAND PLATTED HEREON AND THAT TITLE TO SUCH LAND IS IN THE DEDICATOR(S) FREE AND CLEAR OF ALL LIENS, TAXES AND ENCUMBRANCES.

FIRST AMERICAN TITLE INSURANCE COMPANY

BY: _____

TITLE: _____

DATE: _____

STATE OF COLORADO)
)SS
COUNTY OF _____)

ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20__

BY _____ AS _____

OF FIRST AMERICAN TITLE INSURANCE COMPANY

WITNESS MY HAND AND OFFICIAL SEAL

MY COMMISSION EXPIRES: _____ _____
NOTARY PUBLIC

BOARD OF COUNTY COMMISSIONERS CERTIFICATE

THIS PLAT WAS APPROVED FOR FILING BY THE BOARD OF COUNTY COMMISSIONERS OF DOUGLAS COUNTY,

COLORADO, ON THE _____DAY OF _____ , 20__, SUBJECT TO ANY CONDITIONS SPECIFIED HEREON.

PINERY CENTER BOULEVARD, AND TRACT F, UTILITY EASEMENTS, DRAINAGE AND BLANKET ACCESS EASEMENTS, TEMPORARY ACCESS EASEMENT, AND DRAINAGE EASEMENTS ARE ACCEPTED.

ALL EXPENSES INCURRED WITH RESPECT TO IMPROVEMENTS FOR ALL UTILITY SERVICES, PAVING, GRADING, LANDSCAPING, CURBS, GUTTER, SIDEWALKS, ROAD LIGHTING, ROAD SIGNS, FLOOD PROTECTION DEVICES, DRAINAGE STRUCTURES, AND ALL OTHER IMPROVEMENTS THAT MAY BE REQUIRED SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER AND NOT DOUGLAS COUNTY.

THIS ACCEPTANCE DOES NOT GUARANTEE THAT SOIL CONDITIONS, SUBSURFACE GEOLOGY, GROUNDWATER CONDITIONS OR FLOODING CONDITIONS OF ANY LOTS SHOWN HEREON ARE SUCH THAT A BUILDING PERMIT, WELL PERMIT OR SEWAGE DISPOSAL PERMIT WILL BE ISSUED.

_____
CHAIR, BOARD OF COUNTY COMMISSIONERS

LAND USE TABLE

TRACT	AREA (SQ.FT)	AREA (AC ±)	USE	OWNED BY / MAINTAINED BY
LOT 1	212,152	4.870	COMMERCIAL	OWNER
LOT 2	656,732	15.076	COMMERCIAL	OWNER
LOT 3	1,417,710	32.546	COMMERCIAL	OWNER
ROW DEDICATION	139,327	3.199	RIGHT-OF-WAY	DOUGLAS COUNTY
TRACT A	162,913	3.740	OPEN SPACE / DRAINAGE	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT B	113,415	2.604	OPEN SPACE / DRAINAGE	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT C	537	0.012	OPEN SPACE / DRAINAGE	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT D	128,796	2.957	REGIONAL TRANSPORTATION DISTRICT (RTD)	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT E	988,789	22.699	OPEN SPACE / DRAINAGE	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
TRACT F	3,333	0.077	RIGHT-OF-WAY	DOUGLAS COUNTY
TRACT G	2,954	0.068	LIFT STATION	THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2
LOT TOTAL	2,286,595	52.492		
TRACT TOTAL	1,400,737	32.157		
ROW (STREET) TOTAL	139,327	3.199		
TOTAL	3,826,658	87.848		

(SEE ADDITIONAL TRACT NOTES THIS SHEET)

