



BRYAN D. WEIMER, PWLF
Director

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Centennial, Colorado 80112-3853
720-874-6500
arapahoegov.com

Board of County Commissioners Summary Report

Date: June 4, 2025

To: Arapahoe County Planning Commission

Through: Molly Orkild Planning Division

From: Joseph Boateng, PE
Engineering Services Division

Case name: **PM22-006**
Arcadia Creek



Purpose and Recommendation

The purpose of this report is to communicate the Engineering Services Staff findings, comments, and recommendations regarding the land use application(s) identified above.

Scope/Location:

Arcadia Creek is split between Arapahoe County and Jefferson County. The site is bounded by West Christensen Lane to the north, West Leawood Drive to the west, and Dutch Creek to the south. The portion of the development within Jefferson County will include 23 single-family lots while the Arapahoe County portion will include two single-family lots. This development is for 55-plus-year-old residents. Arcadia Creek has two points of entry, West Leawood Drive in Jefferson County and West Christensen Lane in Arapahoe County. The proposed improvement for the site includes:

- Replacing an existing culvert of 72-inch CMP with a 21' by 6' cast-in concrete box culvert designed for a 10-year storm event on the private drive. This private drive serves the two proposed units on Arapahoe County and 5090 West Christensen Lane. Coon Creek passes through the existing 72" CMP on the private drive.
- Improving the Private drive for the two proposed units in Arapahoe County and 5090 West Christensen Lane. The proposed road cross-section was accepted by the Technical Review Committee (TRC) and approved by South Metro Fire Rescue (SMFR).

- Improving the ditch and inlets on Christensen Lane to improve drainage conditions. The proposed road cross section was accepted by the TRC and approved by SMFR

Engineering Services Staff has reviewed the land use application(s) and has the following findings and comments:

1. The Parcel is in the Coon Creek Drainage Basin.
2. Pavement Design Report will be required for the private road and West Christensen Lane.
3. The county requires the applicant to consider providing a vertical element to serve as a visual and physical lane delineation. This vertical element will have to be either flexible or a breakaway. The spacing of the vertical element should follow MUTCD standards.
4. The county is going to require, as stipulation of the Subdivision Improvement Agreement, that all construction traffic access the Arcadia Creek project using West Leawood Drive (public road) and limit the use of West Christensen Lane (private road) to only those activities needed for localized improvements.
5. The following variances have been requested and received positive recommendation by the Technical Review Committee:
 - 1.a) Variance Request to the County's Standard private roadway cross-section submitted in the year 2020.
 - 1.b) Variance request to modify the private access roadway within the 100-year floodplain submitted in the year 2020.

TRC Recommendation:

- The proposed Cross section of the private access and the gate use plan must be reviewed by the Fire District and Fire District approval is required.
- Recommends "No Parking" signs along both sections of W. Christiansen Lane be installed. This should also be determined and approved by the Fire District
- Clarify the intention of the pedestrian path – whether the path is open to the public or private.
- Public Use Easement is required through the pedestrian path section.

- W. Christensen Lane is connecting directly to a State Highway. Arapahoe County will contact CDOT for the usage of the State Highway by the additional traffic generated from the Development.
- The stream crossing at the private access/Coon Creek should be updated if this private access is being upgraded pursuant to the Phase B Preliminary Design Report for Dutch Creek, Coon Creek, Lilley Gulch and Three Lakes Tributary. The Mile High Flood District (MHFD) makes the recommendation to the design of this stream crossing.
- No fence should be allowed within the floodplain. Arapahoe County's Floodplain Regulation prohibits the fence be placed within the 100-year floodplain.
- Concerns about the emergency access during a flood event. The Developer needs to verify if there is an access to a public road without going through a floodplain including the access in Jefferson County

2.a) Variance request to county's standards requiring a guardrail at the proposed private driveway culvert crossing the Coon Creek in the year 2022.

2.b) A variance to the county's standards requiring a 4' sidewalk for private roads in the year 2022.

TRC Recommendation:

- TRC did not have any objection to the Culvert Design proposed. TRC suggested that the roadway edge signing/delineation be added
- TRC mentioned that the South Metro Fire Rescue will need to see the new proposed design for requirements and approval
- TRC supported variance for not requiring sidewalk along private road

3.) Amendment to variance request to the county's standard private roadway section accepted in the year 2020.

TRC Recommendation:

- The 4-5 feet proposed sidewalk/bikelane path

- The proposed crown on Christensen Lane. All drainage analysis because of this proposal should be addressed in the Drainage Report.
- The TRC denied the proposal of bollards. Stripe the two shoulders on both sides of the road and the walkway path. All materials, striping should conform to MUTCD. South Metro Fire Rescue District should review amended cross-section for comments

4.) Detention pond waiver for Arcadia Creek project.

TRC Recommendation:

- Existing and proposed flow rates and change in flow rates.
- Discuss how the un-detained flows will impact Coon Creek and Dutch Creek.
- Discuss how this flow impacts the peak within Coon Creek.
- How much detention volume would be required to detain the flows.
- Was any offset provided with the ponds in Jefferson County for the flows that go to Coon Creek? For example, did any flows that went to Coon Creek get transferred to Dutch Creek and included in the pond volumes

TRC Recommendation on Christensen Lane Cross-Section:

- The applicant should consider providing a vertical element to serve as a visual and physical lane delineation.
- The applicant should consider providing a vertical element to serve as a visual and physical lane delineation.
- The spacing of the vertical element should follow MUTCD standards,

Engineering Services Staff is recommending approval of the land use application(s) subject to the following conditions:

1. The improvements to West Christensen Lane required to be constructed by the County Engineering Service Division and under County Standards or as accepted by the Technical Review Committee for adequate access to the subdivision must be built within the surveyed bounds of the Lane as described in the Court Orders from *Jefferson Bank and Trust v. Russell, et al.*, Arapahoe County District Court Case No. 92CV2564 and in *Arcadia Creek LLC v. Absher, et al.*, Arapahoe County District Court Case No. 2019CV31104, recognizing multiple rights of egress and ingress, and shall be constructed so as not to interfere with the use of existing recorded easements across, along or within West Christensen Lane.
2. Applicant shall develop a common maintenance agreement or otherwise provided for an agreed maintenance plan, as contemplated and required under the Arapahoe County Infrastructure Design and Construction Standards for private roads, with Fox Hollow HOA holding rights of egress and ingress under the Court Order in *Jefferson Bank and Trust v. Russell, et al.*, Arapahoe County District Court Case No. 92CV2564. No building permits will be issued until such agreement or plan has been approved by County staff.
3. All approved improvements to the “Driveway” for access shall be installed within the confines of the “Driveway” as defined in the Stipulated Quiet Title Decree in *Laguna Builders, Inc., et al. v. Wieder, et al.*, Case No. 94CV2094, unless otherwise agreed with the servient estate property owner as defined in said Decree.
4. Christensen Lane shall not be used for construction access.



Public Works and Development

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BRYAN D. WEIMER, PWLF
Director

March 16, 2020

Barnabas Kane
CONSILIUM DESIGN
2755 South Locust Street, Suite 236
Denver CO 80222
bkane@consiliumdesign.com

RE: Arcadia Creek – Variance Requests to the Private Access

Dear Barnabas:

The Arapahoe County Technical Review Committee (TRC) including Southeast Metro Stormwater Authority (SEMSWA) on February 26, 2020 for a regularly scheduled meeting to discuss the variance requests related to the private access for the Arcadia Creek Development (Development), located in the Jefferson County.

The two requests are:

- a. Variance request to the County's standard private roadway cross section
- b. Variance request to modify the private access roadway within the 100-year floodplain

The private roadway is defined by the County as any roadway, serving two or more residential lots, which will not be maintained by Arapahoe County. The private roadways shall be placed in a tract of common ownership (typically a Homeowner's Association for residential property). It appears that the court cases for the Development are silent on the title in any ownership for the access roadway, and just identified the properties that are allowed to use it.

The TRC is a recommendation group to the Board of County Commissioners (BOCC) for a land use related application. The TRC accepts the variance requests in anticipation of an application in Arapahoe County, any recommendation would probably have to be preliminary and conditioned on having the full detail of the total development. The BOCC is the deciding body and making the final determination to the requests.



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BRYAN D. WEIMER, PWLF
Director

The followings are the TRC's recommendations for the private access:

- The proposed cross section of the private access and the gate use plan must be reviewed by the Fire District, and the Fire District's approval is required.
- Recommends "No Parking" signs along both sections of W. Christiansen Lane be installed. This should also be determined and approved by the Fire District.
- Clarify the intention of the pedestrian path – whether the path is open to the public or private.
- Public Use Easement is required through the pedestrian path section.
- W. Christensen Lane is connecting directly to a State Highway. Arapahoe County will contact CDOT for the usage of the State Highway by the additional traffic generated from the Development.
- The stream crossing at the private access/Coon Creek should be updated if this private access is being upgraded pursuant to the Phase B Preliminary Design Report for Dutch Creek, Coon Creek, Lilley Gulch and Three Lakes Tributary. The Mile High Flood District (MHFD) makes the recommendation to the design of this stream crossing.
- No fence should be allowed within the floodplain. Arapahoe County's Floodplain Regulation prohibits the fence be placed within the 100-year floodplain.
- Concerns about the emergency access during a flood event. The Developer needs to verify if there is an access to a public road without going through a floodplain including the access in Jefferson County.

If you have any questions, please feel free to contact me at 720-874-6500.

