

Planning Commission

Agenda

**November 13, 2025
City Hall, Council Chambers
749 Main Street
6:30 PM for Regular Meeting**

Members of the public are welcome to attend and give comments remotely.

- 1) You can call in to + +1 719-359-4580 or 833-928-4610 Webinar ID # 899 0108 8931 Passcode 650368**
- 2) You can log in via your computer. Please visit the City's website here to link to the meeting: www.louisvilleco.gov/planningcommission**

The Commission will accommodate public comments during the regular meeting. Anyone may also email comments to the Commission prior to the meeting at: planning@louisvilleco.gov

1. Call to Order
2. Roll Call
3. Approval of Agenda
4. Approval of Minutes (Sept 25, Oct 9)
5. Public Comment on Items Not on the Agenda
6. New Business
 - a. **Louisville Center for the Arts Sign** (CONTINUED FROM 10/9/25)– Resolution 16, Series 2025 with a recommendation to City Council for a PUD amendment to allow a new sign for the Louisville Center for the Arts located at 801 Grant Ave.
 - b. **Redtail Ridge Wastewater Lift Station** – Resolution 17, Series 2025 with a recommendation to City Council for a Planned Unit Development (PUD)

Persons planning to attend the meeting who need sign language interpretation, translation services, assisted listening systems, Braille, taped material, or special transportation, should contact the City Clerk's Office at 303 335-4536 or MeredythM@LouisvilleCO.gov. A forty-eight-hour notice is requested.

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request to allow construction of a 1,031 square foot lift station to address wastewater for the future Redtail Ridge development.

- c. **Louisville Mill Site Redevelopment** – Resolution 18, Series 2025 with a recommendation to City Council for a Planned Unit Development (PUD) Amendment request for an Outdoor Eating and Drinking Establishment and Mobile Food Court at 500-544 Front Street.
- 7. Planning Commission Comments
 - 8. Staff Comments
 - 9. Select Items Tentatively Scheduled for Future Meetings
 - a. December 11 (and potential special meeting in December)
 - i. Comprehensive Plan update, including sharing of draft plan before community engagement
 - ii. Nonfunctional turf zoning code amendment to comply with [SB 24-005](#)
 - iii. EV charging zoning code amendment to address [HB 24-1173](#)
 - iv. Redtail Ridge GDP amendment and PUD for new light industrial building
 - 10. Adjourn

Planning Commission

Meeting Minutes

September 25, 2025

City Hall, Council Chambers

749 Main Street

6:30 PM

Call to Order – Chair **Brauneis** called the meeting to order at 6:30 PM.

Roll Call was taken, and the following members were present:

Commission Members Present: Steve Brauneis, Chair
Cullen Choi, Secretary
David Bangs
Jonathan Mihaly
Jeff Moline

Commission Members Absent: Debra Baskett, Vice Chair
Jennifer Hunt

Staff Members Present: Jeff Hirt, Planning Manager
Emily Cline-Gibson, Planner II
Rob Zuccaro, Community Development
Director

APPROVAL OF AGENDA

Motion to approve the agenda was moved by **Moline**, seconded by **Bangs**, and adopted by voice vote.

PUBLIC COMMENTS ON ITEMS NOT ON THE AGENDA

None were heard.

PUBLIC HEARING ITEMS – NEW BUSINESS

- a. **Avista Adventist Hospital GDP, Amendment No. 2** – Resolution 12, Series 2025 presented together with **ConocoPhillips Campus GDP, Amendment No. 1** –

Resolution 12, Series 2025 recommending to the City Council approval of both the Avista Adventist Hospital General Development Plan, Amendment No. 2 and the ConocoPhillips Campus GDP, Amendment No. 1.

Staff Presentation:

Zuccaro introduced the presentation for the GDP Amendments. He presented two linked applications from PorterCare Adventist Health Systems involving amendments to the Avista Adventist Hospital and Redtail Ridge general development plans. The proposal shifts unused development capacity from the existing Avista campus to Redtail Ridge, where a new hospital campus is planned. Specifically, the Avista development cap would be reduced from 750,000 square feet to 398,694 square feet, while the Redtail Ridge cap would be increased to accommodate future construction. The amendments also include establishing building height, massing, and architectural standards for the new hospital campus and dedicating a 7.5-acre parcel on the north side of the current hospital site.

Pause for Commissioner Questions:

Moline asked for clarification to confirm whether the stated number corresponds to the square footage already built.

Zuccaro explained that the number reflects the existing development, which includes the main hospital, Centennial Peaks Hospital, and medical office buildings. He noted that if approved, the applicant could demolish and rebuild under the new maximum cap, but the total development could not exceed that cap.

Bangs pointed out that a table on page four of the staff report shows the existing square footage as slightly different (349,977 sq ft) and noted that the proposed GDP change still results in a higher square footage than what currently exists, suggesting there may be a net change that needs clarification.

Zuccaro noted that there may be a typo in the presentation, but would need to refer to staff report, but that the GDP represents the new cap.

Staff Presentation continues:

Zuccaro explained that the applicant is requesting an additional 364,400 sq. ft. of development capacity within the ConocoPhillips/Red Tail Ridge GDP, limited to their parcel. This would raise the overall cap from 2.5 million to 2.9 million sq. ft., though after swapping capacity with the Avista campus, the net increase is only about 13,000 sq. ft. The intent is to ensure adequate utilities and limit traffic impacts, which were key concerns in earlier approvals.

He outlined zoning and design standards for the hospital parcel: height limits for 3–5 story zones (with the hospital at five stories), step-backs above 45 feet, footprint reductions for taller levels, and rooftop enclosure setbacks. These measures are intended to minimize visual impact and promote architectural variety.

He described a 7.5-acre open space dedication north of the Avista campus, which combined with an earlier dedication, would total 17.5 acres. While the applicant has already satisfied public land requirements, this addition would expand the City's open space. The Open Space Advisory Board recommended approval, though noted the applicant's request that the land remain natural space without trails, with future management discussions suggested.

Pause for Commissioner Questions:

Moline asked if there had been a staff open space recommendation as part of the prior night's discussion.

Zuccaro confirmed that City open space staff had reviewed the proposal, supported incorporating the parcel into open space, and noted the Open Space Advisory Board had already identified it as a high-priority area in 2023.

Brauneis asked what specifically made the property a priority citywide.

Zuccaro explained that the entire parcel was designated high priority because of its value as a buffer contiguous to existing open space and factors like vegetation. He added that this site was one of several (about six to eight) identified across the city in 2023 for potential acquisition.

Staff Presentation continues:

Zuccaro reviewed proposed setback changes for the Avista campus GDP, reducing requirements to 5 feet for parking/drive aisles and 20 feet for buildings, while maintaining large buffers to the Cole Creek neighborhood. Staff supports the change, emphasizing that the campus will still provide significant separation and protection.

He explained that the GDP functions as customized zoning and must meet municipal code standards for coordinated design. Staff found the proposal consistent with these principles, citing clear massing standards, compatibility with nearby Broomfield buildings (4–5 stories), adequate utilities, limited traffic impacts, and expanded buffers/setbacks. The proposal also aligns with the Comprehensive Plan, which allows taller buildings when clustered and buffered, a condition achieved through major open space dedications in both Louisville and Broomfield. He noted Broomfield is finalizing a conservation easement on adjacent land, further strengthening buffers. Historical approvals for the site had

permitted heights up to 95 feet, making the current request consistent with prior expectations.

Zuccaro reported that traffic impacts were analyzed with primary access planned off Rock Crest Drive. Red Tail Ridge is building supporting infrastructure, but additional refinements will occur at the PUD stage, with a development agreement to assign costs to the hospital. On utilities, staff confirmed that existing water and wastewater infrastructure, including the Red Tail Ridge lift station, can handle the additional demand without new facilities.

Staff Recommendation:

Staff recommended approval of both **Avista Adventist Hospital GDP, Amendment No. 2** – Resolution 12, Series 2025 and **ConocoPhillips Campus GDP, Amendment No. 1** –Resolution 12, Series 2025.

Commissioner Questions of Staff:

Bangs asked whether transportation improvements at the PUD stage would include public transit as well as cars.

Zuccaro clarified that the traffic study focuses on vehicles but Redtail Ridge includes multimodal planning such as trails, sidewalks, and a microtransit shuttle. He added that while there is no RTD service, the City plans to meet with RTD about future options.

Moline raised a concern about the “density swap,” asking how to ensure it couldn’t later be reversed or changed by subsequent amendments.

Zuccaro explained that while this approval would set zoning and caps, future city councils could change them through ordinance or GDP amendment, though that is not the current intent. He noted that utility capacity and planning would also be reassessed if future changes were proposed.

Choi asked whether the Avista open space dedication would be permanent.

Zuccaro confirmed the land would transfer to City ownership, be zoned as open space, and could not be rezoned without a citywide vote.

Brauneis asked about the unusual nature of the “swap,” noting the City lacks a formal transfer of development rights program.

Zuccaro explained this was not a formal TDR program but rather a negotiated approach to address community concerns about traffic and infrastructure.

Bangs confirmed the GDP changes apply only to the 40-acre hospital parcel and asked whether the hospital intends to build to full density immediately.

Zuccaro said the applicant could best address phasing plans.

Bangs also asked if open space trail restrictions could change in the future.

Zuccaro responded that trail access could be reconsidered through future amendments if ownership or use changed.

Choi sought clarification on whether reducing Avista's development cap while dedicating seven acres of open space would increase the development ratio on the remaining parcel.

Zuccaro confirmed the ratio would increase, though Avista's GDP is governed by a square-footage cap rather than a floor area ratio. He said the specific ratio could be calculated.

Moline asked whether there are existing or planned trails in the open space area.

Zuccaro said there are social trails and past golf course access routes, and that trail connections to US 36 were studied in 2018 with several possible alignments, some of which may cross the dedicated acreage.

Brauneis questioned the value of restricting trails in open space and suggested the city might prefer to hold the property unencumbered.

Zuccaro explained that some city open space parcels are designated as "no activity," and while trails would not be planned, public access would not be prohibited. He added it is better to secure the land now and leave room for future discussions.

Mihaly asked whether the amendment would negatively affect traffic planning for Campus Drive, noting the packet suggests it may even improve outcomes.

Zuccaro deferred to the applicant's traffic engineer to address the analysis but acknowledged that the redistribution of density could be the reason for improved traffic projections.

Applicant Presentation:

Mark Smith (CEO, AdventHealth Avista Hospital)

- Introduced AdventHealth, noting it operates 55 hospitals in nine states with over 100,000 employees.
- Explained that AdventHealth recently purchased 40 acres in Redtail Ridge to construct a replacement hospital for Avista, which has served Louisville since 1990.

- Cited the Marshall Fire evacuation challenges and the need for better access, expansion capacity, and modern facilities as reasons for relocation.
- Emphasized that the GDP approval is an early step, with a detailed PUD submission to come in November, covering site access, plans, and compliance with city requirements.
- Thanked staff for collaboration and framed the project as necessary to meet the community's evolving health needs.

Valerie Wilkins (Adams Management, Program Manager & Owner's Rep)

- Introduced her role managing the Avista campus project on behalf of AdventHealth.

Afsaneh Makooi

(Smith Group, Design Team Project Manager)

- Explained rationale for five-story hospital height, noting operational efficiency, patient adjacencies, and wayfinding visibility.
- Outlined design standards: step-backs above 45 feet (15 ft), limitations on upper-story square footage (50% of base footprint), architectural roof screening, and additional step-backs above 95 feet.
- Provided examples of comparable five-story hospitals in Colorado (Good Samaritan, UC Highlands Ranch, St. Anthony North, UC Health Medical Center of the Rockies).
- Noted hospitals require greater floor-to-floor heights due to structural, medical gas, ventilation, and infection-prevention systems.
- Highlighted contextual fit: across Northwest Parkway are existing four- and five-story multifamily and office buildings.

Wilkins (on Phasing & Trails)

- Shared that Phase 1 will include the hospital and one medical office building.
- Future phases may add a second office building and a bed tower expansion.
- Addressed trail concerns: AdventHealth opposes trail development on the parcel while it functions as a secure medical campus (safety, liability, parking impacts).
- Stated willingness to revisit trail discussions if land use changes in the future.

Curtis Rowe (Kimley-Horn, Traffic Engineer)

- Addressed traffic concerns, specifically Campus Drive.
- Confirmed that the planned roadway network, including Campus Drive, will adequately accommodate hospital and Redtail Ridge traffic at full buildout.

- Concluded that no additional roadway improvements are required to support the hospital project.

Commissioner Questions of Applicant:

Bangs asked if the traffic study assumed use of the proposed micro-shuttle service or was based solely on personal vehicles.

Rowe explained that the study used national Institute of Transportation Engineers (ITE) standards, which are vehicle-centric and provide a conservative baseline. He noted that Colorado's strong multimodal options would likely reduce actual vehicle trips compared to the national averages.

Bangs followed up on whether bikeways and pathways were factored in. **Rowe** confirmed they were not directly factored in, but they would reduce traffic if used, meaning the study was intentionally conservative.

Choi asked whether the traffic projections included the entire Redtail Ridge buildout as well as full development of the Avista parcel.

Rowe confirmed that the analysis accounted for both: full Redtail Ridge and the hospital parcel at maximum buildout, including office buildings and the bed tower expansion.

Choi asked about the actual heights of adjacent Broomfield residential buildings shown in the applicant's contextual slides.

Makooi explained that five-story residential buildings are about 60 feet tall plus 10–12 feet of rooftop mechanical screening, for a total of roughly 70 feet. In comparison, the hospital would be up to 105 feet with its mechanical penthouse.

Choi questioned whether the additional 350,000 square feet in the development cap was driven by programmatic needs or simply maximizing allowable space.

Wilkins said it was based on master planning to meet projected community healthcare needs, particularly bed capacity and medical office space, not just maximizing square footage.

Choi asked about the difference in bed count between the current Avista and the proposed hospital.

Wilkins explained the current Avista has 90 beds, while the proposed design in schematic planning is 373,000 square feet with 150 beds, close to the existing development cap.

Public Comment:

Cindy Bedell (Louisville resident) asked for clarification about Centennial Peaks Hospital, noting she thought she heard it was a separate entity from AdventHealth. She wanted to know whether Centennial Peaks would remain in its current location or be affected by the proposed changes.

Smith (AdventHealth CEO) responded to public comment, confirming that Centennial Peaks Hospital operates under a long-term land lease exceeding 50 years and will not be affected by the new hospital plans.

Brauneis asked how the applicant would feel about a condition requiring reconsideration of trails on the donated open space.

Smith said AdventHealth is open to continuing conversations, though they remain cautious about trails in close proximity to medical facilities.

Moline asked about future plans for the current Avista campus once the hospital relocates.

Smith said the future use is still under evaluation, with no final decisions, though inpatient services would move to Redtail Ridge.

Bangs asked what assumptions were made in the traffic study regarding the existing Avista site once operations move.

Rowe (Traffic Engineer) explained the study assumed continued medical use at the site; if it became another use, such as high-density residential, traffic impacts would differ.

Zuccaro provided the floor area ratio (FAR) calculation after the open space dedication. With the cap of 398,894 square feet, the FAR is approximately 14%, and with the open space dedication, it increases slightly to 16%.

Commissioner Discussion:

Moline supported the proposal, praising staff and the applicant for balancing hospital retention, open space dedication, and traffic/utility concerns, and found the massing and height standards thoughtful.

Mihaly agreed, noting his height concerns were eased by design standards and the site's low location; he supported the redistribution of development capacity and highlighted the long-term benefit of added open space.

Bangs concurred, cautioning against confusion around the "land swap" terminology, urging diligence in monitoring the future of the Avista campus, and emphasizing multimodal access.

Choi voiced support, acknowledging initial concerns about the Avista parcel's development ratio but accepting staff's FAR calculations; he praised the applicant's efficient, vertical design approach.

Brauneis also supported the project, recognizing its visibility but valuing the placement of taller buildings at the low point, the step-backs, and the balance of traffic, utilities, and open space; he suggested further discussion on trail access.

The commission agreed not to impose a binding trail condition but to echo the Open Space Advisory Board's recommendation for continued talks with the applicant. **Choi** moved, with **Brauneis** seconding, to forward this recommendation to City Council, and the motion passed unanimously.

Motion to approve **Avista Adventist Hospital GDP, Amendment No. 2** – Resolution 12, Series 2025 was moved by **Moline** and seconded by **Brauneis**. The motion was adopted by a vote of 4 to 0.

Motion to approve **ConocoPhillips Campus GDP, Amendment No. 1** –Resolution 12, Series 2025 was moved by **Choi** and seconded by **Brauneis**. The motion was adopted by a vote of 4 to 0.

- b. **811 Walnut Rezoning** – Resolution 14, Series 2025 recommending to the City Council approval of a rezoning from Residential Medium (R-M) to Community Commercial (C-C) for 811 Walnut.

Staff Presentation:

Emily Cline-Gibson presented Resolution 14, Series 2025, a request to rezone 811 Walnut Street from Residential Medium Density (RM) to Commercial Community (CC). The property, originally platted in 1880 and built out in 1954 for telephone operations, has housed various commercial uses but today only retains a valid professional office SRU, with other past approvals expired. Rezoning would align the site with its long-standing commercial function, extend the adjacent CC district, and allow 23 new uses (10 by right, 13 by SRU with public hearings). No exterior changes are proposed, and future redevelopment would require a PUD. Staff recommended a follow-up text amendment to bring the property into the Downtown Design Handbook area. Concluding that the request meets rezoning criterion #2 (area change in the public interest), staff found the property's small scale limits redevelopment, the rezoning would reasonably extend downtown, and the proposal supports the 2013 Comprehensive Plan goals of revitalization, job creation, and local revenue growth.

Staff Recommendation:

Staff recommended approval of **811 Walnut Rezoning** – Resolution 14, Series 2025.

Commissioner Questions of Staff:

Choi asked whether staff had verified if the property at 811 Walnut Street was outside the required distance buffer for natural medicine healing centers, which were recently added as a permitted use.

Cline-Gibson responded that staff had not specifically verified that distance for this site but confirmed that if an application for such a use were submitted, staff would conduct the verification at that time. (see verification below that property would not currently be eligible for such a use with the buffer requirements from certain land uses).

Applicant Presentation:

JD Green, property owner of 811 Walnut Street, requested rezoning from Residential Medium Density (RM) to Commercial Community (CC). He explained that the change would align zoning with the building's long-standing commercial use and support small, locally owned retail consistent with Old Town Louisville's walkable character.

George Colbert, co-owner of Colbert Hat Co., presented his family-owned custom hat business specializing in cowboy hats, fedoras, and trucker hats with personalized fittings and styling. He described the shop as a low-impact, appointment-driven model (about 80% by appointment) that generates limited traffic while attracting destination customers who spend time and money in downtown. Colbert emphasized the company's community engagement through successful pop-ups, local sponsorships, and event partnerships, noting the business would complement existing retailers, contribute to local jobs and tax revenue, and that 811 Walnut Street's size, layout, and parking make it an ideal first storefront, with the potential to open by the holiday season.

Commissioner Questions of Applicant:

Moline asked if the applicant anticipated any exterior changes to the building.

Colbert replied that only minimal changes were considered, such as small signage or window frosting. Any formal signage proposal would be brought back for approval.

Bangs asked whether the business would use outdoor space.

Colbert said no, apart from possibly placing chairs outside for waiting customers. He added that the business had just launched a website, so there might be limited product shipping, though mostly localized.

Green noted the building already accommodates UPS deliveries through the back door, similar to its current use.

Brauneis asked about ADA access, noise impacts, and overlay requirements. **Zuccaro** clarified there was ADA access at the back and occasional outdoor seating would not trigger a Special Review Use (SRU) so long as it wasn't tied to sales or displays. Noise would be governed by the city's "unreasonable noise" standard.

Cline-Gibson explained that while the property is currently outside downtown Louisville's defined overlay, staff recommends initiating a text amendment to include it, ensuring consistency with downtown design standards. **Zuccaro** added that the property would fall within the "transition area," requiring architectural standards to ensure compatibility with adjacent residential uses. **Green** voiced support, noting he owns another Main Street property already subject to such standards.

Choi asked whether including the site in the downtown overlay would be a condition of approval.

Zuccaro said staff did not propose it as a condition but intends to pursue the amendment with the property owner's support.

Public Comment:

None were heard.

Commissioner Discussion:

Choi said the decision was straightforward, noting the property has been non-conforming for 75 years. He supported rezoning to bring it "into the fold" and appreciated staff's plan to adjust the downtown overlay language to ensure integration with design standards if exterior modifications occur.

Mihaly agreed with **Choi** and voiced support for the small business but raised concern about natural medicine healing centers being allowed adjacent to a residential neighborhood. After **Cline-Gibson** clarified that the property lies within a 1,000-foot buffer and therefore such a use would not be permitted, **Mihaly** said that addressed his concern and he was supportive.

Bangs expressed general support, seeing the rezoning as consistent with decades of prior commercial use and hoping it will be a success.

Moline also supported the rezoning.

Brauneis closed by stating he too supported the request for the reasons cited by his fellow commissioners.

Motion to approve **811 Walnut Rezoning** – Resolution 14, Series 2025 was moved by **Moline**, seconded by **Choi**, and adopted by a vote of 4 to 0.

PLANNING COMMISSION COMMENTS

Choi and **Mihaly** both noted they will be absent for the October 9th meeting.

Choi inquired about a second October meeting besides the October 9th meeting.
Hirt responded no.

Choi asked if there exists standard language around when there is a conflict.
Brauneis responded that he could work with staff on that.

STAFF COMMENTS

None were heard.

ADJOURNMENT

Motion to adjourn was moved by **Moline**, seconded by **Bangs**, and adopted by voice vote.

The Commission adjourned at 8:46 PM.

Planning Commission Meeting Minutes

**October 9, 2025
City Hall, Council Chambers
749 Main Street
6:30 PM**

Call to Order – Chair **Brauneis** called the meeting to order at 6:30 PM.

Roll Call was taken, and the following members were present:

Commission Members Present: Steve Brauneis, Chair
Debra Baskett, Vice Chair
David Bangs
Jennifer Hunt
Jeff Moline

Commission Members Absent: Cullen Choi, Secretary
Jonathan Mihaly

Staff Members Present: Jeff Hirt, Planning Manager
Emily Cline-Gibson, Planner II
Rob Zuccaro, Community Development
Director
Matt Post, Senior Planner
Cameron Fowlkes, City Engineer, Public
Works

APPROVAL OF AGENDA

Motion to approve the agenda was moved by **Moline**, seconded by **Bangs**, and adopted by voice vote.

PUBLIC COMMENTS ON ITEMS NOT ON THE AGENDA

None were heard.

PUBLIC HEARING ITEMS – NEW BUSINESS

- a. **Coal Creek Village Mixed Use Development** – Resolution 15, Series 2025 with a recommendation to City Council for a rezoning, subdivision, and Planned Unit Development (PUD) request for the 10.7-acre vacant property located near the southwest corner of South Boulder Road and Highway 42.

Staff Presentation:

Post introduced the presentation for the **Coal Creek Village Mixed Use Development** – Resolution 15, Series 2025. The plan would rezone the site from CCMU and RM to MUR, enabling 188 housing units and 13,500 square feet of commercial space within five blocks of townhomes, mixed-use, and multifamily buildings. A revised traffic study—requested after 2024 hearings—found that the planned Front Street connection is essential to reduce unsafe U-turns and maintain circulation, projecting 1,839 daily trips. Staff supports six design waivers to allow compact, walkable development and confirms the project aligns with the Comprehensive Plan, Highway 42 Revitalization Plan, and Housing Plan. Twelve percent of units will be affordable, and the design includes 316 parking spaces, sidewalks, open space, and public right-of-way dedication. City Engineer **Fowlkes** emphasized that the Front Street connection is recommended for safety, emergency access, and balanced traffic distribution, concluding that the proposal meets transportation and policy goals.

Staff Recommendation:

Staff recommended approval of **Coal Creek Village Mixed Use Development** – Resolution 15, Series 2025.

Applicant Presentation:

Applicant representative Sam **Coutts** of Ripley Design presented updates to the Coal Creek Village proposal on behalf of Markel Homes, emphasizing refinements made since 2024 to enhance connectivity, aesthetics, and neighborhood livability. The updated site plan includes two parks, a central plaza between mixed-use buildings, drought-tolerant landscaping, and cohesive architecture across housing types. Coutts highlighted a revised 2025 traffic study that analyzed “with” and “without” Front Street connection scenarios, confirming the connection improves safety, circulation, and pedestrian conditions while keeping traffic under 1,000 vehicles per day. In response to neighborhood feedback, the applicant introduced a compromise design: a raised, shared-use crossing that maintains emergency access but discourages cut-through traffic. The plan also includes off-site improvements such as turn-lane extensions and enhanced crosswalks. Overall, **Coutts** said the project supports the city’s Housing Plan by providing diverse, attainable housing and advancing walkable mixed-use redevelopment along the Highway 42 corridor.

Commissioner Questions of Staff:

Moline confirmed that staff would still recommend the Front Street connection even without rezoning.

Fowlkes affirmed and explained the connection is needed under existing zoning for safety and circulation.

Moline asked about timing for the Future 42 corridor improvements.

Fowlkes said Future 42 is unfunded, in long-range planning, and likely five to twenty years away.

Bangs asked if the SRU for ground-floor residential would increase apartment count.

Post said no, the SRU only changes layout, not total units.

Moline requested clarification on the alleyway behind Little Italy.

Post explained staff will ask the applicant to improve the alley and coordinate with property owners.

Moline confirmed the alley is outside the application area.

Post affirmed and clarified it is within city right-of-way south of the site and notes the applicant hasn't yet been informed about the alley-improvement request.

Bangs asked whether the alley is accessed from the east.

Fowlkes replied it is accessed from the west via Highway 42, with no connection to Front Street.

Bangs raised drainage concerns voiced by the public.

Fowlkes explained drainage flows to the detention pond and across Highway 42, not toward Little Italy.

Moline clarified a drainageway crosses the site and under Highway 42.

Fowlkes confirmed and noted overflow from the Goodhue Ditch goes the same way.

Brauneis asked why roads aren't wider and about level-of-service standards.

Fowlkes said intersection limits, not site design, cause failures and Future 42 will address them.

Brauneis confirmed Future 42 will have two lanes each direction and multimodal upgrades.

Fowlkes confirmed.

Applicant Presentation:

Applicant Sam **Coutts** of Ripley Design presented updates to the Coal Creek Village plan for Markel Homes, highlighting refinements made with staff and neighbors to improve connectivity, design, and livability. He described two parks, a pedestrian plaza, drought-tolerant landscaping, and cohesive architecture across housing types. Coutts reviewed the updated 2025 traffic study, which found the Front Street connection improves safety and circulation while staying below 1,000 daily vehicles. To address resident concerns, the team proposed a raised, shared-use crossing that allows local and emergency access but discourages cut-through traffic, emphasizing the project's alignment with city housing and walkability goals.

Commissioner Questions of Applicant:

Moline asked where diverted traffic would go if drivers avoided the raised crossing.

Coutts responded that most westbound drivers would continue east to Highway 42 before turning north or using a right-then-right route, while residents would still use the raised connection.

Moline asked whether the raised section would be public or private.

Coutts explained it would be a private drive with a public-access and emergency-access easement.

Bangs asked if flashing pedestrian beacons were still planned.

McDowell-Schrader replied that beacons were considered but not warranted, and staff preferred raised crossings, bump-outs, and signage.

Fowlkes confirmed that RRFBs would not be installed unless warranted and said the crosswalk would be raised and signed.

Hunt asked whether the raised design would slow traffic and deter navigation apps from routing drivers through.

Coutts agreed and said terminating and renaming the street would prevent mapping apps from identifying it as a through route, reducing cut-through traffic.

Public Comment:

David Finamore opposed the Front Street connection, saying traffic already cuts through his neighborhood and additional volume would endanger children walking to Coal Creek Elementary. He urged the Commission to find another solution or keep the road closed.

Juliana Massaro (Attorney for Snarf Sandwiches) spoke on behalf of Snarf's Sandwiches, which operates nearby, expressing concern about access changes, potential congestion, and how construction or rerouting could impact local business operations and deliveries.

Annabelle Maas opposed the street connection and said neighborhood safety and quality of life would be reduced by increased cut-through traffic. She stressed that once opened, the road could not easily be closed again.

Andy Maas echoed concerns about the Front Street link and argued that the area's infrastructure could not safely accommodate additional traffic. He urged the City to block the connection or limit it to emergency access only.

Conrad Zemen said the project was too dense and out of scale with surrounding homes. He cited worries about noise, drainage, and light pollution, asking for lower building heights and reduced unit counts.

Robert Kulicowski said parking overflow was already an issue nearby and would worsen with the new development. He requested stricter parking requirements and on-street management to protect residents.

Linda Cateora urged the Commission to consider wildlife and environmental impacts, emphasizing that bright lighting along Coal Creek would disturb owls and foxes that live in the corridor.

Anita Menendez said the developer had responded to some neighborhood feedback but the project remained too tall and dense, especially next to smaller homes. She requested upper-story step-backs or height reductions along the residential edge.

Mark Zemen spoke against the project's height and massing, saying five-story buildings were incompatible with nearby one- and two-story homes. He urged the developer to step upper floors back or reduce building height near the neighborhood edge.

Rita Zamora raised concerns about parking overflow during community events and requested that the city require on-site guest parking or residential parking permits to protect nearby streets from congestion.

Jody Ash discussed the impact of bright parking-lot lighting on local wildlife and supported requiring full cutoff, dark-sky-compliant fixtures to preserve the natural character of the Coal Creek corridor.

Colby said the project looked nice but argued that narrower sidewalks and higher traffic would reduce pedestrian safety, worsen congestion, and threaten neighborhood pets and wildlife.

Caitlin Sagrillo described existing speeding issues on Front Street and urged the city to install traffic-calming features—like speed humps and raised crossings—before construction begins, not after problems arise.

Mark G. warned that drivers from Broomfield would cut through the Del apartment lot and narrow private alleys to reach the new development, creating safety and congestion issues for residents.

Jean Morgan urged the city to pause approval until a comprehensive traffic-management plan is completed, saying individual projects like this one contribute cumulatively to worsening congestion.

Cindy Bedell said the project would push cut-through traffic onto neighborhood streets, creating safety hazards and parking conflicts, and asked the Commission to reconsider the street connection.

Andre Armijo focused on drainage, noting that stormwater already pools near Canon Circle and asking the city to guarantee proper detention-pond maintenance and protection for nearby yards.

Michael McClure said repeated neighborhood input had led to few visible changes and urged commissioners to take residents' safety and traffic concerns more seriously in their decision.

Jet Sandoval (pooled time with Joyce Goglio) reminded the Commission of Louisville's small-town character, warning that large, high-density projects erode that identity and requesting that Coal Creek Village be scaled back or denied.

Sonam Pejuhesh, a Canon Street resident and child therapist, warned that the Front Street connection would endanger children and disrupt Little Italy's quiet, family-oriented character, urging growth that prioritizes neighborhood safety.

Laurel Danuff (pooled time with Jack Sagrillo) supported adding housing but said 12 percent affordability was inadequate if rezoning increases density; she urged a higher on-site affordable-unit percentage.

Lauren Foster (pooled time with Daniel Alejandro) raised safety concerns at the Canon Circle intersection, said turning left onto South Boulder Road is already difficult, and warned that added traffic would make it unsafe without a signal or protected turn.

Commissioner Questions of Applicant:

Bangs asked about Snarf's Sandwiches' concern over business access.

Markel said they worked with Snarf's and city staff to shift the curb cut at Canon to preserve full turning access, which would be added as a project condition.

Brauneis asked about staff's proposed conditions.

Markel said the project aimed for a “win-win-win” outcome by redesigning the Front Street connection as a private drive that breaks up the right-of-way to deter cut-through traffic. He explained that two-thirds of prior traffic counts were from cut-through drivers, which the new design would largely eliminate, reducing projected volumes. Further stated that landscaping, curves, and a less direct route would further discourage both navigation apps and habitual cut-through drivers.

Moline asked about the northwest property owner surrounded by the project.

Markel said they'd worked with that owner for several years, offering access, parking spaces, landscaping, and sidewalk connections but felt repeated requests had become unreasonable despite their efforts to accommodate him.

Brauneis asked why Markel Homes didn't pursue a single-family neighborhood similar to North End.

Markel said city plans require higher density and that the project intentionally includes diverse housing—micro homes, townhomes, multifamily, and affordable units—to address regional housing affordability gaps. He said smaller units naturally improve attainability and align with city housing goals.

Bangs asked whether the traffic study distinguished resident versus cut-through traffic.

Markel confirmed it did, explaining that charts in the report identified internal (residential and retail) traffic separately from external cut-through traffic, which accounted for roughly 60 percent of existing volumes and would be reduced by the private drive design.

Commissioner Questions of Staff:

Brauneis asked staff to respond to the applicant's statement that the city's housing and comprehensive plans reflect an active city push for higher density and diverse housing types.

Post explained that multiple adopted plans—the Housing Plan, Comprehensive Plan, South Boulder Road Small Area Plan, Highway 42 Revitalization Plan, Mixed-Use Overlay, and Mixed-Use Design Standards—all call for added density and connectivity in this corridor. Affirmed the applicant's interpretation was accurate and that staff administers policies adopted by prior councils and commissions that intentionally support such density and connections in this location.

Brauneis confirmed that the Front Street connection comes down to the u-turns.

Post added that the Front Street connection addresses safety issues like dangerous U-turns on South Boulder Road and that the city's policy framework consistently promotes connected street networks in mixed-use districts.

Bangs asked whether the Front Street link could be limited to emergency access only, rather than open to general traffic.

Post responded that emergency-only access would conflict with adopted city policies favoring full vehicular and multimodal connectivity; said that approach might fit denser, transit-heavy urban areas but not Louisville's current context.

Zuccaro emphasized that limiting the connection would worsen safety by forcing westbound drivers to make hazardous u-turns and reiterated that the connection supports both policy goals and practical circulation needs. Noted that these policies also advance transit-oriented development near the future commuter rail station planned for 2029, aligning with regional transit goals.

Bangs reflected that the Commission must weigh adopted policies against on-the-ground neighborhood realities and deferred further discussion to deliberation.

Zuccaro Clarified that the Planning Commission is free to disagree with staff's recommendation; staff's duty is to implement adopted policies while seeking balance between growth goals and neighborhood concerns.

Hunt asked if there were active plans to improve the Highway 42 and South Boulder Road intersection alongside the transit-oriented redevelopment.

Zuccaro confirmed the city and CDOT have adopted the Highway 42 Vision Plan and begun design work for intersection and capacity upgrades, though construction likely remains five to ten years away.

Fowlkes added that funding is not yet secured but the city is pursuing DRCOG master planning and funding processes to advance multimodal and intersection improvements along the corridor.

Commissioner Discussion:

Hunt thanked residents for their engagement and acknowledged their valid concerns and said the Front Street connection appears necessary under both current zoning and city plans. She noted that rejecting the project would effectively prevent any development on the property, which would conflict with the city's adopted comprehensive and housing plans. She concluded that, despite concerns, the proposal aligns with established policies and should move forward.

Moline said the project presented difficult trade-offs—supporting affordable housing goals but potentially harming nearby neighborhoods. He expressed concern that allowing the Front Street connection would have a detrimental impact on adjacent residents and questioned approving the project before intersection and traffic issues are addressed. He suggested exploring alternatives that permit development without opening Front Street to through traffic.

Baskett said she was convinced by neighbors that allowing the Front Street connection would be untenable and expressed support for pursuing a version of the development that proceeds without the connection in future plans.

Bangs said he was generally comfortable with the project's waivers, drainage design, parking, rezoning, and overall density, noting it aligns with city housing and comprehensive plans. He thanked the applicant for revising the proposal and addressing traffic concerns but said he remained conflicted about the Front Street connection. He suggested a possible compromise of allowing an emergency-access-only connection, though he acknowledged that could later change, and said he was still struggling with including the full connection in the recommendation.

Brauneis agreed with colleagues that the project's requested accommodations were reasonable and praised the diverse housing mix as something new for Louisville. However, he said the Front Street connection remained the core issue, noting that it would permanently alter the adjacent neighborhood and that this concern left him conflicted about supporting the proposal.

Commissioners agreed to add a condition to designate the Front Street connection emergency access only at the cost of the developer.

Motion to approve **Coal Creek Village Mixed Use Development** – Resolution 15, Series 2025 was moved by **Moline** and seconded by **Baskett**. The motion was adopted by a vote of 5 to 0.

- b. **Louisville Center for the Arts Sign** – Resolution 16, Series 2025 with a recommendation to City Council for a PUD amendment to allow a new sign for the Louisville Center for the Arts located at 801 Grant Ave.

Motion to reschedule **Louisville Center for the Arts Sign** – Resolution 16, Series 2025 to November 13 was moved by **Moline** and seconded by **Bangs**. The motion was adopted by a vote of 5 to 0.

PLANNING COMMISSION COMMENTS

Moline thanked staff for their work on the Coal Creek Village Mixed Use Development issue.

STAFF COMMENTS

Hirt stated that a special meeting may be called to address the backlog of issues and reminded Commissioners of an upcoming joint discussion with City Council.

ADJOURNMENT

Motion to adjourn was moved by **Moline**, seconded by **Baskett**, and adopted by voice vote. The Commission adjourned at 10:12 PM

ITEM: Case No. PUD-0003-2025

PLANNER: Emily Cline-Gibson, Planner II

APPLICANT / OWNER: City of Louisville

LOCATION: 801 Grant Avenue

REQUEST: Approval of Resolution 16, Series 2025,
recommending approval of the Memory Square
Planned Unit Development (PUD) Amendment #1.

VICINITY MAP:



SUMMARY:

The City of Louisville is requesting approval of a Planned Unit Development (PUD) Amendment to allow for an electronic message center sign on the Louisville Center for the Arts property located at 801 Grant Avenue.

BACKGROUND:

The subject property is zoned Residential Low Density (R-L) and is subject to the [Memory Square Planned Unit Development](#) (PUD), which establishes development patterns on the property. Signage is evaluated against the [City of Louisville Sign Code](#) ("Sign Code") and all other site design elements are subject to [Title 17](#) of the Louisville Municipal Code (LMC).

The Memory Square PUD was approved by City Council in 2017 and includes a historically landmarked building, known as the Louisville Center for the Arts, a community pool, and a pool building. The property boundaries include a vacated portion of Grant Avenue and the eastern property line borders Memory Square Park. No amendments have been made to the PUD since its original approval. One freestanding interpretive sign is located on the property, and another freestanding sign was located near the southwestern corner of the Center for the Arts building but was destroyed in a storm in 2024. The previous sign was approximately 5.5 feet tall and 7 feet wide.



Image of the Arts Center and previous sign that was destroyed.

The Louisville Center for the Arts hosts a variety of events throughout the year, including concerts, art shows, theatre

productions, classes for adults and children, and meetings. Rental times range from a minimum of 2 hours to multiple days. The building is owned by the City and operated by the City's Cultural Services Department.

Ordinance No. 715, Series 1981 established sign regulations for the City of Louisville, including sign height and size requirements and total number of signs permitted on a

property. Notable amendments to the sign regulations include minor changes in 1992-1994 and a major code amendment in 2006. In 2019, the City of Louisville repealed all previous sign regulations and adopted a city-wide Sign Code through Ordinance No. 1779, Series 2019. Any new sign proposal must comply with the 2019 adopted Sign Code.

PROPOSAL:

The applicant is proposing to install one freestanding sign on the property. The proposed sign is 5 feet tall and approximately 7.7 feet wide. An approximate 1.3-ft. x 6-ft. bottom panel is proposed to be electronic and display Center for the Arts programming information, hours of operation, and potential emergency communications as deemed necessary by the City. The display text will be light colored against a dark background. The remaining sign area will not be electronic.

The sign will be located near the southeastern corner of the Center for the Arts building facing Spruce Street, in a similar location as the previous freestanding sign that was destroyed. The sign will be set back approximately 8 feet from the sidewalk and will be in an existing landscaped area. Sign posts for the destroyed sign are still located on the subject property but will be removed once the proposed sign is installed.



Rendering of the proposed electronic sign.

ANALYSIS:

An electronic message center sign is defined as *a sign capable of displaying words, symbols, figures, or images that can be electronically or mechanically changed by remote or automatic means*. Section 3.4 of the Sign Code regulates electronic message center signage, and states that electronic message centers that are not used as pricing signage for gasoline stations or display signs in commercial and mixed-use areas may only be permitted through the Final PUD process. Since the subject property is

residentially zoned and located in a residential area, the proposed sign must be reviewed as a PUD Amendment. Staff analysis includes review of the electronic message center sign criteria followed by requirements for freestanding signs in residential areas.

Sign Code Section 3.4 – Electronic Message Centers

There are seven criteria that all electronic message signage must meet. Staff analysis of each criterion is found below:

- 1. The electronic message area of a freestanding sign shall be integrated into the design of the freestanding sign. Such electronic message portions of freestanding signs shall not be an add-on feature, but rather must be fully integrated into the sign design.*

The proposed electronic portion of the sign is integrated into the overall design of the sign. This is demonstrated by the electronic and non-electronic portions of the sign being attached to the same posts along with matching hardware. The proposed sign is designed in a uniform manner as other signage located in City property, including the closest sign to the subject property located in Memory Square Park.

Other City signs with multiple panels also typically include a small gap between the top and bottom panels, which the proposed sign has incorporated into its design. **Staff find this criterion is met.**



Images of other City signs.

2. *All electronic message centers shall include a malfunction display and the ability to automatically shut off if a malfunction occurs.*

The software program that will be used to control the electronic sign is called Ignite OPx. This software has no subscription fees or data fees for the life of the sign. This program comes with automatic shut off and malfunction controls to be used in case of sign malfunction. **Staff find this criterion is met.**

3. *Transition method. The electronic message center shall be limited to static messages, changed only through either dissolve or fade transitions, which may otherwise not have movement, or the appearance or optical illusion of movement, of any part of the sign or structure, design, or pictorial segment of the sign, including the movement of any illumination or the flashing, scintillating or varying of light intensity.*

Ignite OPx is equipped with customizable messaging displays that allow the City complete control over message transitions, illumination, flashing, and other display methods. Only static messaging will be displayed on the sign, and transitions between messages will be limited to fade or dissolve effects, with no motion, flashing, or animation. **Staff find this criterion is met.**

4. *Transition duration. The transition duration between messages shall not exceed one (1) second.*

Transition duration between messages will not exceed one second. **Staff find this criterion is met.**

5. *Messages shall not transition on a frequent basis. The message hold time shall be appropriate for the site, surrounding neighborhood, uses, and roadway.*

The frequency of message transitions will be customized to an appropriate hold time based on the surrounding neighborhood and traffic conditions. **Staff find this criterion is met.**

6. *Lighting from an electronic message center shall not exceed 0.3 footcandles between dusk to dawn as measured from the sign's face. The City may require lower light levels if it determines less light is appropriate for the surrounding area. The electronic message center shall have automatic dimmer software or solar sensors to control brightness for nighttime viewing. The intensity of the light source shall not produce glare, the effect of which constitutes a traffic hazard.*

Ignite OPx software includes features that allow custom lighting based on time of day and the requirements of local zoning standards. The proposed sign will not exceed 0.3 footcandles from dusk to dawn and will include automatic dimming technology to prevent glare.

Additionally, Section 3.3 of the Sign Code outlines illumination standards for all signs, which includes the following requirement: *No illuminated sign visible from and located within three hundred (300) feet of any property in a residential zoning district may be illuminated between the hours of 11:00 p.m. or one-half hour after the use to which it is appurtenant is closed, whichever is later, and 7:00 a.m.*

Staff find this criterion is met.

7. *Existing signage proposed for conversion to the use of an electronic message center shall conform to the sign standards in these regulations prior to issuance of a sign permit. Nonconforming signs shall not be eligible for conversion to an electronic message center.*

No existing or nonconforming signage is proposed for the electronic message center. The proposed electronic signage will be attached to a new freestanding sign. **Staff find this criterion is not applicable.**

Sign Code Section 4.10.a – Freestanding Signs in Residential Areas

In addition to the electronic message center requirements outlined above, all freestanding signs must meet the requirements of Sec. 4.10.e of the Sign Code prior to the issuance of a sign permit. Staff finds the proposed sign meets the residential institutional criteria for freestanding signs.

Standard	Residential, Single-Family	Residential, Multi-Family	Residential, Institutional Use
Permitted	Yes	Yes	Yes
Permit Req'd	Yes	Yes	Yes
Max. Number	1 at each neighborhood entrance, not to exceed 4 signs. See note 6.	1 at each entry drive, not to exceed 2 signs. See note 6.	1 at each entry drive, not to exceed 2 signs. See note 6.
Max. Area	32 sf	40 sf	40 sf
Max. Height	6 ft	8 ft	8 ft
Illumination	Externally lit	Externally or halo lit	Externally or halo lit
Min. Setback	5 ft	8 ft	8 ft

Freestanding sign requirements from Sec. 4.10.e of the Sign Code.

The total area of the proposed sign, which is measured using the sign face and does not include structural supports, is approximately 18 square feet, and the maximum height, including posts, does not exceed 8 feet.

Subsection 1 clarifies that a sign may be located at a primary or secondary neighborhood entrance or entry drive, on privately owned common area, or a privately maintained median. Since no entry drives are located on the property, the sign placement is located within a common area on the property.

Subsection 4 requires all freestanding signs be located in a landscaped area that is a

minimum of three times the sign area, which would be a minimum of 54 square feet for the proposed sign. The existing landscape area is over 1,000 square feet.

PUBLIC COMMENTS:

Public comments can be found in Attachment 3.

STAFF RECOMMENDATION:

Staff recommend approval of Resolution 16, Series 2025, recommending approval of the Memory Square Planned Unit Development (PUD) Amendment #1.

ATTACHMENTS:

1. Resolution 16 Series 2025
2. Application Materials
3. Public Comments

**RESOLUTION NO. 16
SERIES 2025**

**A RESOLUTION RECOMMENDING APPROVAL OF THE MEMORY SQUARE
PLANNED UNIT DEVELOPMENT AMENDMENT #1**

WHEREAS, there has been submitted to the Louisville Planning Commission an application for a planned unit development amendment to allow the installation of one electronic message center sign on the property located at 801 Grant Avenue; and

WHEREAS, the subject property, Lots 5-11, Block 5 and vacated adjacent Grant Avenue of the Pleasant Hill Subdivision, is in the Residential Medium Density (RM) Zone District; and

WHEREAS, the City of Louisville Sign Code requires any electronic message center signs not located in commercial and mixed-use areas be permitted only if expressly authorized in an approved planned unit development; and

WHEREAS, City staff have reviewed the information submitted and found that the application complies with the Louisville zoning regulations, sign code and other applicable sections of the Louisville Municipal Code; and

WHEREAS, the Planning Commission has considered the application at a duly noticed public hearing on November 13, 2025, where evidence and testimony were entered into the record.

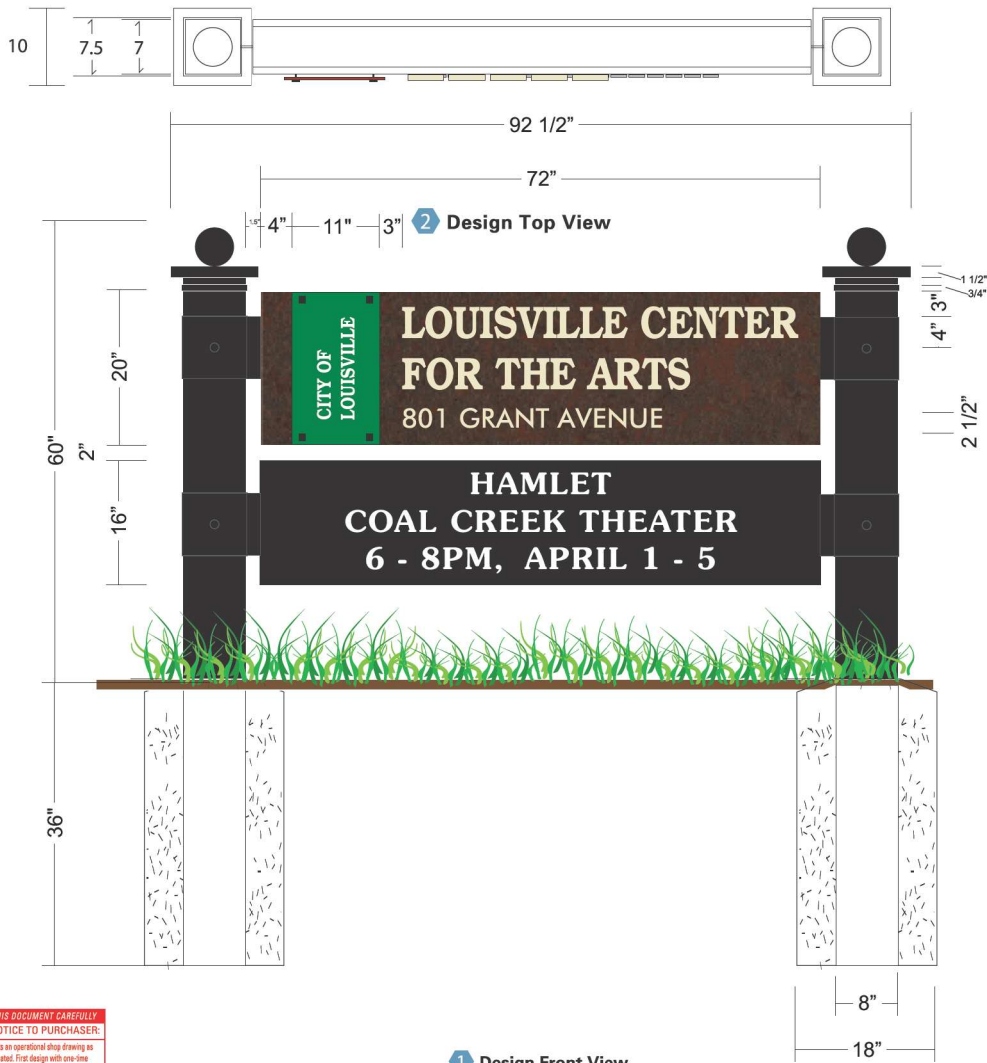
NOW THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Louisville, Colorado does hereby recommend approval of the Memory Square Planned Unit Development Amendment #1 to allow the installation of one electronic message center sign on the property at 801 Grant Avenue.

PASSED AND ADOPTED this 13th day of November, 2025.

By: _____
Steve Brauneis, Chair
Planning Commission

Attest: _____
Cullen Choi, Secretary
Planning Commission

***If acting as a representative/agent of the owner, include written authorization from the owner that certifies the agent's right to submit this application**



Color Schedule:

	PMS 3415 C
	Faux Corten Steel
	Black Satin
	PMS 7499
	3M White Vinyl

3/4=1

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1 Design Front View



Artcraft Sign Company
1717 S. Acoma St.
Denver, CO. 80223
(303) 777-7771
www.artcraftsign.com

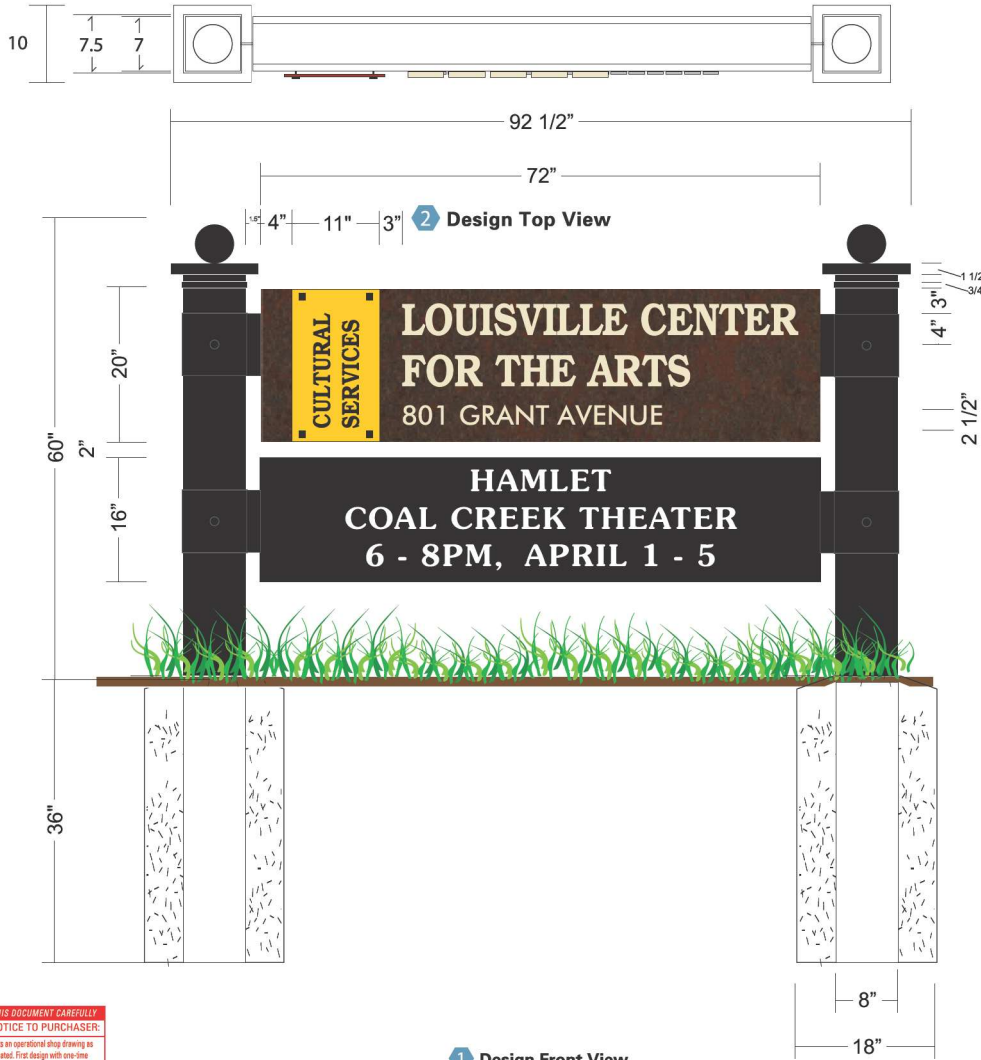
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Project:
City of Louisville

Page Title:

MEMORY SQUARE

Issue/Revision Dates: Page #:



Color Schedule:

	PMS 1235C
	Faux Corten Steel
	Black Satin
	PMS 7499
	3M Black Vinyl

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1 Design Front View

3/4=1



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MEMORY SQUARE

Issue/Revision Dates:

Page #:

Watchfire's Ignite OPx is the best cloud-based solution for complying with municipal codes across multiple signs. Our outdoor displays feature built-in settings that can restrict features to meet zoning requirements, such as requiring long hold times, limiting animations, or requiring signs to be turned off at night. If a user has multiple signs in different communities, OPx allows these settings to be configured on each sign individually.

BRIGHTNESS

Watchfire's LED signs can place an upper brightness limit for day and night municipal restriction codes. This guarantees brightness codes will be followed, ensuring compliant operation for the life of the sign. For example, if a community has a daytime brightness limit of 7500 NITS, the Watchfire Service department can limit the sign controller so the brightness cannot exceed that limit. Further adjustments by the sign owner to increase the brightness above that limit, whether accidental or intended, are then restricted.

HOLD TIMES & ANIMATIONS

Signs using Ignite OPx can also have a set threshold for minimum hold times and restrict the use of transitions or animations. If a municipal ordinance calls for longer hold times, for example, 1-minute hold times per message with no animations, Watchfire can configure the sign controller to comply. Hold times and animation restrictions can be applied per sign, preventing the accidental use of content that might violate municipal codes.

ON & OFF TIMES

Ignite OPx enables signs to be configured according to municipal ordinances that require LED signs to be turned off at night. Located in the Network tab, any sign can be set to have a start on and off time. OPx users can create and edit an on/ off schedule.

Program: ISA2022_1	Configuration
Program: Iowa High S	Screen Width 90
Web Player: TradeSh	Screen Height 60
Program: CI Display	Model Type BC760
	Monitor Orientation normal
Program: Iowa High S	Monitor Connection default
Playlist: NFHS Testin	TV Standard
	Master Volume 0
Program: OAAA2018	Line Volume 0
	Mic Volume 0
Program: OAAA2018	PCM Volume 0
	NTP Server N/A
Program: Red Wall	Day Brightness 140
	Night Brightness 140
Program: Red Wall	Max Allowed Day Brightness 7000
	Max Allowed Night Brightness 7000
Program: OAAA 2021	
Program: SignWorks	Animation No Restriction
	Minimum Hold Time No Minimum

Program: ISA2020.1

Schedule On/Off Times

All Days

On Starting At:

1200AM

Off Starting At:

1200AM

☒ Same Time Every Day

OkCancel

The Watchfire service department can set brightness, hold times, and animation restrictions. For more information on how these features can be used to ensure compliance with local zoning ordinances, please call our service team at 866-637-2645.

RE: Arts Center Sign Check In

From Travis Obenauf <TravisO@ArtcraftSignCompany.com>

Date Wed 5/21/2025 8:57 AM

To Iris Belensky <ibelensky@louisvilleco.gov>

Hi Iris,

I hope that this finds you well! Please see below for the industry standard/ standard practices for EMC illumination.

Illumination Standards for Electronic Messaging Centers (EMCs)

When considering an Electronic Messaging Center (EMC), there are several industry standards and best practices related to illumination that help ensure optimal visibility, compliance, and safety.

1. Brightness Standards

The industry standard, recommended by the International Sign Association (ISA) and the Illuminating Engineering Society (IES), limits brightness to:

- **5,000 nits during the day**
- **500 nits at night**

These levels ensure the sign is readable without being overly bright or distracting.

2. Automatic Dimming

Most EMCs come equipped with **automatic brightness sensors** that adjust illumination based on ambient light. This helps maintain proper visibility in all lighting conditions while reducing energy use and minimizing light pollution.

3. Zoning Compliance

Many local municipalities have specific regulations related to EMC brightness and operating hours. A common standard is that an EMC may not exceed **0.3 footcandles above ambient light levels**, typically measured at **100 feet** from the sign.

It's always best to review local sign codes before proceeding with installation.

4. Best Practices for Operation

- Use appropriate contrast between text and background for readability.
- Avoid overly bright or fast-changing animations that could distract drivers.
- Schedule brightness levels to automatically reduce at night for safety and compliance.

By following these established guidelines, you can ensure your EMC is both effective and responsible in its illumination.

Please let me know if you have any questions.

Best regards,
Travis

Travis Obenauf – Sales Executive

1717 S. Acoma St., Denver CO 80223

O: 303.777.7771 (x127) C: 719.459.5208

TravisO@artcraftsigncompany.com / www.artcraftsign.com

Wylde Ibis, LLC - Company Operated

Dear Members of the Planning Commission,

I am writing in support of the City of Louisville's application for a Planned Unit Development (PUD) amendment to install an electronic sign in front of The Center for the Arts. We believe this sign represents a uniquely valuable opportunity to meet a pressing communication need in a way that benefits the entire community.

The Center for the Arts sits at the heart of Louisville's cultural life and serves as a hub for creativity, civic connection, and lifelong learning. While the building itself is a recognizable landmark, the public programming inside it—and across the broader Cultural Services Department—often goes unseen. We currently lack an effective, visible, and accessible means of communicating with the public about city-sponsored events and initiatives that occur in this space and beyond.

An electronic sign, owned and controlled by the City, would provide a centralized, timely, and visually engaging way to share information about community programs, public events, cultural festivals, exhibitions, and more. This tool would not serve commercial interests but rather support civic life, ensuring that residents and visitors alike are aware of the rich, diverse, and inclusive opportunities offered by the City.

We believe this request is exceptional and meets the criteria for a PUD amendment because:

- The sign would be solely used for approved content, curated and managed by City staff in alignment with community values and aesthetics.
- There is currently no comparable communication tool in this highly visible location that allows for real-time updates and wide public visibility.
- The sign supports the City's mission to foster connection, curiosity, and cultural enrichment—goals aligned with the community's character and identity.
- It meets a unique functional need, helping residents stay informed and engaged in meaningful civic and cultural experiences.

Response to Electronic Message Center Standards (Section 3.4):

We have reviewed the City of Louisville Sign Code, and the proposed electronic message center will fully comply with all applicable design and operational standards, including:

- The sign will be an integrated element of the freestanding monument sign structure—**not an add-on**—ensuring compatibility with the building and surrounding streetscape.
- The system will feature **built-in malfunction detection** and an **automatic shut-off mechanism** in the event of a failure.
- **Only static messages** will be displayed. Transitions between messages will be limited to fade or dissolve effects, with no motion, flashing, or animation.
- Transition durations will **not exceed one (1) second**, and message hold times will be adjusted to be appropriate to the adjacent neighborhood and traffic conditions.
- Lighting from the electronic message center will not exceed **0.3 footcandles from dusk to dawn** and will include **automatic dimming technology** to prevent glare or safety concerns.
- The sign will be constructed in full conformance with the City’s current sign regulations and is **not a conversion of a nonconforming sign**.

We are committed to thoughtful design, responsible use, and ongoing evaluation of this signage to ensure it aligns with Louisville’s distinctive charm and community-oriented values. We respectfully request your approval and support for this application.

Thank you for your time and consideration. Please don’t hesitate to reach out if you have any questions or would like additional materials.

Warm regards,

Brandi Cummings
Director of Cultural Services

LOTS 5-11, BLOCK 5, PLEASANT HILL ADDITION & VACATED GRANT AVENUE
801 GRANT AVENUE, LOUISVILLE, COLORADO 80027
CASE # PUD- 0003 - 2025

PROJECT DESCRIPTION

THE PROPOSAL INCLUDES INSTALLING AN ELECTRONIC MESSAGE CENTER SIGN ON THE SOUTHWESTERN AREA OF THE PROPERTY WHERE A PREVIOUS FREESTANDING SIGN WAS PLACED. NO ADDITIONAL LANDSCAPING OR SITE CHANGES ARE PROPOSED.

PREVIOUSLY APPROVED PUD (7/18/2017)

THIS PROJECT INCLUDED THE DEMOLITION OF THE EXISTING +/- 3,000 SF POOLHOUSE AND CONSTRUCTION OF A NEW OPEN AIR +/- 2,800 SF POOLHOUSE AND ASSOCIATED IMPROVEMENTS, INCLUDING A DECK EXPANSION AND OUTDOOR CABANA AND STORAGE STRUCTURES. FOUR WAIVERS WERE REQUESTED WITH THE PUD AND INCLUDED DESIGN AND SLOPE OF ROOF, REAR YARD SETBACKS, PERIMETER LANDSCAPING, AND SCREENING REQUIREMENTS.

ADDRESS

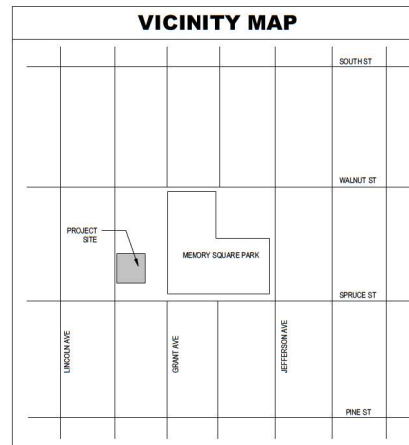
801 GRANT STREET, LOUISVILLE, CO 80027

LEGAL DESCRIPTION

LOTS 5-11, BLOCK 5, PLEASANT HILL ADDITION & VACATED GRANT AVENUE,
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 8, TOWNSHIP 1 SOUTH,
RANGE 69 WEST OF THE P.M.
CITY AND OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

ZONING

RESIDENTIAL LOW DENSITY (RL)

 VICINITY MAP

EXISTING CONDITIONS

ZONING DATA	CITY STANDARDS	EXISTING	PROPOSED
TOTAL SITE AREA	NA	31,500 SQ. FT.	31,000
LOT COVERAGE	4%	28%	28%
FLOOR AREA RATIO	.6	.28	.28
BUILDING HEIGHT	2' - 0" MAX.	13 - 6 1/4" (ABOVE FINISHED GRADE)	10' - 10" (ABOVE FINISHED GRADE)
SETBACKS:			
SIDE YARD - NORTH	7' - 0"	69' - 0"	69' - 4"
REAR YARD - WEST	20' - 0"	0'	0'
STREET SIDE YARD - SOUTH	5' - 0"	14' - 4"	14' - 4"
FRONT YARD - EAST	20' - 0"	99' - 0"	99' - 0"
CDORO			
OPEN SPACE COVERAGE	3%	68%	68%

SHEET INDEX

- | | |
|--------|---------------------------|
| 1 OF 4 | COVER SHEET |
| 2 OF 4 | SITE DEVELOPMENT PLAN |
| 3 OF 4 | GRADING AND DRAINAGE PLAN |
| 4 OF 4 | UTILITY PLAN |

OWNERSHIP SIGNATURE BLOCK

BY SIGNING THE PUD, THE OWNER ACKNOWLEDGES AND ACCEPTS ALL THE REQUIREMENTS AND INTENT SET FORTH IN THIS PUD. WITNESS MY/OUR HAND(S) SEAL(S) THIS _____ DAY OF _____, 20__.

CITY MANAGER DIANA LANGLEY SIGNATURE:

PLANNING COMMISSION CERTIFICATE

APPROVED THIS _____ DAY OF _____, 20____ BY THE
PLANNING COMMISSION OF THE CITY OF LOUISVILLE, COLORADO
RESOLUTION NO. _____, SERIES _____

CITY COUNCIL CERTIFICATE

APPROVED THIS _____ DAY OF _____, 20____ BY THE
CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO
RESOLUTION NO. _____, SERIES _____

MAYOR CHRISTOPHER LEH SIGNATURE:



SINK
COMBS
DETHLEFS

ARCHITECTURE DESIGN
475 LINCOLN STREET
SUITE 100
DENVER, CO 80203
Tel: 303-308-0200

NOT FOR
CONSTRUCTION

MEMORY SQUARE
PLANNED UNIT
DEVELOPMENT, FIRST
AMENDMENT

LOTS 5-11, BLOCK 5, PLEASANT HILL
ADDITION & VACATED GRANT AVENUE

801 GRANT AVENUE
LOUISVILLE, CO 80027

SCD Project No.:

All information appearing herein shall not be duplicated, disclosed or otherwise used without the written consent of Fire Control Details.

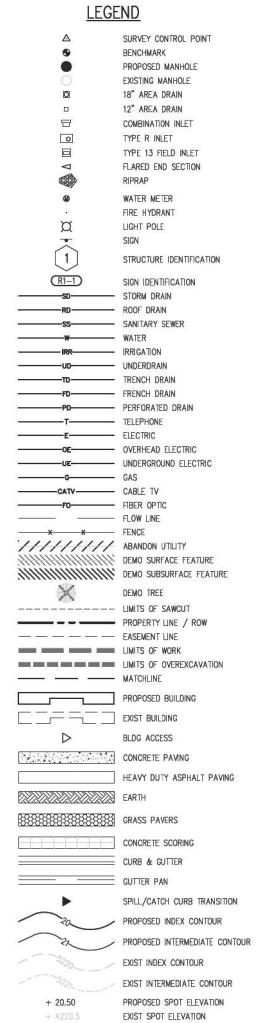
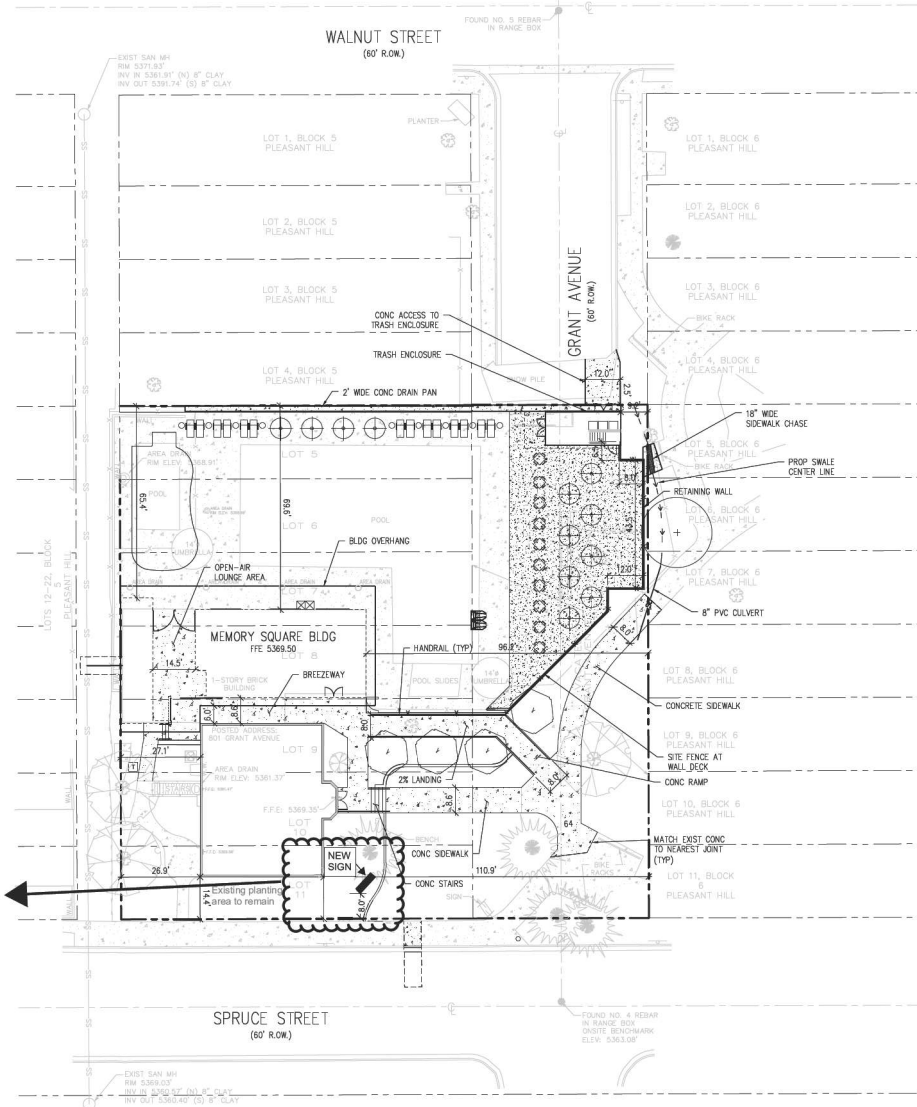
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COVER SHEET

1 OF 4

MEMORY SQUARE PLANNED UNIT DEVELOPMENT FIRST AMENDMENT

LOTS 5-11, BLOCK 5, PLEASANT HILL ADDITION & VACATED GRANT AVENUE
801 GRANT AVENUE, LOUISVILLE, COLORADO 80027
CASE # PUD-0003-2025



**SINK
COMBS
DETHLEFS**
ARCHITECTURE DESIGN
475 LINCOLN STREET
SUITE 100
DENVER, CO 80203
Tel: 303-308-0200

**NOT FOR
CONSTRUCTION**

**MEMORY SQUARE
PLANNED UNIT
DEVELOPMENT AND
SPECIAL REVIEW
USE**

LOTS 5-11, BLOCK 5, PLEASANT HILL
ADDITION & VACATED GRANT AVENUE
801 GRANT AVENUE
LOUISVILLE, CO 80027

SCD Project No.: 1641

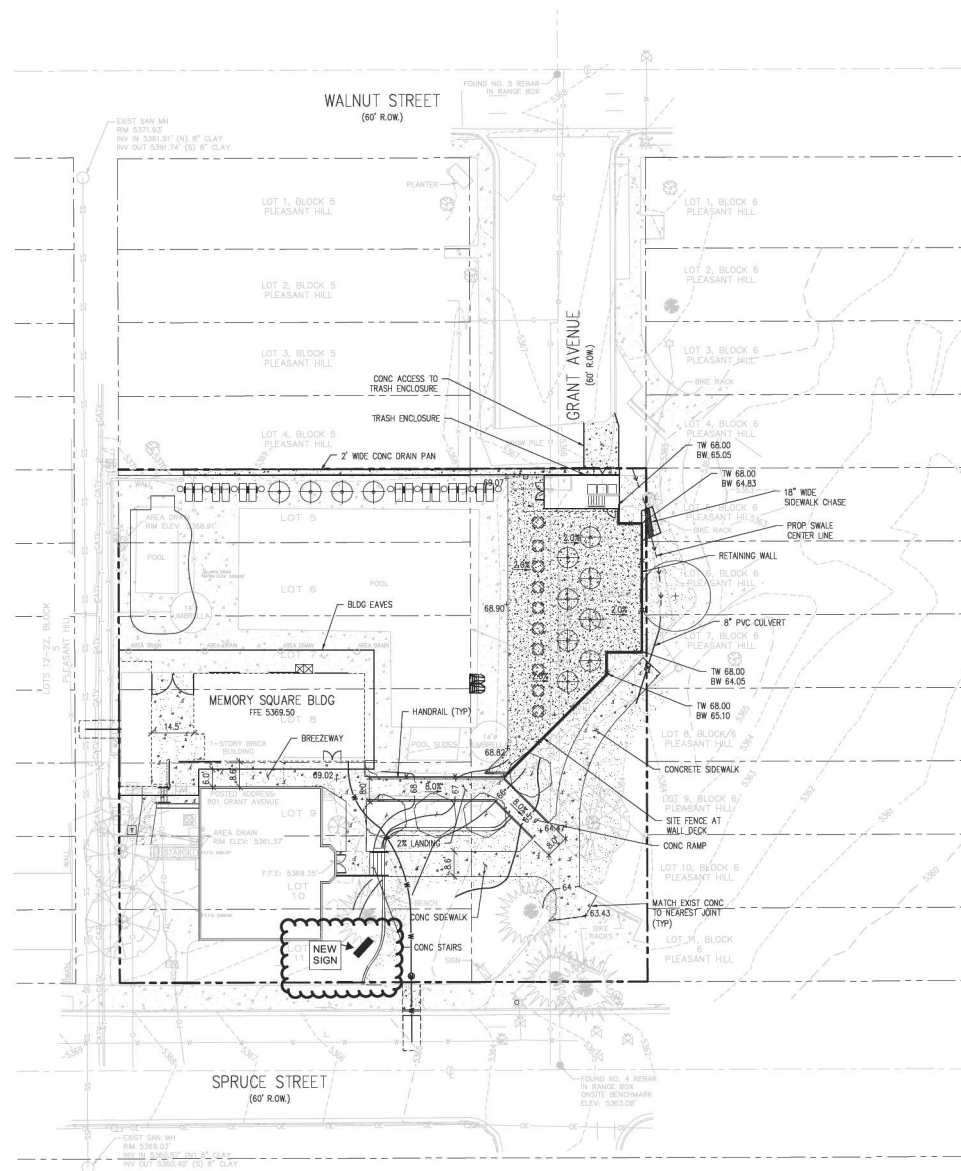
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No.	Issues/Revisions	Date

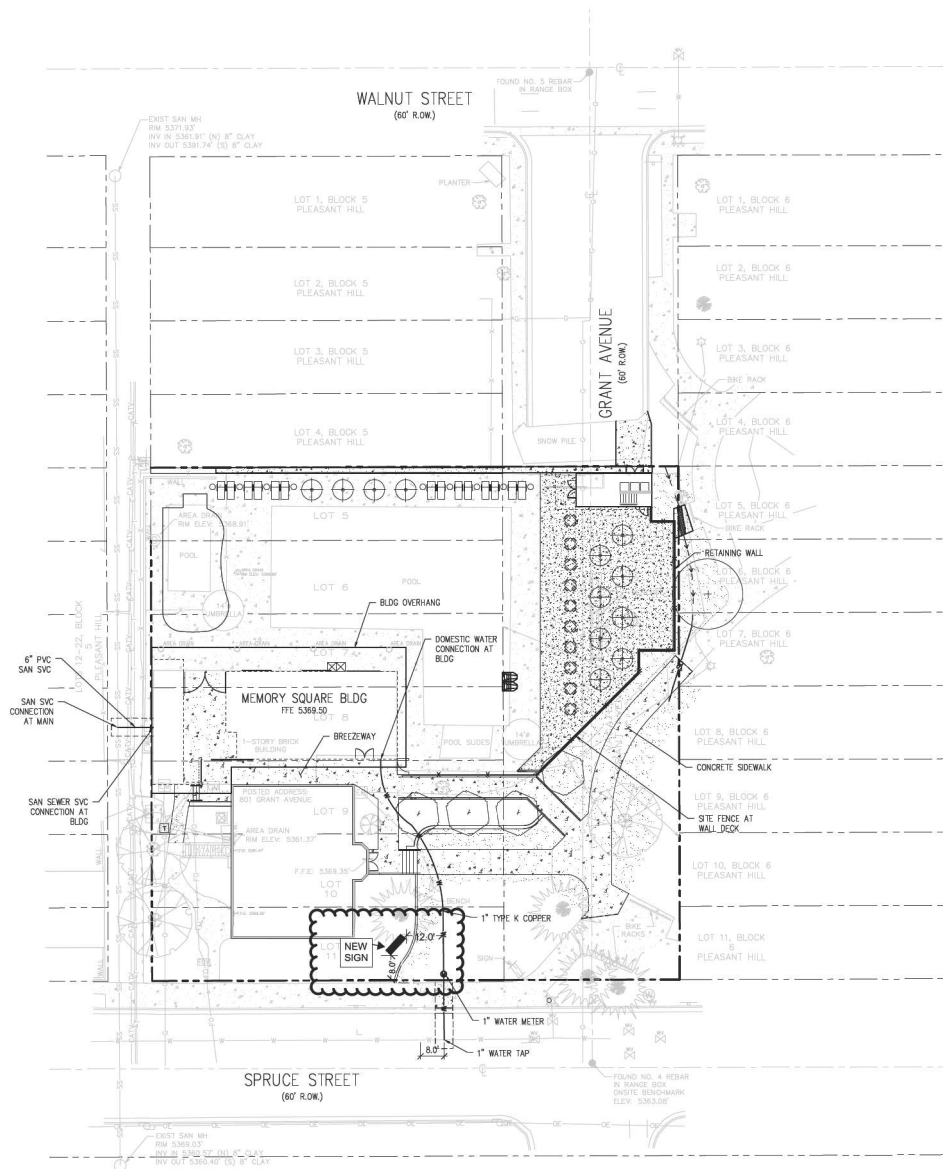
SITE DEVELOPMENT

MEMORY SQUARE PLANNED UNIT DEVELOPMENT AND SPECIAL REVIEW USE

LOTS 5-11, BLOCK 5, PLEASANT HILL ADDITION & VACATED GRANT AVENUE
801 GRANT AVENUE, LOUISVILLE, COLORADO 80027

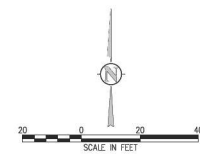


MEMORY SQUARE PLANNED UNIT DEVELOPMENT
AND SPECIAL REVIEW USE
LOTS 5-11, BLOCK 5, PLEASANT HILL ADDITION & VACATED GRANT AVENUE
801 GRANT AVENUE, LOUISVILLE, COLORADO 80027



LEGEND

- | | |
|--|-------------------------------|
| | SURVEY CONTROL POINT |
| | BENCHMARK |
| | PROPOSED MANHOLE |
| | EXISTING MANHOLE |
| | 15' AREA DRAIN |
| | 12" AREA DRAIN |
| | COMBINATION INLET |
| | TYPE R INLET |
| | TYPE 13 FIELD INLET |
| | FLARED END SECTION |
| | RIPRAP |
| | WATER METER |
| | FIRE HYDRANT |
| | LIGHT POLE |
| | SIGN |
| | STRUCTURE IDENTIFICATION |
| | SIGN IDENTIFICATION |
| | STORM DRAIN |
| | ROOF DRAIN |
| | SANITARY SEWER |
| | WATER |
| | IRRIGATION |
| | UNDERDRAIN |
| | TRENCH DRAIN |
| | FRENCH DRAIN |
| | PERFORATED DRAIN |
| | TELEPHONE |
| | ELECTRIC |
| | OVERHEAD ELECTRIC |
| | UNDERGROUND ELECTRIC |
| | GAS |
| | CABLE TV |
| | FIBER OPTIC |
| | FLOW LINE |
| | FENCE |
| | ABANDON UTILITY |
| | DEMO SURFACE FEATURE |
| | DEMO SUBSURFACE FEATURE |
| | DEMO TREE |
| | LIMITS OF SANDCUT |
| | PROPERTY LINE / ROW |
| | EASEMENT LINE |
| | LIMITS OF WORK |
| | LIMITS OF OVEREXCAVATION |
| | MATCHLINE |
| | PROPOSED BUILDING |
| | EXIST BUILDING |
| | BLDG ACCESS |
| | CONCRETE, PAVING |
| | HEAVY DUTY ASPHALT PAVING |
| | EARTH |
| | GRASS PAVERS |
| | CONCRETE, SCORING |
| | CURB & GUTTER |
| | GUTTER PAN |
| | SPILL/CATCH CURB TRANSITION |
| | PROPOSED INDEX CONTOUR |
| | PROPOSED INTERMEDIATE CONTOUR |
| | EXIST INDEX CONTOUR |
| | EXIST INTERMEDIATE CONTOUR |
| | PROPOSED SPOT ELEVATION |
| | EXIST SPOT ELEVATION |



NOT FOR
CONSTRUCTION

MEMORY SQUARE
PLANNED UNIT
DEVELOPMENT AND
SPECIAL REVIEW
USE

LOTS 5-11, BLOCK 5, PLEASANT HILL
ADDITION & VACATED GRANT AVENUE

801 GRANT AVENUE
LOUISVILLE, CO 80027

SCD Project No.: 1641

[illegible]

UTILITY PLAN

Sharon McMonagle
500 Spruce St
Louisville, CO 80027

9/27/2025

Louisville City Planning Council
749 Main Street
Louisville, CO 80027

Re: PUD# 0003-2025: Please Do Not Approve the PUD Amendment for an Electronic Sign at the Center for the Arts

Dear Mayor and Members of the Louisville City Planning Council,

I am writing not just as concerned residents, but as a neighbor whose daily life would be directly and profoundly affected by the proposed electronic sign at the Louisville Center for the Arts. My husband and I chose to make our home here because of the peace, charm, and character of this part of Louisville. The Center for the Arts has always been a point of pride — a historic and beautiful landmark that feels in harmony with the neighborhood. Installing a glowing electronic sign would change that forever. Instead of the quiet, welcoming view we now cherish, we would be confronted with constant light, distraction, and intrusion into the privacy of our home.

This is not just about aesthetics; it's about quality of life. It's about sitting on our porch at dusk without a screen flashing in front of us. It's about sleeping without light seeping into our windows. It's about being able to feel at peace in our own home. The sign would take away something that can't be replaced: the sense of calm and comfort that makes Louisville feel like home.

I understand the City's desire to promote events and share information, but surely there are better ways to do so — ways that do not come at such a high cost to the neighbors who live closest. I love this community and want to see it continue to thrive in a way that honors its history and its people.

For these reasons, I must strongly and wholeheartedly oppose this amendment. I urge you, please, to protect the character of our neighborhood and the well-being of the families who live here by rejecting this proposal.

Thank you for listening to my concerns and for considering the very real human impact this decision would have.

With gratitude and respect,

Sharon McMonagle

500 Spruce St

Louisville, CO 80027

Regarding the proposed electronic sign for Memory Square Park/Art Center:

As neighbors in close proximity to the location of the proposed sign which will be visible from our front porch, our concerns are that if it is bright, on after sunset, contains flashing or moving/scrolling text, it might negatively affect the peaceful character of the park and neighborhood in the evening.

As pictured in the PUD the concept of cream colored text on a black background may be unobjectionable, however, the person entering digital signage information for upcoming shows will likely be prompted by the software to make the sign as visible and eye-catching as possible with colors and moving text and images.

We are fearful that the photo in the PUD may not correctly depict what the digital portion of the sign will look like under actual operation.

As a result we cannot support the sign without clarification of how it will look in use.

With such clarification, however, it's possible we would support the sign as a way to promote the Art Center.

Cameron and Ann Weise

728 Grant Ave.

Louisville, CO 80027

303-919-1551

Patrick McMonagle
500 Spruce St
Louisville, CO 80027

9/27/2025

Louisville City Council
749 Main Street
Louisville, CO 80027

Re: PUD# 0003-2025: Opposition to PUD Amendment for Electronic Sign at the Louisville Center for the Arts:

Dear Members of the Louisville Planning Commission,

I am writing to express my deepest concern and strongest opposition to the proposed PUD Amendment that would allow the installation of an electronic sign at the Louisville Center for the Arts. As one of the three homes that would face the most direct and significant impact of this change, I feel compelled to share my perspective.

An electronic sign of this nature would fundamentally alter the character of our beautiful neighborhood. The Center for the Arts is valued as a historic, community-oriented space, and the addition of an illuminated, digital sign would detract from the aesthetic integrity of both the building and the surrounding residential area. For those of us whose homes directly face the proposed sign, the effects would include light intrusion, diminished privacy, and an overall reduction in quality of life.

We recognize the importance of communication and visibility for city programs and events, but we strongly believe there are alternative ways to accomplish these goals without imposing such a permanent and intrusive burden on neighboring households. The

preservation of Louisville's unique charm and livability should remain a top priority, and this proposal stands in direct conflict with that value.

For these reasons, I am vehemently opposed to the amendment and respectfully urge the Council to deny it. I ask that you carefully consider the negative impact this would have not only on the nearby homes, but also on the broader community character that makes Louisville such a special place to live.

Thank you for your time and thoughtful consideration.

Sincerely,

Pat McMonagle

500 Spruce St

Louisville, CO 80027

From: Planning
Sent: Monday, October 6, 2025 8:44 AM
To: Emily Cline-Gibson
Subject: FW: Arts Center Sign:

From: Dave Clabots <dave.clabots@gmail.com>
Sent: Saturday, October 4, 2025 5:00 PM
To: Planning <planning@Louisvilleco.gov>
Subject: Arts Center Sign:

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

I am against any NEON sign depicting events at the Louisville Arts Center.
Please consider the following even though it may not line up entirely with the current sign code.

- 1: The arts center building is an historic structure where neon would detract from the character of the site.
2. All events at the center are posted on the City's website.
3. There are some event organizers that string large banners on the building during an ongoing event. Perhaps this banner practice could be eliminated but I find this highly unlikely to happen.
- 4: The sign may be a detractor in the old town neighborhood.
- 5: Visibility from the sidewalk may be possible but from the street would be a distraction to the driver. This is in a very high pedestrian use area.
6. Will Parks and Recreation Dept. now request a sign for Memory Square Pool?

I hope you consider all the facts presented here. Last I checked we are in the digital age where all public events are posted online.

Thank you for your time and consideration in this matter.

Dave Clabots
725 Lincoln Ave
Louisville CO 80027

From: Planning
Sent: Monday, October 6, 2025 11:15 AM
To: Emily Cline-Gibson
Subject: FW: Electronic Sign at 801 Grant Avenue

From: Pat Finnoff <patfinnoff@gmail.com>
Sent: Monday, October 6, 2025 10:11 AM
To: Planning <planning@Louisvilleco.gov>
Cc: April Jones <ajgraphics@yahoo.com>
Subject: Electronic Sign at 801 Grant Avenue

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

PUD-0003-2025

I do object to having an electronic sign at the Louisville Center for the Arts. There are many other very artistic and effective ways to do signage without having light pollution in the neighborhood.

My property is at 945 Lincoln, Louisville, CO 80027
Respectfully submitted.

Pat Finnoff 🙄
303-885-1873
patfinnoff@gmail.com

From: Planning
Sent: Monday, October 6, 2025 3:59 PM
To: Emily Cline-Gibson
Subject: FW: 801 Grant - Art Center Signage - Case No. PUD-0003-2025

From: erik@hapcdesign.com <erik@hapcdesign.com>
Sent: Monday, October 6, 2025 3:45 PM
To: Planning <planning@Louisvilleco.gov>
Subject: 801 Grant - Art Center Signage - Case No. PUD-0003-2025

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

Louisville Planning Commission,

We live within a half of a block from the Arts Center, and as a planner and architect, I would like to voice my opposition to the proposed lighted “electronic message center” being proposed at that site. Lighted electronic signage is not appropriate in a residential neighborhood like this, especially in front of one of our great historic structures that has been so carefully restored. I do not believe that the lighted signage would be visible from our house, but we should be considerate of our neighbors who will be within line of sight to this signage.

I am confident that our creative city staff and signage designers can envision something that will be much more appropriate at this location. I walk or drive by this site almost daily and special event signage, when done well, is very effective there. I don’t think that the traffic count on Spruce is high enough to drive a lot of new patron visits to the Arts Center based on additional eye-catching signage. Other forms of broader outreach (website, central information locations such as the Library and Rec. Center, etc.) should be improved if they are not adequate to inform the community of Arts Center events.

Thank you for considering our input on this.

-Erik

J. Erik Hartronft, AIA

Hartronft Associates, p.c.
Architecture - Planning - Interiors

950 Spruce Street, Suite 2C
Louisville, CO 80027
p. 303.673.9304

erik@hapcdesign.com

From: Planning
Sent: Tuesday, October 7, 2025 10:27 AM
To: Emily Cline-Gibson
Subject: FW: 801 Grant - Art Center Signage

Categories: Projects

From: Peter Stewart <peter@stewart-architecture.com>
Sent: Monday, October 6, 2025 4:31 PM
To: Planning <planning@Louisvilleco.gov>
Subject: 801 Grant - Art Center Signage

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

Members of the Planning Commission,

I am writing to express my opposition to the proposed electronic sign at the Louisville Center for the Arts. I live several blocks away and for the record I am the Architect of Record for the center's preservation and rehabilitation a number of years ago. In my opinion this type of sign is not compatible with the historic art center building, the park, nor with the context of the surrounding historic residential neighborhood.

I applaud the City's efforts in promoting events and community activities in the park and at the arts center but feel this can be accomplished in a more elegant and appropriate manner. Please consider banners or other non-illuminated signs for events. Examples for inspiration:





Thank you for your consideration,

Peter Stewart

stewart

ARCHITECTURE

1132 Jefferson Ave. Louisville, CO. 80027

tel: 303.665.6668

peter@stewart-architecture.com

From: Planning
Sent: Monday, October 20, 2025 9:11 AM
To: Emily Cline-Gibson
Subject: FW: Digital Sign at The Art Center

From: Mohamed Ghali <mohamed.ghali@gmail.com>
Sent: Friday, October 17, 2025 3:50 PM
To: Planning <planning@Louisvilleco.gov>
Subject: Digital Sign at The Art Center

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

Dear Louisville Planning Team,

My name is Mohamed Ghali and I have lived in Louisville for the past 17 years. I am also a board member with the Cultural Advisory Board (CAB). I am writing this email to support the idea of having a digital sign at our Arts Center at Memory Square Park.

I strongly believe that a digital sign will enhance communication with our citizens, improve engagement, economic development, enhance environment monitoring and security in our community. Below are the benefits in more detail:

1. **Enhanced Communication:** Digital signs will provide real-time information to citizens and visitors, including public transport schedules, traffic updates, weather forecasts, and emergency alerts like evacuation instructions or natural disaster warnings. They can also display public service announcements and safety reminders. This is much needed especially with fire victims of all the burnt homes!
2. **Improve Engagement:** Digital signs can also promote local community updates, cultural events, exhibitions, and festivals, stimulating tourism and increasing community involvement. Our board would really appreciate this so that we can advertise future events seamlessly.
3. **Economic Development and Revenue Generation:** Digital signs provide opportunities for advertisers to display relevant and local ads for local businesses, which can boost the local downtown economy!

4. **Environmental Monitoring:** Digital signs can display data on air quality, noise levels, and other environmental indicators, which can be used for urban planning and environmental measures.
5. **Increased Safety and Awareness:** Digital signs can be integrated with security cameras and other sensors to improve urban safety, serving as an alert system for emergency situations.

Please consider the proposed digital sign and its benefits. I strongly believe this will enhance our footprint that Louisville is a progressive city for many years to come.

Thank you,

Mohamed

From: Planning
Sent: Wednesday, October 29, 2025 8:41 AM
To: Emily Cline-Gibson
Subject: FW: Electronic Message Board at Louisville Arts Center

Categories: Projects

From: Diane Marino - HOHFaculty <diane.marino@adams12.org>
Sent: Tuesday, October 28, 2025 7:58 PM
To: Planning <planning@Louisvilleco.gov>
Subject: Electronic Message Board at Louisville Arts Center

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

To: Planning Commission

From: Diane Marino, 829 Lincoln Ave, Louisville, Co. 80027

Re: Electronic Message Board,m Louisville Arts Center

A lighted electronic board is not in keeping with the historic Art Center or Memory Square Park. It would be jarring and out of place in this neighborhood.

A non-electronic board with announcements and perhaps an historically correct light would be more appropriate. (Similar to what was in place for the Center)

What is next? Electronic boards for the Methodist and Catholic Churches?

Please keep the historic nature of the Arts Center, Park and Neighborhood and deny the electronic message board.

Thank you, and
Sincerely,

Diane Marino

This is a staff email account managed by Adams 12 Five Star Schools. This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the sender.

From: Lynn Fleming <plfleming@aol.com>
Sent: Tuesday, November 4, 2025 12:44 PM
To: Planning; Emily Cline-Gibson
Cc: Iris Belensky
Subject: Proposed signage for the Arts Center

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

Hello. I'm Lynn Fleming, board secretary for Coal Creek Theater of Louisville. I want to express my enthusiasm for the proposed new sign at the Arts Center, especially with the addition of the electronic component. Lovely and historical as the building is, it remains a hidden gem because of its location and its odd address. (It isn't really on Grant Ave.) Anything that can draw attention to the space would be beneficial.

We at Coal Creek Theater really need a means of highlighting our productions and letting the community know that we exist (now in our 36th season). The electric sign featuring what's playing at the space would be really helpful for us. I understand that the glow from such a sign would be less than what the Christmas lights generate, and those don't seem to interfere with the neighbors. (I wish we could also use those Christmas lights for all of our shows to make the entrance look special and inviting!)

While I think that the plan to make the sign similar to other City properties is a good one, I'd like it to also acknowledge that the space is unique and historical. Even if it strongly resembles the other signs, I wonder if the lettering could be somehow different, maybe with the type of font or with colors. I understand that the sign will be closer to the building than originally shown, a fact that I applaud. It needs to clearly designate that building, not the park or swimming pool.