SHEET INDEX

SHEET 1 COVER SHEET

SHEET 2 OVERALL SHEET

SHEETS 3-4 LOT AND EASEMENT DETAIL SHEETS

GENERAL NOTES

1. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR LAND BOUNDARY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, COLORADO REVISED STATUTE.
2. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY."
3. THE FIELD WORK FOR THIS SURVEY WAS PERFORMED BY AN AZTEC CONSULTANTS, INC. SURVEY CREW AND COMPLETED ON APRIL 01, 2021.
4. BASIS OF BEARINGS - BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM GPS OBSERVATION BASED UPON THE COLORADO COORDINATE SYSTEM OF 1983 CENTRAL ZONE (NAD 83, 2011) REFERENCED TO THE NORTH LINE OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF SECTION 3, TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN BEING MONUMENTED AS SHOWN HEREON, TAKEN TO BEAR NORTH 89°32'31" EAST, A DISTANCE OF 2,635.68 FEET.
5. FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-927312-CO, EFFECTIVE 10/21/2020 AT 5:00 P.M. WAS RELIED UPON FOR RECORD INFORMATION REGARDING RIGHTS-OF-WAY, EASEMENTS AND ENCUMBRANCES. THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY AZTEC CONSULTANTS INC. TO DETERMINE OWNERSHIP, RIGHTS-OF-WAY, EASEMENTS OR OTHER MATTERS OF PUBLIC RECORD.
6. BASED ON A GRAPHICAL REPRESENTATION OF FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) NO. 08035C0184G, WITH AN EFFECTIVE DATE OF MARCH 16, 2016, THE SUBJECT PROPERTY LIES WITHIN ZONE "AE" AREAS WHERE BASE FLOOD ELEVATIONS HAVE BEEN DETERMINED, WITHIN ZONE "X" OTHER AREAS, AND WITHIN "ZONE X" BEING DEFINED AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
7. TRACTS A, B, C, D, E & G SHALL BE OWNED AND MAINTAINED BY THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2, ITS SUCCESSORS AND ASSIGNS, FOR OPEN SPACE.
8. DRAINAGE EASEMENTS ARE HEREBY GRANTED TO DOUGLAS COUNTY ACROSS TRACTS A, B, C, E, AND THE DRAINAGE EASEMENTS ON LOTS 1 & 2 IN PINERY VILLAGE FILING NO. 2 (THE "SUBDIVISION") FOR THE PURPOSE OF ACCESSING, MAINTAINING AND REPAIRING STORM WATER MANAGEMENT IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO INLETS, PIPES, CULVERTS, CHANNELS, DITCHES, HYDRAULIC STRUCTURES, RIPRAP, DETENTION BASINS, FOREBAYS, MICROPOOLS AND WATER QUALITY FACILITIES (COLLECTIVELY, THE "FACILITIES"). IN THE EVENT THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2, ITS SUCCESSORS, AND ASSIGNS ("SYSTEM OWNER") FAILS TO SATISFACTORILY MAINTAIN SAID FACILITIES, A BLANKET ACCESS EASEMENT OVER THE SUBDIVISION IS ALSO GRANTED TO DOUGLAS COUNTY, BUT ONLY FOR THE PURPOSE OF ACCESSING THE FACILITIES IN THE EVENT THAT THE DRAINAGE EASEMENTS DO NOT PROVIDE ADEQUATE ACCESS. THE MAINTENANCE AND REPAIR OF THE FACILITIES LOCATED IN THE SUBDIVISION, AS SHOWN ON THE CONSTRUCTION PLANS ACCEPTED BY DOUGLAS COUNTY OR ON THE PLAT FOR THE SUBDIVISION, SHALL BE THE RESPONSIBILITY OF THE SYSTEM OWNER IN THE EVENT SUCH MAINTENANCE AND REPAIR ARE NOT PERFORMED BY THE SYSTEM OWNER TO THE SATISFACTION OF DOUGLAS COUNTY, THEN DOUGLAS COUNTY SHALL HAVE THE RIGHT, BUT NOT THE OBLIGATION TO ENTER SAID SUBDIVISION AFTER A TEN (10) DAY PRIOR WRITTEN NOTICE TO THE SYSTEM OWNER. UNLESS THERE IS AN EMERGENCY, IN WHICH CASE DOUGLAS COUNTY SHALL GIVE NOTICE AS SOON AS PRACTICABLE, TO PERFORM ALL NECESSARY WORK, THE COST OF WHICH SHALL BE PAID BY THE SYSTEM OWNER UPON BILLING. IN THE EVENT THE SYSTEM OWNER FAILS TO REIMBURSE DOUGLAS COUNTY WITHIN THIRTY (30) DAYS AFTER SUBMISSION OF THE BILL FOR THE COSTS INCURRED, DOUGLAS COUNTY SHALL HAVE THE RIGHT TO ENFORCE SUCH OBLIGATION BY APPROPRIATE LEGAL ACTION. IT IS THE SYSTEM OWNER'S RESPONSIBILITY TO CONSTRUCT, MAINTAIN, AND REPAIR THE FACILITIES IN A MANNER CONSISTENT WITH ALL APPLICABLE PLANS APPROVED OR ACCEPTED BY DOUGLAS COUNTY.
9. PERMANENT STRUCTURES, IMPROVEMENTS, OBJECTS, BUILDINGS, WELLS, WATER METERS AND OTHER OBJECTS THAT MAY INTERFERE WITH THE UTILITY FACILITIES OR USE THEREOF (INTERFERING OBJECTS) SHALL NOT BE PERMITTED WITHIN SAID UTILITY EASEMENTS AND THE UTILITY PROVIDERS, AS GRANTEES, MAY REMOVE ANY INTERFERING OBJECTS AT NO COST TO SUCH GRANTEES, INCLUDING, WITHOUT LIMITATION, VEGETATION. PUBLIC SERVICE COMPANY OF COLORADO (PSCO) AND ITS SUCCESSORS RESERVE THE RIGHT TO REQUIRE ADDITIONAL EASEMENTS AND TO REQUIRE THE PROPERTY OWNER TO GRANT PSCO AN EASEMENT ON ITS STANDARD FORM.
10. A TEMPORARY ACCESS EASEMENT IS GRANTED TO DOUGLAS COUNTY AT THE NORTH END OF NORTH PINERY PARKWAY FOR TEMPORARY USE UNTIL FUTURE CONNECTION TO THE NORTH IS ESTABLISHED.
11. THE SANITARY EASEMENT LABELED AS "PCMD" SHALL BE DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR A SANITARY FORCE MAIN.