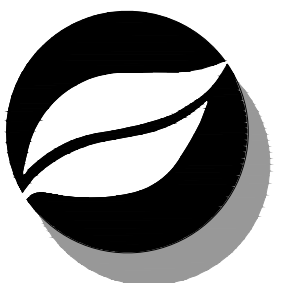
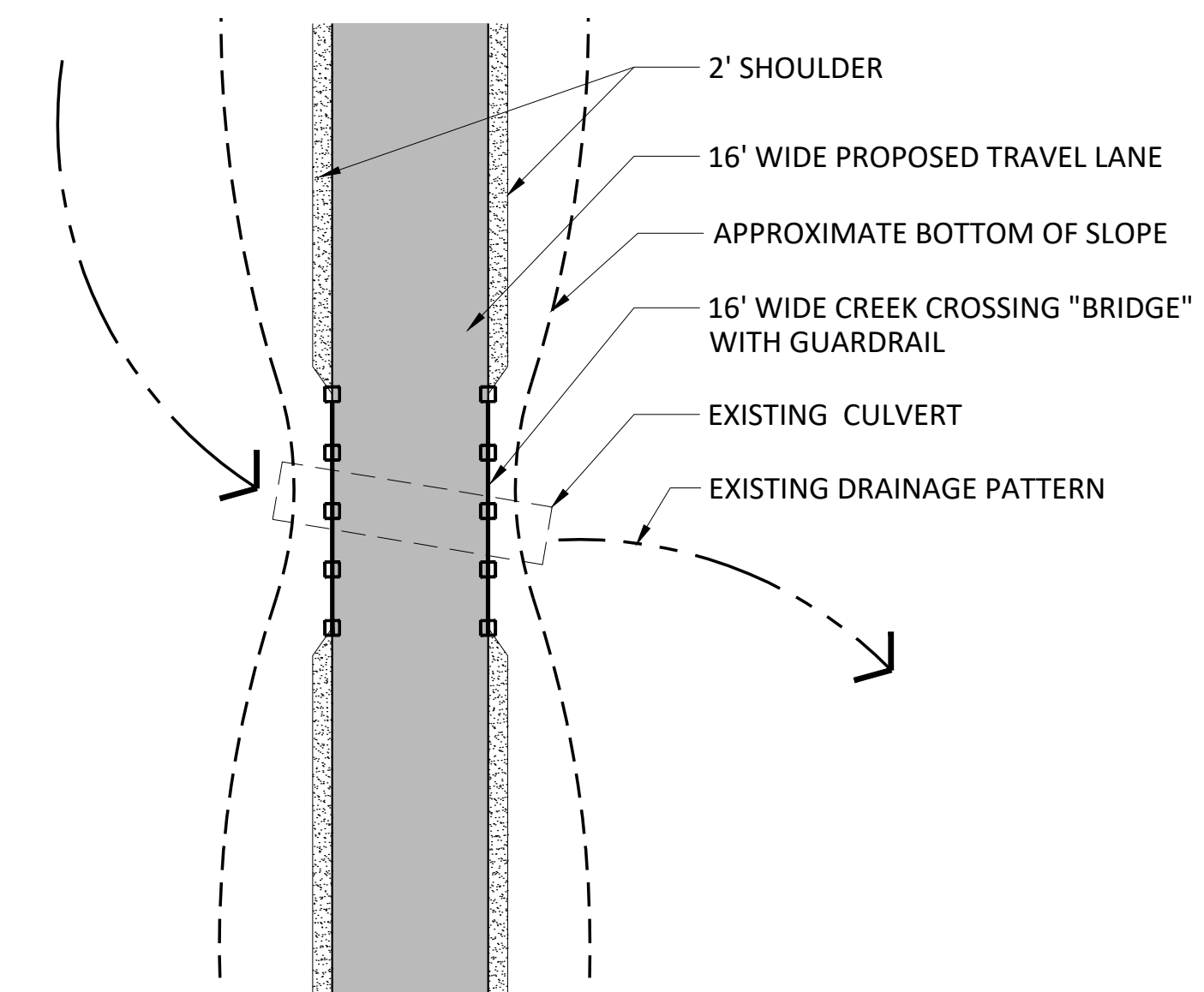
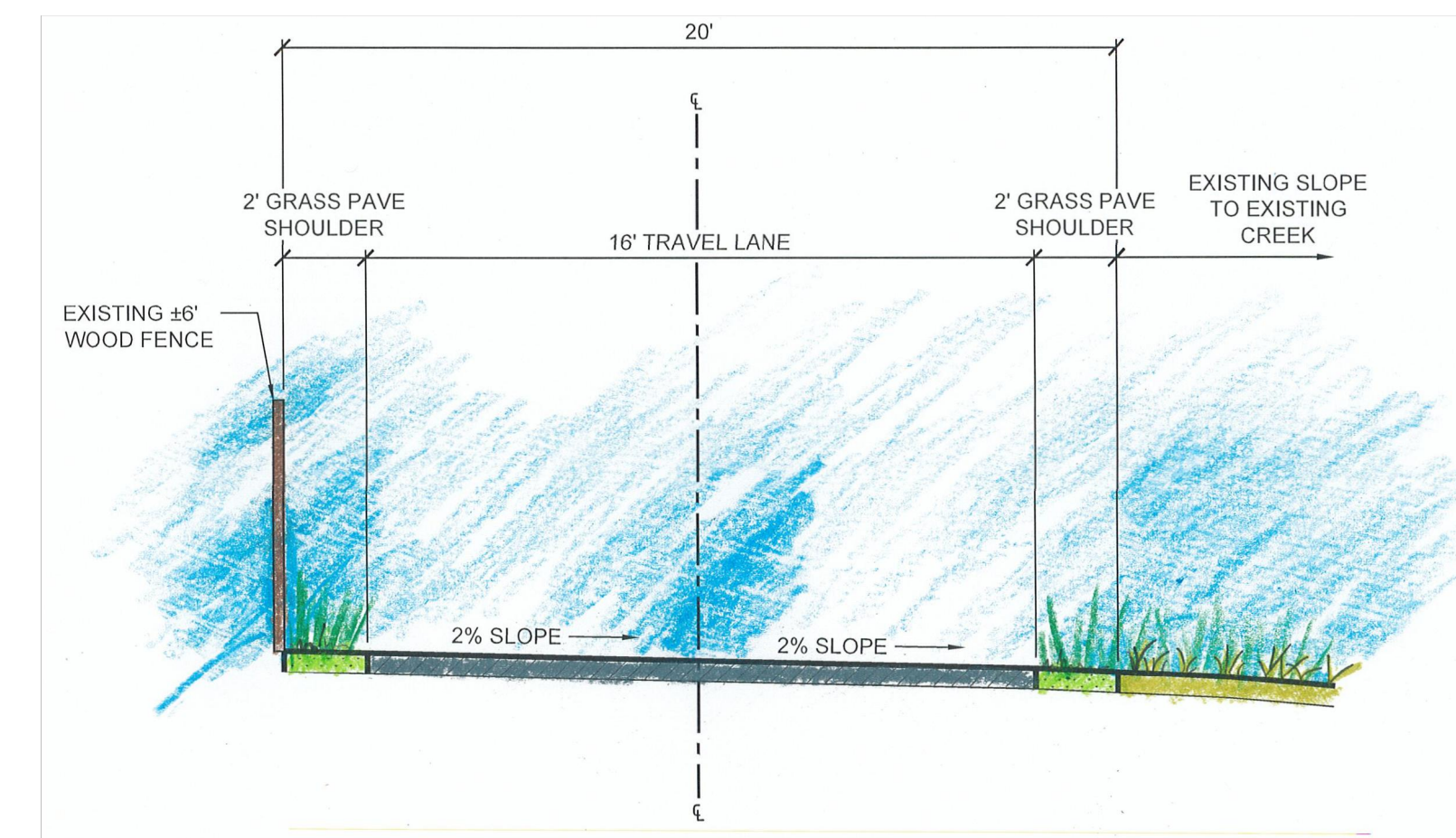
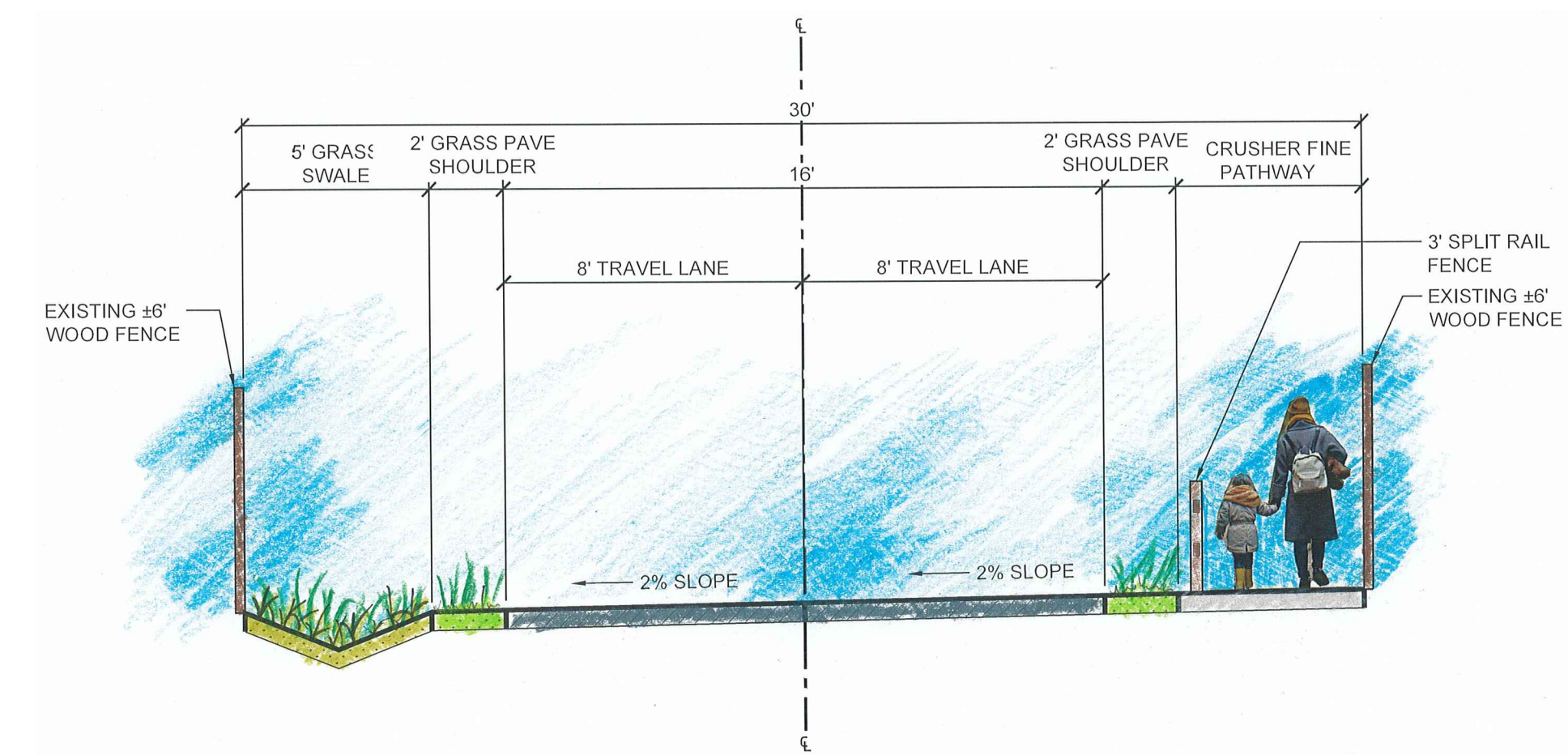
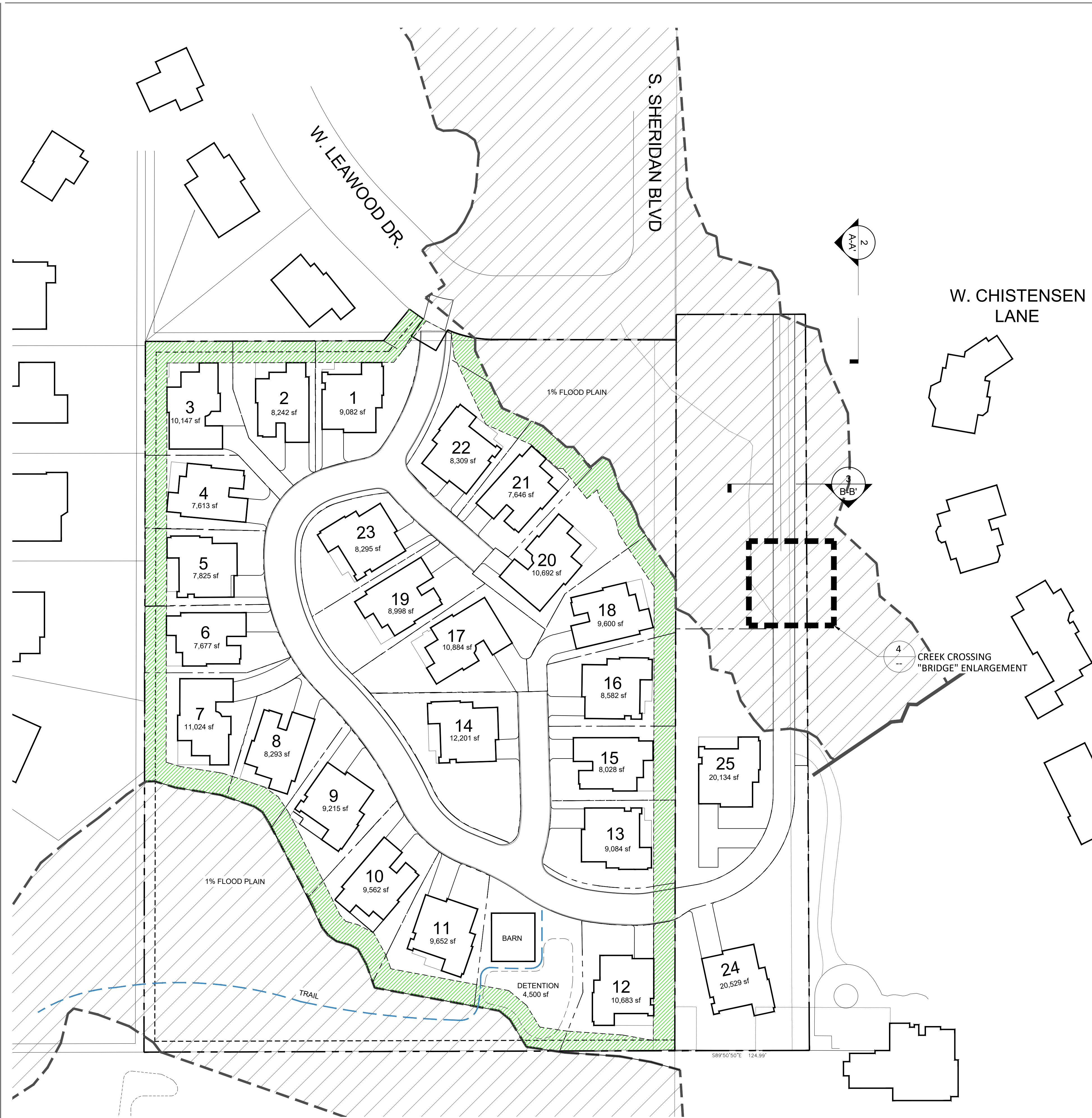
Sincerely,