Overall, I'm delighted that any action is afoot to bring the community to the Louisville Center for the Arts.

Regards,

Lynn Fleming
CCTL Secretary

ITEM: Case No. PUD-0308-2020

PLANNER: Emily Cline-Gibson, Planner II

APPLICANT: Brue Baukol Capital Partners

OWNER: Redtail Ridge Portfolio, LLC

LOCATION: 1020 Rockcross Drive
Tract K, Redtail Ridge Filing No. 1

REQUEST: Approval of Resolution 17, Series 2025,
recommending approval of the Redtail Ridge Lift
Station Planned Unit Development (PUD)

VICINITY MAP:



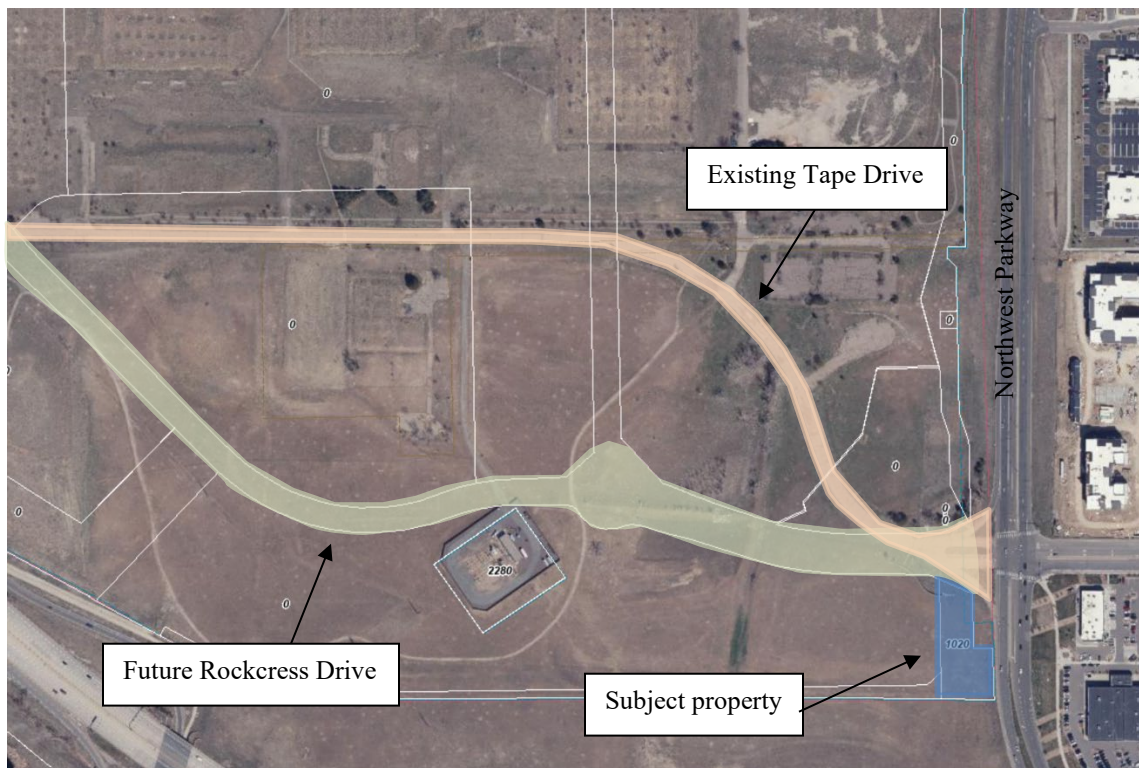
SUMMARY:

The applicant, Brue Baukol Capital Partners, is requesting approval of a final Planned Unit Development (PUD) to allow for the construction of a 1,031 square foot facility which will serve as the lift station for the Redtail Ridge development. The proposed development will include access from future Rockcress Drive with associated landscaping, parking, lighting, and required grading and utilities.

BACKGROUND:

The subject property is located in the southeastern corner of the Redtail Ridge Subdivision Filing No. 1. Development of this area is governed by the ConocoPhillips General Development Plan (GDP), which was established in 2010, and the Commercial Development Design Standards and Guidelines (CDDSG), which was adopted by City Council in 1997. Northwest Parkway is located to the east and Tape Drive is to the north. Directly south of the property is City of Broomfield vacant land.

The Redtail Ridge Filing No. 1 Subdivision was approved by City Council on August 20, 2024, and established a series of lots and blocks for development, road rights of way, utility easements, and private road access easements. As part of the Redtail Ridge improvements, Tape Drive, which extends from east to west across the development, will be removed and replaced by Rockcress Drive, which will serve as the primary east-west connector and will be the sole access road to the lift station property.



Existing and proposed roads in Redtail Ridge

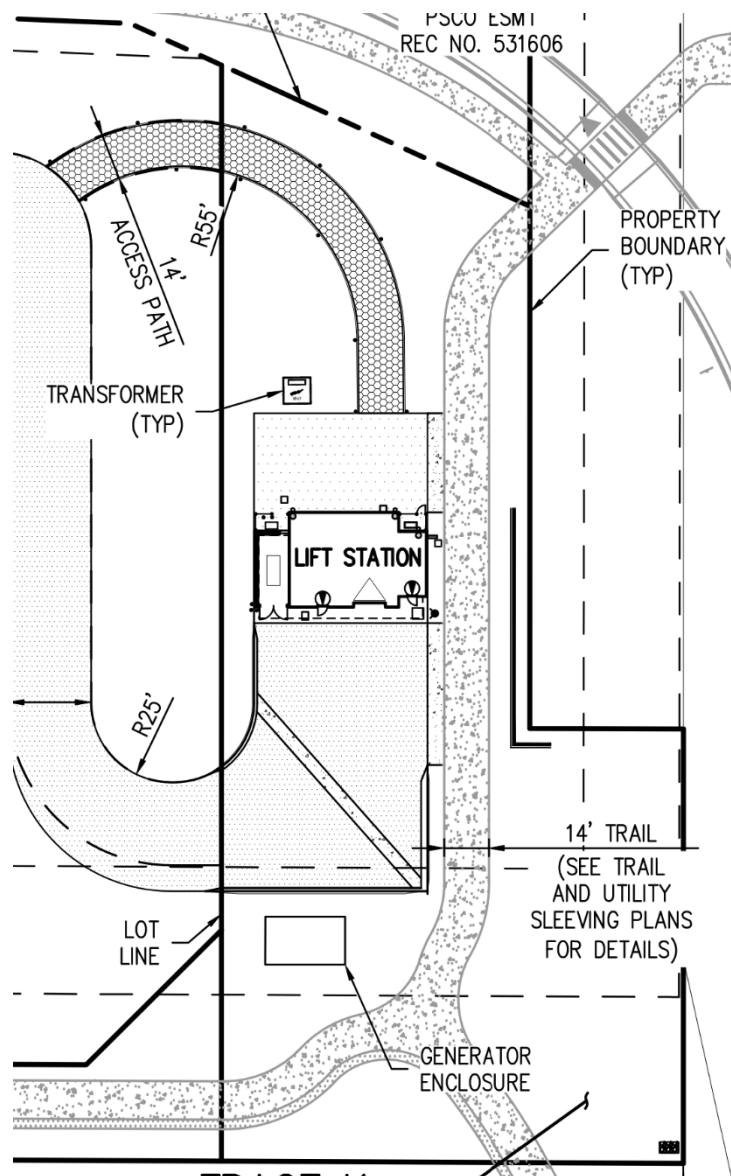
The proposed lift station will serve the entire Redtail Ridge development. Wastewater will be transported from the Redtail Ridge development to the City of Louisville Wastewater Treatment Plant, located at 1155 Empire Road, where it will be treated. This new station is necessary to meet the infrastructure needs for future development in Redtail Ridge. The station will be dedicated to the City of Louisville, and the City will maintain responsibility for operation and maintenance of the property.

PROPOSAL:

Site

The proposal includes constructing a 1,031 square foot building, which will be used for pumping sewage from the Redtail Ridge development to the Louisville Wastewater Treatment Plant. The building will include two primary rooms. The main room will be above a wet well and house piping and equipment. The wet well and associated equipment will be accessed from floor hatches located in the main room. The other room will be an electrical room which will house electrical equipment used to power the station. Also included with the proposal are exterior mechanical equipment areas, including an emergency backup generator which will be enclosed and located on the southern portion of the lot, utility transformers which will be located north of the building, and air handling and air conditioning units. An existing chain link fence that runs through the property is proposed to be removed.

Access to the property is for City operation and maintenance workers only, and no public access will be provided. A 24-foot access easement is dedicated to the property and will run from the proposed roundabout at Rockcress Drive to the western property boundary, connecting to a southern parking area. An additional 15-foot-wide access easement is proposed at the northwestern property boundary.



Site plan

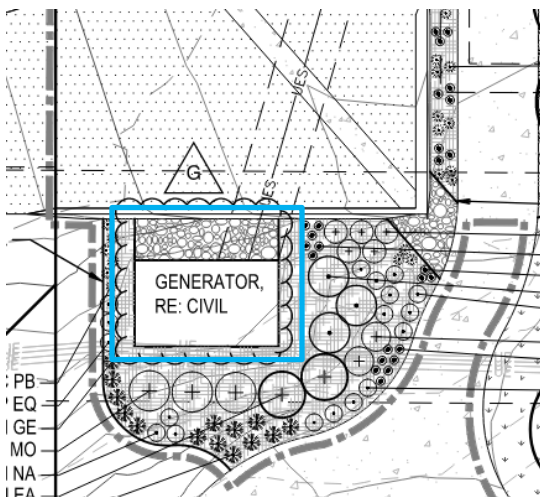
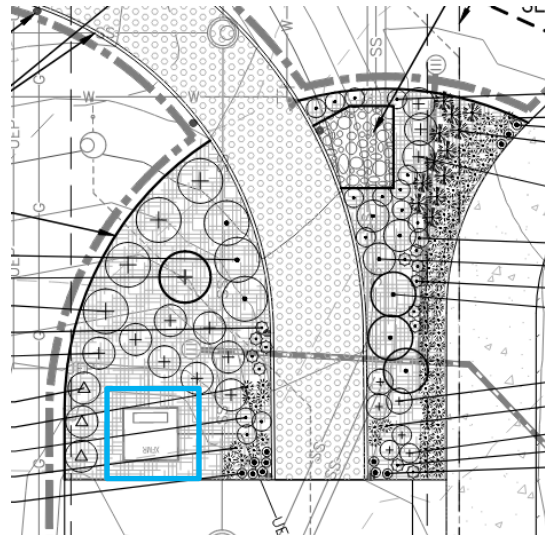
Building

4

Mechanical Equipment

A proposed generator will be in an enclosure measuring 13' x 5' and will be 7-feet tall. The enclosure structure is shown in the bottom right image below, however the final color will be selected to match the building and surroundings. An electric transformer will be located north of the building. Both the generator enclosure and transformer will be screened with landscaping that includes shrub, perennials, and ornamental grasses.

An HVAC unit and an air handling unit will be enclosed by stone walls that extend from the eastern and western sides of the building. The areas will include locked metal gates for controlled access.



Top left: Eastern and western stone wall enclosures; Bottom left: Landscape plan for generator enclosure; Top right: landscape plan for transformer; Bottom right: Generator enclosure

Waivers

The applicant is requesting the following waivers:

1. Allow prefinished painted metal siding as an exterior material.
2. Allow light spill outside of the site boundaries.

Staff analysis of each waiver request is found in the below section.

ANALYSIS:

Zoning Analysis

Compliance with Sec. 17.28.120

Section 17.28.120.A of the Louisville Municipal Code (LMC) lists 28 criteria for PUDs that must be satisfied or found not applicable to approve a PUD. Analysis and staff's recommended finding of each criterion is provided in the attached Appendix A. The proposal has overall been found to comply with all applicable standards of this section.

CDDSG Analysis

Compliance with the CDDSG

The CDDSG establishes design criteria and minimum standards for commercial development. Analysis of each applicable section is provided below.

CDDSG 1: Site Planning

The proposed building meets all setbacks and site coverage standards. Vehicle parking and building entrance are internal to the site and not visible from adjacent streets. All mechanical equipment is appropriately screened. The proposal meets the site standards for site grading and drainage in the CDDSG.

CDDSG 2: Vehicular Circulation and Parking

Access to the site will be provided by a primary access easement on the western side of the property, connecting to the roundabout at Rockcress Drive. A secondary access easement is located to the north. Both easements are granted by the owners of Lot 3, Block 1, and will remain in place once Lot 3, Block 1 is developed. No public parking is proposed, but a parking area for service vehicles is proposed south of the building.

CDDSG 3: Pedestrian and Bicycle Circulation

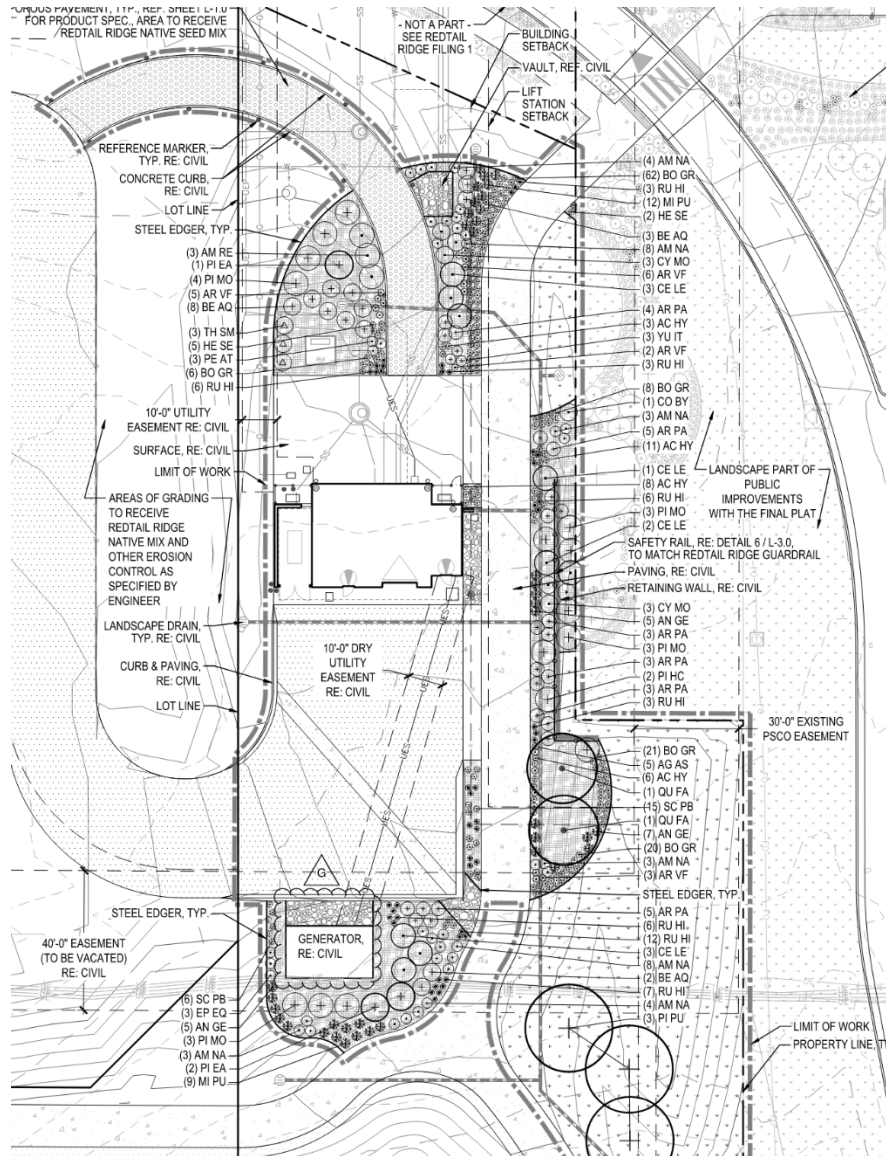
A 14-foot paved concrete trail is proposed on the eastern property boundary. The trail will connect to a larger trail system within the Redtail Ridge development. Since the proposed building will be used exclusively by service personnel and will not be publicly accessible, no additional pedestrian or bicycle amenities are provided on the site.

CDDSG 4: Architectural Design

The proposed building meets height standards and incorporates design elements consistent with the character of the Redtail Ridge development. The façade will include painted metal siding, for which a waiver is requested, and synthetic stone. The gabled roof and overall massing provide an appropriate scale. The building material, color, and texture further contribute to the architectural design.

CDDSG 5: Landscape Design

Ornamental and evergreen trees, shrubs, ornamental grasses, and perennials are proposed in a garden bed located on the north side of the building, near the entrance to the primary building. An additional landscape area is located on the southern side of the building, surrounding the proposed generator enclosure. Deciduous, ornamental, and evergreen trees are proposed along the paved trail as well. The proposed landscape plan satisfies planting requirements in the CDDSG. Additional landscaping outside property boundaries are included in a greater development plan for Redtail Ridge and are not part of this proposal.



Landscape plan

CDDSG 6: Screen Walls and Fences

The proposal includes two screen walls made of synthetic stone and extend from the building. The wall located on the west elevation will be 5-7-feet tall and will include a metal gate to fully enclose the HVAC unit. The wall located on the east elevation will be 13.2 feet tall and will enclose the air handling unit. This wall will also be made of synthetic stone material and will be enclosed with a gate. The CDDSG requires a minimum screen wall height of 6 feet and does not specify a maximum. No perimeter fencing is proposed.

CDDSG 8: Exterior Site Lighting

Three wall-mounted LED lights are proposed near the building entrances, along with one floodlight on the north façade that will only illuminate in emergency situations. All

lighting complies with maximum illumination standards outlined in the CDDSG. A photometric plan for normal operations and emergency operations are included with the proposal. One waiver is requested to allow light spill outside of property boundaries, which is further analyzed in the below section.

Waiver Analysis

Section 17.28.110 of the Louisville Municipal Code (LMC) sets the standards for all PUDs to comply with the underlying zoning standards and adopted design guidelines. The section also states that *any such requirements may be waived or modified through the approval process of the planned unit development if the spirit and intent of the development plan criteria contained in LMC Section 17.28.120 are met*. Analysis of each waiver request is provided below.

Allow prefinished painted metal siding as an exterior material

Section 4.5.1 of the CDDSG states that painted metal is not an acceptable exterior building material. The applicant is requesting a waiver from this standard to allow the use of painted metal siding on all sides of the proposed building. The proposed metal will be painted a brown color and will provide a complimentary and textural appeal alongside the synthetic stone, which is the other proposed building material. Additionally, the metal siding will align with the roof, which is proposed to be made of metal.

Allow light spill outside of the site boundaries

Section 8.1 of the CDDSG requires all site lighting and fixtures to be contained within the property boundaries. The proposal includes lighting that will spill a maximum of 12 feet outside of the western property boundary into Lot 1, Block 3. The light spill may range from 0.1 to 0.5 footcandles outside of property boundaries. Lighting levels have been coordinated with City operation and maintenance staff to ensure safe working conditions for normal and emergency activity. The minimum required 10-foot interior side yard building setback ensures that the majority of the lighting will not be visible from inside adjacent buildings on Lot 1, Block 3.

PUBLIC COMMENTS:

No public comments have been received as of the date of this report.

STAFF RECOMMENDATION:

Staff recommend approval of Resolution 17, Series 2025, recommending approval of the Redtail Ridge Lift Station Planned Unit Development (PUD).

ATTACHMENTS:

1. Resolution 17, Series 2025
2. Application Materials

APPENDIX A: PUD Criteria Analysis

Criteria 17.28.120 (A)	Finding	Narrative
1. An appropriate relationship to the surrounding area;	Compliant	The proposal is appropriate in size and scale to the surrounding area.
2. Circulation in terms of the internal street circulation system, designed for the type of traffic generated, safety, separation from living areas, convenience, access, and noise and exhaust control. Proper circulation in parking areas in terms of safety, convenience, separation and screening;	Compliant	The proposal includes one primary access easement that is 24-feet-wide, which is adequate for two-way vehicular access.
3. Consideration and provision for low and moderate-income housing;	Not applicable	The proposal does not include housing.
4. Functional open space in terms of optimum preservation of natural features, including trees and drainage areas, recreation, views, density relief and convenience of function;	Not applicable	The proposal does not include dedicated open space, nor is existing open space located near the property.
5. Variety in terms of housing types, densities, facilities and open space;	Not Applicable	The proposal does not include housing.
6. Privacy in terms of the needs of individuals, families and neighbors;	Not applicable	The proposal does not include housing.
7. Pedestrian and bicycle traffic in terms of safety, separation, convenience, access points of destination and attractiveness;	Compliant	The proposed concrete trail is located in an accessible location and connects to destination points outside of property boundaries.
8. Building types in terms of appropriateness to density, site relationship and bulk;	Not applicable	The proposed building is one story and 1,031 square feet in size, which is an appropriate size in relation to the surrounding area.
9. Building design in terms of orientation, spacing, materials, color, texture, storage, signs and lighting;	Not Applicable	The proposed building, including waivers, provides a variety of materials and textures.

10. Landscaping of total site in terms of purpose, such as screening, ornamental types used, and materials used, if any; and maintenance, suitability and effect on the neighborhood;	Compliant	The proposed landscape plan provides landscaping for utility screening, trail buffer, and overall site beautification.
11. Compliance with all applicable development design standards and guidelines and all applicable regulations pertaining to matters of state interest, as specified in <u>chapter 17.32</u> ;	Compliant	Aside from the requested waivers, the proposal complies with applicable design standards and guidelines.
12. None of the standards for annexation specified in <u>chapter 16.32</u> have been violated;	Not applicable	No annexation is proposed.
13. Services including utilities, fire and police protection, and other such services are available or can be made available to adequately serve the development specified in the final development plan.	Compliant	The proposed site layout is oriented in a way that provides access for utilities, fire, and police protection.

Criteria 17.28.120 (B)	Finding	Narrative
1. Development shall be in accordance with the adopted elements of the comprehensive development plan of the city, and in accordance with any adopted development design standards and guidelines.	Compliant	The proposal is in accordance with the adopted comprehensive plan and all adopted design standards and guidelines.
2. No structures in a planned unit development shall encroach upon the floodplain. Existing bodies of water and existing stream courses shall not be channelized or altered in a planned unit development plan.	Compliant	The subject property is not located in a floodplain, nor are there existing bodies of water in the area.
3. No occupied structure shall be located on ground showing severe subsidence potential without adequate design and study approved specifically by the city.	Not applicable	There are no signs of subsidence on the subject property.

4. The proposal should utilize and preserve existing vegetation, land forms, waterways, and historical or archeological sites in the best manner possible. Steep slopes and important natural drainage systems shall not be disrupted. How the proposal meets this provision, including an inventory of how existing vegetation is included in the proposal, shall be set forth on the landscape plan submitted to the city.	Not applicable	There are no existing landforms, waterways, historical sites, or significant vegetation on the subject property.
5. Visual relief and variety of visual sitings shall be located within a development in the overall site plan. Such relief shall be accomplished by building placements, shortened or interrupted street vistas, visual access to open space and other methods of design.	Not applicable	The proposal includes a single building that is less than 50 linear feet and will not be open to the public. As such, visual relief is not included with this proposal.
6. Open space within the project shall be located in such a manner as to facilitate pedestrian use and to create an area that is usable and accessible to residents of surrounding developments.	Not applicable	The proposal does not include dedicated open space within property boundaries.
7. Street design should minimize through traffic passing residential units. Suggested standards with respect to paving widths, housing setbacks and landscaping are set forth in public works standards of the city and applicable development design standards and guidelines. The system of streets, including parking lots, shall aid the order and aesthetic quality of the development.	Not applicable	The proposal does not include new streets within property boundaries.
8. There shall exist an internal pedestrian circulation system separate from the vehicular system such that allows access to adjacent parcels as well as to parks, open space or recreation facilities within the development. Pedestrian links to trail systems of the city shall be provided.	Compliant	The proposal includes a paved trail that will connect to an overall trail system in Redtail Ridge, providing adequate pedestrian circulation.

9. The project and development should attempt to incorporate features which reduce the demand for water usage.	Compliant	The proposed landscape plan includes native plant species that reduce water demand.
10. Landscape plans shall attempt to reduce heating and cooling demands of buildings through the selection and placement of landscape materials, paving, vegetation, earth forms, walls, fences, or other materials.	Compliant	The proposed landscape plan includes thoughtful layout of a variety of trees, shrubs, and vegetation that may provide additional benefits to the building.
11. Proposed developments shall be buffered from collector and arterial streets. Such buffering may be accomplished by earthen berms, landscaping, leafing patterns, and other materials. Entrance islands defining traffic patterns along with landscaping shall be incorporated into entrances to developments.	Compliant	The proposal is buffered from collector and arterial streets by landscaping and building setbacks.
12. There shall be encouraged the siting of lot arrangement, building orientation and roof orientation in developments so as to obtain the maximum use of solar energy for heating.	Compliant	The proposed gabled roof is oriented in a direction that may allow for solar energy in the future.
13. The overall PUD shall provide a variety of housing types.	Not applicable	The proposal does not include housing.
14. Neighborhoods within a PUD shall provide a range of housing size.	Not applicable	The proposal does not include housing.
15. Architectural design of buildings shall be compatible in design with the contours of the site, compatible with surrounding designs and neighborhoods, shall promote harmonious transitions and scale in character in areas of different planned uses, and shall contribute to a mix of styles within the city.	Compliant	The proposal includes architectural features that result in a visually appealing final product and are compatible with the surrounding Redtail Ridge development.

**RESOLUTION NO. 17
SERIES 2025**

**A RESOLUTION RECOMMENDING APPROVAL OF THE REDTAIL RIDGE LIFT
STATION PLANNED UNIT DEVELOPMENT**

WHEREAS, there has been submitted to the Louisville Planning Commission an application for a planned unit development to construct a lift station on the property located at 1020 Rockcress Drive; and

WHEREAS, the subject property, Tract K, Redtail Ridge Filing No. 1, is in the Planned Community Commercial (PC) Zone District; and

WHEREAS, City staff have reviewed the information submitted and found that the application complies with the Louisville zoning regulations, design standards and other applicable sections of the Louisville Municipal Code; and

WHEREAS, the Planning Commission has considered the application at a duly noticed public hearing on November 13, 2025, where evidence and testimony were entered into the record.

NOW THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Louisville, Colorado does hereby recommend approval of the Redtail Ridge Lift Station Planned Unit Development to allow the construction of a lift station on the property at 1020 Rockcress Drive.

PASSED AND ADOPTED this 13th day of November, 2025.

By: _____
Steve Brauneis, Chair
Planning Commission

Attest: _____
Cullen Choi, Secretary
Planning Commission

ELECTRONIC LAND USE HEARING REQUEST CASE NO. _____

APPLICANT INFORMATION

Firm: Redtail Ridge Metropolitan District
Contact: Jay Hardy
Address: 1555 Blake Street, Suite 210
Denver, CO 80202
Mailing Address: Same as above.
Telephone: 970-581-8863
Fax: _____
Email: jay.hardy@bruebaukol.com

OWNER INFORMATION

Firm: Same as Applicant
Contact: _____
Address: _____
Mailing Address: _____
Telephone: _____
Fax: _____
Email: _____

REPRESENTATIVE INFORMATION

Firm: Dewberry Engineers, Inc.
Contact: Sam Franzen
Address: 990 S Broadway, Suite 400
Denver, CO 80209
Mailing Address: Same as above.
Telephone: 303-951-0618
Fax: _____
Email: sfranzen@dewberry.com

PROPERTY INFORMATION

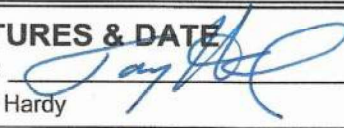
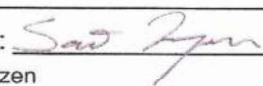
Common Address: See attached legal description
Legal Description: Lot _____ Blk _____
Subdivision _____
Area: _____ Sq. Ft.

TYPE (S) OF APPLICATION

- ☐ Annexation
- ☐ Zoning
- ☐ Preliminary Subdivision Plat
- ☐ Final Subdivision Plat
- ☐ Minor Subdivision Plat
- ☐ Preliminary Planned Unit Development (PUD)
- ☒ Final PUD
- ☐ Amended PUD
- ☐ Administrative PUD Amendment
- ☐ Special Review Use (SRU)
- ☐ SRU Amendment
- ☐ SRU Administrative Review
- ☐ Temporary Use Permit: _____
- ☐ CMRS Facility: _____
- ☐ Other: (easement / right-of-way; floodplain; variance; vested right; 1041 permit; oil / gas production permit)

I hereby request the public hearing(s) on this application be scheduled to be conducted by Electronic Participation in accordance with the attached Resolution No. 30, Series 2020, as adopted by the City Council on April 7, 2020, and in accordance with Resolution No. 38, Series 2020, as adopted by City Council on June 2, 2020 if such hearing(s) can be scheduled during a time period when in-person meetings are not being held due to a health epidemic or pandemic. I acknowledge that holding a quasi-judicial hearing by Electronic Participation may present certain legal risks and involves an area of legal uncertainty, and that having this application heard at a meeting held by Electronic Participation is optional and undertaken at my own risk. I also understand that in-person meetings are preferred for quasi-judicial hearings, and that even if electronic hearing(s) are scheduled, this application will be heard at an in-person meeting if in-person meetings have resumed by the scheduled hearing date(s). I further agree to defend and indemnify the City of Louisville in any action that may arise out of, or in connection with, conducting the hearing by Electronic Participation.

SIGNATURES & DATE

Applicant:  7/16/2021
Print: Jay Hardy
Owner: Same as Applicant.
Print: _____
Representative:  7/16/2021
Print: Sam Franzen

CITY STAFF USE ONLY

- ☐ Electronic Hearing Approved: _____
- ☐ Date(s) of Hearing(s): _____

DESCRIPTION

SITUATED IN THE NORTHEAST 1/4 OF SECTION 29, TOWNSHIP 1 SOUTH,
RANGE 69 WEST OF THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

A PARCEL OF LAND BEING A PORTION OF PARCEL 5 AS DESCRIBED BY SPECIAL WARRANTY DEED RECORDED AT RECEPTION NO. 03223274 OF THE BOULDER COUNTY RECORDS, SITUATED IN THE NORTHEAST QUARTER OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 29;
THENCE SOUTH 00°00'35" WEST ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, A DISTANCE OF 1,180.75 FEET TO THE SOUTHEAST CORNER OF PARCEL NO. TK-75 AS DESCRIBED BY SPECIAL WARRANTY DEED RECORDED AT RECEPTION NO. 03223274, SAID POINT ALSO BEING THE **POINT OF BEGINNING**;
THENCE CONTINUING SOUTH 00°00'35" WEST ALONG SAID EAST LINE, A DISTANCE OF 136.13 FEET TO THE SOUTH LINE OF THE NORTH HALF OF SAID NORTHEAST QUARTER;
THENCE NORTH 89°42'42" WEST ALONG SAID SOUTH LINE, A DISTANCE OF 126.73 FEET;
THENCE NORTH 00°01'40" EAST, A DISTANCE OF 353.78 FEET TO A POINT OF NON-TANGENT CURVATURE;
THENCE ALONG THE ARC OF SAID CURVE TO THE RIGHT AN ARC LENGTH OF 83.14 FEET, SAID CURVE HAVING A RADIUS OF 202.00 FEET, A CENTRAL ANGLE OF 23°34'55", AND A CHORD WHICH BEARS SOUTH 62°15'22" EAST A CHORD DISTANCE OF 82.55 FEET TO A POINT OF NON-TANGENT CURVATURE;
THENCE ALONG THE ARC OF SAID CURVE TO THE RIGHT AN ARC LENGTH OF 13.21 FEET, SAID CURVE HAVING A RADIUS OF 15.00 FEET, A CENTRAL ANGLE OF 50°28'28", AND A CHORD WHICH BEARS SOUTH 25°13'39" EAST A CHORD DISTANCE OF 12.79 FEET TO THE WEST LINE OF SAID PARCEL NO. TK-75;
THENCE ALONG THE PERIMETER OF SAID PARCEL THE FOLLOWING TWO (2) COURSES:
1) SOUTH 00°00'35" WEST, A DISTANCE OF 168.13 FEET;
2) SOUTH 89°48'45" EAST, A DISTANCE OF 48.09 FEET TO THE **POINT OF BEGINNING**;

SAID PARCEL CONTAINS 32,962 SQUARE FEET OR 0.76 ACRES, MORE OR LESS.

BASIS OF BEARINGS: BEARINGS ARE BASED ON THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 29, ASSUMED TO BEAR SOUTH 00°00'35" WEST.

PREPARED BY: AARON MURPHY
PLS 38162
ON BEHALF OF: HARRIS KOCHER SMITH
1120 LINCOLN STREET, SUITE 1000
DENVER, CO 80203
303.623.6300



1120 LINCOLN STREET, SUITE 1000
DENVER, COLORADO 80203
P: 303.623.6300 F: 303.623.6311
HARRISKOCHERSMITH.COM

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

ISSUE DATE: 4-15-2020	PROJECT #: 190108
DATE	REVISION COMMENTS

DESCRIPTION

HKS HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

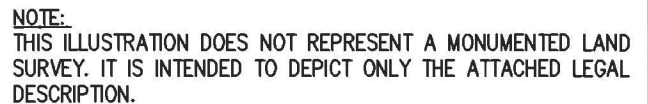
CHK'D BY: AWM
DRAWN BY: TWG

SHEET NO.

1

1 OF 2

SITUATED IN THE NORTHEAST 1/4 OF SECTION 29, TOWNSHIP 1 SOUTH,
RANGE 69 WEST OF THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO



NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

ILLUSTRATION



CHK'D BY: AWM
DRAWN BY: TWG

SHEET NO.

2

2 OF 2



MEMORANDUM

Date: December 1, 2023

To: Rob Zuccaro, Director of Community Development, City of Louisville

From: Sam Franzen, Dewberry Engineers

Subject: Redtail Ridge Lift Station Planned Unit Development Resubmittal

This memorandum and attachments serve as the third resubmittal of the Planned Unit Development (PUD) request for the proposed Redtail Ridge Lift Station in the City of Louisville. The project team consists of Redtail Ridge Metropolitan District, the City of Louisville (the operator), Dewberry Engineers (the lift station design engineer), Harrison Kocher Smith (the civil designer), and Norris Design (landscape architect).

BACKGROUND

The Redtail Ridge Lift Station will serve the Redtail Ridge development. The Redtail Ridge development is in a different drainage than the Louisville Wastewater Treatment Plant (WWTP). The lift station is needed to pump sewage from the development to the WWTP where it will be treated.

PROJECT DESCRIPTION

The Redtail Ridge Lift Station project includes a single building that is 1,031 square feet. The building will consist of two rooms. The main room is above a wet well and houses piping, instrumentation, and equipment. The wet well and pumps, piping, and instrumentation located in the wet well are accessed via hatches in the floor of the main room. The other room is an electrical room and will house electrical equipment used to power and control the lift station equipment and instrumentation. Drawings showing the general layout of the lift station are included in Attachment A.

The Lift Station site will also have on its premises an emergency backup generator housed in its own lockable enclosure, utility transformers, and an air handling unit which provides ventilation for the lift station. The generator enclosure will be factory coated to match the building color scheme. The air handling unit will be located directly adjacent to the building on a concrete pad and will be screened from view with a wall matching the building. Lockable gates will be provided on the entrances to the air handling unit area. There will also be fenced areas on the north side building housing an air conditioning condenser and an odor control unit. A site plan is included in Attachment A.

Exterior building finish materials will be as shown and described on the architectural sections and color rendering included in Attachment A. Proposed metal wall and roof material cut sheets are included in Attachment B along with a photograph of the proposed synthetic stone wall facing. Samples of the metal building material were provided with the previous submittal submitted in May 2020. The building shall be one story.

WAIVERS

A number of requirements listed in the City of Louisville Commercial Development Design Standards and Guidelines are not met by this project because it is not a typical commercial building in that it is non-occupied and solely intended to protect the mechanical equipment inside with occasional visits to the site by technicians. A table listing specific sections that are not being complied with and the reasoning is provided below as well as on the Cover of the drawings provided in Attachment A.

Requested Waivers of CDDS&G Not Applicable to Redtail Ridge Lift Station	
General	Many sections of the Commercial Development Design Standards and Guidelines do not apply to this PUD because of the nature of the building. The building is a new structure that is non-occupied and solely intended to protect the mechanical and electrical equipment inside with only very occasional visits to the site by technicians. See below for specific instances when the code is not applicable.
Section	Notes on Requirements
4.5.1.H	The pre-finished metal siding is a high quality material with a 20 year warranty that will match the aesthetics of the nearby fire station. A waiver has been requested in the PUD request letter.
6.2.C	The transformer and emergency generator are not screened from the west. The generator is in its own enclosure coated to match the building. Vegetation will be planted as possible around the generator and transformer; however, due to maintenance requirements vegetation has to be set back from both pieces of equipment. Future development plans call for a parking or drive areas to the west of this site which should limit the exposure of these items.
8.1D	Lighting has been coordinated with City O&M staff to provide sufficient lighting for normal and emergency activities at the lift station. Reducing the lighting will make working at the lift station more difficult and dangerous. The light on the north side of the building is a switched light that is only to be used in emergencies. Photometric plans with the north light on and off and included in the drawing set. Currently the maximum lumens outside the boundary is 0.5 to the west of the lift station. This is a low light level that we do not believe will negatively affect future development on the adjoining property. The light also spreads to the adjacent road right of ways to the north and east at a maximum lumens of 0.1. We expect those right of ways will be illuminated to a higher level than this by the road and traffic lighting.

LIGHTING

Site lighting will consist of a fully shielded down light mounted on the building above each door located on the south side of the building and a single fully shielded down light mounted on the west wall of the building to provide light for the HVAC area. A single flood light controlled by a

MEMORANDUM

switch inside the lift station will be mounted on the north wall of the lift station. This light will provide light to the north of a building where a portable pump would be parked and operated during an emergency event. The flood light will only be turned on during emergencies. Pole mounted lights are not included on the site. Lighting has been coordinated with City operations and maintenance staff to provide adequate lighting for normal and emergency operations and maintenance activities at the facility. Proposed light fixtures cut sheets and a photometric plan are included in the drawings.

UTILITIES

New electric, natural gas, and water utilities will be required. These utilities will be routed to the building from the nearest location in the new development. The utilities serving the site are shown on the site plan but may shift slightly as they are still being coordinated.

TRAFFIC AND PARKING

Initial site access will be via an exit from a 26 foot wide drive from a traffic circle. The load rating of the drive and gate securing entry to the drive are being coordinated with the City as part of the overall development plan. The drive will follow the future path of a drive lane through a planned parking lot for that parcel. The access path will be through the parking lot in the future. The paved area on the south side of the lift station that will be used as a turnaround and parking area and has coordinated with the City operations and maintenance staff.

The lift station will typically be visited a maximum of once per day by a single truck for approximately half an hour to check operations and equipment. Once a month preventative maintenance will be done which could require two trucks and take a full day. If there is an emergency at the lift station additional trucks and a trailer mounted bypass pump will be onsite until the emergency is resolved. A gravel area to the north of the lift station is provided for the bypass pump.

GRADING AND DRAINAGE

Existing and proposed site grading is shown in the drawing set. The lift station site was included in the drainage plan for the full development. Relative to the rest of the development the impervious area added on the lift station site is small. Drainage from the site is primary directed south and will sheet flow onto the adjoining property. Storage volume and retention will be added elsewhere in the development to account for the additional runoff produced from the lift station site.

LANDSCAPING

Landscaping has been added to the site to screen the building and ancillary equipment. A landscape plan is provided showing the proposed landscaping for the site. Some of the landscaping is within a Public Service Company (PSCO) easement on the site. The PSCO easements are owned by Xcel. Crossings of these easements have been discussed and agreed upon per the letter included as Attachment C. The path and road crossings on or adjacent to the



MEMORANDUM

lift station site are more obtrusive to the easement than the landscaping. Landscaping shown beyond the site boundaries is being coordinated as part of the Redtail Ridge Master Development Plan. Landscaping and irrigation within the lift station site shall be maintained by the Developer or the District.

OWNERSHIP DOCUMENTATION

The land the lift station will be constructed on is owned by Redtail Ridge Development LLC. The Special Warranty Deed for the development property and the legal description for the lift station site is provided as Attachment D.

ADJACENT PROPERTY OWNERS

Table 1 below lists ownership information for properties within 500 feet of the lift station. Information was taken from Boulder County and Broomfield County websites.

Table 1 Adjacent Property Owners

Parcel No.	Owner	County	Owner Address
157528268001	Centennial Venture Ltd. Liability Co.	Broomfield	1644 Platte St. Ste. 130, Denver, CO 80202
157528269001	Parkway Retail LLC	Broomfield	3434 47 th St. #220, Boulder, CO 80301
157528269003	Centennial Venture Ltd. Liability Co.	Broomfield	1644 Platte St. Ste. 130, Denver, CO 80202
157528269002	Centennial Venture Ltd. Liability Co.	Broomfield	1644 Platte St. Ste. 130, Denver, CO 80202
157528271001	Holman Broomfield Real Estate LLC	Broomfield	17800 SE Mill Plain Blvd. Ste. 190, Vancouver, WA 98683
157529105001	Phillips 66 Company	Broomfield	420 S Keeler, Bartlesville, OK 74003
157528200019	Phillips 66 Company	Broomfield	420 S Keeler, Bartlesville, OK 74003

SCHEDULE

Construction is planned to begin 2 months after plat approval.

ATTACHMENTS

Attachment A – Project Drawings

Attachment B – Exterior Building Materials Cut Sheets (Metal Wall and Roof and Stone Wall Facing)

Attachment C – Redtail Ridge Xcel Easement Encroachments Letter

Attachment D – Special Warranty Deed

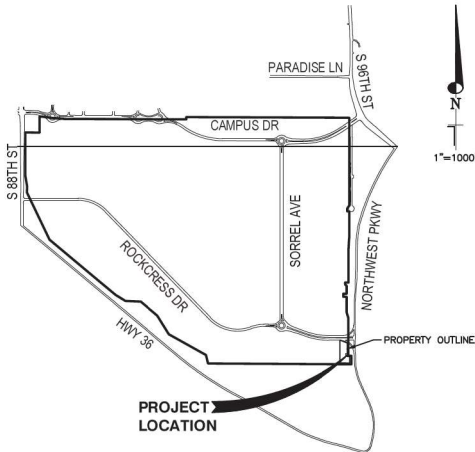
REDTAIL RIDGE LIFT STATION PLANNED UNIT DEVELOPMENT

TRACT K, REDTAIL RIDGE FILING NO. 1
LOCATED IN THE NORTHEAST QUARTER OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69
WEST OF THE 6th P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

DRAWING INDEX

SHT. NO.	DWG. NO.	TITLE
1 OF 13	---	COVER
2 OF 13	C-1	OVERALL SITE PLAN
3 OF 13	C-2	SITE PLAN
4 OF 13	C-3	UTILITY PLAN
5 OF 13	C-4	GRADING PLAN
6 OF 13	L-1.0	LANDSCAPE PLANT SCHEDULE
7 OF 13	L-2.0	LANDSCAPE PLAN
8 OF 13	L-3.0	LANDSCAPE DETAILS
9 OF 13	A-4	BUILDING ELEVATIONS
10 OF 13	A-5	BUILDING ELEVATIONS
11 OF 13	E-101L	EXTERIOR PHOTOMETRIC PLAN NORMAL LIGHTING
12 OF 13	E-101L-1	EXTERIOR PHOTOMETRIC PLAN EMERGENCY LIGHTING
13 OF 13	E-3	LIGHTING FIXTURE CUT-SHEETS AND FIXTURE SCHEDULE

Requested Waivers of CDD&G Not Applicable to Redtail Ridge Lift Station	
Section	Waiver Request
4.5.1.H	Allow prefinished painted metal siding as an exterior material.
8.1D	Allow light spill outside of the site boundaries.



VICINITY MAP

GENERAL NOTES:

1. THE PROPERTY IS ZONED PLANNED COMMUNITY COMMERCIAL.
2. ALL LANDSCAPING WILL BE OWNED/MAINTAINED BY THE METRO DISTRICT.
3. THE CITY OF LOUISVILLE IS NOT RESPONSIBLE FOR DAMAGE TO, OR REPAIR OF, MONUMENT SIGNS, PAVEMENT SURFACES, OR LANDSCAPING CAUSED DURING REPAIR OR MAINTENANCE OF UTILITIES LOCATED WITHIN PUBLIC UTILITY EASEMENTS.

PROJECT DESCRIPTION:

THE BUILDING WILL BE APPROXIMATELY 1,031 SQUARE FEET THAT WILL HOUSE THE LIFT STATION FOR THE REDTAIL RIDGE DEVELOPMENT. THE LIFT STATION SITE WILL ALSO HOUSE A GENERATOR WITH ITS OWN ENCLOSURE COATED TO MATCH THE LIFT STATION COLOR SCHEME AND AN HVAC AREA THAT WILL BE SCREENED FROM VIEW.

LEGAL DESCRIPTION:

TRACT K
REDTAIL RIDGE FILING NO. 1
CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO
SAID PARCEL CONTAINS 32.962 SQUARE FEET OR 0.76 ACRES MORE OR LESS.

OWNERSHIP SIGNATURE BLOCK

The undersigned as the owner of the of the lands described herein, hereby agrees on behalf of itself, and its heirs, successors and assigns to develop and maintain the property described hereon in accordance and compliance with this approved plan and the Louisville Municipal Code.

REDTAIL RIDGE METROPOLITAN DISTRICT

Witness my/our hand(s) and seal(s) this ____ day of _____, 20 ____.

By: RODNEY RICHMOND, MANAGING PRINCIPAL

Owner Name and Signature

Notary Name (print)

(Notary Seal)

Notary Signature

My Commission Expires

CITY COUNCIL CERTIFICATE

Approved this ____ day of _____,
20 ____ by the City Council of the City of
Louisville, Colorado.
Resolution No. _____, Series _____
(City Seal)
Mayor Signature
City Clerk Signature

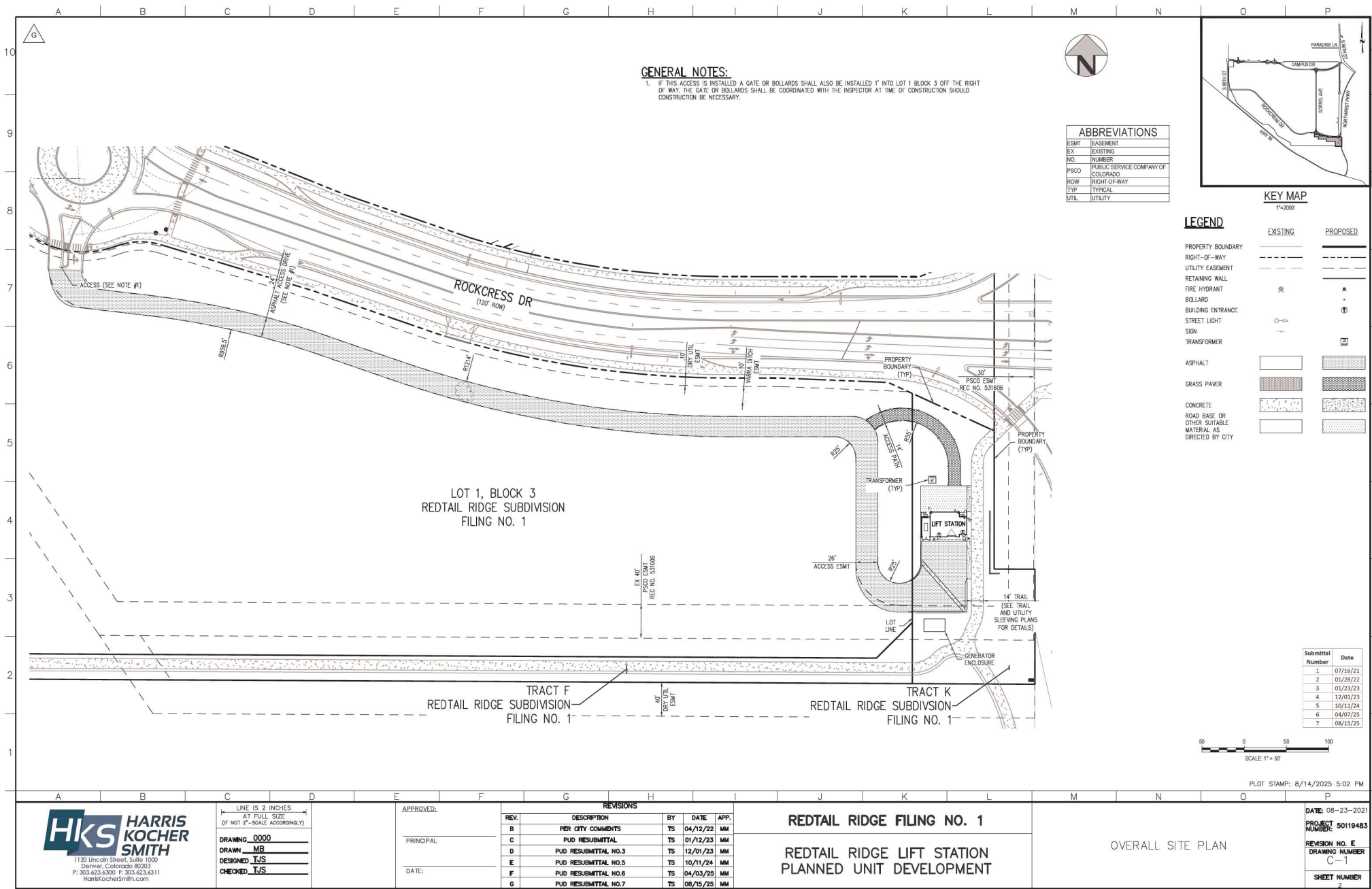
PLANNING COMMISSION CERTIFICATE

Approved this ____ day of _____,
20 ____ by the Planning Commission of the City
of Louisville, Colorado.
Resolution No. _____, Series _____

Contact Information

Landowner:
Redtail Ridge Development,
LLC
1555 Blake Street, Suite 210
Denver, CO 80202
Applicant:
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1555 Blake Street, Suite 210
Denver, CO 80202
970-581-8863
jay.hardy@bruebaukol.com
Architect:
Lintjer+Haywood Architects
Bruce Lintjer
303-408-5939
blintjer@lintjer-haywood.com
Landscape Architect:
Norris Design
Jared Carlon
303-892-1166
jcarlon@norris-design.com
Photometric Engineer:
Dewberry Engineers Inc.
Stephen Blucher
919-424-3775
sblucher@dewberry.com

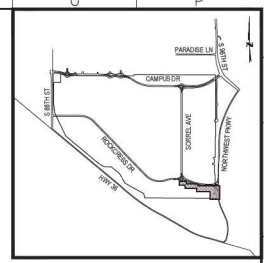
Submittal Number	Date
1	07/16/21
2	01/28/22
3	01/23/23
4	12/01/23
5	10/11/24
6	04/07/25
7	08/15/25



GENERAL NOTES:
1. IF THIS ACCESS IS INSTALLED A GATE OR BOLLARDS SHALL ALSO BE INSTALLED 1' INTO LOT 1 BLOCK 3 OFF THE RIGHT OF WAY. THE GATE OR BOLLARDS SHALL BE COORDINATED WITH THE INSPECTOR AT TIME OF CONSTRUCTION SHOULD CONSTRUCTION BE NECESSARY.



ABBREVIATIONS	
ESMT	EASEMENT
EX	EXISTING
NO.	NUMBER
PSCD	PUBLIC SERVICE COMPANY OF COLORADO
ROW	RIGHT-OF-WAY
TYP	TYPICAL
UTIL	UTILITY



LEGEND

EXISTING	PROPOSED
PROPERTY BOUNDARY	---
RIGHT-OF-WAY	---
UTILITY EASEMENT	---
RETAINING WALL	---
FIRE HYDRANT	⊙
BOLLARD	⊙
BUILDING ENTRANCE	⊙
STREET LIGHT	⊙
SIGN	⊙
TRANSFORMER	⊙
ASPHALT	▨
GRASS PAVEMENT	▨
CONCRETE	▨
ROAD BASE OR OTHER SUITABLE MATERIAL AS DIRECTED BY CITY	▨

Submittal Number	Date
1	07/16/21
2	01/28/22
3	01/23/23
4	12/01/23
5	10/11/24
6	04/07/25
7	08/15/25



PLOT STAMP: 8/14/2025 5:02 PM

HKS HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)
DRAWING 0000
DRAWN MB
DESIGNED TJS
CHECKED TJS

APPROVED:

PRINCIPAL

DATE:

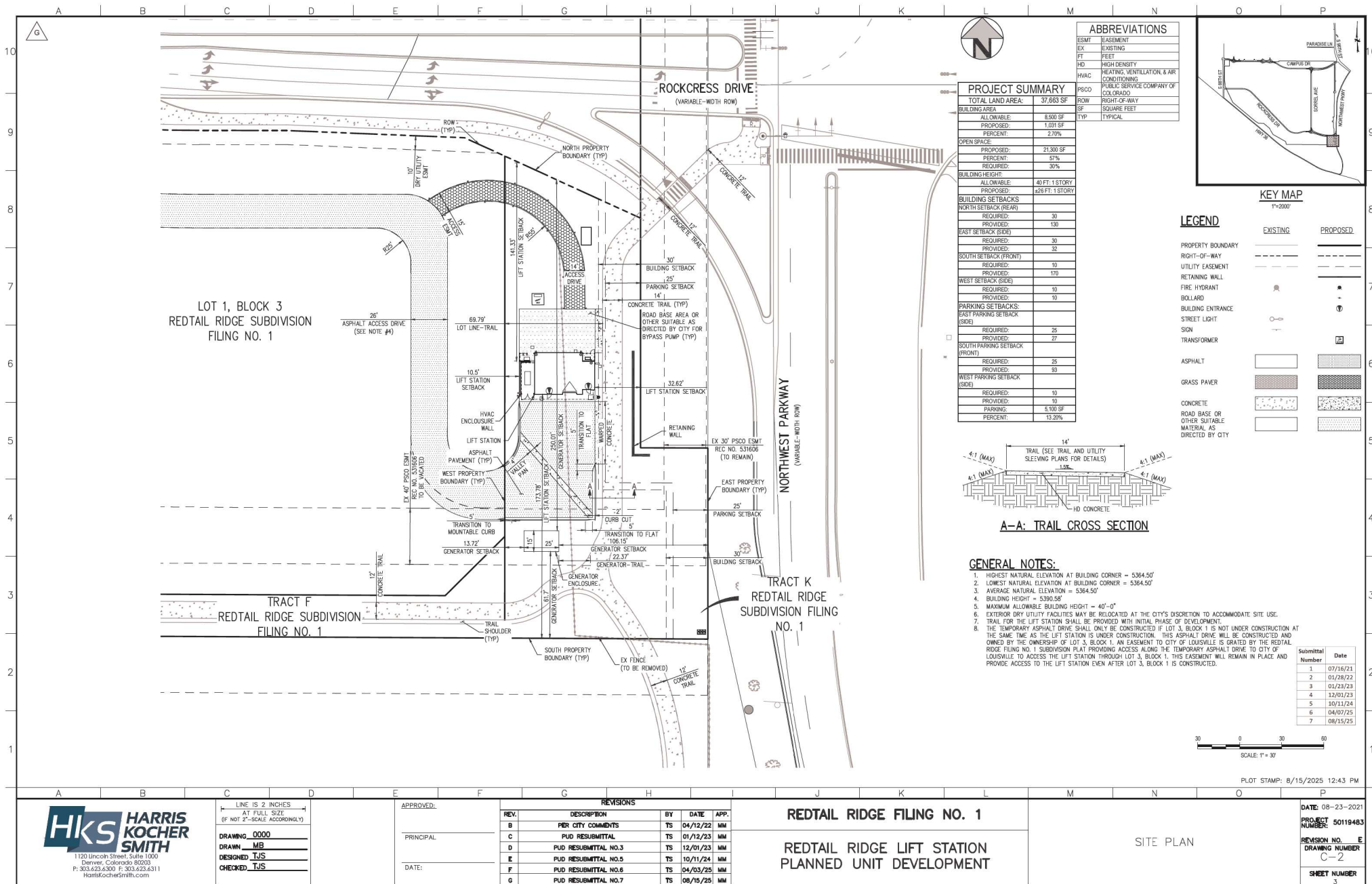
REVISIONS				
REV.	DESCRIPTION	BY	DATE	APP.
B	PER CITY COMMENTS	TS	04/12/22	MM
C	PUD RESUBMITTAL	TS	01/12/23	MM
D	PUD RESUBMITTAL NO.3	TS	12/01/23	MM
E	PUD RESUBMITTAL NO.5	TS	10/11/24	MM
F	PUD RESUBMITTAL NO.6	TS	04/03/25	MM
G	PUD RESUBMITTAL NO.7	TS	08/15/25	MM

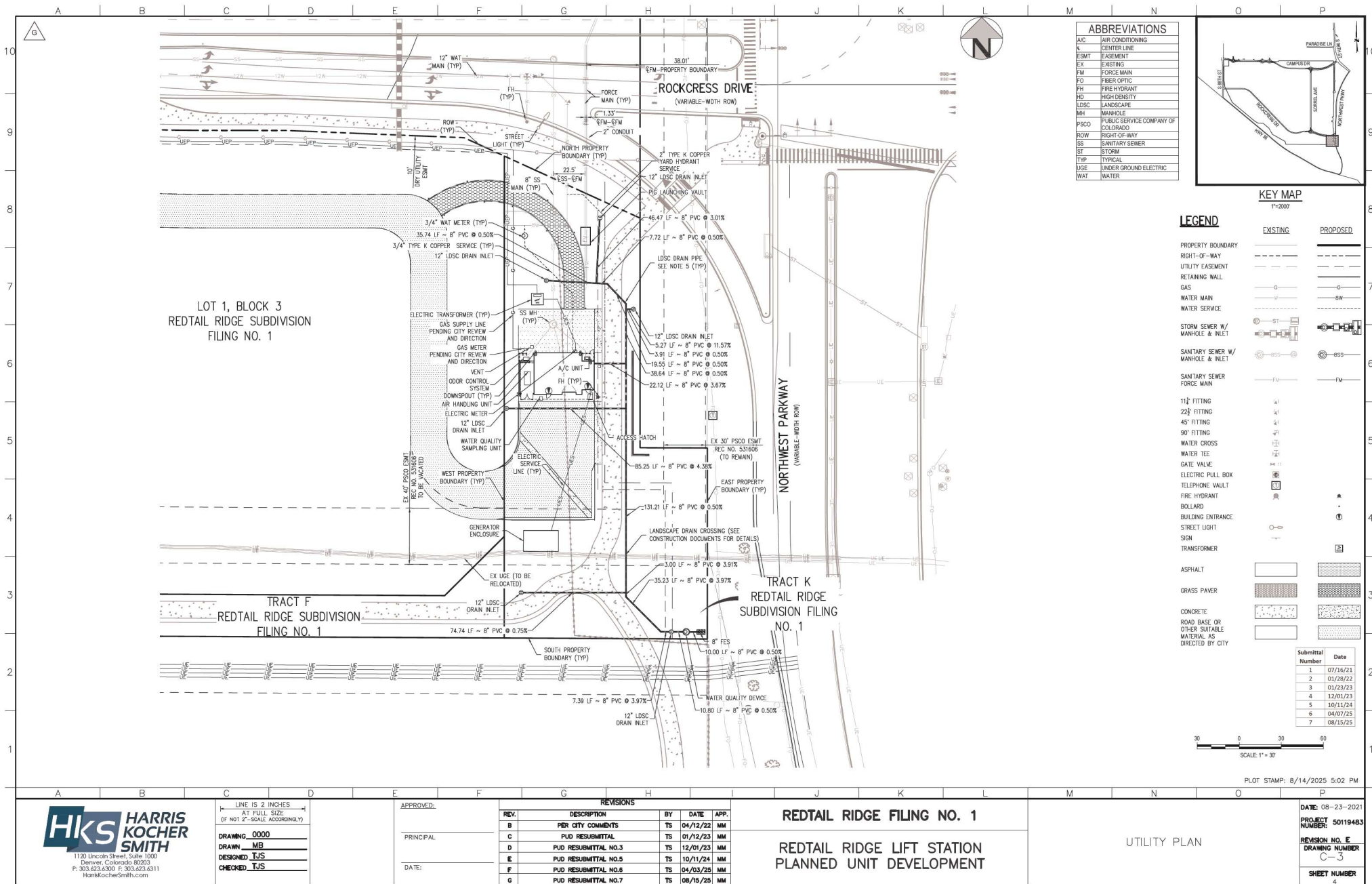
REDTAIL RIDGE FILING NO. 1

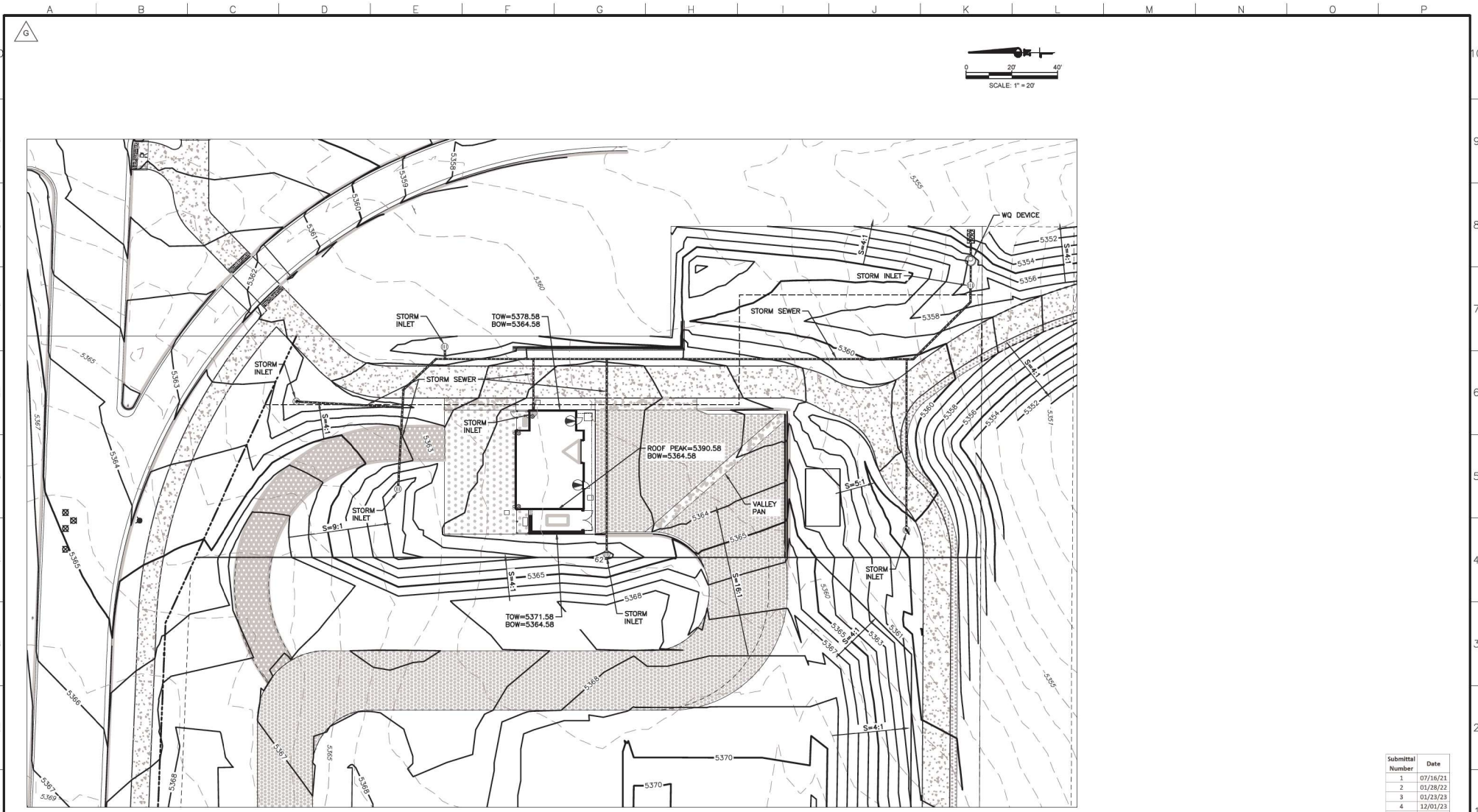
**REDTAIL RIDGE LIFT STATION
PLANNED UNIT DEVELOPMENT**

OVERALL SITE PLAN

DATE: 08-23-2021
PROJECT NUMBER: 50119483
REVISION NO. E
DRAWING NUMBER C-1
SHEET NUMBER 2







Submittal Number	Date
1	07/16/21
2	01/28/22
3	01/23/23
4	12/01/23
5	10/11/24
6	04/07/25
7	08/15/25

Dewberry
Dewberry Engineers Inc.
990 S. BROADWAY, SUITE 400
Denver, Colorado 80209
(303) 825-1802

LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"=SCALE ACCORDINGLY)

DRAWING: CPL19483-1
DRAWN: TWL
DESIGNED: SEF
CHECKED: SEF

APPROVED:
PRINCIPAL
DATE:

REV.	DESCRIPTION	BY	DATE	APP.
A	PUD RESUBMITTAL	TWL	01/22/23	SEF
B	PUD RESUBMITTAL NO. 3	TWL	12/01/23	SEF
C	PUD RESUBMITTAL NO. 5	TWL	10/11/24	SEF
D	PUD RESUBMITTAL NO. 6	TWL	04/03/25	SEF
E	PUD RESUBMITTAL NO. 7	TWL	08/15/25	SEF

REDTAIL RIDGE FILING NO. 1

REDTAIL RIDGE LIFT STATION
PLANNED UNIT DEVELOPMENT

CIVIL

GRADING PLAN

DATE: 01/11/23
PROJECT NUMBER: 50119483
REVISION NO. E
DRAWING NUMBER
C-3
SHEET NUMBER
5

CODE	QTY	BOTANICAL NAME	COMMON NAME	ROOT	
TREES					<u>MATURE SIZE</u>
QU FA	2	QUERCUS ROBUR FASTIGIATA	PYRAMIDAL ENGLISH OAK	2" CAL. B & B	50' H X 20" W
EVERGREEN TREES					<u>MATURE SIZE</u>
PI PU	3	PICEA PUNGENS	COLORADO SPRUCE	2" CAL. B & B	60' H X 20" W
PI EA	4	PINUS LEUCODERMIS 'EMERALD ARROW'	EMERALD ARROW BOSNIAN PINE	2" CAL. B & B	30' H X 8" W
DECIDUOUS SHRUBS 2.4' SPREAD					<u>MATURE SIZE</u>
AM BU	33	AMORPHA NANA	FALSE INDIGO	#5 CONT.	2' H X 20" W
EP EQ	3	EPHEDRA EQUSETINA	BLUESTEM JOINT FIR	#5 CONT.	4' H X 4" W
PE AT	3	PEROVSKIA ATRIPLEXIFOLIA	RUSSIAN SAGE	#5 CONT.	5' H X 4" W
DECIDUOUS SHRUBS 5-7' SPREAD					<u>MATURE SIZE</u>
CO BY	1	CORNUS SERICEA 'BUD'S YELLOW'	BUD'S YELLOW DOGWOOD	#5 CONT.	8' H X 6" W
CY MO	6	CYTISUS SCOPARIUS 'MOONLIGHT'	MOONLIGHT BROM	#5 CONT.	6' H X 6" W
DECIDUOUS SHRUBS 7-9' SPREAD					<u>MATURE SIZE</u>
AM RE	3	AMELANCHIER ALNIFOLIA 'REGENT'	REGENT SERVICEBERRY	#5 CONT.	6' H X 6" W
CE LE	9	CERCOCARPUS LEDIFOLIUS	CURL-LEAF MOUNTAIN MAHOGANY	#5 CONT.	30' H X 12" W
EVERGREEN SHRUB 2.4' SPREAD					<u>MATURE SIZE</u>
YU IT	3	YUCCA FLACCIDIA 'IVORY TOWER'	IVORY TOWER YUCCA	#5 CONT.	4' H X 3" W
EVERGREEN SHRUBS 2.5' SPREAD					<u>MATURE SIZE</u>
AR PA	22	ARCTOSTAPHYLOS X COLORADENSIS 'PANCHITO'	PANCHITO MANZANITA	#5 CONT.	15' H X 5" W
EVERGREEN SHRUBS 5.7' SPREAD					<u>MATURE SIZE</u>
BE AG	13	BERBERIS AQUIFOLIUM	OREGON GRAPE	#5 CONT.	3' H X 6" W
TH SM	3	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVITAE	#5 CONT.	12' H X 5" W
EVERGREEN SHRUBS 7.0' SPREAD					<u>MATURE SIZE</u>
PI MO	13	PICEA PUNGENS 'MONTGOMERY'	MONTGOMERY SPRUCE	#5 CONT.	12' H X 10" W
PI HC	2	PINUS SYLVESTRIS 'HILLSIDE CREEPER'	HILLSIDE CREEPER SCOTCH PINE	#5 CONT.	12' H X 12" W
ORNAMENTAL GRASSES LARGE					<u>MATURE SIZE</u>
AN GE	17	ANDROPOGON GERARDII 'PINWINS' TM	WINDWALKER BIG BLUESTEM	#5 CONT.	6' H X 3" W
MI PU	21	MISCANTHUS SINENSIS 'PURPURESCENS'	PURPLE EULALIA GRASS	#5 CONT.	4' H X 3" W
ORNAMENTAL GRASSES MEDIUM					<u>MATURE SIZE</u>
AC HY	26	ACHATHERUM HYMENODES	INDIAN RICE GRASS	#1 CONT.	1.5' H X 1.5" W
BO GR	117	BOULEAU GRACILIS	BLUE GRAMA GRASS	#1 CONT.	2' H X 2" W
HE SE	117	HELICTOTRICHON SEMPERVIRENS	BLUE AVENA GRASS	#1 CONT.	3' H X 2" W
SC PB	21	SCHIZACHYRIUM SCOPARIUM 'PRAIRIE BLUES'	LITTLE BLUESTEM GRASS	#1 CONT.	4' H X 1.5" W
PERENNIALS LARGE					<u>MATURE SIZE</u>
AG AS	5	AGASTACHE RUPESTRIS 'VALERIE FINNET'	APACHE SUNSET THREADLEAF HYSSOP	#1 CONT.	3' H X 3" W
AR VF	16	ARTEMISIA LUDOVICIANA 'VALERIE FINNET'	VALERIE FINNET SAGEBRUSH	#1 CONT.	3.5' H X 3" W
PERENNIALS MEDIUM					<u>MATURE SIZE</u>
RU HI	46	RUDEBECKIA HIRTA	BLACK-EYED SUSAN	#1 CONT.	2' H X 2" W

REDTAIL RIDGE NATIVE GRASS SEED MIX

*"SHORTGRASS PRAIRIE MIX" BY ARKANSAS VALLEY SEED CO, OR APPROVED EQUAL

COMMON NAME	PLSF# / ACRE	% OF TOTAL
BUFFALO GRASS	21.6	41.5%
SIDEATS GRAMA	0.8	1.9%
WESTERN WHEATGRASS	8.6	16%
BLUE GRAMA	4.0	8%
BOTTLEBRUSH SQUIRRELTAIL	4.0	8%
GREEN NEEDLEGRASS	2.8	5%
PRAIRIE JUNEGRASS	1.0	2%
SAND DROPSEED	0.20	0.5%
TOTAL	52.0 PLSF# / ACRE	100%

NAME	DESCRIPTION
POROUS PAVEMENT	MANUFACTURER - INVISIBLE STRUCTURES PRODUCT NAME - GRASSPAVE2 NOTES - INSTALL PER MANUFACTURER'S SPECIFICATIONS. SEE LANDSCAPE PLAN FOR LOCATION AND DETAIL 7 ON SHEET L-30 FOR EDGE CONSTRAINT TYPE.
COBBLE	SOURCE - LOCAL (BY CONTRACTOR) TYPE - 2" x 4" ROUNDED RIVER ROCK, TAN-BEIGE COLOR RANGE, AS IN REDTAN RIDGE PILING #1. SHALL BE PLACED @ 4" MIN. DEPTH OVER A NON WOVEN POLYPROPYLENE WEED BARRIER SUCH AS TYFAR OR MIRAFIX.

1. ALL PLANT MATERIALS SHALL MEET THE FOLLOWING SIZE CRITERIA, AS NOTED IN SECT. 5.7
DECIDUOUS SHADE/CANOPY TREES: 2" CALIPER
ORNAMENTAL TREES: 2" CALIPER (1.5" CALIPER MAY BE SUFFICIENT IN SOME CASES)
EVERGREEN TREES: 6'-8" HEIGHT (MINIMUM OF 25% SHALL BE 8" HEIGHT)
MULTI-STEM ORNAMENTALS: 8'-10' HEIGHT
SHRUBS: 5 GALLON CONTAINER GROWN
GROUND COVER/PERENNIALS: 2"-14" POTS
VINES: 1 GALLON CONTAINER GROWN
2. CITY FORESTER TO APPROVE/ACCEPT TREES IN RIGHT OF WAY.
3. ALL PLANT MATERIALS SHALL MEET THE SPECIFICATIONS OF THE AMERICAN ASSOCIATION OF NURSERYMEN (AAN).
4. ALL TREES SHALL BE BALLED AND BURLAPPED.
5. DECIDUOUS TREES SHALL BE PLANTED A MINIMUM OF 7' AND EVERGREEN TREES A MINIMUM OF 10' FROM ALL PUBLIC UTILITIES.
6. VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO PLANTING.
7. A HORIZONTAL DISTANCE OF 40' SHALL BE MAINTAINED BETWEEN STREET LIGHT AND STREET TREES.
8. PRE-CONSTRUCTION CONFERENCE REQUIRED WITH PUBLIC WORKS PRIOR CONSTRUCTION.
9. DEVELOPMENT WILL HAVE A 2-YEAR WARRANTY ON ALL PUBLIC IMPROVEMENTS AFTER CONSTRUCTION ACCEPTANCE IS ISSUED. THIS NOTE SHALL NOT IMPACT THE DEVELOPMENT AGREEMENT.

Submittal Number	Date
1	07/16/21
2	01/28/22
3	01/23/23
4	12/01/23
5	10/11/24
6	04/07/25
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Denver, Colorado 80209
(303) 825-1802

LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"=SCALE ACCORDINGLY)

DRAWING _____
DRAWN EH
DESIGNED EH
CHECKED JC

APPROVED:

PRINCIPAL
JC

DATE:
08/14/2025

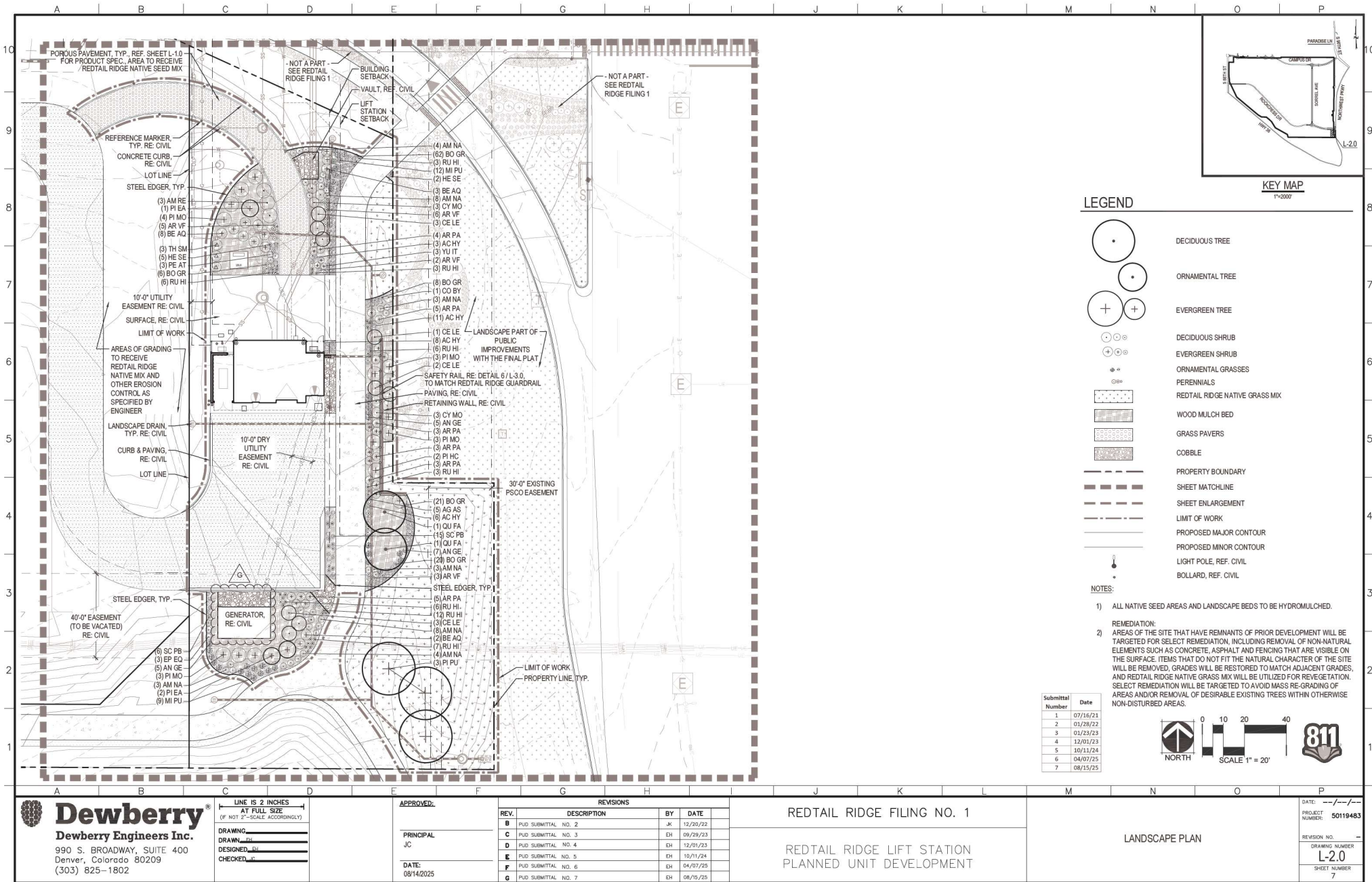
REVISIONS			
REV.	DESCRIPTION	BY	DATE
B	PUD SUBMITTAL NO. 2	JK	12/20/22
C	PUD SUBMITTAL NO. 3	EH	09/29/23
D	PUD SUBMITTAL NO. 4	EH	12/01/23
E	PUD SUBMITTAL NO. 5	EH	10/11/24
F	PUD SUBMITTAL NO. 6	EH	04/07/25
G	PUD SUBMITTAL NO. 7	EH	08/15/25

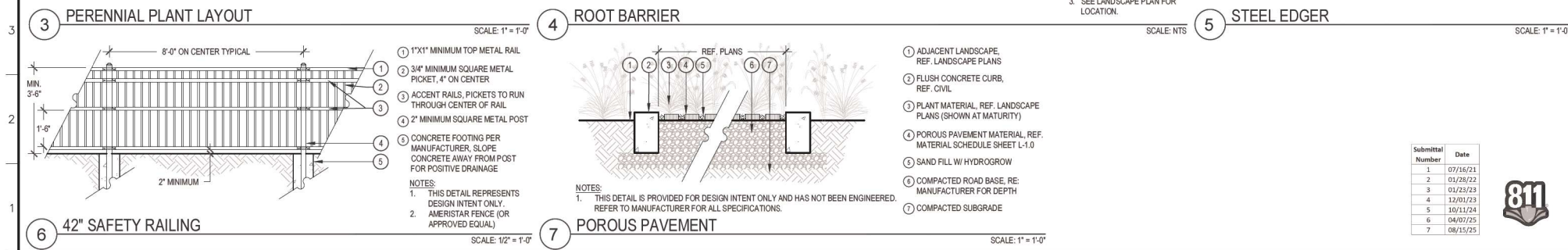
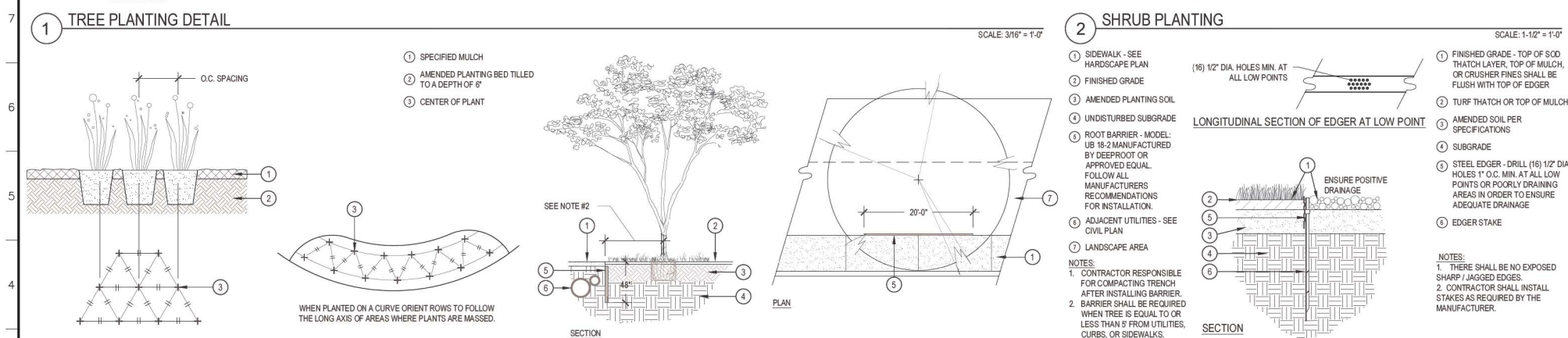
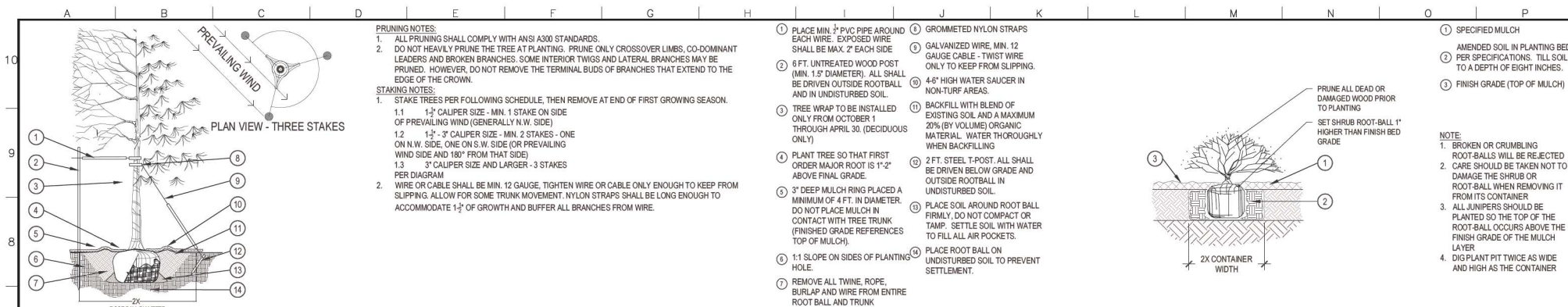
REDTAIL RIDGE FILING NO. 1

REDTAIL RIDGE LIFT STATION
PLANNED UNIT DEVELOPMENT

LANDSCAPE PLANT SCHEDULE

DATE: --/--/--
PROJECT NUMBER: 50119483
REVISION NO. --
DRAWING NUMBER L-1.0
SHEET NUMBER 6





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990 S. BROADWAY, SUITE 400
DENVER, COLORADO 80209
(303) 825-1802

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

DRAWING: _____
DESIGNED: _____
CHECKED: _____

APPROVED: _____
PRINCIPAL: _____
DATE: 08/14/2025

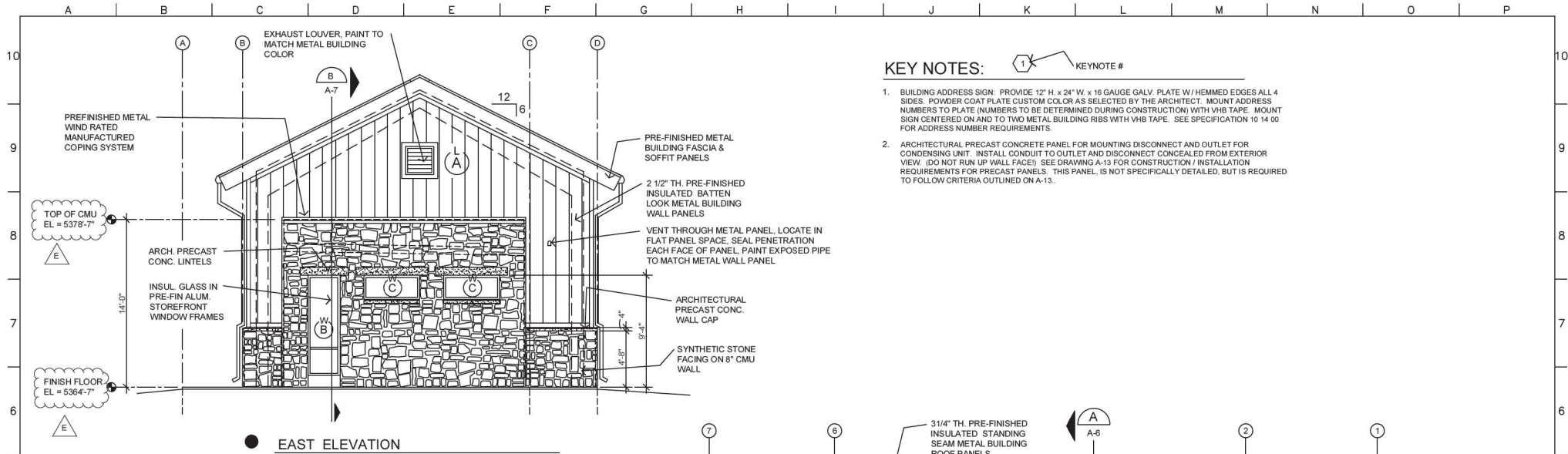
REV.	DESCRIPTION	BY	DATE
B	PUD SUBMITTAL NO. 2	JK	12/20/22
C	PUD SUBMITTAL NO. 3	EH	09/29/23
D	PUD SUBMITTAL NO. 4	EH	12/01/23
E	PUD SUBMITTAL NO. 5	EH	10/11/24
F	PUD SUBMITTAL NO. 6	EH	04/07/25
G	PUD SUBMITTAL NO. 7	EH	08/15/25

REDTAIL RIDGE FILING NO. 1

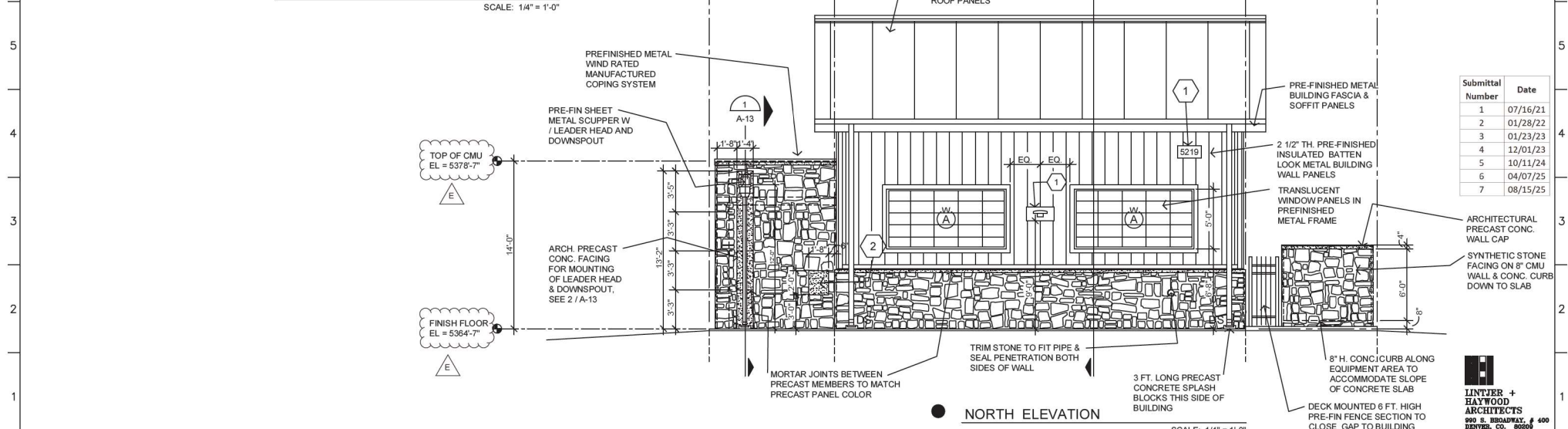
REDTAIL RIDGE LIFT STATION
PLANNED UNIT DEVELOPMENT

LANDSCAPE DETAILS

PROJECT NUMBER: 5019483
REVISION NO.: -
DRAWING NUMBER: L-3.0
SHEET NUMBER: 8



- KEY NOTES:**
- BUILDING ADDRESS SIGN: PROVIDE 12" H. x 24" W. x 16 GAUGE GALV. PLATE W/ HEMMED EDGES ALL 4 SIDES. POWDER COAT PLATE CUSTOM COLOR AS SELECTED BY THE ARCHITECT. MOUNT ADDRESS NUMBERS TO PLATE (NUMBERS TO BE DETERMINED DURING CONSTRUCTION) WITH VHB TAPE. MOUNT SIGN CENTERED ON AND TO TWO METAL BUILDING RIBS WITH VHB TAPE. SEE SPECIFICATION 10 14 00 FOR ADDRESS NUMBER REQUIREMENTS.
 - ARCHITECTURAL PRECAST CONCRETE PANEL FOR MOUNTING DISCONNECT AND OUTLET FOR CONDENSING UNIT. INSTALL CONDUIT TO OUTLET AND DISCONNECT CONCEALED FROM EXTERIOR VIEW. (DO NOT RUN UP WALL FACE). SEE DRAWING A-13 FOR CONSTRUCTION / INSTALLATION REQUIREMENTS FOR PRECAST PANELS. THIS PANEL IS NOT SPECIFICALLY DETAILED, BUT IS REQUIRED TO FOLLOW CRITERIA OUTLINED ON A-15.



Submittal Number	Date
1	07/16/21
2	01/28/22
3	01/23/23
4	12/01/23
5	10/11/24
6	04/07/25
7	08/15/25

LINTJER + HAYWOOD ARCHITECTS
 900 S. BROADWAY, # 400
 DENVER, CO. 80209
 303.408.5939 7500X6

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 990 S. BROADWAY, SUITE 400
 Denver, Colorado 80209
 (303) 825-1802

LINE IS 2 INCHES
 AT FULL SIZE
 (IF NOT 2"=SCALE ACCORDINGLY)

DRAWING A-4 DWG
 DRAWN BRL
 DESIGNED BRL
 CHECKED BRL

REV.	DESCRIPTION	BY	DATE	APP.
A	BUILDING DEPARTMENT SUBMITTAL	BRL	08/24/21	BRL
B	PUD RESUBMITTAL NO. 3	BRL	01/12/23	BRL
C	PUD RESUBMITTAL NO. 5	BRL	12/11/23	BRL
D	PUD RESUBMITTAL NO. 7	BRL	10/11/24	BRL
E	PUD RESUBMITTAL NO. 7	BRL	08/15/25	BRL

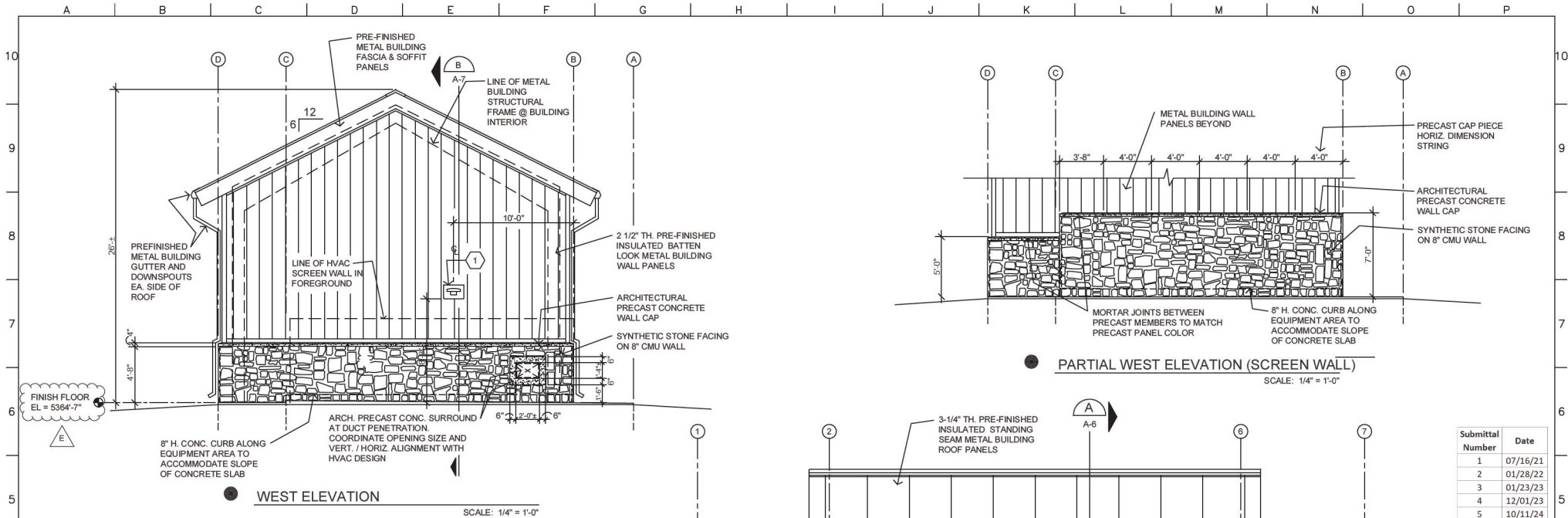
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REDTAIL RIDGE LIFT STATION
 PLANNED UNIT DEVELOPMENT

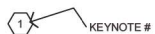
ARCHITECTURAL

BUILDING ELEVATIONS

DATE: 08/24/21
 PROJECT NUMBER: 50119483
 REVISION NO. E
 DRAWING NUMBER A-4
 SHEET NUMBER 5



KEY NOTES:



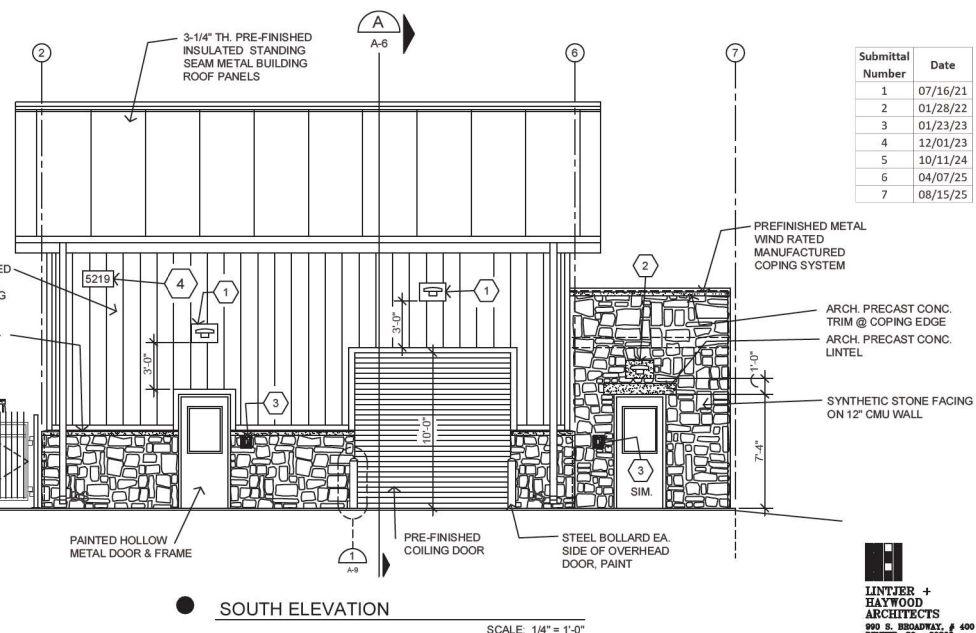
KEYNOTE #

- (WALL) MOUNTED LIGHT FIXTURE. CENTER LIGHT FIXTURE ON 14" HIGH x 20" WIDE PREFINISHED PANEL CENTERED ON DOOR FRAME BELOW. SEE DETAIL 5 / A-12 FOR PANEL REQUIREMENTS.
- (WALL) MOUNTED LIGHT FIXTURE. CENTER LIGHT FIXTURE ON 16" HIGH x 24" WIDE ARCHITECTURAL PRECAST CONCRETE PANEL CENTERED ON DOOR FRAME BELOW. GROUT CMU AT PANEL SUPPORT DOWELS. SEE DETAIL 1 / A-12 FOR PANEL REQUIREMENTS.
- (WALL) MOUNTED ARCHITECTURAL PRECAST CONCRETE PANEL FOR DOOR ACCESS CONTROL. LOCATE PANEL 8" FROM DOOR JAMB. SEE DETAIL 3 / A-12 FOR PANEL REQUIREMENTS.
- BUILDING ADDRESS SIGN: PROVIDE 12" H. x 24" W. x 16 GAUGE GALV. PLATE W/ HEMMED EDGES ALL 4 SIDES. POWDER COAT PLATE CUSTOM COLOR AS SELECTED BY THE ARCHITECT. MOUNT ADDRESS NUMBERS TO PLATE (NUMBERS TO BE DETERMINED DURING CONSTRUCTION) WITH VHB TAPE. MOUNT SIGN CENTERED ON AND TO TWO METAL BUILDING RIBS WITH VHB TAPE. SEE SPECIFICATION 10.14.00 FOR ADDRESS NUMBER REQUIREMENTS.