ADDITIONAL TRACT AND EASEMENTS NOTES:

1. TRACT A, AS SHOWN HEREON IS DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR OPEN SPACE AND DRAINAGE PURPOSES.
2. TRACT B, AS SHOWN HEREON IS DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR OPEN SPACE AND DRAINAGE PURPOSES.
3. TRACT C, AS SHOWN HEREON IS DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR OPEN SPACE AND DRAINAGE PURPOSES.
4. TRACT D, AS SHOWN HEREON SHALL BE OWNED AND MAINTAINED BY THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2, ITS SUCCESSORS AND ASSIGNS, FOR THE REGIONAL TRANSPORTATION DISTRICT (RTD) FACILITY, AND SHALL BE DEDICATED TO RTD WITHIN 30 DAYS OF REQUEST FOR RTD'S OWNERSHIP AND MAINTENANCE.
5. TRACT E, AS SHOWN HEREON IS DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR OPEN SPACE AND DRAINAGE PURPOSES.
6. TRACT F, AS SHOWN HEREON IS DEDICATED TO DOUGLAS COUNTY FOR FUTURE IMPROVEMENTS TO STATE HIGHWAY 83, RIGHT-OF-WAY, ACCESS, AND UTILITY PURPOSES.
7. TRACT G, AS SHOWN HEREON IS DEDICATED TO THE PINERY COMMERCIAL METROPOLITAN DISTRICT NO. 2 FOR SANITATION LIFT STATION, BUILDING, OPERATION, AND MAINTENANCE PURPOSES.
8. THE 20' LANDSCAPE EASEMENTS SHOWN HEREON SHALL BE OWNED AND MAINTAINED BY THE PINERY COMMERCIAL METRO DISTRICTS #1 AND #2, ITS SUCCESSORS AND ASSIGNS