Sue Liu, PE
Engineering Services Division

cc: Charles V. Haskins, Manager, Engineering Services Division
Jason Reynolds, Manager, Planner Division
Robert Hill, Senior Assistant County Attorney
Barnabas Kane at bkane@consiliumdesign.com, Consilium Design



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NOT FOR CONSTRUCTION

PRELIMINARY LAYOUT PLAN

ARAPAHOE COUNTY
COLORADO

ARCADIA CREEK

SUBMITTAL / REVISIONS:
STREET SECTIONS • 02.07.20

October 7, 2022

Joseph Boateng, PE
Engineering I
Arapahoe County Public Works & Development
6924 S Lima St, Centennial, CO 80112-3853

Re: Revised Variance Request Arcadia Creek
Technical Review Committee

Members of Arapahoe County TRC:

On July 20, 2022, we presented two requests for variances to the TRC, which were,

1. A variance to the County's standards requiring a guardrail at the proposed private drive culvert crossing of Coon Creek.
1. A variance to the County's standards requiring a 4' sidewalk (the basis of design requiring that standard would be the: (Private Roadway with Parking on One Side detached sidewalk) for our private drive. Our private drive connects Christensen Lane to the Arcadia Creek community and our neighbor located at 5090 Christensen Lane.

We respectfully request approval of those variances at this time.

October 7, 2022, Revised Request

After the presentation and discussion regarding the elimination of guardrails on our culvert crossing, it was decided that any action on our request be tabled until we evaluated and applied applicable AASHTO standards to our crossing, specifically any standard dealing with clear zones. **Chapter 13 alternate standards (low volume roads)** provide the relevant standards for our private drive. First is the definition and characteristics of low-volume roads.

13.1 DEFINITION AND CHARACTERISTICS

"A very low-volume local road has a functional classification of local road and features a design average daily traffic volume of 400 vehicles per day, at most. Functionally classified collectors may also follow these guidelines so long as the design average daily traffic volume does not exceed 400 vehicles per day. These low volumes significantly reduce the opportunities for accidents to occur. Low-volume roads also cater to local traffic familiar with the roadway; local drivers typically know and can anticipate design abnormalities. Design guidelines for very low-volume roadways may be less strict than for roadways with higher volumes or less familiar drivers."

As a point of reference, our trip generation study, which I have attached, shows that our community will generate 108 traffic trips per day, with 70% of those traveling east, meaning 76 trips out of the neighborhood crossing the culvert well below the 400 trip criteria.

We find the standards for **Clear Zone Width** and **Traffic Barriers** in the following sections of chapter 13, they are;

1. 13.5.5.1 Clear Zone Width

- a.** Roadside clear zones applied to low volume roadways per the AASHTO Roadside Design Guide (3) have shown to provide only limited safety benefits and are not cost effective; however, clear zones should be accommodated when practical. Clear zone guidelines for very low-volume roads are as follow:
 - i.** In areas where a 6-foot shoulder can be provided with minimal costs, and minimal social and environment impacts.
 - ii.** In areas where a 6-foot shoulder cannot be provided at a reasonable cost, or with considerable social or environmental impacts, a shoulder of less than 6 feet may be used including designs with no clear recovery areas.
 - iii.** Clear zone improvements should be considered in locations of higher risk for accidents.
 - iv.** Clear zone improvements should be considered for special circumstances such as areas with higher heavy vehicle traffic, crash history, or future growth.
- b.** Clear zone design is flexible where unique project characteristics should be considered.

2. 13.5.5.2 Traffic Barrier

- a.** Traffic barrier should be considered at the discretion of the engineer. Generally, traffic barrier is not cost effective or practical for very low-volume roadways.

Attached is our revised exhibit reflecting the insertion of clear zones on either side of the 20' drive at the culvert crossing. On the west side of the culvert our clear zone begins at 7.6 feet and expands as you travel south across the culvert crossing. The east side clear zone is a constant 9.4 feet as you travel north across the culvert. In both cases the clear zones we have created exceed AASHTO's recommended 6 feet.

With the addition of both clear zones that exceed the AASHTO's recommended standard we believe our crossing now provides the safety element that the TRC was seeking. Further, AASHTO's recommendation on traffic barriers is at the discretion of the engineer and not considered "practical for very low-volume roadways."

Our revised plan has addressed the safety element while providing an alternative to the need for guardrails on this crossing.

Revised Request Attachments

- 1. Culvert Exhibit showing clear zones, Brightlighter Engineering
- 2. Traffic Study, July 2022, Kimley Horn

Original TRC Request.

In March 2020, the TRC accepted our variance request in anticipation of our application for a minor subdivision plat. The variances requested at that time were for;

1. A variance regarding the County's standard private roadway cross-section regarding Christensen Lane.
2. A variance to modify the private access roadway within the 100-year floodplain

One of the recommendations in the TRC acceptance was that the "stream crossing at the private access/Coon Creek should be updated if this private access is being upgraded according to the Phase B Preliminary Design Report for Dutch Creek, Coon Creek, Lilley Gulch, and Three Lakes Tributary. The Mile High Flood District (MHFD) recommends the design of this stream crossing".

Our private drive will be improved in conjunction with our minor subdivision plat to include a significant change to the culvert crossing of Coon Creek on our private drive. Now that the design criteria for the culvert crossing have been determined, we are asking the TRC to approve two variances from the Arapahoe County standards. Both variance requests modify the private drive from what was accepted by TRC in March 2020. We respectfully request the following two variances:

1. A variance to the County's standards requiring a guardrail at the proposed private drive culvert crossing of Coon Creek.
2. A variance to the County's standards requiring a 4' sidewalk (the basis of design requiring that standard would be the: (Private Roadway with Parking on One Side detached sidewalk) for our private drive. Our private drive connects Christensen Lane to the Arcadia Creek community and our neighbor located at 5090 Christensen Lane.

Variance Request One:

Section 10.1.2 of the Arapahoe County Stormwater Management Manual (SMM) states, "Conduit headwalls and wingwalls shall be provided with guardrails, handrails, or fencing in conformance with local building codes and roadway design safety requirements. Handrails shall be required in areas frequented by pedestrians or bicycles..."