FINISH FLOOR
EL = 5364'-7"



DECK MOUNTED 6 FT.
HIGH, PRE-FIN METAL,
VEHICLE TYPE GATE
@ HVAC AREA END
WALL



Submittal Number	Date
1	07/16/21
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4	12/01/23
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990 S. BROADWAY, # 400
DENVER, CO. 80206
303.408.5639 778038

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990 S. BROADWAY, SUITE 400
Denver, Colorado 80209
(303) 825-1802

LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"=SCALE ACCORDINGLY)

DRAWN: A-5 DWG
DRAWN: BRL
DESIGNED: BRL
CHECKED: BRL

APPROVED:
PRINCIPAL
DATE:

REV.	DESCRIPTION	BY	DATE	APP.
A	BUILDING DEPARTMENT SUBMITTAL	BRL	08/24/21	BRL
B	PUD RESUBMITTAL NO. 3	BRL	01/12/23	BRL
C	PUD RESUBMITTAL NO. 3	BRL	12/1/23	BRL
D	PUD RESUBMITTAL NO. 5	BRL	10/11/24	BRL
E	PUD RESUBMITTAL NO. 7	BRL	08/15/25	BRL

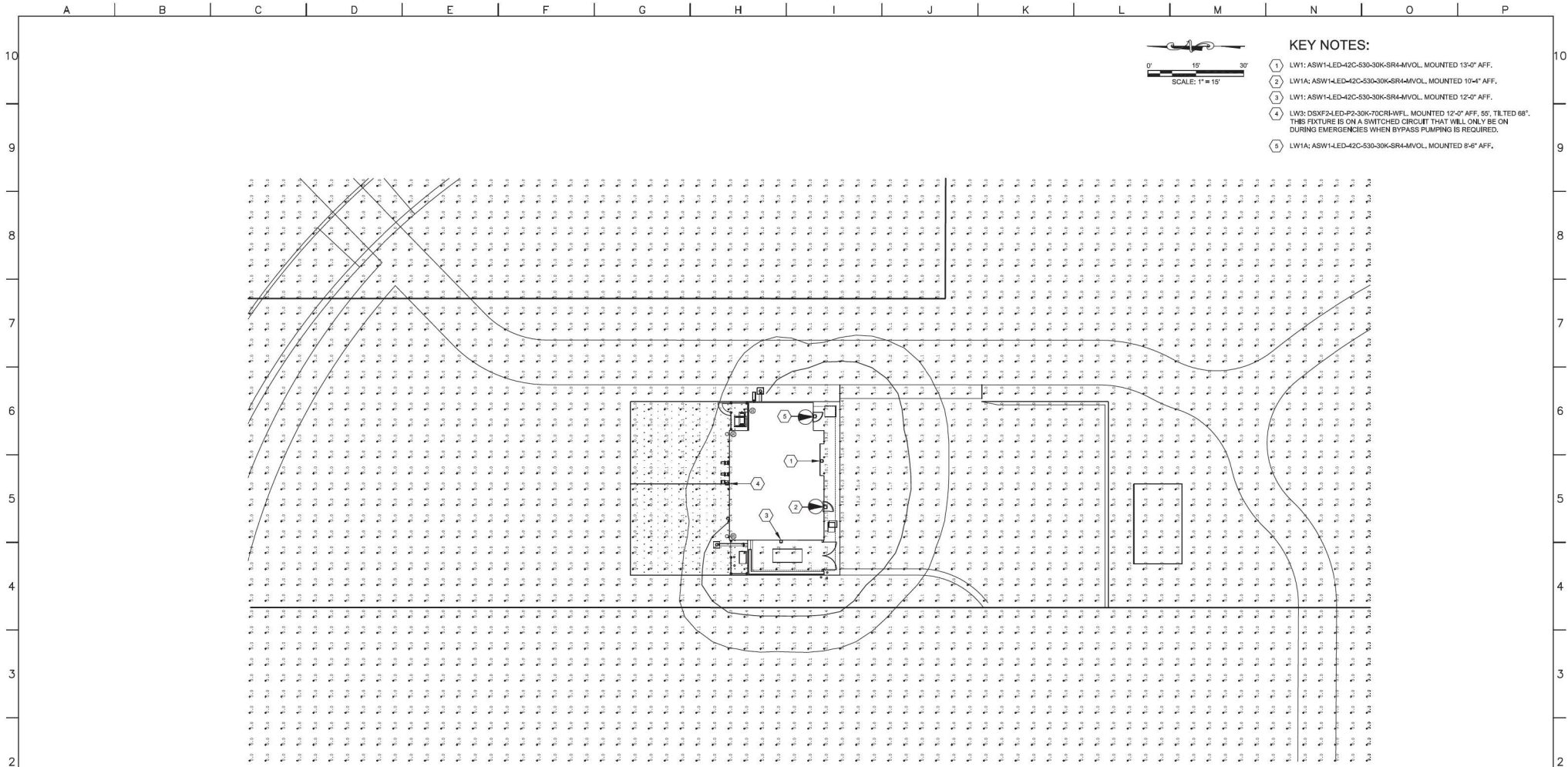
RETAIL RIDGE FILING NO. 1

RETAIL RIDGE LIFT STATION
PLANNED UNIT DEVELOPMENT

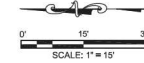
ARCHITECTURAL

BUILDING ELEVATIONS

DATE: 09/24/21
PROJECT NUMBER: 50119483
REVISION NO. E
DRAWING NUMBER A-5
SHEET NUMBER 10



1 LIFT STATION PHOTOMETRIC PLAN
Scale: 1" = 15'



KEY NOTES:

- 1 LW1: ASW1-LED-42C-530-30K-SR4-MVOL, MOUNTED 13-0° AFF.
- 2 LW1A: ASW1A-LED-42C-530-30K-SR4-MVOL, MOUNTED 10-4° AFF.
- 3 LW1: ASW1-LED-42C-530-30K-SR4-MVOL, MOUNTED 12-0° AFF.
- 4 LW3: DISKF2-LED-P2-30K-70CR-WFL, MOUNTED 12-0° AFF, 55° TILTED 68°. THIS FIXTURE IS ON A SWITCHED CIRCUIT THAT WILL ONLY BE ON DURING EMERGENCIES WHEN BYPASS PUMPING IS REQUIRED.
- 5 LW1A: ASW1A-LED-42C-530-30K-SR4-MVOL, MOUNTED 8-6° AFF.

Submittal Number	Date
1	07/16/21
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990 S. BROADWAY, SUITE 400
Denver, Colorado 80209
(303) 825-1802

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AT FULL SIZE
(IF NOT 2"=SCALE ACCORDINGLY)

DRAWING: EPL9483-101L
DRAWN: BDW
DESIGNED: JPB
CHECKED: JPB

APPROVED:

PRINCIPAL

DATE:

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APP.
A	PUD RESUBMITTAL	JPB	12/20/22	SEP
B	PUD RESUBMITTAL NO. 3	TWL	12/01/23	SEP
C	PUD RESUBMITTAL NO. 5	TWL	10/11/24	SEP
D	PUD RESUBMITTAL NO. 7	TWL	08/15/25	SEP

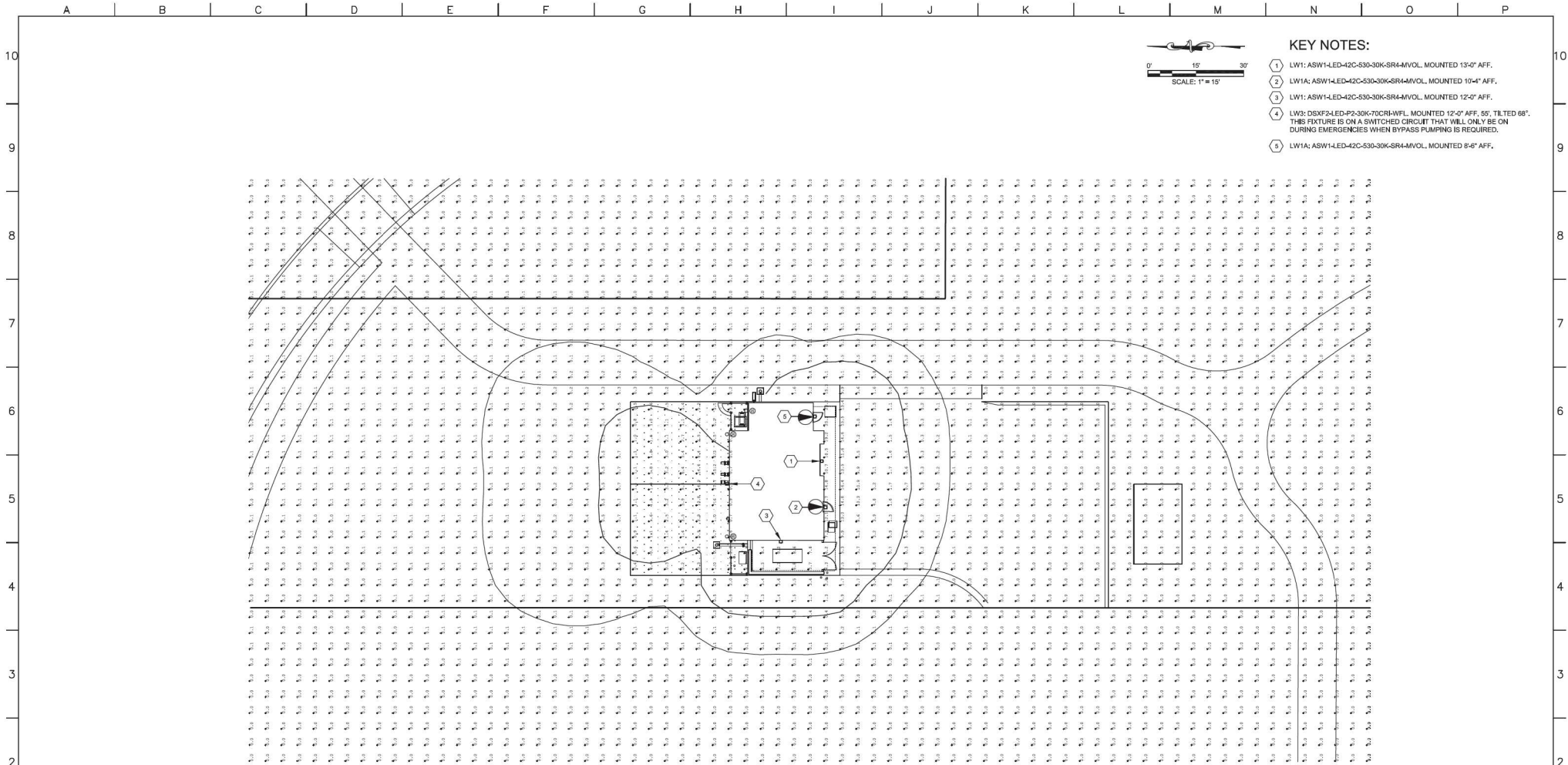
RETAIL RIDGE FILING NO. 1

RETAIL RIDGE LIFT STATION
PLANNED UNIT DEVELOPMENT

ELECTRICAL

EXTERIOR PHOTOMETRIC PLAN
NORMAL LIGHTING

DATE: 12/20/22
PROJECT NUMBER: 50119483
REVISION NO. C
DRAWING NUMBER
E-101L
SHEET NUMBER
11



1 LIFT STATION PHOTOMETRIC PLAN
Scale: 1" = 15'

Submittal Number	Date
1	07/16/21
2	01/28/22
3	01/23/23
4	12/01/23
5	10/11/24
6	04/07/25
7	08/15/25

Dewberry
Dewberry Engineers Inc.
990 S. BROADWAY, SUITE 400
Denver, Colorado 80209
(303) 825-1802

LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"=SCALE ACCORDINGLY)
DRAWING: EPL9483-101L1
DRAWN: BDW
DESIGNED: JPB
CHECKED: JPB

APPROVED:

PRINCIPAL

DATE:

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APP.
A	PUD RESUBMITTAL	JPB	12/20/22	SEP
B	PUD RESUBMITTAL NO. 3	TWL	12/09/23	SEP
C	PUD RESUBMITTAL NO. 4	RWL	12/12/23	SEP
D	PUD RESUBMITTAL NO. 5	TWL	10/11/24	SEP
	PUD RESUBMITTAL NO. 7	TWL	08/15/25	SEP

RETAIL RIDGE FILING NO. 1

RETAIL RIDGE LIFT STATION
PLANNED UNIT DEVELOPMENT

ELECTRICAL

EXTERIOR PHOTOMETRIC PLAN
EMERGENCY LIGHTING

DATE: 12/20/22
PROJECT NUMBER: 50119483
REVISION NO. D
DRAWING NUMBER
E-101L-1
SHEET NUMBER
12

D-Series Size 2 LED Floodlight

Specifications

Ordering Information

EXAMPLE: DSKF2 LED P1 40K MSP MVOLT THK DDBXD

Accessories

Stock configurations are offered for shorter lead times

Notes

LITHONIA LIGHTING

ASW1 LED LED Wall Luminaire

Specifications

Ordering Information

EXAMPLE: ASW1 LED 42C 700 40K SRH MVOLT DDBTDX

Accessories

Notes

LITHONIA LIGHTING

Performance Data

Lumen Output

Lumen Ambient Temperature (LAT) Multipliers

Projected LED Lumen Maintenance

Photometric Diagrams

Features & Specifications

INTENDED USE

CONSTRUCTION

FINISH

OPTICS

ELECTRICAL

INSTALLATION

WARRANTY

Notes

LITHONIA LIGHTING

FIXTURE SCHEDULE			
FIXTURE TYPE	FIXTURE WATTAGE	DESCRIPTION	MANUFACTURER AND MODEL
LW1	28W (max)	WALL-MOUNTED, 120-277VAC, LED LIGHT FIXTURE, COLOR TEMPERATURE OF 3000K, IESNA TYPE III MEDIUM DISTRIBUTION, BLACK DIE-CAST ALUMINUM HOUSING, FULL CUT-OFF OPTICS, 3,000 LUMEN MINIMUM, INTEGRAL PHOTOCELL.	HOLOPHANE WALLPACK FULL CUTOFF LED, HUBBELL LMC SERIES, LITHONIA ASW1 LED OR APPROVED EQUAL
LW1A	28W (max)	SIMILAR TO TYPE LW1 EXCEPT EQUIPPED WITH EMERGENCY BATTERY BACKUP.	SAME AS LW1
LW3	102W (max)	WALL-MOUNTED, 120-277VAC, LED LIGHT FIXTURE, COLOR TEMPERATURE OF 3000K, FLOOD DISTRIBUTION, BLACK DIE-CAST ALUMINUM HOUSING, 10,000 LUMEN MINIMUM, EMERGENCY BATTERY BACKUP.	LITHONIA D-SERIES, OR APPROVED EQUAL

*THE LW3 FIXTURE IS ON A SWITCHED CIRCUIT AND WILL ONLY BE ON WHEN THERE IS AN EMERGENCY AT THE LIFT STATION REQUIRING TEMPORARY BYPASS PUMPING OF THE LIFT STATION.

Submittal Number	Date
1	07/16/21
2	01/28/22
3	01/23/23
4	12/01/23
5	10/11/24
6	04/07/25
7	08/15/25

Dewberry Engineers Inc.

990 S. BROADWAY, SUITE 400
DENVER, COLORADO 80209
(303) 825-1802

LINE IS 2 INCHES AT FULL SIZE (P NOT 2" - SCALE ACCORDINGLY)

DRAWING: EDT119483-E3

DESIGNED: [Signature]

CHECKED: [Signature]

APPROVED: [Signature]

PRINCIPAL: [Signature]

DATE: [Signature]

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
A	PUD RESUBMITTAL	TWL	12/01/22	SEF
B	PUD RESUBMITTAL NO. 3	TWL	12/01/23	SEF
C	PUD RESUBMITTAL NO. 5	TWL	10/11/24	SEF
D	PUD RESUBMITTAL NO. 7	TWL	08/15/25	SEF

REDTAIL RIDGE FILING NO. 1

REDTAIL RIDGE LIFT STATION
PLANNED UNIT DEVELOPMENT

ELECTRICAL

LIGHTING FIXTURE CUT-SHEETS
AND FIXTURE SCHEDULE

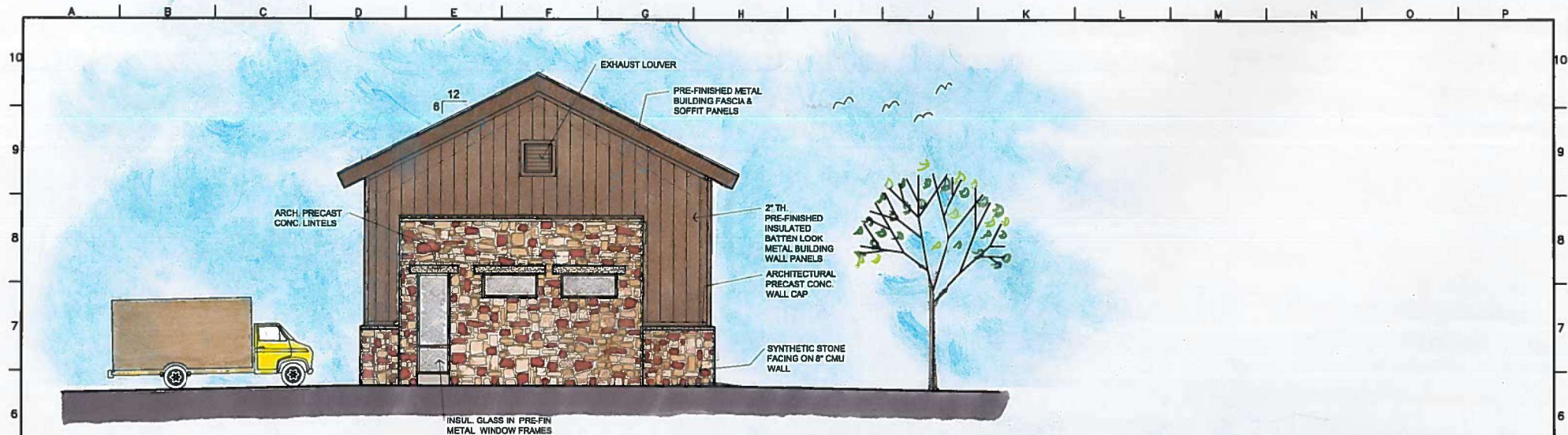
DATE: 12/01/23

PROJECT NUMBER: 50119483

REVISION NO. C

DRAWING NUMBER E-3

SHEET NUMBER 13



● EAST ELEVATION

SCALE: 1/4" = 1'-0"



● NORTH ELEVATION

SCALE: 1/4" = 1'-0"

**LINTIER +
RAYWOOD
ARCHITECTS**
890 S. BROADWAY, # 400
DENVER, CO. 80203
303.466.9839 PHONE

Dewberry
Dewberry Engineers Inc.
990 S. BROADWAY, SUITE 400
Denver, Colorado 80208
(303) 825-1802

LINE IS 3/8" INCHES
AT FULL SIZE
(IF NOT 2" SCALE ACCORDINGLY)
DRAWING A-4 DWG
DRAWN ERL
DESIGNED ERL
CHECKED ERL

APPROVED:
PRINCIPAL
DATE

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APP.

CITY OF LOUISVILLE
LOUISVILLE, COLORADO
RETAIL RIDGE LIFT STATION

ARCHITECTURAL
BUILDING ELEVATION
RENDERINGS

DATE 05/05/20
PROJECT NAME 50115483
REVISION NO.
DRAWING NUMBER
EXHIBIT
SHEET NUMBER

KingRib 3 / KingRib 5

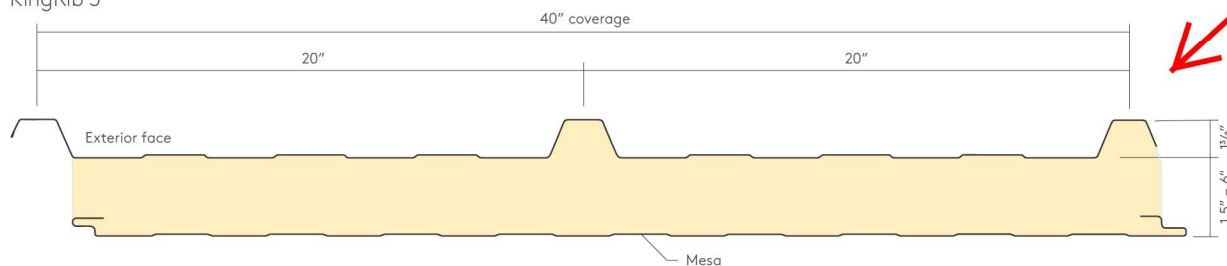
proposed wall panel
w / vertical batten
utilizing the 20"
spacing - bronze

KingRib insulated roof panels are the perfect option for a modern design combined with high energy-efficiency, durability, and high R-value.

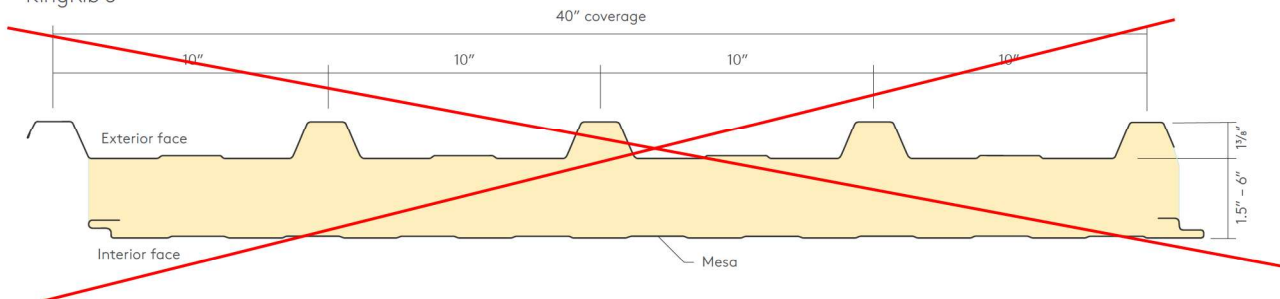


Profile:	Exterior: Mesa with Trapezoidal Ribs / Interior: Mesa
Embossing:	Exterior: Smooth / Interior: Embossed
Gauge:	Exterior: 26 ga Standard (24, 22 ga optional) / Interior: 26 ga Standard (24, 22 ga optional)
Width:	40"
Thickness:	1.5", 2.5", 4", 5", 6"
Length:	8' - 50'
Post fabrication:	Cutbacks
R-value:	~ 7.2 per inch per ASTM C518 @ 75°F / ~ 8.2 per inch per ASTM C518 @ 40°F

KingRib 3



KingRib 5



proposed metal roof panel -
standing seam - bronze

KingSeam

KingSeam insulated standing seam roof panels are designed to offer design flexibility and aesthetics combined with high R-values and unparalleled service life performance. Ideal for new and retrofit applications across a wide variety of building sectors.



Profile:	Exterior: Ribbed standing seam / Interior: Mesa
Embossing:	Exterior: Smooth / Interior: Embossed
Gauge:	Exterior: 26 ga Standard (24, 22 ga optional) / Interior: 26 ga Standard (24, 22 ga optional)
Width:	40"
Thickness:	3.25", 4", 5", 6"
Length:	8' - 50'
Post fabrication:	Cutbacks
R-value:	~ 7.2 per inch per ASTM C518 @ 75°F / ~ 8.2 per inch per ASTM C518 @ 35°F

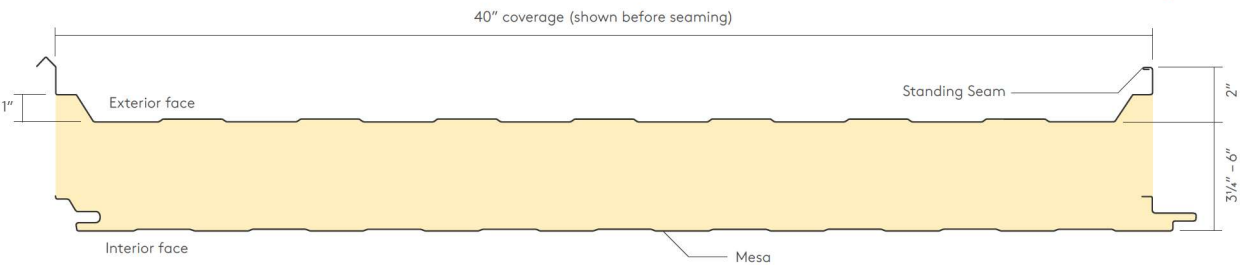






Image shown may not reflect actual configuration

Weather Protective and Sound Attenuated Enclosures

60Hz

Features

Robust/Highly Corrosion Resistant Construction

- Stainless steel flush fitting latches and hinges tested and proven to withstand extreme conditions of corrosion
- Zinc plated or stainless steel fastener

Excellent Access

- Single side access for service and controls
- All non-service sides have removable doors and/or panels
- Radiator fill access
- Lube oil and coolant drains piped to the exterior of the enclosure base
- Large cable entry area for installation ease
- Double doors on both sides
- Vertically hinged doors with solid bar door stays to hold doors in place when open

Security and Safety

- Lockable access doors which give full access to control panel and breaker
- Cooling fan and battery charging alternator fully guarded
- Fuel fill, oil fill, and battery can only be reached via lockable access
- Stub-up area is rodent proof.

Transportability

- These enclosures are of extremely rugged construction to withstand outdoor exposure and rough handling common on many construction sites. The sound deadening material is of a self-extinguishing design
- This range of enclosures are designed on modular principles with many interchangeable components permitting on site repair

Options

- Weather Protective – constructed with 16 gauge steel; industrial silencer mounted within the main enclosure body.
- Sound Attenuated Level 1 – constructed with 16 gauge steel; weather protective with critical silencer - silencer mounted in separate upward discharging radiator hood.
- Sound Attenuated Level 2 – constructed with 16 gauge steel; weather protective with critical silencer and 100% lined with sound deadening material – silencer mounted in separate upward discharging radiator hood.
- Sound Attenuated Aluminum constructed with 14 gauge Aluminum 5052 grade. Weather protective with critical silencer and 100% lined with sound deadening material – silencer mounted in separate upward discharging radiator hood.
- Caterpillar Yellow* or white paint.
- UL Listed sub base tanks.
- Externally mounted emergency stop button.
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, IBC 2012, CBC 2007, CBC 2010.
- IBC certification for 180 mph wind loading

*Not available with Aluminium enclosures

Enclosure is expected to be approximately 13' long by 5 feet wide by 7 feet tall. Color will be selected by the Architect to match the building and surroundings.



August 1st, 2025

Attention:
City of Louisville
Department of Transportation & Infrastructure
Development Engineering Services
749 Main St.
Louisville, CO 80027

This letter summarizes how the proposed storm sewer and drainage improvements associated with Redtail Ridge Lift Station ("Project") conform to the provisions allowed by the Final Master Drainage Report for Redtail Ridge ("Report").

The Project is located at the southwest corner of the intersection of Rockcress Drive and Northwest Parkway, with a total acreage of 0.86 acres. The Site is bound by Redtail Ridge Filing No. 1 Lot 3 Block 1 to the west, Rockcress Drive to the north, Northwest Parkway to the east, and City and County of Broomfield open space to the south. A copy of the vicinity map can be found in Appendix A for reference. The Project is proposed as a sanitary sewer lift station, with associated improvements such as utility service, access road, trail, and grading.

As shown in the Report, sub-basin D-3 encompasses the entirety of this Project. Sub-basin D-3 has a peak runoff of 34.12 cubic feet per second ("cfs") for the major storm event and is routed to Pond C-2. Due to grading constraints within the Site, it is being proposed to direct runoff to the southeast corner of the Site through a system of landscape drains to an ADS Barracuda Max S3 system, where it will be treated. Water quality treatment devices are not typically allowed, however a variance has been submitted and approved by the City of Louisville allowing for one. This variance letter is included in Appendix E, for reference. Approximately 82% of the site can be captured to treat for water quality from a grading perspective. In storm events larger than the water quality event, it is assumed the landscape drains are clogged and runoff will flow to the east where it will continue south through an existing grass swale, following historic conditions. The 82% of the site which can be captured and treated for water quality, follows the City of Louisville design standards for their MS4 permit requirements.

Rational calculations were completed for the Project per City of Louisville and Mile High Flood District ("MHFD") standards and can be found in Appendix C, for reference. As shown on the proposed drainage plan, 82% of the runoff from the Project will be captured onsite, conveyed through the ADS Barracuda Max S3 system for treatment, and ultimately routed offsite. The remaining 18% of the runoff will directly flow offsite, without treatment. The minor and major storms being analyzed with this letter are the 2-year and 100-year respectively, per City of Louisville Criteria. The landscape drain system has been sized to accommodate the 2-year storm. Sizing calculations for the landscape drains are included in Appendix C, for reference.

Two sections were analyzed with this letter using the combined 100-year flow rate from basins A & B

below together totaling 2.42 cfs; Section C-C, near landscape drain A7-1, and Section D-D near the transformer north of the lift station. The 100-year total flow was used as a conservative measure to show that even though the 100-year flow does not specifically drain to either of these sections, there is more than 1' of freeboard over the water surface elevation to the lift station finished floor elevation. These sections are included in Appendix C, and shown on the Drainage Plan in Appendix D, for reference.

Capacity calculations were performed on landscape drain A7-1 just west of the lift station building. This landscape drain was analyzed with the 100-year storm due to its proximity to the lift station. Visually analyzing the amount of runoff going to this basin in the 100-year storm, it was determined that twice Basin B's 100-year runoff was a conservative estimate, which totals 0.14 cfs, as it is more than the flow that does go to A7-1. The capacity of A7-1 was determined based on the maximum head above the drain while maintaining 1' above finished floor was 0.79 ft which resulted in a capacity of 2.08 cfs. Therefore this drain is not a concern and will function properly. The other drains for the Project were analyzed with the 2-year storm due to it being assumed the drains are clogged in the 100-year storm event. Drain A3 was analyzed due to it having the smallest head available, 0.13 ft. The available capacity of drain A3 is 0.45 cfs while the minor storm event for Basin A yields 0.43 cfs. Therefore, all of the other drains for the Project have adequate capacity and follow Louisville Criteria.

SUB-BASIN DESCRIPTION

Basin A (0.71 acres, 36.05% impervious) encompasses a portion of the Project including the proposed building, driveway, trail, and associated landscaping. Runoff will be conveyed through proposed curb and gutter and landscape to a landscape drain system. The landscape drain system will convey runoff into an ADS Barracuda Max S3 system where it will be treated for water quality. In larger storm events, it is assumed the landscape drains are clogged and runoff will sheet flow to the east where it will continue to surface flow offsite and follow the historic drainage pattern south to Rock Creek through an existing grass swale. This emergency overflow path is shown on the Drainage Plan in Appendix D for reference. Peak flows from Basin A for the minor and major storm are 0.43 cfs and 2.34 cfs, respectively.

Basin B (0.07 acres, 2% impervious) encompasses a portion of Lot 1 Block 3 west of the lift station building. Runoff from this basin will flow onto the Project and be captured by a landscape drain where it will then be routed through A7-1 east to the proposed ADS Barracuda Max S3 system where it will be treated for water quality. In larger storm events, it is assumed the landscape drains are clogged and runoff will sheet flow to the north and east where it will continue to surface flow offsite and follow the historic drainage pattern south to Rock Creek through an existing grass swale. This emergency overflow path is shown on the Drainage Plan in Appendix D for reference. Peak flows from Basin B for the minor and major storm are 0.001 cfs and 0.08 cfs, respectively.

Basin OS-1 (0.16 acres, 23.87% impervious) encompasses a portion of the site where capturing runoff is not obtainable due to grading constraints. The basin includes a portion of the trail and landscaping. Runoff for this basin will sheet flow, untreated, to the east where it will continue to surface flow offsite and follow the historic drainage pattern south to Rock Creek through an existing grass swale. Peak flows



from Basin OS-1 for the minor and major storm are 0.06 cfs and 0.39 cfs, respectively.

A drainage plan has been included in Appendix D for reference.

Please contact me if you have any questions or require additional information.

Sincerely,

HARRIS KOCHER SMITH

Tim Saylor, PE
Licensed Professional Engineer
State of Colorado
No. 56955
On behalf of Harris Kocher Smith

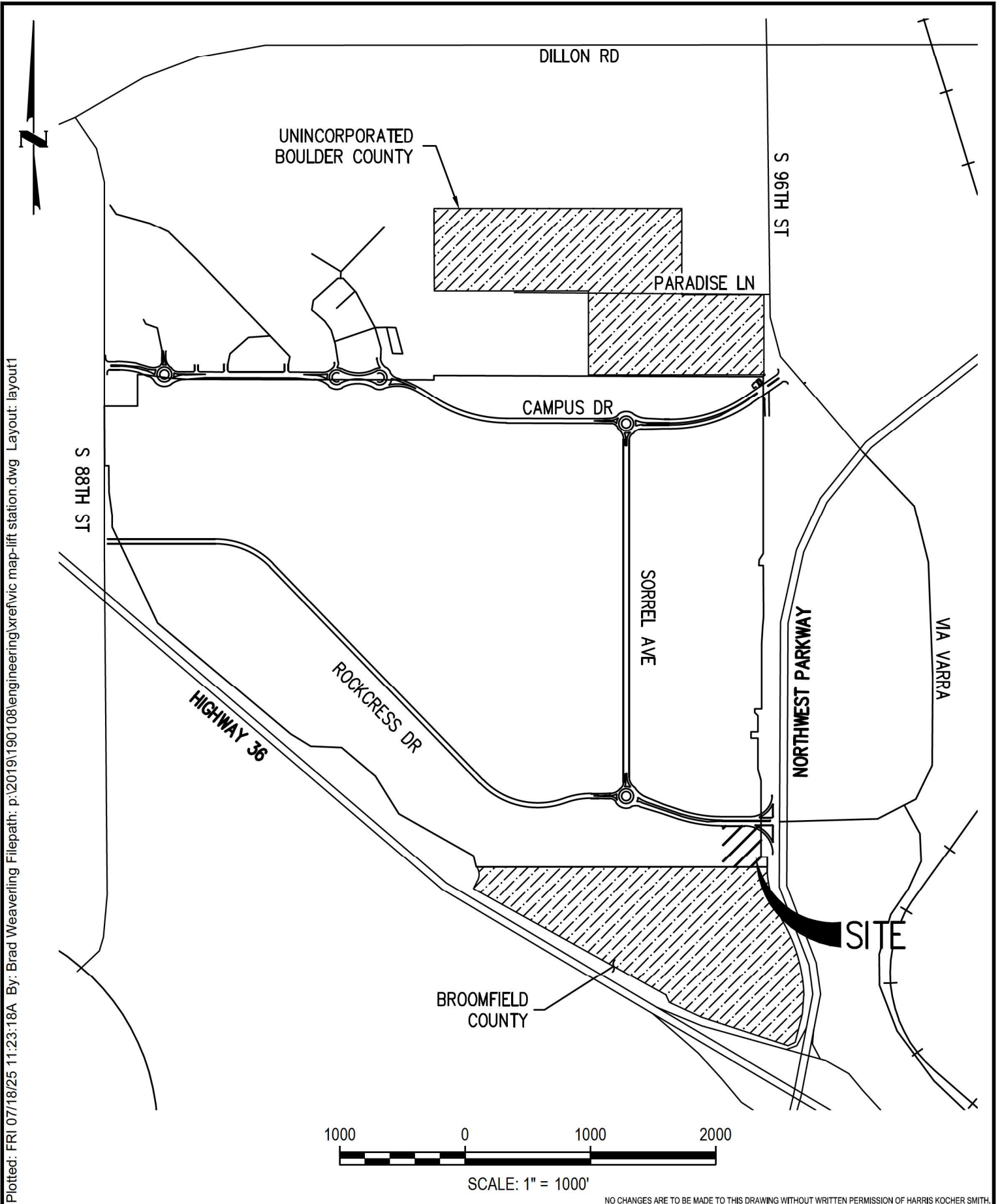
Appendix A

Vicinity Map

Flood Insurance Rate Map (FIRM)

NRCS Web Soil Survey (WSS)

Plotted: FRI 07/18/25 11:23:18A By: Brad Weaverling Filepath: p:\2019\190108\engineering\ref\vic map-lift station.dwg Layout: layout1



NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

ISSUE DATE:	06-06-2019	PROJECT #:	190108
DATE	REVISION COMMENTS		

STERLING BAY

REDTAIL RIDGE
VICINITY MAP

HKS **HARRIS KOCHER SMITH**
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

DSN'D BY: TJS
CHK'D BY: TJS
DRAWN BY: SJA
SHEET NO.
1
1 OF 1

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. This community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or Floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the map represent rounded whole foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.9 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **Floodways** were compiled at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRM for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NGS12
National Geodetic Survey
SSM-C, #9022
1515 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (801) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided by the FEMA Map Service Center and the Boulder Area Spatial Data Cooperative (BASDC). Additional input was provided by the Town of Erie and the City of Longmont. These data are current as of 2004.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contain authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a listing of community tables containing National Flood Insurance Program data for each community as well as a listing of the panels on which each community is located.

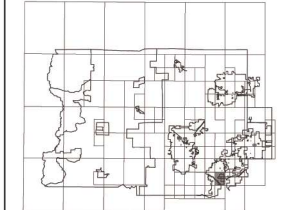
For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at <http://www.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information exchange (PMI)** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov>.

Boulder County Vertical Datum Offset Table			
Flooding Source	Vertical Datum Offset (ft)	Flooding Source	
Coal Creek	3.3	Rock Creek	3.2

Example: To convert Coal Creek elevations to NAVD 88, 3.3 feet were added to the NAVD 29 elevations.

Panel Location Map



This digital Flood Insurance Rate map (FIRM) was produced through a cooperative agreement between the State of Colorado Water Conservation Board, the Upper Colorado River Flood Control District, and the Federal Emergency Management Agency (FEMA). The State of Colorado Water Conservation Board and the Upper Colorado River Flood Control District have entered into a long-term agreement of financial support to reduce the costs associated with flooding. As part of this effort, both the State of Colorado and the Upper Colorado River Flood Control District have joined in Cooperating Federal Partnerships with FEMA to produce this digital FIRM.

Additional Flood Hazard information and resources are available from local communities, the Colorado Water Conservation Board, and the Upper Colorado River Flood Control District.

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LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, VE, and V. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- Zone A** No base flood elevations determined.
- Zone AE** Base Flood Elevations determined.
- Zone AH** Flood depths of 1 to 3 feet (usually areas of ponds). Base Flood Elevations determined.
- Zone AO** Flood depths of 1 to 3 feet (usually areas of low-lying terrain). Average depths determined; for areas of shallow flooding, velocities also determined.
- Zone AR** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a Federal Flood Protection System (FFPS) that has been removed. Zone AR indicates that the former flood control system is being retained to provide protection from the 1% annual chance or greater flood.
- Zone ARS** Area to be protected from 1% annual chance flood by a Federal Flood Protection System under construction. Base Flood Elevations determined.
- Zone V** Coastal flood zone with velocity hazard (waves acting). No base Flood Elevations determined.
- Zone VE** Coastal flood zone with velocity hazard (waves acting). Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of obstructions so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS
Zone X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with damage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood.

OTHER AREAS
Zone D Areas determined to be outside the 0.2% annual chance floodplains.

Coastal Barrier Resources System (CBRS) AREAS
OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain Boundary
Floodway Boundary

Zone D boundary
CBRS and OPA boundary

Boundary defining Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities
Base Flood Elevation line and value, elevation in feet*
Base Flood Elevation value where uniform within zone, elevation in feet

*Referenced to the North American Vertical Datum of 1988

Cross section line
Traverse line
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
1000-meter Universal Transverse Mercator grid values, zone 13
3100000 FT
5000-foot UTM: Colorado State Plane North Zone (FIPS Zone 5001), Lambert Conformal Conic Projection
Bench mark (see explanation in Notes to Users section of this FIRM report)

Water
MAP REPOSITORY
Refer to listing of map repositories on Map Index

EFFECTIVE DATE OF COLORADO FLOOD INSURANCE RATE MAP
June 1, 1995

EFFECTIVE DATES OF REVISIONS TO THIS PANEL
May 4, 1998 - to incorporate previously issued Letters of Map Revision, to add roads and road names, and to update corporate limits.
October 4, 2002 - to change base flood elevations, to change special flood hazard areas, to change zone designations, to update roads and road names, to reflect updated topographic information, to incorporate previously issued Letters of Map Revision, and to change floodway enclosures. 10, 2012 - to update roads and road names, to add Special Flood Hazard Areas previously shown on Town of Erie, Colorado Flood Insurance Rate Map dated December 2, 2004, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to community mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine flood insurance in relation to the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-656-0825.

MAP SCALE 1" = 500'

MAP SCALE 1" = 500'

MAP SCALE 1" = 500'

MAP SCALE 1" = 500'

MAP SCALE 1" = 500'

MAP SCALE 1" = 500'

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MAP SCALE 1" = 500'

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MAP SCALE 1" = 500'

MAP SCALE 1" = 500'

MAP SCALE 1" = 500'

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 1 SOUTH, RANGE 69 WEST.



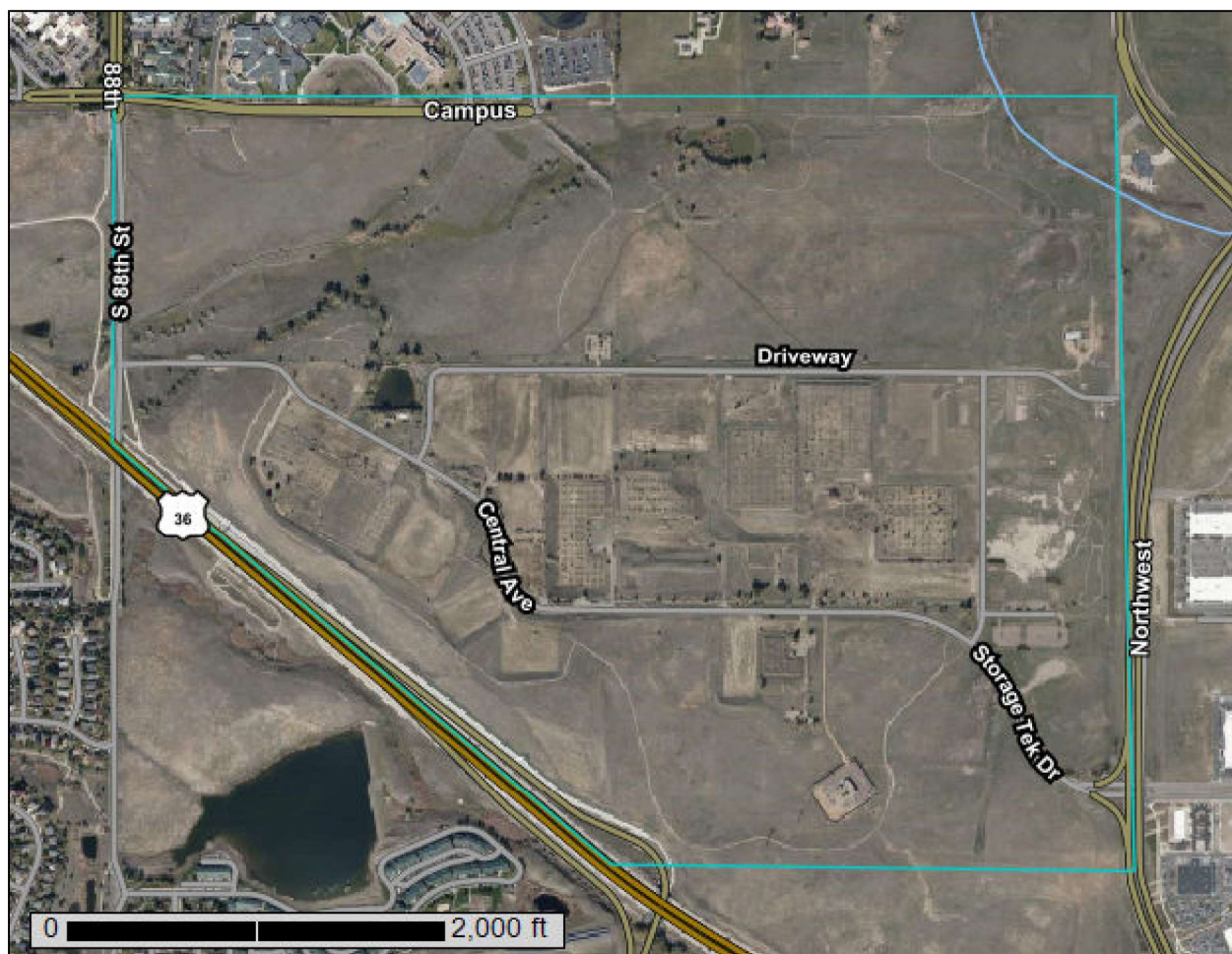
United States
Department of
Agriculture

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 **Boulder County Area, Colorado**



January 6, 2020

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

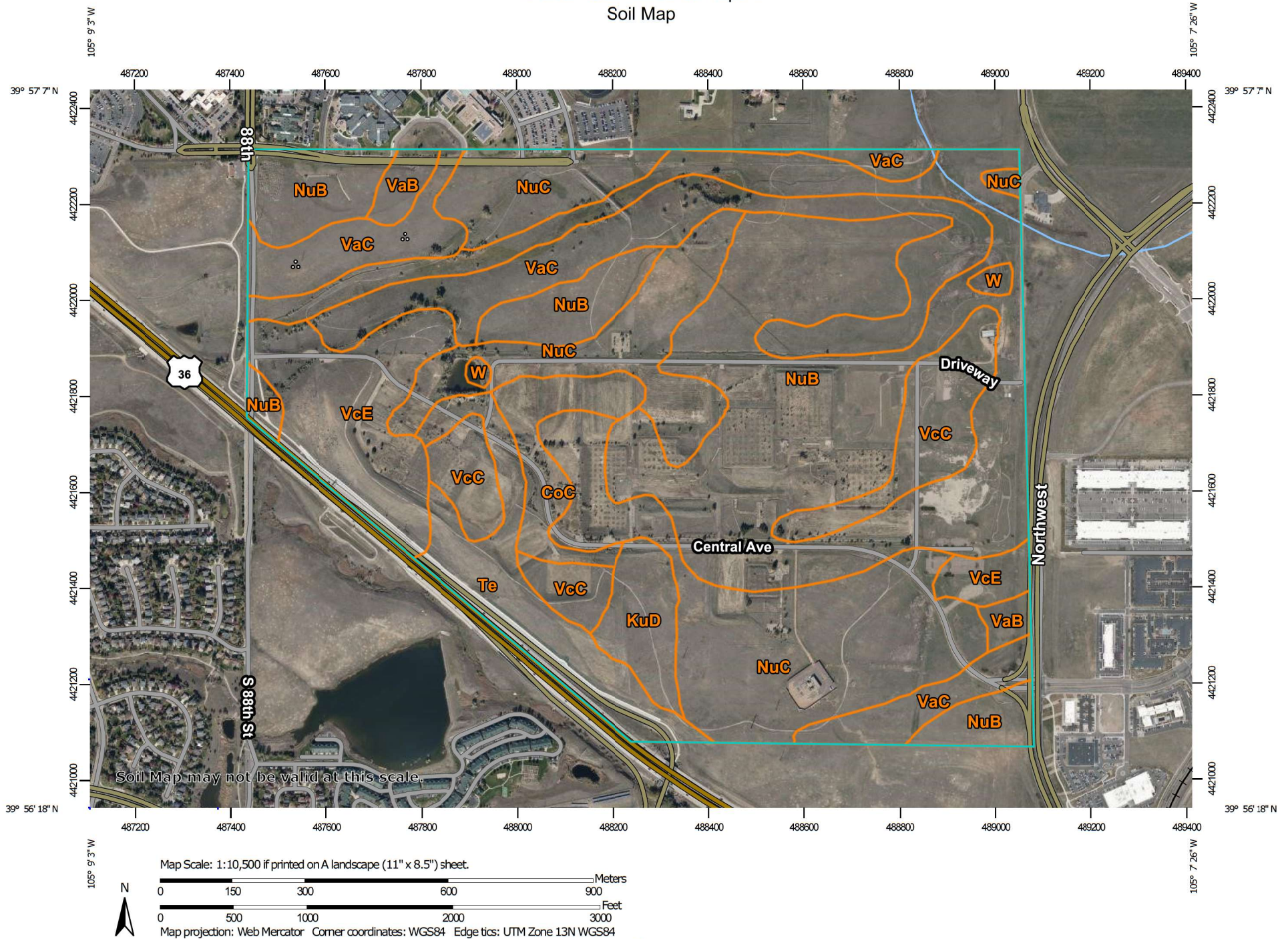
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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.

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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: Boulder County Area, Colorado

Survey Area Data: Version 16, Sep 13, 2019

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

Date(s) aerial images were photographed: Sep 25, 2018—Apr 9, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CoC	Colby silty clay loam, 3 to 5 percent slopes	12.7	2.9%
KuD	Kutch clay loam, 3 to 9 percent slopes	10.6	2.4%
NuB	Nunn clay loam, 1 to 3 percent slopes	154.9	35.8%
NuC	Nunn clay loam, 3 to 5 percent slopes	97.4	22.5%
Te	Terrace escarpments	25.3	5.8%
VaB	Valmont clay loam, 1 to 3 percent slopes	5.7	1.3%
VaC	Valmont clay loam, 3 to 5 percent slopes	62.6	14.5%
VcC	Valmont cobbly clay loam, 1 to 5 percent slopes	27.7	6.4%
VcE	Valmont cobbly clay loam, 5 to 25 percent slopes	34.3	7.9%
W	Water	1.7	0.4%
Totals for Area of Interest		432.9	100.0%

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They

generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Boulder County Area, Colorado

CoC—Colby silty clay loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: jprf
Elevation: 4,900 to 5,500 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 140 to 155 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Colby and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colby

Setting

Landform: Upland slopes
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Uniform eolian deposits

Typical profile

H1 - 0 to 12 inches: silty clay loam
H2 - 12 to 43 inches: silty clay loam
H3 - 43 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Loamy Plains (R067BY002CO)
Hydric soil rating: No

Minor Components

Gaynor

Percent of map unit: 5 percent
Hydric soil rating: No

Weld

Percent of map unit: 5 percent

Hydric soil rating: No

KuD—Kutch clay loam, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: jprx

Elevation: 4,900 to 5,500 feet

Mean annual precipitation: 12 to 18 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 140 to 155 days

Farmland classification: Farmland of statewide importance

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

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 7 inches: clay loam

H2 - 7 to 22 inches: clay

H3 - 22 to 30 inches: clay

H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 9 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural 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 in profile: 15 percent

Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

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Hydrologic Soil Group: D
Ecological site: Clayey Foothill (R049BY208CO)
Hydric soil rating: No

Minor Components

Renohill

Percent of map unit: 6 percent
Hydric soil rating: No

Nunn

Percent of map unit: 5 percent
Hydric soil rating: No

Samsil

Percent of map unit: 2 percent
Hydric soil rating: No

Shingle

Percent of map unit: 2 percent
Hydric soil rating: No

NuB—Nunn clay loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tlpl
Elevation: 3,900 to 5,840 feet
Mean annual precipitation: 13 to 17 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 135 to 160 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Nunn and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nunn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Pleistocene aged alluvium and/or eolian deposits

Typical profile

Ap - 0 to 9 inches: clay loam
Bt - 9 to 13 inches: clay loam
Btk - 13 to 25 inches: clay loam
Bk1 - 25 to 38 inches: clay loam
Bk2 - 38 to 80 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 7 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 0.5
Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey Plains (R067BY042CO)
Hydric soil rating: No

Minor Components

Heldt

Percent of map unit: 10 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey Plains (R067BY042CO)
Hydric soil rating: No

Satanta

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Plains (R067BY002CO)
Hydric soil rating: No

NuC—Nunn clay loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2tlpm
Elevation: 5,000 to 5,750 feet
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 46 to 54 degrees F

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Frost-free period: 100 to 160 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Nunn and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nunn

Setting

Landform: Terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Pleistocene aged alluvium and/or eolian deposits

Typical profile

A - 0 to 6 inches: clay loam

Bt - 6 to 18 inches: clay

Btk - 18 to 30 inches: clay

Bk - 30 to 47 inches: clay loam

BCK - 47 to 80 inches: clay loam

Properties and qualities

Slope: 3 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 7 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 0.5

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Clayey Plains (R067BY042CO)

Hydric soil rating: No

Minor Components

Satanta

Percent of map unit: 10 percent

Landform: Terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Loamy Plains (R067BY002CO)

Hydric soil rating: No

Te—Terrace escarpments

Map Unit Setting

National map unit symbol: jpsv
Elevation: 4,400 to 5,500 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Terrace escarpments: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Terrace Escarpments

Setting

Landform: Paleoterraces, fan remnants
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Base slope, riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Cobbly and stony colluvium over sandstone and shale

Typical profile

H1 - 0 to 6 inches: gravelly sand
H2 - 6 to 60 inches: gravelly sand, very gravelly sand, gravelly coarse sand
H2 - 6 to 60 inches:
H2 - 6 to 60 inches:

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

VaB—Valmont clay loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: jpsw
Elevation: 4,900 to 5,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 140 to 155 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Valmont and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valmont

Setting

Landform: Terraces, fan remnants

Landform position (three-dimensional): Base slope, tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Gravelly and cobbly loamy alluvium

Typical profile

H1 - 0 to 9 inches: clay loam

H2 - 9 to 29 inches: clay loam, clay

H2 - 9 to 29 inches: very gravelly loam, very gravelly sandy loam

H3 - 29 to 60 inches:

H3 - 29 to 60 inches:

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very high (about 12.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: C

Ecological site: Clayey Foothill (R049BY208CO)

Hydric soil rating: No

Minor Components

Nunn

Percent of map unit: 8 percent

Hydric soil rating: No

Fluventic haplaquolls

Percent of map unit: 4 percent

Landform: Terraces

Hydric soil rating: Yes

Heldt

Percent of map unit: 3 percent

Hydric soil rating: No

VaC—Valmont clay loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: jpsx
Elevation: 4,900 to 5,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 140 to 155 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Valmont and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valmont

Setting

Landform: Terraces, fan remnants
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly and cobbly loamy alluvium

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: clay loam, clay
H2 - 7 to 24 inches: very gravelly loam, very gravelly sandy loam
H3 - 24 to 60 inches:
H3 - 24 to 60 inches:

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Custom Soil Resource Report

Ecological site: Clayey Foothill (R049BY208CO)

Hydric soil rating: No

Minor Components

Nunn

Percent of map unit: 8 percent

Hydric soil rating: No

Heldt

Percent of map unit: 5 percent

Hydric soil rating: No

Fluventic haplaquolls

Percent of map unit: 2 percent

Landform: Flood plains

Hydric soil rating: Yes

VcC—Valmont cobbly clay loam, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: jpsy

Elevation: 4,900 to 5,500 feet

Mean annual precipitation: 12 to 18 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 140 to 155 days

Farmland classification: Not prime farmland

Map Unit Composition

Valmont and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valmont

Setting

Landform: Terraces, fan remnants

Landform position (three-dimensional): Base slope, tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Gravelly and cobbly loamy alluvium

Typical profile

H1 - 0 to 8 inches: cobbly clay loam

H2 - 8 to 22 inches: clay loam, clay

H2 - 8 to 22 inches: very gravelly loam, very gravelly sandy loam

H3 - 22 to 60 inches:

H3 - 22 to 60 inches:

Properties and qualities

Slope: 1 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Custom Soil Resource Report

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Cobbly Foothills (R048AY346CO)

Hydric soil rating: No

VcE—Valmont cobbly clay loam, 5 to 25 percent slopes

Map Unit Setting

National map unit symbol: jpsz

Elevation: 4,900 to 5,500 feet

Mean annual precipitation: 12 to 18 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 140 to 155 days

Farmland classification: Not prime farmland

Map Unit Composition

Valmont and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valmont

Setting

Landform: Terraces, fan remnants

Landform position (three-dimensional): Base slope, riser

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Gravelly and cobbly loamy alluvium

Typical profile

H1 - 0 to 6 inches: cobbly clay loam

H2 - 6 to 18 inches: clay loam, clay

H2 - 6 to 18 inches: very gravelly loam, very gravelly sandy loam

H3 - 18 to 60 inches:

H3 - 18 to 60 inches:

Properties and qualities

Slope: 5 to 10 percent

Depth to restrictive feature: More than 80 inches

Custom Soil Resource Report

Natural 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 in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Cobbly Foothills (R048AY346CO)

Hydric soil rating: No

Minor Components

Dacono

Percent of map unit: 9 percent

Hydric soil rating: No

Fluventic haplaquolls

Percent of map unit: 1 percent

Landform: Flood plains

Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Aquolls

Percent of map unit: 5 percent

Landform: Marshes

Hydric soil rating: Yes

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Appendix B

Master Drainage Report Excerpts

Basin C (105.17 acres, 78% imperviousness) is generally in the eastern portion of the Site, lying east of Sorrel Avenue and west of S. 96th Street. It consists of roadways and developable land. The basin contains six sub-basins, four of which primarily contain roadways. The sub-basins not defined by proposed roadways (C-1, C-2) were delineated based on an existing ridge within the parcel. Roadway sub-basins (C-3, C-4, C-5, C-6) will be further subdivided in Filing No. 1 and with the Rockcress Extension plans based on inlet placement. A majority of runoff from Basin C is conveyed either to Pond C-1 or Pond C-2. 2.8 acres of land will release runoff directly to Tributary I, after appropriate water quality treatment. 0.34 acres of roadway, identified as Sub-basin C-6-3 in the future reports, will discharge to existing infrastructure in Northwest Parkway.

Basin D (44.08 acres, 46% imperviousness) is in the southern portion of the Site and generally lies south of Rockcress Drive and Basin E. Extents of proposed development and an existing ridge in Parcel E split Basin D and E. The basin is divided into five sub-basins: D-1, D-2, D-3, D-4, and D-5. Approximately 28.74 acres are proposed to develop with 70% impervious cover, while the rest is proposed to be left either undeveloped or as open space with an imperviousness of 2%. Developed runoff from Basin D will be conveyed to Pond C-2 while the undeveloped portions will continue to flow as they have historically. Portions of the basin flowing offsite are limited to areas wherein it is not practical to capture and treat runoff; these areas include portions of the lift station site, and portions of trail spanning the edge of the basin/property. Runoff from the lift station within the basin will be captured by landscape drains sized for the minor event and treated for water quality via an ADS hydrodynamic separator (HDS) system. Flows in excess of the HDS' treatment capacity will bypass the device and flow offsite. For additional details about the lift station and the associated water quality treatment, see the Redtail Ridge Lift Station Drainage Letter, submitted separately.

Basin E (34.11 acres, 75% imperviousness) constitutes developable land in the southwest portion of the Site, generally between Rockcress Drive and Basin D. Stormwater runoff in Basin E is proposed to be detained in a full spectrum detention facility, Pond E. It is anticipated that the basin area will be developed with curb, gutter, and sewer directing flows to the facility. The pond will ultimately outfall to the proposed sewer in Rockcress Drive. Detailed design of Pond E will be performed with the planned unit developed (PUD) PUD-8 design documents and reporting, which will be required to demonstrate conformance with the preliminary design guidance provided herein.

Basin F (17.05 acres, 2% imperviousness) is in the northern portion of the Site and is existing open space and will drain as it does historically. It is bound on the north by the property line and on the east, west, and south by Campus Drive. The historical flows for Basin F generally flow from the extents of the basin to the center where they meet Tributary I.

Table 1: Basin and Direct Runoff Summary Table

MAJOR DRAINAGE BASIN	CONTRIBUTING AREA (AC)	IMPERV	Q2 (CFS)	Q10 (CFS)	Q100 (CFS)	TRIBUTARY TO
A-1	37.99	2%	0.24	6.80	37.01	TRIBUTARY I
A-2-1	22.67	2%	0.14	4.07	22.07	TRIBUTARY I
A-2-2	25.02	85%	21.68	38.60	82.63	POND B
A-3	0.62	75%	0.24	0.46	1.08	POND C-2
B-1	79.46	85%	82.91	145.96	309.95	POND B
B-2	30.37	85%	33.22	59.73	123.29	POND C-2
C-1	53.21	80%	45.88	83.89	183.63	POND C-1
C-2	19.63	80%	22.10	41.84	88.58	POND C-2
C-3	14.38	78%	5.40	9.90	23.44	POND C-1
C-4	2.78	75%	1.69	3.20	7.26	TRIBUTARY I
C-5	13.12	70%	4.09	7.83	19.54	POND C-2
C-6	1.79	75%	1.20	2.26	5.11	POND C-2
D-1	17.48	70%	12.01	23.25	54.06	POND C-2
D-2	4.96	2%	0.05	1.43	7.19	OFFSITE
D-3	11.26	70%	7.58	14.67	34.12	POND C-2
D-4	8.37	2%	0.17	5.17	23.32	OFFSITE
D-5	2.01	2%	0.02	0.73	3.54	TRIBUTARY I
E	34.11	75%	28.44	53.10	119.32	POND E
F	17.1	2%	0.11	3.06	16.59	TRIBUTARY I
OS-1	77.43	9%	2.81	21.66	99.62	TRIBUTARY I
OS-2	32.32	6%	0.71	7.20	40.72	TRIBUTARY I
OS-3	19.51	5%	0.01	0.32	1.56	TRIBUTARY I

Goodhue Ditch

The Goodhue Ditch traverses the far northeast corner of the Site and is owned by the Ditch Company. The Goodhue Ditch contains a defined bed and bank with fringe wetlands along portions of the banks. The Goodhue Ditch is shown on the U.S. Geological Survey (USGS) Louisville topographic quadrangle and on the National Hydrography Dataset (NHD) as a canal/ditch and intermittent stream.

A crossing of the Goodhue Ditch by Campus Drive is planned, subject to Ditch Company's approval, with the proposed development. The Ditch will continue to outfall per historic conditions at the existing location on northeast property boundary. The Ditch Company has been contacted regarding the requirements of the proposed Goodhue Ditch revisions. The proposed Goodhue Ditch crossing has been designed

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

2-year

		Unit Hydrograph Parameters and Results										Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f.)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)	
A-1		0.158	0.132	58.7	7.47	30.5	5.28	12.4	30	137,904	0.01	1,207	45.0	0.24	1,207	0.01	
A-2-1		0.158	0.105	59.0	6.25	30.7	4.42	10.4	18	82,292	0.01	720	45.0	0.14	720	0.01	
A-2-2		0.076	0.150	16.0	3.35	8.3	2.37	5.6	73	90,823	0.65	59,164	30.0	21.67	58,643	0.87	
A-3		0.079	0.028	37.6	2.30	19.6	1.62	3.8	1	2,251	0.57	1,277	35.0	0.24	1,254	0.39	
A-3-1		0.079	0.020	32.5	2.00	16.9	1.42	3.3	0	1,125	0.57	638	35.0	0.14	622	0.44	
A-3-2		0.079	0.020	32.5	2.00	16.9	1.42	3.3	0	1,125	0.57	638	35.0	0.14	622	0.44	
B-1		0.076	0.253	11.4	3.71	5.9	2.62	6.2	327	288,440	0.65	187,896	30.0	82.92	184,365	1.04	
B-2		0.076	0.164	9.9	2.74	5.1	1.94	4.6	144	110,243	0.65	71,815	30.0	33.22	69,136	1.09	
C-1		0.077	0.208	14.8	3.86	7.7	2.73	6.4	169	193,152	0.61	117,656	30.0	45.87	116,835	0.86	
C-2		0.077	0.133	7.6	2.28	4.0	1.61	3.8	121	71,257	0.61	43,405	25.0	22.10	40,142	1.13	
C-3		0.078	0.115	46.2	5.58	24.0	3.94	9.3	15	52,199	0.59	30,920	40.0	5.26	30,882	0.37	
C-3-1		0.077	0.041	27.8	2.37	14.4	1.67	3.9	2	5,118	0.61	3,118	35.0	0.74	3,045	0.53	
C-3-2		0.077	0.038	39.0	2.63	20.3	1.86	4.4	1	4,356	0.61	2,653	35.0	0.50	2,620	0.41	
C-3-3		0.079	0.025	27.6	2.03	14.3	1.43	3.4	1	1,779	0.57	1,009	35.0	0.24	979	0.49	
C-3-4		0.079	0.023	28.9	2.01	15.0	1.42	3.4	1	1,525	0.57	865	35.0	0.20	840	0.47	
C-3-5		0.077	0.032	13.8	1.84	7.2	1.30	3.1	3	2,977	0.61	1,813	30.0	0.67	1,688	0.82	
C-3-6		0.077	0.030	21.4	1.99	11.1	1.41	3.3	2	2,577	0.61	1,570	30.0	0.45	1,510	0.64	
C-3-7		0.077	0.034	19.0	2.00	9.9	1.41	3.3	2	3,449	0.61	2,101	30.0	0.65	2,010	0.69	
C-3-8		0.077	0.035	21.8	2.08	11.3	1.47	3.5	2	3,557	0.61	2,167	30.0	0.61	2,090	0.63	
C-3-9		0.079	0.028	55.5	2.70	28.8	1.91	4.5	1	2,360	0.57	1,338	40.0	0.19	1,327	0.30	
C-3-10		0.079	0.028	54.3	2.67	28.3	1.89	4.4	1	2,323	0.57	1,318	40.0	0.19	1,306	0.30	
C-3-11		0.077	0.026	32.0	2.14	16.7	1.51	3.6	1	1,888	0.61	1,150	35.0	0.25	1,123	0.47	
C-3-12		0.077	0.027	31.1	2.14	16.2	1.51	3.6	1	1,997	0.61	1,216	35.0	0.27	1,187	0.48	
C-3-13		0.077	0.033	27.5	2.20	14.3	1.55	3.7	2	3,231	0.61	1,968	35.0	0.47	1,915	0.53	
C-3-14		0.077	0.047	38.0	2.88	19.7	2.03	4.8	2	7,151	0.61	4,356	35.0	0.84	4,313	0.42	
C-3-15		0.077	0.048	38.5	2.92	20.0	2.06	4.9	2	7,333	0.61	4,467	35.0	0.85	4,426	0.42	
C-3-16		0.096	0.010	17.1	1.64	8.9	1.16	2.7	0	581	0.25	146	30.0	0.05	137	0.32	
C-4		0.079	0.054	20.9	2.37	10.9	1.68	4.0	6	10,091	0.57	5,725	30.0	1.69	5,555	0.61	
C-4-1		0.079	0.037	26.8	2.26	14.0	1.59	3.8	2	4,211	0.57	2,389	30.0	0.58	2,327	0.50	
C-4-2		0.079	0.043	26.8	2.37	13.9	1.68	4.0	3	5,881	0.57	3,336	30.0	0.82	3,258	0.50	
C-5		0.081	0.107	48.6	5.49	25.3	3.88	9.1	13	47,626	0.53	25,044	40.0	4.10	25,016	0.31	
C-5-1		0.098	0.035	75.3	3.51	39.2	2.48	5.9	2	9,075	0.23	2,129	45.0	0.26	2,125	0.10	
C-5-2		0.094	0.036	71.7	3.49	37.3	2.47	5.8	1	7,986	0.28	2,237	45.0	0.27	2,233	0.12	
C-5-3		0.079	0.033	52.4	2.82	27.3	1.99	4.7	1	3,267	0.57	1,853	40.0	0.28	1,838	0.31	
C-5-4		0.079	0.033	52.7	2.81	27.4	1.99	4.7	1	3,231	0.57	1,833	40.0	0.28	1,818	0.31	
C-5-5		0.079	0.027	32.9	2.19	17.1	1.55	3.6	1	2,178	0.57	1,236	35.0	0.26	1,207	0.43	
C-5-6		0.079	0.027	32.9	2.19	17.1	1.55	3.6	1	2,178	0.57	1,236	35.0	0.26	1,207	0.43	
C-5-7		0.079	0.032	53.4	2.81	27.8	1.98	4.7	1	3,086	0.57	1,750	40.0	0.26	1,736	0.31	
C-5-8		0.079	0.032	52.3	2.76	27.2	1.95	4.6	1	3,013	0.57	1,709	40.0	0.26	1,695	0.31	
C-5-9		0.079	0.022	7.3	1.62	3.8	1.15	2.7	2	1,343	0.57	762	25.0	0.36	644	0.96	
C-5-10		0.079	0.029	36.6	2.33	19.0	1.64	3.9	1	2,577	0.57	1,462	35.0	0.29	1,436	0.40	
C-5-11		0.079	0.029	36.6	2.33	19.1	1.64	3.9	1	2,577	0.57	1,462	35.0	0.29	1,436	0.40	
C-5-12		0.077	0.035	25.0	2.17	13.0	1.53	3.6	2	3,630	0.61	2,211	30.0	0.57	2,141	0.57	
C-5-13		0.077	0.034	30.5	2.30	15.8	1.63	3.8	1	3,485	0.61	2,123	35.0	0.47	2,075	0.49	
C-6		0.079	0.045	17.9	2.11	9.3	1.49	3.5	5	6,498	0.57	3,686	30.0	1.20	3,525	0.67	
C-6-1		0.079	0.027	25.7	2.04	13.3	1.44	3.4	1	2,214	0.57	1,256	30.0	0.31	1,215	0.52	
C-6-2		0.079	0.031	25.7	2.12	13.4	1.50	3.5	1	2,940	0.57	1,668	30.0	0.42	1,617	0.52	
C-6-3		0.079	0.022	12.1	1.70	6.3	1.20	2.8	1	1,343	0.57	762	30.0	0.30	701	0.82	
D-1		0.081	0.122	16.4	3.03	8.5	2.14	5.1	50	63,452	0.53	33,366	30.0	12.02	32,860	0.69	
D-2		0.158	0.053	33.2	2.85	17.3	2.02	4.8	7	18,005	0.01	155	35.0	0.05	153	0.01	
D-3		0.081	0.100	16.6	2.78	8.7	1.96	4.6	32	40,874	0.53	21,493	30.0	7.58	20,990	0.67	
D-4		0.158	0.067	12.2	2.13	6.3	1.50	3.5	32	30,383	0.01	266	30.0	0.17	249	0.02	
D-5		0.158	0.035	24.3	2.16	12.7	1.53	3.6	4	7,296	0.01	63	35.0	0.02	61	0.01	
E		0.079	0.168	13.1	3.19	6.8	2.26	5.3	122	123,819	0.57	70,240	30.0	28.44	68,353	0.83	
F		0.158	0.092	58.6	5.66	30.4	4.00	9.4	14	62,073	0.01	543	40.0	0.11	543	0.01	
OS-1		0.139	0.162	43.4	6.91	22.6	4.88	11.5	84	281,071	0.04	11,546	40.0	2.81	11,545	0.04	
OS-2		0.148	0.116	41.0	5.15	21.3	3.64	8.6	37	117,322	0.02	2,732	40.0	0.71	2,727	0.02	
OS-3		0.151	0.094	39.1	4.32	20.3	3.05	7.2	23	70,821	0.02	1,317	40.0	0.36	1,314	0.02	
EX-X		0.158	0.024	22.0	1.90	11.5	1.34	3.2	2	3,013	0.01	26	35.0	0.01	25	0.01	
OS-4-1		0.076	0.043	36.1	2.68	18.8	1.89	4.5	2	5,481	0.65	3,583	35.0	0.71	3,536	0.47	
OS-4-2		0.075	0.045	35.3	2.71	18.4	1.92	4.5	2	6,026	0.67	4,062	35.0	0.82	4,009	0.49	
OS-7-1		0.073	0.027	42.0	2.38	21.8	1.68	4.0	1	1,924	0.79	1,513	40.0	0.26	1,490	0.50	
OS-7-2		0.073	0.027	42.6	2.38	22.2	1.68	4.0	1	1,851	0.79	1,456	40.0	0.25	1,434	0.49	
OS-7-3		0.073	0.028	45.2	2.46	23.5	1.74	4.1	1	1,997	0.79	1,570	40.0	0.26	1,550	0.47	
OS-7-4		0.073	0.028	44.8	2.46	23.3	1.74	4.1	1	2,033	0.79	1,599	40.0	0.27	1,578	0.47	

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

10-year

		Unit Hydrograph Parameters and Results										Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f.)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)	
A-1		0.157	0.132	58.7	7.44	30.5	5.26	12.4	30	137,904	0.25	34,689	45.0	6.87	34,688	0.18	
A-2-1		0.157	0.104	59.0	6.23	30.7	4.40	10.4	18	82,292	0.25	20,700	45.0	4.07	20,706	0.18	
A-2-2		0.076	0.151	16.0	3.35	8.3	2.37	5.6	73	90,823	1.21	109,722	30.0	38.59	108,735	1.54	
A-3		0.079	0.028	37.5	2.30	19.5	1.62	3.8	1	2,251	1.09	2,451	35.0	0.46	2,407	0.74	
A-3-1		0.079	0.020	32.3	2.00	16.8	1.42	3.3	0	1,125	1.09	1,226	35.0	0.25	1,194	0.82	
A-3-2		0.079	0.020	32.3	2.00	16.8	1.42	3.3	0	1,125	1.09	1,226	35.0	0.25	1,194	0.82	
B-1		0.076	0.253	11.3	3.71	5.9	2.62	6.2	328	288,440	1.21	348,461	30.0	145.97	341,983	1.84	
B-2		0.076	0.164	9.8	2.74	5.1	1.94	4.6	145	110,243	1.21	133,184	25.0	59.73	128,168	1.97	
C-1		0.077	0.209	14.7	3.86	7.6	2.73	6.4	170	193,152	1.15	221,852	30.0	83.88	220,188	1.58	
C-2		0.077	0.133	7.6	2.28	3.9	1.61	3.8	121	71,257	1.15	81,845	25.0	41.84	75,660	2.13	
C-3		0.078	0.115	46.0	5.57	23.9	3.94	9.3	15	52,199	1.12	58,714	40.0	9.64	58,642	0.67	
C-3-1		0.077	0.041	27.7	2.37	14.4	1.67	3.9	2	5,118	1.15	5,879	30.0	1.37	5,740	0.97	
C-3-2		0.077	0.038	38.9	2.63	20.2	1.86	4.4	1	4,356	1.15	5,003	35.0	0.91	4,940	0.76	
C-3-3		0.079	0.025	27.4	2.02	14.3	1.43	3.4	1	1,779	1.09	1,937	30.0	0.45	1,879	0.93	
C-3-4		0.079	0.023	28.8	2.01	15.0	1.42	3.4	1	1,525	1.09	1,661	30.0	0.37	1,612	0.89	
C-3-5		0.077	0.032	13.7	1.84	7.1	1.30	3.1	3	2,977	1.15	3,419	30.0	1.22	3,182	1.49	
C-3-6		0.077	0.030	21.3	1.99	11.1	1.41	3.3	2	2,577	1.15	2,960	30.0	0.83	2,846	1.17	
C-3-7		0.077	0.034	19.0	2.00	9.9	1.41	3.3	2	3,449	1.15	3,961	30.0	1.20	3,788	1.26	
C-3-8		0.077	0.035	21.7	2.08	11.3	1.47	3.5	2	3,557	1.15	4,086	30.0	1.13	3,940	1.15	
C-3-9		0.079	0.028	55.2	2.70	28.7	1.91	4.5	1	2,360	1.09	2,570	40.0	0.36	2,548	0.55	
C-3-10		0.079	0.028	54.1	2.67	28.1	1.88	4.4	1	2,323	1.09	2,530	40.0	0.36	2,507	0.56	
C-3-11		0.077	0.026	31.9	2.14	16.6	1.51	3.6	1	1,888	1.15	2,168	35.0	0.45	2,116	0.87	
C-3-12		0.077	0.027	31.0	2.14	16.1	1.51	3.6	1	1,997	1.15	2,293	35.0	0.49	2,237	0.88	
C-3-13		0.077	0.033	27.4	2.20	14.3	1.55	3.7	2	3,231	1.15	3,711	30.0	0.86	3,612	0.97	
C-3-14		0.077	0.047	37.8	2.88	19.7	2.03	4.8	2	7,151	1.15	8,214	35.0	1.53	8,133	0.78	
C-3-15		0.077	0.048	38.4	2.91	20.0	2.06	4.9	2	7,333	1.15	8,422	35.0	1.55	8,345	0.77	
C-3-16		0.096	0.011	16.6	1.64	8.6	1.16	2.7	0	581	0.64	374	30.0	0.14	350	0.87	
C-4		0.079	0.054	20.8	2.37	10.8	1.67	4.0	6	10,091	1.09	10,992	30.0	3.20	10,665	1.15	
C-4-1		0.079	0.037	26.7	2.25	13.9	1.59	3.8	2	4,211	1.09	4,586	30.0	1.10	4,467	0.95	
C-4-2		0.079	0.043	26.6	2.37	13.8	1.68	4.0	3	5,881	1.09	6,405	30.0	1.55	6,254	0.96	
C-5		0.081	0.107	48.3	5.48	25.1	3.87	9.1	13	47,626	1.03	49,077	40.0	7.86	49,018	0.60	
C-5-1		0.097	0.036	73.1	3.49	38.0	2.47	5.8	2	9,075	0.62	5,625	45.0	0.71	5,614	0.28	
C-5-2		0.094	0.037	70.3	3.48	36.5	2.46	5.8	1	7,986	0.68	5,420	45.0	0.69	5,408	0.31	
C-5-3		0.079	0.033	52.2	2.81	27.1	1.99	4.7	1	3,267	1.09	3,558	40.0	0.52	3,530	0.58	
C-5-4		0.079	0.033	52.4	2.81	27.2	1.99	4.7	1	3,231	1.09	3,519	40.0	0.51	3,491	0.58	
C-5-5		0.079	0.027	32.8	2.19	17.0	1.55	3.6	1	2,178	1.09	2,372	35.0	0.49	2,317	0.81	
C-5-6		0.079	0.027	32.8	2.19	17.0	1.55	3.6	1	2,178	1.09	2,372	35.0	0.49	2,317	0.81	
C-5-7		0.079	0.032	53.2	2.80	27.6	1.98	4.7	1	3,086	1.09	3,361	40.0	0.48	3,334	0.57	
C-5-8		0.079	0.032	52.0	2.76	27.0	1.95	4.6	1	3,013	1.09	3,282	40.0	0.48	3,254	0.58	
C-5-9		0.079	0.022	7.2	1.62	3.8	1.15	2.7	2	1,343	1.09	1,463	25.0	0.69	1,235	1.86	
C-5-10		0.079	0.029	36.4	2.32	18.9	1.64	3.9	1	2,577	1.09	2,807	35.0	0.54	2,756	0.76	
C-5-11		0.079	0.029	36.5	2.32	19.0	1.64	3.9	1	2,577	1.09	2,807	35.0	0.54	2,756	0.76	
C-5-12		0.077	0.035	24.9	2.17	12.9	1.53	3.6	2	3,630	1.15	4,169	30.0	1.04	4,037	1.04	
C-5-13		0.077	0.034	30.3	2.30	15.8	1.62	3.8	1	3,485	1.15	4,003	35.0	0.86	3,913	0.90	
C-6		0.079	0.045	17.8	2.11	9.3	1.49	3.5	5	6,498	1.09	7,077	30.0	2.26	6,766	1.26	
C-6-1		0.079	0.027	25.5	2.04	13.3	1.44	3.4	1	2,214	1.09	2,412	30.0	0.60	2,331	0.98	
C-6-2		0.079	0.031	25.6	2.11	13.3	1.49	3.5	1	2,940	1.09	3,203	30.0	0.79	3,103	0.98	
C-6-3		0.079	0.022	12.0	1.70	6.2	1.20	2.8	1	1,343	1.09	1,463	30.0	0.56	1,345	1.53	
D-1		0.081	0.122	16.3	3.03	8.5	2.14	5.0	50	63,452	1.03	65,386	30.0	23.26	64,377	1.33	
D-2		0.157	0.053	33.2	2.85	17.3	2.01	4.7	7	18,005	0.25	4,529	35.0	1.43	4,470	0.29	
D-3		0.081	0.100	16.5	2.77	8.6	1.96	4.6	32	40,874	1.03	42,119	30.0	14.67	41,127	1.30	
D-4		0.157	0.067	12.2	2.12	6.3	1.50	3.5	32	30,383	0.25	7,643	30.0	5.17	7,166	0.62	
D-5		0.157	0.035	24.3	2.16	12.7	1.52	3.6	4	7,296	0.25	1,835	35.0	0.73	1,776	0.36	
E		0.079	0.168	13.1	3.19	6.8	2.25	5.3	122	123,819	1.09	134,864	30.0	53.09	131,229	1.56	
F		0.157	0.092	58.5	5.64	30.4	3.98	9.4	14	62,073	0.25	15,614	45.0	3.08	15,605	0.18	
OS-1		0.136	0.159	43.3	6.79	22.5	4.80	11.3	84	281,071	0.32	90,162	40.0	21.66	90,172	0.28	
OS-2		0.146	0.114	41.0	5.09	21.3	3.60	8.5	37	117,322	0.24	28,432	40.0	7.20	28,377	0.22	
OS-3		0.149	0.093	39.0	4.28	20.3	3.03	7.1	23	70,821	0.23	16,338	40.0	4.36	16,298	0.22	
EX-X		0.157	0.024	22.0	1.90	11.5	1.34	3.2	2	3,013	0.25	758	35.0	0.32	728	0.39	
OS-4-1		0.076	0.043	36.0	2.68	18.7	1.89	4.5	2	5,481	1.21	6,619	35.0	1.26	6,532	0.83	
OS-4-2		0.075	0.045	35.3	2.71	18.3	1.92	4.5	2	6,026	1.24	7,451	35.0	1.43	7,354	0.86	
OS-7-1		0.073	0.027	42.0	2.38	21.8	1.68	4.0	1	1,924	1.39	2,672	35.0	0.44	2,631	0.83	
OS-7-2		0.073	0.027	42.6	2.38	22.2	1.68	4.0	1	1,851	1.39	2,571	35.0	0.42	2,532	0.82	
OS-7-3		0.073	0.028	45.2	2.46	23.5	1.74	4.1	1	1,997	1.39	2,773	35.0	0.43	2,736	0.78	
OS-7-4		0.073	0.028	44.8	2.46	23.3	1.74	4.1	1	2,033	1.39	2,823	35.0	0.44	2,786	0.79	

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

100-year

		Unit Hydrograph Parameters and Results										Excess Precip.		Storm Hydrograph			
		CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)		Volume (c.f.)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)	
Catchment Name/ID	User Comment for Catchment																
A-1		0.156	0.131	58.7	7.42	30.5	5.24	12.4	30	137,904	1.52	208,970	55.0	37.40	208,965	0.98	
A-2-1		0.156	0.104	59.0	6.21	30.7	4.39	10.4	18	82,292	1.52	124,700	55.0	22.08	124,736	0.97	
A-2-2		0.076	0.151	16.0	3.35	8.3	2.36	5.6	74	90,823	2.47	224,472	35.0	82.62	222,420	3.30	
A-3		0.079	0.028	37.3	2.30	19.4	1.62	3.8	1	2,251	2.35	5,296	45.0	1.09	5,201	1.76	
A-3-1		0.079	0.020	32.2	2.00	16.8	1.42	3.3	0	1,125	2.35	2,648	40.0	0.60	2,579	1.93	
A-3-2		0.079	0.020	32.2	2.00	16.8	1.42	3.3	0	1,125	2.35	2,648	40.0	0.60	2,579	1.93	
B-1		0.076	0.253	11.3	3.70	5.9	2.62	6.2	329	288,440	2.47	712,892	35.0	309.97	699,737	3.90	
B-2		0.076	0.164	9.8	2.74	5.1	1.94	4.6	145	110,243	2.47	272,471	30.0	123.28	262,135	4.06	
C-1		0.077	0.209	14.7	3.85	7.6	2.72	6.4	170	193,152	2.41	465,944	35.0	183.61	462,292	3.45	
C-2		0.077	0.133	7.6	2.28	3.9	1.61	3.8	121	71,257	2.41	171,894	30.0	88.58	158,851	4.51	
C-3		0.078	0.115	45.9	5.56	23.9	3.93	9.3	15	52,199	2.39	124,685	50.0	22.85	124,539	1.59	
C-3-1		0.077	0.041	27.6	2.36	14.3	1.67	3.9	2	5,118	2.41	12,347	40.0	3.10	12,057	2.20	
C-3-2		0.077	0.038	38.8	2.63	20.2	1.86	4.4	1	4,356	2.41	10,508	45.0	2.11	10,374	1.76	
C-3-3		0.079	0.025	27.3	2.02	14.2	1.43	3.4	1	1,779	2.35	4,186	40.0	1.05	4,059	2.15	
C-3-4		0.079	0.023	28.7	2.01	14.9	1.42	3.4	1	1,525	2.35	3,588	40.0	0.88	3,483	2.09	
C-3-5		0.077	0.032	13.7	1.84	7.1	1.30	3.1	3	2,977	2.41	7,180	35.0	2.68	6,683	3.27	
C-3-6		0.077	0.030	21.2	1.99	11.0	1.40	3.3	2	2,577	2.41	6,217	35.0	1.83	5,976	2.58	
C-3-7		0.077	0.034	18.9	2.00	9.8	1.41	3.3	2	3,449	2.41	8,319	35.0	2.64	7,955	2.78	
C-3-8		0.077	0.035	21.7	2.08	11.3	1.47	3.5	2	3,557	2.41	8,582	35.0	2.50	8,275	2.55	
C-3-9		0.079	0.028	55.0	2.70	28.6	1.91	4.5	1	2,360	2.35	5,552	50.0	0.88	5,506	1.35	
C-3-10		0.079	0.028	53.9	2.66	28.0	1.88	4.4	1	2,323	2.35	5,467	50.0	0.88	5,416	1.37	
C-3-11		0.077	0.026	31.8	2.14	16.6	1.51	3.6	1	1,888	2.41	4,553	40.0	1.03	4,445	1.99	
C-3-12		0.077	0.027	30.9	2.13	16.1	1.51	3.6	1	1,997	2.41	4,816	40.0	1.12	4,698	2.03	
C-3-13		0.077	0.033	27.4	2.20	14.2	1.55	3.7	2	3,231	2.41	7,793	40.0	1.96	7,585	2.20	
C-3-14		0.077	0.047	37.7	2.87	19.6	2.03	4.8	2	7,151	2.41	17,251	45.0	3.54	17,082	1.80	
C-3-15		0.077	0.048	38.3	2.91	19.9	2.06	4.9	2	7,333	2.41	17,689	45.0	3.60	17,523	1.78	
C-3-16		0.095	0.011	16.3	1.64	8.5	1.16	2.7	0	581	1.91	1,109	35.0	0.41	1,036	2.57	
C-4		0.079	0.054	20.8	2.37	10.8	1.67	3.9	6	10,091	2.35	23,747	35.0	7.26	23,039	2.61	
C-4-1		0.079	0.037	26.6	2.25	13.8	1.59	3.8	2	4,211	2.35	9,909	40.0	2.55	9,649	2.20	
C-4-2		0.079	0.043	26.5	2.37	13.8	1.68	4.0	3	5,881	2.35	13,838	40.0	3.59	13,509	2.21	
C-5		0.080	0.107	48.1	5.47	25.0	3.86	9.1	13	47,626	2.29	109,261	50.0	19.60	109,117	1.49	
C-5-1		0.097	0.036	71.4	3.48	37.2	2.46	5.8	2	9,075	1.89	17,118	55.0	2.40	17,082	0.96	
C-5-2		0.094	0.037	69.2	3.47	36.0	2.46	5.8	1	7,986	1.94	15,526	55.0	2.21	15,492	1.00	
C-5-3		0.079	0.033	52.0	2.81	27.0	1.99	4.7	1	3,267	2.35	7,688	50.0	1.27	7,627	1.41	
C-5-4		0.079	0.033	52.2	2.81	27.2	1.98	4.7	1	3,231	2.35	7,602	50.0	1.25	7,542	1.40	
C-5-5		0.079	0.027	32.6	2.19	17.0	1.54	3.6	1	2,178	2.35	5,125	40.0	1.15	5,007	1.92	
C-5-6		0.079	0.027	32.7	2.19	17.0	1.54	3.6	1	2,178	2.35	5,125	40.0	1.15	5,007	1.92	
C-5-7		0.079	0.032	53.0	2.80	27.5	1.98	4.7	1	3,086	2.35	7,261	50.0	1.18	7,202	1.39	
C-5-8		0.079	0.032	51.8	2.76	27.0	1.95	4.6	1	3,013	2.35	7,090	50.0	1.17	7,030	1.41	
C-5-9		0.079	0.022	7.2	1.62	3.8	1.15	2.7	2	1,343	2.35	3,161	30.0	1.51	2,667	4.08	
C-5-10		0.079	0.029	36.3	2.32	18.9	1.64	3.9	1	2,577	2.35	6,065	45.0	1.27	5,954	1.79	
C-5-11		0.079	0.029	36.3	2.32	18.9	1.64	3.9	1	2,577	2.35	6,065	45.0	1.27	5,954	1.79	
C-5-12		0.077	0.035	24.8	2.17	12.9	1.53	3.6	2	3,630	2.41	8,757	40.0	2.32	8,478	2.32	
C-5-13		0.077	0.034	30.3	2.30	15.7	1.62	3.8	1	3,485	2.41	8,406	40.0	1.98	8,217	2.07	
C-6		0.079	0.045	17.7	2.11	9.2	1.49	3.5	5	6,498	2.35	15,290	35.0	5.11	14,613	2.86	
C-6-1		0.079	0.028	25.4	2.04	13.2	1.44	3.4	1	2,214	2.35	5,211	40.0	1.37	5,035	2.24	
C-6-2		0.079	0.031	25.5	2.11	13.3	1.49	3.5	1	2,940	2.35	6,919	40.0	1.82	6,701	2.24	
C-6-3		0.079	0.022	12.0	1.70	6.2	1.20	2.8	1	1,343	2.35	3,161	35.0	1.27	2,905	3.42	
D-1		0.080	0.122	16.2	3.02	8.4	2.14	5.0	51	63,452	2.29	145,571	35.0	54.08	143,287	3.09	
D-2		0.156	0.053	33.2	2.84	17.3	2.01	4.7	7	18,005	1.52	27,283	40.0	7.19	26,928	1.45	
D-3		0.080	0.100	16.5	2.77	8.6	1.96	4.6	32	40,874	2.29	93,771	35.0	34.11	91,547	3.03	
D-4		0.156	0.066	12.1	2.12	6.3	1.50	3.5	32	30,383	1.52	46,040	35.0	23.33	43,163	2.79	
D-5		0.156	0.035	24.3	2.15	12.7	1.52	3.6	4	7,296	1.52	11,056	40.0	3.55	10,701	1.77	
E		0.079	0.168	13.0	3.19	6.8	2.25	5.3	123	123,819	2.35	291,367	35.0	119.31	283,485	3.50	
F		0.156	0.092	58.5	5.62	30.4	3.97	9.4	14	62,073	1.52	94,061	55.0	16.66	94,003	0.97	
OS-1		0.134	0.157	43.2	6.71	22.4	4.74	11.2	84	281,071	1.59	445,892	50.0	99.62	445,986	1.29	
OS-2		0.144	0.113	40.9	5.06	21.3	3.57	8.4	37	117,322	1.51	176,827	45.0	40.72	176,472	1.26	
OS-3		0.148	0.092	39.0	4.26	20.3	3.01	7.1	23	70,821	1.50	105,895	45.0	25.31	105,642	1.30	
EX-X		0.156	0.023	22.0	1.90	11.5	1.34	3.2	2	3,013	1.52	4,566	40.0	1.56	4,383	1.87	
OS-4-1		0.076	0.043	35.9	2.68	18.7	1.89	4.5	2	5,481	2.47	13,544	40.0	2.83	13,365	1.87	
OS-4-2		0.075	0.045	35.2	2.71	18.3	1.91	4.5	2	6,026	2.50	15,064	40.0	3.18	14,866	1.92	
OS-7-1		0.073	0.027	42.0	2.38	21.8	1.68	4.0	1	1,924	2.65	5,099	45.0	0.93	5,021	1.76	
OS-7-2		0.073	0.027	42.6	2.38	22.2	1.68	4.0	1	1,851	2.65	4,907	45.0	0.89	4,832	1.75	
OS-7-3		0.073	0.028	45.2	2.46	23.5	1.74	4.1	1	1,997	2.65	5,292	45.0	0.92	5,222	1.68	
OS-7-4		0.073	0.028	44.8	2.46	23.3	1.74	4.1	1	2,033	2.65	5,388	45.0	0.95	5,316	1.69	



LEGEND:

- BASIN BOUNDARY
- OFF-SITE BASIN
- TRIBUTARY / FLOODING LIMITS
- 10-YEAR EVENT
- 100-YEAR EVENT
- PR PEDESTRIAN TRAIL
- PROPOSED STORM SEWER SYSTEM
- DRAINAGE FLOW
- EMERGENCY OVERFLOW
- PROPOSED CONTOURS
- EXISTING CONTOURS
- CONSTRUCTION PHASING DELINEATIONS
- FILING NO. 1
- ROCKCRESS EXTENSION
- INTERNAL ROADS



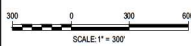
MAJOR BASIN SUMMARY AND DIRECT RUNOFF TABLE:

MAJOR DRAINAGE BASIN	CONTRIBUTING AREA (AC)	Q2 (CFS)	Q10 (CFS)	Q100 (CFS)	TRIBUTARY TO
A-1	37.99	0.24	6.87	37.40	TRIBUTARY I
A-2-1	22.67	0.14	4.07	22.08	TRIBUTARY I
A-2-2	25.02	0.16	38.59	82.62	POND B
A-3	0.62	0.24	0.46	1.09	POND C-2
B-1	79.46	82.92	145.97	309.97	POND B
B-2	30.37	33.22	59.73	123.28	POND C-2
C-1	53.21	45.87	83.88	183.61	POND C-1
C-2	19.63	22.10	41.84	88.58	POND C-2
C-3	14.38	5.26	9.64	22.85	POND C-1
C-4	2.78	1.69	3.20	7.26	TRIBUTARY I
C-5	13.12	4.10	7.86	19.60	POND C-2
C-6	1.79	1.20	2.26	5.11	POND C-2
D-1	17.48	12.02	23.26	54.08	POND C-2
D-2	4.96	0.05	1.43	7.19	OFFSITE
D-3	11.26	7.58	14.67	34.11	POND C-2
D-4	8.37	0.17	5.17	23.33	OFFSITE
D-5	2.01	0.02	0.73	3.55	TRIBUTARY I
E	34.11	28.44	53.09	119.31	POND E
F	17.1	0.11	3.08	16.66	TRIBUTARY I

POND SUMMARY TABLE:

POND	CONTRIBUTING BASINS	WATERSHED AREA (ac)	MAX 100-YR DEPTH (ft)	WATERSHED IMPERVIOUSNESS (%)	WQCV (ac-ft)	EURV (ac-ft)	REQUIRED VOLUME (ac-ft)			PROVIDED VOLUME (ac-ft)	ALLOWABLE RELEASE RATE (cfs)			DESIGN RELEASE RATE (cfs)		
							2-YR	10-YR	100-YR		2-YR	10-YR	100-YR	2-YR	10-YR	100-YR
B (FILING NO. 1)	A-2-2, B-1	104.48	5.83	85.00%	3.16	8.78	5.37	9.56	14.15	20.20	N/A	30.69	159.03	4.88	7.14	84.26
C-1 (FILING NO. 1)	C-1, C-3	67.59	3.61	79.74%	1.84	5.29	3.23	5.80	8.70	9.62	N/A	9.18	53.01	2.39	4.77	47.47
C-2 (FILING NO. 1)	A-3, B-2, C-2, C-5, C-4-1, C-6-2, D-1, B-3	93.90	8.77	77.05%	2.43	7.09	4.31	7.73	11.53	12.76	N/A	20.87	112.30	1.42	15.14	75.76
E (PUD 8)	E	34.11	8.10	75.00%	0.86	2.51	1.52	2.75	4.18	6.17	N/A	8.64	45.45	0.47	3.60	39.86

- THE DIRECT RUNOFF TABLE SUMMARIZES DIRECT SURFACE RUNOFF AS DETERMINED BY THE CUPP PROGRAM. ROUTED CUPP/SWMM RESULTS ARE INCLUDED IN THE MASTER FINAL DRAINAGE REPORT.
- DESIGN POINTS AND A ROUTED RUNOFF SUMMARY TABLE ARE PROVIDED WITH THE FILING NO. 1 AND ROCKCRESS EXTENSION DRAINAGE PLANS.
- WQCV-EXTENSION SOFTWARE USED TO CALCULATE POND SUMMARY TABLE VALUES. REFER TO FINAL MASTER DRAINAGE REPORT FOR FULL RESULTS.
- ALLOWABLE RELEASE RATE IS SIZE OF THE PREDEVELOPMENT 100-YR PEAK RUNOFF RATE PER WQCV USDM CRITERIA.
- DIRECT RUNOFF VALUES OF MAJOR BASINS SUMMARIZED HEREON MAY VARY FROM CUMULATIVE DIRECT RUNOFF FROM INDIVIDUAL SUBBASINS DELINEATED WITH FILING NO. 1 AND THE ROCKCRESS EXTENSION.
- OFF-SITE FLOWS FROM BVSD AND 88TH STREET REFERENCED FROM BVSD LOUISVILLE CAMPUS PUD DRAINAGE REPORT; REFER TO APPENDIX B OF FINAL MASTER DRAINAGE REPORT FOR EXCERPTS.
- FINAL DESIGN FOR POND C SHALL BE COMPLETED WITH PUD 8.
- A PORTION OF BASIN C-6, IDENTIFIED AS SUBBASIN C-6-3 IN FILING NO. 1 AND ROCKCRESS EXTENSION PLANS, FLOWS OFFSITE TO NORTHWEST PARKWAY.
- ROCK CREEK TRIBUTARY I IS NOT A FEMA REGULATED DRAINAGEWAY. FLOOD LIMITS SHOWN ARE FOR INFORMATIVE PURPOSES ONLY AND DO NOT REFLECT ANY EXISTING OR PROPOSED REGULATORY FLOODPLAIN BOUNDARY.