SURVEYOR'S CERTIFICATE

I, MICHAEL J. NOFFSINGER, A DULY REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS PLAT TRULY AND CORRECTLY REPRESENTS THE RESULTS OF A SURVEY MADE ON APRIL 28, 2021, BY ME OR UNDER MY DIRECT SUPERVISION AND THAT ALL MONUMENTS EXIST AS SHOWN HEREON; THAT MATHEMATICAL CLOSURE ERRORS ARE LESS THAN 1:50,000 (SECOND ORDER); AND THAT SAID PLAT HAS BEEN PREPARED IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS OF THE STATE OF COLORADO DEALING WITH MONUMENTS, SUBDIVISIONS OR SURVEYING OF LAND, ALL SURVEYING REGULATORY RULES, REQUIREMENTS, AND STANDARDS OF PRACTICE, AND ALL APPLICABLE PROVISIONS OF THE DOUGLAS COUNTY SUBDIVISION RESOLUTION. THIS CERTIFICATION IS BASED ON MY KNOWLEDGE, INFORMATION AND BELIEF AND IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

I ATTEST THE ABOVE ON THIS _____ DAY OF _____, 20__

FOR REVIEW

MICHAEL J. NOFFSINGER, LICENSED PROFESSIONAL LAND SURVEYOR COLORADO P.L.S. NO. 38367
FOR AND ON BEHALF OF AZTEC CONSULTANTS, INC.

NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

NOTICE: PER THE STATE OF COLORADO BOARD OF LICENSURE FOR ARCHITECTS, PROFESSIONAL ENGINEERS, AND PROFESSIONAL LAND SURVEYORS RULE 1.6.B.2 THE WORD "CERTIFY" AS USED HEREON MEANS AN EXPRESSION OF PROFESSIONAL OPINION AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED. THE SURVEY REPRESENTED HEREON HAS BEEN PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE AND IS BASED UPON MY KNOWLEDGE, INFORMATION AND BELIEF.

CLERK AND RECORDERS CERTIFICATE

STATE OF COLORADO)
COUNTY OF DOUGLAS)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE ON THIS __ DAY OF _____ 20__,