Our culvert improvements are significant and reflect a substantial improvement to the area. Our design handles a 10-year storm event entirely within the confines of our culvert. More significant storms, such as a 100-year event, will continue to overtop our private drive; however, the improvements also result in a zero-rise condition upstream and downstream of the culvert improvement. However, the overtopping in a 100-year storm does mean that any installation of a guardrail would be in the flood plain and a direct violation of SEMSWA's requirements, and in conflict with the prior approved TRC variance dated March 16, 2020, that stated "no fence should be allowed within the floodplain. Arapahoe County's Floodplain Regulations prohibits the fence to be placed within the 100-year floodplain." The March 2020 variance calls for Mile High Flood District (MHFD) to make the recommendation for the design of this stream crossing, and they have recommended a 10-year crossing at this location. SEMSWA has stated that a 10-year culvert crossing is appropriate and complies with the Phase B Preliminary Design Report for Dutch Creek, Coon

Creek, Lilley Gulch, and Three Lakes Tributary Major Drainageway Planning study and agrees with MHFD's recommendation. In addition, South Metro Fire Rescue (SMFR) has reviewed our improvements and design. They have accepted the crossing design with no guardrail with the condition that the roadway is widened to 20 feet and reflective markers are installed at the edge of the embankment, a change from the TRC acceptance in March 2020.

We have incorporated the recommendations we received from Mile High Flood District, SEMSWA, and South Metro Fire and Rescue, into our design, but additional factors need to be considered when determining the approval of this variance request that include,

1. The first is the language within the (SMM) that reads Handrails shall be required in areas frequented by pedestrians or bicycles...". We will address the pedestrian concern in our subsequent variance request.
2. Improving the culvert will significantly mitigate stormwater in the corridor during more significant storm events. The max flow the current culvert can handle is 230 cfs, half of this region's 2-year storm event of 507 cfs. The 10-year flow at our private drive is 1215 cfs or ten times the capacity of the existing culvert. Our improvement will be able to pass just under 600% more water during a storm event than the current culvert.
3. Our private drive is the only point of access to Christensen Lane for our neighbor located at 5090 W. Christensen Lane.
4. Improvement to the culvert will improve the emergency service situation for our neighbor living at 5090 Christensen Lane. Once enhanced, emergency services can reach their property under most storm conditions without concern of overtopping on the private drive, unlike their current situation where they are limited to emergency services. The new culvert installation also provides our neighbor and our neighborhood access to emergency services regardless of the storm conditions by providing access through our neighborhood outside a floodplain.
5. Since our neighborhood is gated, it stops any east-west traffic flow from Leawood Drive to Christensen Lane. Our traffic study report shows trip generation produced by our community as being 108 car trips per day, with 70% of them traveling east. The traffic crossing the culvert daily will be minimal.
6. Pedestrians/bikers do not encounter the culvert crossing, detailed in our variance request number two below.
7. Additional safety precautions will be utilized, including installing reflective markers, posted speed limits in the teens, and no parking signs along the drive.

Based on the recommendations from SEMSWA, MHFD, and SMFR and the benefits provided to the region, our neighbors, and our community, we ask that you accept our variance request for the improvements on our private drive to include a 10-year culvert crossing with no guardrails that incorporates the guidelines from SMFR in our drive design.

Variance Request Two:

In our initial variance request accepted by the TRC in March 2020, we addressed the design of the private drive. However, the letter also stated, "The stream crossing at the private access/Coon Creek should be updated if this private access is being upgraded pursuant to the Phase B Preliminary Design Report for Dutch Creek, Coon Creek, Lilley Gulch, and Three Lakes Tributary. The Mile High Flood District (MHFD) makes the recommendation to the design of this stream crossing." As referenced earlier, we will be updating the culvert, and SEMSWA has stated that a 10-year culvert crossing is appropriate and complies with the Phase B Preliminary Design Report.

The design of the culvert crossing has changed the original cross-section of the private drive accepted by the TRC. We have applied those changes created by the culvert improvement with the requirements from South Metro Fire and Rescue in our private drive design.

The original variance was a change from the design standard of a Private Roadway with Parking on One Side detached sidewalk for both Christensen Lane and the private drive that connects our community and our neighbor to Christensen Lane. The variance accepted by TRC in March 2020 for the private drive had two eight-foot drive lanes with two two-foot grass paved shoulders. The drive narrowed at the culvert crossing to 16 feet, then widened back to the same size before the culvert. The private drive design that TRC accepted was also acceptable to South Metro Fire and Rescue. The approved design along the private drive did not have a sidewalk. During the review of our request for no guardrails at the culvert crossing, South Metro Fire and Rescue has required the private drive to be paved the entire length and width, of the drive, including the culvert crossing.

Based on the improvements of the culvert and the design requirements by South Metro Fire and Rescue, the modification to the private drive we request would begin where the private drive meets Christensen Lane and then continues south into our neighborhood. As previously mentioned, SMFR requires a 20-foot wide drive from Christensen Lane to the community, including the culvert crossing, which is paved with reflective markers installed at the embankment's edge. The private drive would be like Christensen Lane, except there would be no continuation of a predestination path or sidewalk down the private drive, just like the previously approved private drive design. There is no need for a sidewalk along our private drive, for our neighborhood has provided a safer alternative for pedestrian/bike traffic than down the private drive.

Currently, east-west pedestrian/bike traffic between Leawood Drive and Sheridan Boulevard to Platte Canyon is by Christensen Lane. One of the primary elements of the variance TRC accepted regarding Christensen Lane was the extension of a pedestrian/bike path the length of this western section of Christensen Lane that we are responsible for maintaining in its entirety. We incorporated this design feature on Christensen Lane in response to multiple public meetings and numerous public hearings during the rezoning process in Jefferson County. We purposely built safe zones for pedestrian/bike traffic along the Lane, including bollards to separate pedestrians/bikers from vehicle traffic on the Lane. This type of safety feature is not found on any other section of Christensen Lane.

How do we account for pedestrian/bike traffic safely through our community? Our private drive where it meets Christensen Lane is a vehicular-only gated entrance to the community. It does not allow the continuation of pedestrian/bike traffic to leave Christensen Lane to access the private drive. Instead, pedestrian/bike traffic leaves Christensen Lane via the south sidewalk of Leawood Drive, where Christensen Lane, Sheridan Blvd, and Leawood Drive meet. Traveling +/- 40 yards, pedestrians/bikers can enter our neighborhood through our gated west entrance that provides vehicular and pedestrian/bike access to the community without leaving a safe zone. Once on Arcadia Creek Property, they can continue through our neighborhood on sidewalks and connect to the

Jefferson County regional trail system. Accounting for safe passage by pedestrian/bike traffic through our community was by design and is defined in our Jefferson County ODP, which describes permitted uses, including pedestrian and bike trails. We eliminated the need for pedestrian/bike access down our private drive by creating a safe transition from Christensen Lane through our property to reach the regional trail system in Jefferson County. Our design of Christensen Lane, the private drive, and the neighborhood all work together to ensure that pedestrian/bike traffic flows through our project and streets safely.

In March of 2020, the TRC accepted the design of our private drive without needing a sidewalk in this location. The private drive is not available for access by the public, and a safe option for pedestrian/bike traffic has been accounted for through our neighborhood to the regional trail system.

Based on the provisions for a safe transition of pedestrian/bike traffic through our neighborhood, outside the private drive, we ask that you accept our variance request for the design of the private drive again, with the modifications defined by SMFR to include the elimination of a 4' sidewalk.

Respectfully Submitted

A handwritten signature in blue ink, reading "David P. Tschetter".

David Tschetter
Managing Member Arcadia Creek LLC

Exhibits

1. Revised cross-section of the private drive with SMFR recommendations incorporated.
2. MFD email response regarding the 10-year culvert design.
3. SEMSWA email response to MHFD 10-year culvert design comments.
4. SMFR initially accepted Christensen Lane and the private drive design in April 2020.
5. SMFR email approval of no guardrails with requirements.
6. Jefferson County ODP.
7. Pedestrian/bike transition from W. Christensen Lane through Arcadia to the trail.



Public Works and Development

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October 14, 2022

David Tschetter
Managing Member Arcadia Creek LLC

RE: Q22-022: A Variance to County's Standards requiring a guardrail at the proposed private drive culvert crossing of Coon Creek.
A Variance to the County's standards requiring a 4' sidewalk

Dear David,

The Arapahoe County Technical Review Committee (TRC) met on October 12, 2022 for a regularly scheduled meeting to discuss your variance/waiver requests and made the following recommendations:

- a. TRC did not have any objection to the Culvert Design proposed. TRC suggested that the roadway edge signing/delineation be added.
- b. TRC mentioned that the South Metro Fire Rescue will need to see the new proposed design for requirements and approval.
- c. TRC supported variance for not requiring sidewalk along private road.

Decisions of the TRC may be appealed to the Director of Public Works and Development, Bryan Weimer. If you wish to appeal the decision of the TRC, please submit a written request to my attention. Within six working days, you will be notified of a date and time for the appeal meeting with the Director of Public Works and Development. This process is further outlined in Arapahoe County's IDCS, section 3.2.2.

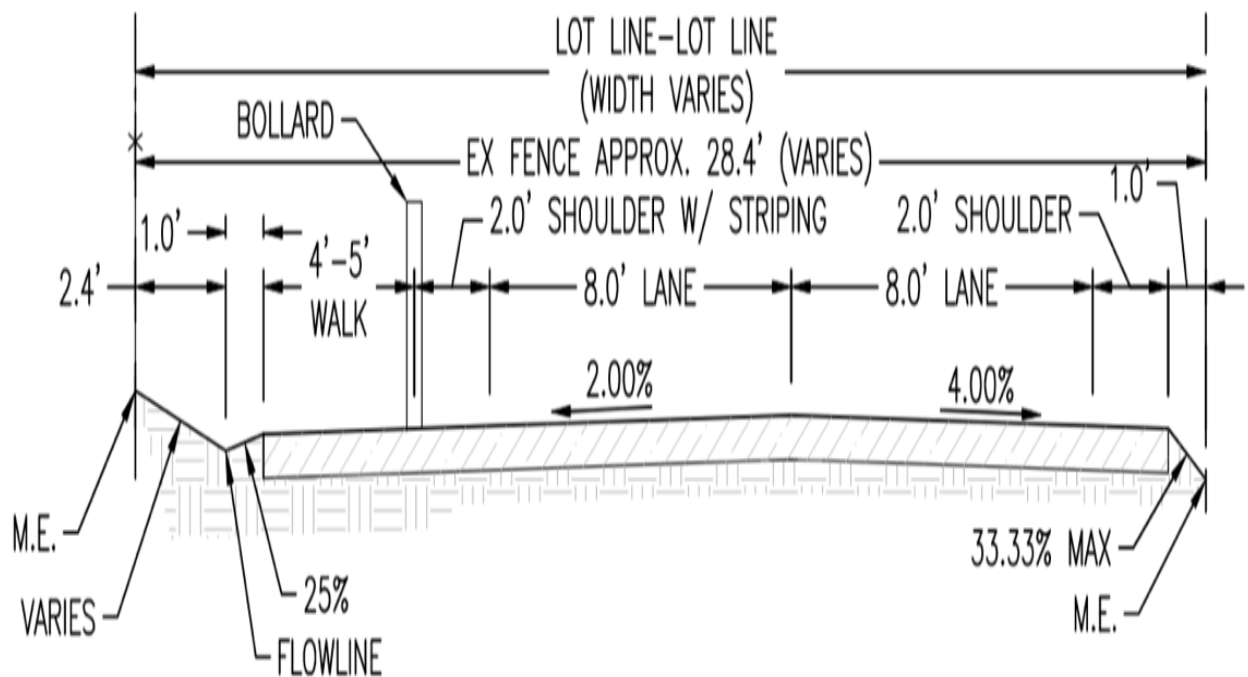
If the development intentions deviate from that which was represented in these requests, a new request or requests shall be sought from the Engineering Services Division.
If you have any questions, please feel free to contact me at 720-874-6500.