DESIGNED BY: SDM
CHECKED BY: MAM
DRAWN BY: SDM

DATE	REVISION COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM
04-05-2021	SECOND SUBMITTAL NEW PROGRAM PER CITY COMMENTS
05-21-2021	THIRD SUBMITTAL NEW PROGRAM
05-21-2021	RESUBMITTAL POST PRELIMINARY PLAN
07-28-2021	CONSTRUCTION BID SET
08-24-2021	REDCITY COMMENTS
08-24-2021	REDCITY COMMENTS



STERLING BAY

RETAIL RIDGE
MASTER DRAINAGE PLAN

PRELIMINARY
NOT FOR
CONSTRUCTION

PROJECT #: 190108

SHEET NUMBER

1

1 OF 2

Appendix C

Rational Calculations

Landscape Drain Pipe 2 Year Storm Analysis

Section C-C Analysis

Section D-D Analysis

Landscape Drain A7-1 and A3 Capacity Calculations

RipRap Pad Sizing

Project Name: Redtail Ridge - Lift Stations

Composite C-Value Computations

Post-Development

Project No: 190108

Date: 11/06/23

Revised: 08/01/25

Design by: MJS

Checked by: TJS

Hydrologic Soil Group: C

BASIN	TOTAL AREA (ACRES)	ROOFS (90%)	GRAVEL (40%)	DRIVES & WALKS (90%)	GARAGE & STREETS (100%)	LANDSCAPE AREA (2%)	PERCENT IMPERVIOUS	C ₂ =	C ₅ =	C ₁₀ =	C ₁₀₀ =
A	0.71	0.03	0.05	0.22	0.00	0.41	36.05%	0.22	0.23	0.25	0.39
B	0.07	0.00	0.00	0.00	0.00	0.07	2.00%	0.01	0.01	0.01	0.13
OS-1	0.16	0.00	0.00	0.04	0.00	0.12	23.87%	0.13	0.14	0.15	0.30
Total On-Site	0.86	0.03	0.05	0.26	0.00	0.53	33.85%	0.21	0.22	0.23	0.37
Total Captured	0.78	0.03	0.05	0.22	0.00	0.48	32.90%	0.20	0.21	0.22	0.37

Project Name: Redtail Ridge - Lift Stations

Project No: 190108

Date: 11/6/2023

Revised: 8/1/2025

STANDARD FORM SF-2
TIME OF CONCENTRATION

Designed By: MJS

Checked By: TJS

SUB-BASIN DATA			INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Ti)					Tc CHECK (URBANIZED BASINS)			FINAL	REMARKS
BASIN	AREA (AC)	C _s	LENGTH (FT)	SLOPE %	Ti (MIN)	LENGTH (FT)	SLOPE %	C _v	VELOCITY (FPS)	Tt (MIN)	COMPOS. Tc (MIN)	TOTAL LENGTH	Tc = (L/180) + 10 (MIN)	Tc (MIN)	
A	0.71	0.23	10	2.00	3.99	148	5.00	20.00	4.47	0.55	5.00	158	10.88	5.00	
B	0.07	0.01	15	25.00	2.66	72	2.00	15.00	2.12	0.57	5.00	87	10.48	5.00	
OS-1	0.16	0.14	35	25.00	3.57	0	2.00	15.00	2.12	0.00	5.00	35	10.19	5.00	

1-HR Rainfall

https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html

Return Interval (YR)	1-hour Rainfall				
WQ	0.6				
2	0.801				
5	1.08				
10	1.35				
100	2.49				
tc	WQ	2yr	5yr	5yr	100yr
5	2.0351	2.717	3.663	4.579	8.446
6	1.934	2.582	3.482	4.353	8.028
7	1.844	2.462	3.320	4.150	7.654
8	1.763	2.354	3.174	3.968	7.318
9	1.690	2.256	3.042	3.803	7.014
10	1.623	2.167	2.922	3.652	6.737
11	1.562	2.086	2.812	3.515	6.483
12	1.506	2.011	2.711	3.389	6.250
13	1.454	1.942	2.618	3.272	6.036
14	1.407	1.878	2.532	3.165	5.837
15	1.362	1.818	2.452	3.065	5.653
16	1.321	1.763	2.377	2.972	5.481
17	1.282	1.712	2.308	2.885	5.321
18	1.246	1.663	2.243	2.804	5.171
19	1.212	1.618	2.182	2.727	5.030
20	1.180	1.576	2.124	2.656	4.898

Project Name: Redtail Ridge - Lift Static
Project No: 190108
Date: 11/06/23
Revised: 08/01/25

STANDARD FORM SF-2
Post-Development
Rational Method Procedure

Designed By: MJS
Checked By: TJS
Design Storm: WQ YR

BASIN (s)	DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				STREET/INLET					REMARKS
		AREA (AC)	RUNOFF COEFF	T _c (min)	C x A (AC)	I (IN/HR)	DIRECT RUNOFF, Q (CFS)	T _c (MAX)	Σ(C x A) (AC)	I (IN/HR)	TOTAL RUNOFF, Q (CFS)	SLOPE (%)	STREET FLOW (CFS)	INLET DESIGN FLOW (CFS)	STREET OR INLET INTERCEPTION (CFS)	CARRYOVER (CFS)	
A	1	0.71	0.22	5.00	0.16	2.04	0.32										Onsite Flows Captured
B	2	0.07	0.01	5.00	0.00	2.04	0.001										Off-Site Flows, Captured
OS-1	3	0.16	0.13	5.00	0.02	2.04	0.041										Off-Site Flows, Flows South Offsite

Project Name: Redtail Ridge - Lift Station
Project No: 190108
Date: 11/06/23
Revised: 08/01/25

STANDARD FORM SF-2
Post-Development
Rational Method Procedure

Designed By: MJS
Checked By: TJS
Design Storm: 2 YR

BASIN (s)	DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				STREET/INLET					REMARKS
		AREA (AC)	RUNOFF COEFF	T _c (min)	C x A (AC)	I (IN/HR)	DIRECT RUNOFF, Q (CFS)	T _c (MAX)	Σ(C x A) (AC)	I (IN/HR)	TOTAL RUNOFF, Q (CFS)	SLOPE (%)	STREET FLOW (CFS)	INLET DESIGN FLOW (CFS)	STREET OR INLET INTERCEPTION (CFS)	CARRYOVER (CFS)	
A	1	0.71	0.22	5.00	0.16	2.72	0.43										Onsite Flows Captured
B	2	0.07	0.01	5.00	0.00	2.72	0.001										Off-Site Flows, Captured
OS-1	3	0.16	0.13	5.00	0.02	2.72	0.055										Off-Site Flows, Flows South Offsite

Project Name: Redtail Ridge - Lift Station
Project No: 190108
Date: 11/06/23
Revised: 08/01/25

STANDARD FORM SF-2
Post-Development
Rational Method Procedure

Designed By: MJS
Checked By: TJS
Design Storm: 100 YR

BASIN (s)	DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				STREET/INLET					REMARKS
		AREA (AC)	RUNOFF COEFF	T _c (min)	C x A (AC)	I (IN/HR)	DIRECT RUNOFF, Q (CFS)	T _c (MAX)	Σ(C x A) (AC)	I (IN/HR)	TOTAL RUNOFF, Q (CFS)	SLOPE (%)	STREET FLOW (CFS)	INLET DESIGN FLOW (CFS)	STREET OR INLET INTERCEPTION (CFS)	CARRYOVER (CFS)	
A	-	0.71	0.39	5.00	0.28	8.45	2.34										Onsite Flows Captured
B	-	0.07	0.13	5.00	0.01	8.45	0.08										Off-Site Fows, Captured
OS-1	-	0.16	0.30	5.00	0.05	8.45	0.39										Off-Site Fows, Flows South Offsite

BASIN SUMMARY TABLE				
BASIN	AREA (AC)	WQ (CFS)	Q2 (CFS)	Q100 (CFS)
A	0.71	0.32	0.43	2.34
B	0.07	0.001	0.001	0.08
OS-1	0.16	0.04	0.06	0.39

Design
Point

impervious

36.05%
2.00%
23.87%

Channel Report

Landscape Drain 2 Year Storm Analysis

Circular

Diameter (ft) = 0.67

Invert Elev (ft) = 5354.00

Slope (%) = 0.50 Minimum Slope

N-Value = 0.013

Calculations

Compute by: Known Q

Known Q (cfs) = 0.43 Basin A + B 2-Year Flow

Highlighted

Depth (ft) = 0.34

Q (cfs) = 0.430

Area (sqft) = 0.18

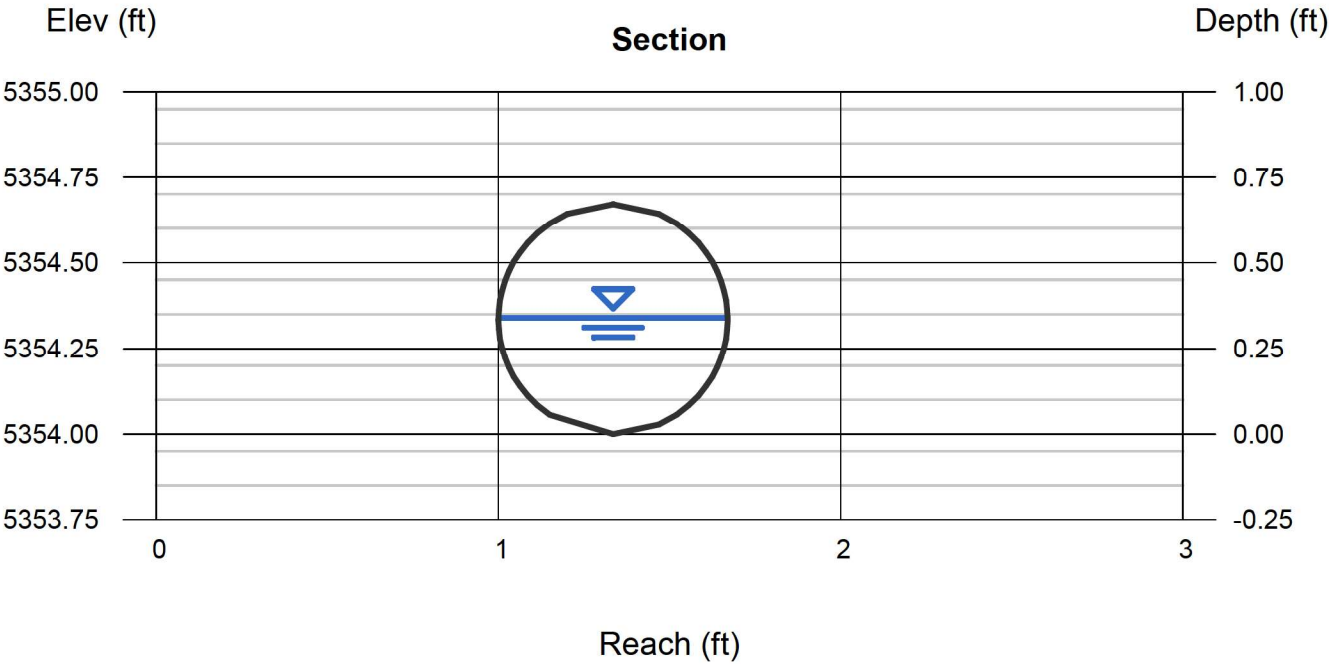
Velocity (ft/s) = 2.38

Wetted Perim (ft) = 1.07

Crit Depth, Yc (ft) = 0.31

Top Width (ft) = 0.67

EGL (ft) = 0.43



Channel Report

Section C-C

User-defined

Invert Elev (ft)

= 5363.21

Slope (%)

= 2.00

N-Value

= 0.020

Highlighted

Depth (ft)

= 0.36

Q (cfs)

= 2.420

Area (sqft)

= 0.75

Velocity (ft/s)

= 3.21

Wetted Perim (ft)

= 4.25

Crit Depth, Yc (ft)

= 0.41

Top Width (ft)

= 4.19

EGL (ft)

= 0.52

Calculations

Compute by:

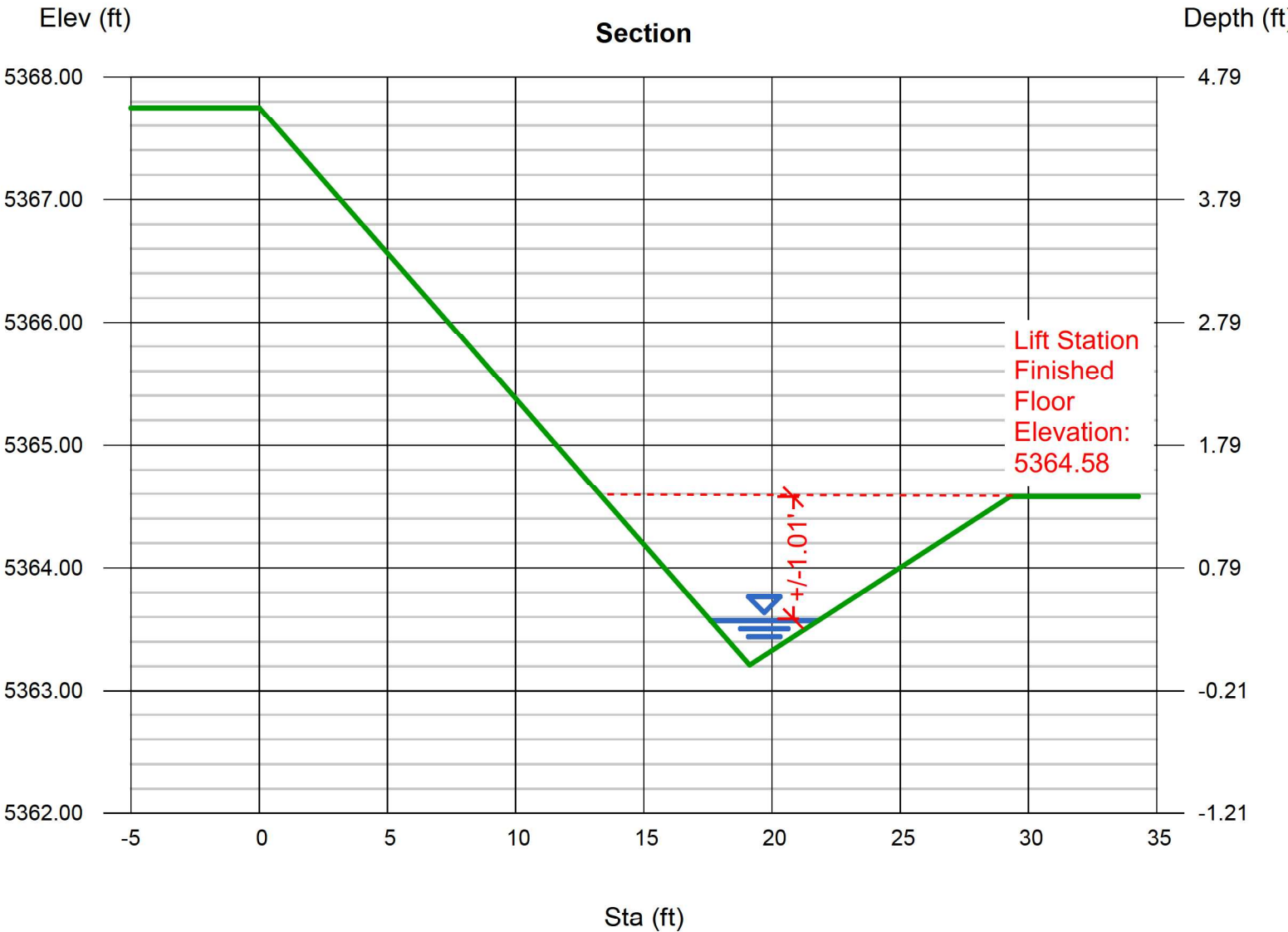
Known Q

Known Q (cfs)

= 2.42 Basin A + B 100-Year Flow

(Sta, El, n)-(Sta, El, n)...

(0.00, 5367.75)-(19.12, 5363.21, 0.020)-(29.29, 5364.58, 0.020)



Channel Report

Section D-D

User-defined

Invert Elev (ft) = 5363.33
Slope (%) = 2.38
N-Value = 0.021

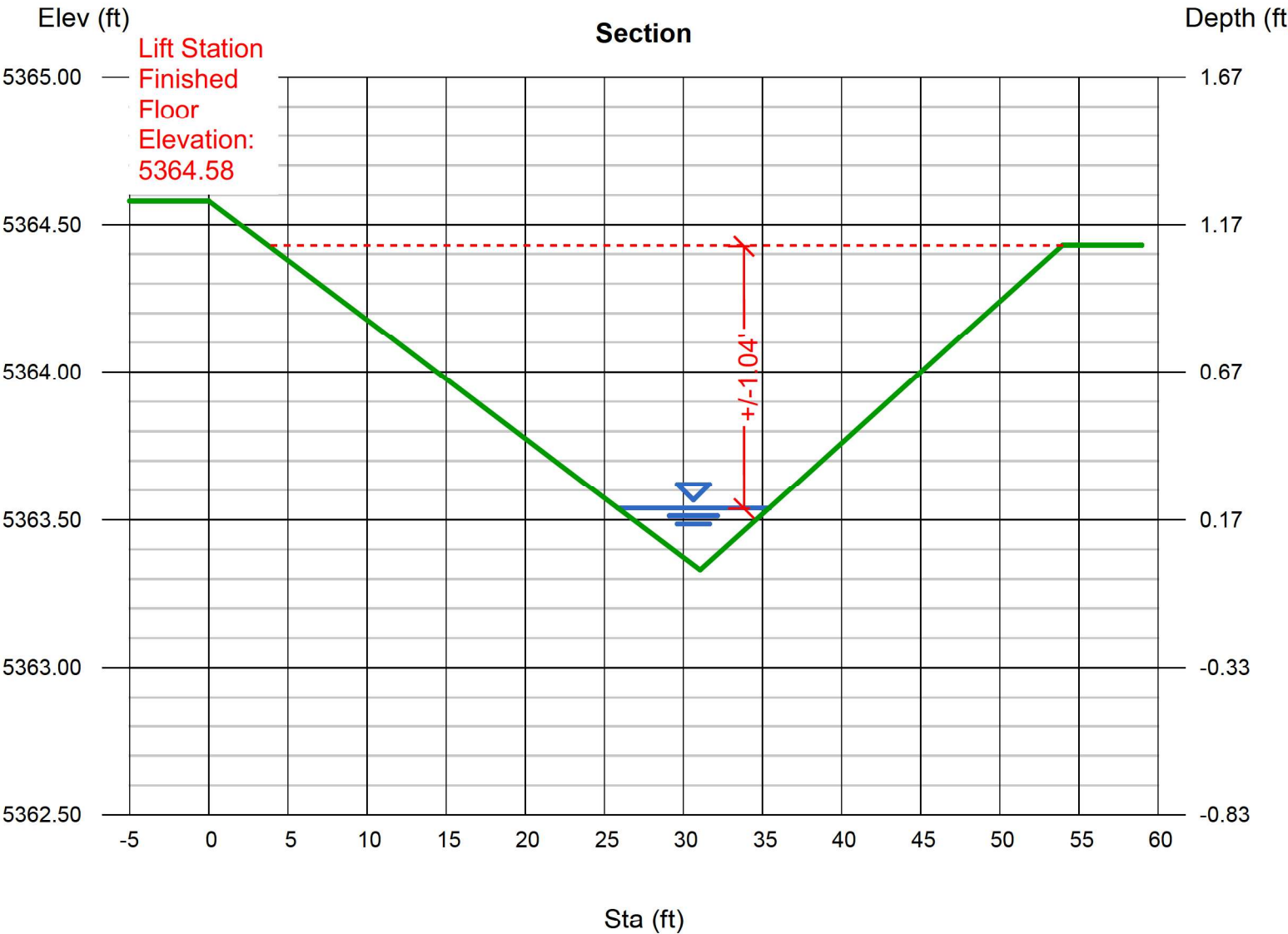
Calculations

Compute by: Known Q
Known Q (cfs) = 2.42 **Basin A + B 100-Year Flow**

Highlighted

Depth (ft) = 0.21
Q (cfs) = 2.420
Area (sqft) = 1.01
Velocity (ft/s) = 2.40
Wetted Perim (ft) = 9.60
Crit Depth, Yc (ft) = 0.24
Top Width (ft) = 9.59
EGL (ft) = 0.30

(Sta, El, n)-(Sta, El, n)...
(0.00, 5364.58)-(31.06, 5363.33, 0.022)-(53.98, 5364.43, 0.020)





Nyloplast Inlet Capacity Table

DISCLAIMER: SAFETY FACTORS ARE NOT INCLUDED IN THESE CALCULATIONS. ACTUAL CALCULATIONS SHOULD BE CARRIED OUT AND VERIFIED BY THE DESIGN ENGINEER TAKING INTO ACCOUNT ALL LOCAL CONDITIONS. NYLOPLAST RECOMMENDS USING A MINIMUM SAFETY FACTOR OF 1.25 FOR PAVED AREAS AND 2.0 FOR TURF AREAS. ADS/NYLOPLAST IS NOT RESPONSIBLE FOR MISUSE OF THIS TOOL.

Input	
Type of Grate	12" Dome
Head (ft)	0.79
Properties	
Orifice Flow Area (in)	70.37
Orifice Flow Area (ft)	0.49
Weir Flow Perimeter (in)	34.56
Weir Flow Perimeter (ft)	2.88
Solution	
Capacity (cfs)	2.08
Capacity (gpm)	932.23

MAXIMUM HEAD
FROM LANDSCAPE
DRAIN ELEVATION
TO 1' BELOW LIFT
STATION FINISHED
FLOOR

$$Q_{weir} = CLH^{3/2}$$

$C = 3.33$ Weir Discharge Coefficient

L = Perimeter of Grate Opening (ft)

H = Flow Height of Water Surface Above Weir (ft)

$$Q_{orifice} = CA\sqrt{2gh}$$

$C = 0.60$ Orifice Discharge Coefficient

A = Area of the Orifice (ft²)

g = Gravitational Constant $\left(32.2 \frac{ft}{s^2}\right)$

H = Depth of Water Above Center of Orifice (ft)



Nyloplast Inlet Capacity Table

DISCLAIMER: SAFETY FACTORS ARE NOT INCLUDED IN THESE CALCULATIONS. ACTUAL CALCULATIONS SHOULD BE CARRIED OUT AND VERIFIED BY THE DESIGN ENGINEER TAKING INTO ACCOUNT ALL LOCAL CONDITIONS. NYLOPLAST RECOMMENDS USING A MINIMUM SAFETY FACTOR OF 1.25 FOR PAVED AREAS AND 2.0 FOR TURF AREAS. ADS/NYLOPLAST IS NOT RESPONSIBLE FOR MISUSE OF THIS TOOL.

Input	
Type of Grate	12" Dome
Head (ft)	0.13
Properties	
Orifice Flow Area (in)	70.37
Orifice Flow Area (ft)	0.49
Weir Flow Perimeter (in)	34.56
Weir Flow Perimeter (ft)	2.88
Solution	
Capacity (cfs)	0.45
Capacity (gpm)	201.73

LOWEST HEAD
FROM ANY
LANDSCAPE DRAIN
ON SITE (DRAIN A3)

$$Q_{weir} = CLH^{3/2}$$

$C = 3.33$ Weir Discharge Coefficient

L = Perimeter of Grate Opening (ft)

H = Flow Height of Water Surface Above Weir (ft)

$$Q_{orifice} = CA\sqrt{2gh}$$

$C = 0.60$ Orifice Discharge Coefficient

A = Area of the Orifice (ft²)

g = Gravitational Constant $\left(32.2 \frac{ft}{s^2}\right)$

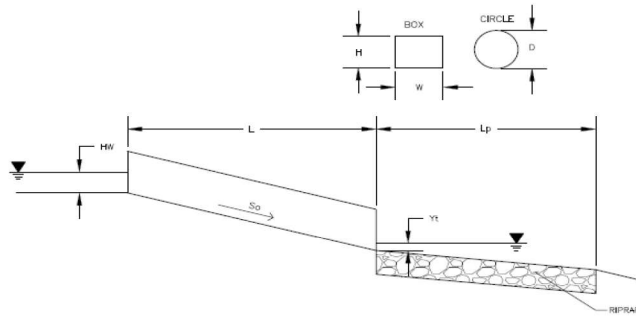
H = Depth of Water Above Center of Orifice (ft)

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.01 (April 2025)

Project: **REDTAIL RIDGE LIFT STATION - OUTFALL RIPRAP SIZING**

ID: _____



Soil Type:

Choose One:

☐ Sandy

☒ Non-Sandy

Design Information:

Design Discharge

Q = 2.42 cfs

Circular Culvert:

Barrel Diameter in Inches

D = 8 inches

Inlet Edge Type (Choose from pull-down list)

Grooved Edge in Headwall

OR:

Box Culvert:

Barrel Height (Rise) in Feet

H (Rise) = OR

Barrel Width (Span) in Feet

W (Span) =

Inlet Edge Type (Choose from pull-down list)

Number of Barrels

Barrels = 1

Inlet Elevation

Elev IN = 5353.75 ft

Outlet Elevation OR Slope

Elev OUT = 5353.7 ft

Culvert Length

L = 10 ft

Manning's Roughness

n = 0.014

Bend Loss Coefficient

k_b = 0

Exit Loss Coefficient

k_x = 1

Tailwater Surface Elevation

Y_t Elevation = ft

Max Allowable Channel Velocity

V = 5 ft/s

Calculated Results:

Culvert Cross Sectional Area Available

A = 0.35 ft²

Culvert Normal Depth

Y_n = 0.67 ft

Culvert Critical Depth

Y_c = 0.65 ft

Froude Number

Fr = -

Entrance Loss Coefficient

k_e = 0.20

Friction Loss Coefficient

k_f = 0.62

Sum of All Loss Coefficients

k_s = 1.82

Headwater:

Inlet Control Headwater

HW_I = 1.88 ft

Outlet Control Headwater

HW_O = 1.96 ft

Design Headwater Elevation

HW = 5355.71 ft

Headwater/Diameter OR Headwater/Rise Ratio

HW/D = 2.95 HW/D > 1.5!

Outlet Protection:

Flow/(Diameter^{2.5})

Q/D^{2.5} = 6.67 ft^{0.5}/s

Tailwater Surface Height

Y_t = 0.27 ft

Tailwater/Diameter

Y_t/D = 0.40

Expansion Factor

1/(2*tan(θ)) = 1.82

Flow Area at Max Channel Velocity

A_k = 0.48 ft²

Width of Equivalent Conduit for Multiple Barrels

W_{eq} = - ft

Length of Riprap Protection

L_p = 3 ft

Width of Riprap Protection at Downstream End

T = 3 ft

Adjusted Diameter for Supercritical Flow

Da = - ft

Minimum Theoretical Riprap Size

d₅₀ min = 4 in

Nominal Riprap Size

d₅₀ nominal = 6 in

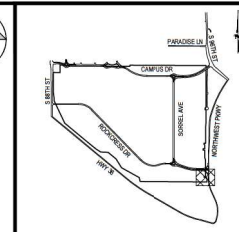
MHFD Riprap Type

Type = VL

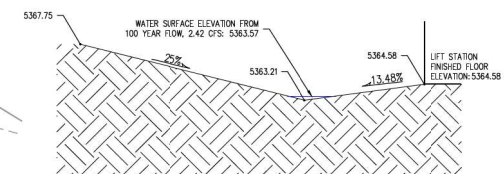
Appendix D

Drainage Plan

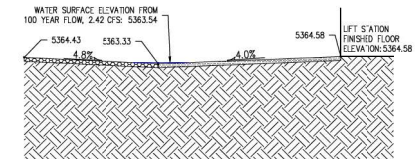
ADS Barracuda Max S3 Details



KEY MAP
1"=2000'



SECTION C-C
NTS

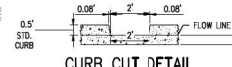


SECTION D-D
NTS

BASIN	AREA (AC)	WQ (CFS)	Q2 (CFS)	Q100 (CFS)
A	0.71	0.32	0.43	2.34
B	0.07	0.001	0.001	0.08
QS-1	0.16	0.04	0.06	0.23

LEGEND

-



CURB CUT DETAIL
NTS

EXISTING:

- EXISTING:**
- | | | |
|---------------------|--------------------------|-------------------------------|
| BASIN DESIGNATION | OS 1 | 2-YR RATIONAL C COEFFICIENT |
| BASIN SIZE IN ACRES | AREA = 1.27
C = 0.057 | 100-YR RATIONAL C COEFFICIENT |
- PROPOSED:**
- | | | |
|---------------------|--------------------------|-------------------------------|
| BASIN DESIGNATION | OS 1 | 2-YR RATIONAL C COEFFICIENT |
| BASIN SIZE IN ACRES | AREA = 1.27
C = 0.057 | 100-YR RATIONAL C COEFFICIENT |



20 0 20 40
SCALE: 1" = 20'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MJS

REDTAIL RIDGE
DRAINAGE PLAN

ISSUE DATE: 11-15-2019		PROJECT #: 19010	
DATE	REVISION COMMENTS		
02-07-2026	RESUBMITTAL POST PRELIMINARY PLAT		
06-16-2026	RPP SET		
01-28-2025	IFC SET		
04-29-2025	PER CITY COMMENTS		
06-04-2025	PER CITY COMMENTS		



SHEET NO.
LS - 5

NO CHANGES ARE TO BE MADE TO THE DRAWING WITHOUT WRITTEN PERMISSION OF ADAMS COOPER SYSTEMS

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	ADAMS COOPER SYSTEMS 303-545-7555 JRODRIGUEZ@ADSCORP.COM
ADDS SALES REP:	ADDS PIPELINE 303-475-8706 ADDS PIPELINE@ADSCORP.COM
PROJECT NO.:	190108



RETAIL RIDGE - LIFT STATION

LOUISVILLE, COLORADO

ADS BARRACUDA SPECIFICATIONS

MATERIALS & FABRICATION
CONCRETE STRUCTURES, DESIGNED FOR H-20 AND/OR HS-20 TRAFFIC LOADING AND APPLICABLE SOIL LOADS OR AS OTHERWISE DETERMINED BY A LICENSED PROFESSIONAL ENGINEER. THE MATERIALS AND STRUCTURAL DESIGN OF THE DEVICE SHALL BE PER ASTM C507 AND ASTM C508.

48" HP MANHOLE STRUCTURES MADE FROM AN IMPACT MODIFIED COPOLYMER POLYPROPYLENE MEETING THE MATERIAL REQUIREMENTS OF ASTM F2724. THE EGG-POUNCE CONE REDUCER SHALL BE MANUFACTURED FROM POLYETHYLENE MATERIAL MEETING ASTM D3355 CLASS D3320D. GASKETS SHALL BE MADE OF MATERIAL MEETING THE REQUIREMENTS OF ASTM F477.

SEPARATOR MATERIALS SHALL BE SUBSTANTIALLY CONSTRUCTED OF STAINLESS STEEL, POLYETHYLENE, OR OTHER THERMOPLASTIC MATERIAL APPROVED BY THE MANUFACTURER.

PERFORMANCE
THE STORMWATER TREATMENT UNIT SHALL BE AN INLINE UNIT CAPABLE OF CONVEYING 100% OF THE DESIGN PEAK FLOW. IF PEAK FLOW RATES EXCEED MAXIMUM HYDRAULIC RATE, THE UNIT SHALL BE INSTALLED OFFLINE.

THE STORMWATER TREATMENT UNIT INTERNALS SHALL CONSIST OF (1) SEPARATOR CONE ASSEMBLY, AND (2) BUMP ASSEMBLY WHICH INCLUDES (3) LIDS WITH "TEETH".

THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 80% OF THE SUSPENDED SOLIDS ON AN ANNUAL AGGREGATE REMOVAL BASIS. S/D REMOVAL SHALL BE BASED ON FULL-SCALE THIRD PARTY TESTING USING D50-100 MEDIA GRADATION OR EQUIVALENT AND 20 mg/L INFILTRANT CONCENTRATION. S/D FULL-SCALE TESTING SHALL HAVE INCLUDED SEGMENT CAPTURE BASED ON ACTUAL TOTAL MASS COLLECTED BY THE STORMWATER TREATMENT UNIT.

OR
THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 50% OF TSS USING A MEDIA MIX WITH d_{50} 75 MICRON AND 200 mg/L INFILTRANT CONCENTRATION.

OR
THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 50% OF TSS PER PREVIOUS 2013 NIDEP/ACAT HDS PROTOCOL.

MANUFACTURER
EACH STORMWATER TREATMENT SYSTEM SHALL BE A BARRACUDA SYSTEM AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS™, 2650 HAMILTON EATON RD., HAMILTON, OHIO 45011.

BARRACUDA MAINTENANCE

BARRACUDA SYSTEMS MUST BE INSPECTED AND MAINTAINED PERIODICALLY. INSPECTION IS MADE BY CHECKING THE DEPTH OF SEDIMENT IN EACH MANHOLE WITH A GRAZ STICK OR SIMILAR DEVICE. MAINTENANCE IS REQUIRED WHEN THE SEDIMENT DEPTH IN EXCESS OF 20 INCHES. MINIMUM INSPECTION IS RECOMMENDED TWICE A YEAR TO MAINTAIN OPERATION AND FUNCTION OF THE UNIT.

MAINTENANCE INSTRUCTIONS

1. REMOVE THE MANHOLE COVER TO PROVIDE ACCESS TO THE POLLUTANT STORAGE. POLLUTANTS ARE STORED IN THE BUMP, BELOW THE BOWL ASSEMBLY, VISIBLE FROM THE SURFACE. YOU WILL ACCESS THIS AREA THROUGH THE CENTER ACCESS CYLINDER.
2. USE A VACUUM TRUCK OR OTHER SIMILAR EQUIPMENT TO REMOVE ALL WATER, DEBRIS, OILS AND SEDIMENT.
3. USE A HIGH PRESSURE HOSE TO CLEAN THE MANHOLE OF ALL THE REMAINING SEDIMENT AND DEBRIS. THEN, USE THE VACUUM TRUCK TO REMOVE THE WATER.
4. FILL THE CLEANED MANHOLE WITH WATER UNTIL THE LEVEL REACHES THE INVERT OF THE OUTLET PIPE.
5. REPLACE THE MANHOLE COVER.
6. DISPOSE OF THE POLLUTED WATER, OILS, SEDIMENT AND TRASH AT AN APPROVED FACILITY.
7. LOCAL REGULATIONS PROHIBIT THE DISCHARGE OF SOLID MATERIAL INTO THE SANITARY SYSTEM. CHECK WITH THE LOCAL HEALTH AUTHORITY FOR AUTHORITY TO DISCHARGE THE LIQUIDS.
8. SOME LOCALITIES TREAT THE POLLUTANTS AS LEACHATE. CHECK WITH LOCAL REGULATORS ABOUT DISPOSAL REQUIREMENTS.
9. ADDITIONAL LOCAL REGULATIONS MAY APPLY TO THE MAINTENANCE PROCEDURE.

BARRACUDA INSTALLATION NOTES

INSTALLATION OF THE STORMWATER TREATMENT UNIT(S) SHALL BE PERFORMED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. SUCH INSTRUCTIONS CAN BE OBTAINED BY CALLING ADVANCED DRAINAGE SYSTEMS AT (800) 821-8710 OR BY LOGGING ON TO WWW.ADS-CORP.COM

BARRACUDA MAX 60	
UNIT ID	A2
PERMANENT RATE (CFS)	4.2
TREATMENT FLOW RATE (CFS)	0.8

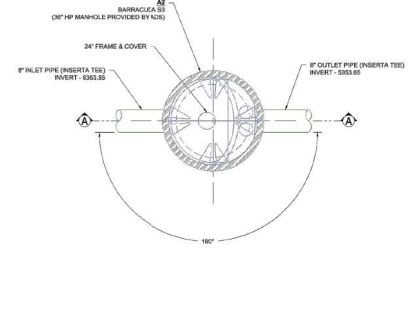
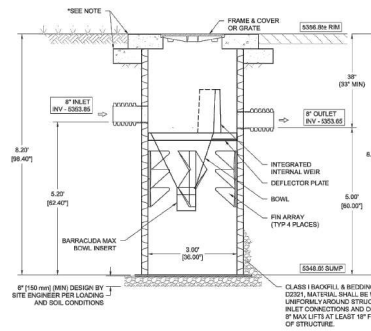
ATTENTION:

THIS TREATMENT UNIT WAS DESIGNED WITHOUT SITE SPECIFIC INFORMATION ON GROUNDWATER LEVELS. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE GROUNDWATER LEVEL RELATIVE TO THE BURIED DEPTH OF THE UNIT. IF THE GROUNDWATER DEPTH ABOVE THE BOTTOM OF THE BUMP EXCEEDS ONE-THIRD THE DEPTH OF THE UNIT, CONTACT ADS FOR SOLUTIONS. SEE TECHNICAL NOTE 8.22 FOR GUIDANCE.

PLEASE NOTE: 4" x 10" (100 mm x 250 mm) CONNECTIONS REQUIRE THE USE OF INSERT-A-TIE FITTINGS AND ARE TO BE ORDERED SEPARATELY FROM THE WATER QUALITY HP MANHOLE. INSERT-A-TIE FITTINGS ORDERED ARE DEPENDENT ON CONNECTION DIAMETER AND MATERIAL TYPE.

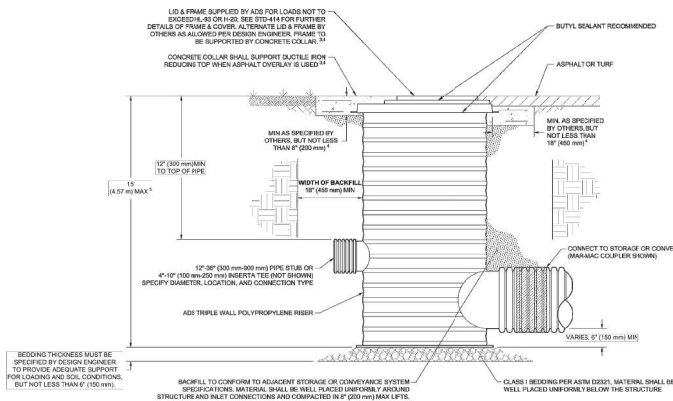
PRODUCT SPECIFICATIONS

- THE STORMWATER TREATMENT UNIT SHALL BE AN INLINE UNIT CAPABLE OF CONVEYING 100% OF THE DESIGN PEAK FLOW.
- IF PEAK FLOW RATES EXCEED MAXIMUM HYDRAULIC RATE, THE UNIT SHALL BE INSTALLED OFFLINE.
- THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 80% OF THE SUSPENDED SOLIDS ON AN ANNUAL AGGREGATE REMOVAL BASIS. S/D REMOVAL SHALL BE BASED ON FULL-SCALE THIRD PARTY TESTING USING D50-100 MEDIA GRADATION OR EQUIVALENT AND 200 mg/L INFILTRANT CONCENTRATION. S/D FULL-SCALE TESTING SHALL HAVE INCLUDED SEGMENT CAPTURE BASED ON ACTUAL TOTAL MASS COLLECTED BY THE STORMWATER TREATMENT UNIT.
- OR -
- THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 50% OF TSS USING A MEDIA MIX WITH d_{50} 75 MICRON AND 200 mg/L INFILTRANT CONCENTRATION.
- OR -
- THE BARRACUDA UNIT SHALL BE DESIGNED TO REMOVE AT LEAST 50% OF TSS PER PREVIOUS 2013 NIDEP/ACAT HDS PROTOCOL.
- CONCRETE SLAB DIMENSIONS ARE FOR GUIDELINE PURPOSES ONLY. ACTUAL CONCRETE SLAB MUST BE DESIGNED TAKING INTO CONSIDERATION LOCAL SOIL CONDITIONS, TRAFFIC LOADING, & OTHER APPLICABLE DESIGN FACTORS.
- SUPPLIED BY ADS FOR LOADS NOT TO EXCEED 14.4K. SEE 8014-4 FOR FURTHER DETAILS OF FRAME & COVER. ALTERNATE LID & FRAME BY OTHERS ARE ALLOWED PER DESIGN ENGINEER. FRAME TO BE SUPPORTED BY CONCRETE COLLAR.



HP MANHOLE WIDUCTILE IRON FLATFRAME INSTALLATION

NTS



NOTES

1. ADS POLYPROPYLENE BASINS ARE TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
2. ADAPTERS CAN BE MOUNTED ON ANGLES 0° TO 30° TO DETERMINE MAXIMUM ANGLE BETWEEN ADAPTERS, SEE DRAWING NO. 1006-10-000.
3. ADAPTERS CAN BE MOUNTED ON ANGLES 0° TO 30° TO DETERMINE MAXIMUM ANGLE BETWEEN ADAPTERS, SEE DRAWING NO. 1006-10-000.
4. ALL CONNECTIONS TO LANDING OR RISING AND STRUCTURE PRIOR TO CONCRETE COLLAR INSTALLATION.
5. CONCRETE SLAB DIMENSIONS ARE FOR GUIDELINE PURPOSES ONLY. ACTUAL CONCRETE SLAB MUST BE DESIGNED TAKING INTO CONSIDERATION LOCAL SOIL CONDITIONS, TRAFFIC LOADING, & OTHER APPLICABLE DESIGN FACTORS.
6. FOR BURIAL DEPTHS GREATER THAN 12' (3.7 m), OR WHERE GROUNDWATER WILL BE ENCOUNTERED, CONTACT ADS ENGINEERING.
7. GRATES/COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
8. FRAMES & REDUCING PLATE SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.

RETAIL RIDGE - LIFT STATION

LOUISVILLE, COLORADO

DATE: 07/20/2019 DRAWN: CTS

PROJECT: 190108

PRODUCT: BARRACUDA

MANUFACTURER: ADS

REVISION: 1

REVISION: 2

REVISION: 3

REVISION: 4

REVISION: 5

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REVISION

Appendix E

Variance Letter



DENVER • DALLAS/FORT WORTH

August 1, 2025

Cameron Fowlkes P.E., CFM
City Engineer
749 Main St
Louisville, CO 80027

via e-mail: cfowlkes@louisvilleco.gov

RE: Redtail Ridge
Variance Request Letter
Hydrodynamic Separator

Dear Mr. Fowlkes,

Harris Kocher Smith, on behalf of the Redtail Ridge Metropolitan District, is submitting this letter to request a variance allowing for the use of a specialized Hydrodynamic Separator (HDS) to achieve stormwater quality treatment for small areas of the Redtail Ridge development that are unable to be routed to our proposed water quality basins due to grade. Of the nearly 400 acres of developed area, less than 3.75 acres are very difficult to drain to our proposed water quality and detention basins and will need to be treated via HDS systems. Specifically, a 1.16-acre basin and a 1.62-acre basin at the intersection of Campus Drive and S 96th St collectively known together as basin C-4 and the 0.86-acre basin for the proposed lift station will utilize HDS structures to achieve water quality.

As we have discussed, during the evolution of the project design, and after our initial submittal of plans, Mile High Flood District (MHFD) modified their criteria, which the City of Louisville follows, and their recommended MS4 treatment measures in 2024. Specifically noting in Table 4-1 that HDSs do not generally meet the Runoff Reduction, Water Quality Capture Volume (WQCV) Capture Standards, nor the Pollutant Removal Standard for MS4 permit applicability.

A variance from the City of Louisville criteria is requested to allow for the use of the ADS Barracuda MAX HDS for the Redtail Ridge project because this system meets the requirements of the City's MS4 permit. As stated in comments from the city on this variance letter, the following two criteria must be met to allow for the ADS Barracuda MAX variance to be accepted.

- The Mile High flood district standard requires removal of **80-90% TSS** per the design of other water quality control designs.
- Louisville's MS4 permit has a requirement for the following for treatment and for an allowable area to not be treated:
 - (B) Pollutant Removal Standard:
 - The control measure(s) is designed to treat at a minimum the 80th percentile storm event. The control measure(s) shall be designed to treat stormwater runoff in a manner expected to reduce the event mean concentration of **total suspended solids (TSS) to a median value of 30 mg/L** or less.

ADS has provided two letters for the two locations on site which are proposed to use the HDS systems. Each letter, attached to this variance, indicates that the average removal efficiency calculated based on data collected by an independent third-party review was **80.1%** and that using the median event mean concentration for urban land uses, the discharge effluent mean concentration was reduced to less than 30 mg/L at **19.1 mg/L**.

For these reasons, we request the ADS Barracuda MAX be allowed within the limits of Redtail Ridge to treat for pollutant removal in the basins which cannot otherwise drain to the proposed water quality and detention ponds.

Please contact me if you have any questions or require additional information at tsayler@hkseng.com or 303-623-6300.

Timothy Sayler, P.E.

Project Manager

Harris Kocher Smith



Analysis of Barracuda MAX Removal Efficiencies

Project Name: Redtail Ridge – Filing 1

Unit: Unit C-4

Location: Louisville, CO

Project Information:

WQ Flow rate: 1.13 cfs

100–Year Bypass Flow: 7.26 cfs

Barracuda MAX S4

Treatment Capacity: 1.52 cfs

Peak Bypass Capacity: 10.5 cfs

Treatment System Information:

The below table demonstrates the Barracuda MAX system achieves an annualized weighted removal efficiency of 80.1% for incoming flows below, at, and above the listed treatment capacity of the specified system. These removal efficiencies were calculated based on data collected by Boggs Environmental Consultants, Inc during an independent third-party review of a Barracuda MAX water quality system. The testing performed follows the procedure outlined in the NJCAT verification program.

Fraction of MTR	Flow Rate (cfs)	Removal Efficiency	NJCAT Weighting Factor
25%	0.38	99.6%	0.25
50%	0.76	87.0%	0.30
75%	1.14	74.4%	0.20
100%	1.52	61.8%	0.15
125%	1.90	49.2%	0.10
Average Removal Efficiency		80.1%	

The 101 mg/L TSS incoming concentration is the “Median Event Mean Concentration for Urban Land Uses” provided by the Nationwide Urban Runoff Program (NURP).

Incoming EMC (mg/L)	WQ Flow Rate (cfs)	Removal Efficiency (%)	Discharge EMC (mg/L)
101	1.13	74.4%	25.9

As shown above, the proposed Barracuda MAX S3 system for the Redtail Ridge Filing No.1 Unit: C-4 has an expected reduction of Effluent Mean Concentration to less than 30mg/l, thus meeting the Colorado MS4 Performance Standard.

Our reason is water.™



Analysis of Barracuda MAX Removal Efficiencies

Project Name: Redtail Ridge – Lift Station

Unit: Lift Station

Location: Louisville, CO

Project Information:

WQ Flow rate: 0.32 cfs

100-Year Bypass Flow: 2.42 cfs

Barracuda MAX S3

Treatment Capacity: 0.85 cfs

Peak Bypass Capacity: 2.50 cfs

Treatment System Information:

The below table demonstrates the Barracuda MAX system achieves an annualized weighted removal efficiency of 80.1% for incoming flows below, at, and above the listed treatment capacity of the specified system. These removal efficiencies were calculated based on data collected by Boggs Environmental Consultants, Inc during an independent third-party review of a Barracuda MAX water quality system. The testing performed follows the procedure outlined in the NJCAT verification program.

Fraction of MTR	Flow Rate (cfs)	Removal Efficiency	NJCAT Weighting Factor
25%	0.38	99.6%	0.25
50%	0.76	87.0%	0.30
75%	1.14	74.4%	0.20
100%	1.52	61.8%	0.15
125%	1.90	49.2%	0.10
Average Removal Efficiency		80.1%	

The 101 mg/L TSS incoming concentration is the “Median Event Mean Concentration for Urban Land Uses” provided by the Nationwide Urban Runoff Program (NURP).

Incoming EMC (mg/L)	WQ Flow Rate (cfs)	Removal Efficiency (%)	Discharge EMC (mg/L)
101	0.32	99.6	0.4

As shown above, the proposed Barracuda MAX S3 system for the Redtail Ridge Lift Station Unit: Lift Station has an expected reduction of Effluent Mean Concentration to less than 30mg/l, thus meeting the Colorado MS4 Performance Standard.

Our reason is water.™

DESCRIPTION

SITUATED IN THE NORTHEAST 1/4 OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

A PARCEL OF LAND BEING A PORTION OF LOT 1, BLOCK 3, REDTAIL RIDGE FILING NO. 1 RECORDED AT RECEPTION NO. 04071256 OF THE RECORDS OF THE BOULDER COUNTY CLERK AND RECORDER, SITUATED IN THE NORTHEAST QUARTER OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 29;

THENCE SOUTH 08°19'35" WEST, A DISTANCE OF 1,001.60 FEET TO A POINT ON THE EAST LINE OF SAID LOT 1 AND **THE POINT OF BEGINNING**;

THENCE SOUTH 00°00'35" WEST ALONG SAID EAST LINE, A DISTANCE OF 15.30 FEET TO A POINT OF NON-TANGENT CURVATURE;

THENCE ALONG THE ARC OF SAID CURVE TO THE LEFT AN ARC LENGTH OF 44.35 FEET, SAID CURVE HAVING A RADIUS OF 54.50 FEET, A CENTRAL ANGLE OF 46°37'14", AND A CHORD WHICH BEARS SOUTH 79°38'35" WEST A CHORD DISTANCE OF 43.13 FEET;

THENCE SOUTH 56°19'58" WEST, A DISTANCE OF 2.56 FEET TO THE EAST LINE OF THAT ACCESS EASEMENT GRANTED BY SAID REDTAIL RIDGE FILING NO. 1 AND A POINT OF NON-TANGENT CURVATURE;

THENCE ALONG SAID EAST LINE AND ALONG THE ARC OF SAID CURVE TO THE LEFT AN ARC LENGTH OF 15.40 FEET, SAID CURVE HAVING A RADIUS OF 30.00 FEET, A CENTRAL ANGLE OF 29°24'16", AND A CHORD WHICH BEARS NORTH 43°35'22" WEST A CHORD DISTANCE OF 15.23 FEET;

THENCE NORTH 56°19'58" EAST, A DISTANCE OF 5.19 FEET TO A POINT OF CURVATURE;

THENCE ALONG THE ARC OF SAID CURVE TO THE RIGHT AN ARC LENGTH OF 53.12 FEET, SAID CURVE HAVING A RADIUS OF 69.50 FEET, A CENTRAL ANGLE OF 43°47'36", AND A CHORD WHICH BEARS NORTH 78°13'46" EAST A CHORD DISTANCE OF 51.84 FEET TO THE **POINT OF BEGINNING**.

SAID PARCEL CONTAINS 779 SQUARE FEET OR 0.02 ACRES, MORE OR LESS.

BASIS OF BEARINGS: BEARINGS ARE BASED ON THE NORTH LINE OF THE NORTHEAST QUARTER OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE SIXTH PRINCIPAL MERIDIAN, ASSUMED TO BEAR NORTH 89°42'42" WEST, BEING MONUMENTED AT THE NORTH QUARTER CORNER OF SAID SECTION BY A #6 REBAR WITH A 3.25" BRASS CAP STAMPED "1998 PLS 16401" AND MONUMENTED AT THE NORTHEAST CORNER OF SAID SECTION BY A #6 REBAR WITH A 3.25" ALUMINUM CAP STAMPED "MERRICK & CO 2009 PLS 33200".

PREPARED BY: AARON MURPHY
PLS 38162
ON BEHALF OF: HARRIS KOCHER SMITH
1120 LINCOLN STREET, SUITE 1000
DENVER, CO 80203
303.623.6300



Plotted: WED 07/30/25 3:24:12P By: Aaron Murphy Filepath: p:\2019\190108\survey\esmt_acces_lot 1 block 3.dwg Layout: desc

ILLUSTRATION

SITUATED IN THE NORTHEAST 1/4 OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69 WEST
OF THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

1/4 COR. SEC. 20/29

#6 REBAR W/ 3.25" BRASS CAP
"1998 PLS 16401"

POINT OF COMMENCEMENT

NE COR. SEC. 29

3.25" ALUM. CAP ON #6 REBAR
"MERRICK & CO 2009 PLS 33200"

BASIS OF BEARINGS

N LINE NE 1/4 SEC. 29 N89°42'42"W 2659.28'



ROCKCRESS DR
(PUBLIC R.O.W.)



LOT 1, BLOCK 3*

L=53.12'
R=69.50'
Δ=43°47'36"
ChB=N78°13'46"E
ChL=51.84'

PARCEL CONTAINS
779 SQ. FT.
OR 0.02 AC.±

24' CITY OF LOUISVILLE
ACCESS ESMT.*

N56°19'58"E 5.19'

L=15.40'
R=30.00'
Δ=29°24'16"
ChB=N43°35'22"W
ChL=15.23'

L=44.35'
R=54.50'
Δ=46°37'14"
ChB=S79°38'35"W
ChL=43.13'

S56°19'58"W 2.56'

POINT OF BEGINNING

S00°00'35"W 15.30'

TRACT K*



SCALE: 1" = 20'

* = REDTAIL RIDGE FILING NO. 1 REC. NO. 04071256

NOTE:

THIS EXHIBIT DOES NOT REPRESENT A MONUMENTED LAND SURVEY.
IT IS INTENDED TO DEPICT ONLY THE ATTACHED DESCRIPTION.

ITEM: PUD-000557-2025 – Louisville Mill Site Redevelopment PUD
1st Amendment and SRU-000558-2025 – Louisville Mill Site
Redevelopment SRU to Allow an Outdoor Eating and
Drinking Establishment and Mobile Food Court

STAFF: Rob Zuccaro, AICP, Community Development Director

REQUEST: Approval of Resolution 18, Series 2025 Recommending to
the City Council approval of the Louisville Mill Site
Redevelopment PUD, 1st Amendment and an SRU for an
Outdoor Eating and Drinking Establishment and Mobile Food
Court

VICINITY MAP:



SUMMARY:

The applicants, Louisville Mill Site LLC, 544CR LLC, and RCC LLC, request approval of an amendment to the Louisville Mill Site Redevelopment Planned Unit Development (PUD) for redevelopment and renovation of the historic Louisville Grain Elevator building. The proposal includes use of the property as an Eating and Drinking Establishment and a Special Review Use (SRU) to allow an Outdoor Eating and Drinking Establishment and a Mobile Food Court. The majority of the development would take place on Lot 2 and Outlot A of the Louisville Mill Site Subdivision, with limited development for parking, drive aisles, and drainage infrastructure occurring on

Lot 1 and Lot 3 and in the BNSF right of way. See Attachment No. 2 for application materials and supporting documentation.

BACKGROUND:

The City purchased the Louisville Grain Elevator property in 2012 for \$950,000 using Historic Preservation Funds (HPF) in order to avoid the demolition of the historic building. The Grain Elevator represents a unique part of Louisville's agricultural history, is among few remaining historic grain elevators, and has been considered a high value property for local historic preservation. The City's acquisition included the Grain Elevator property and the adjoining commercial property at 544 Front Street (previously a NAPA auto parts store and currently houses E-Bike of Colorado).

The City then published a request for proposals (RFP) for a public-private partnership to redevelop the properties, which included the restoration and activation of the Grain Elevator property for commercial use. The City initially entered into an agreement with a redevelopment company (Olde Town Group) for restoration of the Grain Elevator property and approved up to \$2.1M in HPF grants to assist with development costs.

Issues arose around property boundaries and a building encroachment onto the adjoining property to the south (500 Front Street). Due to a lack of resolution around these issues, the project with Olde Town Group was dropped, and instead the City entered into an agreement with a different entity, Louisville Mill Site, LLC. This new development partnership included the owner of 500 Front Street and facilitated resolution of the outstanding encroachment and property boundary issues.

The agreement with Louisville Mill Site, LLC included selling the property for a discounted price of \$200,000, a grant from the HPF for \$500,000 for initial stabilization work on the Grain Elevator, waiver of public land dedication fees or requirements, and rebates on application fees associated with the redevelopment of the property. The initial stabilization work was completed in 2016 and the property transferred to Louisville Mill Site, LLC.

In 2015, the City approved the following applications related to the Grain Elevator property:

- Designation of the Grain Elevator building as a local landmark, establishment of a conservation easement for the building, and approval of a historic preservation "Alternation Certificate" for the restoration work on the building and to allow a small building addition on the east side of the Grain Elevator.
- The Louisville Mill Site Subdivision, establishing three lots and an outlot in front of the Grain Elevator (see Attachment No. 3). Lot 1 encompassed the existing commercial building on the south side of the development, Lot 2 encompassed the Grain Elevator, and Lot 3 encompassed the existing commercial building on the north side of the development. Outlot A is located in front of the Grain Elevator. Outlot A and portions of Lots 2 and 3 include a conservation easement (Note No. 8 on plat) that provides "No Build Areas" limiting development in order to preserve public view corridors to the Grain Elevator building.

- The Louisville Mill Site Redevelopment PUD/SRU, which approved the demolition of the NAPA building (Lot 3) to be replaced by a new 19,000 sq. ft. three-story commercial building, a three-story addition to the existing commercial building on Lot 3, a small building addition on the east side the Grain Elevator (Lot 2), and an outdoor gathering area on Outlot A with an alternative plan for development as a parking lot (see Attachment No. 4). The development plans also included use of a leased area from BNSF for additional parking in the BNSF right of way on the east side of the development. The SRU authorized an “outdoor activity area” on Outlot A and Lot 2 to include food and beverage service. The PUD and SRU approvals have since expired.

Figure 1: Current Louisville Mill Site Subdivision with No Build Area Highlighted

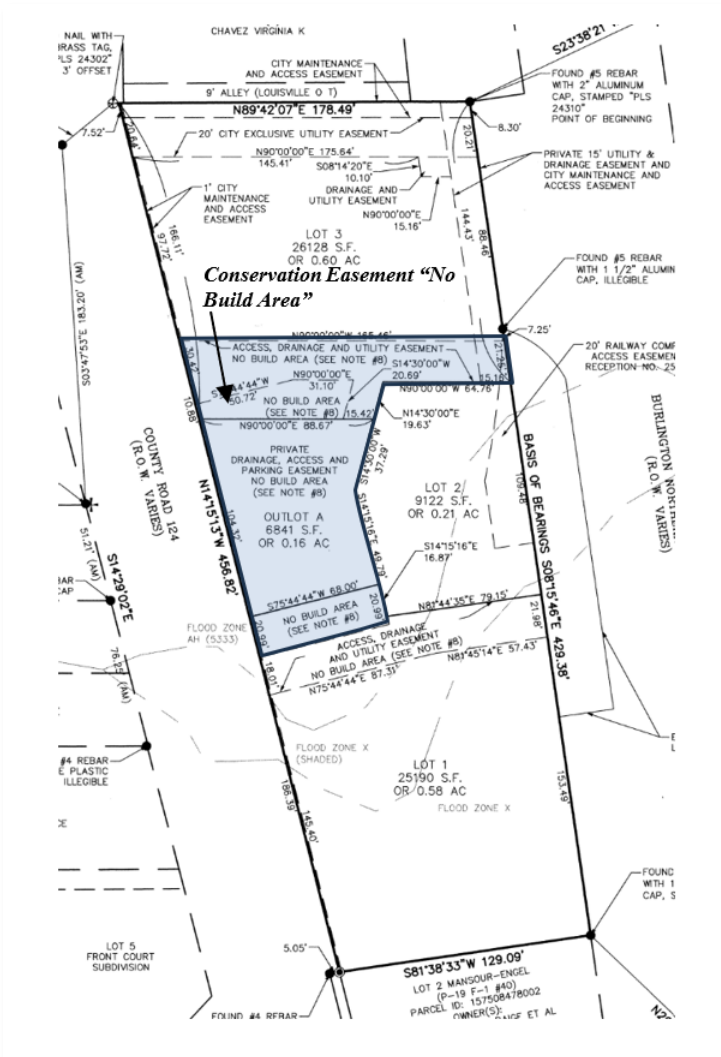


Figure 2: Current Louisville Mill Site Redevelopment PUD Site Plan

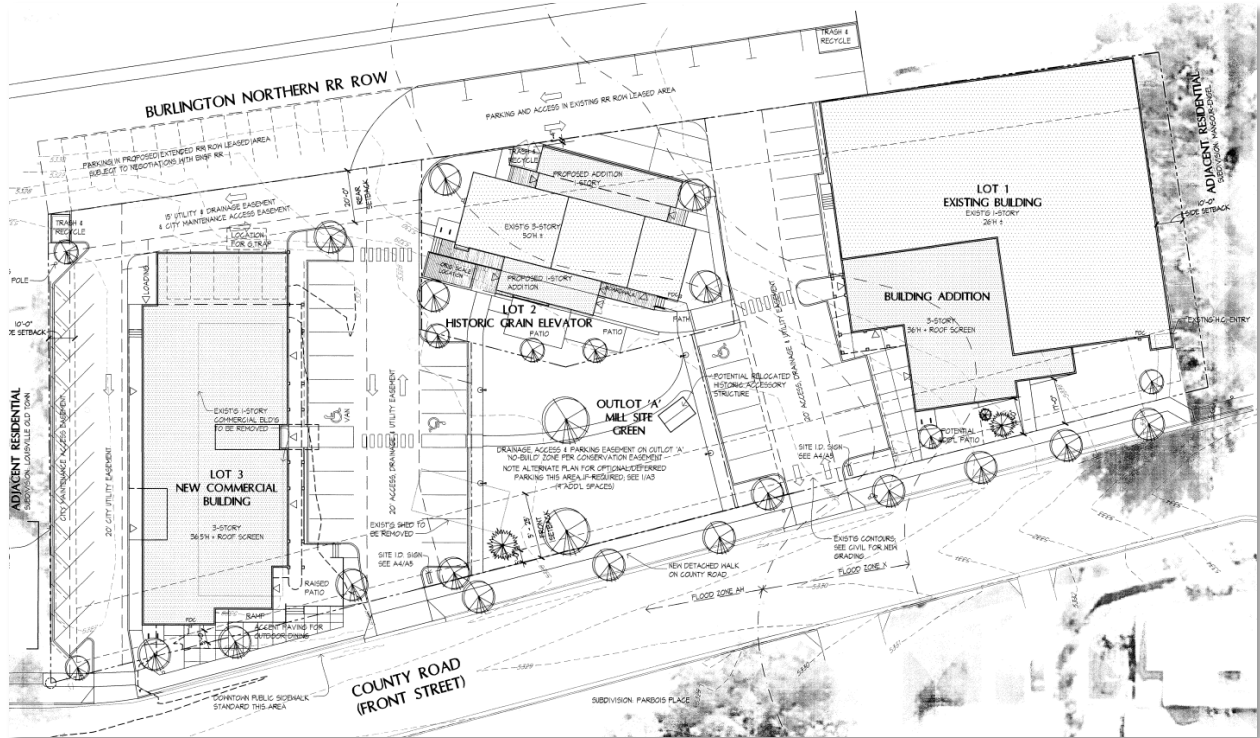
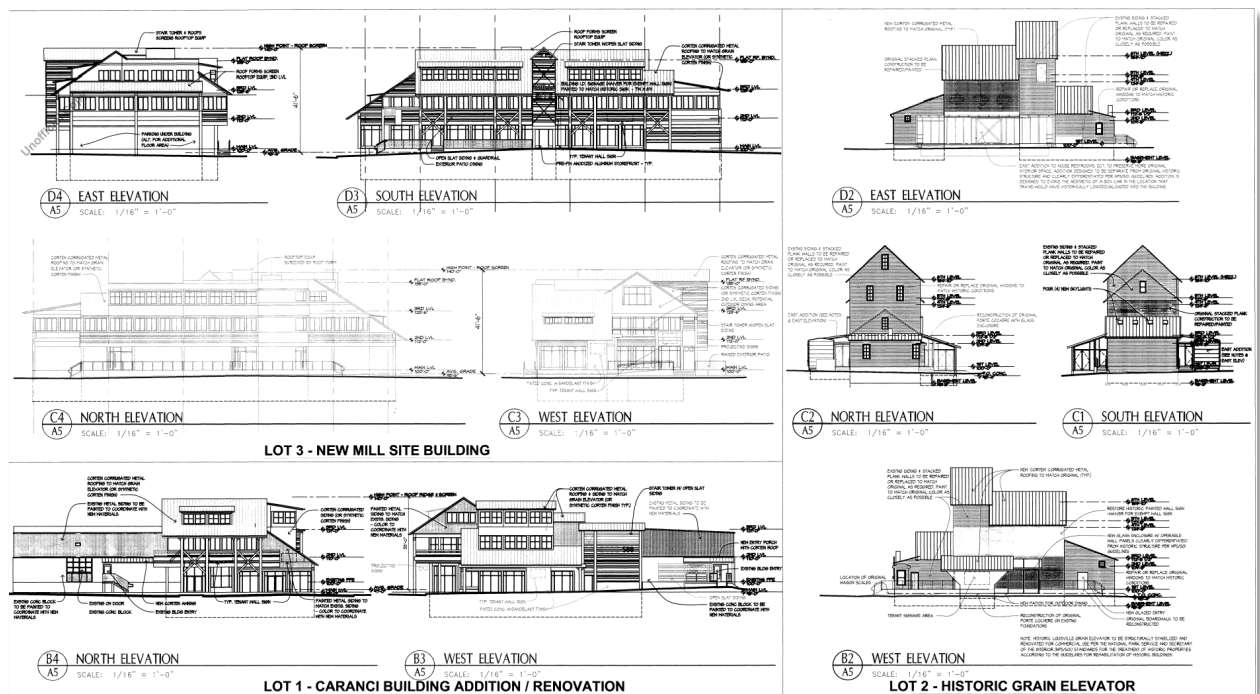


Figure 3: Current Louisville Mill Site Redevelopment PUD Building



To date, the City and the City's Urban Renewal Authority have provided \$1,470,439 in assistance for the redevelopment of the property. The applicants currently have an additional HPF grant request for \$1,476,557 that is under review and the City is anticipating additional urban renewal grant funding and tax increment financing requests.

Table 1: Prior City Financial Contributions

Sale of Property*	\$750,000
HPF Stabilization Grant	\$500,000
Urban Renewal Public Streetscape Improvements**	\$163,526
Public Land Dedication Waiver	\$48,927
Fee Waivers	\$7,986
TOTAL	\$1,470,439

* \$950,000 acquisition cost minus \$200,000 sale price

** Required Infrastructure by Subdivision Improvement Agreement

PROPOSAL:

The current proposal focuses on the development of Lot 2 and Outlot A to complete restoration of the Grain Elevator building and leasing the space to The Grain Yard, LLC, which intends to occupy the space as a bar, gathering space, and Mobile Food Court. The plans include restoring the porte cochere and boardwalk on the front side of the building, including a historic wagon scale, and a small "boxcar" building addition on the rear of the Grain Elevator. The outdoor gathering area would be fenced and include, food truck pads, outdoor seating, a relocated historic accessory structure used as a tap house, and a small stage in the southwest corner of the lot.

The proposal includes improved drive aisles and parking on the north and south sides of the Grain Elevator property in parts of Lot 1 and Lot 3, and parking in the BNSF right of way on the east side of the property. There would be 24 parking spaces developed as part of the site improvements. The applicants have submitted a shared parking agreement and a Common Area Use, Maintenance, and Management Agreement covering access, drainage and utilities covering all properties within the subdivision and the BNSF lease area.

Drainage improvements would be installed for this first phase of development that could be expanded with additional development on Lot 1 and Lot 3.

Figure 4: Birdseye Rendering of Proposal



BURLINGTON NORTHERN RR ROW

LOT 2 HISTORIC GRAIN ELEVATOR

LOT 3

LOT 1

OUTLOT 'A' THE GRAIN YARD

LANDSCAPE LEGEND

NOTES

SCALE

1" = 10'

2 U-RACK DETAIL (BICYCLE PK'G)

1" = 10'

SCHEMATIC LANDSCAPE PLAN & PARKING PLAN

[illegible]

The SRU proposal includes requests for approval of an Outdoor Eating and Drinking Establishment and a Mobile Food Court in part of Lot 2 and in Outlot A. There are three food truck pads proposed on the north side of the outdoor activity area. The lighting plan includes outdoor string lighting, building mounted lighting for the boardwalk and tap house building, stage lighting, and pedestrian level pole-mounted lighting along the fencing. The plans note the following restrictions:

- Use of the outdoor areas would be limited to 8am and midnight seven days a week, and outdoor amplified music limited to 9pm Sunday through Thursday and 10pm on Friday and Saturday.
- Outdoor decorative lights and stage lighting would be turned off after business hours.
- Temporary structures, such as tents, would be allowed but limited to 60 days total in any 6-month period. Temporary shade features and table umbrellas would be exempt.
- Each of the Food Truck vendor pads would be equipped with electrical connections so that the use of electrical generators are not needed.

ANALYSIS:

The project is located within the Commercial Core Transition Area of Downtown and the property is zoned Commercial Business (CB). Staff analysis includes review of the following standards applicable to the development:

- [Design Handbook for Downtown Louisville](#)
- [Parking Standards Designated for Downtown Louisville \(LMC Sec. 17.20.025\)](#)
- Waiver Requests to CB Zoning Standards
- Compliance with the No-Build Area and view corridor conservation easement restrictions established through the Louisville Mill Site Subdivision
- [Special Review Use Criteria \(LMC Chapter 17.40\)](#) and [Mobile Food Court Criteria \(LMC Sec. 17.16.310.D\)](#)
- [Planned Unit Development Criteria \(LMC Sec. 17.28.120\)](#) (Staff analysis provided in Appendix)

Design Handbook for Downtown Louisville

Staff have highlighted the following policies that are applicable to the project, along with staff's analysis in italics. Staff finds that the project is consistent with applicable standards and guidelines outlined in the Design Handbook. Please reference pg. 4 of the Design Handbook for further discussion on how the policies are structured as either mandatory or only encouraged. Policies are broken out by categories of General Standards and Guidelines (“G”) applicable to all areas of Downtown, Transition Area Standards and Guidelines (“T”), and Historic Standards and Guidelines (“H”). Not all policies need to be met for approval or support of a project, but all projects should seek to meet all applicable policies when appropriate.

G1. All projects should respect the traditional context of downtown.

- 1) In all cases, consideration should be given to the broader context of the block and the town at large.
- 2) If historic resources exist on the property, then the Design Standards and Guidelines for Historic Buildings also shall apply.

The Grain Elevator is not immediately adjacent to other historic buildings and is unique in its context and location near the railroad tracks, where it was used for loading agricultural products into rail cars for transport. The surrounding development includes new and historic residences and commercial buildings.

G10. Minimize the visual impacts of site and architectural lighting.

- 1) Prevent glare onto adjacent properties by using shielded and focused light sources that direct light onto the ground.
- 2) Un-shielded, high intensity light sources and those which direct light upward will not be permitted.
- 3) Shield lighting associated with service areas, parking lots and parking structures.
- 4) Avoid placing lights in highly visible locations, such as on the upper walls of buildings.

All lighting is full cut off to minimize glare except the string lights used for the outdoor gathering area and stage lighting. The proposal includes limiting the times when these lights could be turned on to business hours. The plans also include a photometric analysis demonstrating minimal light spill outside of the project boundary.

G11. Provide site lighting that encourages pedestrian activity at night.

- 1) Site lighting should be at a pedestrian scale and help define different functional areas of the property.

The development includes lighting in the outdoor areas so that the areas are well lit but not excessively lit according to the photometric plans submitted. The lighting is meant to support the outdoor activity areas and are mounted on poles around the fenced area and include decorative string lights. There is additional lighting for the tap house accessory building, the stage and the boardwalk.

G13. Where appropriate, design a parking area to be accessed from an alley rather than the street.

- 1) In a residential context, the use of a detached garage, located along the alley, is especially encouraged.

The project does include alley access to parking, but primary access will be from Front Street.

G14. Screen a parking lot from view from the street.

- 1) Provide buffers between the edge of a parking lot and sidewalk.
- 2) Use planted areas, decorative paving, fences, hedges and decorative walls.

- 3) The landscape should be at least 5 feet in width.

The new parking areas on the north and side sides of the Grain Elevator property and The plans include minimum 5' landscape buffers between the sidewalk and the parking area.

G15. Locate parking such that it will be subordinate to other site features.

- 1) An on-site parking area should be located inside or behind a building, where its visual impacts will be minimized.
- 2) Minimize the surface area of paving and consider using less impervious material. Options to consider are modular pavers in the Core Area and "grasscrete" in the Transition Areas.

Due to the existing location of the Grain Elevator building there is limited opportunity to provide parking behind the building. The plans included some parking behind the building in an area leased from BNSF. The new parking areas on the north and side sides of the Grain Elevator property and Outlot A are compact gravel rather than pavement, providing less impervious materials.

G17. Minimize the visual impacts of trash storage areas.

- 1) Trash enclosures should be constructed with similar materials as those of the primary structure.
- 2) Locate a service area along the rear of a site, accessed by an alley, when feasible.
- 3) Trash areas, including large waste containers (dumpsters) should also be screened from view of major pedestrian routes, using a fence or hedge. For a larger storage facility, consider using a shed to enclose it.
- 4) Combine service areas with other properties, when feasible.

A fenced and covered trash enclosure is located on the east side of the building south of the proposed "box car" building addition and includes metal doors and fencing that will be architecturally incorporated into the building.

G20. New construction should appear similar in mass and scale to structures found traditionally in the area.

The Grain Elevator building is unique in its mass and scale for the area and will be maintained. Restoration of the porte cochere and boardwalk on the front of the building will closely resemble the historic design of the structure. The "boxcar" addition on the east side of the building will be largely screened from view from Front Street.

T1. Maintain the general alignment of building fronts.

- 1) Front yard setbacks range from 5 to 25 feet. This range of setbacks should be maintained in new construction.
- 2) Where similar front setbacks are characteristic, maintain the alignment of building facades.

- 3) New construction should be set back to match the general alignment of buildings on the street and to maintain the traditional front yard.
- 4) Landscaping and fences that help define the yard's front edge are encouraged.

The Grain Elevator building is situated in its traditional location at the rear of the development adjacent to the railroad tracks. The proposed outdoor activity area includes a historic one-story outbuilding to be relocated to the property that is located near Front Street, complimenting the residential context of the properties on the west side of Front Street. The proposed stage, fencing, and outdoor gathering areas will help define the front edge of the development.

H1. Respect the original design character of the building.

- 1) Analyze the building to determine which elements are essential to its character.
- 2) Don't try to make it appear older (or younger) in style than it really is. Instead, the genuine heritage of downtown *should be expressed*.

The existing Grain Elevator would be rehabilitated and the plans include restoring the front porte cochere and boardwalk back to the historic form.

H3. Preserve an historic structure in its original location on the site when feasible.

- 1) This includes orientation, setbacks, building height and the relationship of the first floor to finish grade.
- 2) Existing historic landscape features, such as fences, sidewalks and mature vegetation, should be preserved, and should be protected during construction.

The Grain Elevator would be maintained in its historic location and maintain its historic building height.

H4. Avoid removing or altering any historic material or significant architectural features.

- 1) Original materials and details that contribute to the historic significance of the structure are qualities that should be preserved whenever feasible.
- 2) Rehabilitation work should not destroy the distinguishing character of the property or its environment.
- 3) Retain and preserve original wall and siding material.

The restoration and rehabilitation plans include preserving the majority of original materials when feasible.

H5. Avoid adding materials, elements or details which were not part of the original building.

- 1) For example, details such as decorative millwork or shingles should not be added to buildings if they were not an original feature of that structure.

The restoration and rehabilitation plans include preserving the majority of original materials when feasible and restoration work on the front porte cochere and boardwalk

similar to the original structure.

H6. Maintain existing significant stylistic elements.

- 1) The best preservation procedure is to maintain historic features from the outset so that intervention is not required. Employ treatments such as rust removal, caulking, limited paint removal and reapplication of paint.
- 2) Protect historic material with maintenance treatments such as rust removal, caulking and re-painting.
- 3) Repair only those features that are deteriorated. Finally, replace only those features that are beyond repair.
- 4) Patch, piece-in, splice, consolidate or otherwise upgrade the existing material, using recognized preservation methods whenever possible.

The restoration and rehabilitation plans include preserving the majority of original materials when feasible and restoration work on the front porte cochere and boardwalk similar to the original structure.

H7. Replace only missing portions of original elements when necessary.

- 1) Don't throw out an entire window frame, for example, if only the sill is rotted.
- 2) Match the original material when patching with new material.

The plans included restoring the front porte cochere and boardwalk back to the historic form using appropriate materials to match historic architecture and form.

H10. Replace missing original features in kind when feasible.

- 1) Use the same kind of material as the original when feasible. A substitute material may be acceptable if the form and design of the substitute itself conveys the visual appearance of the original material.
- 2) Replacement of missing architectural elements should be based on accurate duplications of original features. In some cases, an entire detail must be reconstructed. In the event replacement is necessary, the new material should match the original in design, color, texture and other visual qualities.
- 3) Where reconstruction of an element is impossible because of a lack of historical evidence, then a new design that relates to the building in general size, scale and material may be considered.

The plans included restoring the front porte cochere and boardwalk back to the historic form using appropriate materials to match historic architecture and form.

H12. Preserve original siding when feasible.

- 1) Avoid removing siding that is in good condition or that can be repaired in place.
- 2) If portions of wood siding must be replaced, be sure to match the style and lap dimensions of the original.
- 3) Maintain protective coatings of paint. If the building was painted historically, it should remain painted, including all trim.

The restoration and rehabilitation plans include preserving the majority of original materials when feasible.

H16. Design an addition to be as inconspicuous as possible.

- 1) An addition should be visually subordinate to the main building.
- 2) Set an addition back from the primary facade in order to allow the original proportions, form and overall character of the main building to remain prominent.
- 3) Consider setting an addition back from the sides of buildings, as well.
- 4) Additions to buildings in visible locations, such as corners, require greater sensitivity.

The “box car” addition is located behind the main façade of the Grain Elevator and would be visually subordinate to the main building.

Parking Standards Designated for Downtown Louisville

The zoning code establishes off-street parking standards specific to Downtown Louisville recognizing the unique urban design of the Downtown area. This includes a focus on Downtown Louisville having a traditional street grid network with alleys, and public parking and shared street parking that fosters pedestrian friendly development with a focus on an active streetscape. This differs significantly from suburban-type development patterns that have a higher demand for vehicular parking and incorporate all parking within the development parcel.

The Downtown Louisville parking standards also promote new development and redevelopment by exempting the first 999 sq. ft. of new floor area from meeting minimum parking standards and exempts areas such as uninhabitable areas below grade, restrooms, food prep and service areas, and circulation areas such as hallways and stairwells. Any additional building area beyond the first 999 sq. ft. must provide parking at a ratio of 1 new space for each 500 sq. ft. of additional new development, rounded to the nearest 500 sq. ft.

The proposed development includes 2,937 sq. ft. of new development area with 2,915 sq. ft. of that area falling under the exemptions. Therefore, under the parking requirements for Downtown Louisville, no additional off-street parking is required for the project. However, the proposal will have a significant outdoor activity area that will add to the parking demand, and additional parking can be required through the SRU review process, which is discussed further below. The project provides 24 additional off-street parking spaces and has a shared parking agreement with the two adjoining commercial properties. Additionally, on-street parking is available adjacent to the property and the public parking lots located south of Lucky Pie and Sweet Cow are near the site. The proposal also includes 8 bicycle parking racks on the north side of the building. Staff finds that the proposed parking plan provides sufficient parking to meet the standards for Downtown Louisville and adequately addresses additional parking demand.

Waiver Criteria

The applicant is requesting the following waivers from the CB zoning standards:

- 8' front setback for the accessory building in the outdoor gathering area where a 30' front setback is required.
- 9'-4" side setback on the south side for the existing Grain Elevator building where a 10' side setback is required.
- 1'-4" rear setback for the proposed "box car" addition where 20' is required.
- 44% lot coverage on Lot 2 where a 40% maximum is required.

LMC Sec. 17.28.110 states that waivers may be granted through a PUD approval process "if the spirit and intent of the development plan criteria contained in section 17.28.120 are met and the city council finds that the development plan contains areas allocated for usable open space in common park area in excess of public use dedication requirements or that the modification or waiver is warranted by the design and amenities incorporated in the development plan, and the needs of residents for usable or functional open space and buffer areas can be met."

Staff finds that the waivers are warranted by the design and amenities incorporated in the development plan and that usable and functional open spaces are provided in the outdoor activity area. The setback waivers associated with the Grain Elevator building accommodate the preservation of the historic structure and facilitate an appropriate design of the "box car" addition behind and subordinate to the historic structure. The front yard setback for the accessory building in Outlot A is appropriate considering the design of the Mobile Food Court and outdoor activity area layout. The lot coverage is well below the 40% standard when considering the Lot 2 and Outlot A areas combined.

No-Build Area and View Corridor Conservation Easement

The No-Build Area and conservation easement established through the Louisville Mill Site Subdivision is intended to preserve view corridors to the Grain Elevator for historic preservation purposes. The No-Build Area generally prohibits buildings and other improvements within the area. However, the conservation easement allows consideration of some development in the No-Build Area if authorized through a resolution approved by City Council. Considering the stated intent of the conservation easement, staff finds that limited development within the No-Build Area could be appropriate if such development does not materially impact the public view corridors to the Grain Elevator. The proposed use of the No-Build Area includes parking areas, the Mobile Food Court and associated development such as the accessory building, fencing, a stage, and decorative lighting. These improvements will help facilitate redevelopment and activation of the property and will have a minimal impact on the intended view corridors.

Figure 7: Conservation Easement Note

8. NO-BUILD AREA: THE NO-BUILD AREAS NOTED ON THIS PLAT ARE SUBJECT TO THE FOLLOWING RESTRICTION: NO BUILDINGS OR OTHER IMPROVEMENTS SHALL BE CONSTRUCTED WITHIN THE NO-BUILD AREA WITHOUT THE EXPRESS PRIOR WRITTEN CONSENT OF THE CITY OF LOUISVILLE, AS EVIDENCED BY WRITTEN RESOLUTION OF THE CITY OF LOUISVILLE CITY COUNCIL. THE OWNERS HEREBY ESTABLISH THAT THE FOREGOING RESTRICTION SHALL CONSTITUTE A COVENANT RUNNING WITH OUTLOT A AND THOSE PORTIONS OF LOTS 1 AND 3 WITHIN THE NO-BUILD AREA, AND THAT SUCH RESTRICTION SHALL ENCUMBER THE NO-BUILD AREA AND BE BINDING UPON ALL OWNERS OF ANY OWNERSHIP OR OTHER INTEREST IN THE NO-BUILD AREA. THE OWNERS HEREBY FURTHER DEDICATE TO THE CITY OF LOUISVILLE A PERPETUAL CONSERVATION EASEMENT IN GROSS TO ENFORCE THE FOREGOING PROHIBITION ON THE CONSTRUCTION OF BUILDINGS OR OTHER IMPROVEMENTS WITHIN THE NO-BUILD AREA, IT BEING THE INTENT THAT SUCH PROHIBITION IS FOR THE PRESERVATION OF VIEW CORRIDORS FOR HISTORIC PRESERVATION PURPOSES. THE RESTRICTION AND EASEMENT HEREIN ESTABLISHED SHALL NOT BE SUBJECT TO ABANDONMENT OR MERGER AND MAY ONLY BE MODIFIED, TERMINATED, EXTINGUISHED OR RELEASED BY INSTRUMENT APPROVED BY RESOLUTION OF THE LOUISVILLE CITY COUNCIL AND EXECUTED BY THE MAYOR AND CITY CLERK. IMPROVEMENTS AUTHORIZED BY THE LOUISVILLE MILL SITE PLANNED UNIT DEVELOPMENT PLAN, AS APPROVED BY CITY COUNCIL RESOLUTION, SHALL BE PERMITTED IMPROVEMENTS IN THE NO-BUILD AREA.

Figure 8: Street Level View of Grain Elevator and Mobile Food Court

**Grain Yard - West
View From West Side of Street**



Special Review Use

LMC Sec. 17.12.030 allows Outdoor Eating and Drinking Establishments and Mobile Food Courts in the CB zone district if approved through an SRU. SRUs shall be reviewed against the criteria listed in LMC Sec. 17.40.100 to determine whether the proposed use is compatible with the surrounding area and if any conditions on the use may be appropriate. LMC Sec. 17.16.310.D includes additional criteria for Mobile Food Courts. Staff's analysis of the SRU review criteria is provided below.

General SRU Criteria:

1. That the proposed use/development is consistent in all respects with the spirit and intent of the comprehensive plan and of this chapter, and that it would not be contrary to the general welfare and economic prosperity of the city or the immediate neighborhood.

The Comprehensive Plan (Plan) envisions “a healthy and vibrant Downtown” (Policy LU-4.2) with a “mix of uses that bring new revenue generation to the Downtown area” (Policy ED-5.3). The Comprehensive Plan classifies Downtown Louisville as Center type development and describes Center development by the following:

Centers are defined by their mixture of uses (retail, commercial, and residential), street interconnectivity, and integrated public spaces. A center’s physical design is that of a destination or gathering point for city-wide activities. Centers are connected to and oriented toward their adjacent land uses. Centers typically have the greatest retailing opportunities. Centers feature integrated public spaces with a recognized public space, or focal point.

*The Downtown Louisville Framework Plan includes a goal to “Maintain downtown as a vibrant, mixed-use activity center”. The use and activation of this previously vacant site will improve economic activity and vibrancy of downtown while also improving the streetscape and pedestrian scale development patterns. **Staff find the proposal meets this criterion.***

2. That such use/development will lend economic stability, compatible with the character of any surrounding established areas;

*The proposed uses will support continued economic activity and investment in the area. The building design is consistent with Design Handbook for Downtown Louisville policies, including creating an inviting pedestrian scale to Downtown. Surrounding development includes a mix of residential and commercial uses, which are all compatible with an outdoor dining use in the downtown area. **Staff find the proposal meets this criterion.***

3. That the use/development is adequate for internal efficiency of the proposal, considering the functions of residents, recreation, public access, safety and such factors including storm drainage facilities, sewage and water facilities, grades, dust control and such other factors directly related to public health and convenience;

*Public Works has reviewed the drainage plan and is coordinating the utility plans for the development and is in support of the proposal. The Fire District has also reviewed the plans and has no conflict with the proposal. **Staff finds the proposal meets this criterion.***

4. That external effects of the proposal are controlled, considering compatibility of land use; movement or congestion of traffic; services, including arrangement of signs and lighting devices as to prevent the occurrence of nuisances; landscaping and other similar features to prevent the littering or accumulation of

trash, together with other factors deemed to affect public health, welfare, safety and convenience;

*The development proposal includes parking exceeding the standards for Downtown Louisville, partly to accommodate parking demand for the outdoor activity areas. The site is fenced and landscaped, providing a buffer from the public way. The applicant also proposes limits on the allowed hours of use for the outdoor area, limits on hours when amplified music is allowed and a requirement to turn off the outdoor decorative lights after business hours. These restrictions are similar to other restrictions placed on Outdoor Eating and Drinking Establishments. **Staff find the proposal meets this criterion.***

5. That an adequate amount and proper location of pedestrian walks, malls and landscaped spaces to prevent pedestrian use of vehicular ways and parking spaces and to separate pedestrian walks, malls and public transportation loading places from general vehicular circulation facilities.