A.D., AT _____ A.M./P.M. AND WAS RECORDED AT RECEPTION NO. _____

_____
DOUGLAS COUNTY CLERK AND RECORDER

AZTEC CONSULTANTS, INC.
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

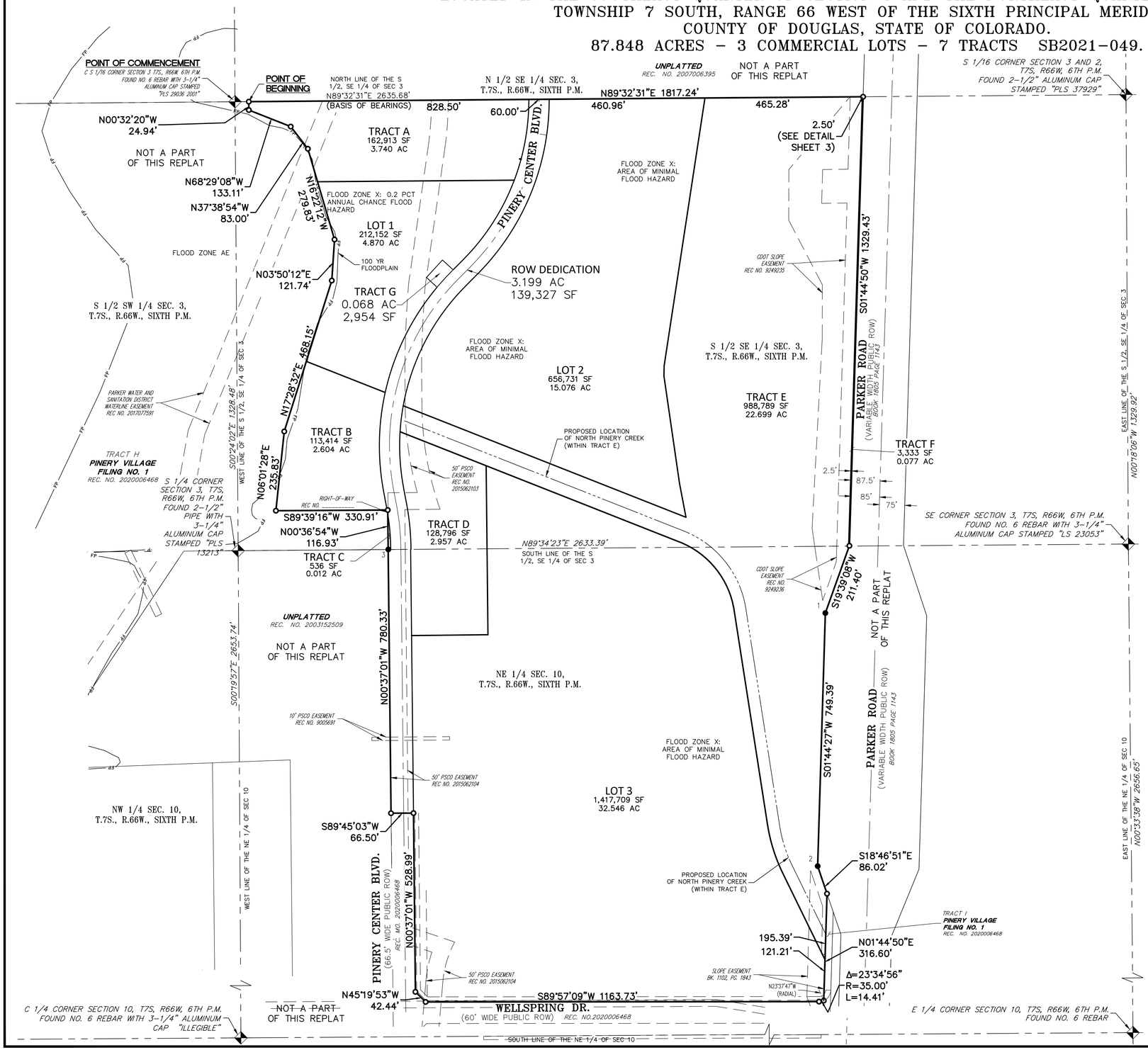
AzTec Proj. No: 54820-23 Drawn By: RDR

DEVELOPER
PINERY OWNER, LLC
2040 14TH STREET, SUITE 210
BOULDER, CO 80302

DATE OF PREPARATION:	2026-02-17
SCALE:	NA
SHEET 1 OF 4	

PINERY VILLAGE FILING NO. 2

A PORTION OF PLANNING AREAS 41, 42, 43, & OPEN SPACE H-1, AND LOT 2 & TRACT E, PINERY VILLAGE FILING NO. 1
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10,
TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
87.848 ACRES - 3 COMMERCIAL LOTS - 7 TRACTS SB2021-049.



MONUMENT SYMBOL LEGEND

- SET NO. 5 X 18" REBAR WITH 1-1/4" ORANGE PLASTIC CAP STAMPED "AZTEC LS 38367"
- 1 FOUND 4"X4" CONCRETE WITH NO. 5
- 2 FOUND 5" DIAMETER CONCRETE WITH 3" BRASS CAP STAMPED "CDOT ROW"
- 3 FOUND NO. 5 REBAR WITH 1-1/4" YELLOW PLASTIC CAP STAMPED "LS5112"
- (ROW) RIGHT-OF-WAY
- FP LIMITS OF FLOOD PLAIN

LINETYPE LEGEND

- SECTION LINES
- SUBJECT PARCEL (BOUNDARY)
- SUBJECT PARCEL (LOT LINE)
- ADJOINING PROPERTY BOUNDARIES
- PROPOSED CENTERLINE OF NORTH PINERY CREEK. (ALSO SEE LABEL)
- PROPOSED EASEMENT (SEE LABEL FOR TYPE & FACILITY)
- EXISTING EASEMENT (SEE LABEL FOR TYPE, FACILITY, & RECEPTION NUMBER)
- FP FLOODPLAIN

N

0' 75' 150' 300'
SCALE: 1" = 150'

FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC

AZTEC CONSULTANTS, INC.
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

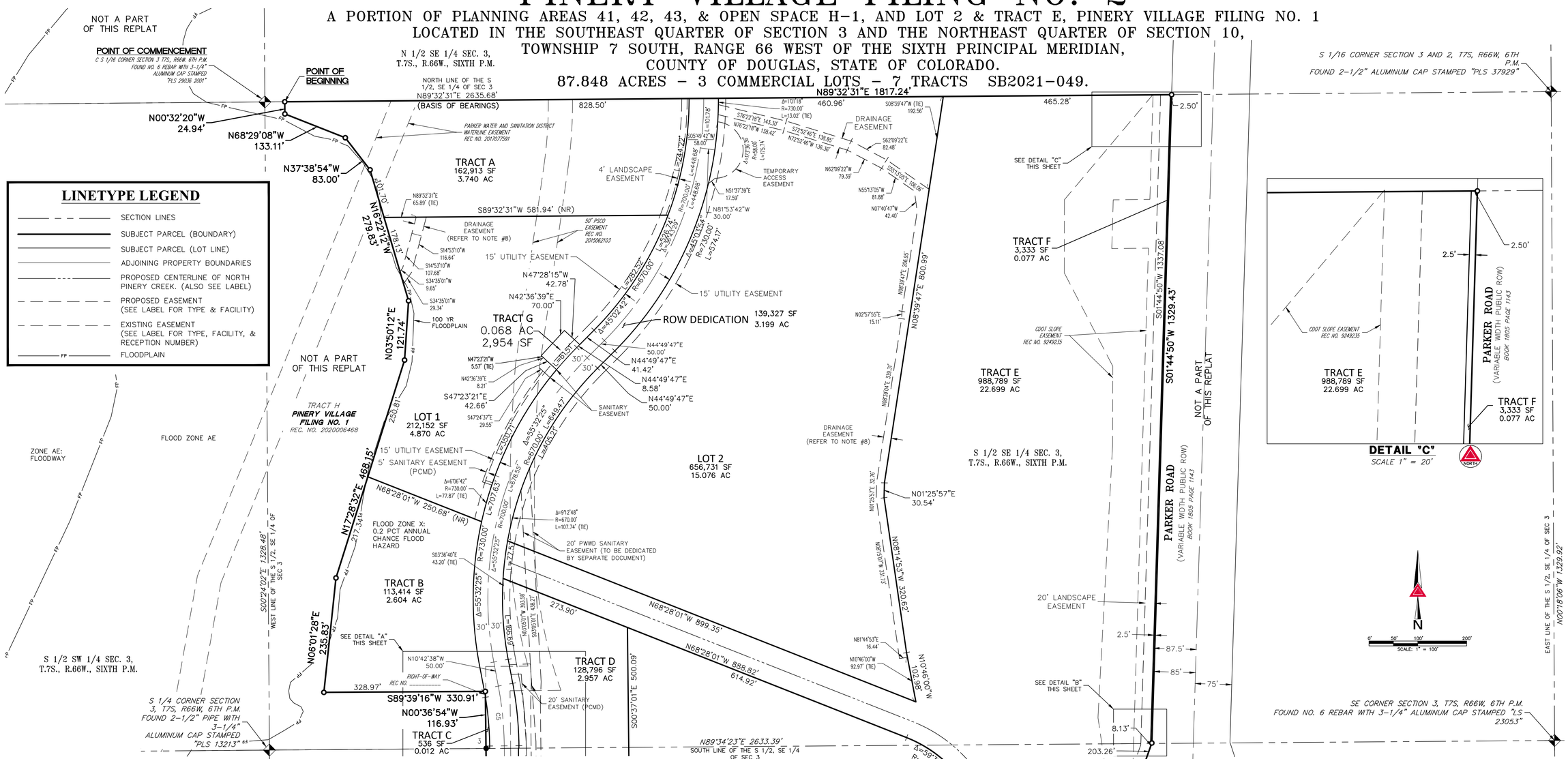
AzTec Proj. No.: 54820-23 Drawn By: RDR

DEVELOPER
PINERY OWNER, LLC
2040 14TH STREET, SUITE 210
BOULDER, CO 80302

DATE OF PREPARATION:	2026-02-17
SCALE:	1"=150'
SHEET 2 OF 4	

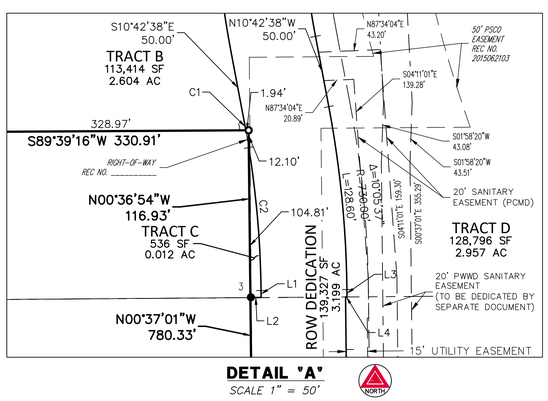
PINERY VILLAGE FILING NO. 2

A PORTION OF PLANNING AREAS 41, 42, 43, & OPEN SPACE H-1, AND LOT 2 & TRACT E, PINERY VILLAGE FILING NO. 1
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10,
TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
87.848 ACRES - 3 COMMERCIAL LOTS - 7 TRACTS SB2021-049.



LINETYPE LEGEND

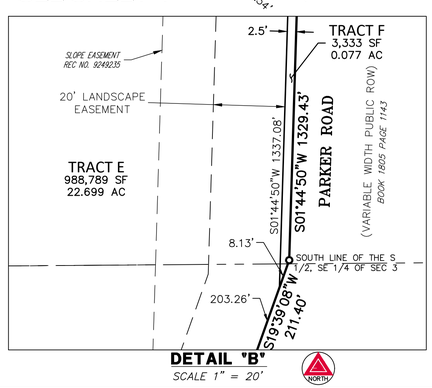
- SECTION LINES
- SUBJECT PARCEL (BOUNDARY)
- SUBJECT PARCEL (LOT LINE)
- ADJOINING PROPERTY BOUNDARIES
- PROPOSED CENTERLINE OF NORTH PINERY CREEK. (ALSO SEE LABEL)