Sincerely,
Joseph Boateng, PE

cc: Charles V. Haskins, Manager, Engineering Services Division

MISSION

Enhancing your quality of life through exceptional delivery of services and efficient use of public funds.



CHRISTENSEN LANE TYPICAL SECTION

SCALE: 1" = 5'

August 15, 2023

Joseph Boateng, PE
Engineering I
Arapahoe County Public Works & Development
6924 S Lima St, Centennial, CO 80112-3853

Re: Amendment to Approved Variance Request Arcadia Creek

Members of Arapahoe County TRC:

We are asking the TRC to amend our original variance approval to reflect the incorporated changes to our construction documents which we modified based on the results of surveys, drainage analysis, input from SEMSWA and SMDFR, and public input.

The Arapahoe County Technical Review Committee (TRC), including Southeast Metro Stormwater Authority (SEMSWA), met on February 26, 2020, for a regularly scheduled meeting to discuss the variance requests related to the private access for the Arcadia Creek Development (Development), located in Arapahoe and Jefferson Counties. The request for variance dealt with the County's standard for a private roadway cross-section. Our variance request was approved on March 16, 2020. That approval was based on the conceptual design diagram of what we anticipated the engineered cross-section of Christensen Lane would eventually reflect.

The cross-section of Christensen Lane in our plan set has been designed based on the current conditions of the Lane determined by surveys, drainage analysis, input from SEMSWA and SMDFR, and or engineers.

The changes to the March 16, 2020, approval by TRC that you have asked us to respond to and are asking you to amend are.

1. "The 4' proposed sidewalk/bike lane path as to the 5' as approved."
2. "Reason for the removal of the split rail."
3. "The slope of the cross-section in both directions(crown) is supposed to slope to the south as approved by TRC. TRC has no issue with the crown so far as the drainage works."
4. "Planning is advocating making the walking area distinct from the travel way. TRC recommends striping from the edge of the travel way. (Striping will span the 2' shoulder and the 4' sidewalk path."

Regarding the 4' proposed sidewalk/bike lane path as to the 5' as approved.

Since the creation of the Lane before the transfer of our property from Charles Bowles to Victor Christensen in 1912, the Lane has seen its fair share of modifications. As properties were acquired along the Lane, homes and subdivisions needing access to the Lane were built. The result of these events has resulted in the width of the Private R.O.W. running between Leawood Dr. to Platte Canyon to vary, east to west; at a minimum, the easement width is 28 ft which is less than the approved 30-ft road section in the original approval by the TRC. Because of this

easement constraint, the road section had to be reduced to ensure proper swale capacity and tie-back grading of the proposed roadway.

The inconsistency of the Private R.O.W., the easement known as Christensen Lane, required minor adjustments to our road cross-section design. As a result, our proposed sidewalk/bike lane now varies from four to five feet instead of a consistent five feet as initially approved by the TRC. However, our change is consistent and representative of the current sidewalk/bike lane between Fox Hollow and the entrance of Christensen Lane Estates, where the width of the sidewalk/bike lane also varies between 4 and 5 feet, a result of the inconsistency of the Private R.O.W., known as Christensen Lane.

In addition, unlike the sidewalk/bike lane between Fox Hollow and the entrance of Christensen Lane Estates, where there is no separation between the drive lanes and the sidewalk/bike lane, we have a two-foot reflective stripped shoulder. We are also proposing hardwood bollards as an additional safety element to the sidewalk/bike lane along our section of the Lane.

Regarding your question on why the split rail fence was removed from our plans.

We removed the fence before our initial submittal, and Hard Wood Bollards replaced it. I missed that the Bollards were not in our current plan set. My responsibility is to ensure that our plans accurately reflect our design and that those corrections will be added. We believe using Bollards is the appropriate solution for this location, keeping the character of the Lane more in line with how it is used daily by the public while adding safety elements to this section of the Lane.

The impetus for changing the fence to bollards was based on our interactions with the public, who indicated they would like the Lane to remain open. A common theme of the public was to allow the Lane to function as it does now, where people move to a side of the Lane when vehicles approach. Our goal of using bollards enables us to increase safety along the Lane while allowing the public to move freely in and out of a safe zone as vehicles pass, and it accomplishes the goal stated by Planning to make "the walking area distinct from the travel way."

Why did we change the slope of the cross-section in both directions (crown) instead of keeping the slope to the south as approved by TRC? TRC has no issue with the crown so far as the drainage works.

The cross-section approved in the original TRC approval could not evaluate the existing conditions of Christensen Lane, including topography, easements, and offsite drainage concerns. The proposed design facilitates proper drainage of the Lane, considering the offsite basins traveling to the Lane from the Coventry subdivision to the north. The Lane, as it exists today, is crowned. The proposed design has shifted the crown to the south to reduce the amount of runoff traveling to the Fox Hollow subdivision as sheet flow. The proposed crown ensures that runoff captured by the Lane is transported safely to the proposed inlets and does not spill across the road's centerline. Our design improves the current drainage situation along the Lane.

To the question that Planning is advocating making the walking area distinct from the travel way. TRC recommends striping from the edge of the travel way. (Striping will span the 2' shoulder and the 4' sidewalk path.

Striping, like the bollards, has always been an essential element of our plans, and I missed both of those elements being included in plan sets. We believe that with reflective striping and bollards, this section of the Lane will accomplish a distinct safe zone, with clear delineation of separation from the travel way along this section of the Lane. We concur with Planning and the recommendation of the TRC.

Respectfully,

A handwritten signature in blue ink, reading "David P. Tschetter". The signature is fluid and cursive, with the first name "David" being more prominent.

Arcadia Creek, LLC
David Tschetter, manager



ARAPAHOE COUNTY
COLORADO'S FIRST

Public Works and Development

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TDD: 720-874-6574
www.arapahoegov.com
publicworks@arapahoegov.com

August 25, 2023
David Tschetter.
Arcadia Cree,LLC

RE: PM22-006

- **Amendment to Approved Variance Request Arcadia Creek**

Dear David,

The Arapahoe County Technical Review Committee (TRC) met on August 23,2023 for a regularly scheduled meeting to discuss your variance/waiver requests and made the following recommendations:

The TRC approved the following items with some recommendations:

- The 4-5 feet proposed sidewalk/bikelane path.
- The proposed crown on Christensen lane. All drainage analysis as a result of this proposal should be addressed in the Drainage Report.

The TRC denied the proposal of bollards and made this recommendation:

- Stripe the two shoulders on both sides of the road and the walkway path. All materials, striping should conform to MUTCD. South Metro Fire Rescue District should review amended cross-section for comments.

Decisions of the TRC may be appealed to the Director of Public Works and Development, Bryan Weimer. If you wish to appeal the decision of the TRC, please submit a written request to my attention. Within six working days, you will be notified of a date and time for the appeal meeting with the Director of Public Works and Development. This process is further outlined in Arapahoe County's IDCS, section 3.2.2.

If the development intentions deviate from that which was represented in these requests, a new request or requests shall be sought from the Engineering Services Division.

If you have any questions, please feel free to contact me at 720-874-6500.

Sincerely,
Joseph Boateng,PE

cc: Charles V. Haskins, Manager, Engineering Services Division

MISSION

Enhancing your quality of life through exceptional delivery of services and efficient use of public funds.

Joseph Boateng, PE
Arapahoe County Public Works & Development
6924 S Lima St, Centennial, CO 80112-3853

Re: Variance Request Arcadia Creek
Technical Review Committee

January 08, 2024

Members of the Arapahoe County TRC:

The purpose of this letter is to request a variance from Arapahoe County Stormwater Management Manual (ACSM) Section 13.1.1 which mandates on-site detention (flood control) be provided for the development at Lot 1, Block 30, Leawood Subdivision Filing No. 5 (Site). This letter shall detail the variance per requirements stated in ACSM Section 1.9.1.

CRITERIA FOR WHICH APPLICANT IS SEEKING VARIANCE

Section 13.1.1 of the Arapahoe County Stormwater Management Manual states:
“Detention shall be Provided for all New Development, Redevelopment and Expansion. The County requires that Water Quality Capture Volume and flood control detention be provided for all new development, redevelopment, or expansion of a site.”

The applicant is requesting relief from flood control detention only, as the project meets exemptions for water quality (for the undetained basins) as stated in Section 14.4, also described in the Phase III Drainage Report submitted as part of the plat application.

The ACSM further defines this requirement in Section 13.1.4:

“Expansion of a site occurs when additional area on the site is to be developed. The expansion of a site shall require that current County standards for detention for the entire site are met, where feasible. There are two conditions that may arise for site expansion, depending upon whether or not detention has been provided for the existing site prior to expansion.”

The project site meets the second condition, as described below:

“Detention has not been provided for the existing developed area. Detention will be required for the full expansion and to the extent possible, for the existing site area that

has previously been un-detained. The County will require that a reasonable attempt be made to provide detention storage for the previously developed, un-detained portion of the site."

Exemptions from the detention requirement are described in ACSMM Section 13.1.5:

"Exemptions from the detention requirement may be granted for additions to existing buildings and paved areas, provided that the total impervious area of all additions (cumulative over the history of the site expansions) cover less than 5,000 square feet of impervious area and that no adverse impacts to downstream properties would be created by the additional undetained runoff."