*The proposal includes 5-foot paved sidewalks connecting to Front Street proving adequate access to the site separated from the parking and drive aisles. The trash enclosure access and loading areas are available south of the development to provide adequate and separated loading areas from pedestrian ways. Adequate vehicular circulation is provided around the development separated from the pedestrian ways. **Staff find the proposal meets this criterion.***

Mobile Food Court Criteria:

Under the City's code for Mobile Retail Food Establishments, mobile food vehicles or vending carts are allowed to locate in temporary locations on private property or in public rights of way and require approval of any brick and mortar restaurant within 150 feet of the proposed location. The Mobile Food Court designation allows the permanent establishment of an area for food trucks and vending carts to operate through the public hearing SRU process, even if such area is within 150 feet of a brick and mortar restaurant. Mobile Food Courts must have designated vendor pads equipped with electrical connections (generators are prohibited) and minimum setbacks from residential areas matching any established minimum setbacks for parking areas applicable to the property. Hours of operation for mobile food vehicles or vending carts is limited to 7am to 9pm, but these hours may be reduced or expanded for a Mobile Food Court through the SRU process. Additionally, mobile food vehicles and vending carts are not allowed to operate amplified music. However, amplified music may be authorized through the SRU process for Mobile Food Courts.

LMC Sec. 17.16.310.D.5. requires that the applicant provide a site plan as part of the SRU application with the following information:

- a) *The location and orientation of each vendor pad;*
- b) *The location of all proposed dining areas and areas designated for gathering and activities;*

- c) *The location of any paving, trash enclosures, landscaping, planters, fencing, or any other site requirement by the international building code or Boulder County Public Health Department;*
- d) *The location of permanent electrical and other necessary utility connections;*
- e) *The circulation of all pedestrian, bicycle, and vehicle traffic;*
- f) *The location of any fixed or movable seating and tables;*
- g) *The location of permanent and ADA accessible restrooms;*
- h) *The location of vehicular and bicycle parking.*

Staff finds that the proposed operation of the Mobile Food Court is in compliance with the SRU standards and specific site plan standards for Mobile Food Courts. The minimum parking setback in the Transition area of Downtown is 5', and the vendor pads are setback beyond that minimum. The proposal includes expansion of hours of operation beyond the standard 9pm cutoff for mobile food vehicles and vending carts and would allow operation until midnight, with amplified music allowed until 9pm on Sundays through Thursdays and 10pm on Fridays and Saturdays. The Mobile Food Court is located adjacent to residential areas, and restrictions on hours of operation and ensuring decorative lights are turned off after business hours will help to limit potential impacts to those residential areas.

DEVELOPMENT CAP IN WESTERLY PORTION OF DOWNTOWN:

Section 17.12.060 of the LMC establishes a cap of 475,000 sq. ft. of floor area for the [Westerly Portion of Downtown](#), which this property is within the boundaries of. Current floor area totals 348,195 sq. ft. and would increase by 2,937 sq. ft. with this proposal for a total of 351,132 sq. ft. which is within the maximum floor area allowed.

PUBLIC COMMENTS:

See Attachment No. 5 for public comments received prior to publication of this report.

STAFF RECOMMENDATION:

Staff recommends approval of Resolution 18, Series 2025 recommending to the City Council approval of the Louisville Mill Site Redevelopment PUD, 1st Amendment and an SRU for an Outdoor Eating and Drinking Establishment and Mobile Food Court with the following conditions:

1. Prior to the City Council hearing, the applicant shall obtain an Alteration Certificate approval from the Louisville Historic Preservation Commission.
2. Prior to the City Council hearing, the applicant shall submit to Public Works civil engineering construction plans for review.
3. Prior the City Council hearing, the applicant shall revise the PUD plans and Drainage Report to address outstanding Public Works comments related to the drainage infrastructure.

ATTACHMENTS:

1. Resolution 18, Series 2025, Recommending to the City Council approval of the Louisville Mill Site Redevelopment PUD, 1st Amendment and an SRU for an Outdoor Eating and Drinking Establishment and Mobile Food Court

2. Application Materials
3. Louisville Mill Site Subdivision
4. Louisville Mill Site Redevelopment PUD/SRU
5. Public Comments

APPENDIX: PUD Criteria Analysis

Criteria 17.28.120 (A)	Finding	Narrative
1. An appropriate relationship to the surrounding area.	Compliant	The design is appropriate for the area and permitted in the CB zone district. The site and building design are compatible with the Design Handbook for Downtown Louisville.
2. Circulation in terms of the internal street circulation system, designed for the type of traffic generated, safety, separation from living areas, convenience, access, and noise and exhaust control. Proper circulation in parking areas in terms of safety, convenience, separation and screening.	Compliant	The application provides for adequate and safe internal circulation. The City's engineering division and Fire District have reviewed the proposal and have no concerns.
3. Consideration and provision for low and moderate-income housing	Not Applicable	No housing is proposed.
4. Functional open space in terms of optimum preservation of natural features, including trees and drainage areas, recreation, views, density relief and convenience of function	Compliant	The project provides functional private open space and landscape buffers.
5. Variety in terms of housing types, densities, facilities and open space	Not Applicable	No housing is proposed.
6. Privacy in terms of the needs of individuals, families and neighbors	Compliant	The proposal provides limits on use of the outdoor areas to limit potential impacts to neighbors.
7. Pedestrian and bicycle traffic in terms of safety, separation, convenience, access points of destination and attractiveness	Compliant	The PUD provides pedestrian amenities, creates pedestrian scale development in Downtown and adds bicycle parking.
8. Building types in terms of appropriateness to density, site relationship and bulk	Compliant	The application is compatible with surrounding development, preserves a unique historic building in Downtown, and meets Design Handbook for Downtown Louisville policies for historic buildings.
9. Building design in terms of orientation, spacing, materials, color, texture, storage, signs and lighting	Compliant	The PUD complies with the architectural design and site planning requirements in the Design Handbook for Downtown Louisville.

Criteria 17.28.120 (A)	Finding	Narrative
10. Landscaping of total site in terms of purpose, such as screening, ornamental types used, and materials used, if any; and maintenance, suitability and effect on the neighborhood	Compliant	The PUD complies with landscape requirements in the Design Handbook for Downtown Louisville.
11. Compliance with all applicable development design standards and guidelines and all applicable regulations pertaining to matters of state interest, as specified in <u>chapter 17.32</u>	Compliant	The PUD complies with all applicable development design standards and guidelines.
12. None of the standards for annexation specified in <u>chapter 16.32</u> have been violated	Not applicable	Annexation is not proposed.
13. Services including utilities, fire and police protection, and other such services are available or can be made available to adequately serve the development specified in the final development plan	Compliant	The Public Works Department and Louisville Fire District reviewed the PUD and meets their requirements.

Criteria 17.28.120 (B)	Finding	Narrative
1. Development shall be in accordance with the adopted elements of the comprehensive development plan of the city, and in accordance with any adopted development design standards and guidelines.	Compliant	The PUD complies with the adopted elements of the comprehensive plan, and the adopted development design standards and guidelines.
2. No structures in a planned unit development shall encroach upon the floodplain. Existing bodies of water and existing stream courses shall not be channelized or altered in a planned unit development plan.	Compliant	The property is not located in a floodplain, nor are there any existing bodies of water in the area.
3. No occupied structure shall be located on ground showing severe subsidence potential without adequate design and study approved specifically by the city.	Compliant	There is no known subsidence on the property.

Criteria 17.28.120 (B)	Finding	Narrative
4. The proposal should utilize and preserve existing vegetation, land forms, waterways, and historical or archeological sites in the best manner possible. Steep slopes and important natural drainage systems shall not be disrupted. How the proposal meets this provision, including an inventory of how existing vegetation is included in the proposal, shall be set forth on the landscape plan submitted to the city.	Compliant	The PUD preserves and activates the open area in front of the Grain Elevator building, and creatively activates use of the historic property. There is no noteworthy existing vegetation or topography that should be preserved on the property.
5. Visual relief and variety of visual sitings shall be located within a development in the overall site plan. Such relief shall be accomplished by building placements, shortened or interrupted street vistas, visual access to open space and other methods of design.	Compliant	The PUD complies with site planning requirements in the Design Handbook for Downtown Louisville.
6. Open space within the project shall be located in such a manner as to facilitate pedestrian use and to create an area that is usable and accessible to residents of surrounding developments.	Compliant	The proposal includes private outdoor areas that will provide a new public amenity for Downtown.
7. Street design should minimize through traffic passing residential units. Suggested standards with respect to paving widths, housing setbacks and landscaping are set forth in public works standards of the city and applicable development design standards and guidelines. The system of streets, including parking lots, shall aid the order and aesthetic quality of the development.	Compliant	The PUD complies with requirements in the Design Handbook for Downtown Louisville, ensuring properly designed orientation to the adjacent street network.

Criteria 17.28.120 (B)	Finding	Narrative
8. There shall exist an internal pedestrian circulation system separate from the vehicular system such that allows access to adjacent parcels as well as to parks, open space or recreation facilities within the development. Pedestrian links to trail systems of the city shall be provided.	Compliant	The PUD complies with bicycle and pedestrian requirements in the Design Handbook for Downtown Louisville and municipal code, ensuring adequate pedestrian and bicycle access.
9. The project and development should attempt to incorporate features which reduce the demand for water usage.	Compliant	The PUD proposes appropriate use of water, with minimal landscaping and no turf included in the proposal.
10. Landscape plans shall attempt to reduce heating and cooling demands of buildings through the selection and placement of landscape materials, paving, vegetation, earth forms, walls, fences, or other materials.	Compliant	Street trees were previously installed along the road frontage.
11. Proposed developments shall be buffered from collector and arterial streets. Such buffering may be accomplished by earthen berms, landscaping, leafing patterns, and other materials. Entrance islands defining traffic patterns along with landscaping shall be incorporated into entrances to developments.	Not applicable	The PUD is adjacent to a local street; it is not located next to collector or arterial streets.
12. There shall be encouraged the siting of lot arrangement, building orientation and roof orientation in developments so as to obtain the maximum use of solar energy for heating.	Compliant	The main building is an existing building and historic in nature. No new substantial buildings are proposed.
13. The overall PUD shall provide a variety of housing types.	Not applicable	No housing is proposed.
14. Neighborhoods within a PUD shall provide a range of housing size.	Not applicable	No housing is proposed.

Criteria 17.28.120 (B)	Finding	Narrative
15. Architectural design of buildings shall be compatible in design with the contours of the site, compatible with surrounding designs and neighborhoods, shall promote harmonious transitions and scale in character in areas of different planned uses, and shall contribute to a mix of styles within the city.	Compliant	The plans do not have significant new buildings. The “box car” accessory building will be the closest to the adjoining neighborhood and is appropriately scaled in character.

**RESOLUTION NO. 18
SERIES 2025**

**A RESOLUTION RECOMMENDING APPROVAL OF A PLANNED UNIT
DEVELOPMENT AMENDMENT AND SPECIAL REVIEW USE TO ALLOW
CONSTRUCTION OF A 728 SF ADDITION TO AN EXISTING BUILDING TO
ESTABLISH OUTDOOR DINING AND OUTDOOR COMMERCIAL AMUSEMENT
USES WITH A BAR AND RESTAURANT LOCATED AT 947 PINE STREET.**

WHEREAS, there has been submitted to the Louisville Planning Commission an application for a final planned unit development amendment for redevelopment and preservation of the Grain Elevator property, with improvements planned on Lots 1, 2, and 3 and Outlot A of the Louisville Mill Site Subdivision;

WHEREAS, there has been submitted to the Louisville Planning Commission an application to approve a Special Review Use to and Outdoor Eating and Drinking Establishment and Mobile Food Court associated with the redevelopment of the Grain Elevator property;

WHEREAS, City staff has reviewed the information submitted and found that, with the requested waivers, the application complies with the applicable zoning regulations, design standards, and other applicable sections of the Louisville Municipal Code; and

WHEREAS, the Planning Commission has considered the application at a duly noticed public hearing on November 18, 2025, where evidence and testimony were entered into the record.

NOW THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Louisville, Colorado does hereby recommend approval of the Louisville Mill Site Redevelopment PUD, 1st Amendment and an SRU for an Outdoor Eating and Drinking Establishment and Mobile Food Court with the following conditions:

1. Prior to the City Council hearing, the applicant shall obtain an Alteration Certificate approval from the Louisville Historic Preservation Commission.
2. Prior to the City Council hearing, the applicant shall submit to Public Works civil engineering construction plans for review.
3. Prior the City Council hearing, the applicant shall revise the PUD plans and Drainage Report to address outstanding Public Works comments related to the drainage infrastructure.

PASSED AND ADOPTED this 18th day of November 2025.

By: _____
Steve Brauneis, Chair
Planning Commission

Attest: _____
Debra Baskett, Secretary
Planning Commission

Development Review Application Form

Please complete this form and include it with the submittal documents for your development review application. Applications will not be processed until all required information is provided to the satisfaction of the City of Louisville Planning Department.

Property Information

Common Address(es): 520 and 540 County Road, Louisville Colorado

Legal Description:

Lot 2 & Outlot 'A' Block 1 Subdivision Louisville Mill Site Subdivision

Lot Area: 9,122 (Lot 2) + 6,841 (Outlot A) Sq. Ft. or 0.366 Acres

LAND USE PROCESS (check all that apply)

- ☐ Annexation
- ☐ Concept Plan
- ☐ Easement Vacation
- ☐ Oil and Gas
- ☐ General Development Plan (GDP)
 - ☐ Amendment
 - ☐ New GDP
- ☒ Planned Unit Development (PUD)
 - ☒ Amendment
 - ☐ Preliminary
 - ☐ New PUD
- ☐ Rezoning
- ☒ Special Review Use (SRU)
 - ☐ Amendment
 - ☒ New SRU
- ☐ Subdivision
 - ☐ Final or Replat
 - ☐ Preliminary Plat
- ☐ Temporary Use Permit
- ☐ Variance
- ☐ Vested Property Right
- ☐ Wireless Facility
- ☐ Other: _____

PROJECT DESCRIPTION:

Louisville Mill Site LLC & Louisville's Living Room LLC are proposing to redevelop Lot 2 and Outlot A of the Louisville Mill Site Subdivision. This will include the historic grain elevator and the outlot/open space in front of the grain elevator. Louisville's Living Room LLC is proposing to create a unique food beverage venue called "The Grain Yard" on this property that will showcase the historic grain elevator structure and add vitality to the southern end of Downtown Louisville. The 'front yard' will become a vibrant, active part of the concept as an informal gathering space for the community and a new outdoor area for events. The redevelopment will focus on 520 and 540 County Road, and will affect 500 and 544 County Road only as necessary for utilities, drainage and access. The original PUD and SRU are the basis for this Amendment.

Property Owner Information

Name: J. Erik Hartronft & Ross Bowdy Entity (if applicable) Louisville Mill Site, LLC

Address: 950 Spruce Street, Suite 2C, Louisville, CO 80027

Phone: LMS LLC: 303-673-9304 Ross Bowdy: 720-583-4369 Email: erik@hapcdesign.com & ross@foxpropertymgmt.com

Application Representative Information

Name: J. Erik Hartronft Entity (if applicable) Hartronft Associates, p.c.

Address: 950 Spruce Street, Suite 2C, Louisville, CO 80027

Phone: 303-673-9304 Email: erik@hapcdesign.com

Certification/Signature

I certify that the information I have submitted is true and correct to the best of my knowledge and in filing the application and submittal documents, I am acting as and/or with the knowledge and consent of those persons who are owners of the subject property or are parties to this application.

Signature*  _____ Print Name J. Erik Hartronft, AIA _____ Date 09/15/25

*If acting as a representative/agent of the owner, include written authorization from the owner that certifies the agent's right to submit this application

Development Review Application Form

Please complete this form and include it with the submittal documents for your development review application. Applications will not be processed until all required information is provided to the satisfaction of the City of Louisville Planning Department.

Property Information

Common Address(es): 544 County Road, Louisville Colorado

Legal Description:

Lot 3 Block 1 Subdivision Louisville Mill Site Subdivision

Lot Area: 27,158.57 sf Sq. Ft. or 0.623 Acres

LAND USE PROCESS (check all that apply)

- ☐ Annexation
- ☐ Concept Plan
- ☐ Easement Vacation
- ☐ Oil and Gas
- ☐ General Development Plan (GDP)
 - ☐ Amendment
 - ☐ New GDP
- ☒ Planned Unit Development (PUD)
 - ☒ Amendment
 - ☐ Preliminary
 - ☐ New PUD
- ☐ Rezoning
- ☒ Special Review Use (SRU)
 - ☐ Amendment
 - ☒ New SRU
- ☐ Subdivision
 - ☐ Final or Replat
 - ☐ Preliminary Plat
- ☐ Temporary Use Permit
- ☐ Variance
- ☐ Vested Property Right
- ☐ Wireless Facility
- ☐ Other: _____

PROJECT DESCRIPTION:

Note: This property will not be redeveloped per this application. Previously approved PUD will be amended as indicated herein to allow the redevelopment of Lot 2 and Outlot A, including access and drainage improvements on this property & installation of utilities within easements.

Property Owner Information

Name: J. Erik Hartrnft & Randall C. Caranci Entity (if applicable) 544CR, LLC

Address: 950 Spruce Street, Suite 2C, Louisville, CO 80027

Phone: Erik Hartrnft: 303-673-9304 Randall C Caranci: 303-910-0019 Email: erik@hapcdesign.com & randy@carancicorp.com

Application Representative Information

Name: J. Erik Hartrnft Entity (if applicable) Hartrnft Associates, p.c.

Address: 950 Spruce Street, Suite 2C, Louisville, CO 80027

Phone: 303-673-9304 Email: erik@hapcdesign.com

Certification/Signature

I certify that the information I have submitted is true and correct to the best of my knowledge and in filing the application and submittal documents, I am acting as and/or with the knowledge and consent of those persons who are owners of the subject property or are parties to this application.

Signature*  J. Erik Hartrnft, AIA Print Name Date 09/15/25

*If acting as a representative/agent of the owner, include written authorization from the owner that certifies the agent's right to submit this application

Development Review Application Form

Please complete this form and include it with the submittal documents for your development review application. Applications will not be processed until all required information is provided to the satisfaction of the City of Louisville Planning Department.

Property Information

Common Address(es): 500 County Road, Louisville Colorado

Legal Description:

Lot 1 Block 1 Subdivision Louisville Mill Site Subdivision

Lot Area: 26,220.15sf Sq. Ft. or 0.601 Acres

LAND USE PROCESS (check all that apply)

- ☐ Annexation
- ☐ Concept Plan
- ☐ Easement Vacation
- ☐ Oil and Gas
- ☐ General Development Plan (GDP)
 - ☐ Amendment
 - ☐ New GDP
- ☒ Planned Unit Development (PUD)
 - ☒ Amendment
 - ☐ Preliminary
 - ☐ New PUD
- ☐ Rezoning
- ☒ Special Review Use (SRU)
 - ☐ Amendment
 - ☒ New SRU
- ☐ Subdivision
 - ☐ Final or Replat
 - ☐ Preliminary Plat
- ☐ Temporary Use Permit
- ☐ Variance
- ☐ Vested Property Right
- ☐ Wireless Facility
- ☐ Other: _____

PROJECT DESCRIPTION:

Note: This property will not be redeveloped per this application. Previously approved PUD will be amended as indicated herein to allow the redevelopment of Lot 2 and Outlot A, including access and drainage improvements on this property & installation of utilities within easements.

Property Owner Information

Name: Randall C. Caranci Entity (if applicable) R.C.C. LLC

Address: 441 Elk Trail, Lafayette, CO 80026

Phone: Randall C Caranci: 303-910-0019 Email: randy@carancicorp.com

Application Representative Information

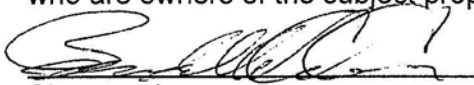
Name: NA Entity (if applicable) _____

Address: _____

Phone: _____ Email: _____

Certification/Signature

I certify that the information I have submitted is true and correct to the best of my knowledge and in filing the application and submittal documents, I am acting as and/or with the knowledge and consent of those persons who are owners of the subject property or are parties to this application.



Signature*

Randall C. Caranci

Print Name

09/15/25

Date

*If acting as a representative/agent of the owner, include written authorization from the owner that certifies the agent's right to submit this application

LOUISVILLE MILL SITE LLC



950 Spruce Street, Suite 2C, Louisville, CO 80027 303.673.9304

Mr. Rob Zuccaro, Planning Director
City of Louisville, Colorado
749 Main Street
Louisville, CO 80027

16 May 2025

Re: Louisville Mill Site Redevelopment
Final PUD Amendment - Phase 1
520, 540 County Road (Front Street)

Rob,

We are pleased to present herein, an amendment to the Louisville Mill Site Final PUD for the first phase development of the Louisville Mill Site Subdivision.

The redevelopment of Louisville's historic Grain Elevator is intended to transform this iconic 120-year-old utilitarian agrarian structure into a vibrant venue that will become a community gathering place, contributing to Downtown Louisville's vitality. Please see the attached letter from the owners of The Grain Yard LLC, who will be the tenants of the building and site. Please note that the managing partners of the Grain Yard LLC are also partners in the ownership of the property as part of Louisville Mill Site LLC/Louisville's Living Room LLC ownership group.

The design for the Grain Yard redevelopment retains all of the original features of this historic landmark and provides for reconstructing the original porte cochere, wagon ramp and wagon scales, which were an integral part of the original building design and function. We have proposed a small addition on the back of the building which will emulate a boxcar, in the location of the railroad siding that used to run behind the building. The proposed design for this first phase is consistent with the original PUD and SRU that was approved in 2015. This amendment to that PUD is intended to allow for some minor changes to the original approval, but is mainly a separation of this first phase from the rest of the development that is not currently moving forward. The grain elevator building will be fully renovated inside in the areas that will accommodate this new use, while preserving the historic fabric of the wooden structure, (even preserving evidence of the major fire that occurred in the past). The building will be ADA accessible, and energy upgrades will be provided as well as structural upgrades and new mechanical and electrical systems. New electrical service will be provided as well as new water and sewer services.

The site will be improved with landscaping, fencing and lighting for the open space in front of the grain elevator, which will be an area for community gathering, events and relaxing at this historic site, with spaces for food trucks. We envision interpretive historic signage and displays documenting the agrarian history of Louisville's early years and this building and site. We would like to work with the City of Louisville and the Museum to bring this history to life on this site. We would also like to move a small private granary from the Warembourg farm to the Grain Yard as a demonstration of how farmers stored grain on their private land versus the commercial grain elevator. We will utilize that small structure as a tap house for the Grain Yard in good weather. We will also propose landmark status for this structure.

We truly envision this project as a significant community benefit from an experiential and educational perspective. Again, the ability to have this type of a tenant utilize the building is perfect to sustain the

history of this site, and Louisville's history into the future. It will activate the site and give people access inside this amazing wooden agricultural cathedral. The revenue from the commercial use of the building will provide the ability to properly maintain the property, which is not possible without a significant revenue stream and private investment into the building and the business.

As we will demonstrate with our grant assistance submittals to the LRC and the HPC, the redevelopment of this site and the renovation and adaptive reuse of this unique historic structure will not be possible without significant public assistance. Such assistance will be an investment together with a private venture for economic revitalization of this area, and also an investment in preserving and maintaining one of the most significant (if not the most significant) remaining structures from Louisville's early history. We look forward to accomplishing this project together with the City of Louisville, the Historic Preservation Commission and the Louisville Revitalization Commission. This one truly takes a village.

We are sensitive to possible concerns related to this proposed use at this site as they were expressed during the original PUD and SRU hearings. Parking is always a concern in downtown Louisville, and we have addressed this issue similar to the originally approved PUD and SRU. There are three commercial properties within this subdivision, which have entered into shared access, maintenance and parking agreements. As part of this development, we will be providing parking on site as required per the Downtown parking regulations, as well as providing 20 shared spaces on Lot 1 (including BNSF leased ROW) and Lot 3 with formalized access lanes through the combined site. We are also showing potential for approximately 30 additional parking spaces in the adjacent BNSF ROW leased area that is controlled by the City of Louisville. We would like to work with the city and the LRC to provide additional parking spaces for downtown in this area, which has been leased by the city for parking. Please note that there are 6 street-parking spaces directly in front of the site on County Road and a city parking lot is about ½ block from the site.

The submittal also includes an amendment to the previously approved SRU, which is intended to provide for specified outdoor activity areas on Lot 2 as well as the Outlot 'A', including the potential for food and beverage service, (subject to other applicable regulations). The SRU is also intended to provide for the potential of a governmental use on Lot 2 and/or Outlot 'A' which would include a potential historic interpretive site, and similar uses within the building which could be private, public, or a combination thereof. Again, this SRU amendment is substantially the same as approved in 2015, with the phasing changed as indicated. An area for outdoor music is proposed in the southwest corner of the Grain Yard, which would be oriented towards the northeast, away from the adjacent residential neighborhoods. Landscape screening, fencing around the outdoor activity area and an acoustical barrier behind the performance area will help to mitigate off-site sound migration.

Concurrently with this Final PUD amendment and SRU, we are also submitting an amended application to the HPC for our previously approved Landmark Alteration Certificate.

We anticipate that construction will begin after final City Council approval of the PUD/SRU and any LRC and HPC funding is approved. We are hoping to get the approvals by approximately the fourth quarter of 2025, with building permit issuance subsequent to that. Ideally, we would like to have the construction complete by mid-summer 2026.

Please see the attached supplemental graphic information regarding the proposed project. Also attached are excerpts from the Louisville Mill Site Subdivision Plat, showing the access, drainage and utility easement areas. Please note that the exterior of the rehabilitated Grain Elevator structure will

appear as it did in the early 1900's, as much as possible. Obviously, there will be significant historically sensitive improvements and modifications on the interior for the proposed adaptive reuse. Those improvements will be described in more detail with our presentations to Planning Commission, HPC, City Council, and the LRC.

Please consider this request for approval of the Final PUD Amendment attached herein. Let us know if you have any questions regarding this proposal.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. Erik Hartnoff", with a long horizontal line extending to the right.

J. Erik Hartnoff, Manager, LMSLLC

City of Louisville,

The ownership group of The Grain Yard, LLC is excited to begin the process of working with the City to bring the grain elevator back to the community.

We are proud to be the catalyst for the Restoration, Rehabilitation, and continued Preservation of the most historic commercial building in Louisville. It is our intention to work alongside the building owner to utilize the inherent strengths of the building and honor the history of the space.

Our concept as tenants of the building is to create a community gathering space. We will be open all day, every day as a place for people to gather, talk, and learn. Beyond the casual hangout moments, we plan to host pop up events, yoga classes, business meetings, private parties and public events, like museum tours. We will utilize lots of the cool spaces inside the building and also the yard between the building and the street.

We plan to sell all sorts of beverages from coffee and tea to kombucha and mocktails to beer and cocktails. We do not plan on having a kitchen, but rather we will partner with local restaurants like Azul Fuego and Lucky Pie during their slow hours and bring in food trucks during busy times. We will need to apply for a liquor license that includes the building and the outlot. The outlot will be fenced in to create a boundary for the license, but will be minimal in design to honor the conservation easement that requires the building not be obstructed.

We will also be coming to the City for a Special Review Use for outdoor dining and live music. The live music will be limited in frequency and size, with the sound directed to the North East, away from the residential neighbors.

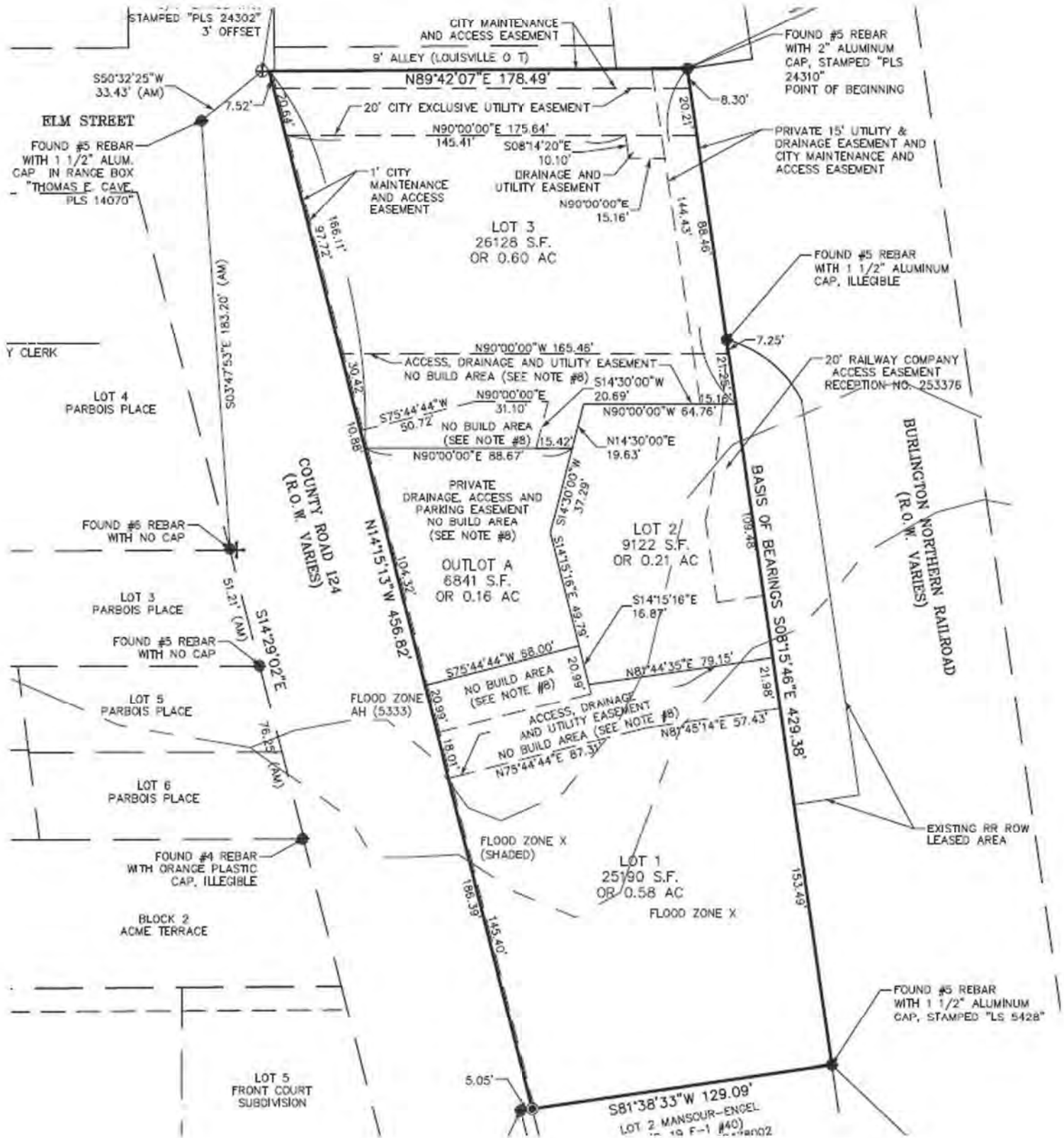
Finally, we intend on submitting an application for a Business Assistance Package with the City prior to signing any lease agreement with the building owners. We hope for some use tax rebates for the tenant improvements that are quite complicated in this old building and a sales tax rebate for our first few years to help us get off to a profitable beginning.

We can't wait to work with a great team of building owners, architects, builders, City staff, boards and commissions, neighbors, and all residents to bring this idea to life and return the grain elevator to the community.

Sincerely,

Ownership Group of the The Grain Yard

EXHIBIT A
Louisville Mill Site Subdivision Plat
EXCERPT Boulder County Reception #03563028



Lease Exhibit – Caranci Inc. & BNSF Railway Company



EXHIBIT C Common Area Easement Depiction

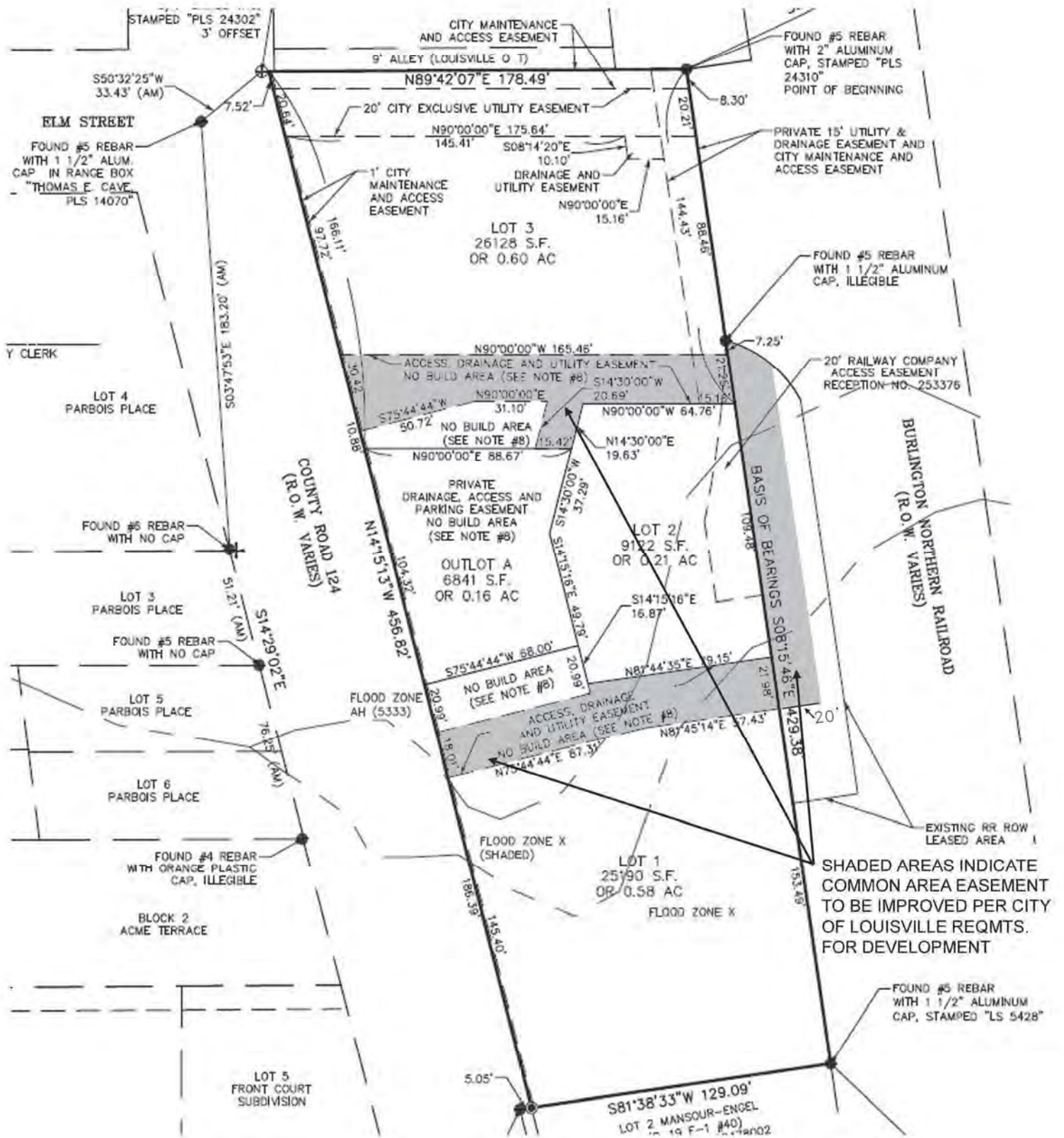


Exhibit C

Utility and Drainage Easement

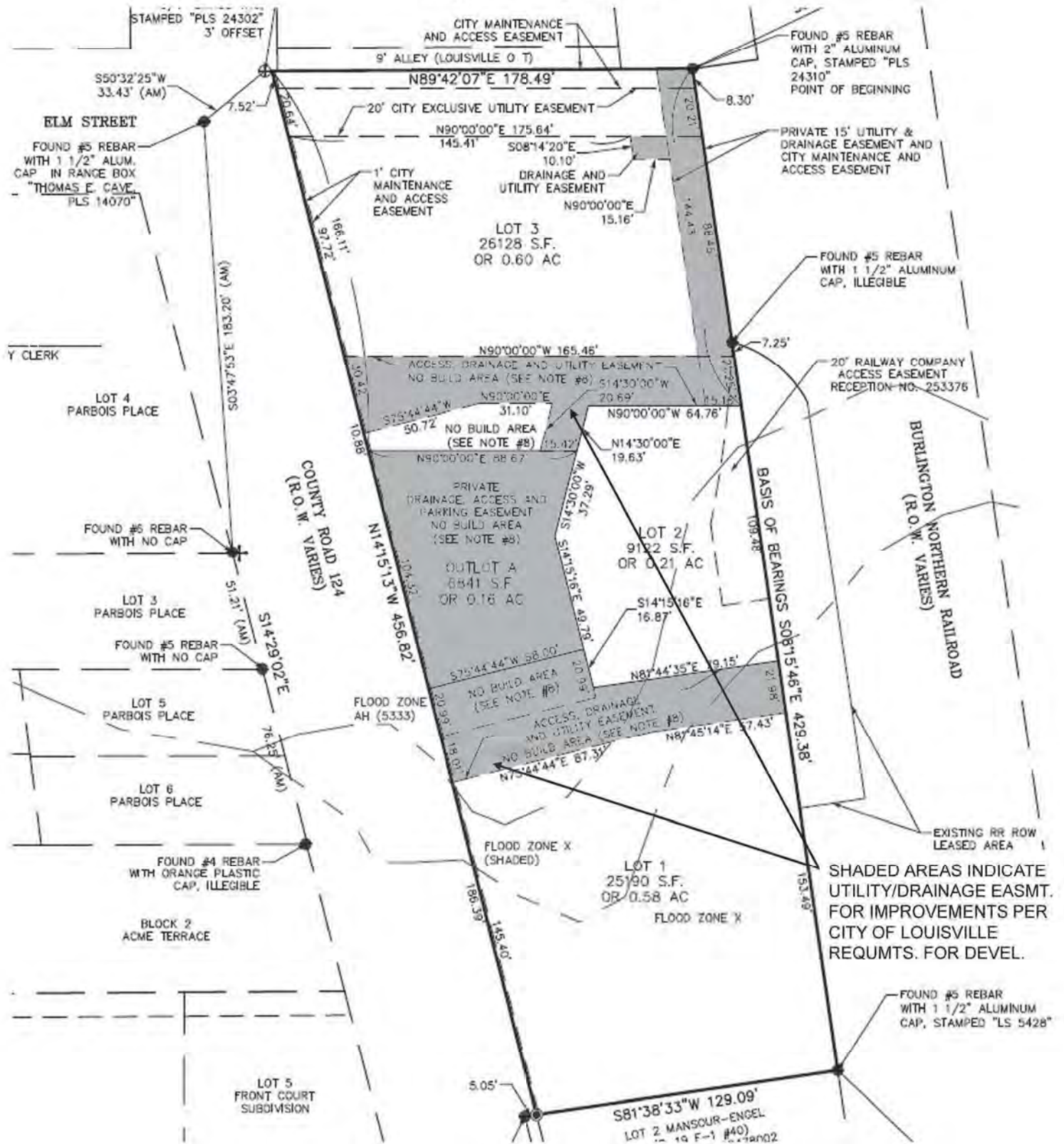


Exhibit D

LOUISVILLE MILL SITE LLC



950 Spruce Street, Suite 2C, Louisville, CO 80027 303.673.9304

Mr. Rob Zuccaro, Planning Director
City of Louisville, Colorado
749 Main Street
Louisville, CO 80027

16 May 2025

Re: Louisville Mill Site Redevelopment
Special Review Use - Phase 1
520, 540 County Road (Front Street)

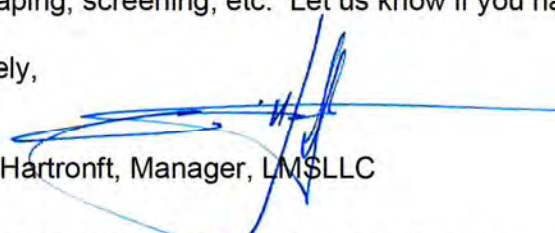
Rob,

Attached please find the SRU Plan indicating the proposed Special Review Use for the Louisville Mill Site Subdivision. The SRU is intended to provide for specified outdoor activity areas on Lot 2 as well as the Outlot 'A', including the potential for food and beverage service, (subject to other applicable regulations). The SRU is also intended to provide for the potential of a governmental use on Lot 2 and/or Outlot 'A' which would include a potential historic interpretive site, and similar uses in the building which could be private, public, or a combination thereof. Below is the formal written response addressing the SRU criteria.

- 1) The proposed uses / development is consistent in all respects with the spirit and intent of the comprehensive plan and of chapter 17, and it is not contrary to the general welfare and economic prosperity of the city or the immediate neighborhood;
- 2) The proposed uses / development will lend economic stability, compatible with the character of any surrounding established areas;
- 3) The proposed uses / development are adequate for internal efficiency of the proposal, considering the functions of residents, recreation, public access, safety and such factors including storm drainage facilities, sewage and water facilities, grades, dust control and such other factors directly related to public health and convenience;
- 4) The external effects of the proposal are controlled, considering compatibility of land use; movement or congestion of traffic; services, including arrangement of signs and lighting devices as to prevent the occurrence of nuisances; landscaping and other similar features to prevent the littering or accumulation of trash, together with other factors deemed to effect public health, welfare, safety and convenience;
- 5) An adequate amount and proper location of pedestrian walks, malls and landscaped spaces are provided to prevent pedestrian use of vehicular ways and parking spaces and to separate pedestrian walks, malls and public transportation loading places from general vehicular circulation facilities.

Please consider this request for approval of the Special Review Use attached herein. Also refer to our Final PUD Amendment for this project which contains additional information regarding parking, landscaping, screening, etc. Let us know if you have any questions regarding this proposal.

Sincerely,


J. Erik Hartnoff, Manager, LMSLLC



Planning
Architecture
Interior Design

Old Square Court, #2C
Lawrence, KS 66077
TEL: 303-673-9304
FAX: 303-673-9339



Downstate Signature Book By signing this <u>LSJ-2</u> the owner acknowledges and accepts all the requirements and intent set forth in this <u>LSJ-2</u> (Witness my hand(s)) I, the _____ hereby this _____ day of _____ 20____	PLANNING COMMISSION CERTIFICATE Approved this _____ day of _____ _____ by the Planning Commission of the City of Louisville, Colorado: Resolution No. _____ Series _____
J. E. H. H. H. Owner Name and Signature _____ LS-2 & LS-3 (LS-4) _____ Owner Name and Signature _____ LS-2 & LS-3 _____ Owner Name and Signature _____ LS-1 & LS-3 _____	CITY COUNCIL CERTIFICATE Approved this _____ day of _____ _____ by the City Council of the City of Louisville, Colorado: Resolution No. _____ Series _____
Notary Name (print) _____ (Notary Seal) Notary Signature _____ My Commission Expires _____	_____ (City Seal) Mayor Signature _____ City Clerk Signature _____

SHORT DESCRIPTION	OWNER-EXCLUSIONS
ARCHITECTURE	OWNER-EXCLUSIONS
A1 Cover Sheet, Project Data & Rendering	10/23/2004 10:58 AM Loretta, Calhoun 800297
A2 Site Plan	Current: 10/23/2004 10:57:33 AM Loretta, Calhoun 800297 305.663.4389
A3 Landscape Plan & Parking Plan	
A4 Site Photographs	ARCHITECT PLANS
A5 Building Elevations	10/23/2004 10:58 AM Loretta, Calhoun 800297
A6 Site Plan	Current: 10/23/2004 10:57:33 AM Loretta, Calhoun 800297 305.663.4389
A7 SPECIAL REVIEW USE	
CIVIL	CIVIL EXCLUSIONS
C1 Grading & Drainage Plan	2/13/2005 1:57 PM Buckley, Calhoun 80502
C2 Utility Plan	Current: 2/13/2005 1:57 PM Buckley, Calhoun 80502 305.916.7859
C3 Tree & Shrub Planting Analysis	
C101 Utility Plan - Future Phase	

Carmichael Branch Library for Local History / Boulder Historical Society Collection



An aerial photograph of the Grain Yard development in Louisville. The central feature is a large, dark brown building with a red roof, designed to look like a historic grain elevator. The side of the building is covered in white lettering that reads "The Louisville M & E Co FEED GRAIN CRUISING". In front of the building is an outdoor patio area with several orange umbrellas and people sitting at tables. To the left of the main building is a smaller, orange-colored structure. A green train car with the number "6470" is visible in the background, parked on a set of tracks. The surrounding area includes parking lots with several cars, a large tree on the left, and a mix of residential and commercial buildings in the distance. The overall scene is set in a sunny, open environment with a clear sky.

[illegible]

LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR
520 & 540 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Louisville's Living Room LLC

FINAL COPY
FIRST ANSWERS

PROJECT # 125250
DATE 05/16/20
DRAWN BY: HAPG
CHECKED BY: JSH
REVISIONS: TPC 05/15/20

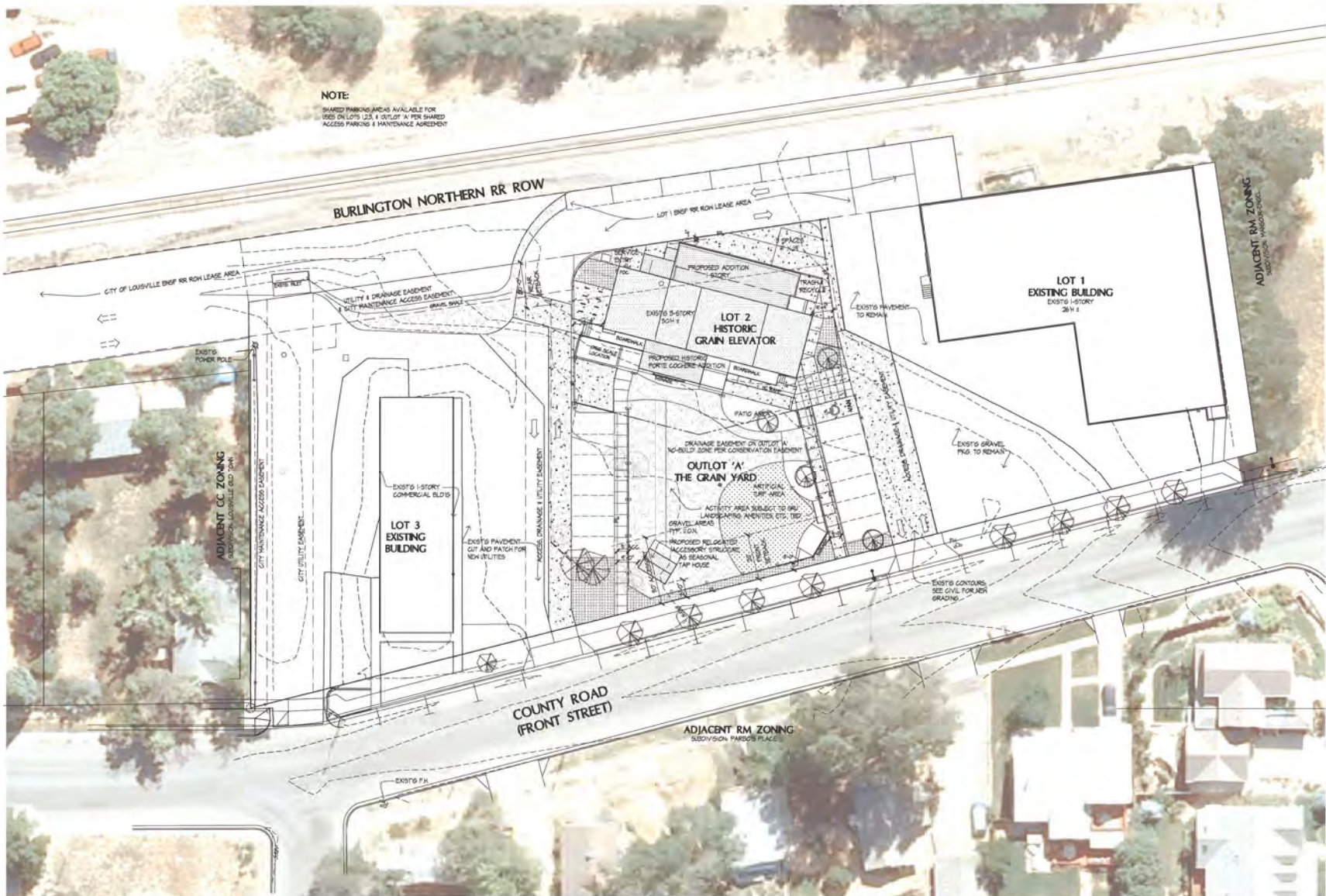
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COVER SHEET
PROJECT DATA
RENDERING
SIGNATURES

Sheet

A1

of Sheets



1
A2 ARCHITECTURAL SITE PLAN
1" = 20'

0 10 20 30 40 50 60 70 80 90 100 FEET



HARTSON ASSOCIATES
A Professional Corporation

Planning
Architecture
Interior Design

1000 Spruce Street, #20
Louisville, CO 80037
TEL: (303) 857-9000
FAX: (303) 857-9000

**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
520 & 540 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Louisville's Living Room LLC

Plan and
Section

PROJECT # 05250
DATE 05/16/25
DRAWN BY: HAPC
CHECKED BY: JEN
REVISIONS: TPC 05/15/25

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Hartson Associates, P.C.

SITE PLAN

Sheet

A2

2 of 2 Sheets

BURLINGTON NORTHERN RR ROW

EXISTING DRIVE SURFACE TO BE REPLACED WITH ASPHALT AS SHOWN

6 SPACES - 22' x 8' PER LOT 1 SHARED PKG AGREEMENT

LOT 2 HISTORIC GRAIN ELEVATOR

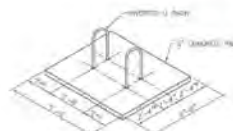
LOT 1

LANDSCAPE LEGEND

- Planting bed - permeable - ornate
- Ornamental Grasses
- Coniferous Shrub 5' GAL.
- Deciduous Shrub 5' GAL.
- 6" - 8" Caliper Deciduous Tree
- Deciduous Tree 1/2" - 2" Caliper
- Coniferous Tree 10" & TL
- Existing Coniferous Tree over 10" Caliper
- Existing Coniferous Tree 5" - 8" Caliper
- Existing Deciduous Tree over 10" Caliper
- Existing Deciduous Tree 6" - 10" Caliper
- Existing Deciduous Tree 5" - 8" Caliper
- Existing Deciduous Tree 1" - 2" Caliper
- Existing Shrub

1. APPLICANT TO PROVIDE DETAILED LANDSCAPE & IRRIGATION DRAWINGS FOR PLANNING AND PUBLIC WORKS REVIEW & APPROVAL. DURING THE CIVIL PLAN REVIEW PRIOR TO PERMIT, TREES SHALL BE PLANTED NO CLOSER THAN 5' TO CURB OR WALK. THE USE OF ROOT BARRIER IS REQUIRED FOR ALL TREES LESS THAN 5' FROM CURB OR WALK.
- 2.
- 3.

NOTES:



2 U-RACK DETAIL @BICYCLE PK'G N.T.S.

OUTLOT 'A' THE GRAIN YARD

1 SCHEMATIC LANDSCAPE PLAN & PARKING PLAN

HARTRONFT ASSOCIATES
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Planning
Architecture
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1000 Spruce Street, #20
Louisville, CO 80037
TEL: (303) 857-9004
FAX: (303) 857-9005

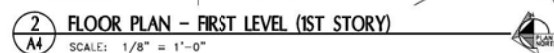
LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR
520 & 540 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Louisville's Living Room LLC

PROJECT # DS250
DATE 05/16/20
DRAWN BY: HAPC
CHECKED BY: JH
REVISIONS: TFS 04/15/21

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LANDSCAPE & PARKING PLAN

Sheet
A3
3 of 3 Sheets



FINAL RPD
FIRST AID

PROJECT # 1252.50
DATE: 05/16/25
DRAWN BY: HAPC
CHECKED BY: JEH
REVISIONS: FPG 04/15

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Horowitz Associates, p.c.

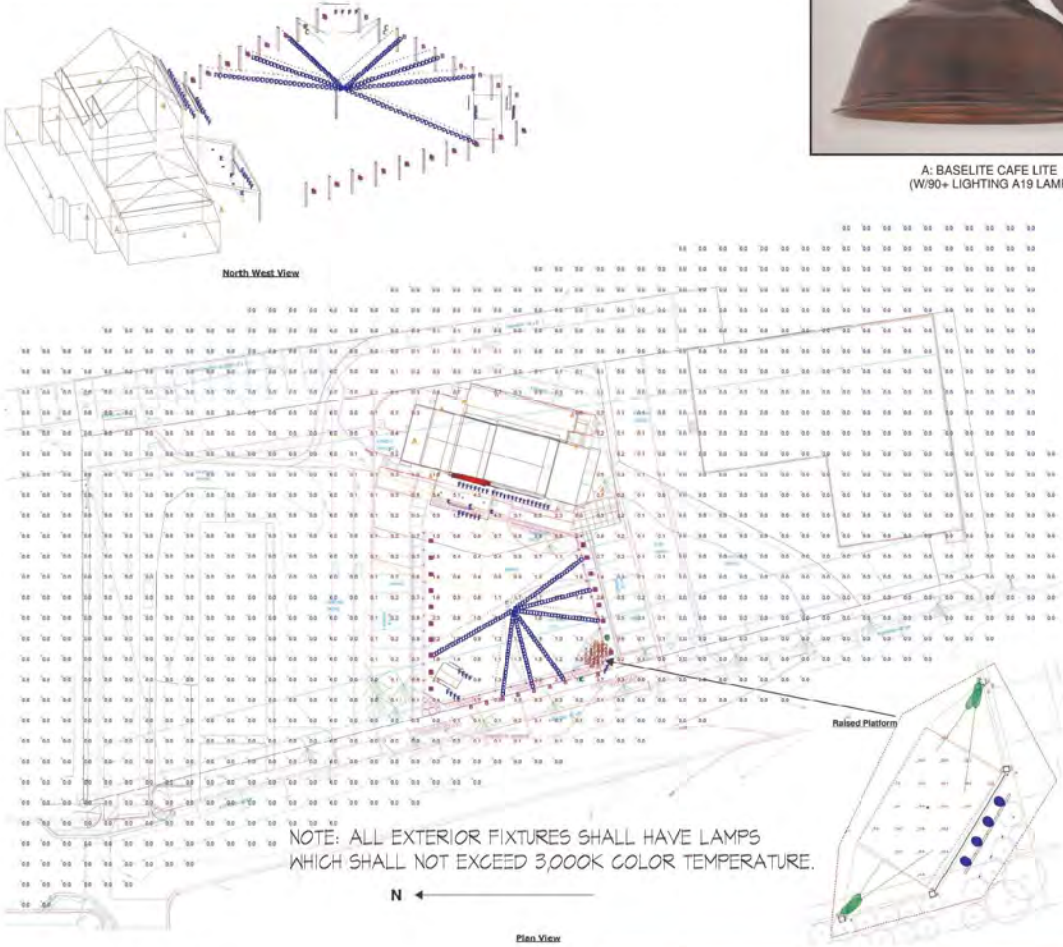
FLOOR FLANS

Sheet

A4

4 of 11 Sheets

Luminaire Schedule									
Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Fixture Name	Luminaire Per Foot
	A	9	90+ LIGHTING			A19 90+ 2000K 3000K PSE PF 0.7	24	90+ T90 PSL A19 10 10 3000K 3000K E26 PF 0.7-0.8	1
	B	43	WAC LIGHTING	WS-014911-00	Surface-mounted Luminaire		1	WS- 014911, 183P, 30 E26 PF 0.7-0.8	200
	C	4	LUMINIS	OC203-L1110-PLD-40K	Scope 3	(1) Bridgeport B100 40K 2000K-0-73 CIE PRA80 4000K-180V4000K 0 L45.0V	1	OC203-L1110-PLD- 40K 40K	900
	D	194	Tivoli, LLC	LSL2-B-12-V-3P-0			1	900-LSL2-B-12- V30-0-0-0	83
	E	3	Juno Lighting	JP42 70K 150W 30K 900V PVSULT 27 60"	7' Square Slimform (Slimform) Surface Mount, 2000K, 900V, 30K, 150W	N/A	1	JP42 70K 150W 30K 900V 900V 7.7 30K 40K	1007
	F	41	LUMENPULSE	LP-120/277-1A-3-30W- 30K-2000K-CL-90-10V	LUMENFACADE PURE This fix was created by Lumenpulse to reflect an accessorial configuration.		1	LP-120/277-1A- 3-30W-30K- 2000K-CL- 90V40K	603



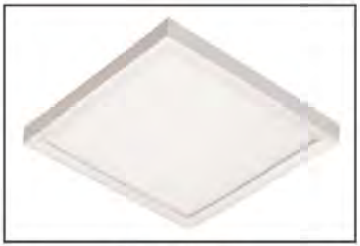
A: BASELITE CAFE LITE
(W90+ LIGHTING A19 LAMP)



B: WAC SLANT



C: LUMINIS SCOPO 355



E: JUNO SLIMFORM



D: TIVOLI LITESPHERE 2.0



F: LUMENPULSE LUMENFACADE PURE

CLICK ON FIXTURE IMAGES
TO LINK TO PRODUCT PAGES



Statistics							
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min	Avg/Max
RAISED PLATFORM	+	15.1 fc	25.6 fc	7.8 fc	3.3:1	1.9:1	0.6:1
SITE	+	0.1 fc	7.1 fc	0.0 fc	N/A	N/A	0.0:1

Note
Lighting calculation software is for
estimating purposes only, not
generating exact values.
These calculations are for the use
and adoption by our clients and
owners' solely at their discretion.
This includes evaluation of the
calculated lighting levels and model
by the Architect, Engineer, Lighting
Designer or Owner for adherence to
the project's lighting specifications
for levels and uniformity.

We make no guarantees of meeting
any subjective expectations.
Calculations are based on a model
only. Space characteristics and
electrical supply to fixtures, along
with installation details, may affect
performance. Model is based on
standard reflectance values unless
otherwise noted.

Any variance from reflectance
values, obstructions, light loss
factors (including both physical and
electrical in nature) or dimensional
data will affect the actual light levels
obtained.

Final construction drawings and
calculations are the responsibility of
a licensed architect or engineer.

The Lighting Agency provides these
calculations as a courtesy for
evaluation only.

Note
1 file=visual-files-may2025-milite3-
leumville grain v2.rvt

HARTRONFT ASSOCIATES
A Professional Consultant

Planning
Architecture
Interior Design

900 Spruce Street, Rm.
Louisville, CO 80037
TEL: 303-452-8904
FAX: 303-673-9199

**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
520 & 540 COUNTY ROAD,
LOUISVILLE, CO
Louisville Mill Site LLC - Louisville's Living Room LLC

PROJECT # 025250
DATE 05/08/23
DRAWN BY: HAPC
CHECKED BY: JCH
REVISIONS: PPS-01/01/23

CREDIT: 0001
All work and written statements
submitted herein are the property
of the Lighting Agency and may be
used without written consent of
Hartron Associates, LLC.

SITE PHOTOMETRIC

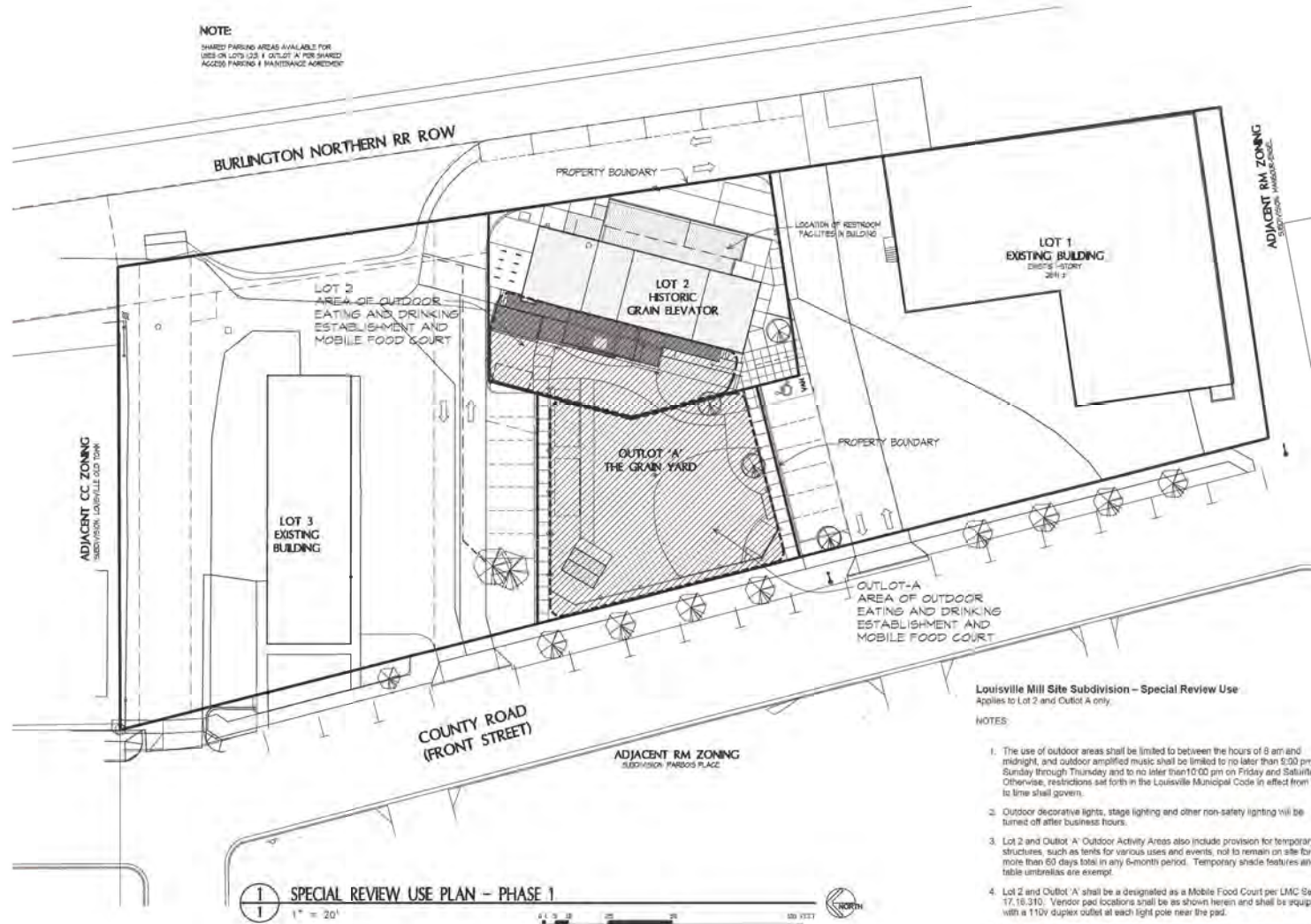
Sheet
A6
1 of 8 Sheets

SPECIAL REVIEW USE - AMENDMENT - PHASE 1 LOUISVILLE MILL SITE REDEVELOPMENT

LOUISVILLE MILL SITE SUBDIVISION

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 8, TOWNSHIP 1 SOUTH RANGE 69 WEST OF
THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

NOTE:
SHARED PARKING AREAS AVAILABLE FOR
USES ON LOTS 1, 2 & 3. OUTLOT 'A' FOR SHARED
ACCESS PARKING & PAINTED SPACE APPROVED



Louisville Mill Site Subdivision - Special Review Use
Applies to Lot 2 and Outlot A only.

NOTES

- The use of outdoor areas shall be limited to between the hours of 8 am and midnight, and outdoor amplified music shall be limited to no later than 9:00 pm Sunday through Thursday and to no later than 10:00 pm on Friday and Saturday. Otherwise, restrictions set forth in the Louisville Municipal Code in effect from time to time shall govern.
- Outdoor decorative lights, stage lighting and other non-safety lighting will be turned off after business hours.
- Lot 2 and Outlot 'A' Outdoor Activity Areas also include provision for temporary structures, such as tents for various uses and events, not to remain on site for more than 60 days total in any 6-month period. Temporary shade features and table umbrellas are exempt.
- Lot 2 and Outlot 'A' shall be a designated as a Mobile Food Court per LMC Sec. 17.18.310. Vendor pad locations shall be as shown herein and shall be equipped with a 110V duplex outlet at each light pole near the pad.
- Drawings, including a Site Plan and Landscape Plan and detailed construction documents for the Mobile Food Court shall be submitted at time of building permit indicating compliance with requirements of LMC Sec. 17.18.310.D.5, as well as compliance with applicable building codes and Boulder County Health Department requirements.

SPECIAL REVIEW USE PLAN - PHASE 1
1" = 20'
100 FEET
NORTH



HARTRON ASSOCIATES
A Professional Corporation

Planning
Architecture
Interior Design

100 Spruce Street, #20
Louisville, CO 80037
TEL: (303) 873-9000
FAX: (303) 673-9335

**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
520 & 540 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Louisville's Living Room LLC

SPECIAL REVIEW USE

PROJECT # 05250
DATE 05/16/25
DRAWN BY: HMC
CHECKED BY: JH
REVISIONS: 15 04/15/25

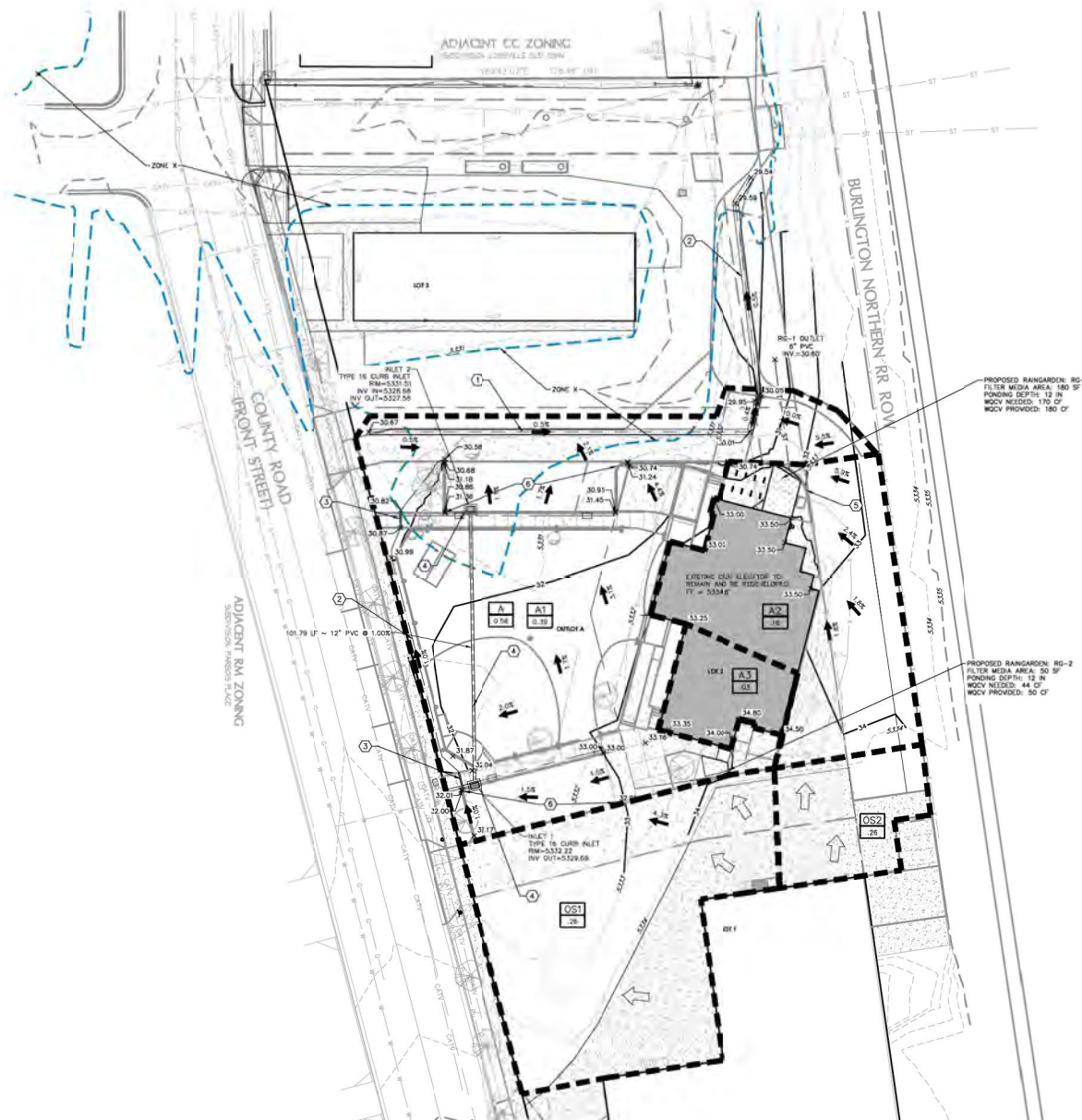
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Hartron Associates, P.C.

SPECIAL REVIEW USE

Sheet

A7

1 of 8 Sheets



LEGEND

- PROPOSED CONTOUR
ADD 5.00' TO ALL CONTOURS
- PROPOSED SPOT ELEVATION
ADD 5.00' TO ALL SPOT ELEVATIONS
- PROPOSED SPOT ELEVATION
- PROPOSED FLOW DIRECTION
- HISTORIC SHEET FLOW
- PROPOSED SUB-BASIN DESIGNATION
- AREA IN ACRES
- PROPOSED BASIN BOUNDARY

GRADING NOTES

1. FLOOD INFORMATION: ACCORDING TO FEMA FLOOD INSURANCE MAP NO. 080330000K DATED 06/15/2010, THE NORTH OF OUTLET A IS LOCATED IN ZONE X (SHADED). AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREA LESS THAN 1 SQUARE MILE, THE ENTIRETY OF LOT 2 IS OUTSIDE OF ANY MAPPED FLOODPLAIN.
2. BENCHMARK INFORMATION: CITY OF LOUISVILLE UPS, FOUND 2.5\"/>

KEYED NOTES

1. PROPOSED 2\"/>

PHASE 1
FINAL
PROPOSED

PROJECT # 2588A
DATE 04/12/2015
DRAWN BY: JMM
CHECKED BY: JMM
REVISIONS:

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Hortonsville Association, LLC.

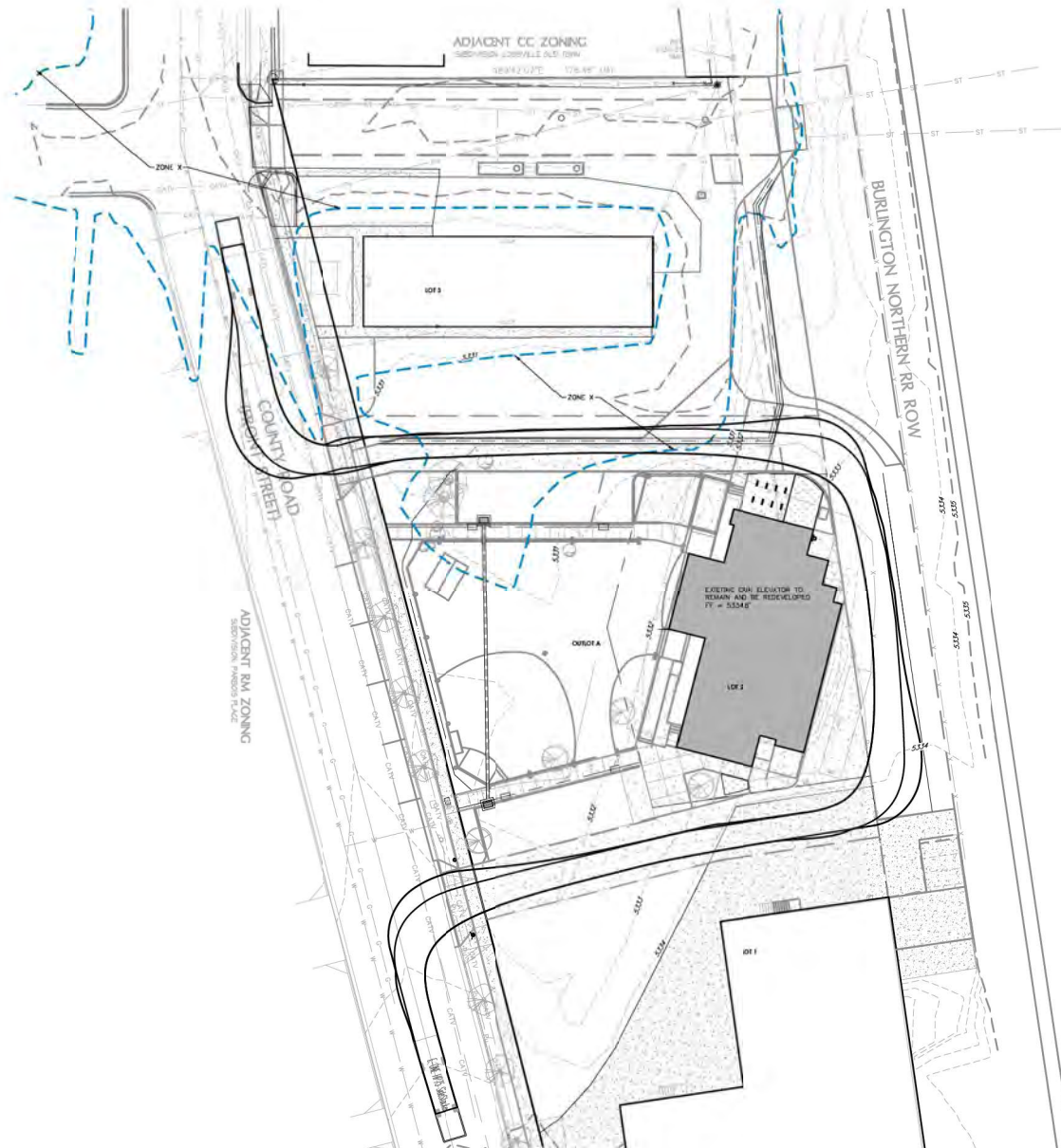
GRADING
&
DRAINAGE
PLAN

Sheet

C-101

1 of 4 Sheets

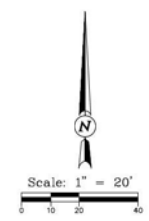




LEGEND

C-ONE HP75 SlideStacker
 Overall Length 31.000'
 Overall Width 10.000'
 Max. Ramp Clearance 10.000'
 Max. Ramp Angle 45.000°
 Max. Wheel Angle 45.000°

31.000'
 10.000'
 10.000'
 45.000°
 45.000°



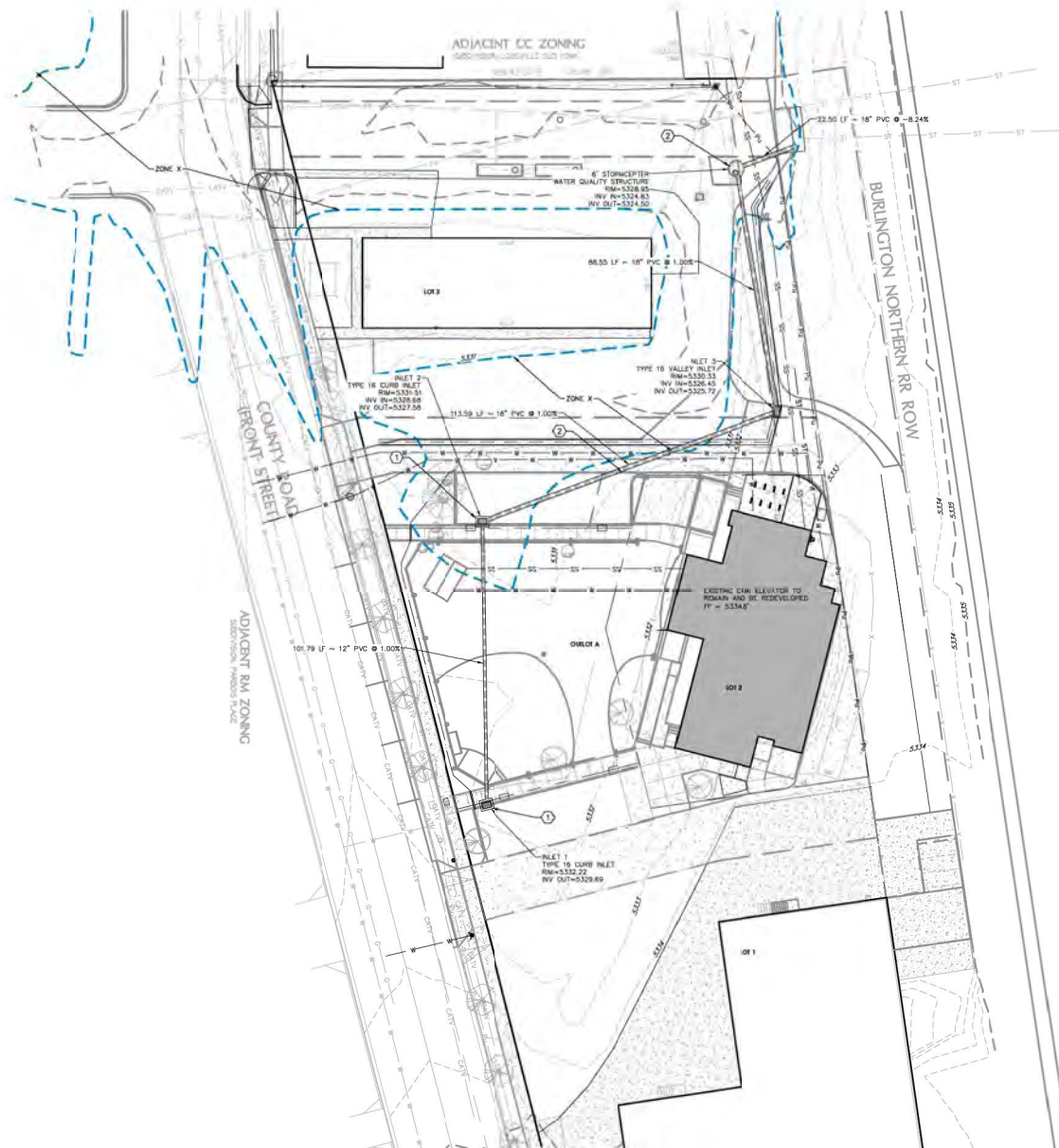
**LOUISVILLE MILL SITE REDEVELOPMENT
 & HISTORIC GRAIN ELEVATOR**
 520 & 540 COUNTY ROAD, LOUISVILLE, CO
 Louisville Mill Site LLC - Louisville's Living Room LLC

PROJECT # 2588A
 DATE 04/12/25
 DRAWN BY: DPA
 CHECKED BY: DPA
 REVISIONS:

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TURNING ANALYSIS

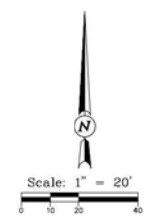
Sheet
C-103
 3 of 4 Sheets



LEGEND	
---	EXISTING CONTOUR
⊙	EXISTING SEWER CLEANOUT
⊕	EXISTING WATER METER
⊗	EXISTING STORM MANHOLE
⊕	EXISTING WATER VALVE
⊕	EXISTING POWER POLE
⊕	EXISTING LIGHT POLE
⊕	EXISTING SIGN
⊕	EXISTING FIRE HYDRANT
---	EXISTING FENCE
---	EXISTING OVERHEAD POWER LINE
---	EXISTING SANITARY SEWER W/MANHOLE
---	EXISTING WATER W/FIRE HYDRANT
---	EXISTING STORM SEWER W/MANHOLE
---	PROPOSED WATER W/FIRE HYDRANT
---	PROPOSED SANITARY SEWER SERVICE
---	PROPOSED GAS SERVICE
⊕	PROPOSED WATER METER

KEYED NOTES ①

1. PROPOSED UNDERGROUND STORM SEWER FOR FUTURE TIE IN. STEEL COVER TO BE REMOVED AND INLETS ALLOWED TO DRAIN.
2. PROPOSED PHASE 2 STORM SEWER IMPROVEMENT. PARKING LOT SLOPE TO DRAIN INTO STORMSEWER AND TIE INTO EXISTING TYPE 2 INLET.



**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
520 & 540 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Louisville's Living Room LLC



PROJECT # 25188A
DATE: 01/12/25
DRAWN BY: JPM
CHECKED BY: JPM
REVISIONS:

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**UTILITY
PLAN
PHASE
2**

Sheet
C-201
4 of 4 Sheets

**Grain Yard - Southwest
View From East Side of Street**



**Grain Yard - Southwest
View From West Side of Street**



**Grain Yard - West
View From West Side of Street**



**Grain Yard - Northwest
View From West Side of Street**



PARKING AGREEMENT

This Parking Agreement is made and entered into on this 21 day of FEBRUARY, 2025, by and between:

RCC, LCC, owner of 500 County Rd, Louisville, CO 80027

LMS, LLC owner of 540 County Rd, Louisville, CO 80027

LLR, LLC, owner of 540 County Rd, Louisville, CO 80027

544CR, LLC, owner of 544 County Rd, Louisville, CO 80027

This Agreement is between the property owners of 500, 540, and 544 County Road. The purpose of this Agreement is to establish shared use of parking spaces among all businesses operating on the properties owned by the parties. This Agreement remains in effect unless terminated by one of the members of the agreement in writing.

Owner of 500 County Rd, RCC, LLC:

Signature: [Signature]
Name: RANDALL C CARANCI
Date: 2-21-2025

Owner 1 - 540 County Rd, LMS, LLC:

Signature: [Signature]
Name: J. ERIK HARTMAN
Date: 2.21.25

Owner 2 - 540 County Rd, LLR, LLC:

Signature: [Signature]
Name: JAMES DICKINSON
Date: 2/21/25

Owner 1 - 544 County Rd, 544CR, LLC:

Signature: [Signature]
Name: RANDALL C CARANCI
Date: 2-21-2025

Owner 2 - 544 County Rd, 544CR, LLC:

Signature: [Signature]
Name: J. ERIK HARTMAN
Date: 2.21.25

**COMMON AREA USE, MAINTENANCE AND MANAGEMENT AGREEMENT
(LOUISVILLE MILL SITE SUBDIVISION)**

THIS COMMON AREA USE, MAINTENANCE, AND MANAGEMENT AGREEMENT ("**Agreement**") is made this 23rd day of January, 2025, by and between **R.C.C., LLC**, a Colorado limited liability company formerly known as **RCC LTD.**, a partnership ("**L1 Owner**") having an address of 441 Elk Trail, Lafayette, CO 80026 ("**L1 Owner**"), **LOUISVILLE MILL SITE LLC**, a Colorado limited liability company having an address of 950 Spruce Street, Suite 2C, Louisville, CO 80027 ("**L2 Owner**" and "**OA Owner**" or collectively "**L2/OA Owner**"), and **544CR LLC**, a Colorado limited liability company having an address of 950 Spruce Street, Suite 2C, Louisville, CO 80027 ("**L3 Owner**"). L1 Owner, L2/OA Owner, and L3 Owner may be collectively referred to as the "**Owners**" or individually as an "**Owner**."

RECITALS:

A. L1 Owner is the owner of certain real property located at 500 County Road, Louisville, Colorado,, more particularly described as Lot 1, Louisville Mill Site Subdivision, County of Boulder, State of Colorado ("**Lot 1**").

B. L2/OA Owner is the owner of certain real property located at 540 and 520 County Road, Louisville, Colorado, more particularly described as Lot 2 and Outlot A, Louisville Mill Site Subdivision, County of Boulder, State of Colorado ("**Lot 2**" and "**Outlot A**" respectively).

C. L3 Owner is the owner of certain real property located at 544 County Road, Louisville, Colorado, more particularly described as Lot 3, Louisville Mill Site Subdivision, County of Boulder, State of Colorado (the "**Lot 3**").

D. L1 Owner is also the Lessee under a lease for certain land adjacent to the Louisville Mill Site Subdivision which is owned by The Burlington Northern and Santa Fe Railway Company as shown on **Exhibit B** attached hereto and incorporated herein by this reference (the "**BNSF Lease Area**").

E. Lot 1, Lot 2, Outlot A, Lot 3, and the BNSF Lease Area (for so long as any Owner under this agreement or its successors and/or assigns are lessee thereof) are collectively referred to as the "**Properties**." The legal description of the Properties are depicted on the plat shown on **Exhibit A** and incorporated herein by this reference.

F. The Owners wish to grant and receive a reciprocal perpetual easement for pedestrian and vehicular use, ingress and egress over, upon and across the parking lots, sidewalks, and other outdoor spaces within their respective owned and leased Properties generally accessible by the public shown on **Exhibit C** attached hereto and incorporated herein by this reference, or any future generally public spaces constructed, redesigned, or repurposed (the "**Common Area**"), and to grant to the other Owners a construction easement allowing the respective Owners to construct, maintain, replace, alter and repair the Common Areas, as more particularly set forth herein.

G. The Owners wish to grant and receive a reciprocal perpetual easement for providing utility and drainage facilities across and below their respective Properties, and to grant to the other Owners a construction easement allowing the respective Owners to construct, maintain, replace, alter and repair the utility and drainage easement areas, as more particularly set forth herein.

H. The Owners wish to establish certain rights relating to the use of Outlot 'A' located within the L2/OA Owner's Property, as more particularly set forth herein.

I. The Owners wish to establish certain rights related to reciprocal parking on their respective Properties, as more particularly set forth herein.

J. Additionally, the Owners desire to seek approval for a Planned Unit Development, Special Review Use, and other necessary approvals per the City of Louisville for improvements on each of the Properties, and the Owners agree to cooperate with each other regarding such approvals irrespective of which properties may be involved in such approvals.

NOW, THEREFORE, in exchange for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and the mutual covenants and promises of the parties hereto, the parties enter into this Agreement upon the following terms and conditions.

AGREEMENT

1. Recitals. The parties acknowledge that the foregoing recitals are true and correct and are incorporated herein by this reference.

2. Ingress and Egress Easements.

(a) Each of the Owners hereby grant to each of the other Owners, and their successors, assigns, tenants, their employees, customers and invitees a perpetual, non-exclusive easement appurtenant to the Owners' Properties over, upon and across the Common Area, for pedestrian and vehicular ingress and egress and required emergency access between the Properties as depicted in Exhibit C attached hereto and incorporated herein by this reference (the "**Common Area Easement**").

(b) The annual/monthly rental cost of the lease for the BNSF Lease Area shall be split evenly between the Owners of Lot 1, Lot 2, and Lot 3 and their successors and/or assigns. L1 Owner shall bill the other Owners for such cost once annually, no later than August 31 of each calendar year, and the Owners shall reimburse L1 Owner within 30 days of receipt of such rental invoice. If L1 Owner elects to discontinue the Lease for the BNSF Lease Area, L1 Owner shall notify all other Owners no less than 120 days prior to the discontinuance of the Lease to allow other Owners the opportunity to obtain the lease rights to the BNSF Lease Area. If L1 Owner becomes aware of the intent of BNSF, or any representative of the Lessor, to terminate the Lease Agreement for the BNSF Lease Area, L1 Owner shall notify all other Owners immediately.

(c) Each Owner shall be responsible for constructing improvements constituting Common Area within the property such Owner(s) own as required and approved by the City of Louisville at their own expense. However, if required Common Area improvements have not been necessary and/or provided on a given Property at such time that any of the Properties shall require access per this Agreement, the Owner of the Property requiring such access shall be responsible for construction the access improvements required by the City of Louisville at their expense, whether on their Property or another Owner's Property. Each Owner hereby grants to any other Owner and its successors and assigns a construction easement for the construction, repair, replacement and alteration of improvements within the Common Area and any related curbing, sidewalks and other similar improvements from time to time situated within the Common Area which they are necessary

or desirable to construct (the "**Construction Easement**"). Prior to beginning construction, The Owner making such improvements shall obtain the consent to its construction plans by the other affected Owners, which consent shall not be unreasonably conditioned, withheld, or delayed. If the non-construction Owners do not consent or deny consent to such plans within ten (10) days of receipt of notice by the constructing Owner, their consent will be deemed given. At such time that any other Property requires access by virtue of renovations, additions, and/or new construction valued greater than 50% of the value of the improvements on the Property as existing on the date of this Agreement, then the Owner of such Property is required to reimburse the Owner making the initial improvements one third of the cost of such access improvements actually paid by that Owner.

(d) No walls, fences or barriers of any kind shall be constructed or maintained in the Common Area which shall prevent or impair the use or exercise of any of the easements granted in this Agreement. The Common Area shall in no event be blocked, closed, altered, changed or removed and shall at all times remain in place as depicted in plans approved by the City of Louisville. There shall be maintained between the boundaries of the Properties a smooth and level grade transition to allow the use of the Common Area for pedestrian and vehicular ingress and egress. The only exception to this provision shall be (i) temporary barriers to the extent necessary for maintenance and repair of the Common Area, (ii) incidental encroachments which may occur as a result of the use of ladders, scaffolding, storefront barricades or similar facilities resulting in temporary obstruction of the Common Area, so long as their use is kept within reasonable requirements of construction work being expeditiously pursued, (iii) barriers required under applicable laws, rules, regulations or codes, and (iv) temporary closure of the Common Area Easement for construction activities on one or more of the Properties in which case the Parties agree to maintain legal access for operating businesses and required emergency access to all properties during the construction period.

(e) No facility on the Properties for vehicular drive-up or drive-through in which the stopping or standing of motor vehicles in line at a location for drop off and/or pickup is intended (as, for example, at a restaurant, car wash or bank) shall be assigned, constructed, used or operated in any manner on any of the Owners' Properties such that motor vehicles in line at such facility stop or stand onto any of the other Owners' Properties, and under no circumstances shall such stacking of vehicles extend onto the Common Area or otherwise interfere with the normal pattern and flow of pedestrian or vehicular traffic on and across the other Owners' Properties and/or the Common Area.

(f) Nothing in this Section 2 shall be deemed to create any easement for parking upon any of the Owners' properties, or within the Common Area. Owners and their customers, agents, guests, invitees, and licensees shall be required to park on such Owners' property.

3. Utility and Drainage Easements.

(a) Each of the Owners hereby grant to each of the other Owners, and their successors, and assigns, a perpetual, non-exclusive easement appurtenant to the Owners' Properties over, across and under the portion of the Owners' respective Properties as depicted in **Exhibit D** attached hereto and incorporated herein by this reference (the "**Utility and Drainage Easement Area**"), for locating utility service lines and storm water drainage and storm water quality facilities for the benefit of the Properties (the "**Utility and Drainage Easement**").

(b) At such time that any of the Properties shall require any utility service and/or drainage facilities to be placed within the Utility and Drainage Easement Area per this Agreement, the

Owner of the Property requiring such utilities and/or drainage shall be responsible for constructing the improvements as required at their expense. Each Owner hereby grants to any other Owner and its successors and assigns a construction easement for the construction, repair, replacement and alteration of such improvements within the Utility and Drainage Easement and any related surface improvements and other similar improvements from time to time situated within the Utility and Drainage Easement Area (the "**Construction Easement**"). Prior to beginning construction, The Owner making such improvements shall obtain the consent to its construction plans by the other affected Owners, which consent shall not be unreasonably conditioned, withheld, or delayed. At such time that any other Property requires the use of any of the previously constructed common utility service lines, equipment, etc. or increased stormwater drainage, by virtue of renovations, additions, and/or new construction, then the Owner of such Property is required to reimburse the Owner making the initial improvements one third of the cost of such utility(ies) or drainage facilities and similar improvements actually paid by that Owner.

4. Use of Outlot A and Other Provisions.

(a) L2/OA Owner hereby grants to each of the other Owners, and their successors, assigns, and to the benefit of their tenants, their employees, customers and invitees, a perpetual, non-exclusive license appurtenant to a portion of Outlot A located within Lot 2 (the "**License Area**"), for certain events and use as determined from time to time by L2/OA Owner and any of the other Owners. The boundaries of the License Area and schedule for the use of the License Area shall be determined at time of use and agreed to in a written License Agreement approved by L2/OA Owner, which approval shall not be unreasonably withheld, conditioned, or delayed. The Owner utilizing the License Area agrees that any alcohol consumed thereon shall be purchased from L2/OA Owner's tenant for the Property as long as that tenant (or L2/OA Owner) holds a liquor license for the License Area, and L2/OA Owner agrees that the cost to use the License Area shall not exceed \$10 per event. Other specific provisions shall be enumerated in the License Agreement executed for each event.

(b) Potential Future Underground Parking Garage. L2/OA Owner hereby grants to L3 Owner, and their successors, assigns, a perpetual, non-exclusive easement appurtenant to the subsurface and areas of the surface necessary for access to Outlot A for purposes of constructing an underground parking garage. The Owners shall have shared rights to any parking created in this location pro rata in proportion to each Owner's contribution to the costs related to the construction of the parking garage. No surface parking shall be allowed on Outlot A. Any improvements, landscaping or other fixtures or property disturbed by the construction of the underground parking garage by L3 Owner on Outlot A shall be restored to the condition existing prior to underground parking construction. Parties shall endeavor to schedule the construction for the underground parking garage to primarily occur between August and April of the following year to minimize disruption of the business of L2/OA Owner's tenant. Parties shall determine an equitable compensation for loss of revenue for any of the businesses located on the Properties during construction. Parties shall agree to which parties to this agreement, or outside this agreement shall be responsible for such loss.

(c) Right of First Offer for Outlot A.

(i) Grant of Right of First Offer. Commencing on the Effective Date and subject to the terms and conditions hereinafter provided OA Owner hereby grants to each of the other Owners a continuing and exclusive right of first offer to purchase the Outlot A.

(ii) Offer Notice. If OA Owner desires to sell, offer to sell, or otherwise transfer all or any portion of Outlot A, OA Owner shall first make an offer of the Outlot A or any portion thereof to the other Owners as follows:

(1) OA Owner shall first provide written notice (each, an "**Offer Notice**") thereof to the other Owners stating: (i) its bona fide intention to sell the Outlot A or a portion thereof; (ii) a description of the Outlot A or portion thereof to be offered or sold together with any other real or personal property owned or controlled by OA Owner that is a part of the subject offer or proposed sale (collectively, the "**Offered Property**"); and (iii) the price and terms upon which OA Owner proposes to offer the Offered Property. Such price cannot exceed a 3rd party appraiser's valuation by more than 10%.