- PROPOSED EASEMENT (SEE LABEL FOR TYPE & FACILITY)
- EXISTING EASEMENT (SEE LABEL FOR TYPE, FACILITY, & RECEPTION NUMBER)
- FLOODPLAIN



MONUMENT SYMBOL LEGEND

- ○ SET NO. 5 X 18" REBAR WITH 1-1/4" ORANGE PLASTIC CAP STAMPED "AZTEC LS 38367"
- ● 1 FOUND 4"X4" CONCRETE WITH NO. 5
- ● 2 FOUND 5" DIAMETER CONCRETE WITH 3" BRASS CAP STAMPED "CDOT ROW"
- ● 3 FOUND NO. 5 REBAR WITH 1-1/4" YELLOW PLASTIC CAP STAMPED "LS5112"

(ROW) RIGHT-OF-WAY
U.E. UTILITY EASEMENT
PWWD PINERY WATER & WASTE WATER DISTRICT
——"—— LIMITS OF FLOOD PLAIN
(NR) NON RADIAL
CDOT COLORADO DEPT. OF TRANSPORTATION



CURVE TABLE			
CURVE	DELTA	RADIUS	LENGTH
C1	0°27'56"	670.00'	5.44'
C2	8°34'46"	670.00'	100.33'
C3	1°43'29"	666.00'	20.05'
C4	5°16'14"	666.00'	61.27'
C5	10°05'37"	700.00'	123.32'

LINE TABLE		
LINE	BEARING	LENGTH
L1	S00°37'01"E	4.88'
L2	N89°34'30"E	7.50'
L3	N00°37'01"W	5.08'
L4	N89°34'30"E	1.00'
L9	N33°28'57"E	20.80'