The development exceeds the allotted undetained impervious area of 5,000 square feet, and therefore does not qualify for exemption. See attached exhibits for reference.

JUSTIFICATION FOR NOT COMPLYING WITH THE CRITERIA

To preface, the applicant is providing full-spectrum detention (water quality and flood control) for a large portion of the subject property. Specifically, the southern portion of the site which has means to be captured and transported to a pond within the Jefferson County parcel. This variance request pertains to the northern half of the subject parcel, and the common ownership tract of Christensen Lane. Due to topography, floodplain, and lack of existing infrastructure, it is not feasible to provide detention for these areas.

The applicant is requesting relief from the detention requirement triggered by the development of the project site, but more specifically, the widening of Christensen Lane. During the pre-submittal review dated February 14th, 2018, Arapahoe County requested that Christensen Lane be *"designed and built/improved to meet Arapahoe County private roadway standards."* Subsequently, the applicant submitted a private roadway standard variance to the Technical Review Committee (TRC) and received approval on March 16th, 2020. The variance approved a cross-section for the private roadway; and since the initial approval of the cross-section of the Lane, it has been refined, and now includes the last approval by the TRC on August 25, 2023. The approved cross-section met the needs of the development and County while working within the existing constraints of Christensen Lane.

As illustrated in the attached exhibits, the widening of Christensen Lane adds approximately 8,480 sq. ft. of impervious area. This additional area is the main trigger for the detention requirement, and exceeds the allotted 5,000 sq. ft. This additional area is outside the subject property boundary.

A summary table is provided below:

Undetained basins within subject property boundary

- Pre-development impervious area = 12,090-sf
- Post-development impervious area = 13,159-sf
- Delta = 1,069-sf of impervious area un-detained to Coon Creek.

Undetained basins within Christensen Lane

- Pre-development impervious area = 22,133-sf
- Post-development impervious area = 30,613-sf
- Delta = 8,480-sf of impervious area added with widening of the lane

With the development of the lane, the applicant is proposing additional stormwater inlets and re-grading of the roadway that significantly improves the existing drainage condition. In the developed condition, the lane will capture and transport more runoff than the existing condition. Neighboring properties will see a reduction in runoff and will not be negatively impacted by this development. The additional impervious surface will not negatively impact the adjacent properties along the lane.

The applicant has evaluated placement of a detention pond for the undetained basins associated with the lane. A summary of those findings is listed below.

- An existing FEMA Special Flood Hazard Area (SFHA) Zone AE and SFHA Floodway encumber a large portion of the subject property and the western end of Christensen Lane. Detention ponds (above or underground) are not allowed within FEMA SFHA designated areas. The only area outside the SFHA Zone AE and within the subject property boundary totals 900 square feet, approximately 25% of the required area to construct an above-ground pond.
- Detention ponds must discharge at or above the 100-year base flood elevation of the adjacent tributaries. This requirement is to ensure proper hydraulic function of a detention pond when flooding of the tributary occurs. To meet these criteria, a proposed pond must have a minimum invert elevation (pond bottom) of 5409, as illustrated on Sheet 31 of the FHAD for Dutch Creek, Coon Creek, Lilley Gulch, and Three Lakes Tributary prepared by Mile High Flood District. If enough area were provided onsite to construct a pond, existing topography would prevent the required elevations from being met. Topography would not allow the capture and transport of runoff from the lane into a detention pond at the required invert elevation.

- An above-ground pond is not possible given the physical constraints horizontally and vertically. Underground detention is not allowed in Arapahoe County and must be applied for via variance.
- If underground detention were allowed by variance through TRC, there are still challenges to providing an acceptable design.
 - Underground detention would need to be placed with the common ownership tract of Christensen Lane.
 - Existing utility conflicts include storm sewer pipe, water mains, and gas mains.
 - An existing water easement and main would need to be relocated and vacated, which may not be physically possible.
 - The underground detention system would require pumping and would not be allowed to gravity drain given the proximity to the creek and imposing base flood elevations.
 - Detention access would conflict with vehicular traffic of the lane.

For the reasons presented above, providing detention for the additional impervious paving along Christensen Lane is a significant hardship for the applicant. Section 13.1.4 of ACSMM states *“The expansion of a site shall require that current County standards for detention for the entire site are met, where feasible.”* Based on engineering judgement and physical constraints, detention is not feasible for the areas described herein.

ALTERNATIVE CRITERIA OR STANDARD PROPOSED

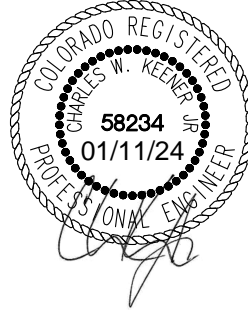
The applicant shall provide detention per Section 13.1 .1 of the Arapahoe SMM to the extent physically possible. These areas include the two single family dwellings and associated private drive, the southern portion of the subject property. See attached exhibit for clarification.

The applicant shall remove and replace existing inlets along Christensen Lane, supporting a more robust drainage conveyance system. The existing storm sewer within Christensen Lane shall be cleaned of debris to help facilitate the transport of runoff to Coon Creek. The existing outlet into Coon Creek shall be repaired and sediment removed. The outlet pipe shall be retrofitted with updated erosion control measures including rip rap and energy dissipation.

SUPPORTING DOCUMENTATION

Please see the appendix to this letter with supporting documentation.

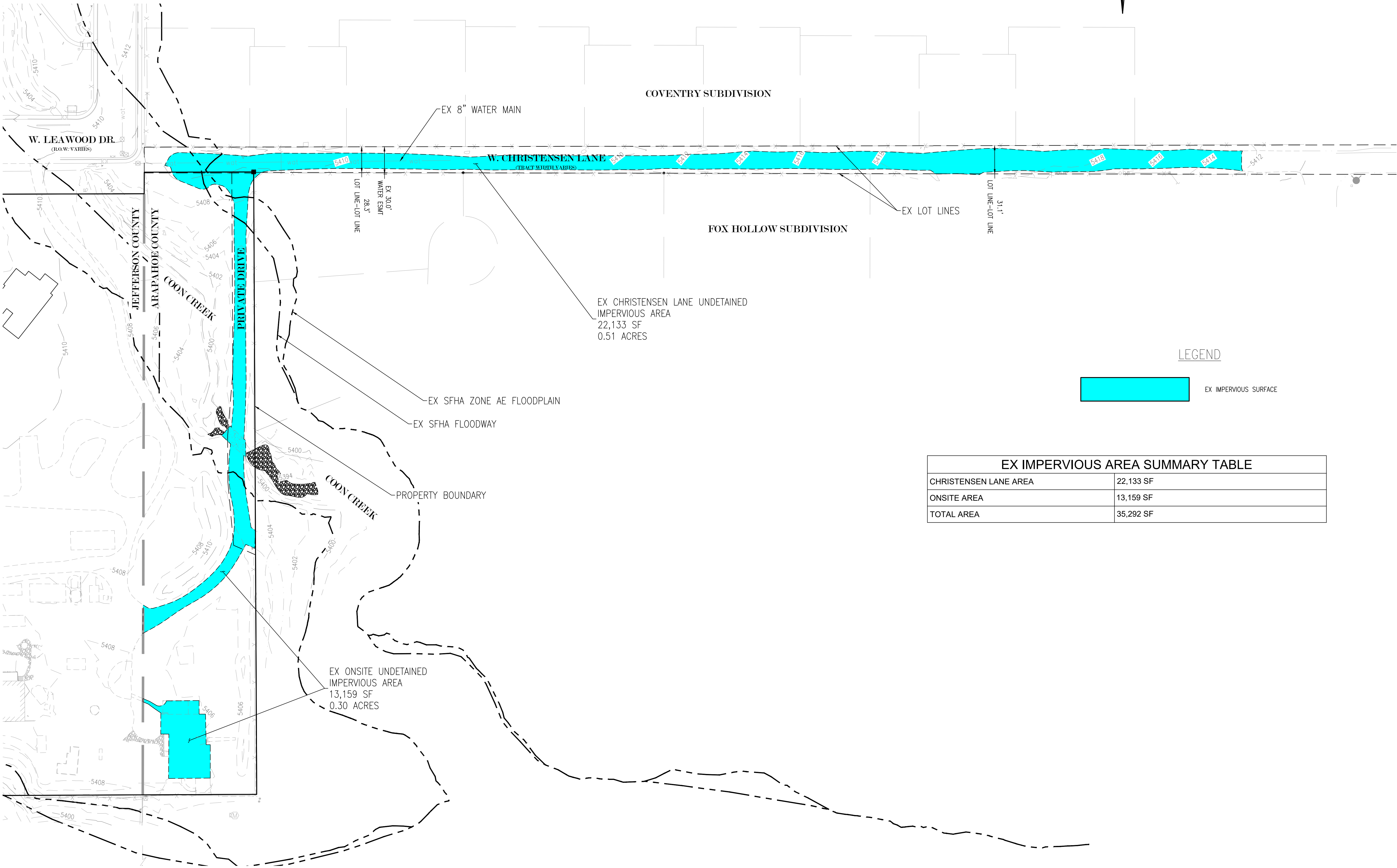
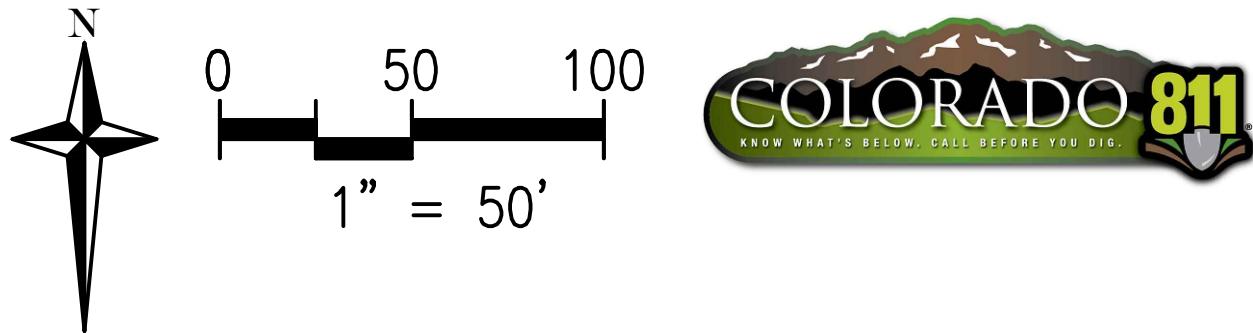
Respectfully submitted,
On behalf of Arcadia Creek LLC
Brightlighter Engineering LLC