(2) The other Owners (or any of the them individually) may elect to acquire all of the Offered Property identified in an Offer Notice in accordance with the terms contained in an Offer Notice by providing written notice (an "**Election Notice**") to OA Owner, within fifteen (15) days after receipt of the Offer Notice, of the other Owners' willingness to enter into a contract for the purchase of the Offered Property upon the terms in the Offer Notice. The other Owners' failure to deliver an Election Notice within such fifteen-day period the other Owners shall be deemed to have rejected the Offered Property. If multiple other Owners elect to acquire the Offered Property, they shall have the option to either: (a) acquire the party as tenants-in-common; or (b) upon the written request of either of the acquiring Owners provided to all Owners, elect to bid for Outlot A (the "**Bid Election Notice**"), in which case each of the acquiring owners shall submit a bid at or above the price in the Offer Notice within five (5) days to OA Owner, and the higher bid shall have the right to proceed with purchase of Outlot A under this Agreement.

(iii) Recurring Right. The rights of the other Owners hereunder with respect to the Outlot A are recurring rights, however, if the other Owners rejects the terms of any particular Offer Notice or otherwise fails to exercise its exclusive right of first offer with respect to a particular Offer Notice as provided herein then OA Owner shall be entitled to offer the applicable Outlot A to other prospective purchasers; provided however, if either: (a) OA Owner desires to offer the applicable Offered Property to a prospective purchaser on economic terms more favorable than those in the applicable Offer Notice by a factor of ten percent (10%) or more; or (b) OA Owner does not close on a sale of the applicable Offered Property within one hundred eighty (180) days of the other Owners' Election Notice, then The other Owners' right of first offer with respect to such portion of the Outlot A shall be re-instated and OA Owner shall be required to comply with the terms of this First Offer Agreement prior to sale of the such portion of the Outlot A.

(iv) Contract Format. Upon delivery of the other Owners' Election Notice to OA Owner, the other Owners and OA Owner shall use commercially reasonable efforts (each party to pay its own expenses incurred with respect thereto, including legal fees and costs) to prepare, execute and mutually deliver a purchase and sale agreement consistent with the offered terms and otherwise substantially consistent with the Offer Notice (each a "**Contract**") with respect to the Offered Property within twenty (20) days after OA Owner's receipt of the Election Notice.

(v) Closing. If The other Owners elects to purchase the Outlot A, the closing shall occur pursuant to the terms of the Contract.

5. Reciprocal Parking Provisions.

(a) Each of the Owners may grant to any or all of the other Owners, by separate agreement, an easement, license, or lease to park upon that Owner's property as deemed to be desirable by the parties.

6. Miscellaneous Provisions

(a) The easements herein above granted shall be used and enjoyed by the Owners respectively, and their respective successors, assigns, tenants, their employees, customers and invitees (collectively, "**Permittees**"), in such a manner so as not to unreasonably interfere with, obstruct or delay the conduct and operations of the business of any other Owner or its Permittees at any time conducted on its property, including, without limitation, public access to and from said business, and the receipt or delivery of merchandise in connection therewith. Once commenced, any construction undertaken in reliance upon the Construction Easement granted herein shall be diligently prosecuted to completion, so as to minimize any interference with the business of any Owner and its Permittees. Except in cases of emergency, the right of any Owner to enter upon the property of another Owner for the exercise of any right pursuant to the easements set forth, or to prosecute work on such Owner's own property if the same interferes with utility or drainage easements or easements of ingress, egress or access to or in favor of another party, shall be undertaken only in such a manner so as to minimize any interference with the business of the other Owner and its Permittees. In such case, no affirmative monetary obligation shall be imposed upon the other Owner(s), and the Owner undertaking such work shall, with due diligence, repair, at its sole cost and expense, any and all damage caused by such work and restore the affected portion of the property upon which such work is performed to a condition which is equal to or better than the condition which existed prior to the commencement of such work. In addition, the Owner undertaking such work shall pay all costs and expenses associated therewith and shall indemnify and hold harmless the other affected Owner(s) and its Permittees from all damages, losses, liens or claims attributable to the performance of such work.

(b) Once one of the Owners has constructed the applicable improvements within the Common Area and/or the Utility and Drainage Easement Area per City of Louisville approved plans, no Owner shall make any changes to the location or configuration of such improvements without the prior written consent of the other Owners, such consent not to be unreasonably withheld, conditioned or delayed.

7. Indemnification. Each Owner having rights with respect to an easement granted hereunder shall indemnify and hold the Owner whose property is subject to the easement harmless from and against all claims, liabilities and expenses (including reasonable attorneys' fees) relating to accidents, injuries, loss, or damage of or to any person or property arising from the exercise by an Owner of its easement rights granted hereunder or arising from the construction of the Easement Area as provided in this Agreement, which are caused by the negligent, intentional or willful acts or omissions of such Owner, its contractors, employees, agents, or others acting on behalf of such Owner.

8. Exculpation. Notwithstanding any other provisions of this Agreement, whether express or implied, or any obligation or duty at law or in equity, no members, officers, directors, stockholders, partners, managers, employees, affiliates, representatives or agents of any Owner (individually, a

"Covered Person" and, collectively, the "Covered Persons") shall be liable to any other party or person for any act or omission taken or omitted by a Covered Person in good faith reliance on the provisions of this Agreement, provided such act or omission does not constitute willful misconduct, gross negligence, or a knowing violation of law.

9. Maintenance and Repair. Each Owner shall maintain and repair those portions of the Common Area on their respective property in good condition and repair to permit the reasonable use of the Common Area Easement granted herein. Regular maintenance such as snow removal within the Common Area shall be split evenly between all Owners. The cost of any repairs to the Common Area shall be split evenly between all Owners. If maintenance and repairs are required for the utility and drainage facilities within the Utility and Drainage Easement Area, the cost of such repair and maintenance shall be split evenly between all Owners.

10. Insurance.

(a) Throughout the term of this Agreement, each Owner shall procure and maintain general and/or comprehensive public liability and property damage insurance against claims for personal injury (including contractual liability arising under the indemnity contained in paragraph 7 above), death, or property damage occurring upon such Owner's Property, with single limit coverage of not less than an aggregate of One Million Dollars (\$1,000,000.00) including umbrella coverage, if any, and naming the other Owners (provided the Owner obtaining such insurance has been supplied with the name of such other Owners in the event of a change thereof) as additional insureds. Any insurance coverage required herein may be included in general or blanket policies of insurance. Each Owner shall furnish evidence of such insurance to another Owner within fifteen (15) days following written request.

(b) To the extent of insurance proceeds actually received, each Owner hereby waives and releases the other Owners from any and all liability (to each other and anyone claiming under any of them by subrogation or otherwise) for matters insured or required to be insured hereunder.

11. Non-Conflicting Uses. Nothing in this Agreement shall be construed to prevent an Owner from the reasonable use of the property owned by such Owner, provided such use does not interfere with the other Owners' rights hereunder.

12. Performance of Other Party's Obligations.

(a) In the event of an emergency requiring maintenance or repair to or of the Common Area or the Utility and Drainage Easement Area described herein, if the Owner who is responsible for such maintenance and repair (the "Responsible Party") does not, upon reasonable advance notice under the circumstances, undertake the same within a period of time that is reasonable under the circumstances or it does not appear that the Responsible Party will, or will be able to, undertake such maintenance or repair, the other Owner(s) may, at any of their option, perform such maintenance or repair and pay the costs associated therewith (subject to reimbursement from the Responsible Party as described below).

(b) In the event a failure by an Owner hereto to maintain or repair the easement area for which such party is responsible for maintenance and repair results in a material interference with the rights granted to the other Owners by this Agreement or with the use or operation of another

Owner's property, but does not result in an emergency, the other Owner(s) may notify the party in default in writing of such failure. In the event the Owner in default fails to remedy the default within ten (10) days after receipt of such notice or, if such default cannot reasonably be cured within ten (10) days, in the event the Owner in default fails to commence the cure of such default within such ten (10) day period and diligently pursue such cure to completion, the other Owner, or Owners may, at their option, perform the obligation which the Owner in default has failed to properly perform hereunder and pay any and all costs and charges associated therewith.

(c) In any event described in subparagraphs 12(a) or 12(b) above, the performing Owner(s) shall be entitled to recover from the Responsible Party the charges, fees, costs and expenses incurred by the performing Owner(s) in connection therewith (including reasonable attorneys' fees), together with interest thereon at a rate of fifteen percent (15%) per annum from the date of payment. Such charges, fees, costs, expenses and interest shall be paid by the other party within fifteen (15) days from receipt of a statement thereof from the performing Owner(s) (accompanied by reasonable documentation substantiating such statement).

(d) Notwithstanding the foregoing, in the event of (i) a blockage or material impairment of the easement rights, and/or (ii) the unauthorized parking of vehicles on any Owner's property, an Owner may immediately cure the same and be reimbursed by the other party upon demand for the reasonable cost thereof together with interest at the rate of fifteen percent (15%) per annum.

(e) In the event of a violation or threat thereof of any of the provisions of Section 2 of this Agreement, each Owner agrees that such violation or threat thereof shall cause the nondefaulting Owner(s) and/or its Permittees to suffer irreparable harm and such nondefaulting Owner(s) and its Permittees shall have no adequate remedy at law. As a result, in the event of a violation or threat thereof of any of the provisions of paragraphs 2 or 4 of this Agreement, the nondefaulting Owner(s), in addition to all remedies available at law or otherwise under this Agreement, shall be entitled to injunctive or other equitable relief to enjoin a violation or threat thereof of Section 2 of this Agreement. Notwithstanding anything to the contrary, however, in no event shall any Owner become liable to another Owner for, and each Owner hereby waives, consequential, indirect, incidental, punitive, special and/or other speculative damages arising out of, relating to or in connection with any breach of this Agreement by another Owner.

13. Notices. All notices and demands which may or are to be required or permitted to be given by either party to the other hereunder shall be in writing. All notices and demands shall be sent by personal delivery, receipted overnight delivery, email (if provided), or registered or certified mail, postage prepaid, and to the applicable address below:

To L1 Owner:

R.C.C. LLC
441 Elk Trail
Lafayette, Colorado 80026
Attn: Randy Caranci
Email randy@carancicorp.com

To L2/OA Owner:

Louisville Mill Site, LLC
950 Spruce Street, Suite 2C
Louisville, Colorado 80027

Attn: Erik Hartronft and Caleb Dickinson
Email: erik@hapcdesign.com
caleb@foxpropertymgmt.com

To L3 Owner: 544CR LLC
950 Spruce Street, Suite 2C
Louisville, Colorado 80027
Attn: Erik Hartronft and Randy Caranci
Email: erik@hapcdesign.com
randy@carancicorp.com

Any Owner may at any time change its respective address by sending written notice of the change to the other Owners in the manner hereinabove prescribed. Notices shall be deemed to be given (a) upon receipt (or refusal thereof) if by personal delivery or email, (b) on the first (1st) business day after deposit with a receipted overnight delivery service, or (c) on the third (3rd) business day after mailing, if sent by registered or certified mail, postage prepaid.

14. Attorneys' Fees and Costs. In the event of any dispute arising out of this Agreement, or in the event of enforcement of any of the provisions of this Agreement, the prevailing party shall be entitled to recover its reasonable costs and attorneys' fees from the non-prevailing party.

15. Term and Amendment. This Agreement shall become effective upon its recordation in the Office of the Clerk and Recorder for Boulder County, Colorado, and shall run with the land, regardless of whether specifically mentioned in any subsequent deed or conveyance of all or a part of any of the Properties, and shall be binding on all persons subsequently acquiring all or a part thereof and any tenant or licensee. This Agreement may be amended or modified only by an instrument signed by all Owners. No amendment shall become effective prior to being recorded in the Office of the Clerk and Recorder for Boulder County, Colorado.

16. Applicable Law. This Agreement shall be construed and enforced under the laws of the State of Colorado.

17. Estoppel Certificates. Each Owner, within twenty (20) day of its receipt of a written request from another Owner, shall from time to time provide the requesting Owner, a certificate binding upon such Owner stating: (a) to the best of such Owner's knowledge, whether any party to this Agreement is in default or violation of this Agreement and if so identifying such default or violation; and (b) that this Agreement is in full force and effect and identifying any amendments to the Agreement as of the date of such certificate.

18. Severability. Invalidation of any term or provision of this Agreement, by judgment or court order, shall not affect any of the other provisions hereof which shall remain in full force and effect.

19. Entire Agreement. This Agreement contains all the provisions and terms between the Owners relating to the matters set forth herein, and supersedes all prior or contemporaneous agreement or understanding, written or oral, pertaining to the same.

20. Counterparts. This Agreement may be executed in one or more counterparts, each of which will be deemed an original, and all of which together will constitute one single document.

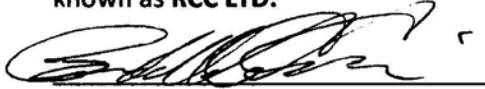
[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS HEREOF, the foregoing instrument has been executed by the parties effective as of the date set forth above.

L1 OWNER:

R.C.C. LLC

a Colorado limited liability company formerly
known as **RCC LTD.**



By: Randall C. Caranci, Manager

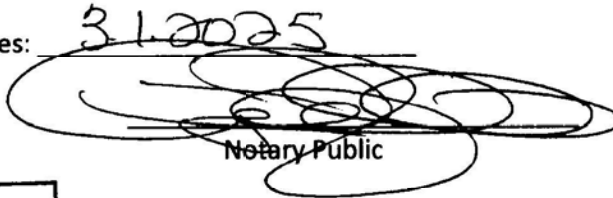
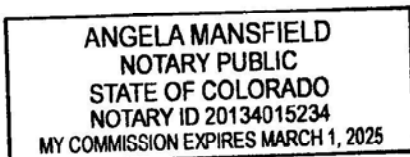
STATE OF COLORADO)

COUNTY OF Boulder) ss
)

The foregoing instrument was acknowledged before this 23rd day of January, 2025, by Randall C. Caranci, Manager of R.C.C. LLC, a Colorado limited liability company formerly known as RCC LTD., a partnership.

Witness my hand and official seal.

My commission expires: 31.2025


Notary Public

L2/OA OWNER:

LOUISVILLE MILL SITE LLC,
Colorado limited liability company


By: J. Caleb Dickinson, Manager

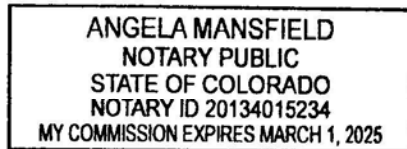

By: J. Erik Hartronft, Manager

STATE OF COLORADO)
COUNTY OF Boulder) ss
)

The foregoing instrument was acknowledged before this 23rd day of January 2025, by J. Caleb Dickinson, Manager of Louisville Mill Site LLC, a Colorado limited liability company.

Witness my hand and official seal.

My commission expires: 3-1-2025



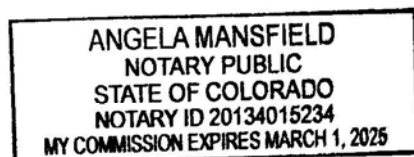

Notary Public

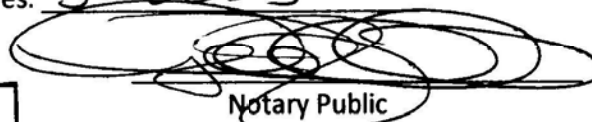
STATE OF COLORADO)
COUNTY OF Boulder) ss
)

The foregoing instrument was acknowledged before this 23rd day of January 2025, by J. Erik Hartronft, Manager of Louisville Mill Site LLC, a Colorado limited liability company.

Witness my hand and official seal.

My commission expires: 3-1-2025



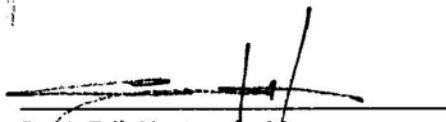

Notary Public

L3 OWNER:

544CR LLC,
a Colorado limited liability company



By: Randall C. Caranci, Manager

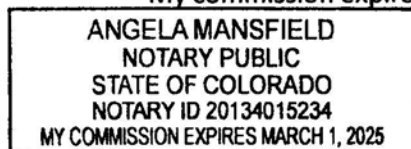


By: J. Erik Hartronft, Manager

STATE OF COLORADO)
COUNTY OF Boulder) ss
)

The foregoing instrument was acknowledged before this 23rd day of January, 2025, by Randall C. Caranci, Manager of 544CR LLC, a Colorado limited liability company.

Witness my hand and official seal.

My commission expires: 3-1-2025
Notary Public

STATE OF COLORADO)
COUNTY OF Boulder) ss
)

The foregoing instrument was acknowledged before this 23rd day of January, 2025, by J. Erik Hartronft, Manager of 544CR LLC, a Colorado limited liability company.

Witness my hand and official seal.

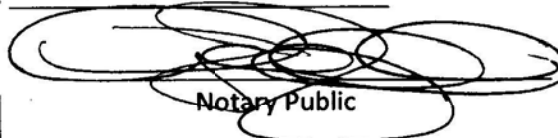
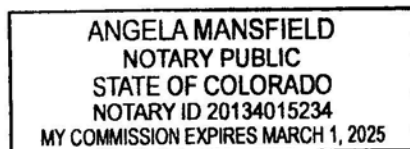
My commission expires: 3-1-2025
Notary Public

EXHIBIT A
Louisville Mill Site Subdivision Plat
EXCERPT Boulder County Reception #03563028

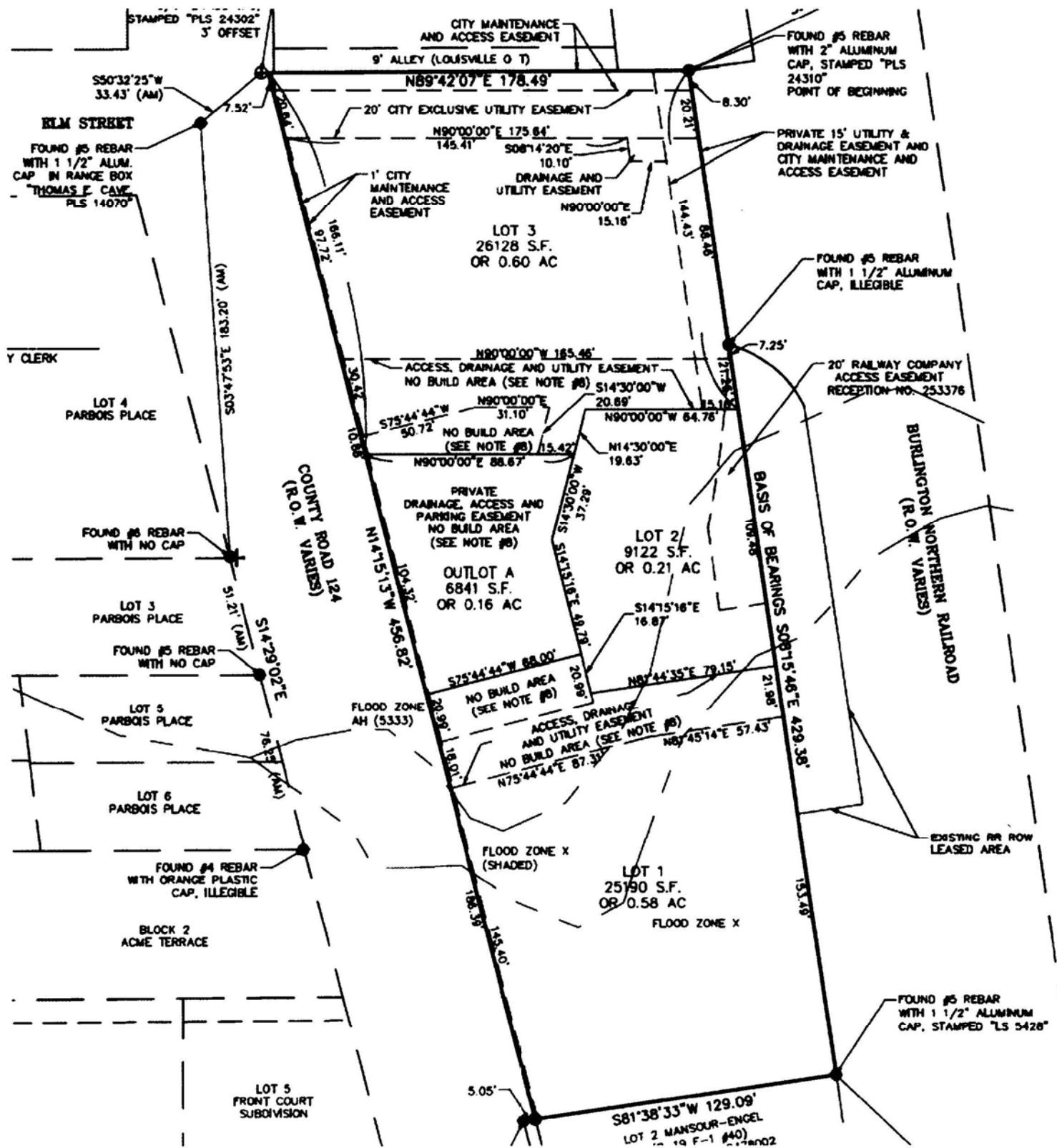


Exhibit A

EXHIBIT B
Lease Exhibit – Caranci Inc. & BNSF Railway Company

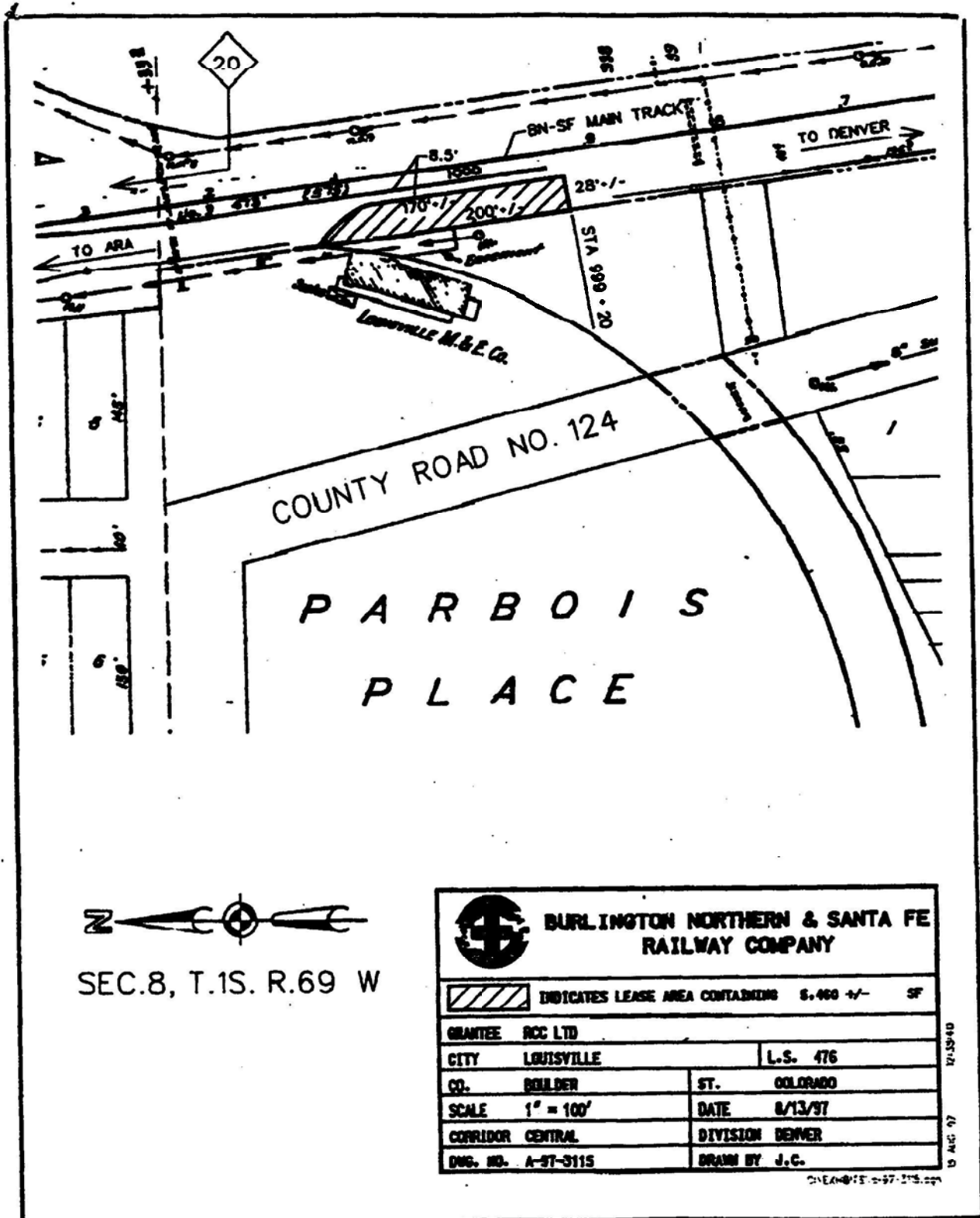


EXHIBIT C
Common Area Easement Depiction

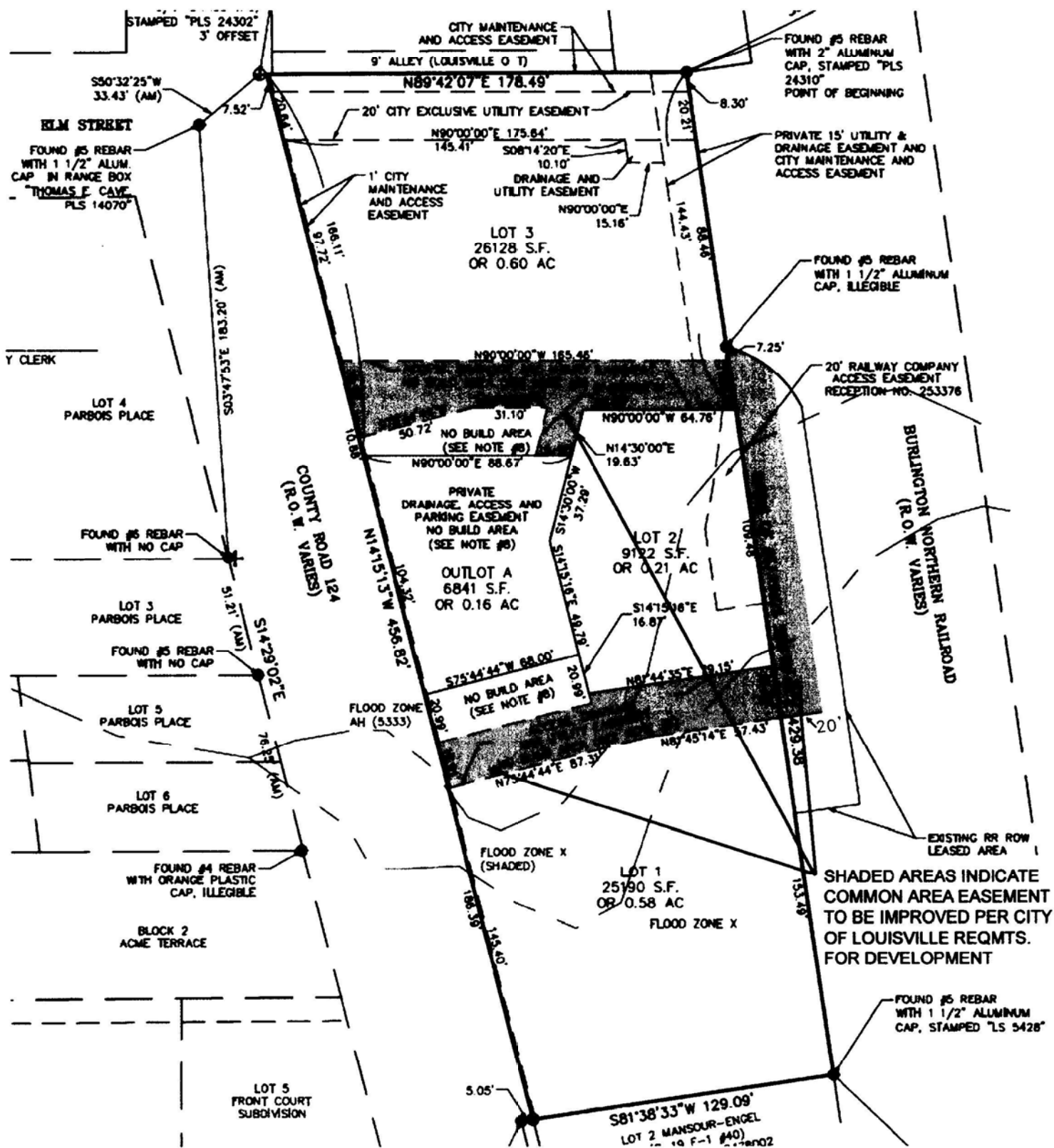
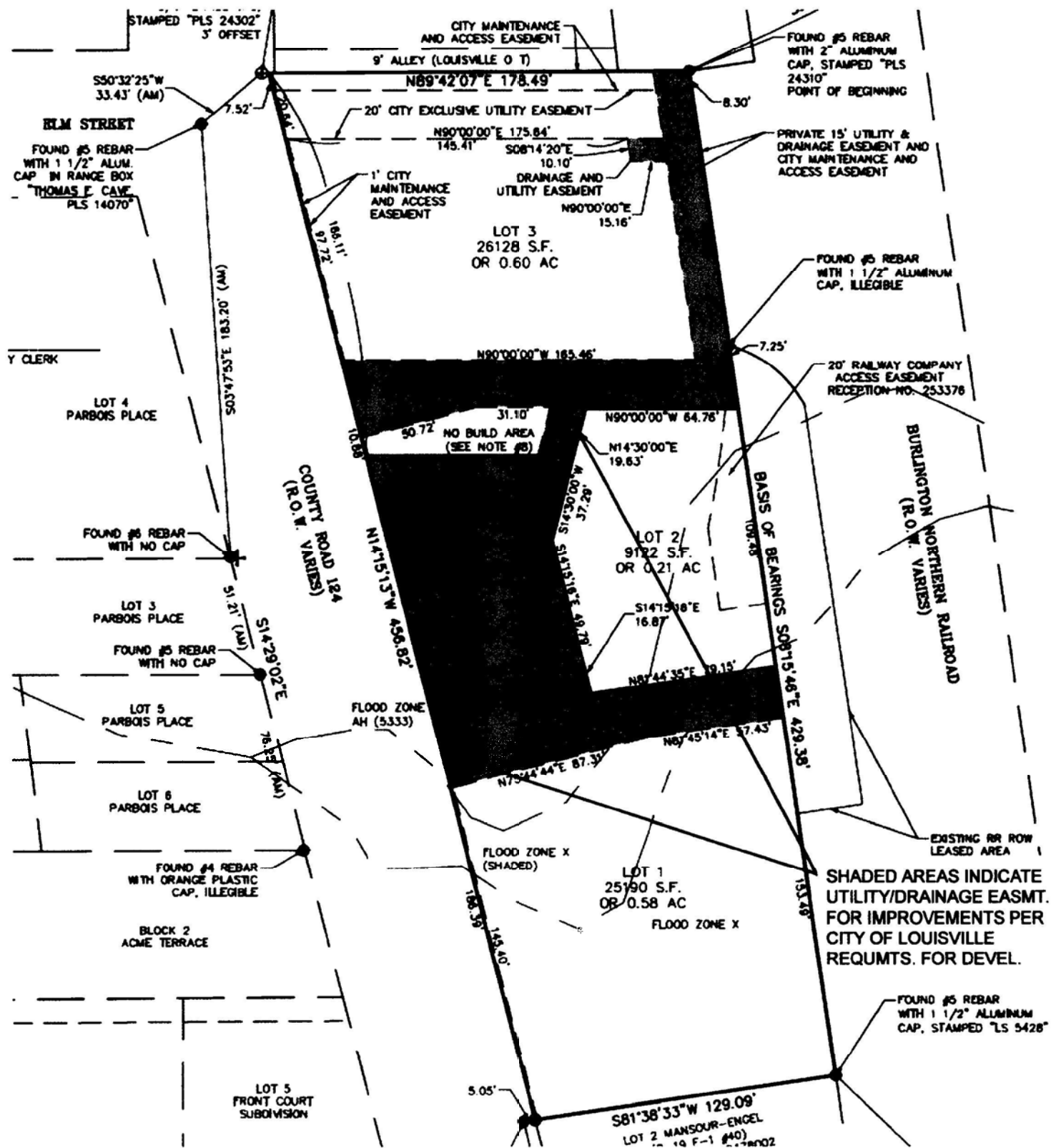


Exhibit C

EXHIBIT D**Utility and Drainage Easement**

LEGAL DESCRIPTION (PER TITLE COMMITMENT)

LOT 1, LOUISVILLE MILL SITE SUBDIVISION, COUNTY OF BOULDER, STATE OF COLORADO.

TITLE COMMITMENT NOTES

THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY SITESURVEYS LLC. FIRST AMERICAN TITLE COMMITMENT NO. 3509-433016, EFFECTIVE DATE 08/19/2025 AT 8:00 A.M. WAS SOLELY RELIED UPON FOR INFORMATION REGARDING EASEMENTS, RIGHTS-OF-WAY, AND ENCUMBRANCES OF RECORD IN THE PREPARATION OF THIS SURVEY.

THE FOLLOWING ITEMS ARE AS ENUMERATED IN SCHEDULE B-2 EXCEPTIONS. [SURVEYOR'S NOTES]

ITEMS 1-7 STANDARD EXCEPTIONS REFER TO TITLE COMMITMENT.

B- ANY WATER RIGHTS, CLAIMS OR TITLE TO WATER, IN, ON OR UNDER THE LAND, WHETHER OR NOT THE MATTERS EXCEPTED ARE SHOWN BY THE PUBLIC RECORDS. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

B- ANY INTEREST IN ALL OIL, GAS AND OTHER MINERALS AS RESERVED BY UNION PACIFIC COAL COMPANY IN DEED RECORDED AUGUST 31, 1905 IN BOOK 296 AT PAGE 53, TOGETHER WITH ANY RIGHTS OF MINES AND EGRESS THEREIN AND ANY AND ALL ASSIGNMENTS THEREOF OR INTERESTS THEREIN.

NOTE: REQUEST FOR NOTIFICATION OF SURFACE DEVELOPMENT RECORDED MAY 11, 2002 AT RECEPTION NO. 228849. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE. RAILROAD SHOWN]

10- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN EASEMENT DEED BY COURT ORDER IN SETTLEMENT OF LANDOWNER ACTION RECORDED MARCH 14, 2013 AT RECEPTION NO. 329705. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

11- NOTES AND EASEMENTS AS SHOWN ON THE PLAT OF LOUISVILLE MILL SITE SUBDIVISION RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563028. [AFFECTS THE PROPERTY AND IS SHOWN]

12- COVENANTS, CONDITIONS, RESTRICTIONS AND EASEMENTS, IF ANY, WHICH DO NOT CONTAIN A FORTITURE OR REVERTER CLAUSE, DECLARING ANY RESTRICTIONS INDICATING ANY PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS OR NATIONAL ORIGIN, AS CONTAINED IN INSTRUMENT RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563028 AND ANY AND ALL AMENDMENTS AND/OR SUPPLEMENTS THEREIN. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

13- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN SUBDIVISION AGREEMENT RECORDED DECEMBER 13, 2016 3563035. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

14- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN FINAL P.L.O.D. LOUISVILLE MILL SITE REDEVELOPMENT RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563036. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

15- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN SPECIAL REVIEW USE LOUISVILLE MILL SITE REDEVELOPMENT RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563038. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

16- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN COMMON AREA USE, MAINTENANCE AND MANAGEMENT AGREEMENT RECORDED JANUARY 29, 2025 AT RECEPTION NO. 407473. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

17- ANY EXISTING LEASES OR TENANCIES.

LEGAL DESCRIPTION (PER TITLE COMMITMENT)

LOT 2 AND 3 AND OUTLOT A, LOUISVILLE MILL SITE SUBDIVISION, COUNTY OF BOULDER, STATE OF COLORADO.

TITLE COMMITMENT NOTES

THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY SITESURVEYS LLC. FIRST AMERICAN TITLE COMMITMENT NO. 3509-433016, EFFECTIVE DATE 01/13/2025 AT 8:00 A.M. WAS SOLELY RELIED UPON FOR INFORMATION REGARDING EASEMENTS, RIGHTS-OF-WAY, AND ENCUMBRANCES OF RECORD IN THE PREPARATION OF THIS SURVEY.

THE FOLLOWING ITEMS ARE AS ENUMERATED IN SCHEDULE B-2 EXCEPTIONS. [SURVEYOR'S NOTES]

ITEMS 1-7 STANDARD EXCEPTIONS REFER TO TITLE COMMITMENT.

B- ANY WATER RIGHTS, CLAIMS OR TITLE TO WATER, IN, ON OR UNDER THE LAND, WHETHER OR NOT THE MATTERS EXCEPTED ARE SHOWN BY THE PUBLIC RECORDS. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

B- RESERVATIONS MADE BY THE UNION PACIFIC RAILWAY COMPANY IN DEED RECORDED AUGUST 31, 1905 IN BOOK 296 AT PAGE 53, PROVIDING SUBSTANTIALLY AS FOLLOWS: RESERVING UNTO THE COMPANY AND ITS ASSIGNS ALL COAL THAT MAY BE FOUND UNDERNEATH SURFACE OF LAND HEREIN DESCRIBED AND THE EXCLUSIVE RIGHT TO PROSPECT AND MINE FOR SAME, ALSO SUCH RIGHT OF WAY AND OTHER GROUNDS AS MAY APPEAR NECESSARY FOR PROPER WORKING OF ANY COAL MINES THAT MAY BE DEVELOPED UPON SAID PREMISES, AND FOR TRANSPORTATION OF COAL FROM SAME, AND ANY AND ALL ASSIGNMENTS THEREOF OR INTEREST THEREIN. REQUEST FOR NOTIFICATION OF SURFACE DEVELOPMENT IN CONNECTION WITH THE ABOVE RESERVATION RECORDED MAY 11, 2002 AT RECEPTION NO. 228849. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE. RAILROAD SHOWN]

10- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN EASEMENT DEED BY COURT ORDER IN SETTLEMENT OF LANDOWNER ACTION RECORDED MARCH 14, 2013 AT RECEPTION NO. 329705. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

11- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN RESOLUTION NO. 30 SERIES 2015 RECORDED MAY 29, 2015 AT RECEPTION NO. 3448801 AND RE- RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563033. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

12- NOTES AND EASEMENTS AS SHOWN ON THE PLAT OF LOUISVILLE MILL SITE SUBDIVISION RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563028. [AFFECTS THE PROPERTY AND IS SHOWN]

13- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN SUBDIVISION AGREEMENT RECORDED DECEMBER 13, 2016 3563035. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

14- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN GRANT OF CONSERVATION EASEMENT IN GRASS RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563036. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE. LOT 2]

15- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN FINAL P.L.O.D. LOUISVILLE MILL SITE REDEVELOPMENT RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563038. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

16- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN SPECIAL REVIEW USE LOUISVILLE MILL SITE REDEVELOPMENT RECORDED DECEMBER 13, 2016 AT RECEPTION NO. 3563038. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

17- ANY EXISTING LEASES OR TENANCIES.

18- TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, OBLIGATIONS, EASEMENTS, AND RESTRICTIONS, IF ANY, AS CONTAINED IN COMMON AREA USE, MAINTENANCE AND MANAGEMENT AGREEMENT RECORDED JANUARY 29, 2025 AT RECEPTION NO. 407473. [AFFECTS THE PROPERTY BUT IS BLANKET IN NATURE]

SURVEY NOTES

- THE BASIS OF BEARINGS IS THE NORTH LINE OF LOT 3 BETWEEN THE FOUND MONUMENTS SHOWN HEREON AND BEARS 089°42'07"W, PER THE PLAT.
- ORIGIN BENCH MARK: CITY OF LOUISVILLE LPS, FOUND 2.5" ALUMINUM CAP IN A RANGE BOX IN SOUTH ST. BEING THE CENTER E 1/8 CORNER OF SECTION 8. ELEVATION=5454.49' (NAD83). SITE BENCHMARKS AS SHOWN. CONTOURS SHOWN ARE FROM A GROUND SURVEY.
- THE SIZE AND TYPE OF MONUMENTS FOUND ARE SHOWN HEREON. ALL MONUMENTS AT GRADE UNLESS NOTED.
- BUILDING MEASUREMENTS ARE AT GROUND LEVEL. ROOF OVERHANGS AND ARCHITECTURAL PROJECTIONS OF THE BUILDINGS ARE WITHIN THE BOUNDARY OF THE SITE BUT ARE NOT SHOWN ON THIS SURVEY UNLESS NOTED.
- NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED ON 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. CRS-13-80-105 (2)(a)
- FLOOD PLAN DESIGNATION OF THE SURVEYED PROPERTY PER FIRM MAP NUMBER 08030282C, 08/19/2019 IS ZONE X, BEING AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN. AREAS OF ZONE X SHOWN AS SHOWN.
- THE LOCATION OF THE ABOVE GROUND UTILITIES SHOWN HEREON ARE BASED ON THE FIELD SURVEY BY SITESURVEYS LLC. A PRIVATE UTILITY LOCATE WAS DONE BY LSC UNDERGROUND CONSULTING SOLUTIONS ON 08/19/2025. THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON SAID SURVEY AND INFORMATION PROVIDED BY LSC. CITY OF LOUISVILLE, ICD, AND GIST MAPPING. SITESURVEYS LLC IS NOT RESPONSIBLE FOR UTILITY INFORMATION PROVIDED BY OTHERS. SITESURVEYS LLC RECOMMENDS THAT THE LOCATION OF THE UTILITIES BE FIELD VERIFIED PRIOR TO ANY DIGGING ON, OR ADJACENT TO THE SUBJECT PROPERTY.
- LAND SURVEY PLATS OR PLATS, REFERENCED OR USED FOR THIS SURVEY: 15-13-093, ALTA/ACSM SURVEY BY SCOTT COX & ASSOCIATES, P.L.S. 24302.
- ALL ADJOINING STREETS ARE PUBLIC.
- NO OBSERVABLE EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS, NO OBSERVED EVIDENCE OF PROPOSED STREET RIGHT OF WAY LINES, RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS, NO RECORD OF OFFSITE EASEMENTS OR SERVITUDES BENEFITING THE SURVEYED PROPERTY.

CERTIFICATION

TO: FIRST AMERICAN TITLE; LOUISVILLE MILL SITE LLC, A COLORADO LIMITED LIABILITY COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1-15, 71(1)(b), 8, 9, 11(a)(b), AND 13 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED 08/26/2025.

A. JOHN BURL, PLS 24302
FOR AND ON BEHALF OF
SITESURVEYS LLC



LEGEND

	EXISTING DECEDUOUS TREE
	EXISTING CONTOUR
	EXISTING STAKE
	SET 40 REBAR WITH 1" RED PLASTIC CAP STAMPED PLS 24302 (PACS) (UNLESS NOTED)
	SET NAIL AND 1.5" ALUMINUM TAG STAMPED PLS 24302 (NAIL/TAG) AS NOTED
	FOUND MONUMENT AS NOTED
	EXISTING ELECTRIC METER
	EXISTING MAILBOX
	EXISTING WATER VALVE
	EXISTING CLEANOUT
	EXISTING GAS METER
	EXISTING WATER METER
	CONTROL POINT
	EXISTING POWER POLE
	EXISTING LIGHT POLE
	EXISTING SIGN
	EXISTING FIRE HYDRANT
	EXISTING SPRINKLER VALVE BOX
	EXISTING FENCE
	EXISTING UNDERGROUND POWER LINE
	EXISTING OVERHEAD POWER LINE
	EXISTING GAS LINE
	EXISTING SANITARY SEWER W/MANHOLE
	EXISTING WATER W/FIRE HYDRANT
	EXISTING STORM SEWER W/MANHOLE
	RECORD COURSE PER PLAT
	MEASURED COURSE PER THIS SURVEY

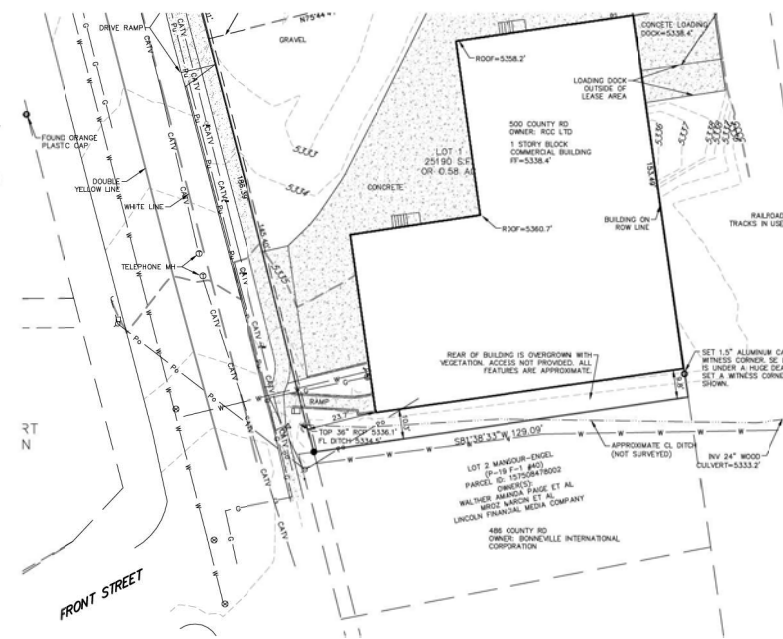
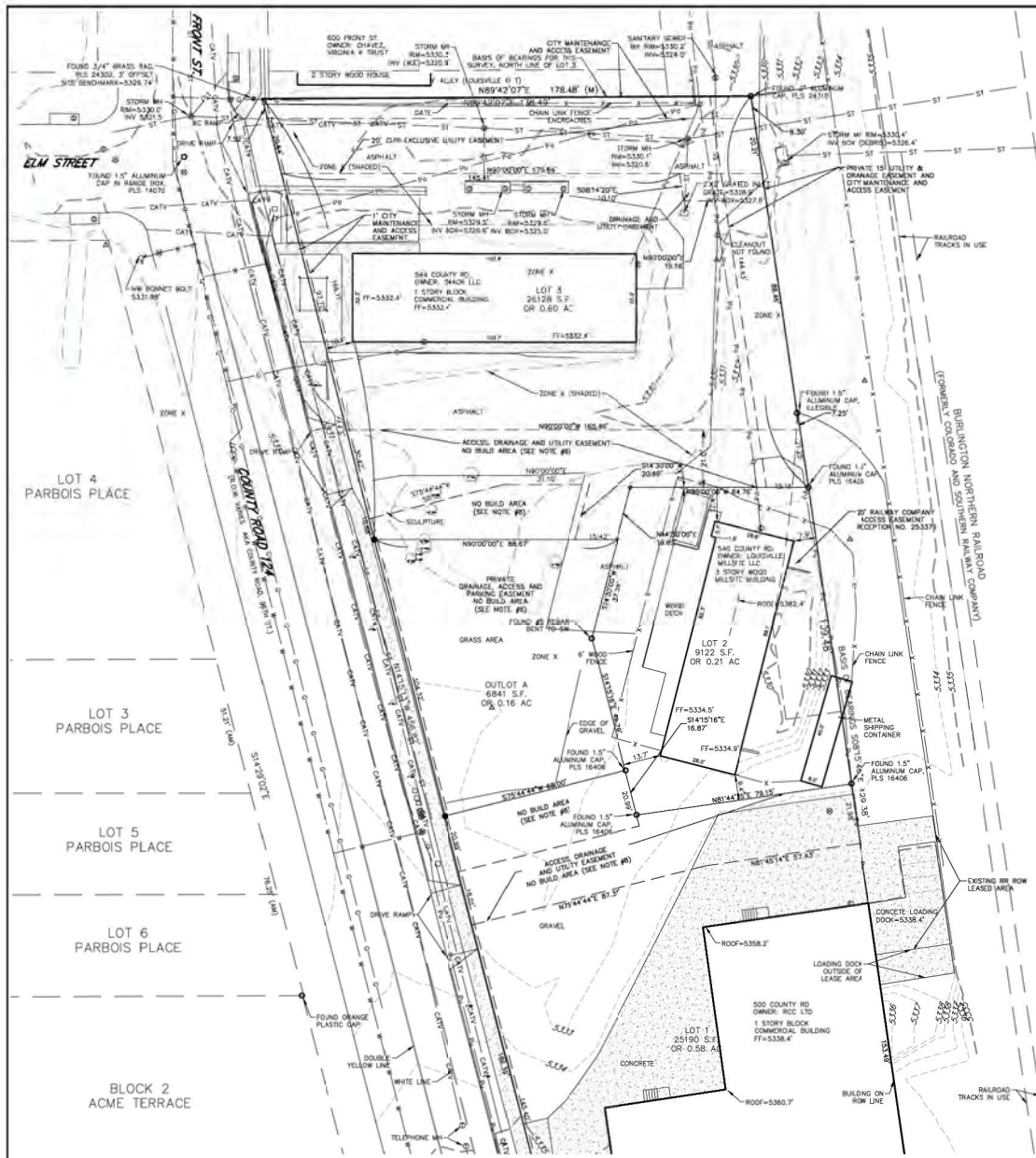
Scale: 1" = 20'
U.S. SURVEY FEET

ALTA/NSPS LAND TITLE SURVEY
LOCATED IN THE SE 1/4 OF SEC. 8,
T1S R69W OF THE 6TH P.M.
CITY OF LOUISVILLE
COUNTY OF BOULDER
STATE OF COLORADO
500, 540, 544 COUNTY RD.

SITESURVEYS LLC

Land Surveyors
186 Wrensch Court • Louisville, Colorado 80027
(303) 616-7831 • info@sitesurveys.com

Designed by	AJB	Date	09/03/25	Scale	1"=20'	Growing no.	25438-2	Sheet	1
Drawn by	JAS	Revision		Description		Date		Project no.	25438
Checked by	AJB								



LEGEND

- EXISTING DECIDUOUS TREE
- EXISTING CONTOUR
- EXISTING SWALE
- SET 4" REBAR WITH 1" RED PLASTIC CAP
- STAMPED PLS 24302 (P&G) (UNLESS NOTED)
- SET NAIL AND 1.5" ALUMINUM TAG
- STAMPED PLS 24302 (NAILTAG) AS NOTED
- FOUND MONUMENT AS NOTED
- EXISTING ELECTRIC METER
- EXISTING WALDOX
- EXISTING WATER VALVE
- EXISTING CLEANOUT
- EXISTING GAS METER
- EXISTING WATER METER
- CONTROL POINT
- EXISTING POWER POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
- EXISTING FIRE HYDRANT
- EXISTING SPRINKLER VALVE BOX
- EXISTING FENCE
- EXISTING UNDERGROUND POWER LINE
- EXISTING OVERHEAD POWER LINE
- EXISTING GAS LINE
- EXISTING SANITARY SEWER W/MANHOLE
- EXISTING WATER W/FIRE HYDRANT
- EXISTING STORM SEWER W/MANHOLE
- RECORD COURSE PER PLAT
- MEASURED COURSE PER THIS SURVEY

ALTA/NSPS LAND TITLE SURVEY
 LOCATED IN THE SE 1/4 OF SEC. 8,
 T1S R69W OF THE 6TH P.M.
 CITY OF LOUISVILLE
 COUNTY OF BOULDER
 STATE OF COLORADO
 500, 540, 544 COUNTY RD.

SITESURVEYS LLC				
Land Surveyors				
185 W. 10th Street • Louisville, Colorado 80027				
(303) 915-1800 • info@sitesurveys.com				
Designed by	Date	Scale	Growing no.	Sheet
AJB	09/03/25	1"=20'	25438-2	2
Drawn by	Revision	Description	Date	Project no.
JAS				25438
Checked by	Revision	Description	Date	Project no.
AJB				25438

site**works**

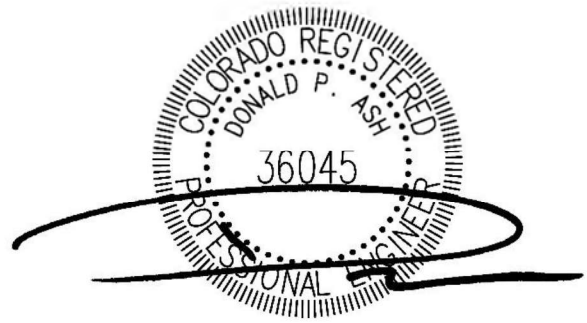
Phase I
Drainage Report

Louisville Mill Site Redevelopment
540 County Road
Louisville, CO

09/12/2025

ENGINEER'S STATEMENT

I hereby certify that this Phase I Drainage Report for 540 County Road was prepared by me, or under my direct supervision, in accordance with sound engineering practice and all applicable state, federal and local regulations.



Donald P. Ash
Registered Professional Engineer
State of Colorado No. 36045

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I. GENERAL LOCATION AND DESCRIPTION

A. Location

1. This report is submitted as the Phase I Drainage Report of the existing and proposed conditions for the property located at 540 County Road in Louisville, Colorado.
2. The site is located in the southeast quarter of Section 8, Township 1 South, Range 69 West of the 6th Principal Meridian in the City of Louisville, Boulder County, State of Colorado.
3. The site is bounded by Burlington Northern Railway to the east, commercial lots to the south and north, County Road to the West, and residential lots on the west side of County Road. A Vicinity Map is included in Appendix A.

B. Description of Property

1. The existing .58-acre site is currently developed with an existing mill building.
2. Existing ground cover consists of grass, a gravel driveway and existing mill building.
The site generally flows to the north and surface drains into an existing asphalt parking lot and into a 2'x2' inlet located in Lot 3. Existing drainage patterns are shown on the Drainage Plan that is included with this report.
3. The United States Department of Agriculture (USGS) Natural Resources Conservation Service (NRCS) Soil Survey for the site identifies the majority of the existing site soils as Ascalon Sandy Loam (AcA) with a hydrologic soil group of B.
4. There are no major or minor drainageways located on or near the property.
5. There are no irrigation facilities located on or near the site.
6. The proposed land use will be commercial. A Planned Unit Development (PUD) Zoning overlay will control the specific zoning on the subject property.
7. There are no wetland areas located on the property.
8. There are no drainage easements that are affected by the proposed improvements.

II. HISTORIC DRAINAGE

A. Major Basin Description

1. This site is not located within any drainageways.
2. FEMA LOMR effective: March 8, 2018 reduced the mapped flooding potential on the site from Zone AH to Zone X (shaded) and the site is now mostly outside of any mapped flood zone.
3. Based on the FEMA Flood Insurance Rate Map (FIRM) - Map Number 08013C0582K dated August 15, 2019. The north of Outlot A is located in Zone X (shaded), areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage area less than 1 square mile. The entirety of Lot 2 is outside of any mapped floodplain.
4. The majority of the site generally slopes from the south to north to the northeast at an approximate slope of 1%-3%. Existing ground cover consists of grass, a gravel driveway and an existing mill building. The site drainage discharges via surface drainage to the asphalt drive on the south side of Lot 3, where it drains through the parking lot to the east and north into an existing 2'x2' graded inlet.
5. There are no irrigation ditches or facilities which will be affected by the proposed development.
6. There are no lakes or ponds which influence or may be influenced by the local drainage. There are no dams on or adjacent to the subject property.

B. Sub-Basin Description

1. For the purposes of this report, the existing site has been broken into one (1) sub-basin, Basin H. Basin H consists of the entire site. Runoff from within this basin flows to the north where the site drainage discharges via surface drainage to the asphalt drive on the south side of Lot 3, where it drains through the parking lot to the east and north into an existing 2'x2' graded inlet.
2. There is no offsite drainage that affects the site.
3. The runoff from the existing site is summarized in Table 1. Existing runoff calculations have been included in Appendix B.

III. DRAINAGE DESIGN CRITERIA

A. Development Criteria Reference and Constraints

1. A Preliminary Drainage Report was submitted by JVA Consulting Engineers, dated April 3, 2014. This report has been included in appendix E.
2. The site drainage was generally constrained by the existing conditions. Grading was constrained by the existing grades along the existing asphalt drives on lots 1 and 3, and the existing grain elevator. The site was also constrained by the existing curb and gutter elevations along County Road to the west.
3. There are no wetland areas located on the property.
4. The following reports, files and drawings form the basis of this report: 1) City of Louisville Municipal Code; 2) City of Louisville Manual of Design Criteria & Standard. 3) Urban Drainage and Flood Control District (UDFCD) Urban Storm Drainage Criteria Manual, Volumes 1-3 (USDCM). Relevant sections, as required, can be found in the Appendix located at the back of this report.
5. This drainage plan is in general conformance with the City of Louisville Manual of Design Criteria & Standard Specifications, the UD&FCD Storm Drainage Criteria Manual and the Stormwater Masterplan.
6. This report details the Phase 1 plan of the Mill site development and designs Lot 2 and Outlot A. A Phase 2 drawing has been included in this report in Appendix B, outlining the drainage plan for future development. Future development will connect the storm sewer on Outlot A to a stormceptor unit located on Lot 3, the stormceptor will provide water quality treatment for the entirety of the Mill Site Development.

B. Hydrological Criteria

1. The design rainfall data used in this study was taken from the CRITERIA, Volume 2 – Chapter 5 – Rainfall, Section 2.O – Rainfall Depth-Duration Frequency and Section 4.O – Intensity-Duration Curves for Rational Method. One-hour rainfall depth was taken from Table 1 and used in conjunction with the intensity equation listed under Section 4.O. This was correlated to the Intensity-Duration Frequency Curve from Figure 1.

As required in the CRITERIA, for all land uses, hydrologic information was developed for an initial storm return period of 2-years and major storm return period of 100-years. The criteria and methodology used in determining the storm runoff peaks and volumes were those outlined in the USDCM as directed by the CRITERIA.

2. Runoff calculations were obtained using the Rational Method as outlined in the Manual for basins having less than 130 acres.

Rational Formula is:

$$Q = CIA$$

Where: Q = Peak Discharge (cfs)
 C = Runoff Coefficient (USDCM)
 I = Rainfall Intensity (in/hr) (USDCM)
 A = Drainage Basin Tributary Area (acres)

C. Hydraulic Criteria

1. The proposed site ultimately drains to the north. The mill building and the road to the east of the mill building drain flow into rain gardens located on the north and south side of the mill building. The west portion of the site flows into a concrete drainage pan and swale and flows to the existing type R inlet located in Lot 3, north of the site.
2. Water quality volumes, discharges and storage calculations are based on the USDCM Volume 2, Storage. Detention and water quality facilities have been designed in accordance with the USDCM Volume 3, Best Management Practices. The UDFCD detention worksheets were used for calculations of the detention and water quality facilities.

D. Adaptions from Criteria

1. There are no adaptions or variances requested from the Criteria.

IV. DRAINAGE FACILITY DESIGN

A. General Concepts

1. Developed runoff from the site drains either to the north to an existing storm sewer or to the west on to County Road. Runoff from the roof will be drained in to two raingardens and treated for water quality.
2. Offsite basins will be unaffected by the redevelopment.
3. Proposed drainage patterns are shown on the Drainage Plan. Proposed runoff from the site is shown in Table 1.

B. Specific Details

1. The Drainage Plan shows the proposed site plan, on-site grading and overland flow directions. Under the proposed conditions, the site will be broken into three (3) sub-basins, Basins A1 through A3 as well as two (2) off-site basins, Basins OS1 and OS2.

Drainage from Basin A1 comprises of the western portion of the site. It includes lawn, the southern and northern parking spaces. Runoff from within this basin flows to the northwest corner of the southern parking lot via overland flow, into a swale running along the west edge of the site which eventually flows into the existing Type R inlet located in Lot 3. All runoff in this basin will drain into the gravel swale or concrete drain pan.

Water quality for Basin A1 will be provided during the phase 2 improvements. Currently, the basin contains large amounts of landscaping and some existing asphalt parking areas. The imperviousness of the basin will increase slightly but the overall impact to the drainageway will be negligible. Therefore, water quality for this basin will be delayed until phase 2 to accommodate future improvements and increased impervious areas.

Drainage from Basin A2 comprises of the east portion of the site and the north half of the Mill Building roof. Runoff from within this basin flows north into proposed Rain Garden 1 (RG-1) This rain garden has been designed to treat the Water Quality Capture Volume and pass the 100-year storm.

Drainage from Basin A3 comprises the south half of the roof. Runoff from this site will be piped into Rain Garden 2 (RG-2). This rain garden has been designed to treat the Water Quality Capture Volume and pass the 100-year storm.

Drainage from Basin OS1 comprises the west portion of the parking area of Lot 1. Runoff from this basin follows existing drainage patterns and flows into Basin A1 where is runoff follows the proposed routing for that basin.

Drainage from Basin OS2 comprises the east portion of the parking area of Lot 1. Runoff from this basin flows into Basin A2.

The existing and proposed conditions for the entire site were analyzed for the 5 and 100-year storm events. The results are shown in the following Table 1 and the relevant calculation sheets are provided in Appendix B.

TABLE 1
RUNOFF CALCULATIONS SUMMARY

Drainage Basin	Area (acres)	C ₂	C ₁₀₀	2-Year Peak Runoff (cfs)	100-Year Peak Runoff (cfs)
Basin H	0.58	0.22	0.59	0.25	2.22
Basin A	0.58	0.39	0.60	0.44	2.15
Basin A1	0.34	0.53	0.73	0.26	1.28
Basin A2	0.16	0.43	0.70	0.15	0.82
Basin A3	0.03	0.80	0.90	0.06	0.23
Basin OS1	0.21	0.63	0.81	0.33	1.36
Basin OS2	0.05	0.73	0.84	0.10	0.35

2. The rain gardens have been designed for the Water Quality Capture Volume per the recommended approach in the USDCM and will accommodate the Water Quality Capture Volume (WQCV).

TABLE 1
DETENTION POND SUMMARY

Pond	Basin Area (ac)	WQCV (CF) Needed	WQCV (CF) Provided
RG-1	0.16	170	180
RG-2	0.03	44	50

3. Maintenance of the water quality rain garden will be provided by the property owner.

V. SUMMARY

A. Compliance with Standards

1. This drainage report and plan are in general conformance with the City of Louisville Municipal Code.
2. This drainage report and plan are in general conformance with the Town of Lyons Storm Drainage Criteria Addendum to Urban Drainage Storm Drainage Criteria Manuals, Volumes 1, 2 and 3 (CRITERIA)
3. This drainage report and plan are in general conformance with the Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual.

B. Drainage Concept

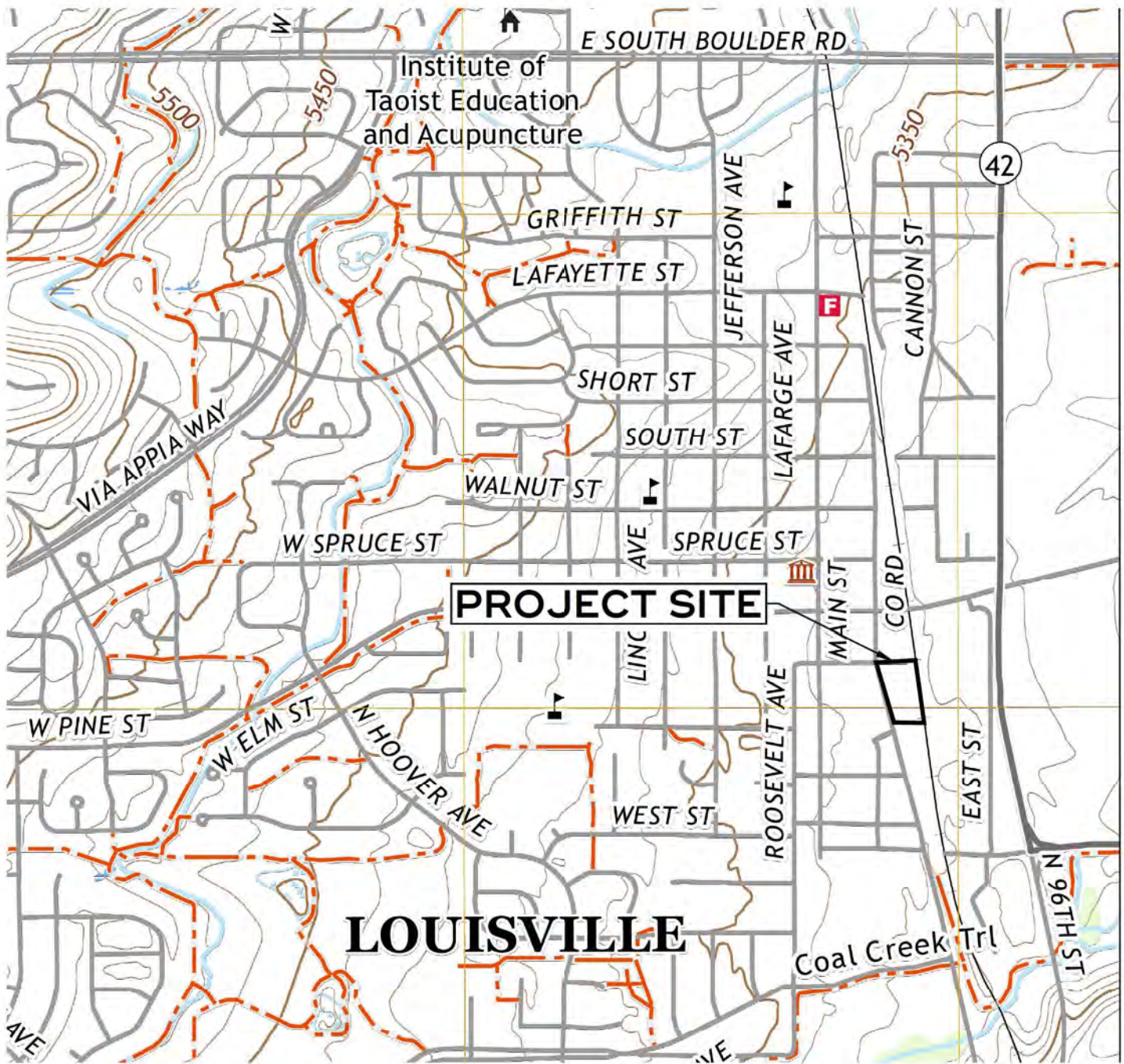
1. The primary consideration for this project was to design a drainage plan to offset the impact of the proposed construction. The drainage plan accommodates on-site runoff and off-site flows. The drainage will not negatively affect any upstream or downstream properties.
2. While this report is focused on the current redevelopment of Lot 2 and Outlot A, the drainage plan for the entire Mill Site development has also been included in a Phase 2 drawing, included in Appendix B. The Phase 2 drainage plan will include additional storm sewer lines to tie the parking lot cut off storm sewer to the existing type R inlet in the northeast corner of lot 3. Water quality will be provided in the form of a stormceptor that will treat runoff from Basins A1 and OS1

VI. REFERENCES

1. Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual, Volumes 1-3, dated August 2018.
2. FEMA LOMR 17-08-0625P, City of Louisville, dated March 8, 2018.
3. Preliminary Drainage Report for Louisville Mill Site, by JVA Consulting Engineers, dated April 3, 2015.

APPENDIX A

LOCATION MAP

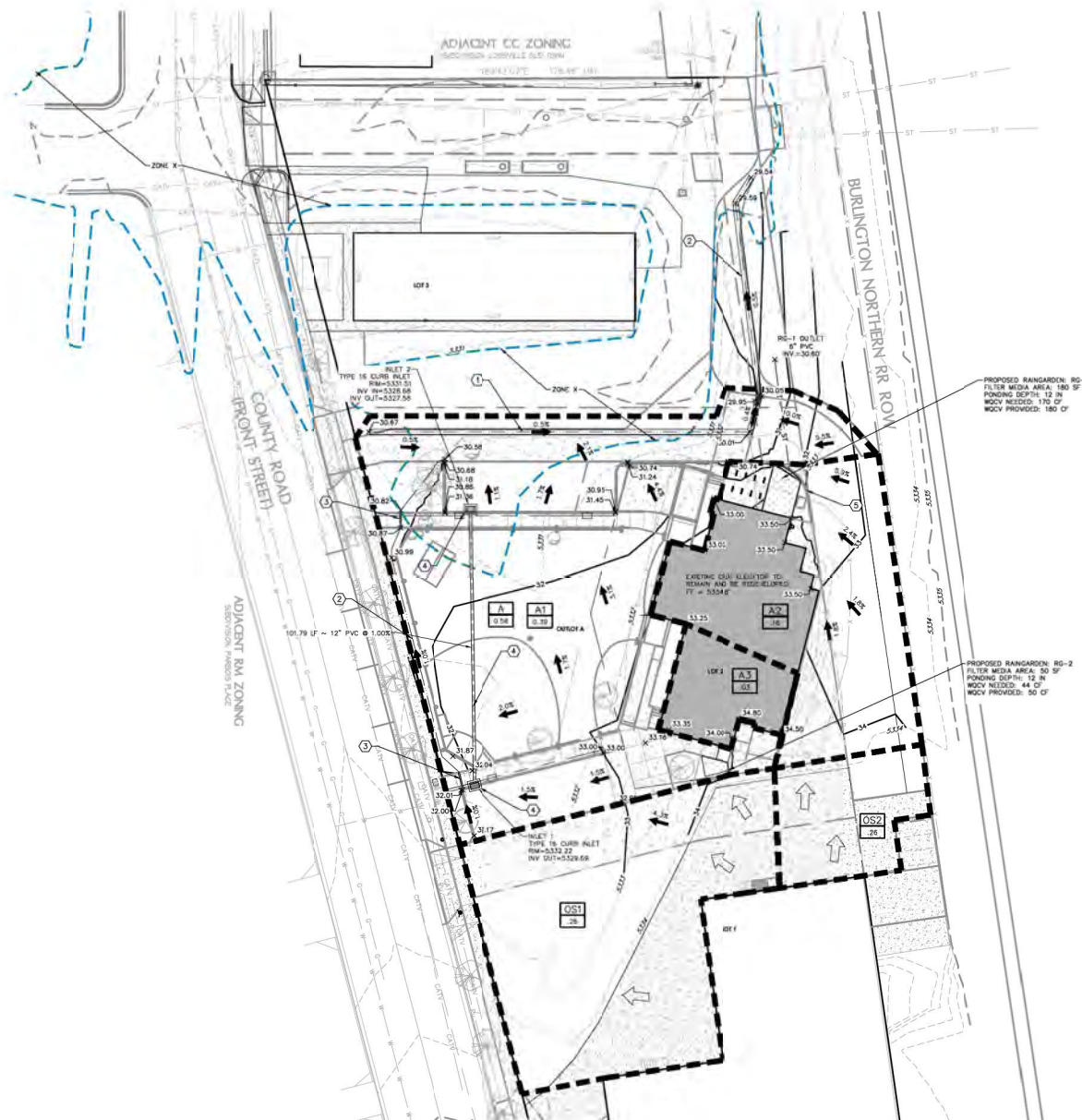


1 LOCATION MAP

SCALE: 1" = 1000'

APPENDIX B

DRAINAGE PLAN



LEGEND

- PROPOSED CONTOUR
ADD 5.00' TO ALL CONTOURS
- x 25.8 PROPOSED SPOT ELEVATION
ADD 5.00' TO ALL SPOT ELEVATIONS
- EXISTING SPOT ELEVATION
- PROPOSED FLOW DIRECTION
- HISTORIC SHEET FLOW
- A PROPOSED SUB-BASIN DESIGNATION
- 1 AREA IN ACRES
- PROPOSED BASIN BOUNDARY

GRADING NOTES

1. FLOOD INFORMATION: ACCORDING TO FEMA FLOOD INSURANCE MAP NO. 080330000K DATED 06/15/2018, THE NORTH OF OUTLET A IS LOCATED IN ZONE X (SHADED). AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREA LESS THAN 1 SQUARE MILE. THE ENTIRETY OF LOT 2 IS OUTSIDE OF ANY MAPPED FLOODPLAIN.
2. BENCHMARK INFORMATION: CITY OF LOUISVILLE UPS, FOUNDED 2.5" ALUMINUM CAP IN A RANGE BOX IN SOUTH ST. BEING THE CENTER E & CORNER OF SECTION 8 ELEVATION=344.45 (NAVD83). SITE BENCHMARKS AS SHOWN. CONTOURS SHOWN ARE FROM A GROUND SURVEY.
3. THE LOCATION OF THE ABOVE GROUND UTILITIES SHOWN HEREON ARE BASED ON THE FIELD SURVEY BY SITEWORKS, LLC DATED 07/26/2018. THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON S&P SURVEY AND INFORMATION PROVIDED BY OTHERS WHICH MAY INCLUDE THE UTILITY OWNER OR UTILITY LOCATING SERVICES. SITEWORKS, LLC IS NOT RESPONSIBLE FOR UTILITY INFORMATION PROVIDED BY OTHERS. SITEWORKS, LLC RECOMMENDS THAT THE LOCATION OF THE UTILITIES BE FIELD VERIFIED PRIOR TO ANY DIGGING ON OR ADJACENT TO THE SUBJECT PROPERTY.

KEYNOTES

1. PROPOSED 2" CONCRETE SWALE.
2. PROPOSED GRAVEL SWALE.
3. PROPOSED SIDEWALK CHASE.
4. PROPOSED UNDERGROUND STORM SEWER FOR FUTURE PHASE 2 DEVELOPMENT. STEEL COVER TO GO OVER STORM SEWER INLETS TO PREVENT ANY DRAINAGE UNTIL FUTURE DEVELOPMENT.
5. PROPOSED 12" CURB CUT TO ALLOW RUNOFF TO DRAIN INTO RAINGARDEN THROUGH SLOTTED CURB.



**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
520 & 540 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Louisville's Living Room LLC

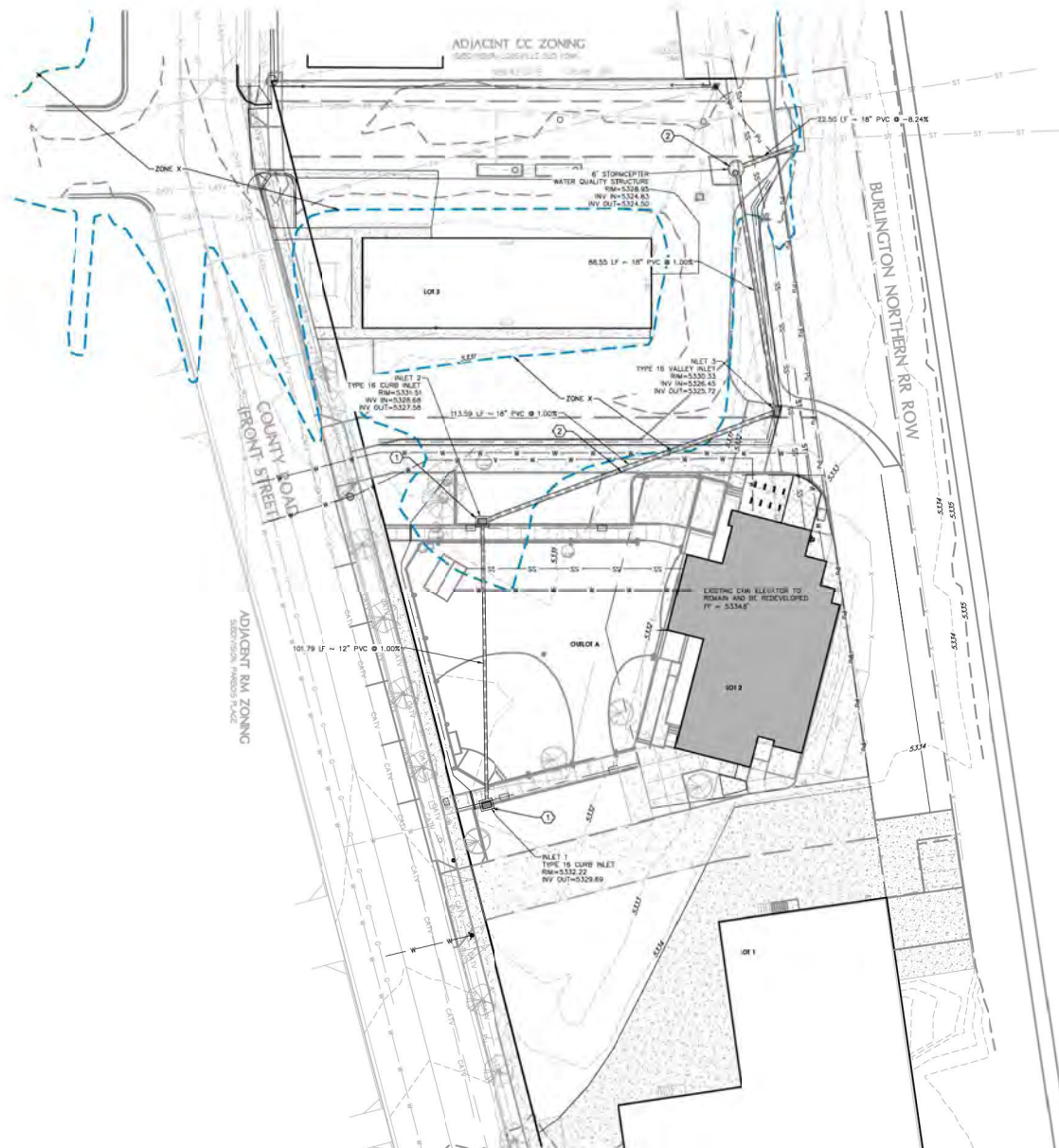
PHASE 1
FINAL
SUBMITTAL

PROJECT # 2588A
DATE 04/12/2019
DRAWN BY: JMM
CHECKED BY: JMM
REVISIONS:

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used without written consent of
Horvath Associates, P.C.

**GRADING
& DRAINAGE
PLAN**

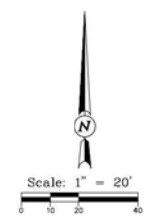
Sheet
C-101
1 of 4 Sheets



LEGEND	
	EXISTING CONTOUR
	EXISTING SEWER CLEANOUT
	EXISTING WATER METER
	EXISTING STORM MANHOLE
	EXISTING WATER VALVE
	EXISTING POWER POLE
	EXISTING LIGHT POLE
	EXISTING SIGN
	EXISTING FIRE HYDRANT
	EXISTING FENCE
	EXISTING OVERHEAD POWER LINE
	EXISTING SANITARY SEWER W/MANHOLE
	EXISTING WATER W/FIRE HYDRANT
	EXISTING STORM SEWER W/MANHOLE
	PROPOSED WATER W/FIRE HYDRANT
	PROPOSED SANITARY SEWER SERVICE
	PROPOSED GAS SERVICE
	PROPOSED WATER METER

KEYED NOTES ①

1. PROPOSED UNDERGROUND STORM SEWER FOR FUTURE TIE IN. STEEL COVER TO BE REMOVED AND INLETS ALLOWED TO DRAIN.
2. PROPOSED PHASE 2 STORM SEWER IMPROVEMENT. PARKING LOT SILVER TO DRAIN INTO STORMSEWER AND RE INTO EXISTING TYPE 2 INLET.



**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
520 & 540 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Louisville's Living Room LLC

PHASE 1
FINAL
PROPOSED

PROJECT # 25188A
DATE: 05/16/2015
DRAWN BY:
CHECKED BY:
REVISIONS:

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designer and shall not be
used without written consent of
Hartman Associates, P.C.

**UTILITY
PLAN
PHASE
2**

Sheet
C-201
4 of 4 Sheets

APPENDIX C

HYDROLOGIC CALCULATIONS

	Runoff Coefficients						Initial Overland Time (t _i) t _i =1.8(1.1-C _d)L ^{1/2} S ^{-1/3}			Travel Time (t _t) t _t =Length/(Velocity*60)					t _c Computed	t _c Urbanized Check	t _c Final	Rainfall Intensities (in/hr)				Flow Rates (cfs)				
Municipality: Boulder	Parcel Size (sf)						Overland Flow (L _o) (ft)								Time of Conc t _i + t _t = t _c	Total Length (ft)	t _c =(L/180)+10 (min)	Minimum t _c =5 min								
Parcel Name	C ₂	C ₅	C ₁₀	C ₁₀₀	% Impervious	Slope (ft/ft)	t _i (min)	Length (ft)	Slope (ft/ft)	Cv	Velocity (ft/s)	t _t (min)					I ₂	I ₅	I ₁₀	I ₁₀₀	Q ₂	Q ₅	Q ₁₀	Q ₁₀₀		
Basin H	25,429	0.22	0.29	0.37	0.59	53.65	175.0	0.015	17.1	40	0.0200	7	0.99	0.7	17.8	215	11.2	11.2	2.01	2.69	3.36	6.41	0.25	0.46	0.73	2.22
Basin A	25,265	0.39	0.42	0.47	0.60	55.59	320.0	0.020	17.6	40	0.0200	7	0.99	0.7	18.3	360	12.0	12.0	1.95	2.61	3.26	6.23	0.44	0.64	0.89	2.15
Basin A1	16,988	0.34	0.36	0.40	0.53	47.18	320.0	0.020	19.2	40	0.0150	7	0.86	0.8	20.0	360	12.0	12.0	1.95	2.61	3.26	6.23	0.26	0.37	0.51	1.28
Basin A2	6,970	0.43	0.49	0.55	0.70	68.72	100.0	0.030	7.8	20	0.0150	7	0.86	0.4	8.2	120	10.7	8.2	2.26	3.03	3.79	7.24	0.15	0.24	0.34	0.82
Basin A3	1,307	0.80	0.85	0.90	0.90	95.00	50.0	0.010	3.2	20	0.0150	7	0.86	0.4	3.6	70	10.4	5.0	2.63	3.53	4.41	8.41	0.06	0.09	0.12	0.23
Basin OS1	9,148	0.63	0.66	0.70	0.81	83.33	100.0	0.030	5.5	20	0.0150	7	0.86	0.4	5.9	120	10.7	5.9	2.51	3.36	4.21	8.02	0.33	0.47	0.62	1.36
Basin OS2	2,178	0.73	0.75	0.77	0.84	88.00	100.0	0.030	4.5	20	0.0150	7	0.86	0.4	4.9	120	10.7	5.0	2.63	3.53	4.41	8.41	0.10	0.13	0.17	0.35

APPENDIX D

WATER QUALITY CALCULATIONS

Site Layout

SCM Design, Version 4.00 (April 2024)

Designer: DRS

Company: Siteworks, LLC

Date: September 12, 2025

Project: Louisville Mill Site Redevelopment

Location: 540 County Road

SITE LAYOUT INFO (User Input in Blue Cells)

Water Quality Event (WQE) 0.60 inches

Outfall ID	1	2										
Total Tributary Area (ft ²)	1,469	7,048										
Imperviousness (%)	95.0%	85.0%										
MS4 Design Standard	WQCV	WQCV										
SCM Type	BR	BR										

Notes:

OUTFALL RESULTS

SCM Worksheet Name	BR_1	BR_2										
Untreated Area (ft ³)	0	0										
Default WQCV (ft ³)	44	170										
WQCV Reduction (ft ³)	0	0										
Remaining WQCV (ft ³)	44	170										
WQCV Reduction (%)	0%	0%										
Design WQCV of SCM (ft ³)	50	180										
Pollutant Removal (ft ³)	0	0										
Untreated WQCV (ft ³)	0	0										

TOTAL SITE RESULTS (Sums results from all Outfalls)

Total Site Area	8,517	ft ²	0.20	acres
Treated Area	8,517	ft ²	0.20	acres
Untreated Area	0	ft ²	0.00	acres
Total Site Imperviousness	86.7%	%		
Default WQCV	214	ft ³	0.005	acre-feet
Remaining WQCV	214	ft ³	0.005	acre-feet
WQCV Reduction	0%	%		
Design WQCV	230	ft ³	0.005	acre-feet
Untreated WQCV	0	ft ³	0.000	acre-feet

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: **DRS**

Company: **Siteworks, LLC**

Date: **September 12, 2025**

Project: **Louisville Mill Site Redevelopment**

Location: **540 County Road**

Outfall ID: **2**

1. Subsurface Exploration and Infiltration System Selection

A) Identify Site Constraints

- i) Is subgrade depth to bedrock < 3 feet?
- ii) Is subgrade depth to seasonal high groundwater table < 3 feet?

B) Identify Site Risks

- i) Are expansive/collapsible soils present?
- ii) Are highly concentrated pollutant sources present (hotspot)?
- iii) Is site located above contaminated soils or groundwater?
- iv) Is SCM located at top of steep slope? (> 3H:1V)
- v) Is SCM located adjacent to building, hardscape, or pavement?
- vi) Is SCM located above building foundation wall backfill?
- vii) Are there other concerns that indicate high risk for infiltration?

C) Preliminary Infiltration/Percolation Tests of underlying soils

- i) Were preliminary infiltration/percolation tests conducted?
- ii) Preliminary estimate of infiltration rate

$F_{\text{prelim}} =$ in/hr

D) Final Design Infiltrometer Test

- i) Were infiltrometer tests conducted?
- ii) Select type of infiltrometer test performed:
- iii) How many locations were tested?
- iv) Describe test locations relative to borings/pits

$N_{\text{Tests}} =$

- v) What was the maximum infiltration rate tested?
- vi) What was the minimum infiltration rate tested?
- vii) Design Infiltration Rate

$F_{\text{Max}} =$ in/hr
 $F_{\text{Min}} =$ in/hr
 $F_{\text{Design}} =$ in/hr

E) Recommended Infiltration System

F) Select Infiltration System to use for Design

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: DRS
Company: Siteworks, LLC
Date: September 12, 2025
Project: Louisville Mill Site Redevelopment
Location: 540 County Road
Outfall ID: 2

2. Inlet Design and Pretreatment

A) Is RPA (GB/GS) used for Runoff Reduction upstream of SCM?

NO

Define inflow points for all areas tributary to the SCM below.

B) Inflow Points contributing to SCM (max 8)

Inflow Design Point ID	1	2						
Tributary Area to Inflow Point (ft ²)	2,415	4,632						
Imperviousness above Inflow Point (%)	85.0%	85.0%						
Default WQCV for Inflow Point (ft ³)	58	112						
WQCV Reduction above Inflow Point (ft ³)	0							
Remaining WQCV at Inflow Point (ft ³)	58	112						
Will pretreatment be provided with a Sedimentation MTD (HDS)	NO	NO						
Paired Pretreatment HDS Worksheet Name	--	--						
Sheet or Concentrated Flow	Conc	Sheet						

C) Sheet Flow

Select sheet flow inflow feature	--	Slotted						
Is Concrete Edger used?	--	--						
Spacing between slots, recommend ≤ 2 ft on center (ft)	--	0.50						
Slot Opening Length, recommend 1.5 (in)	--	1.50						
Select type of blind swale used to distribute flow	--	--						
Select energy dissipation method for level spreader	--	--						
Height of drop, recommend 2 to 3 (in)	--	2.00						
Is concrete mowing strip provided to facilitate maintenance?	--	NO						

D) Concentrated Flow

Select concentrated flow inflow feature	Downspout	--						
Is downspout extension needed to bridge backfill zone?	--	--						
Depth of gutter flow line depression for curb opening, recommend 3 (in)	--	--						
Curb opening inlet width (ft)	--	--						
Height of drop to sediment pad/forebay, recommend ≥ 1 (in)	--	--						
Select energy dissipation method for downspouts and/or curb openings.	--	--						
Select energy dissipation method for swales, channels, and piped outfalls	--	--						

v) Forebay

Impervious area tributary to concentrated inflow location (ft ²)	--	--						
Forebay Type (Concrete Sediment Pad sufficient for Imp Area ≤ 2 acre)	--	--						
Minimum Forebay Volume (ft ³)	--	--						
Design Forebay Volume (ft ³)	--	--						
Maximum Forebay Depth (in)	--	--						
Design Forebay Depth (in)	--	--						
Rectangular Weir Notch Width to Empty Forebay in 5-minutes (in)	--	--						
Design Notch Width (in)	--	--						
Forebay Drain Time (minutes)	--	--						

Provide pretreatment to remove coarse sediment, trash and debris. This is especially critical for roadway runoff to bioretention systems.

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: DRS
Company: Siteworks, LLC
Date: September 12, 2025
Project: Louisville Mill Site Redevelopment
Location: 540 County Road
Outfall ID: 2

3. Design Storage Volume

- A) Contributing Watershed Area (including bioretention area)
 B) Imperviousness of Tributary Area
 C) Default WQCV
 D) WQCV Reduction resulting from Upstream RPA (GB/GS)
 E) Remaining WQCV

Inflow Points above should be fully defined before proceeding below

Area = 7,048 ft²

i = 85.0% %

V_{WQCV Default} = 170 ft³

WQCV Reduction = 0

V_{WQCV Remaining} = 170

4. Bioretention System Basin Geometry

- A) Minimum Filter Media Surface Area
 B) Design Filter Media Surface Area
 C) WQCV Ponding Depth (recommend max. 12-inch)
 D) Media Surface Slope (typically flat or mild slope < 0.01 ft/ft)
 E) Max. Side Slope (Z = 4:1 or flatter, horiz. dist per unit vertical)
 (Use "0" if bioretention has vertical walls)
 F) Media Surface Length-to-Width Ratio
 G) Calculated WQCV (based on A_{F Design}, D_{WQCV}, and Z)
 H) Design WQCV (based on actual design geometry)
 I) If basin geometry is irregular, design volume differs, or media pore space is being utilized, please provide description.

A_{F Min} = 120 ft²

A_{F Design} = 180 ft²

D_{WQCV} = 12.00 in

S_{Surface} = 0.000 ft / ft

Z = 0.00 ft / ft

R_{LW} = 1.8

V_{WQCV Calculated} = 180 ft³

V_{WQCV Design} = 180 ft³

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: **DRS**
Company: **Siteworks, LLC**
Date: **September 12, 2025**
Project: **Louisville Mill Site Redevelopment**
Location: **540 County Road**
Outfall ID: **2**

5. Underdrain System, Impermeable Liner, and Geotextile

- A) Are underdrains provided?
- B) Is a Drain Trench provided consistent with Figure 4-2?
- Trench Bottom Width $\geq$ 12 inches, Trench Depth $\geq$ 15 inches
 - Drain gravel satisfies gradation specifications for AASHTO M 43 No. 8 coarse aggregate
 - Filter sand above drain gravel satisfies gradation specifications for AASHTO M 43 fine aggregate
 - Filter sand depth above drain trench $\geq$ 6 inches
 - Filter sand extends $\geq$ 12 inches beyond trench top width
- C) Select Factory-Slotted Pipe Size and Material
- D) Does the specified pipe material meet the specifications for slot configurations shown in Table 4-6 and Figure 4-3.
- E) Are cleanouts provided for inspection and maintenance?
- F) Is an impermeable geomembrane liner provided?
- G) Are details provided regarding sealing at underdrain penetrations similar to Figure 4-6?
- H) Are geomembrane connections to vertical concrete surfaces consistent with Figure 4-7?
- I) Do the plans specify thermal welding and air lance testing of joints?

6. Bioretention Media

- A) Depth of Media (18-inch minimum, 36-inch when trees planted)
- B) Do construction documents specify media testing requirements?

$D_{Media} =$ in

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer:	DRS
Company:	Siteworks, LLC
Date:	September 12, 2025
Project:	Louisville Mill Site Redevelopment
Location:	540 County Road
Outfall ID:	2

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: DRS
Company: Siteworks, LLC
Date: September 12, 2025
Project: Louisville Mill Site Redevelopment
Location: 540 County Road
Outfall ID: 2

7. Vegetation

A) Select the method of vegetation planting (pulldown list).
Consult with vegetation specialist to consider shade, heat island effects, application of deicers in the watershed, and other site-specific factors.

B) Has a landscape/vegetation management plan been developed?

C) Describe vegetation/landscaping considerations:

- Stability issues (steep slopes, high erosion potential)?
- Topsoil management (assessment, stockpiling, and placement)?
- Community benefits with place-making approach?
- Biodiversity of the site including pollinator species?
- Environmental stewardship through conservation?
- Inundation frequency and depth impacts on vegetation?
- Required maintenance activities and intervals?

8. Irrigation

A) How will irrigation be provided for vegetation establishment?

9. Outlet

A) Underdrain Orifice Diameter for 12-hour drain time

i) Underdrain Orifice Invert Depth
(distance from filter media surface to orifice invert)

y = in

ii) Calculated Underdrain Orifice Diameter
Simplified Equation (when not using MHFD-Detention)
MHFD-Detention Calculation (if used)

Dia. Simplified = in

Dia. MHFD-Detention = in

iii) Underdrain Orifice Diameter specified on construction plans

Orifice Dia. Design = in

B) Describe Underdrain Orifice Outlet Configuration.

C) Describe Outlet Structure(s) for events larger than WQCV.
(full-spectrum detention, overflow spillway, etc.)

Notes:

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: **DRS**

Company: **Siteworks, LLC**

Date: **September 12, 2025**

Project: **Louisville Mill Site Redevelopment**

Location: **540 County Road**

Outfall ID: **1**

1. Subsurface Exploration and Infiltration System Selection

A) Identify Site Constraints

- i) Is subgrade depth to bedrock < 3 feet?
- ii) Is subgrade depth to seasonal high groundwater table < 3 feet?

NO

B) Identify Site Risks

- i) Are expansive/collapsible soils present?
- ii) Are highly concentrated pollutant sources present (hotspot)?
- iii) Is site located above contaminated soils or groundwater?
- iv) Is SCM located at top of steep slope? (> 3H:1V)
- v) Is SCM located adjacent to building, hardscape, or pavement?
- vi) Is SCM located above building foundation wall backfill?
- vii) Are there other concerns that indicate high risk for infiltration?

C) Preliminary Infiltration/Percolation Tests of underlying soils

- i) Were preliminary infiltration/percolation tests conducted?
- ii) Preliminary estimate of infiltration rate

$F_{\text{prelim}} =$ in/hr

D) Final Design Infiltrometer Test

- i) Were infiltrometer tests conducted?
- ii) Select type of infiltrometer test performed:
- iii) How many locations were tested?
- iv) Describe test locations relative to borings/pits

$N_{\text{Tests}} =$

- v) What was the maximum infiltration rate tested?
- vi) What was the minimum infiltration rate tested?
- vii) Design Infiltration Rate

$F_{\text{Max}} =$ in/hr
 $F_{\text{Min}} =$ in/hr
 $F_{\text{Design}} =$ in/hr

E) Recommended Infiltration System

--

F) Select Infiltration System to use for Design

--

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: DRS
Company: Siteworks, LLC
Date: September 12, 2025
Project: Louisville Mill Site Redevelopment
Location: 540 County Road
Outfall ID: 1

2. Inlet Design and Pretreatment

Define inflow points for all areas tributary to the SCM below.