FOR REVIEW

FOR AND ON BEHALF OF AZTEC CONSULTANTS, INC

AzTec Consultants, Inc.
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

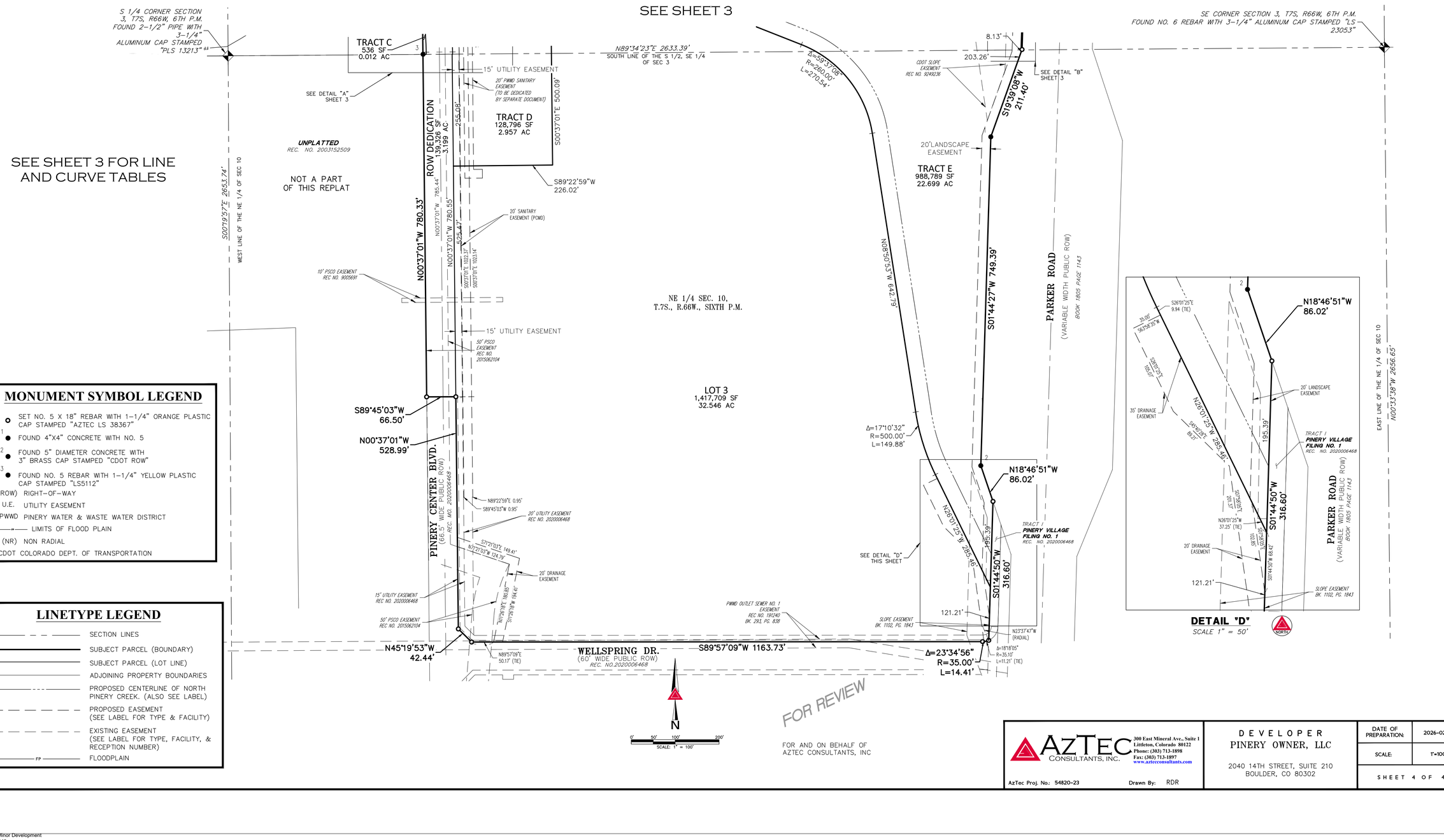
AzTec Proj. No.: 54820-23 Drawn By: RDR

DEVELOPER
PINERY OWNER, LLC
2040 14TH STREET, SUITE 210
BOULDER, CO 80302

DATE OF PREPARATION:	2026-02-17
SCALE:	1"=100'
SHEET 3 OF 4	

PINERY VILLAGE FILING NO. 2

A PORTION OF PLANNING AREAS 41, 42, 43, & OPEN SPACE H-1, AND LOT 2 & TRACT E, PINERY VILLAGE FILING NO. 1
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3 AND THE NORTHEAST QUARTER OF SECTION 10,
TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO.
87.848 ACRES - 3 COMMERCIAL LOTS - 7 TRACTS SB2021-049.



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