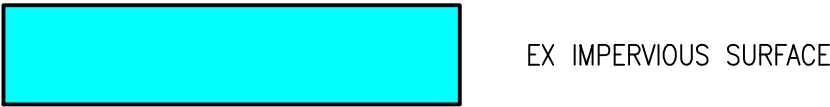
ARCADIA CREEK

A PART OF LOT 1, BLOCK 30, LEAWOOD SUBDIVISION FILING NO. 5, SITUATED IN THE SE1/4 OF SECTION 24, T.5S., R.69W., AND A PARCEL OF LAND SITUATED IN THE SE1/4 OF SECTION 24, T.5S., R.69W.,OF THE 6TH P.M. CITY OF LITTLETON, COUNTIES OF JEFFERSON AND ARAPAHOE, STATE OF COLORADO

NOT FOR CONSTRUCTION



LEGEND



EX IMPERVIOUS AREA SUMMARY TABLE

CHRISTENSEN LANE AREA	22,133 SF
ONSITE AREA	13,159 SF
TOTAL AREA	35,292 SF

PROJECT #	AC2130
PROJECT DATE	07/14/22
DESIGNER	EMR
REVIEWER	CWK



DETENTION VARIANCE EXHIBIT

ARCADIA CREEK
5234 LEAWOOD DRIVE
LITTLETON, CO 80123
CHARLES KEENER JR

REVISION NUMBER	REVISION DESCRIPTION	DATE

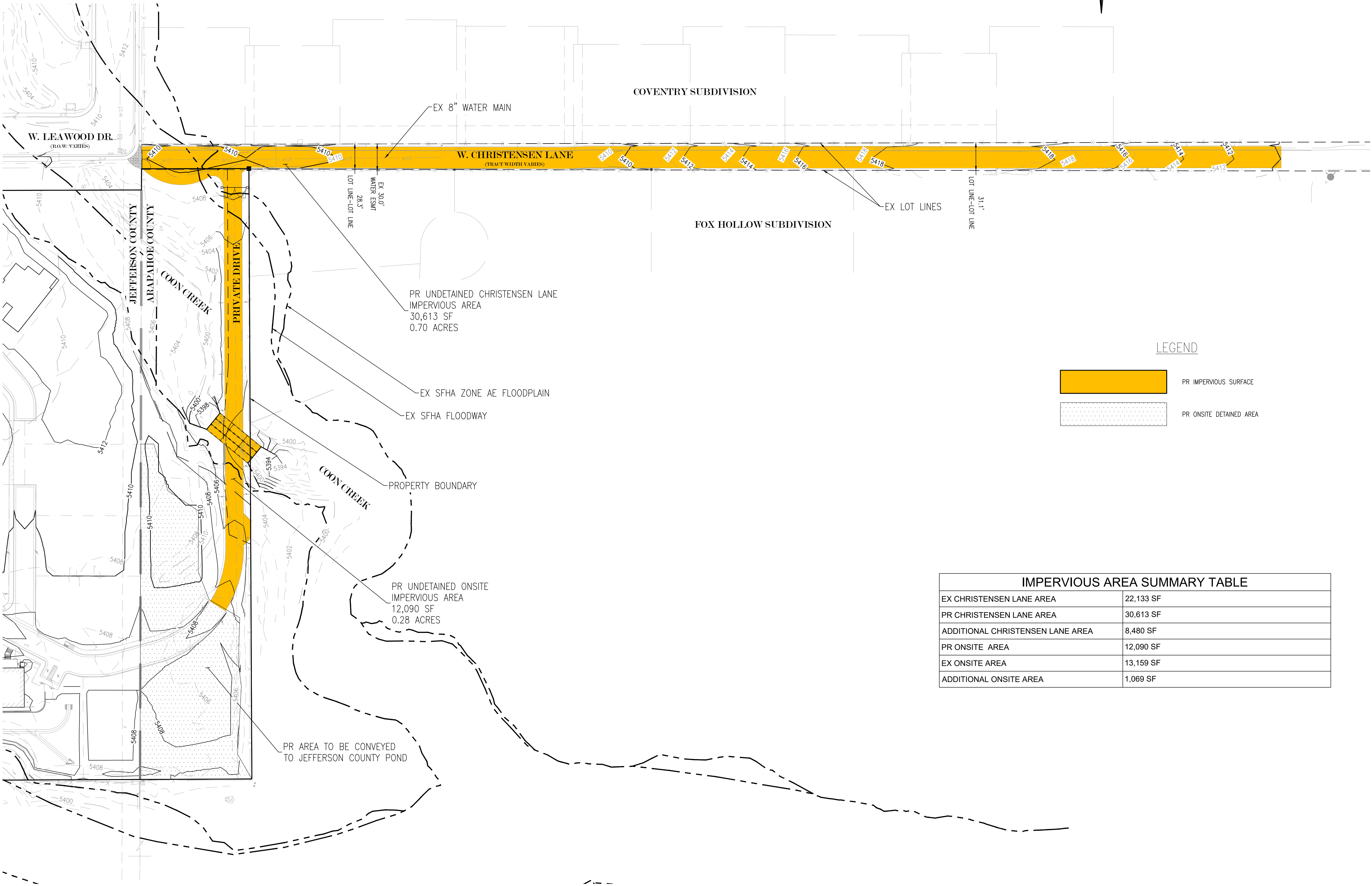
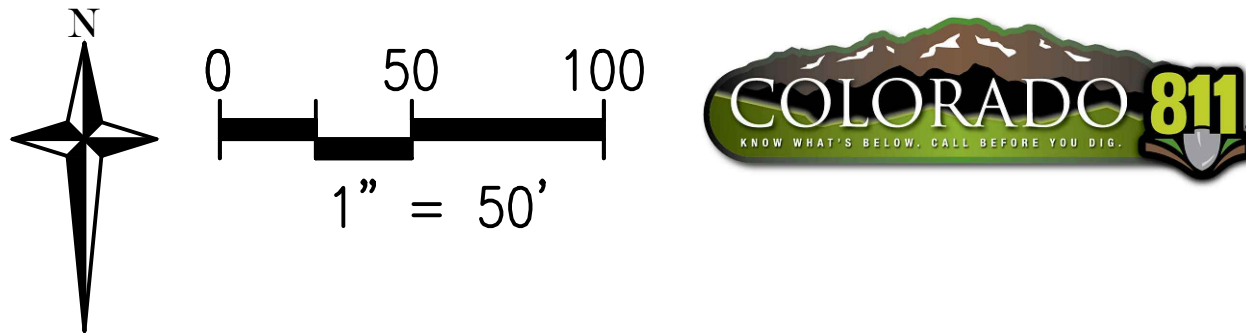
DETENTION VARIANCE EXHIBIT



ARCADIA CREEK

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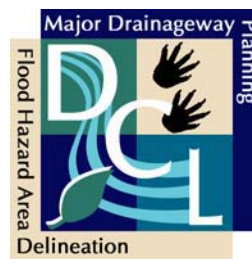
NOT FOR CONSTRUCTION



Flood Hazard Area Delineation

Dutch Creek, Coon Creek, Lilley Gulch, and Three Lakes Tributary

March 2008



Prepared for:

Urban Drainage and Flood Control District

Arapahoe County • Jefferson County • City and County of Denver • Town of Columbine Valley

Southeast Metro Stormwater Authority

Prepared by:



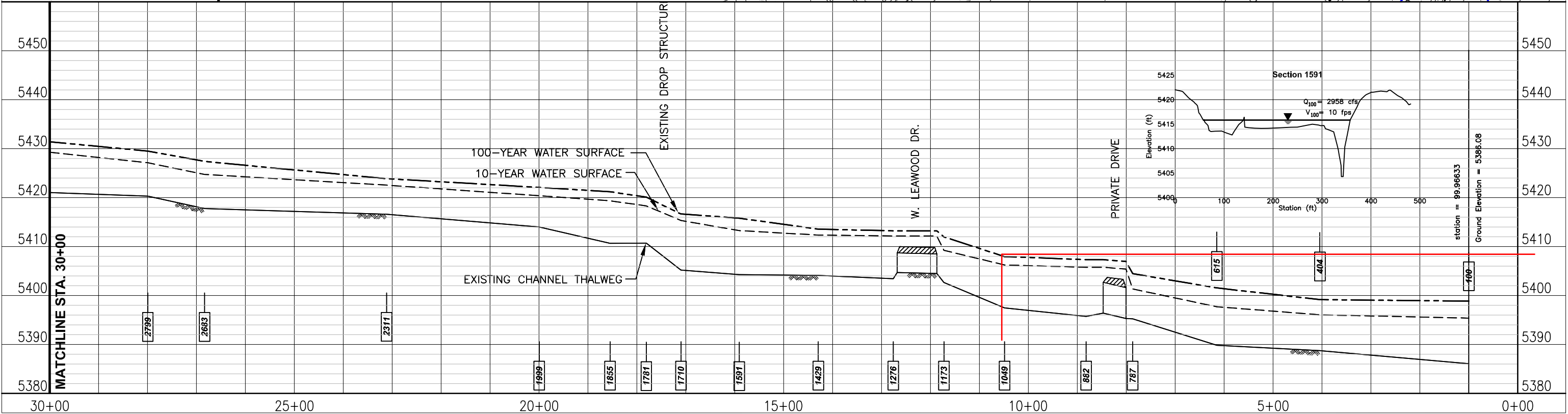
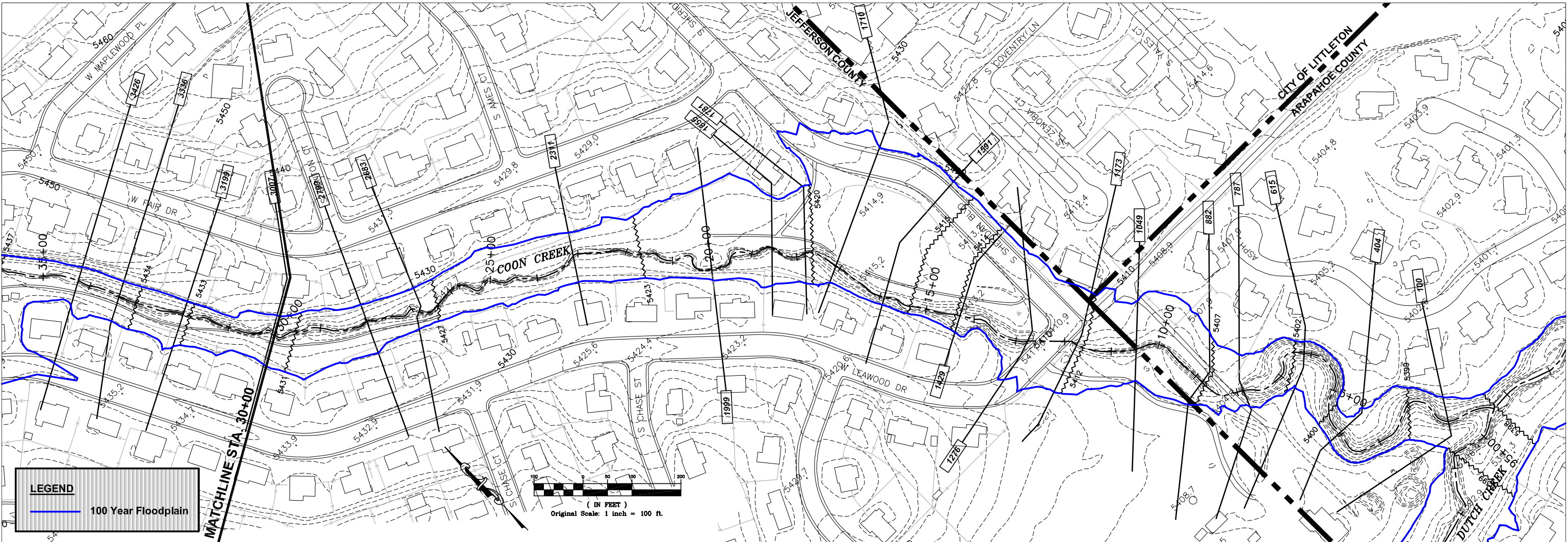
4601 DTC Boulevard