A) Is RPA (GB/GS) used for Runoff Reduction upstream of SCM?

NO

B) Inflow Points contributing to SCM (max 8)

Inflow Design Point ID	1							
Tributary Area to Inflow Point (ft ²)	1,469							
Imperviousness above Inflow Point (%)	95.0%							
Default WQCV for Inflow Point (ft ³)	44							
WQCV Reduction above Inflow Point (ft ³)	0							
Remaining WQCV at Inflow Point (ft ³)	44							
Will pretreatment be provided with a Sedimentation MTD (HDS)								
Paired Pretreatment HDS Worksheet Name								
Sheet or Concentrated Flow	Conc							

C) Sheet Flow

Select sheet flow inflow feature	--							
Is Concrete Edger used?	--							
Spacing between slots, recommend ≤ 2 ft on center (ft)	--							
Slot Opening Length, recommend 1.5 (in)	--							
Select type of blind swale used to distribute flow	--							
Select energy dissipation method for level spreader	--							
Height of drop, recommend 2 to 3 (in)	--							
Is concrete mowing strip provided to facilitate maintenance?	--							

D) Concentrated Flow

Select concentrated flow inflow feature	Downspout							
Is downspout extension needed to bridge backfill zone?	NO							
Depth of gutter flow line depression for curb opening, recommend 3 (in)	--							
Curb opening inlet width (ft)	--							
Height of drop to sediment pad/forebay, recommend ≥ 1 (in)	--							
Select energy dissipation method for downspouts and/or curb openings.	Concrete							
Select energy dissipation method for swales, channels, and piped outfalls	--							

v) Forebay

Impervious area tributary to concentrated inflow location (ft ²)	--							
Forebay Type (Concrete Sediment Pad sufficient for Imp Area ≤ 2 acre)	--							
Minimum Forebay Volume (ft ³)	--							
Design Forebay Volume (ft ³)	--							
Maximum Forebay Depth (in)	--							
Design Forebay Depth (in)	--							
Rectangular Weir Notch Width to Empty Forebay in 5-minutes (in)	--							
Design Notch Width (in)	--							
Forebay Drain Time (minutes)	--							

Provide pretreatment to remove coarse sediment, trash and debris. This is especially critical for roadway runoff to bioretention systems.

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: DRS
 Company: Siteworks, LLC
 Date: September 12, 2025
 Project: Louisville Mill Site Redevelopment
 Location: 540 County Road
 Outfall ID: 1

3. Design Storage Volume

- A) Contributing Watershed Area (including bioretention area)
 B) Imperviousness of Tributary Area
 C) Default WQCV
 D) WQCV Reduction resulting from Upstream RPA (GB/GS)
 E) Remaining WQCV

Inflow Points above should be fully defined before proceeding below

Area = ft²

i = %

V_{WQCV Default} = ft³

WQCV Reduction =

V_{WQCV Remaining} =

4. Bioretention System Basin Geometry

- A) Minimum Filter Media Surface Area
 B) Design Filter Media Surface Area
 C) WQCV Ponding Depth (recommend max. 12-inch)
 D) Media Surface Slope (typically flat or mild slope < 0.01 ft/ft)
 E) Max. Side Slope (Z = 4:1 or flatter, horiz. dist per unit vertical)
 (Use "0" if bioretention has vertical walls)
 F) Media Surface Length-to-Width Ratio
 G) Calculated WQCV (based on A_{F Design}, D_{WQCV}, and Z)
 H) Design WQCV (based on actual design geometry)
 I) If basin geometry is irregular, design volume differs, or media pore space is being utilized, please provide description.

A_{F Min} = ft²

A_{F Design} = ft²

D_{WQCV} = in

S_{Surface} = ft / ft

Z = ft / ft

R_{LW} =

V_{WQCV Calculated} = ft³

V_{WQCV Design} = ft³

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: DRS
Company: Siteworks, LLC
Date: September 12, 2025
Project: Louisville Mill Site Redevelopment
Location: 540 County Road
Outfall ID: 1

5. Underdrain System, Impermeable Liner, and Geotextile

- A) Are underdrains provided?
- B) Is a Drain Trench provided consistent with Figure 4-2?
- Trench Bottom Width $\geq$ 12 inches, Trench Depth $\geq$ 15 inches
 - Drain gravel satisfies gradation specifications for AASHTO M 43 No. 8 coarse aggregate
 - Filter sand above drain gravel satisfies gradation specifications for AASHTO M 43 fine aggregate
 - Filter sand depth above drain trench $\geq$ 6 inches
 - Filter sand extends $\geq$ 12 inches beyond trench top width
- C) Select Factory-Slotted Pipe Size and Material
- D) Does the specified pipe material meet the specifications for slot configurations shown in Table 4-6 and Figure 4-3.
- E) Are cleanouts provided for inspection and maintenance?
- F) Is an impermeable geomembrane liner provided?
- G) Are details provided regarding sealing at underdrain penetrations similar to Figure 4-6?
- H) Are geomembrane connections to vertical concrete surfaces consistent with Figure 4-7?
- I) Do the plans specify thermal welding and air lance testing of joints?

YES

6. Bioretention Media

- A) Depth of Media (18-inch minimum, 36-inch when trees planted)
- B) Do construction documents specify media testing requirements?

$D_{Media} =$ in

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: **DRS**

Company: **Siteworks, LLC**

Date: **September 12, 2025**

Project: **Louisville Mill Site Redevelopment**

Location: **540 County Road**

Outfall ID: **1**

Bioretention System (BR)

SCM Design, Version 4.00 (April 2024)

Designer: DRS
Company: Siteworks, LLC
Date: September 12, 2025
Project: Louisville Mill Site Redevelopment
Location: 540 County Road
Outfall ID: 1

7. Vegetation

A) Select the method of vegetation planting (pulldown list).
Consult with vegetation specialist to consider shade, heat island effects, application of deicers in the watershed, and other site-specific factors.

B) Has a landscape/vegetation management plan been developed?

C) Describe vegetation/landscaping considerations:

- Stability issues (steep slopes, high erosion potential)?
- Topsoil management (assessment, stockpiling, and placement)?
- Community benefits with place-making approach?
- Biodiversity of the site including pollinator species?
- Environmental stewardship through conservation?
- Inundation frequency and depth impacts on vegetation?
- Required maintenance activities and intervals?

8. Irrigation

A) How will irrigation be provided for vegetation establishment?

9. Outlet

A) Underdrain Orifice Diameter for 12-hour drain time

i) Underdrain Orifice Invert Depth
(distance from filter media surface to orifice invert)

y = in

ii) Calculated Underdrain Orifice Diameter
Simplified Equation (when not using MHFD-Detention)
MHFD-Detention Calculation (if used)

Dia. Simplified = in

Dia. MHFD-Detention = in

iii) Underdrain Orifice Diameter specified on construction plans

Orifice Dia. Design = in

B) Describe Underdrain Orifice Outlet Configuration.

C) Describe Outlet Structure(s) for events larger than WQCV.
(full-spectrum detention, overflow spillway, etc.)

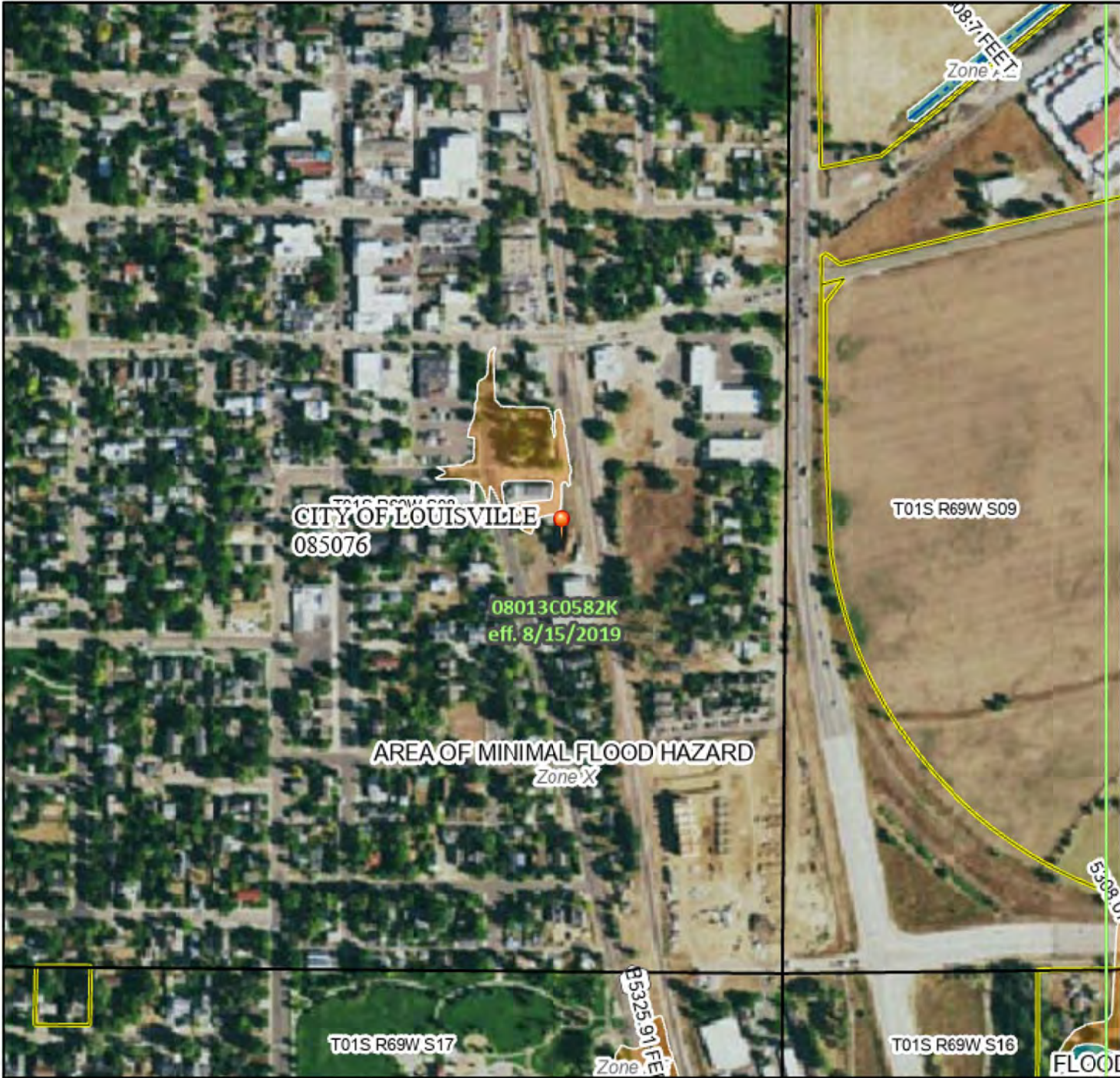
Notes:

APPENDIX E

RELEVANT DOCUMENTS

National Flood Hazard Layer FIRMette

105°8'7"W 39°58'45"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, A0, 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 |
| GENERAL STRUCTURES | | Area of Undetermined Flood Hazard Zone D |
| | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| OTHER FEATURES | | Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| MAP PANELS | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |
- 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 5/16/2025 at 4:56 AM 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.



Federal Emergency Management Agency

Washington, D.C. 20472

October 25, 2017

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Bob Muckle
Mayor, City of Louisville
749 Main Street
Louisville, CO 80027

IN REPLY REFER TO:

Case No.: 17-08-0625P
Community Name: City of Louisville, CO
Community No.: 085076
Effective Date of
This Revision: March 8, 2018

Dear Mayor Muckle:

The Flood Insurance Study report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed that provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Denver, Colorado, at (303) 235-4830, or the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at <http://www.fema.gov/national-flood-insurance-program>.

Sincerely,

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: The Honorable Deb Gardner
Chair, Boulder County
Board of Commissioners

Mr. Aaron Asquith P.E.
City Engineer
City of Lafayette

The Honorable Christine Berg
Mayor, City of Lafayette

Ms. Deb Ohlinger, P.E. CFM
Project Engineer
Olsson Associates

Mr. Robert Zuccaro, AICP
Planning & Building Safety Director
City of Louisville

Ms. Varda Blum, CFM
Floodplain Program Manager
Boulder County



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Louisville Boulder County Colorado	CHANNELIZATION	HYDRAULIC ANALYSIS HYDROLOGIC ANALYSIS UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 085076		
IDENTIFIER	Lafayette-Louisville Boundary Area Drainage Improvements Project	APPROXIMATE LATITUDE AND LONGITUDE: 39.982, -105.120 SOURCE: USGS QUADRANGLE DATUM: NAD 83	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 08013C0601J DATE: December 18, 2012 TYPE: FIRM* NO.: 08013C0582J DATE: December 18, 2012		DATE OF EFFECTIVE FLOOD INSURANCE STUDY: December 18, 2012 PROFILES: 381P-383P SUMMARY OF DISCHARGES TABLE: 4	

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map

FLOODING SOURCES AND REVISED REACHES

See Page 2 for Additional Flooding Sources

Drainageway A-2 - From the confluence with Drainageway A to approximately 1,170 feet upstream of the confluence with Drainageway A

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Drainageway A-2	Zone X (unshaded)	Zone AE	YES	NONE
	No BFEs*	BFEs	YES	NONE
	Zone AE	Zone X (unshaded)	NONE	YES
	Zone AH	Zone X (shaded)	NONE	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3801 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional information about the NFIP is available on our website at <http://www.fema.gov/national-flood-insurance-program>.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

17-08-0625P

102-I-A-C



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

OTHER FLOODING SOURCES AFFECTED BY THIS REVISION

FLOODING SOURCE AND REVISED REACH

Drainageway A-2 - From the confluence with Drainageway A to approximately 1,170 feet upstream of the confluence with Drainageway A
Drainageway A - From the confluence with Drainageway 7 to approximately 800 feet upstream of the confluence with Drainageway A-2

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Drainageway A-2	BFEs*	No BFEs	NONE	YES
	Zone A	Zone AE	NONE	YES
	Zone X (shaded)	Zone X (unshaded)	NONE	YES
Drainageway A	Zone X (shaded)	Zone X (unshaded)	NONE	YES
	Zone AH	Zone X (unshaded)	NONE	YES
	Zone AE	Zone X (unshaded)	NONE	YES
	Zone X (shaded)	Zone AE	YES	YES
	No BFEs	BFEs	YES	NONE
	BFEs	No BFEs	NONE	YES

* BFEs - Base Flood Elevations

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <http://www.fema.gov/national-flood-insurance-program>.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

17-08-0625P

102-I-A-C



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

OTHER COMMUNITIES AFFECTED BY THIS REVISION

CID Number: 080023 **Name:** Boulder County, Colorado

AFFECTED MAP PANELS			AFFECTED PORTIONS OF THE FLOOD INSURANCE STUDY REPORT
TYPE: FIRM*	NO.: 08013C0601J	DATE: December 18, 2012	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: December 18, 2012 PROFILES: 381P-386P SUMMARY OF DISCHARGES TABLE: 4
TYPE: FIRM*	NO.: 08013C0582J	DATE: December 18, 2012	

CID Number: 080026 **Name:** City of Lafayette, Colorado

AFFECTED MAP PANELS			AFFECTED PORTIONS OF THE FLOOD INSURANCE STUDY REPORT
TYPE: FIRM*	NO.: 08013C0601J	DATE: December 18, 2012	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: December 18, 2012 PROFILES: 384P SUMMARY OF DISCHARGES TABLE: 4

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional information about the NFIP is available on our website at <http://www.fema.gov/national-flood-insurance-program>.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance discharges computed in the submitted hydrologic model. Future development of projects upstream could cause increased discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on discharges and could, therefore, indicate that greater flood hazards exist in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <http://www.fema.gov/national-flood-insurance-program>.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Jeanine D. Petterson
Director, Mitigation Division
Federal Emergency Management Agency, Region VIII
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267
(303) 235-4830

STATUS OF THE COMMUNITY NFIP MAPS

We are processing a revised FIRM and FIS report for Boulder County in our countywide format; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the countywide FIRM and FIS report, which present information from the effective FIRMs and FIS reports for your community and incorporated communities in Boulder County, were submitted to your community for review on February 16, 2017. We will incorporate the modifications made by this LOMR into the countywide FIRM and FIS report before they become effective.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional information about the NFIP is available on our website at <http://www.fema.gov/national-flood-insurance-program>.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

PUBLIC NOTIFICATION OF REVISION

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below, and through FEMA's Flood Hazard Mapping website at https://www.floodmaps.fema.gov/fhm/bfe_status/bfe_main.asp

LOCAL NEWSPAPER

Name: *The Daily Camera*

Dates: November 1, 2017 and November 8, 2017

Within 90 days of the second publication in the local newspaper, any interested party may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised flood hazard determination presented in this LOMR may be changed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional information about the NFIP is available on our website at <http://www.fema.gov/national-flood-insurance-program>.

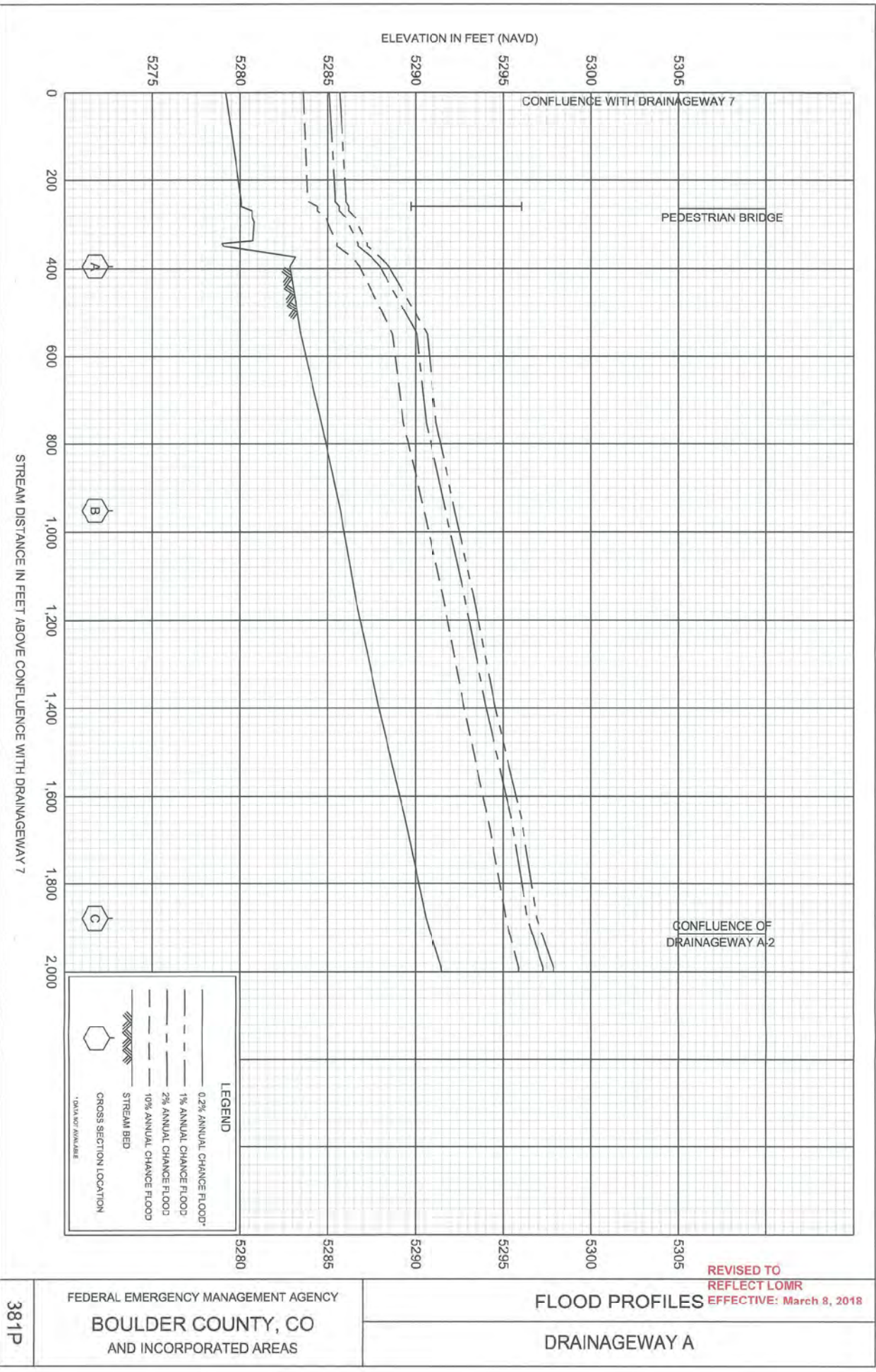
Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

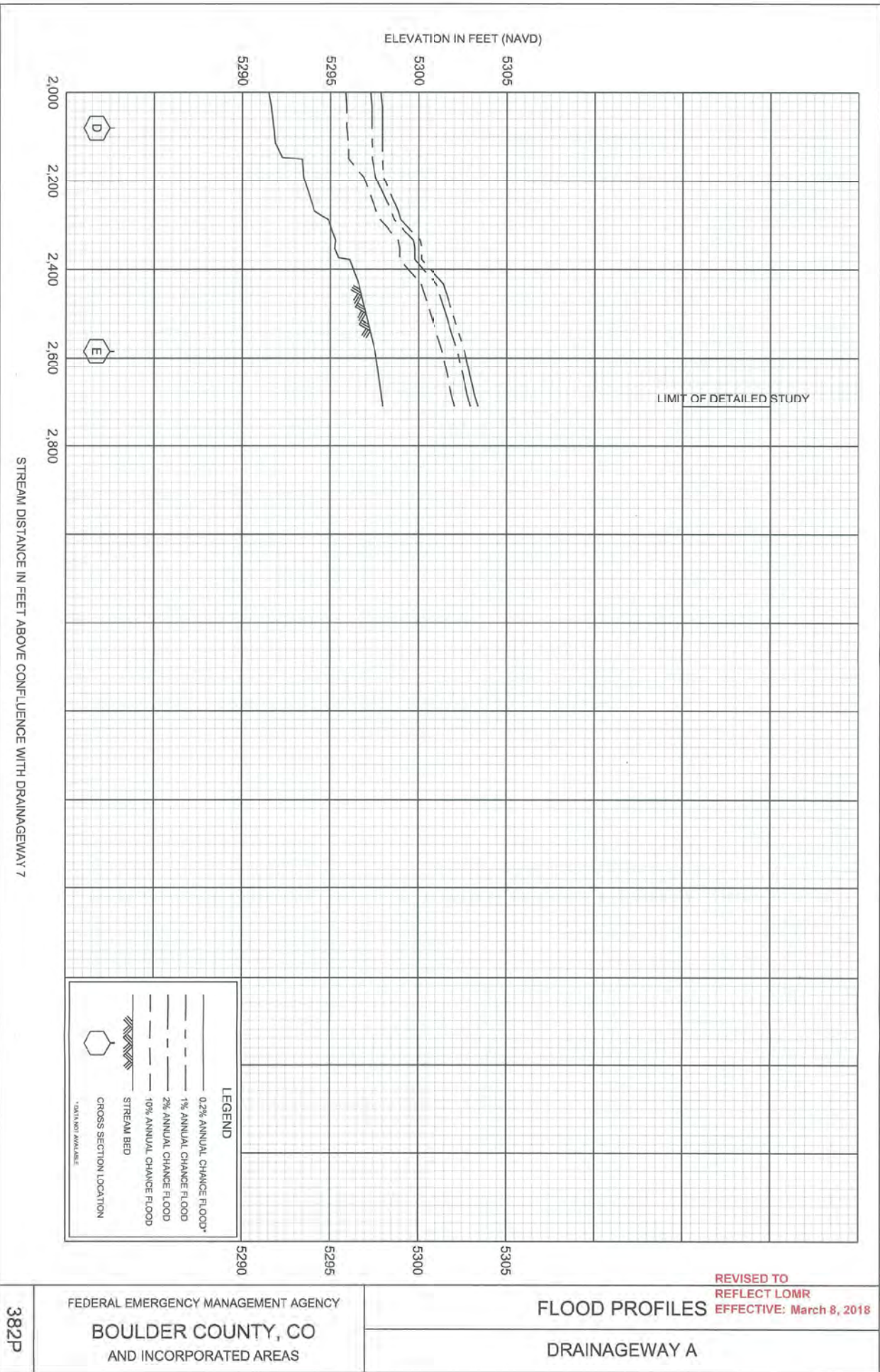
Table 4 - Summary of Discharges (Continued)

<u>Flooding Source and Location</u>	<u>Drainage Area (Square Miles)</u>	<u>Peak Discharges (cfs)</u>			
		<u>10-Percent Annual Chance</u>	<u>2-Percent Annual Chance</u>	<u>1-Percent Annual Chance</u>	<u>0.2-Percent Annual Chance</u>
Drainageway A Upstream of Confluence with Drainageway 7	1.39	400	724	894	— ¹
Upstream of Confluence with Drainageway A-2	1.13	157	281	367	— ¹
Drainageway A-2 Upstream of Confluence with Drainageway A	0.21	266	457	566	— ¹
Drainageway 7-2 Upstream of Confluence with Drainageway 7	0.39	181	315	383	— ¹
Drainageway 7 Upstream of Confluence with Coal Creek	1.92	647	1,238	1,544	— ¹

¹ Data Not Available

**REVISED TO
REFLECT LOMR
EFFECTIVE: March 8, 2018**





REVISED TO
REFLECT LOMR
EFFECTIVE: March 8, 2018

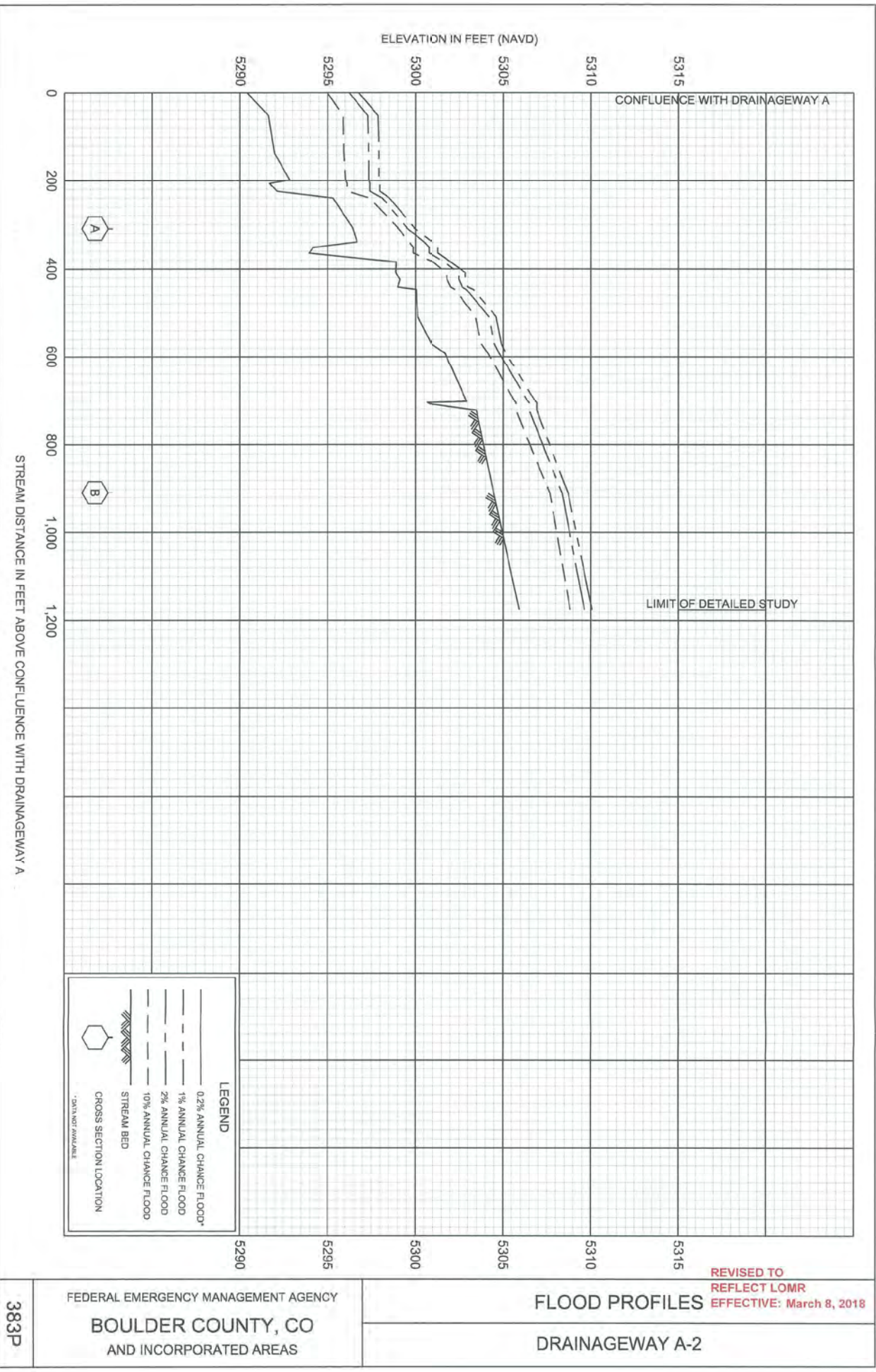
FLOOD PROFILES

DRAINAGEWAY A

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO

AND INCORPORATED AREAS



383P

FEDERAL EMERGENCY MANAGEMENT AGENCY
BOULDER COUNTY, CO
AND INCORPORATED AREAS

FLOOD PROFILES
DRAINAGEWAY A-2

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REFLECT LOMR
EFFECTIVE: March 8, 2018



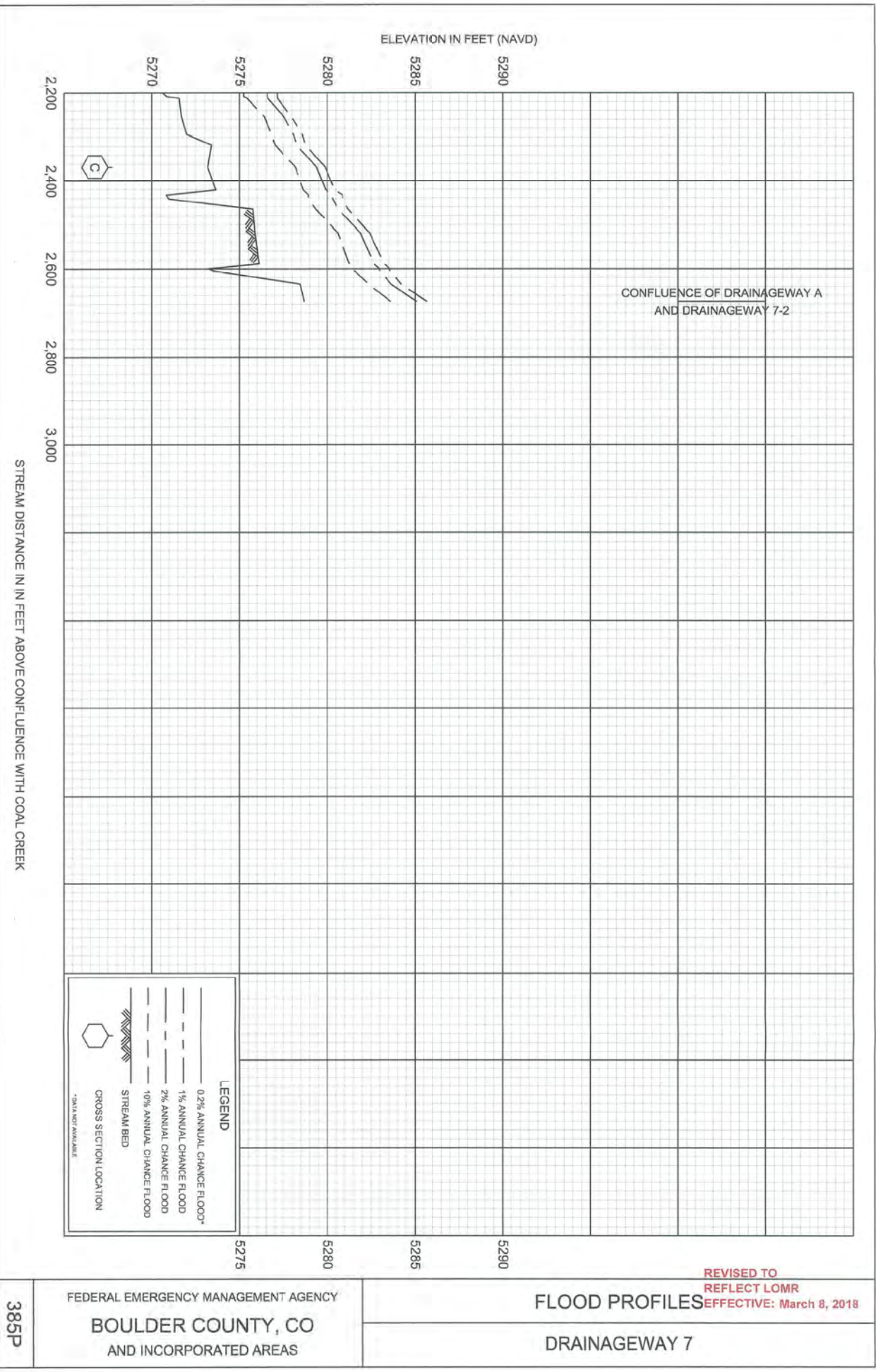
REVISED TO
REFLECT LOMR
EFFECTIVE: March 8, 2018

FLOOD PROFILES

DRAINAGEWAY 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

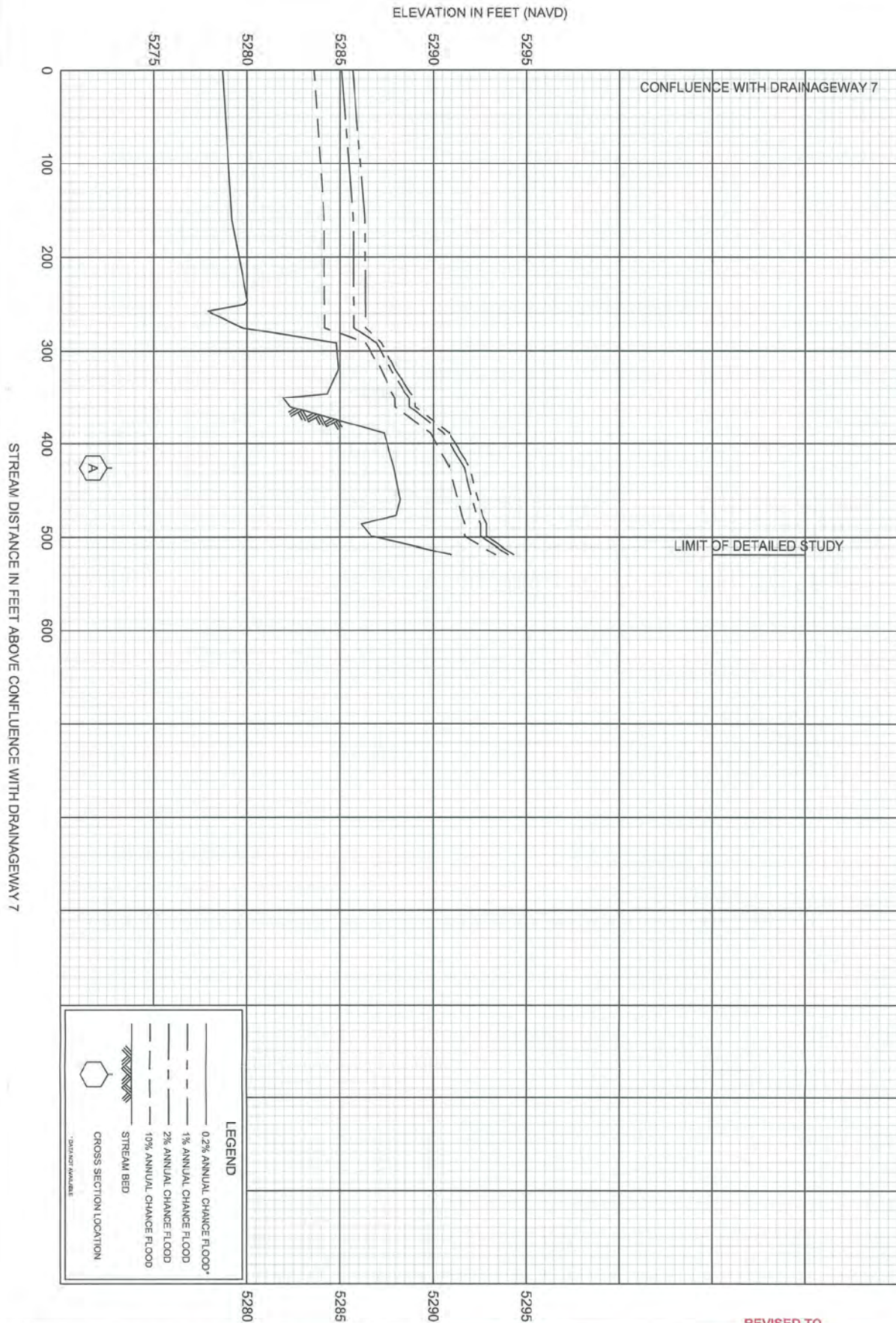
BOULDER COUNTY, CO
AND INCORPORATED AREAS

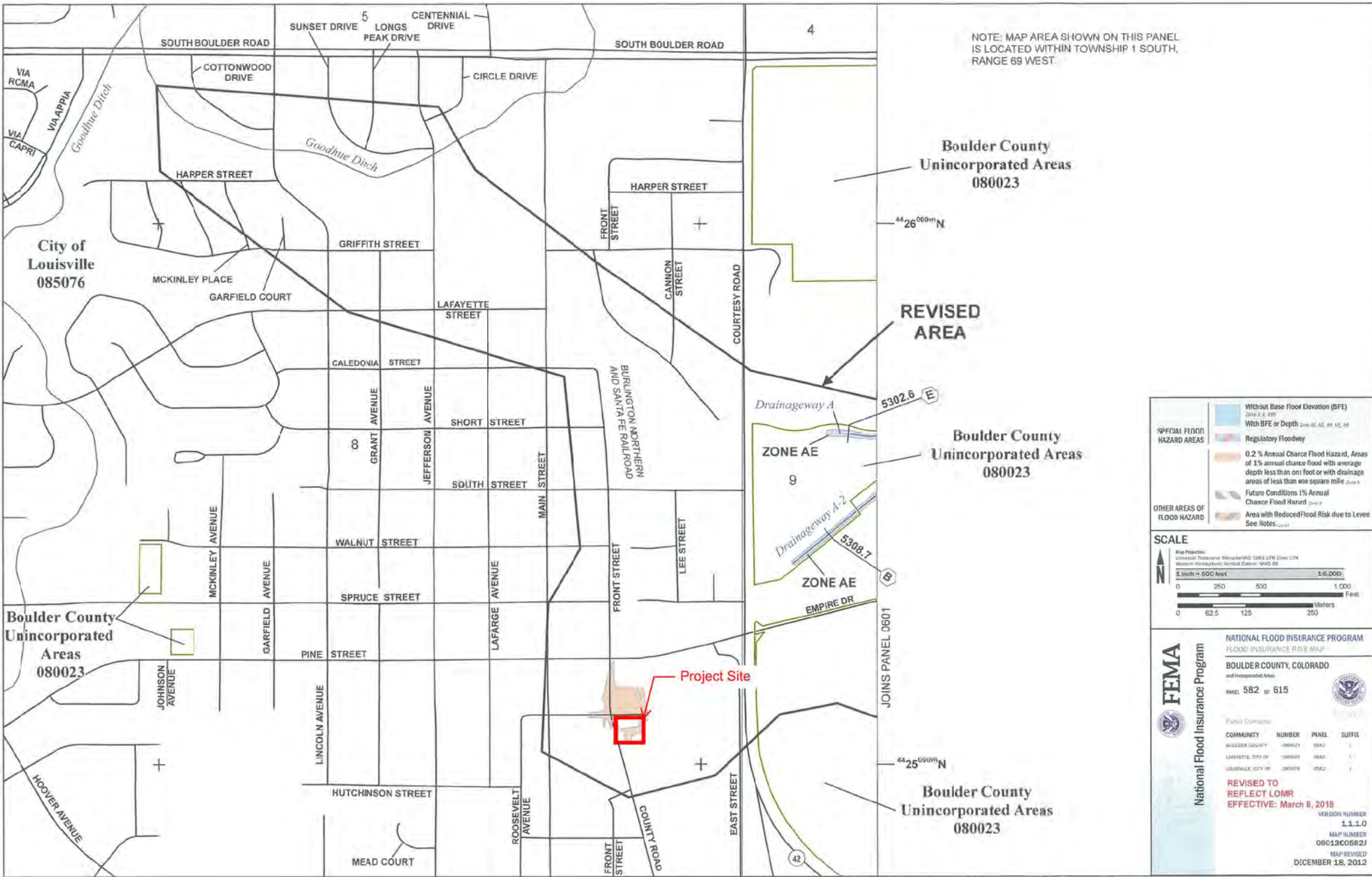


REVISED TO
REFLECT LOMR
EFFECTIVE: March 8, 2018

FLOOD PROFILES

DRAINAGEWAY 7





SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) Zone A, X, AE
- With BFE or Depth Zone AE, AD, AH, VE, VE
- Regulatory Floodway
- 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 B
- Future Conditions 1% Annual Chance Flood Hazard Zone B
- Area with Reduced Flood Risk due to Levees See Notes, 2012

OTHER AREAS OF FLOOD HAZARD

SCALE

Map Projections:
Universal Transverse Mercator (UTM) 18N UTM Zone 12N
Western Hemisphere, Vertical Datum: NAVD 83

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet
0 62.5 125 250 Meters

FEMA
National Flood Insurance Program

**NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
BOULDER COUNTY, COLORADO
and Incorporated Areas**

PANEL 582 OF 615

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER COUNTY	080021	582	/
LARVENET, CITY OF	080022	582	/
LOUISVILLE, CITY OF	085076	582	/

**REVISED TO REFLECT LOMR
EFFECTIVE: March 8, 2019**

VERSION NUMBER
11.1.0
MAP NUMBER
08013C0582J
MAP REVISED
DECEMBER 18, 2012

T-3 BIORETENTION SYSTEMS

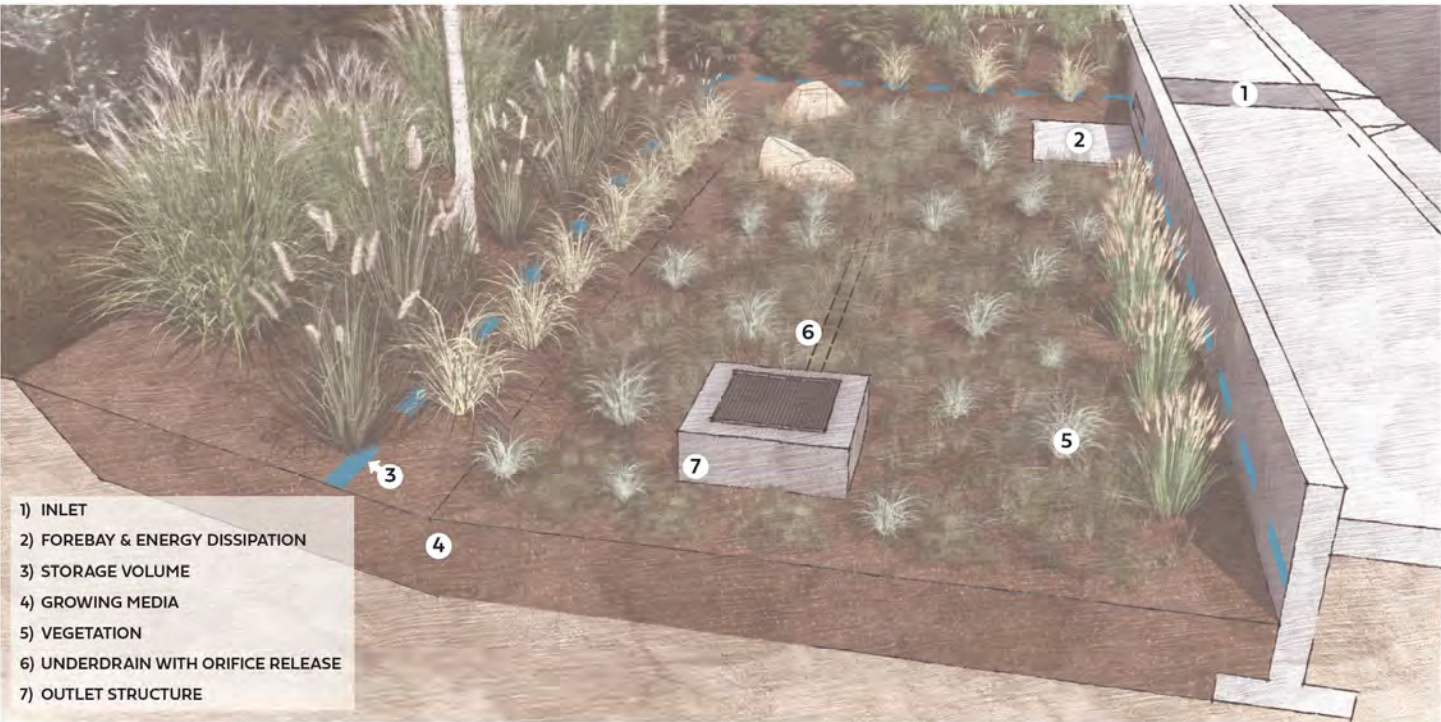


Figure BR-1. Bioretention System Components

DESCRIPTION

Bioretention systems are vegetated, engineered, depressed landscape areas designed to capture and filter and/or infiltrate the water quality capture volume (WQCV). Engineered media and vegetation facilitate filtration, adsorption, absorption, and biological processes that retain stormwater pollutants and enhance infiltration capabilities. The terms porous landscape detention (PLD), rain garden, and bioretention are often used interchangeably in the MHFD region. The term rain garden is sometimes used to describe smaller engineered bioretention systems or non-engineered installations and when describing this SCM to the public. Bioretention can be configured in several ways in urban areas and may be described as streetside planters, curbside bioretention, bump-out stormwater planters. Ultra-urban adaptations of bioretention can also include tree trenches and tree pits (although not described in this fact sheet). Local jurisdictions may have additional or different requirements for various types of bioretention systems.

MHFD strongly encourages use of bioretention as a stormwater control measure (SCM) because properly designed, constructed and maintained bioretention systems provide effective stormwater treatment, reduce runoff volume and erosive flow rates, and provide community connection benefits and green space in the urban environment.

Bioretention systems can be designed to provide detention for events exceeding the WQCV by incorporating storage of the Excess Urban Runoff Volume (EURV) and 100-year detention storage volumes above the WQCV, with drain times and release rates in accordance with the *Storage* chapter.

TABLE BR-1. BR OVERVIEW

BIORETENTION SYSTEMS	
MS4 Permit Applicability (Dependent on design and level of treatment)	
Meets Runoff Reduction Standard	Potential ¹
Meets WQCV Capture Standard	Yes
Meets Pollutant Removal Standard	Yes
Typical Effectiveness for Targeted Pollutants	
Sediment/Solids	High
Total Phosphorus	Low-Medium ¹
Total Nitrogen	Low-Medium ¹
Total Metals	High
Bacteria	Medium
Common Applications	
Runoff Reduction (General)	Potential ¹
Used for Pretreatment	No
Integrated with Flood Control	Yes

¹ Depends on design including full-infiltration, partial infiltration or no-infiltration section.

SCM COMPONENTS

The primary components of bioretention include inlet(s), energy dissipation and forebay(s), a surcharge volume, engineered media, vegetation, an underdrain (for no- or partial-infiltration designs), and an outlet structure (Figure BR-1). The primary outflow for the WQCV is typically an underdrain or infiltration into the underlying soil. When bioretention is designed to provide full spectrum detention, design the outlet to release the EURV and 100-year volumes in accordance with the EURV drain time and 100-year release rates. Even if the bioretention system is only designed to treat the WQCV, an emergency overflow (outlet or spillway) is necessary to safely convey flows from larger events.

See Section 3.0 *Site Assessment* and Section 4.0 *Filtration and Infiltration Systems* of this chapter for guidance and criteria on determining the appropriate type of bioretention system and designing underdrain and liner systems as needed based on site-specific conditions. Section 5.0 *SCM Inflow Features* and Section 6.0 *SCM Outflow Features* of this chapter provide guidance on creative ways to drain runoff into the SCM and release the treated runoff.

Check bioretention media sourcing and composition is important. MHFD recommends confirming the gradation and nutrient content in the field. The engineered media and vegetation are the core water quality treatment

TABLE BR-2. BR COMPONENTS

COMPONENT	INTENT
Inlet	Allows stormwater to enter the SCM.
Forebay	Facilitates removal of trash and coarse sediments, providing pretreatment for the SCM.
Energy Dissipation	Minimizes potential for erosion of media surface.
Storage Volume	Provides temporary storage needed to attenuate design flows.
Engineered Media	Supports plant growth and reduces pollutants by filtering and through other biological treatment processes.
Vegetation	Helps maintain infiltration over time through root penetration of media, increases evapotranspiration and biological uptake of pollutants, aerates media, catalyzes soil ecology, and creates an attractive SCM.
Underdrain with Orifice Release	For partial and no infiltration systems, collects and slowly releases the WQCV over 12 hours to reduce erosion in the receiving stream and enhance treatment by increasing contact time with the media.
Outlet Structure	Safely conveys stormwater flows that exceed the design volume. For bioretention systems that detain the EURV and/or 100-year flow, surface outlet structures will have additional orifice controls for surface discharge rather than infiltration through the media.

BENEFITS OF BIORETENTION

- When designed and constructed correctly, routine maintenance is straightforward consisting of sediment/debris removal from the forebay and vegetation management.
- Incorporates multiple treatment processes including sedimentation, filtering, adsorption, evapotranspiration, and biological uptake of constituents.
- Stormwater features are integrated with landscaping.
- Decreases urban heat island effects.
- Can be integrated into space-constrained urban areas in a variety of shapes and sizes.
- Avoids problems with clogging of small orifices common with some EDBs.

LIMITATIONS OF BIORETENTION

- Vegetation requires management.
- Requires additional steps when near a building foundation or when expansive soils exist.
- In a developing or otherwise erosive watershed, sediment loads can clog the system.
- Trash and sediment can block inlets and cause bypass of flows, if not maintained.



Photograph BR-1. This bioretention area treats runoff from the roof and lot, while serving as an aesthetically pleasing landscape feature. Photo: Wright Water Engineers.



Photograph BR-2. Bioretention system treating urban stormwater during runoff event. Photo: Wright Water Engineers.

elements of bioretention. The media must balance good infiltration capabilities with properties needed to support vegetation. MHFD has conducted significant testing of different mixes for bioretention media to develop the recommended specifications in this fact sheet. Additionally, national research has included media amendments targeting specific pollutants (Tirpak et al. 2021, Pitt and Clark 2010, Clark and Pitt 2012, Erickson et al. 2012 & 2021, Hunt et al. 2012, Chandrasena 2014, Mohanty and Boehm 2015, O'Neil and Davis 2012a&b, Mohanty et al. 2018, Herrera 2020, among many others). This fact sheet focuses on a basic engineered media design suitable for broad use in the MHFD jurisdiction, but does not preclude consideration of media amendments designed to target specific pollutants, provided that they maintain the intended functions of MHFD's media.

Other bioretention design variations in the underdrain configuration, such as use of an upturned underdrain elbow to create an internal water storage zone (Brown et al. 2009) to reduce nitrogen, are discussed further in Section 4.3.3 of this chapter.

SITE CONSIDERATIONS

Bioretention is an excellent choice for small sites because it treats the WQCV and serves as a landscape feature. It is typically a much better choice for small sites than an extended detention basin (EDB) because EDBs treating small drainage areas have outlet structures with small orifices that are prone to clogging. Bioretention can also be incorporated into larger sites and can be designed to provide full spectrum detention.

Bioretention systems typically are installed in locations such as:

- Plazas
- Parks
- Parking lot islands
- Street medians



Photograph BR-3. Terraced bioretention SCM in recreation center parking lot. Photo: MHFD

- Landscape areas between the road and a detached walk
- Planter boxes that collect roof drain flows

To avoid clogging of media, bioretention requires a stable watershed. When the watershed includes phased construction, sparsely vegetated areas, or steep slopes, consider another SCM that is less susceptible to clogging or provide pretreatment to facilitate sedimentation before runoff from these areas reaches the bioretention media surface. Additionally, bioretention is intended to dry out between runoff events; therefore, it should not be used when a baseflow is anticipated.

The surface of the bioretention media should be flat or at a mild slope. For this reason, bioretention can be more difficult to incorporate into steeply sloping terrain; however, terracing can be used to create flat areas suitable for bioretention even with sloped topography.

When bioretention areas are located adjacent to structures or infrastructure that could be adversely affected by infiltrating runoff or in areas with expansive soils, consult with a geotechnical engineer. A geotechnical engineer can evaluate the suitability of soils, identify potential impacts, and establish minimum distances or other physical barriers to implement between the bioretention system and structures. See Section 3.0 *Site Assessment* and Section 4.0 *Filtration and Infiltration Systems* for guidance and criteria on geotechnical considerations and testing requirements, underdrain and filter layers, perimeter barriers, and other aspects common to infiltration-based SCMs including bioretention.

COMMUNITY VALUES

Bioretention provides opportunities to provide a high level of treatment for stormwater while also creating landscape features that add value to a site by enhancing the landscape aesthetics and experience. Bioretention areas that are an integral part of the site's landscape provide far more benefits than areas dedicated solely to stormwater treatment, such as small EDBs, because bioretention areas are multifunctional and can serve other purposes including meeting landscape area requirements, providing attractive pockets of interesting plants, aesthetic screening of parking lots, and others.

It is important to establish pre-design planning objectives to facilitate a successful design. At an early stage, determine the aesthetic design approach that best meets the overall project objectives. There are many opportunities for creativity in grading, plant selection, and design of inflow and outflow features for bioretention. Design approaches typically endeavor either to integrate the SCM into its surroundings with a “contextual design,” or consciously contrast with the surroundings to highlight the SCM as a “stand-alone element,” providing a counterpoint to the context of the site.

In a contextual design, the design responds to and builds on the character of the surroundings. Forms and shapes are related to and harmonious with surrounding structures and site improvements and fit into their environment through use of similar or complementary materials, scale, and design detailing. Materials used in this approach may directly reflect materials used in the surrounding architectural and engineering improvements. Coordinate design details for the bioretention area, such as concrete or stone edgers and retaining walls, with the surrounding site improvements to provide a unifying effect with the surroundings. Plant materials should also relate to surrounding landscape in overall character, massing, and degree of formal or naturalistic arrangement, while selecting drought-tolerant plants that will also thrive in the periodically wet environment.

A “stand-alone” or counterpoint design aims to create a feature that contrasts with its surroundings through uses of form, scale, materials, color, and other features. A counterpoint design can create a strong dramatic effect, but to be successful, it must be done in a way that creates an overall balanced site design.

Of these two approaches, contextual design is more common and is generally easier to accomplish. With either approach, the emphasis should be on creating a feature that adds value to the site while effectively treating the WQCV. Maintenance is critical for ensuring long-term function of bioretention and community acceptance, so planning for maintenance and selecting plants that are suitable for the hydrologic conditions in the SCM are important design aspects to avoid burdensome maintenance.

Appropriate plant selection enhances the community value of bioretention systems. Considerations for plant selection from a community-values perspective include:

- Select plants that thrive and perform over the long-term without excessive maintenance. For bioretention to be accepted by the community, it should be attractive (Davis, Traver and Hunt 2022), which requires healthy plants and routine maintenance.
- Select plants appropriate for the site’s unique micro-climatic conditions and bioretention design features, construction techniques, and expected maintenance levels of service. Microclimate, including solar aspect, exposure to wind, and shading or sun reflections from adjacent buildings, can have a significant effect on the conditions that plants must tolerate. Visiting the site during different times of the day in summer months prior to design is very informative for understanding sun and shading as well as urban heat island effects.
- Small trees can provide significant added value to bioretention areas, including runoff reduction and mitigation of urban heat island effects. When considering trees for bioretention systems, assess the compatibility of different species with the hydrologic, soil, and solar aspect of the SCM. Healthy trees also require adequate above and belowground space (Davis et al. 2022). (See additional considerations for trees in the Design section of this fact sheet.)
- Use natives plant species when feasible. Native species tend to tolerate the region’s hot summers and cold winters better than most non-natives. Native grasses have deep roots that can reach residual moisture in the bioretention media during times of drought.
- Select plants that are drought tolerant but that can also tolerate prolonged periods of inundation or media saturation, particularly during sequential storms.
- Consider planting vegetation in groupings or masses of single or similar species. Generally, large masses of plants grouped relatively close together create dense stands of vegetation that grow together to out-compete weed growth, while enhancing infiltration through root penetration that creates macropores as roots die and decay.

MAINTENANCE

Routine maintenance of bioretention is similar to landscape maintenance, consisting of trash and sediment removal from the forebay and care for vegetation. Chapter 6 of this manual provides recommended maintenance practices for all SCMs. During design, consider the following during design to ensure ease of maintenance over the long-term:

- Consider how the SCM will be accessed for routine and restorative maintenance, what equipment will be required, and how routine maintenance activities can be performed in a way that minimizes impacts to vegetation.
- Understand the level of maintenance that will be needed over the long term. Bioretention features designed as aesthetic amenities in public areas may require more frequent maintenance than those with more naturalized designs in suburban settings. Do not select plantings that require frequent maintenance if the owner does not have the resources to perform such maintenance. Poorly maintained bioretention areas can become weedy eye sores that contribute to poor public acceptance.
- Make the bioretention surface area (bowl) as shallow as needed. Increasing the depth unnecessarily can create erosive side slopes and complicate maintenance. Shallow bioretention areas are also more attractive.
- The best surface cover for bioretention is full vegetation, in part because it reduces weeding and various mulch-related maintenance issues. Use rock mulch sparingly because it limits infiltration, is more difficult to maintain and can also increase urban heat island effects. Wood mulch handles sediment build-up better than rock mulch; however, wood mulch floats and can settle unevenly or clog the overflow depending on the configuration of the outlet. Some municipalities may not allow wood mulch for this reason. When specifying mulch, look for shredded varieties. Also, increase density of grasses at the interface of the forebay and vegetation to slow flows entering the basin.
- Provide pretreatment when it will reduce the extent and frequency of maintenance necessary to maintain function over the life of the SCM. Provide a forebay for any concentrated inflows. For small inflows, the forebay may consist of a pad for sediment accumulation and removal surrounded by grasses to help keep sediment from migrating onto the filter area.
- Note that research shows that deicers can cause reduced infiltration rates in media and soils with clay content (Sileshi, Pitt and Clark 2017). Understand the composition of the media and the underlying soils in this respect and develop the planting plan accordingly. Deicers in runoff can stress vegetation, which may result in increased maintenance and vegetation replacement requirements. Conifers are particularly sensitive to salt.
- Establishing healthy vegetation is critical for this SCM to properly function. Design and adjust the irrigation system (temporary or permanent) to provide appropriate water for the establishment and maintenance of selected vegetation.
- Consider maintenance access and requirements for tree pruning and frequency of raking, if trees are included in bioretention systems. Do not operate heavy equipment on the media surface (e.g., cherry picker lifts) for tree pruning.
- Do not put a filter sock on the underdrain. This is not necessary and can cause the underdrain to clog.
- Never use bioretention systems for snow storage. Designate a location for snow storage elsewhere.

DESIGN PROCEDURES & CRITERIA

Criteria and guidance for bioretention components including inlets, forebays, underdrains, liners, and outlets are provided in the front section of this chapter. Reference this section for design of these specific features.

The SCM Design workbook, available at www.mhfd.org, is an Excel-based workbook that steps through the criteria listed below and performs design calculations for bioretention. Use this workbook to ensure designs meet criteria for treating the WQCV. Use a separate tool, MHFD-Detention, to develop and route storm hydrographs for a range of events through bioretention systems.

The following steps outline the design procedures and criteria for designing bioretention for water quality:

1. **Subsurface Exploration and Determination of a Full Infiltration, Partial Infiltration or No-Infiltration Section:** See Section 3.0 *Site Assessment* and Section 4.0 *Filtration and Infiltration Systems* of this chapter to determine the most appropriate type of filtration and/or infiltration system for the bioretention area based on site conditions.
2. **Inlet Design and Pretreatment:** See Section 5.0 *SCM Inflow Features* of this chapter for guidance and criteria for inlets, energy dissipation, and forebays. Provide pretreatment with a properly designed forebay or other device designed to remove coarse sediment, trash, and debris. Pretreatment of roadway runoff to remove sediment is especially critical for bioretention systems receiving roadway runoff.

Where feasible, inlets set above the WQCV elevation will reduce maintenance requirements related to sediment deposition in the inflow pipe due to backwater conditions.
3. **Design Storage Volume:** Provide a storage volume equal to the WQCV¹ based on a 12-hour drain time, after accounting for runoff-reduction SCMs in the contributing watershed. Determine the required WQCV (watershed inches of runoff) using Equation 3-2 of Chapter 3 of this manual (for WQCV). Always size SCMs based on their tributary area. When sizing the basin for EURV or larger detention volumes, see the *Storage* chapter of Volume 2. Where needed to meet the required volume, also consider the available void storage capacity of the media at 15 percent.
4. **Bioretention System Basin Geometry:** Basin geometry considerations include surface area, filter surface slopes and ponding depth.
 - **Media Surface Area:** Equation BR-1 provides a minimum media surface area for the WQCV allowing for some of the volume to be stored beyond the flat area of the media (i.e., above the side slopes of the bioretention basin). Additional surface area beyond this minimum may be necessary to meet the maximum recommended ponding depth.

$$A_F = 0.02 \cdot A \cdot I$$

Equation BR-1

Where:

A_F = minimum filter area (ft²)

A = area tributary to the SCM (ft²)

I = imperviousness of tributary area draining to the SCM (percent expressed as a decimal)

Use vertical walls or slope the sides of the basin to achieve the required volume. Side slopes should be no steeper than 4:1.

- **Ponding Depths:** Maximum ponding depths vary depending on the bioretention design, with a maximum recommended WQCV ponding depth of 12 inches stored above the surface to minimize stress to vegetation for frequent inundation and to manage the hydraulic loading. When the bioretention basin is designed for the WQCV only, locate the overflow spillway crest at or above the elevation associated with the maximum ponding depth for the WQCV measured vertically from the flat filter media surface.
- **Media Surface Slopes:** The media surface of the bioretention area typically should be flat. The exception to this is when a mild slope (e.g., < 1%) from the inlet to the outlet will help distribute runoff to the vegetation and reduce sediment deposited at the inlet. Linear systems, such as streetside stormwater planters, may benefit from a mild slope from inlet to outlet. When the flow path is long, consider level grade beams to maintain sheet flow. The intent is to fully use the filter area to avoid higher sediment deposition in lower areas of the basin.

¹MHFD's standard design procedure is based on treatment of the WQCV, which corresponds to the Colorado's MS4 WQCV design standard. In some cases, bioretention systems may be designed to meet a volume reduction target, particularly where underlying soils allow for infiltration. In this case, conduct site-specific analysis to determine whether the volume reduction target can be met for site conditions.

TABLE BR-3. BIORETENTION MEDIA PROPERTIES

SOIL PARAMETERS	TEST NAME	BIORETENTION MEDIA PROPERTIES
Texture/Gradation	ASTM D7928 Sedimentation (Hydrometer) Method	<u>Particle Size Distribution:</u> 70-80% Sand (0.05-2.0 mm diameter) 5-25% Silt (0.002-0.05 mm diameter) 5-15% Clay (<0.002 mm diameter) <u>Notes:</u> Sand, silt and clay percentages are by dry weight. Particle sizes are based on the USDA soil classification system. Distribution is measured after gravel > 2 mm is removed from sample. Media should have no more than 25% material > 2 mm. Equivalent sieve sizes for the upper and lower limit of sand are #10 and #240, respectively.
Organic Matter	ASTM D2974	1-5% by dry weight
pH	ASA/AASHTO	6.0 - 8.5
Salinity/Salts (EC) dS/m or mmhos/cm	Saturated Paste	<3
Nitrate Nitrogen (ppm)	ASA2 33-3	<30
Phosphorus (ppm)	Use Olsen when pH>6.2, otherwise use Mehlich-3	Olsen: <20 or Mehlich-3: <30

5. **Underdrain System, Impermeable Liner, and Geotextile Separator Fabric:** See Section 4.0 *Filtration and Infiltration Systems* of this chapter for guidance and criteria based on the type of filtration and infiltration system selected. Underdrain systems in bioretention basins consist of a slotted PVC pipe placed within a layer of drain gravel beneath the bioretention media. A 6-inch layer of sand is also specified above the drain gravel in Section 4.0. Research (Herrera 2020) indicates that a sand layer below the media can serve as a polishing layer for the effluent.
6. **Bioretention Media:** Provide a minimum of 18 inches of bioretention media to enable establishment of the roots of the vegetation. If trees are planted, increase the media depth to 36 inches.

MHFD’s bioretention media is intended to balance high infiltration capacity with properties needed to support healthy vegetation. Table BR-1 outlines recommended parameters for bioretention media. MHFD’s media recommendation begins with topsoil that can be amended as needed, typically with sand, until it meets the specifications in Table BR-1. See *Availability of Bioretention Media in the MHFD Region (MHFD 2023)* for more information. It is important that the media contain organic material with living soil organisms such as earthworms, bacteria, and fungi to enhance agronomic and infiltration properties and create a healthy, living media. Do not add compost to the bioretention media; instead, other forms of organic matter such as mulch, peat or woodchips should be used if needed because they have lower nitrogen and phosphorus content and are more resistant to microbial degradation (Davis, Hunt and Traver 2022).

The media texture in Table BR-1 has a slightly higher proportion of silts and clays and a lower sand percentage compared to prior MHFD media specifications. The purpose of this change is to increase moisture and nutrient holding capacity to aid in the establishment of a dense vegetation cover, which ultimately helps to sustain infiltration capacity.

A high level of quality control for the media is critical. Quality control measures include reviewing media particle size distribution data, media chemistry data, and results of nutrient analysis to ensure that the media meets specifications. The media can either be sampled after delivery and prior to placement, or sampled by the supplier just prior to site delivery. In any case, the samples should be collected within several days of placement of the media so that the results are representative of the media placed.

7. **Vegetation:** The media must be vegetated. MHFD recommends drought-tolerant species that thrive in sandy soils. Approaches to vegetating bioretention areas can include planting sod-forming native grasses from seed, installing sand-grown sod, and/or planting container-grown plants or small trees. Consult with a vegetation specialist to understand which types of vegetation will be successful in a given location, considering shade, heat island effects, application of deicers in the watershed, and other site-specific factors. Recommendations for vegetation established from seed, planted in containers or plugs, and trees follow. While establishment from seed typically costs less than container-grown plants, container-grown plants establish more quickly and are less susceptible to being washed away during establishment. A mixture of container-grown plants and seed may help with initial vegetation cover and media stabilization.

Table BR-4 provides a suggested seed mix for sites that typically will not need to be irrigated after the grass has been established, except for periods of extended drought. Guidelines for establishing vegetation from seed include:

- Mix seed well and broadcast, followed by hand raking to cover seed.
- Immediately after seeding, install a biodegradable 100-percent coconut erosion control blanket over the media to keep seed and media in place during runoff and irrigation events during establishment.
- Consider seasonality when planting to ensure establishment. Both frequent storms and extended hot, dry periods can affect seed establishment.
- Do not place seed when standing water or snow is present or if the ground is frozen.
- Weed control is critical in the first two to three years, especially when starting with seed.

When using sod, specify sand-grown sod which is available in Colorado, although not as common as conventional sod. Do not use conventional sod. Conventional sod is grown in clay soil that can seal the filter area, greatly reducing overall function of the SCM. Be aware that local jurisdictions may restrict use of turf varieties with high irrigation requirements (e.g., Kentucky bluegrass) and may require native grasses for water conservation reasons.

TABLE BR-4. NATIVE SEED MIX FOR BIORETENTION

COMMON NAME	SCIENTIFIC NAME	VARIETY	PURE LIVE SEED (PLS)	
			POUNDS/ACRE	OUNCES/ACRE
Sand bluestem	<i>Andropogon hallii</i>	Garden	3.5	
Sideoats grama	<i>Bouteloua curtipendula</i>	Butte	3	
Prairie sandreed	<i>Calamovilfa longifolia</i>	Goshen	3	
Indian ricegrass	<i>Oryzopsis hymenoides</i>	Paloma	3	
Switchgrass	<i>Panicum virgatum</i>	Blackwell	4	
Western wheatgrass	<i>Pascopyrum smithii</i>	Ariba	3	
Little bluestem	<i>Schizachyrium scoparium</i>	Patura	3	
Alkali sacaton	<i>Sporobolus airoides</i>		3	
Sand dropseed	<i>Sporobolus cryptandrus</i>		3	
Pasture sage ¹	<i>Artemisia frigida</i>			2
Blue aster ¹	<i>Aster laevis</i>			4
Blanket flower ¹	<i>Gaillardia aristata</i>			8
Prairie coneflower ¹	<i>Ratibida columnifera</i>			4
Purple Prairie Clover ¹	<i>Dalea (Petalostemum) purpurea</i>			4
Sub-Totals:			27.5	22
Total pounds/acre			28.9	

¹ Wildflower seed (optional) for a more diverse and natural look.

TABLE BR-5. CONTAINER-GROWN PLANTS AND PLUGS FOR BIORETENTION (SOURCE: CITY & COUNTY OF DENVER 2016)

COMMON NAME	SCIENTIFIC NAME
Grasses	
Dancing Wind Big Bluestem	<i>Andropogon gerardii</i> 'Dancing Wind'
Windwalker Big Bluestem	Winter <i>Andropogon gerardii</i> 'P003S'
Feather Reed Grass	Winter <i>Calamagrostis x acutiflora</i> 'Karl Forester'
Tufted Hair Grass	<i>Deschampsia caespitosa</i>
Blonde Ambition Grama Grass	<i>Bouteloua gracilis</i> 'Blonde Ambition'
Hot Rod Switchgrass	<i>Panicum virgatum</i> 'Hot Rod'
Northwind Switchgrass	<i>Panicum virgatum</i> 'Northwind'
Prairie Sky	<i>Panicum virgatum</i> 'Prairie Sky'
Prairie Blues Little Bluestem	<i>Schizachirium scoparium</i> 'Prairie Blues'
Undaunted Ruby Muhly	<i>Muhlenbergia reverchoni</i> 'Undaunted'
Prairie dropseed	<i>Sporobolus heterolepis</i>
Herbaceous Perennials	
Pearly Everlasting	<i>Anaphalis margaritacea</i>
Prairie Bluebell	<i>Mertensia lanceolata</i>
Dakota Sunshine Sunflower	<i>Helianthus maximiliani</i> 'Dakota Sunshine'
Western Blue Flag Iris	<i>Iris missouriensis</i>
Rocky Mountain Gayfeather	<i>Liatris ligulistylis</i>
Wild Bergamont	<i>Monarda fistulosa</i>
Eastern Bergamont	<i>Monarda bradburiana</i>
Evening Primrose	<i>Oenothera fruticose</i> 'Fireworks' / Fyrveckeri
Husker Red Penstemon	<i>Penstemon digitalis</i> 'Husker Red'
Garden Phlox	<i>Phlox paniculate</i> 'Blue Paradise'
Border Phlox	<i>Phlox paniculate</i> 'David'
Prairie coneflower	<i>Ratibida pinnata</i>
Bluebird smooth aster	<i>Symphyotrichum laeve</i> 'Bluebird' smooth aster
Bulbs	
Blue Danube Wild Hyacinth	<i>Camassia leichtlinii</i> 'Blue Danube'
Shrubs	
Leadplant	<i>Amorpha canescens</i>
Prairie Snow White Cinquefoil	<i>Dasiphora</i> (Potentilla) <i>fruticosa</i> var. <i>dahurica</i> 'Prairie Snow'
Apache Plume	<i>Fallugia paradoxa</i>
Pawnee Buttes Sand Cherry	<i>Prunus besseyi</i> 'Pawnee Buttes'
Autumn Amber Skunkbush Sumac	<i>Rhus trilobata</i> 'Autumn Amber'
Glow Girl Spirea	<i>Spirea betulifolia</i> 'Tor Gold'

When selecting a container-grown plant palette, consider water needs, exposure (sun/shade), plant height and spread, recommended container sizes, plant spacing and future maintenance requirements. Common container-grown plants or plugs suitable for bioretention systems in urban areas are listed in Table BR-3 (City and County of Denver 2016). Other drought-tolerant plants may also be considered.

When using an impermeable liner, select plants with diffuse (or fibrous) root systems, not taproots. Taproots can damage the liner and/or underdrain pipe.

Small trees may be considered in bioretention areas, provided that adequate media, irrigation, and space are available. Trees are generally better suited for larger bioretention areas. Recommendations for planting trees in bioretention areas include:

- Do not install trees in bioretention systems with an impermeable liner.
- Provide irrigation for trees.
- Consider planting trees on side slopes, above the more frequently inundated areas.
- Select trees that can withstand periods of inundation.
- Avoid conifers in areas exposed to deicing chemicals.
- Provide access for tree maintenance, which may include pruning, removal of bioretention media removal and replacement, tree removal and replacement, and incidental removal of other vegetation.
- Install trees at least 5 feet away from inlets, outlets, and underdrains because tree roots may obstruct inlets and outlets or damage the underdrain. Consider limiting the length of the underdrain to allow for placement of trees where desired.
- For deciduous trees, plan for additional seasonal maintenance to remove leaf litter and avoid media clogging.
- Avoid trees with fruit litter.
- Select shade-tolerant species for tree understory plants.
- When considering trees for bioretention systems located in easements, check local requirements regarding allowed vegetation types and replacement requirements.
- Be aware that some jurisdictions may not allow trees in bioretention.
- See Denver's Ultra-Urban Guidelines (Denver 2016) for tree pit/trench bioretention variations.

8. **Irrigation:** Irrigation is required for vegetation establishment, for supplemental water during extended dry periods, and may be needed on a routine basis depending on plant selection. During establishment, all plants should receive approximately 1 inch of moisture (combined rain and irrigation) per week for the first growing season to promote establishment. Some plants may require more than one growing season to become fully established. Providing a permanent irrigation system at the time of SCM installation provides greater flexibility in plant selection and aesthetics, even if regular irrigation is not routinely required after plant establishment.

Install spray irrigation at or above the WQCV elevation when permanent irrigation is provided or place temporary irrigation on top of the bioretention media surface. Do not place sprinkler heads on the flat media surface as they can become buried over time. Remove temporary irrigation pipes that are laid on the surface once vegetation is established.

VEGETATION ESTABLISHMENT AND INFILTRATION RATES

During vegetation establishment, water applied to bare media can mobilize and rearrange fine silt and clay particles on the surface to create a lower permeability layer. For this reason, vegetation is a critical component in maintaining infiltration in the bioretention system over time. When establishing vegetation from seed, install seed and blanket immediately after media is placed to reduce the mobilization of fines and facilitate germination of the seed.

If left in place, temporary irrigation will become buried over time and will be damaged during maintenance operations.

Adjust irrigation schedules during the growing season to provide the minimum amount of water necessary to maintain plant health, while maintaining free pore space for infiltration.

9. **Outlet:** For partial and no-infiltration configurations, drain the underdrain to the outlet structure and use an orifice plate to drain the WQCV over approximately 12 hours. Section 6.0 *SCM Outflow Features* of this chapter includes conceptual details for the underdrain and orifice outlet both for attenuating the WQCV and larger volumes. When designing for EURV and/or 100-year attenuation, flows greater than the WQCV are controlled and released at the outlet structure, rather than forced through the filter area of the bioretention basin. Provide a spillway for larger events that will convey overflows to the receiving drainage system without adversely affecting adjacent structures or infrastructure. Use the simplified equation in Section 6.1 of this chapter or the MHFD-Detention workbook to size the orifice. MHFD-Detention also aids with design of outlet controls for larger runoff events.

CONSTRUCTION CONSIDERATIONS

Proper construction of bioretention areas involves careful attention to material specifications, final grades, and construction details. For a successful project, implement the following practices:

- Protect the bioretention area from excessive sediment loading during construction. This is the most common cause of clogging of bioretention systems. The portion of the site draining to the SCM must be stabilized before allowing flow into the bioretention area. This includes completion of paving operations.
- Avoid over-compaction of the bioretention area to preserve infiltration rates (for partial and full infiltration sections).
- Provide construction observation to ensure compliance with design specifications. It is important to avoid improper installation, particularly related to elevations of the inlet, underdrain and outlet. Observation/oversight is recommended for the following:
 - » Conformance of subgrade with design assumptions.
 - » Installation of impermeable liner (for no infiltration sections).
 - » Construction of underdrain and installation of media layer.
 - » Review of bioretention media test data to verify conformance with specifications prior to installation.
- Provide adequate construction staking to ensure that the site properly drains into the SCM, particularly with respect to surface drainage away from adjacent buildings.

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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 Boulder County Area, Colorado



Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

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: Boulder County Area, Colorado

Survey Area Data: Version 21, Sep 6, 2024

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AcA	Ascalon sandy loam, 0 to 3 percent slopes	1.7	100.0%
Totals for Area of Interest		1.7	100.0%

Map Unit Descriptions

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

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

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

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

Custom Soil Resource Report

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.

Boulder County Area, Colorado

AcA—Ascalon sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2swl3
Elevation: 3,870 to 5,960 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 135 to 160 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ascalon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wind-reworked alluvium and/or calcareous sandy eolian deposits

Typical profile

Ap - 0 to 6 inches: sandy loam
Bt1 - 6 to 12 inches: sandy clay loam
Bt2 - 12 to 19 inches: sandy clay loam
Bk - 19 to 35 inches: sandy clay loam
C - 35 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: No

Minor Components

Olnest

Percent of map unit: 10 percent

Landform: Interfluves

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R067BY024CO - Sandy Plains

Hydric soil rating: No

Vona

Percent of map unit: 5 percent

Landform: Interfluves

Landform position (two-dimensional): Summit

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R067BY024CO - Sandy Plains

Hydric soil rating: No

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Custom Soil Resource Report

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PRELIMINARY DRAINAGE REPORT

FOR THE

LOUISVILLE MILL SITE

AT

**500, 540, AND 544 COUNTY ROAD
LOUISVILLE, COLORADO 80027**

FOR

LOUISVILLE MILL SITE, LLC

April 3, 2014
Revised September 30, 2014
Revised March 12, 2015



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March 12, 2015

Mr. Craig Duffin, Assistant City Engineer
City of Louisville – Engineering Development Review
749 Main Street
Louisville, CO 80027

RE: Preliminary Drainage Report
Louisville Mill Site
Louisville, CO 80027
JVA No. 2221c

Dear Craig:

The following *Preliminary Drainage Report* and enclosed drainage figures for this project have been prepared for the above referenced project. The stormwater report and figures have been produced in accordance with the "City of Louisville, Storm Drainage Design and Technical Criteria, 2013 Edition" and comply with provisions thereof. Revisions have been made to this report based on comments received from the Final PUD submittal on December 31, 2014.

It is our understanding that the information provided herein meets all requirements of the City of Louisville.

Please contact us if you have any questions regarding this submission.

Sincerely,
JVA, Inc.

A handwritten signature in blue ink, appearing to read "Darren Stewart", written over a horizontal line.

Darren Stewart
Project Manager

A handwritten signature in blue ink, appearing to read "Charlie R. Hager, IV, P.E.", written over a horizontal line.

Charlie R. Hager, IV, P.E.
Vice President



ENGINEER'S STATEMENT:

"I hereby certify that this report (plan) for the final drainage design of Louisville Mill Site was prepared by me (or under my direct supervision) in accordance with the provisions of City of Louisville Storm Drainage Design and Technical Criteria for the owners thereof."

Charlie R. Hager
Registered Professional Engineer
State of Colorado No. 37146

PRELIMINARY DRAINAGE REPORT
LOUISVILLE MILL SITE
AT
500, 540, AND 544 COUNTY ROAD
LOUISVILLE, COLORADO 80027
FOR
LOUISVILLE MILL SITE, LLC

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JVA Project No. 2221c

April 3, 2014
Revised September 30, 2014
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- FIGURE 1 – HISTORIC DRAINAGE MAP
- FIGURE 2 – DEVELOPED DRAINAGE MAP

PRELIMINARY DRAINAGE REPORT

INTRODUCTION

GENERAL LOCATION AND DESCRIPTION

Louisville Mill Site, LLC, is proposing the redevelopment of the existing historic Louisville Mill Site located at the southeast corner of the intersection of County Road and Elm Street in Louisville, Colorado. The subject property is approximately 1.54 acres of previously developed land located in the Southeast Quarter of the Southeast Quarter of Section 8, Township 1 South, Range 69 West of the 6th Principal Meridian in Boulder County, City of Louisville, State of Colorado. More specifically, the site is bound by County Road 124 to the west, a railroad right-of-way for BNSF Railway Company to the east, and residential properties to the north and south. A vicinity map is included in Appendix A of this report.

PROPOSED PROJECT

The proposed development will include the preservation and restoration of the existing historic mill building, an addition to an existing warehouse building on the south side of the site, and a new commercial and office building on the north side of the site. The areas surrounding these buildings within the site will be redeveloped with parking, access drives, utility infrastructure and landscaping. The right-of-way along County Road will be redeveloped out to the edge-of-roadway and includes curb and gutter replacement, sidewalk replacement, site drive ramps, street lighting upgrades, and landscape improvements.

HISTORIC DRAINAGE

MAJOR DRAINAGE BASIN DESCRIPTION

The site's ultimate outfall is Coal Creek southeast of the property.

According to the FEMA Flood Insurance Rate Map Number 08013C0582J, dated December 18, 2012, the north end of the site is located within Flood Zone AH, with an elevation of NAVD88 5333. A portion of the referenced flood map is included in Appendix A.

EXISTING SITE DRAINAGE AND FACILITIES

Stormwater detention and water quality enhancements are not provided in the existing condition. The existing site consists of a one story commercial building, the historic mill building and the existing warehouse building. The site generally lies between 5335 feet and 5330 feet on the NAVD88 datum with existing grades generally sloping south to north. The existing site is approximately 60% impervious, with pervious areas consisting of irrigated turf and landscape and gravel parking areas. An additional 0.48 acres of offsite flows enter the site from the railroad ROW to the east. Refer to the Historic Drainage Map (see enclosed Figure 1).

The soils found onsite are Ascalon sandy loam with a NRCS hydrologic soils group rating of B. Soils with a rating of B have a moderate infiltration rate when thoroughly wet and therefore have moderate runoff potential. A copy of the NRCS soils classification map is included in the Appendix.

Runoff from the site currently flows overland to the northeast corner of the site where an existing Type R curb inlet is located in the BNSF Railroad ROW and a small catch basin is located within the property limits. The catch basin is connected to a 54" diameter City storm drain that comes from County Road and has an outfall on the east side of Highway 42. The Type R inlet outlets into a ditch on the other side of the railroad. The Type R sits slightly above grade, therefore most likely only works in a ponding condition. Drainage flows from the existing Type R inlet are conveyed by open channel and culverts to State Highway 42, then is conveyed south by sheet flow through CDOT ROW to Coal Creek.

During smaller storm events, runoff is conveyed through the catch basin. Per discussions with City staff, this storm sewer system is planned to be improved to convey flood flows out of this area and under the railroad with work possibly starting in 2015.

PROPOSED (REDEVELOPED) DRAINAGE

DRAINAGE DESIGN CRITERIA

The proposed private storm drainage facilities for the project are designed to comply with the "City of Louisville, Storm Drainage Design and Technical Criteria," 2013 Edition, and the Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual (USDCM), June 2001 Edition.

HYDROLOGIC METHOD AND DESIGN STORM FREQUENCIES

Design storm recurrence intervals for this project are consistent with the City of Louisville requirements for residential and commercial areas: the minor or initial storm will be the 2-year event (for onsite private storm systems), and the major storm will be the 100-year event (for overland and street conveyance).

The Rational Method ($Q=CIA$) was used to determine the storm runoff (Q) from the site, with composite runoff coefficients (C) and contributing areas (A) given for design points in sub-basins. Intensities (I) were determined using the Time-Intensity-Frequency Curves for Louisville, Colorado (Table 2) and a calculated Time of Concentration (t_c). Post-development Time of Concentration calculations for each sub-basin, corresponding rainfall intensities, and composite runoff coefficients for each sub-basin are provided in the Appendix.

PROPOSED SITE BASINS

The development is divided into four overall onsite basins that contribute to the primary storm drain system which provides water quality treatment. Two smaller basins flow offsite without water quality treatment. Three offsite basins east of the site currently flow across the existing site, and these will be routed to the proposed storm drainage system. As requested by the City as part of their flood improvement project, two 15-ft Type R curb inlets are proposed along the northern access drive. These inlets will be in a sump condition and connect directly to the existing 54" storm drain. As proposed, all basins free release runoff, undetained.

Basin Descriptions:

- Basin A: 0.06 acres – Basin A is located in the northern portion of the site and is comprised of an asphalt parking lot and landscaping. Runoff from this basin will flow overland to be captured by inlets and conveyed into the proposed storm drain system and water quality device.
- Basin B: 0.20 acres – Basin B consists of the roof drainage from the commercial building on Lot 3. This drainage will be connected directly to the proposed storm drainage system and water quality device.
- Basin C: 0.14 acres – Basin C consists of asphalt parking, sidewalks, roof drainage from the existing mill building and landscape areas. Runoff will be conveyed via curb inlet to the proposed storm sewer and water quality device.
- Basin D: 0.28 acres – Basin D is located on the western perimeter of the site adjacent to the public right-of-way. Runoff from the basin will flow overland into the right-of-way and into gutters on County Road. Flows will be intercepted by an existing Type R inlet at the corner of the existing north access to the property and County Road on the northern edge of the project.
- Basin E: 0.38 acres – Basin E is located in the southern end of the property and consists of asphalt parking, sidewalks, and roof drainage from the existing warehouse building and landscape areas. Runoff will be conveyed via curb and gutter to the Type 16 curb inlet and conveyed to the water quality device.
- Basin F: 0.18 acres – Basin F lies on the southern perimeter of the site and will maintain the historic drainage pattern that conveys flows south into an existing irrigation ditch. No changes are proposed in this basin as part of this development. Currently, the owner of 500 County Road is in contact with the irrigation ditch owner for approval.
- Basin G: 0.11 acres – Basin G lies north of the proposed building on Lot 3 and consists primarily of paved roadway. This basin will convey flow to the 2- 15-ft Type R inlets and directly into the existing 54" storm drain.
- Basin H: 0.20 acres – Basin H lies west of the mill building and consists of primarily landscaped areas. This basin will drain to an area drain that connects to the proposed storm sewer.
- Basin OS1: 0.24 acres – Basin OS1 is located on the southeast corner of the site in the railroad ROW. This area has historically drained through the property and consists of gravel parking and dirt and grass areas. This basin will be conveyed via curb and gutter curb inlet located in Basin E.
- Basin OS2: 0.07 acres – Basin OS2 is located on the eastern edge of the site in the railroad ROW. This area has historically drained through the property and consists of gravel parking and dirt and grass areas. This basin will be conveyed via curb and gutter to the Type 13 inlet at Design Point 8.

- Basin OS3: 0.15 acres – Basin OS3 is located on the northeast edge of the site in the railroad ROW. This area has historically drained through the property and consists of gravel parking and dirt and grass areas. This basin will be conveyed via a concrete pan to the Type 13 inlet at Design Point 9. The existing Type R inlet located in this basin is approximately 12-inches above grade and will only function in a flooding event. If this basin is developed for parking, improvements will incorporate this inlet and not negatively impact its flood overflow functionality.

RUNOFF AND STORMWATER QUALITY ENHANCEMENT/DETENTION FACILITIES

Due to the developed nature of the site, constraints of working around the historic grain elevator, limited amount of landscaped area, and location within the shallow flooding Zone, a water quality capture volume BMP and detention are not provided for the redevelopment project, as discussed with the City. An underground water quality unit (hydronic separator type) will be provided prior to connecting the proposed storm sewer to the existing City storm sewer to provide water quality for the developed site. This unit is located adjacent to an access road for maintenance access. The proposed project will increase imperviousness from 57% to 67%, therefore post developed flows will show a small increase from historic levels. The overall 10-year design flow rate from the site will increase from 4.4 cfs to 6.0 cfs. The overall 100-year design flow rate from the site will increase from 8.8 cfs to 11.2 cfs.

Water quality will be provided for the majority of the site as well as some off-site basins including Basins A, B, C, H, E, OS-1, OS-2 and OS-3 by an underground water quality unit (Contech CDS Unit). This unit will be sized to provide treatment for the 2-year developed storm event and bypass the 100-yr event.

As requested, detention and water quality capture volume calculations are provided for the developed site in the appendix for reference.

STREETS

No street improvements are proposed with this development, however walks will be installed along the east side of County Road.

OPEN CHANNEL FLOW

No open channel flow is proposed with this development.

STORM SEWERS

All onsite inlets and storm pipes are designed to capture and carry the minor (2-year) and major (100-year) storm events to the existing storm sewer system.

STORMWATER MANAGEMENT PLAN

The Stormwater Management Plan (SWMP) will be included in the final engineering plans, with all structural and non-structural Best Management Practices (BMP's) shown as required.

STRUCTURAL BMP'S

Temporary structural erosion control features will be established during overlot grading and prior to the building construction. All erosion control measures will be maintained until vegetation becomes established. Vehicle tracking control and inlet protection BMP's will be included on the construction plans. Silt fencing will be installed at critical locations on the site with respect to current and proposed drainage.

NON-STRUCTURAL BMP'S

Non-structural erosion controls, including project schedule, surface roughening and other pollution prevention measures, will be detailed in the construction activities of the SWMP. Permanent, perennial, native seeding will be established onsite in locations specified by the SWMP and Landscape Architect. The seed mix will be provided in the SWMP reference.

WETLAND IMPACTS

No wetland impacts are proposed with this development.

CONCLUSION

20 The drainage facilities for the development of the Louisville Mill Site have been designed in accordance with the City of Louisville, Storm Drainage Design and Technical Criteria, 2013 Edition. Stormwater detention and water quality enhancements are not provided in the existing condition. An underground treatment unit is proposed to provide water quality for the majority of the developed area. The proposed redevelopment will result in a small increase in flow rate as a result of increased imperviousness over the entirety of the site.

The drainage report for the redevelopment project is non-conforming to the City of Louisville Storm Drainage Design and Technical Criteria Manual. A variance from the City of Louisville Storm Drainage Design and Technical Criteria Manual is being requested for no onsite detention due to lack of landscaped areas, as well as the interest to preserve the historic mill site grounds. In addition, a variance is being requested for the release of runoff into the irrigation ditch from a portion of the existing warehouse building on Lot 1, preserving historic conditions. Currently, the owner of 500 County Road is requesting approval from the irrigation ditch owner to continue historic drainage conditions.

REFERENCES

1. "City of Louisville, Storm Drainage Design and Technical Criteria," 2013 Edition.
2. "Urban Storm Drainage Criteria Manual," Urban Drainage and Flood Control District, Revised June 2001.

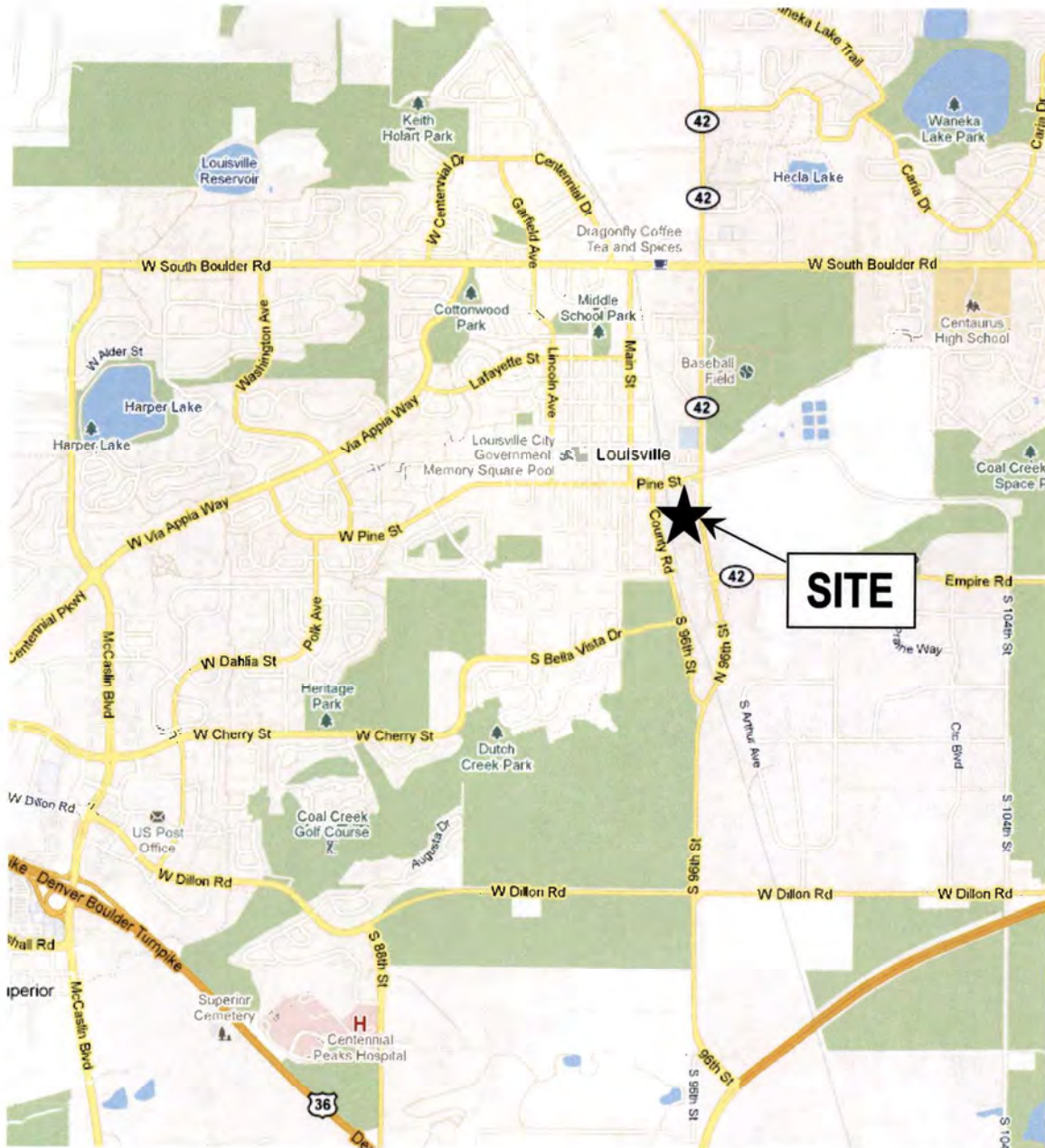
APPENDIX A – SITE MAPS

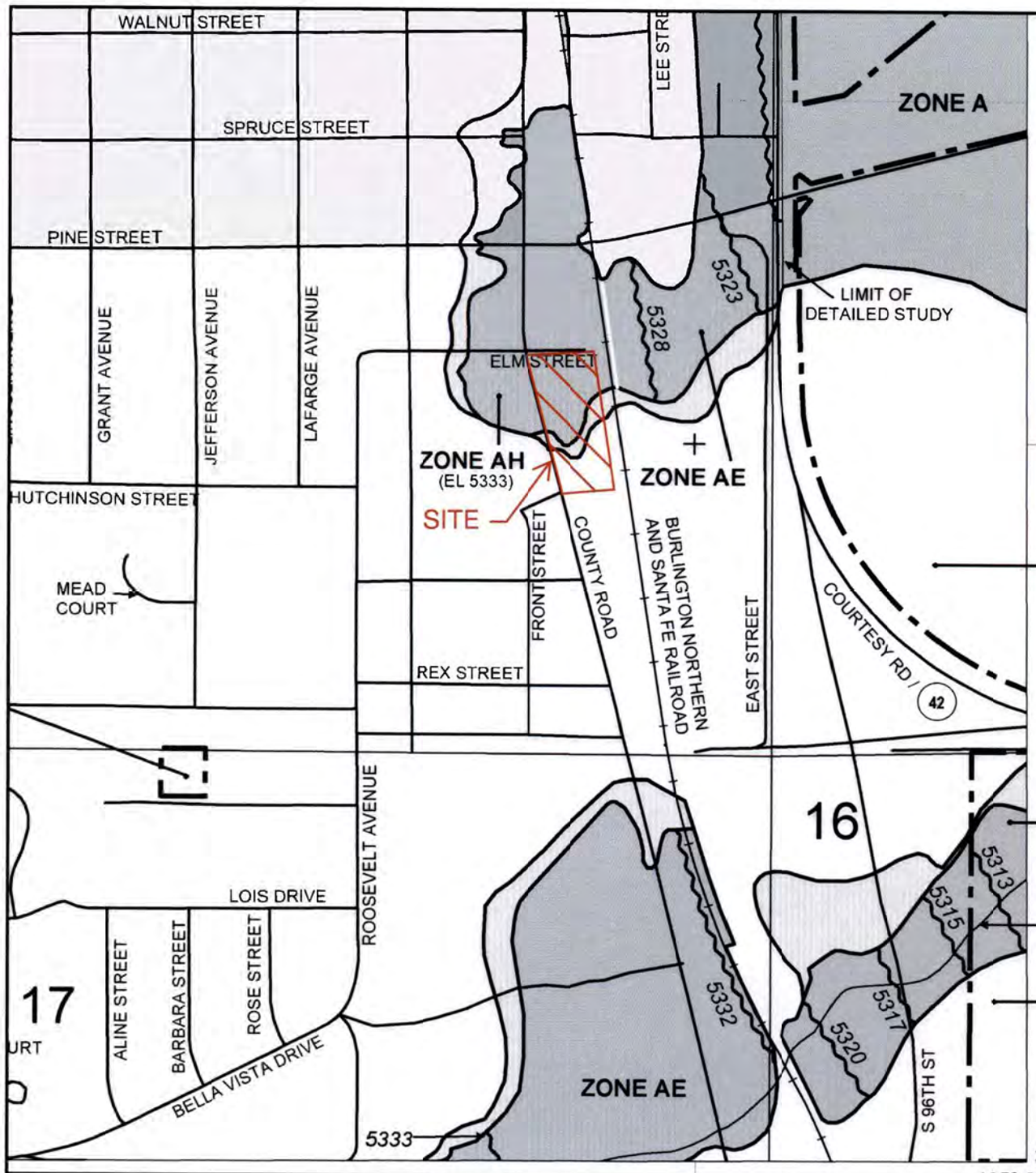
LOUISVILLE MILL SITE

AT

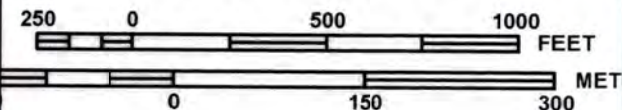
500, 540, AND 544 COUNTY ROAD
LOUISVILLE, COLORADO 80027

VICINITY MAP – NOT TO SCALE





MAP SCALE 1" = 500'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0582J

FIRM

**FLOOD INSURANCE RATE MAP
BOULDER COUNTY,
COLORADO
AND INCORPORATED AREAS**

PANEL 582 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER COUNTY	080023	0582	J
LAFAYETTE, CITY OF	080026	0582	J
LOUISVILLE, CITY OF	085076	0582	J

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



**MAP NUMBER
08013C0582J**

**MAP REVISED
DECEMBER 18, 2012**

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX B— SOIL INFORMATION



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 Boulder County Area, Colorado



April 1, 2014

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 (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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 alternative means

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Soil Map.....	8
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AcC—Ascalon sandy loam, 3 to 5 percent slopes.....	13
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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

Custom Soil Resource Report

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

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: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Boulder County Area, Colorado
Survey Area Data: Version 10, Dec 30, 2013

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

Date(s) aerial images were photographed: Apr 28, 2011—Aug 29, 2012

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

Map Unit Legend

Boulder County Area, Colorado (CO643)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AcA	MLRA 67B - Ascalon sandy loam, 0 to 3 percent slopes	15.6	87.2%
AcC	Ascalon sandy loam, 3 to 5 percent slopes	2.3	12.8%
Totals for Area of Interest		17.9	100.0%

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

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

Boulder County Area, Colorado

AcA—MLRA 67B - Ascalon sandy loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 3,870 to 5,960 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Ascalon and similar soils: 85 percent

Description of Ascalon

Setting

Landform: Paleoterraces, plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wind-reworked alluvium and/or calcareous sandy eolian deposits

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline (0.1 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Moderate (about 7.7 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 3e
Land capability (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: Sandy Plains (R067BY024CO)

Typical profile

0 to 6 inches: Sandy loam
6 to 12 inches: Sandy clay loam
12 to 19 inches: Sandy clay loam
19 to 35 inches: Sandy clay loam
35 to 80 inches: Sandy loam

AcC—Ascalon sandy loam, 3 to 5 percent slopes

Map Unit Setting

Elevation: 4,900 to 5,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 140 to 155 days

Map Unit Composition

Ascalon and similar soils: 90 percent

Description of Ascalon

Setting

Landform: Terraces
Landform position (three-dimensional): Side slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed loamy alluvium and/or eolian deposits

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 16.5 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 3e
Land capability (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Sandy (R067XB026CO)

Typical profile

0 to 8 inches: Sandy loam
8 to 19 inches: Sandy clay loam, sandy loam
19 to 60 inches: Fine sandy loam, loamy fine sand, sandy loam

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APPENDIX C – HYDROLOGY

TIME - INTENSITY - FREQUENCY TABULATION

TIME OF CONCENT. (min)	INTENSITY - IN/HR			
	FREQUENCY - YEARS			
	2	5	10	100
5	3.35	4.90	5.85	9.40
10	2.58	3.88	4.65	7.30
15	2.20	3.25	3.88	6.20
20	1.90	2.83	3.35	5.40
25	1.68	2.43	2.95	4.78
30	1.53	2.23	2.63	4.25
35	1.38	2.02	2.38	3.85
40	1.28	1.84	2.18	3.53
45	1.18	1.68	2.02	3.25
50	1.10	1.58	1.87	3.03
55	1.02	1.46	1.76	2.85
60	0.96	1.38	1.68	2.70

NOTE: 1. The minimum time-of-concentration for use with the Rational Method is 5 minutes.

2. Refer to Figure-1 for a plot of the data

3. Refer to Text Section 4.3 "Rational Method"

WRC, Inc.

Date: Dec, 1981

Reference:

NOAA Atlas 2, Precipitation - Frequency Atlas of the Western United States, Volume III - Colorado

CITY OF LOUISVILLE
STORM DRAINAGE DESIGN AND TECHNICAL CRITERIA

TABLE 3

RUNOFF COEFFICIENTS FOR RATIONAL METHOD

LAND USE OR SURFACE CHARACTERISTICS	PERCENT IMPERVIOUS	FREQUENCY			
		2	5	10	100
<u>Business:</u>					
Commercial Areas	95	.87	.88	.90	.93
Neighborhood Areas	65	.60	.65	.70	.80
<u>Residential:</u>					
Single-Family	40	.40	.45	.50	.70
Multi-Unit (detached)	50	.50	.55	.60	.75
Multi-Unit (attached)	70	.65	.70	.70	.80
1/2 Acre Lot or Larger	30	.30	.40	.45	.65
Apartments	70	.65	.70	.70	.80
<u>Industrial:</u>					
Light Areas	80	.75	.80	.80	.85
Heavy Areas	90	.80	.80	.85	.90
<u>Parks, Cemeteries</u>	7	.15	.25	.35	.60
<u>Playgrounds</u>	13	.20	.30	.40	.70
<u>Schools</u>	50	.50	.55	.60	.75
<u>Railroad Yard Areas</u>	40	.40	.45	.50	.70
<u>Undeveloped Areas:</u>					
Historic Flow Analysis	2	.10	.20	.30	.60
Greenbelts, Agricultural					
Offsite Flow Analysis	45	.45	.50	.55	.72
(when land use not defined)					
<u>Streets:</u>					
Paved	100	.87	.88	.90	.93
Gravel	7	.15	.25	.35	.65
<u>Drives and Walks</u>	96	.85	.87	.90	.92
<u>Roofs</u>	90	.80	.85	.90	.90
<u>Lawns, Sandy Soil</u>	0	.00	.10	.20	.50
<u>Lawns, Clayey Soil</u>	0	.10	.20	.30	.60

NOTE: These Rational Formula coefficients do not apply for larger basins where the time-of-concentration exceeds 60 minutes.

WRC, Inc.

Reference:

Urban Drainage & Flood Control District Rational
 Formula Procedure, Hydrology Research Program, August
 1979.

Date: Dec, 1981

APPENDIX D – CALCULATIONS



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Job Name: Louisville Mill Site
Job Number: 2221c
Date: 9/3/14
By: MDE

Louisville Mill Site

Historic Runoff Coefficient & Time of Concentration Calculations

Location: Louisville
Minor Design Storm: 10
Major Design Storm: 100
Soil Type: C/D

$$CA = KA + (1.31i3 - 1.44i2 + 1.135i + 0.12)$$

$$CCD = KCD + (0.858i3 - 0.786i2 + 0.774i + 0.04)$$

$$CB = (CA + CCD)/2$$

Basin Design Data

	I (%) =	100%	90%	90%	40%	10%	25%	0%	0%		I (%)	Runoff Coeff's				Initial Overland Time (t) $t=0.395(1.1-C_p)L^{1/2}S^{-1/3}$			Travel Time (t) $t_t=\text{Length}/(\text{Velocity} \times 60)$				$t_c=\text{Length}/(\text{Velocity})$		tc Urbanized Check ON		t _c Final		
Basin Name	Design Point	A _{paved streets} (sf)	A _{driveway/co nc} (sf)	A _{roof} (sf)	A _{grass} (sf)	A _{plynd} (sf)	A _{hrt. turf} (sf)	A _{escape (B soil)} (sf)	A _{escape (C/D soil)} (sf)	A _{Total} (sf)	A _{Total} (ac)	Imp (%)	C2	C5	C10	C100	Upper most Length (ft)	Slope (%)	t (min)	Length (ft)	Slope (%)	Type of Land Surface	C _v	Velocity (fps)	t (min)	Time of Conc $t_t + t_c = t_c$	Total Length (ft)	$t_c=(L/180)+10$ (min.)	Min t _c
H1	1		2,840					325		3,165	0.07	80.8%	0.60	0.63	0.67	0.75	62	1.5%	5.9			Paved areas & shallow paved swales	20	0.0	0.0	5.9	62	10.3	5.9
H2	2		3,570		4,555			800		8,925	0.20	56.4%	0.38	0.43	0.49	0.62	125	2.2%	10.5			Paved areas & shallow paved swales	20	0.0	0.0	10.5	125	10.7	10.5
H3	3			6,525				1,295		7,820	0.18	75.1%	0.54	0.58	0.62	0.71	119	2.0%	8.3			Paved areas & shallow paved swales	20	0.0	0.0	8.3	119	10.7	8.3
H4 OFF	4				19,812					19,812	0.45	40.0%	0.28	0.35	0.42	0.58	420	2.0%	22.4			Paved areas & shallow paved swales	20	0.0	0.0	22.4	420	12.3	12.3
H4 ON	5		17065	10173	8,353			11,785		47,376	1.09	58.8%	0.40	0.45	0.50	0.63	313	1.8%	17.4			Paved areas & shallow paved swales	20	0.0	0.0	17.4	313	11.7	11.7
TOTAL SITE		0	23,475	16,698	32,720	0	0	14,205	0	87,098	2.00	56.5%	0.38	0.43	0.49	0.62													

$$I = (28.5 P^1) / ((10 + TC) 0.786)$$

Basin Name	Design Point	Time of Conc (t _c)	Runoff Coeff's				Rainfall Intensities (in/hr)				Area		Flow Rates (cfs)			
			C2	C5	C10	C100	2	5	10	100	A _{Total} (sf)	A _{Total} (ac)	Q2	Q5	Q10	Q100
H1	1	5.9	0.60	0.63	0.67	0.75	3.11	4.47	5.44	8.75	3,165	0.07	0.14	0.21	0.26	0.48
H2	2	10.5	0.38	0.43	0.49	0.62	2.55	3.66	4.46	7.16	8,925	0.20	0.20	0.33	0.45	0.91
H3	3	8.3	0.54	0.58	0.62	0.71	2.79	4.00	4.87	7.83	7,820	0.18	0.27	0.41	0.54	1.00
H4 OFF	4	12.3	0.28	0.35	0.42	0.58	2.38	3.43	4.17	6.71	19,812	0.45	0.30	0.54	0.79	1.78
H4 ON	5	11.7	0.40	0.45	0.50	0.63	2.44	3.50	4.26	6.85	47,376	1.09	1.05	1.71	2.33	4.68
TOTAL SITE											87,098	2.00	1.96	3.20	4.37	8.84



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Job Name: Louisville Mill Site
 Job Number: 2221c
 Date: 3/12/15
 By: MDE

Louisville Mill Site

Composite Runoff Coefficient Calculations

Location: Louisville
 Minor Design Storm: 2
 Major Design Storm: 100
 Soil Type: C/D

$$CA = KA + (1.31/3 - 1.44/2 + 1.135i + 0.12)$$

$$CCD = KCD + (0.858/3 - 0.786/2 + 0.774i + 0.04)$$

$$CB = (CA + CCD)/2$$

Basin Design Data																
	I (%) =	100%	90%	90%	40%	10%	25%	0%	0%			I (%)	Runoff Coeff's			
Basin Name	Design Point	A _{paved streets} (sf)	A _{drives/c onc} (sf)	A _{roof} (sf)	A _{gravel} (sf)	A _{piygnd} (sf)	A _{art. turf} (sf)	A _{yscape (B soil)} (sf)	A _{yscape (C/D soil)} (sf)	A _{Total} (sf)	A _{Total} (ac)	Imp (%)	C2	C5	C10	C100
A	1		2,550					195		2,745	0.06	83.6%	0.64	0.67	0.70	0.77
B	2			8,625						8,625	0.20	90.0%	0.73	0.75	0.77	0.83
C	3		4,985					1,000		5,985	0.14	75.0%	0.54	0.57	0.62	0.71
D	4		5,532					5,850		11,382	0.26	43.7%	0.30	0.37	0.43	0.59
E	5		8,125	7,610				945		16,680	0.38	84.9%	0.66	0.68	0.71	0.78
F	6			6,525				1,345		7,870	0.18	74.6%	0.54	0.57	0.61	0.71
G	10		4,395					275		4,670	0.11	84.7%	0.65	0.68	0.71	0.78
H	11		2,370	3,435				3,164		8,969	0.21	58.3%	0.39	0.45	0.50	0.63
OS1	7		2,965		7,310					10,275	0.24	54.4%	0.37	0.42	0.48	0.61
OS2	8		1,670		1,355					3,025	0.07	67.6%	0.47	0.51	0.56	0.67
OS3	9		225		6,475					6,700	0.15	41.7%	0.29	0.36	0.42	0.59



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Job Name: Louisville Mill Site
 Job Number: 2221c
 Date: 3/12/15
 By: MDE

Louisville Mill Site

Time of Concentration Calculations

Location: Louisville
 Minor Design Storm: 2
 Major Design Storm: 100
 Soil Type: C/D

Sub-Basin Data				Initial Overland Time (t_i)			Travel Time (t_t) $t_t = \text{Length} / (\text{Velocity} \times 60)$							t_c Comp	t_c Urbanized Check ON	t_c Final
Basin Name	Design Point	A_{Total} (ac)	C5	Upper most Length (ft)	Slope (%)	t_i (min)	Length (ft)	Slope (%)	Type of Land Surface	C_v	Velocity (fps)	t_t (min)	Time of Conc $t_i + t_t = t_c$	Total Length (ft)	$t_c = (L/180) + 10$ (min)	Min t_c
A	1	0.06	0.67	123	1.5%	7.7			Paved areas & shallow paved swales	20	0.0	0.0	7.7	123	10.7	7.7
B	2	0.20	0.75	120	2.0%	5.7			Paved areas & shallow paved swales	20	0.0	0.0	5.7	120	10.7	5.7
C	3	0.14	0.57	80	4.0%	5.4	35	5.0%	Grassed waterway	15	3.4	0.2	5.6	115	10.6	5.6
D	4	0.26	0.37	67	1.5%	9.6			Paved areas & shallow paved swales	20	0.0	0.0	9.6	67	10.4	9.6
E	5	0.38	0.68	143	2.5%	6.8	45	5.0%	Grassed waterway	15	3.4	0.2	7.0	188	11.0	7.0
F	6	0.18	0.57	119	2.0%	8.4			Paved areas & shallow paved swales	20	0.0	0.0	8.4	119	10.7	8.4
G	10	0.11	0.68	0	2.0%	0.0	75	2.0%	Paved areas & shallow paved swales	20	2.8	0.4	0.4	75	10.4	5.0
H	11	0.21	0.45	40	2.0%	6.0	45	2.0%	Grassed waterway	15	2.1	0.4	6.4	85	10.5	6.4
OS1	7	0.24	0.42	114	0.5%	16.7	117	1.0%	Paved areas & shallow paved swales	20	2.0	1.0	17.7	231	11.3	11.3
OS2	8	0.07	0.51	30	0.5%	7.4	56	1.5%	Paved areas & shallow paved swales	20	2.4	0.4	7.8	86	10.5	7.8
OS3	9	0.15	0.36	130	2.0%	12.3			Paved areas & shallow paved swales	20	0.0	0.0	12.3	130	10.7	10.7



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 By: MDE

Louisville Mill Site

Developed Storm Runoff Calculations

Design Storm :

2 Year

Point Hour Rainfall (P₁) : **0.96**

$$I = (28.5 P_1) / ((10 + TC)^{0.786})$$

Basin Name	Direct Runoff							Total Runoff				Inlets			Pipe					Pipe/Swale Travel Time		Total Time (min)	
	Design Point	Area (ac)	Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)		tt (min)
A	1	0.06	0.64	7.70	0.04	2.86	0.12	7.70	0.04	2.86	0.12							0.1					
B	2	0.20	0.73	5.70	0.14	3.14	0.45	5.70	0.14	3.14	0.45							0.5					
C	3	0.14	0.54	5.60	0.07	3.16	0.23	5.60	0.07	3.16	0.23							0.2					
D	4	0.26	0.30	9.60	0.08	2.64	0.21	9.60	0.08	2.64	0.21							0.2					
E	5	0.38	0.66	7.00	0.25	2.95	0.74	7.00	0.25	2.95	0.74							0.7					
F	6	0.18	0.54	8.40	0.10	2.77	0.27	8.40	0.10	2.77	0.27							0.3					
G	10	0.11	0.65	5.00	0.07	3.26	0.23	5.00	0.07	3.26	0.23												
H	11	0.21	0.39	6.40	0.08	3.04	0.25	6.40	0.08	3.04	0.25												
OS1	7	0.24	0.37	11.30	0.09	2.47	0.21	11.30	0.09	2.47	0.21							0.2					
OS2	8	0.07	0.47	7.80	0.03	2.85	0.09	7.80	0.03	2.85	0.09							0.1					
OS3	9	0.15	0.29	10.70	0.04	2.53	0.11	10.70	0.04	2.53	0.11							0.1					
TOTAL SITE		2.00							TOTAL SITE		2.91					TOTAL SITE		2.9					



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Job Name: Louisville Mill Site
 Job Number: 2221c
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 By: MDE

Louisville Mill Site

Developed Storm Runoff Calculations

Design Storm :

10 Year

Point Hour Rainfall (P₁) : **1.68**

$$I = (28.5 P_1) / ((10 + TC)^{0.786})$$

Basin Name	Design Point	Area (ac)	Runoff Coeff	Direct Runoff				Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Total Time (min)	
				tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q Intercepted	Q carryover	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)		tt (min)
A	1	0.06	0.70	7.70	0.04	5.00	0.22	7.70	0.04	5.00	0.22						0.2						
B	2	0.20	0.77	5.70	0.15	5.50	0.84	5.70	0.15	5.50	0.84						0.8						
C	3	0.14	0.62	5.60	0.08	5.53	0.47	5.60	0.08	5.53	0.47						0.5						
D	4	0.26	0.43	9.60	0.11	4.62	0.52	9.60	0.11	4.62	0.52						0.5						
E	5	0.38	0.71	7.00	0.27	5.16	1.41	7.00	0.27	5.16	1.41						1.4						
F	6	0.18	0.61	8.40	0.11	4.85	0.54	8.40	0.11	4.85	0.54						0.5						
G	10	0.11	0.71	5.00	0.08	5.70	0.43	5.00	0.08	5.70	0.43						0.4						
H	11	0.21	0.50	6.40	0.10	5.31	0.55	6.40	0.10	5.31	0.55						0.5						
OS1	7	0.24	0.48	11.30	0.11	4.33	0.49	11.30	0.11	4.33	0.49						0.5						
OS2	8	0.07	0.56	7.80	0.04	4.98	0.19	7.80	0.04	4.98	0.19						0.2						
OS3	9	0.15	0.42	10.70	0.07	4.42	0.29	10.70	0.07	4.42	0.29						0.3						
TOTAL SITE		2.00							TOTAL SITE		5.94						TOTAL SITE		5.9				



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Job Name: Louisville Mill Site
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 By: MDE

Louisville Mill Site

Developed Storm Runoff Calculations

Design Storm :

100 Year

Point Hour Rainfall (P₁) : **2.70**

$$I = (28.5 P_1) / ((10 + TC)^{0.786})$$

Basin Name	Design Point	Area (ac)	Runoff Coeff	Direct Runoff				Total Runoff				Inlets			Pipe					Pipe/Swale Travel Time		Total Time (min)	
				tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)		tt (min)
A	1	0.06	0.77	7.70	0.05	8.04	0.39	7.70	0.05	8.04	0.39							0.4					
B	2	0.20	0.83	5.70	0.17	8.84	1.46	5.70	0.17	8.84	1.46							1.5					
C	3	0.14	0.71	5.60	0.10	8.88	0.86	5.60	0.10	8.88	0.86							0.9					
D	4	0.26	0.59	9.60	0.15	7.42	1.14	9.60	0.15	7.42	1.14							1.1					
E	5	0.38	0.78	7.00	0.30	8.30	2.49	7.00	0.30	8.30	2.49							2.5					
F	6	0.18	0.71	8.40	0.13	7.80	0.99	8.40	0.13	7.80	0.99							1.0					
G	10	0.11	0.78	5.00	0.08	9.16	0.77	5.00	0.08	9.16	0.77							0.8					
H	11	0.21	0.63	6.40	0.13	8.54	1.10	6.40	0.13	8.54	1.10							1.1					
OS1	7	0.24	0.61	11.30	0.14	6.95	1.01	11.30	0.14	6.95	1.01							1.0					
OS2	8	0.07	0.67	7.80	0.05	8.01	0.37	7.80	0.05	8.01	0.37							0.4					
OS3	9	0.15	0.59	10.70	0.09	7.11	0.64	10.70	0.09	7.11	0.64							0.6					
TOTAL SITE		2.00							TOTAL SITE		11.23					TOTAL SITE		11.2					



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 By: MDE

Louisville Mill Site

Detention Pond Volume Calculations: $V = K \cdot A$ Method

ALLOWABLE RELEASE RATE

Table SO-1 - Maximum Unif Flow Release Rates (cfs/ac)

Design Frequency	NRCS Hydrologic Soil Group		
	A	B	C & D
5-year	0.07	0.13	0.17
10-year	0.13	0.23	0.30
100-year	0.50	0.85	1.00

Q release = Area * Max Unit Flow Release Rate

Soil Type: **C/D**

Release Rates:

Q10 = 0.46 CFS

Q100 = 1.54 CFS

DETENTION POND SIZING

$$V = K \cdot A$$

(UDFCD, Vol 2, Chapter 10, Equation SO-1)

10 Year Pond Volume

$$K = (0.95 \cdot I - 1.9) / 1000$$

(UDFCD, Vol 2, Chapter 10, Equation SO-3)

100 year Pond Volume:

$$K = (1.78 \cdot I - 0.002 \cdot I^2 - 3.56) / 900$$

(UDFCD, Vol 2, Chapter 10, Equation SO-2)

I = **68.1%**

I = Percent Impervious

A = **1.5** acres

A = Tributary Area

V = Required Volume

K10 = 0.0628

K100 = 0.1204

V10 = 4,210 CF

V100 = 8,075 CF

TOTAL DETENTION POND VOLUME

Water Quality Capture Volume (WQCV) =		1,266 CF
Volume Minor =	V10 + 0% WQCV =	4,210 CF
Volume Major =	V100 + 0% WQCV =	8,075 CF

Design Procedure Form: Rain Garden (RG)

Sheet 1 of 2

Designer: REP
 Company: JVA, Inc.
 Date: March 12, 2015
 Project: Louisville Mill (Developed Site-Basins A-H)- For reference only, no WQCV provided for site
 Location: Louisville, Colorado

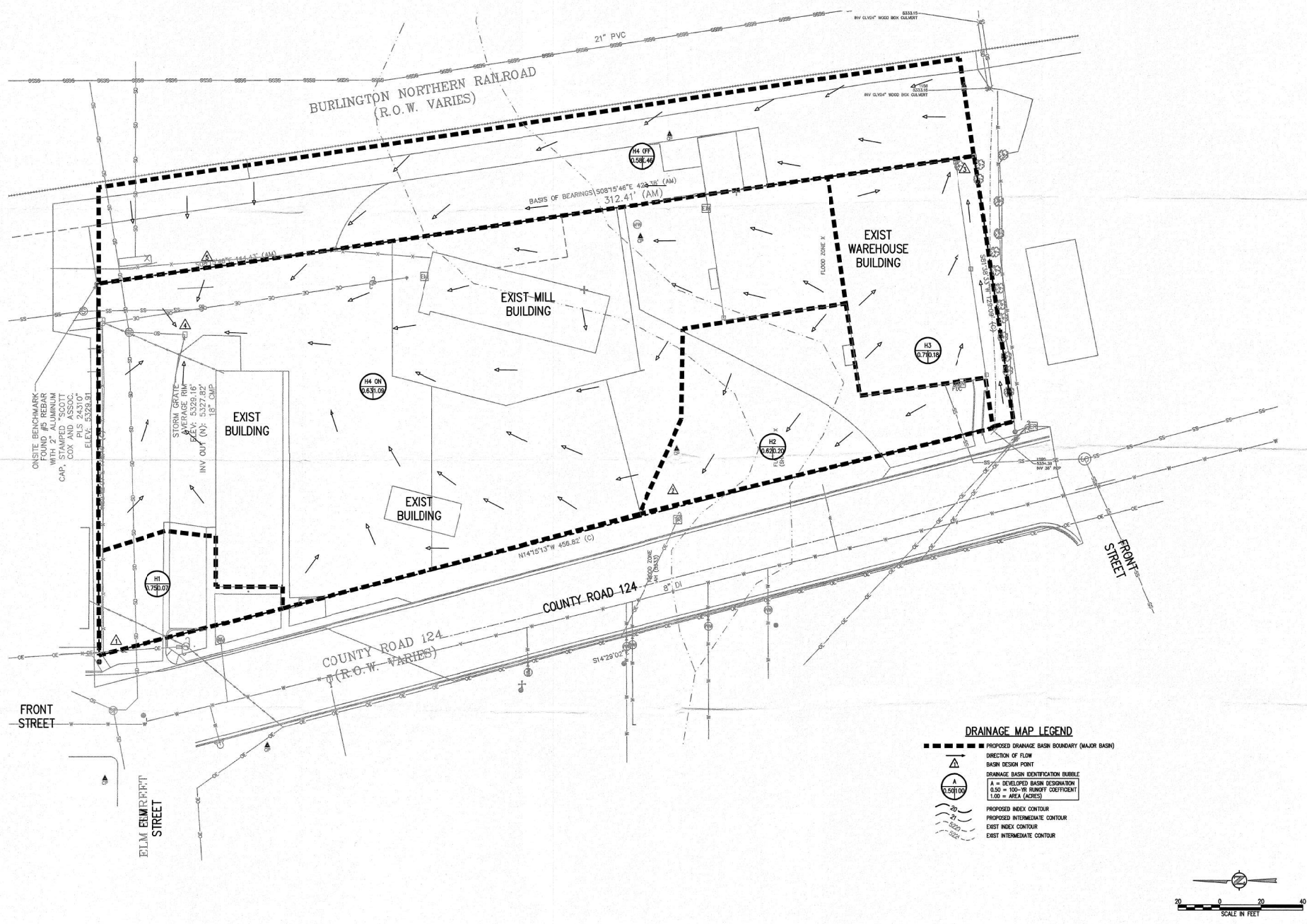
1. Basin Storage Volume A) Effective Imperviousness of Tributary Area, I_e (100% if all paved and roofed areas upstream of rain garden) B) Tributary Area's Imperviousness Ratio ($I = I_e/100$) C) Water Quality Capture Volume (WQCV) for a 12-hour Drain Time ($WQCV = 0.8 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i)$) D) Contributing Watershed Area (including rain garden area) E) Water Quality Capture Volume (WQCV) Design Volume $Vol = (WQCV / 12) * Area$ F) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)	$I_e =$ <u>71.5</u> % $I =$ <u>0.715</u> WQCV = <u>0.23</u> watershed inches Area = <u>67,285</u> sq ft $V_{WQCV} =$ <u>1,266</u> cu ft $d_s =$ _____ in $V_{WQCV \text{ OTHER}} =$ _____ cu ft $V_{WQCV \text{ USER}} =$ _____ cu ft
2. Basin Geometry A) WQCV Depth (12-inch maximum) B) Rain Garden Side Slopes ($Z = 4$ min., horiz. dist per unit vertical) (Use "0" if rain garden has vertical walls) C) Minimum Flat Surface Area D) Actual Flat Surface Area E) Area at Design Depth (Top Surface Area) F) Rain Garden Total Volume ($V_T = ((A_{Top} + A_{Actual}) / 2) * Depth$)	$D_{WQCV} =$ <u>12</u> in $Z =$ <u>4.00</u> ft / ft $A_{Min} =$ <u>844</u> sq ft $A_{Actual} =$ <u>844</u> sq ft $A_{Top} =$ <u>1700</u> sq ft $V_T =$ <u>1,272</u> cu ft
3. Growing Media	Choose One ☒ 18" Rain Garden Growing Media ☐ Other (Explain): _____
4. Underdrain System A) Are underdrains provided? B) Underdrain system orifice diameter for 12 hour drain time i) Distance From Lowest Elevation of the Storage Volume to the Center of the Orifice ii) Volume to Drain in 12 Hours iii) Orifice Diameter, 3/8" Minimum	Choose One ☐ YES ☒ NO $y =$ <u>N/A</u> ft $Vol_{12} =$ <u>N/A</u> cu ft $D_o =$ <u>N/A</u> in

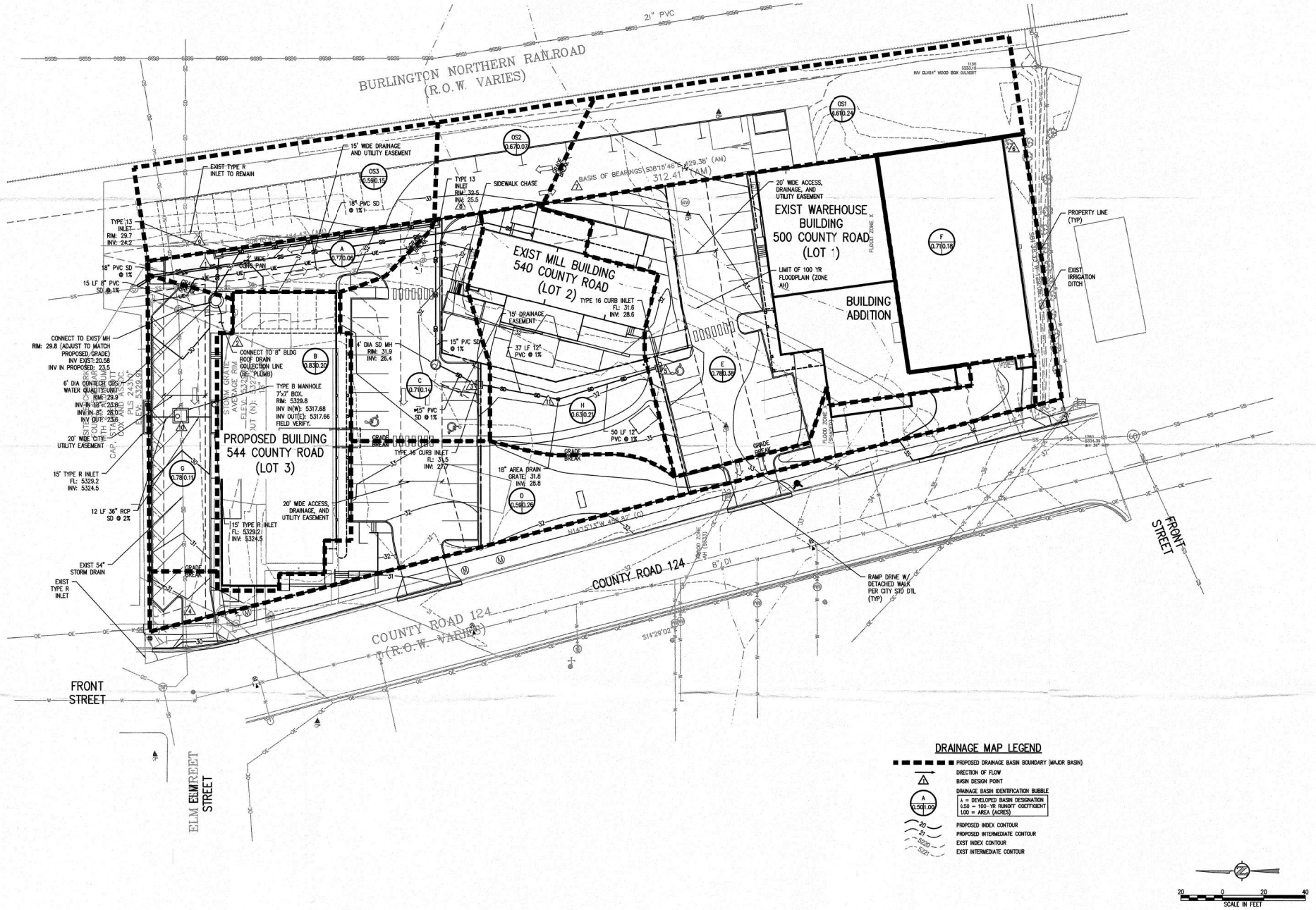
NO.	DATE	REVISION DESCRIPTION

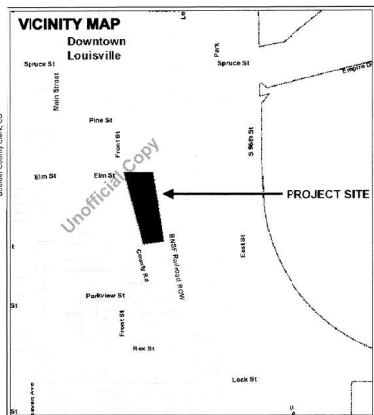
DESIGNED BY:
DRAWN BY:
CHECKED BY:
JOB # 2221c
DATE: APRIL 03, 2014
© JGA INC

LOUISVILLE MILL SITE
LOUISVILLE, COLORADO
HISTORIC DRAINAGE MAP

SHEET NO.
FIG 1







FINAL P.U.D. **LOUISVILLE MILL SITE REDEVELOPMENT** **500, 540, 544 County Road** **LOUISVILLE MILL SITE SUBDIVISION** **LOCATED IN THE SOUTHEAST QUARTER OF SECTION 8, TOWNSHIP 1 SOUTH RANGE 69 WEST OF** **THE 6TH P.M., CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO**



HARTRONFT ASSOCIATES
A Professional Corporation
Planning
Architecture
Interior Design
 950 Spruce Street, #1A
 Louisville, CO 80027
 TEL: 303.673.9304
 FAX: 303.673.9319

LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR
500, 540 & 544 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Caranci / Hartronft



PROJECT # 125.10
DATE: 04/05/14
DRAWN BY: HFC
CHECKED BY: EH
REVISIONS:
 PRG/HFC - 06/13/14
 HFC - 11/06/14
 FPC - 03/13/15
 FCC - 05/06/15

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COVER SHEET
PROJECT DATA
RENDERINGS
SIGNATURES

Sheet
A1
 1 of 4 Sheets

SIGNATURES

OWNER'S SIGNATURE BLOCK
 By signing this PUD, the owner acknowledges and accepts all the requirements and intent set forth in this PUD. Witness my hand and seal this ____ day of _____, 20__.

J. Erik Hartronft, Member
 Louisville Mill Site LLC
 Owner Name and Signature

Randall C. Caranci, Member
 Louisville Mill Site LLC
 Owner Name and Signature

Randall C. Caranci
 RCCL LLC
 Owner Name and Signature

Notary Name (print) (Notary Seal)
Notary Signature
My Commission Expires _____

PLANNING COMMISSION CERTIFICATE
 Approved this ____ day of _____, 20__ by the Planning Commission of the City of Louisville, Colorado.
 Resolution No. ____ Series ____

CLERK AND RECORDER CERTIFICATE
 (COUNTY OF BOULDER, STATE OF COLORADO)
 I hereby certify that this instrument was filed in my office at ____ o'clock ____ P. M. this ____ day of _____, 20__, and is recorded in Plan File ____ Fee \$____ per ____ Fil No. ____ Reception: ____

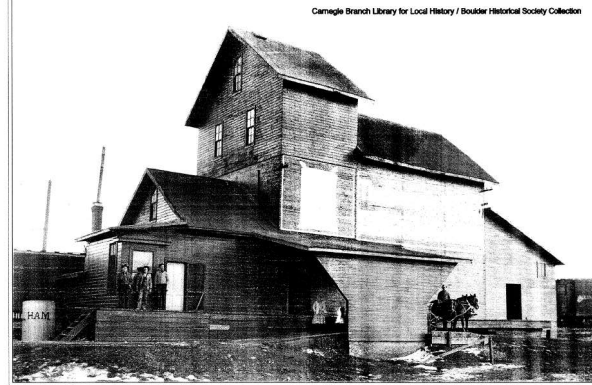
Hillary Hall
 Clerk & Recorder
Deputy

CITY COUNCIL CERTIFICATE
 Approved this ____ day of _____, 20__ by the City Council of the City of Louisville, Colorado.
 Resolution No. ____ Series ____ (City Seal)
Mayor Signature
City Clerk Signature

SHEET INDEX

SHEET	DESCRIPTION	PROJECT DIRECTORY
ARCHITECTURAL		
A1	Cover Sheet, Project Data & Renderings	Louisville Mill Site LLC * 950 Spruce Street, Suite 1A Louisville, Colorado 80027 Contact: Erik Hartronft 303-673-9304
A2	Site Plan	ARCHITECT/PLANNER
A3	Landscape & Parking Plan, All Parking Plan	Hartronft Associates, P.C. 950 Spruce Street, Suite 1A Louisville, Colorado 80027 Contact: Erik Hartronft, AIA 303-673-9304
A4	Plans	
A5	Building Elevations	
A6	Site Photometric	
SURVEY		
1	ALTA/ACSM Land Title Survey	CIVIL ENGINEER
CIVIL		
C1.0	Drainage Plan	JWA, Incorporated 1319 Spruce Street Boulder, Colorado 80502 Contact: Darren Stewart 303-444-1951
C2.0	Utility Plan	
EX-1	Autolum Firetruck Exhibit	
EX-2	Autolum Firetruck Exhibit	

HISTORIC VIEW OF GRAIN ELEVATOR FROM THE NORTHWEST



Louisville Mill Site - Use and Zoning Information Final PUD and Plat - 11/06/14 (rev. 3/13/15)

Project Description:
 The Louisville Mill Site Redevelopment project will combine two adjacent properties, and subdivide the combined land area into 3 building lots and one outlier for common use. The northern property currently contains the historic Louisville Grain Elevator building which will be dismantled and rehabilitated for commercial use with minor additions, and a 3,360sf commercial building, and small shed which will be both be removed. The southern property currently contains a commercial structure, formerly used as a warehouse, now home to a fitness-related business. An addition is planned for this building. The proposed uses for all buildings on the property is commercial, with retail, restaurant/bar, and similar allowable uses on the ground level, with offices anticipated on upper levels. There is a potential for some public or private museum space in the grain elevator structure.

Building Bulk and Density Standards:	Addresses and Legal Descriptions:
Required Setbacks: Front 5'-25' Rear 20' Side (internal) 5' 10' minimum Allowable Height: 2 story - 35' 3 story - 38.5' * 35' from Main Level FFE to flat roof with allowance for rooftop screening Due to floodplain grading requirements, building height from average Main Level FFE to flat roof is 36.5' with tower and roof screening to 41.5'	See Plat and Survey for Legal Descriptions: Caranci Grain Green Mill Site Lot 1 Lot 2 Outlot A Lot 3 Address - County Road 500 540 544

Louisville Mill Site - Plat Areas & PUD Yield Per Lot Including Parking Final PUD and Plat - 11/06/14 (rev. 3/13/15)

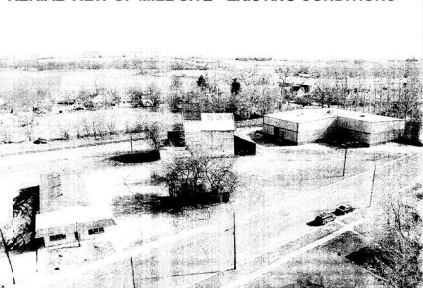
Existing Property Area:	PUD Yield From Redevelopment	Caranci	Grain	Green	Mill Site	Total
Existing Mill Site Land Area 48,546 sf +/- 69.18%						
Existing Caranci Property Land Area 29,725 sf +/- 30.82%						
Total Plat Area 67,261 sf +/- 100.00%		75,190	9,122	6,841	36,129	67,281
RR ROW Lease Area 1 (Caranci) 5,208 sf +/- existing		5,288			3,578	8,874
RR ROW Lease Area 2 (Proposed Mill Site) 3,578 sf +/- future					3,360	17,454
Total Plat Area plus RR ROW 76,125 sf +/-					15,640	
Existing Building Area*		10,000	4,094			
Additional Building Area / Lot		6,500	1,500			
Total Proposed Usable Building Area		16,500	5,594	0	19,094	39,094
Big Area Percentage of total		42.24%	9.11%		48.64%	100.00%
Total Unconditioned in Grain Elev.		2,034 +/-				
Net Area (- lost - util. circ. ht. etc.)		0.9	13,950	1,404		32,454
Parking Required @ 1sp per		500	28	3		531
Parking Proposed						
On Site		19	3	0	34	56
Existing RR ROW		9				9
Potential add on-site spaces**					9	5
Potential add RR ROW***					12	shared/common

Notes:
 * Existing bldg. area of Grain Elevator not included all counted "proposed usable"
 ** Existing Lot 3 Commercial (former Napa) to be removed, total is all new construction
 *** 9 net spaces / green space replaced by parking, 5 potential spaces tucked under bldg
 **** Dependent upon successful negotiation with BNSF for extended lease area
 A shared parking/garage/maintenance agreement shall be executed by all Mill Site Subdivision property owners and recorded concurrently with the Final PUD and Plat.

VIEW OF PROPOSED MILL SITE BUILDING AND HISTORIC GRAIN ELEVATOR FROM THE SOUTHWEST



AERIAL VIEW OF MILL SITE - EXISTING CONDITIONS



VIEW OF LOT 1 BUILDING AND GRAIN ELEVATOR FROM THE NORTHWEST



Unofficial Copy



1 ARCHITECTURAL SITE PLAN
A2 1" = 20'



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FAX: 303.673.9319

**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
500, 540 & 544 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Carand / Hartonft



PROJECT # 125210
DATE 04/03/14
DRAWN BY: HAFG
CHECKED BY: JH
REVISIONS
REV. NO. DATE BY
1 06/13/14 HAFG
2 03/13/15 JH
3 05/06/15 JH

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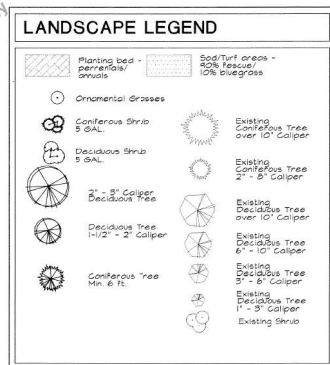
SITE PLAN

Sheet

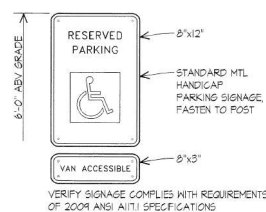
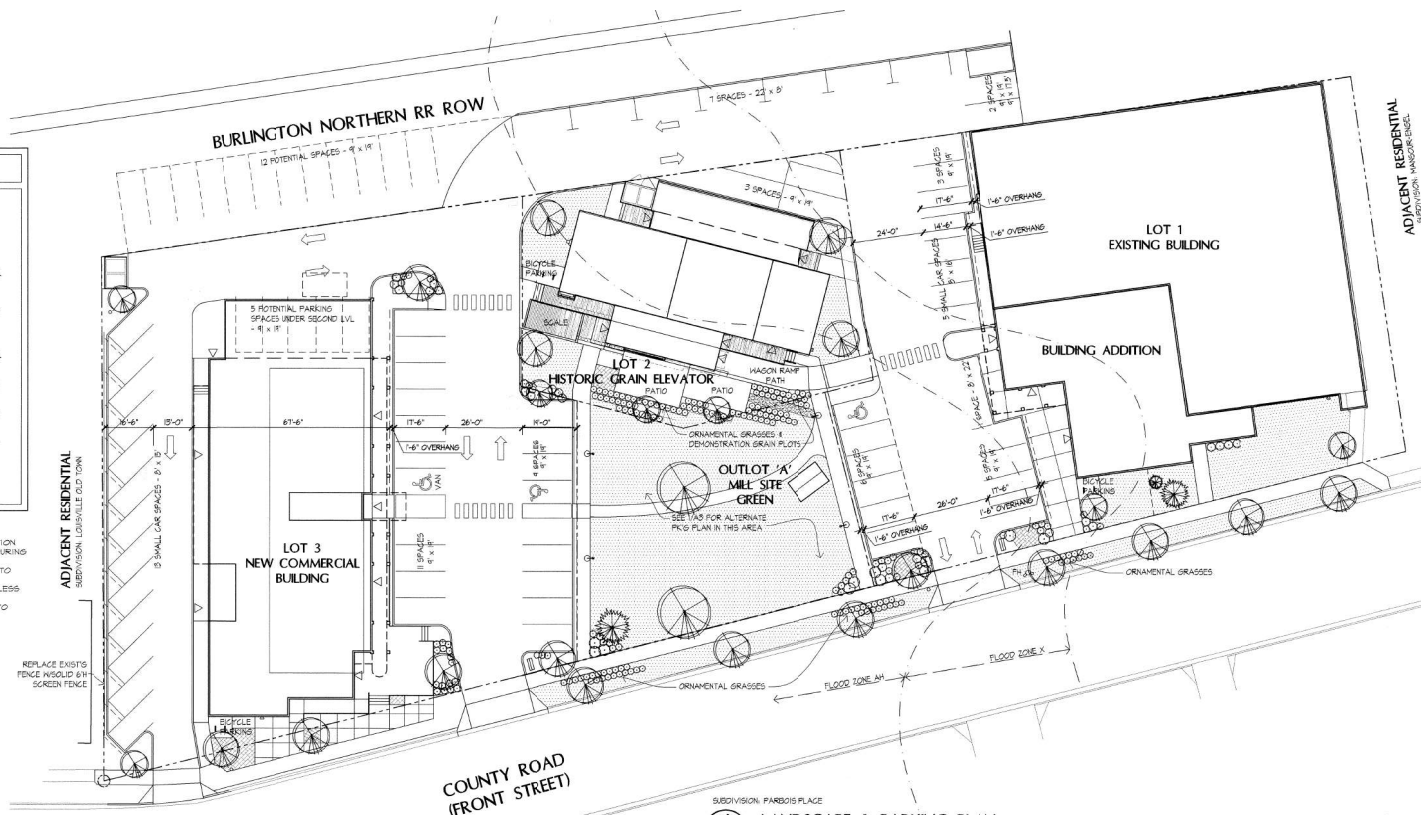
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2 of 6 Sheets

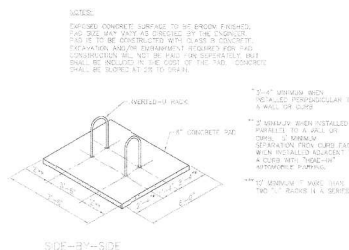
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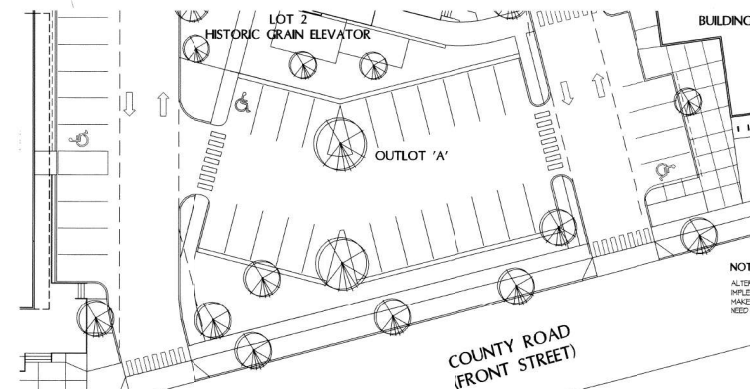
- NOTES:
1. APPLICANT TO PROVIDE DETAILED LANDSCAPE & IRRIGATION DRAWINGS TO PUBLIC WORKS FOR REVIEW & APPROVAL DURING THE CIVIL PLAN REVIEW
 2. PARKWAY TREES SHALL BE PLANTED NO CLOSER THAN 5' TO CURB OR WALK
 3. THE USE OF ROOT BARRIER IS REQUIRED FOR ALL TREES LESS THAN 5' FROM CURB OR WALK
 4. THE PARKWAY IRRIGATION SYSTEM SHALL NOT SPRAY ONTO PAVED SERVICES



3 H.C. PK'G SIGN DETAIL
A3 N.T.S.



2 U-RACK DETAIL @BICYCLE PK'G
A3 N.T.S.



1
A3

ALTERNATE PARKING PLAN

1" = 20'

NOTE:
ALTERNATE PARKING PLAN SHALL ONLY BE
IMPLEMENTED BY THE OWNER IF THE CITY
MAKES A DETERMINATION THAT THERE IS A
NEED FOR ADDITIONAL PARKING ON SITE.



**LOUISVILLE MILL SITE REDEVELOPMENT
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5500, 540 & 544 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Caranci / Hattonfit

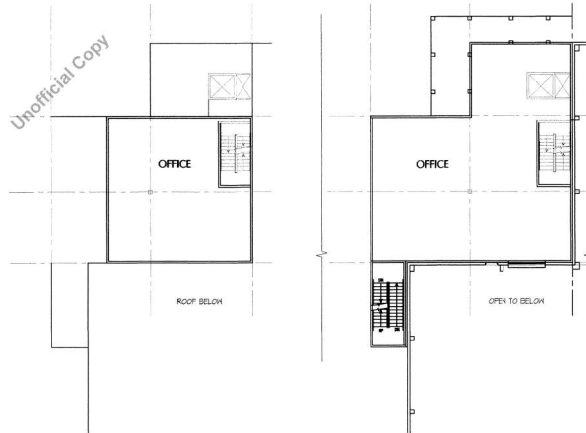


PROJECT # 1252.10
DATE: 04/03/14
DRAWN BY: HAPC
CHECKED BY: JEH
REVISIONS:
PPC/PCC - 06/13/14
FINAL - 11/06/14
FPC - 03/13/15
FCC - 05/06/15

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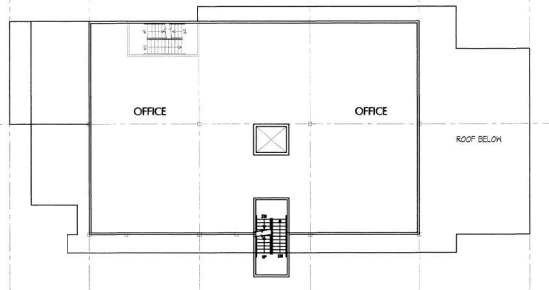
LANDSCAPE &
PARKING PLAN
ALT PARKING PLAN

Sheet
A3
3 of 1 Sheets

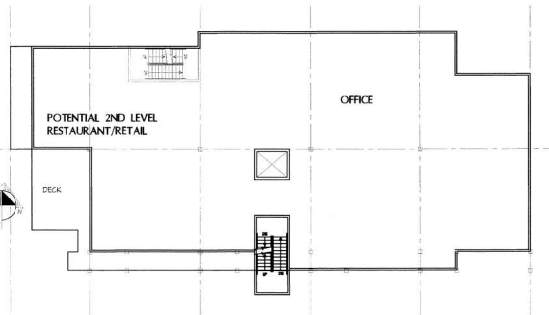


C4
A4 FLOOR PLAN - THIRD LEVEL
SCALE: 1/16" = 1'-0"

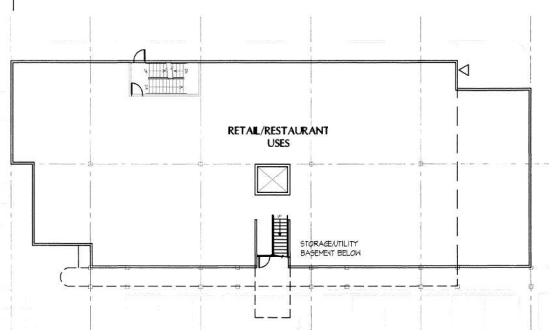
C3
A4 FLOOR PLAN - SECOND LVL
SCALE: 1/16" = 1'-0"



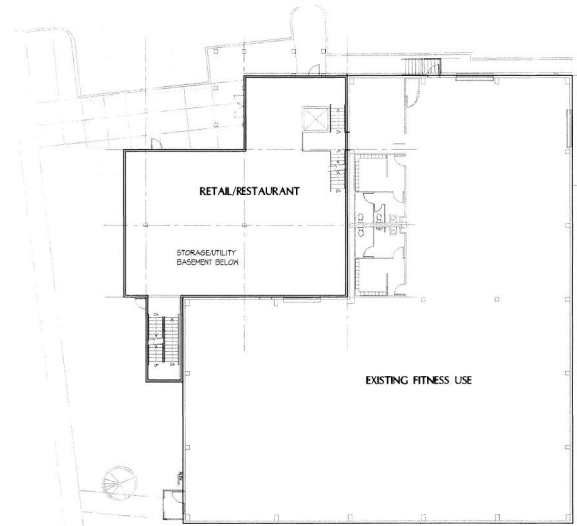
C2
A4 FLOOR PLAN - THIRD LEVEL
SCALE: 1/16" = 1'-0"



B2
A4 FLOOR PLAN - SECOND LEVEL
SCALE: 1/16" = 1'-0"



A2
A4 FLOOR PLAN - MAIN LEVEL
SCALE: 1/16" = 1'-0"



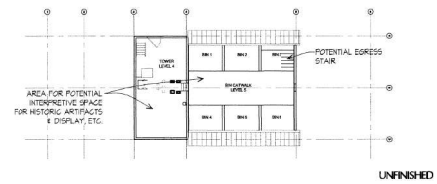
A4
A4 FLOOR PLAN - MAIN LEVEL
SCALE: 1/16" = 1'-0"

LOT 1 - CARANCI BUILDING

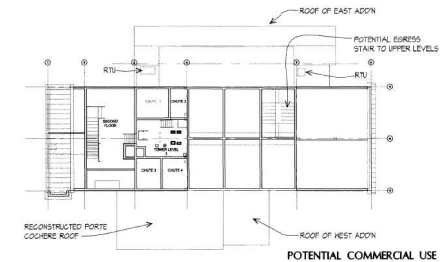
LOT 3 - MILL SITE BUILDING

COMMERCIAL USE NOTES:

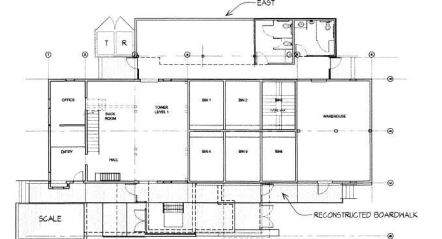
USE DESIGNATIONS ARE INTENDED TO DESCRIBE THE INTENDED CHARACTER OF THE SPACE TO BE CONSTRUCTED & DO NOT LIMIT ANY PERMITTED USE PER ZONING REGULATIONS OR AS OTHERWISE APPROVED, TYP.



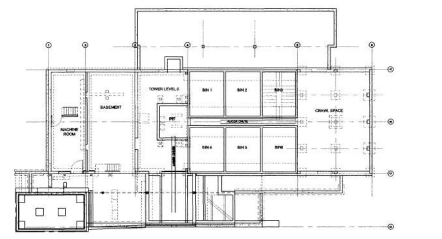
D1
A4 FLOOR PLAN - FOURTH/FIFTH LEVEL (3RD STORY)
SCALE: 1/16" = 1'-0"



C1
A4 FLOOR PLAN - SECOND/THIRD LEVEL (2ND STORY)
SCALE: 1/16" = 1'-0"



B1
A4 FLOOR PLAN - FIRST LEVEL (1ST STORY)
SCALE: 1/16" = 1'-0"



A1
A4 FLOOR PLAN - BASEMENT/CRAWL SPACE
SCALE: 1/16" = 1'-0"

LOT 2 - HISTORIC GRAIN ELEVATOR

HARTRONFT ASSOCIATES
A Professional Corporation
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Architecture
Interior Design
950 Spruce Street, #11A
Louisville, CO 80027
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FAX: 303.673.9319

**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR, CO**
500, 540 & 544 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Caranci / Hartonft



PROJECT # 1252.10
DATE: 04/05/14
DRAWN BY: HARG
CHECKED BY: JH
REVISIONS:
REV. 1 - 06/13/14
REV. 2 - 11/06/14
REV. 3 - 03/12/15

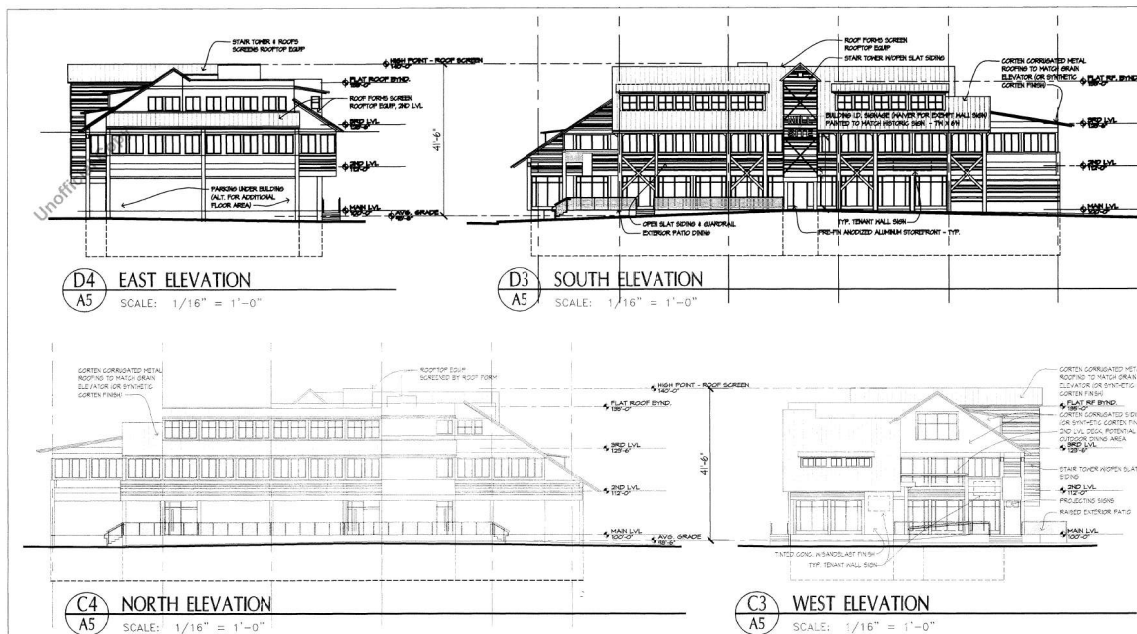
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PLANS

Sheet

A4

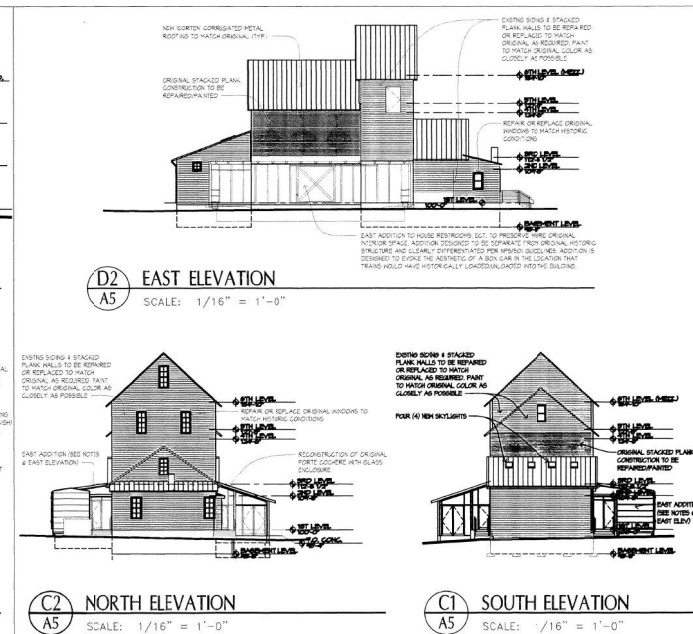
4 of 4 Sheets



LOT 3 - NEW MILL SITE BUILDING

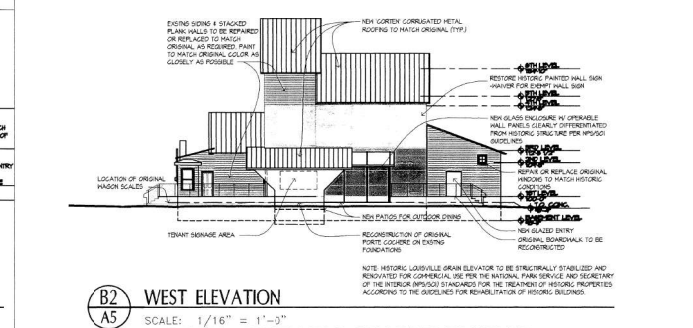


LOT 1 - CARANCI BUILDING ADDITION / RENOVATION



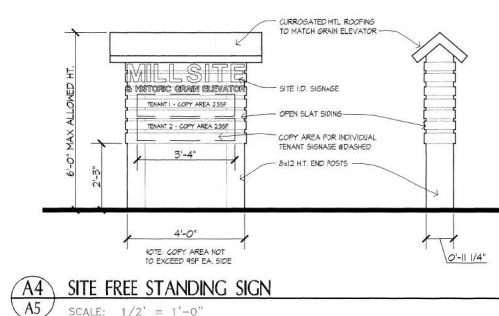
C2 NORTH ELEVATION
A5 SCALE: 1/16" = 1'-0"

C1 SOUTH ELEVATION
A5 SCALE: 1/16" = 1'-0"



B2 WEST ELEVATION
A5 SCALE: 1/16" = 1'-0"

LOT 2 - HISTORIC GRAIN ELEVATOR



A4 SITE FREE STANDING SIGN
A5 SCALE: 1/2" = 1'-0"

SIGN AREA CALCULATIONS

LOT 1	LOT 2	LOT 3
HALLWAY SIGN COPY AREA MAXIMUM ALLOWED FOR COMBINATION OF ANY HALL, MARQUEE, ANNUNCIATOR, & FREE STANDING SIGN PRIMARY PRONTAGE (FACING COPY RCT) 123.5 L.F. x 25' PER L.F. = 2417 SF SECONDARY PRONTAGE (FACING THE GREEN) 123.5 L.F. x 10' PER L.F. = 1234 SF HALL SIGN COPY AREA TOTAL ALLOWED COPY AREA OF HALL SIGNS PRIMARY PRONTAGE (FACING COPY RCT) 123.5 L.F. x 25' PER L.F. = 2417 SF SECONDARY PRONTAGE (FACING THE GREEN) 123.5 L.F. x 10' PER L.F. = 1234 SF ANNING & CANOPY SIGN COPY AREA TOTAL ALLOWED COPY AREA OF ANNING & CANOPY SIGNS PRIMARY PRONTAGE (FACING COPY RCT) 123.5 L.F. x 15' PER L.F. = 1234 SF SECONDARY PRONTAGE (FACING THE GREEN) 123.5 L.F. x 10' PER L.F. = 1234 SF PROJECTING SIGNS TOTAL ALLOWED COPY AREA OF PROJECTING SIGNS THE MAXIMUM COPY AREA OF EACH PROJECTING SIGN ALONG ALL BUILDING FRONTAGES IS 15 SF PER SIDE MULTI TENANT BUILDING MAY UTILIZE ONE PROJECTING SIGN PER TENANT	HALLWAY SIGN COPY AREA MAXIMUM ALLOWED FOR COMBINATION OF ANY HALL, MARQUEE, ANNUNCIATOR, & FREE STANDING SIGN PRIMARY PRONTAGE (FACING COPY RCT) 88.0 L.F. x 25' PER L.F. = 1760 SF HALL SIGN COPY AREA TOTAL ALLOWED COPY AREA OF HALL SIGNS PRIMARY PRONTAGE (FACING COPY RCT) 88.0 L.F. x 25' PER L.F. = 1760 SF ANNING & CANOPY SIGN COPY AREA TOTAL ALLOWED COPY AREA OF ANNING & CANOPY SIGNS PRIMARY PRONTAGE (FACING COPY RCT) 88.0 L.F. x 15' PER L.F. = 880 SF PROJECTING SIGNS TOTAL ALLOWED COPY AREA OF PROJECTING SIGNS THE MAXIMUM COPY AREA OF EACH PROJECTING SIGN ALONG ALL BUILDING FRONTAGES IS 15 SF PER SIDE MULTI TENANT BUILDING MAY UTILIZE ONE PROJECTING SIGN PER TENANT	HALLWAY SIGN COPY AREA MAXIMUM ALLOWED FOR COMBINATION OF ANY HALL, MARQUEE, ANNUNCIATOR, & FREE STANDING SIGN PRIMARY PRONTAGE (FACING COPY RCT) 96.5 L.F. x 25' PER L.F. = 1224 SF SECONDARY PRONTAGE (FACING THE GREEN) 142.0 L.F. x 10' PER L.F. = 1420 SF HALL SIGN COPY AREA TOTAL ALLOWED COPY AREA OF HALL SIGNS PRIMARY PRONTAGE (FACING COPY RCT) 96.5 L.F. x 25' PER L.F. = 1224 SF SECONDARY PRONTAGE (FACING THE GREEN) 142.0 L.F. x 10' PER L.F. = 1420 SF ANNING & CANOPY SIGN COPY AREA TOTAL ALLOWED COPY AREA OF ANNING & CANOPY SIGNS PRIMARY PRONTAGE (FACING COPY RCT) 96.5 L.F. x 15' PER L.F. = 960 SF SECONDARY PRONTAGE (FACING THE GREEN) 142.0 L.F. x 10' PER L.F. = 1420 SF PROJECTING SIGNS TOTAL ALLOWED COPY AREA OF PROJECTING SIGNS THE MAXIMUM COPY AREA OF EACH PROJECTING SIGN ALONG ALL BUILDING FRONTAGES IS 15 SF PER SIDE MULTI TENANT BUILDING MAY UTILIZE ONE PROJECTING SIGN PER TENANT
FREE STANDING SIGNS THE TWO FREE STANDING SIGNS FOR THE 3 LOTS ARE PROPOSED TO ACCOMMODATE MAJOR TENANTS & COPY IDENTIFICATION (SEE DETAIL 1 SITE PLAN). MAX 8' COPY AREA PER SIDE (HIGH COUNTS TOWARDS MAX SIGN COPY AREA)		

GENERAL NOTE: ALL SIGNAGE SHALL BE COMBINED WITH THE FOLLOWING SIGNAGE MAXIMUM USABLE HEIGHT: MAXIMUM USABLE HEIGHT IS INDICATED BY RED DASHES

**HARTRONFT
ASSOCIATES**
A Professional Corporation

*Planning
Architecture
Interior Design*

950 Spruce Street, #31A
Louisville, CO 80027
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FAX: 303.673.9411

**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
5500, 540 & 544 COUNTY ROAD, LOUISVILLE, CO
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PROJECT # 125210
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REVISIONS:
PPC/PCC - 06/13/1
FINAL - 11/06/1
FPC - 03/13/1
FCC - 05/06/1

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BUILDING ELEVATIONS

Sheet
A5

TYPE A

TYPE B

TYPE C

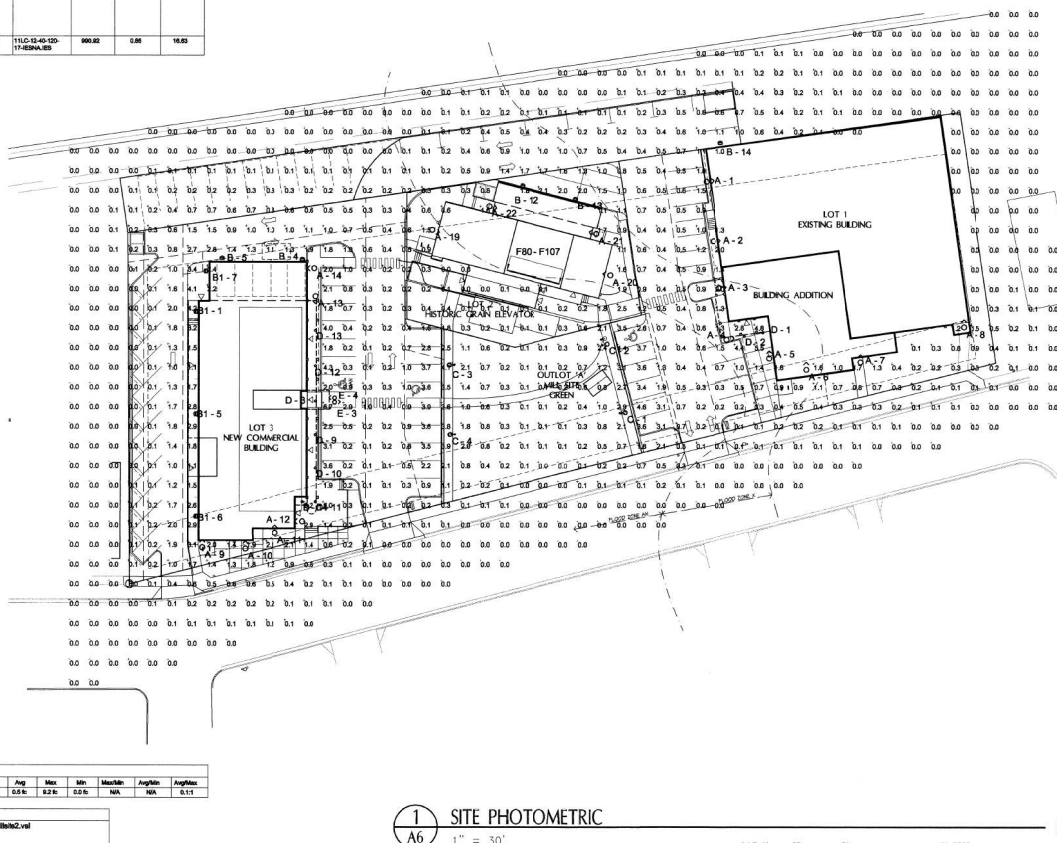
TYPE D

TYPE E

TYPE F

Statistics	
Description	Symb
Calc Zone #1	+

Note
1. file=visual-files-sept2014-mills-h2.xls



1 SITE PHOTOMETRIC
A6 1" = 30'



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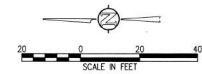
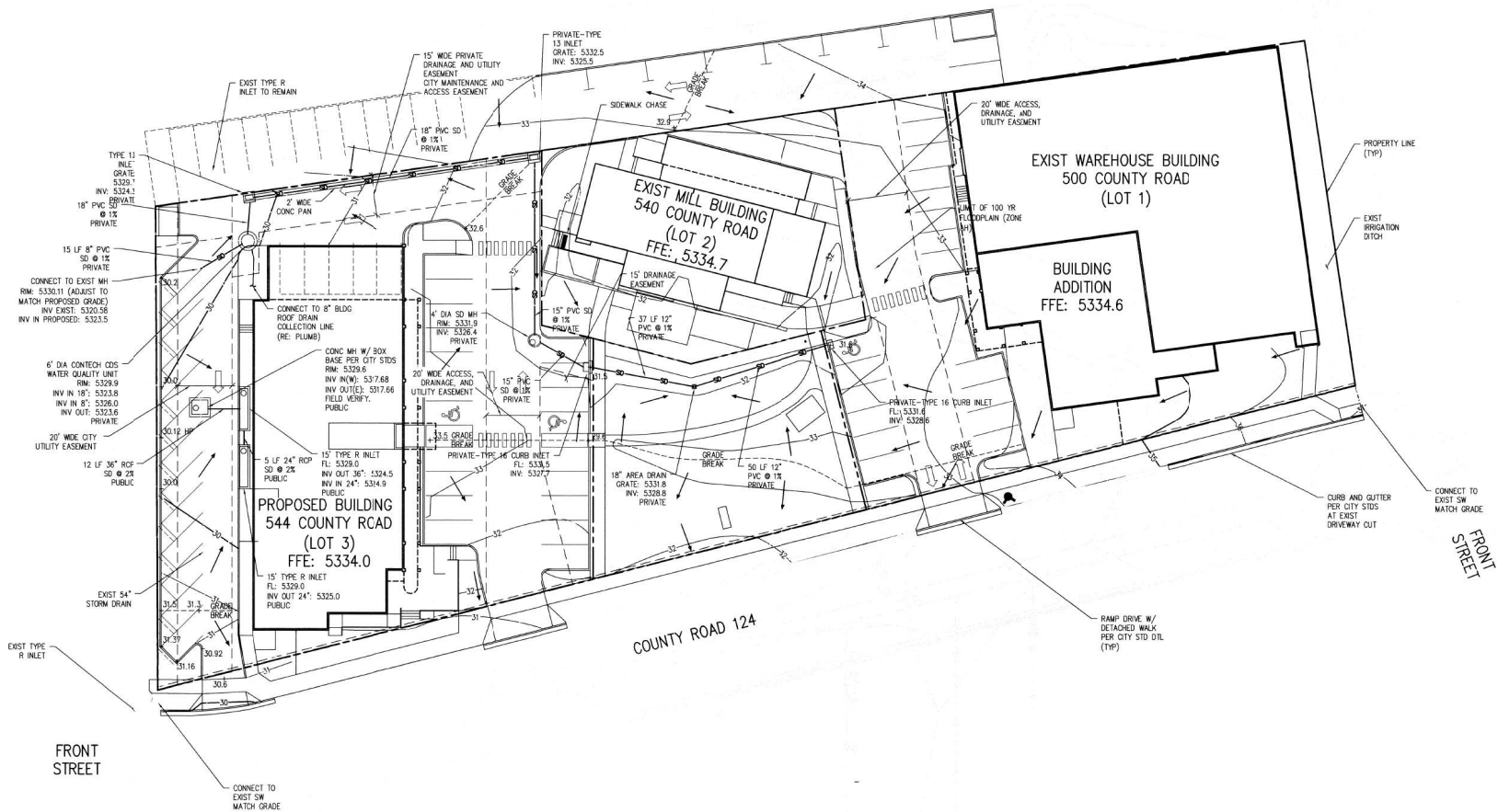
**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
500, 540 & 544 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Caranci / Hartroft



PROJECT # 115210
DATE: 04/13/14
DRAWN BY: ---
CHECKED BY: ---
REVISIONS:
PVC/CCC - 06/13/14
FINAL - 11/06/14
PCC - 03/13/15
CCC - 02/06/15

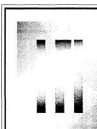
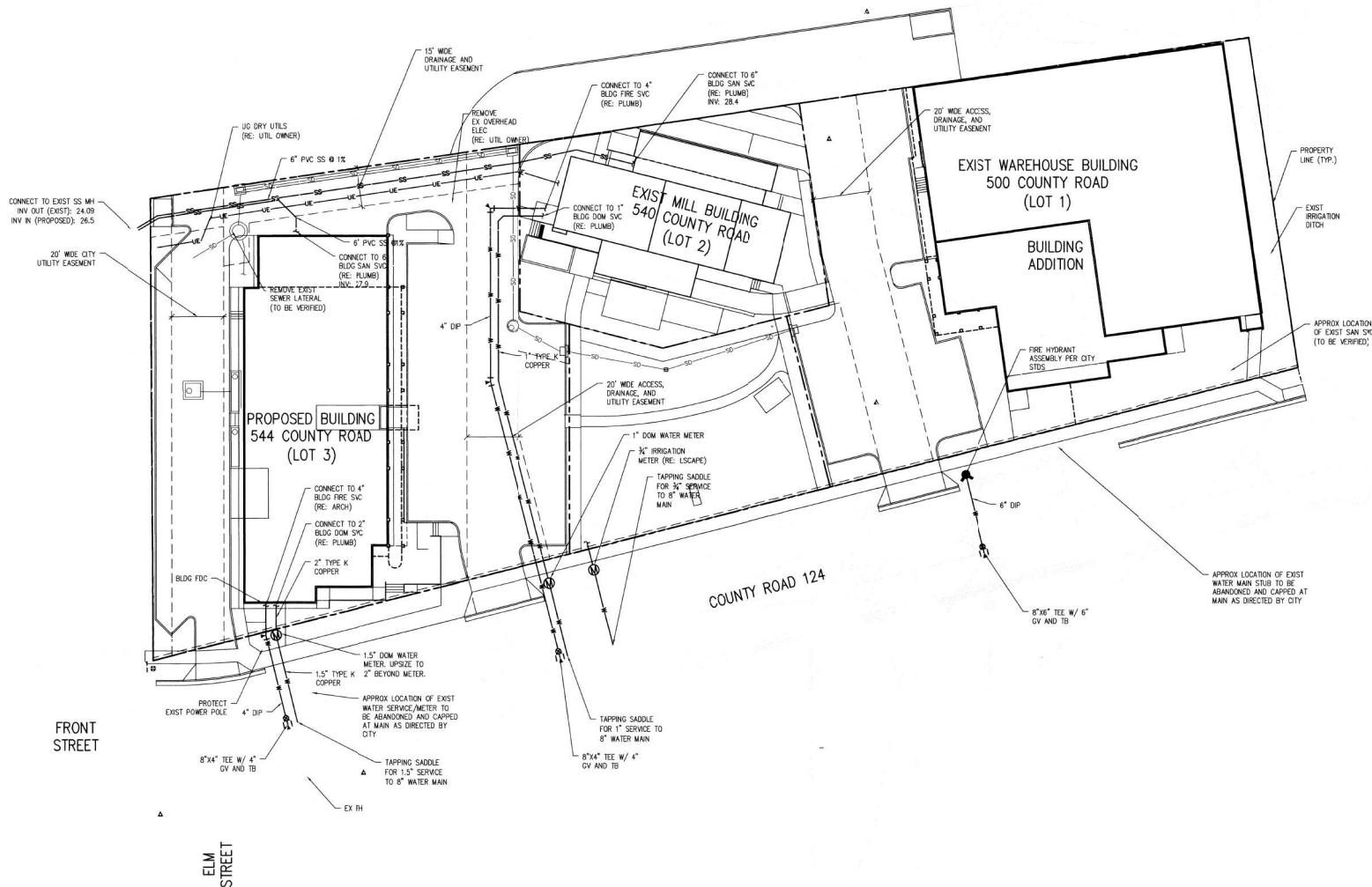
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DRAINAGE PLAN
Sheet:
SHEET NO.
C1.0
of Sheets



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- NOTES:**
1. OLD WATER AND SEWER SERVICES SHALL BE ABANDONED AS DIRECTED BY THE CITY.
 2. CURB STOP VALVES AND METER PITS SHALL BE LOCATED AND INSTALLED AS DIRECTED BY THE CITY.
 3. FIRE LINES ARE PRIVATELY OWNED/MAINTAINED DOWNSTREAM OF WATER MAIN GATE VALVES.
 4. LIMITED UTILITY SURVEY INFORMATION WAS PROVIDED. PORTIONS OF SHOWN UTILITIES ARE BASED ON CITY UTILITY MAPPING. ALL UTILITY LOCATIONS, INVERTS, SIZES, ETC. TO BE FIELD LOCATED AND SURVEYED PRIOR TO CONSTRUCTION.



**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR, CO
500, 540 & 544 COUNTY ROAD, LOUISVILLE, CO**
Louisville Mill Site LLC - Carand / Hartronft



PROJECT # 125210
DATE: 04/13/14
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CHECKED BY: --
REVISIONS:
PFC/PCS - 06/3/14
FINAL - 11/06/14
PFC - 03/15/15
FCC - 05/06/15

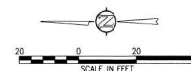
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UTILITY PLAN

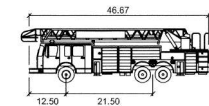
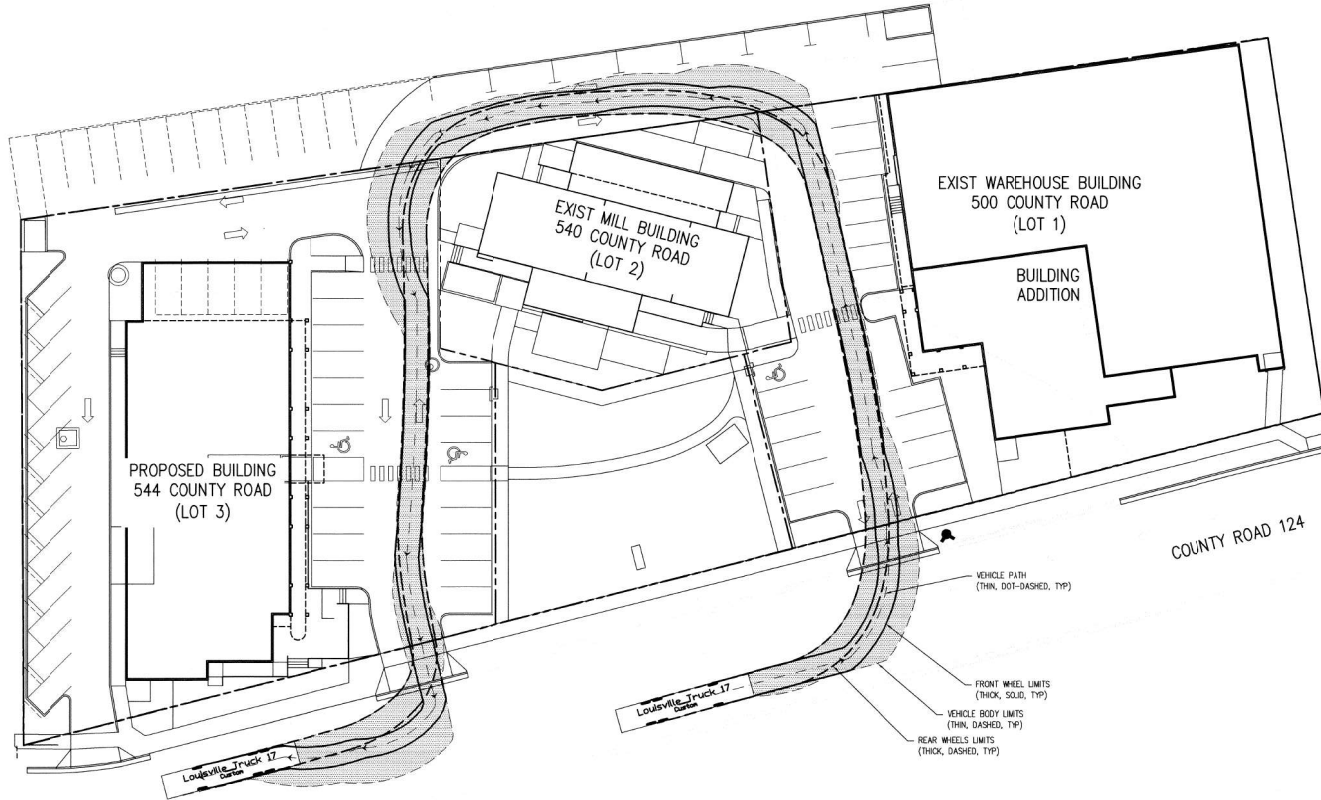
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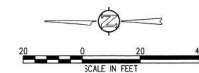
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Louisville Truck 17 feet
Width : 8.00
Track : 8.00
Lock to Lock Time : 5.0
Steering Angle : 45.0



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& HISTORIC GRAIN ELEVATOR CO**
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PROJECT # 125210
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FOR 05/13/15

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AUTOTURN
FIRE TRUCK
EXHIBIT

Sheet

EX-1

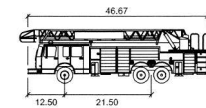
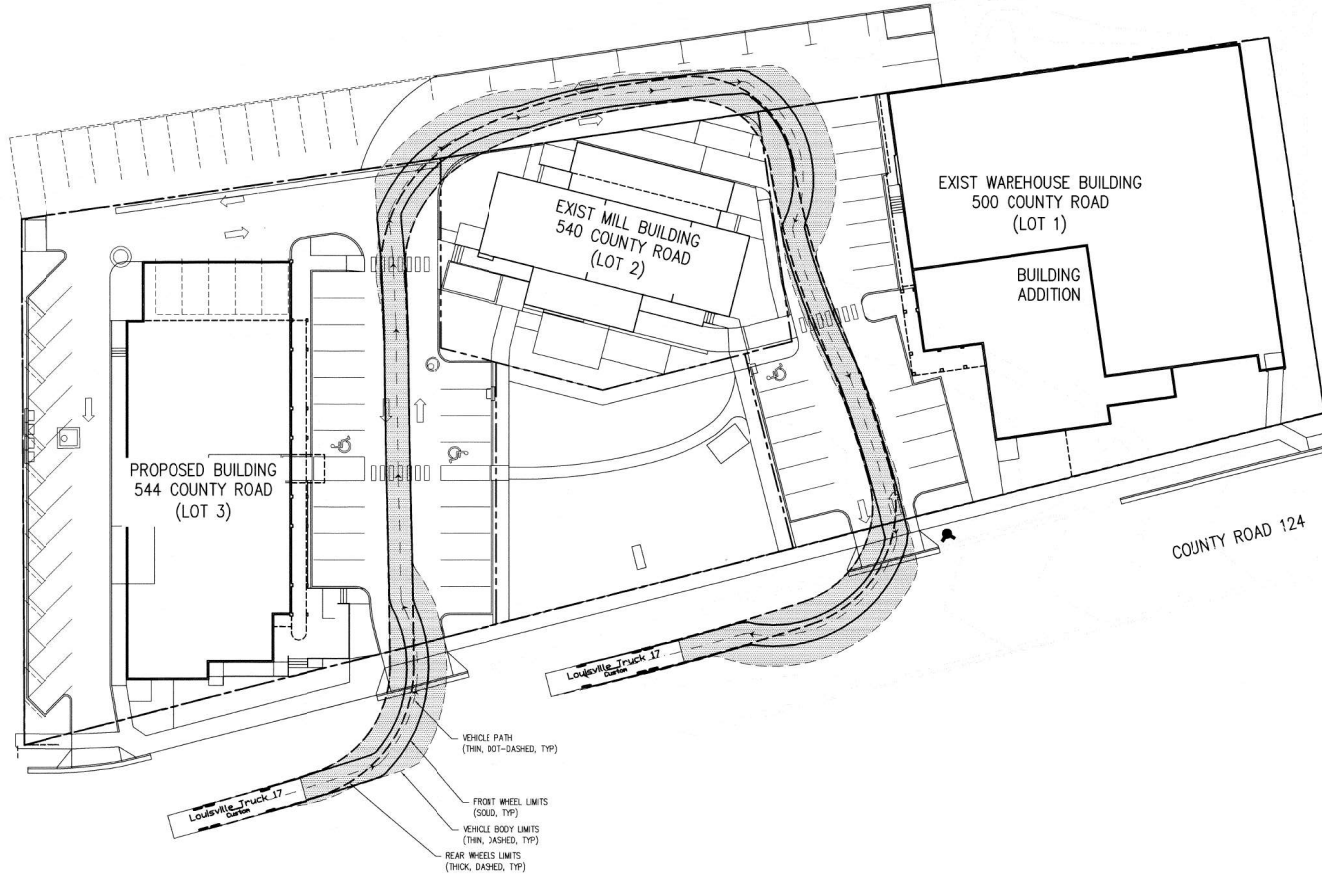
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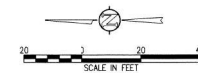
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FRONT STREET

ELM STREET



Louisville Truck 17 feet
Width : 8.00
Track : 8.00
Lock to Lock Time : 5.0
Steering Angle : 45.0



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**LOUISVILLE MILL SITE REDEVELOPMENT
& HISTORIC GRAIN ELEVATOR**
500, 540 & 544 COUNTY ROAD, LOUISVILLE, CO
Louisville Mill Site LLC - Caranci / Harttronft



PROJECT # 1252.10
DATE: 04/05/14
DRAWN BY: --
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REVISIONS:
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FINAL - 11/06/14
FPC - 03/13/15
FCC - 05/06/15

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AUTOTURN
FIRETRUCK
EXHIBIT

Sheet
EX-2
of Sheets

of Sheets

Rob Zuccaro

Subject: FW: Grain Yard PUD Amendment and SRU

From: Mona Ferrera <nonar47@gmail.com>

Sent: Monday, October 27, 2025 7:29 AM

To: Planning <planning@Louisvilleco.gov>

Subject: Grain Yard PUD Amendment and SRU

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

Good morning,

I'm not able to attend the meeting on Thursday November 13, 2025.

My question is, will there be a parking lot for the Outdoor Eater and Mobile Food Court?

I live at 600 1/2 Lafarge Avenue, Louisville, CO 80027.

When there's big events in Louisville there isn't enough parking for all the cars that come in. Usually No Parking Signs are ignored or people are parking too close to intersections or alleys.

Thank you for taking the time to address this issue.

Respectfully,

Mona Ferrera

Rob Zuccaro

Subject: FW: 540 Front St. Grainyard PUD and SRU

From: Patricia Lucey <luceype@gmail.com>
Sent: Sunday, November 2, 2025 5:58 AM
To: Rob Zuccaro <rzuccaro@louisvilleco.gov>
Subject: 540 Front St. Grainyard PUD and SRU

[EXTERNAL EMAIL] From outside of City of Louisville DO NOT CLICK links or attachments unless you validate the sender and know the content is safe.

To the Louisville Planning Commission,

I am writing to express my support for the proposed **Grainyard PUD and SRU application**.

I have lived at **527 Front Street** for over twenty years, directly across from the E-bike warehouse. From my home office overlooking Front Street, I see the Grain Mill, the E-bike buildings, and—over this past year—a run-down food truck every day. I drive and walk past this site multiple times each day.

The site at **540 Front Street** has been a blighted property for most of my years here in Louisville. The City of Louisville sold the property to private owners with the intent of restoring this historic structure. While the initial restoration efforts were promising, unfortunately the building has since fallen back into disrepair.

As a very close neighbor to this site, I have several ongoing concerns. Parking in this area is already limited, and additional commercial activity could worsen the shortage. Noise after 8 p.m. would be disruptive in what is primarily a residential and mixed-use corridor. I also hope the City will ensure that any approvals include **clear, enforceable limits** on food truck operations and other outdoor uses so that the property remains orderly and consistent with the agreements made by the developers. Past projects have not always received adequate follow-up or enforcement once approved, and I urge the City to maintain active oversight to ensure compliance with all conditions.

Despite these concerns, I **support the overall plans** to redevelop the property under the Grainyard PUD and SRU. This is a crucial opportunity to finally bring this landmark site back into productive use, preserve an important piece of Louisville's history, and revitalize the Front Street corridor.

Thank you for your consideration.

Patricia Lucey

527 Front St., Louisville, CO