Suite 700

Denver, CO 80237

Town of Columbine Valley







ARAPAHOE COUNTY
COLORADO'S FIRST

Public Works and Development

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publicworks@arapahoegov.com

January 24, 2024

Charles Keener, P.E.
Bright Lighter Engineering

RE: PM22-006

- **A variance request to ACSMM Section 13.1.1 for the Provision of On-site detention for a new development and redevelopment**

Dear Charles,

The Arapahoe County Technical Review Committee (TRC) met on January 17, 2024 for a regularly scheduled meeting to discuss your variance/waiver requests.

The TRC needs more information to approve the variance request. The recommendations are:

- Existing and proposed flow rates and change in flow rates.
- Discuss how the un-detained flows will impact Coon Creek and Dutch Creek.
- Discuss how this flow impacts the peak within Coon Creek.
- How much detention volume would be required to detain the flows.
- Was any offset provided with the ponds in Jefferson County for the flows that go to Coon Creek? For example, did any flows that went to Coon Creek get transferred to Dutch Creek and included in the pond volumes?

Decisions of the TRC may be appealed to the Director of Public Works and Development, Bryan Weimer. If you wish to appeal the decision of the TRC, please submit a written request to my attention. Within six working days, you will be notified of a date and time for the appeal meeting with the Director of Public Works and Development. This process is further outlined in Arapahoe County's IDCS, section 3.2.2.

If the development intentions deviate from that which was represented in these requests, a new request or requests shall be sought from the Engineering Services Division.

If you have any questions, please feel free to contact me at 720-874-6500.

Sincerely,
Joseph Boateng, PE

cc: Charles V. Haskins, Manager, Engineering Services Division

MISSION

Enhancing your quality of life through exceptional delivery of services and efficient use of public funds.

Joseph Boateng, PE
Arapahoe County Public Works & Development
6924 S Lima St, Centennial, CO 80112-3853

Re: Variance Request Arcadia Creek
Technical Review Committee

January 08, 2024

Members of the Arapahoe County TRC:

The purpose of this letter is to request a variance from Arapahoe County Stormwater Management Manual (ACSM) Section 13.1.1 which mandates on-site detention (flood control) be provided for the development at Lot 1, Block 30, Leawood Subdivision Filing No. 5 (Site). This letter shall detail the variance per requirements stated in ACSM Section 1.9.1.

CRITERIA FOR WHICH APPLICANT IS SEEKING VARIANCE

Section 13.1.1 of the Arapahoe County Stormwater Management Manual states: *“Detention shall be Provided for all New Development, Redevelopment and Expansion. The County requires that Water Quality Capture Volume and flood control detention be provided for all new development, redevelopment, or expansion of a site.”*

The applicant is requesting relief from flood control detention only, as the project meets exemptions for water quality (for the undetained basins) as stated in Section 14.4, also described in the Phase III Drainage Report submitted as part of the plat application.

The ACSM further defines this requirement in Section 13.1.4:

“Expansion of a site occurs when additional area on the site is to be developed. The expansion of a site shall require that current County standards for detention for the entire site are met, where feasible. There are two conditions that may arise for site expansion, depending upon whether or not detention has been provided for the existing site prior to expansion.”

The project site meets the second condition, as described below:

“Detention has not been provided for the existing developed area. Detention will be required for the full expansion and to the extent possible, for the existing site area that

has previously been un-detained. The County will require that a reasonable attempt be made to provide detention storage for the previously developed, un-detained portion of the site."

Exemptions from the detention requirement are described in ACSMM Section 13.1.5:

"Exemptions from the detention requirement may be granted for additions to existing buildings and paved areas, provided that the total impervious area of all additions (cumulative over the history of the site expansions) cover less than 5,000 square feet of impervious area and that no adverse impacts to downstream properties would be created by the additional undetained runoff."

The development exceeds the allotted undetained impervious area of 5,000 square feet, and therefore does not qualify for exemption. See attached exhibits for reference.

JUSTIFICATION FOR NOT COMPLYING WITH THE CRITERIA

To preface, the applicant is providing full-spectrum detention (water quality and flood control) for a large portion of the subject property. Specifically, the southern portion of the site which has means to be captured and transported to a pond within the Jefferson County parcel. This variance request pertains to the northern half of the subject parcel, and the common ownership tract of Christensen Lane. Due to topography, floodplain, and lack of existing infrastructure, it is not feasible to provide detention for these areas.

The applicant is requesting relief from the detention requirement triggered by the development of the project site, but more specifically, the widening of Christensen Lane. During the pre-submittal review dated February 14th, 2018, Arapahoe County requested that Christensen Lane be *"designed and built/improved to meet Arapahoe County private roadway standards."* Subsequently, the applicant submitted a private roadway standard variance to the Technical Review Committee (TRC) and received approval on March 16th, 2020. The variance approved a cross-section for the private roadway; and since the initial approval of the cross-section of the Lane, it has been refined, and now includes the last approval by the TRC on August 25, 2023. The approved cross-section met the needs of the development and County while working within the existing constraints of Christensen Lane.

As illustrated in the attached exhibits, the widening of Christensen Lane adds approximately 8,480 sq. ft. of impervious area. This additional area is the main trigger for the detention requirement, and exceeds the allotted 5,000 sq. ft. This additional area is outside the subject property boundary.

A summary table is provided below:

Undetained basins within subject property boundary

- Pre-development impervious area = 12,090-sf
- Post-development impervious area = 13,159-sf
- Delta = 1,069-sf of impervious area un-detained to Coon Creek.

Undetained basins within Christensen Lane

- Pre-development impervious area = 22,133-sf
- Post-development impervious area = 30,613-sf
- Delta = 8,480-sf of impervious area added with widening of the lane

With the development of the lane, the applicant is proposing additional stormwater inlets and re-grading of the roadway that significantly improves the existing drainage condition. In the developed condition, the lane will capture and transport more runoff than the existing condition. Neighboring properties will see a reduction in runoff and will not be negatively impacted by this development. The additional impervious surface will not negatively impact the adjacent properties along the lane.

The applicant has evaluated placement of a detention pond for the undetained basins associated with the lane. A summary of those findings is listed below.

- An existing FEMA Special Flood Hazard Area (SFHA) Zone AE and SFHA Floodway encumber a large portion of the subject property and the western end of Christensen Lane. Detention ponds (above or underground) are not allowed within FEMA SFHA designated areas. The only area outside the SFHA Zone AE and within the subject property boundary totals 900 square feet, approximately 25% of the required area to construct an above-ground pond.
- Detention ponds must discharge at or above the 100-year base flood elevation of the adjacent tributaries. This requirement is to ensure proper hydraulic function of a detention pond when flooding of the tributary occurs. To meet these criteria, a proposed pond must have a minimum invert elevation (pond bottom) of 5409, as illustrated on Sheet 31 of the FHAD for Dutch Creek, Coon Creek, Lilley Gulch, and Three Lakes Tributary prepared by Mile High Flood District. If enough area were provided onsite to construct a pond, existing topography would prevent the required elevations from being met. Topography would not allow the capture and transport of runoff from the lane into a detention pond at the required invert elevation.

- An above-ground pond is not possible given the physical constraints horizontally and vertically. Underground detention is not allowed in Arapahoe County and must be applied for via variance.
- If underground detention were allowed by variance through TRC, there are still challenges to providing an acceptable design.
 - Underground detention would need to be placed with the common ownership tract of Christensen Lane.
 - Existing utility conflicts include storm sewer pipe, water mains, and gas mains.
 - An existing water easement and main would need to be relocated and vacated, which may not be physically possible.
 - The underground detention system would require pumping and would not be allowed to gravity drain given the proximity to the creek and imposing base flood elevations.
 - Detention access would conflict with vehicular traffic of the lane.

For the reasons presented above, providing detention for the additional impervious paving along Christensen Lane is a significant hardship for the applicant. Section 13.1.4 of ACSMM states *“The expansion of a site shall require that current County standards for detention for the entire site are met, where feasible.”* Based on engineering judgement and physical constraints, detention is not feasible for the areas described herein.

ALTERNATIVE CRITERIA OR STANDARD PROPOSED

The applicant shall provide detention per Section 13.1 .1 of the Arapahoe SMM to the extent physically possible. These areas include the two single family dwellings and associated private drive, the southern portion of the subject property. See attached exhibit for clarification.

The applicant shall remove and replace existing inlets along Christensen Lane, supporting a more robust drainage conveyance system. The existing storm sewer within Christensen Lane shall be cleaned of debris to help facilitate the transport of runoff to Coon Creek. The existing outlet into Coon Creek shall be repaired and sediment removed. The outlet pipe shall be retrofitted with updated erosion control measures including rip rap and energy dissipation.

SUPPORTING DOCUMENTATION

Please see the appendix to this letter with supporting documentation.

Respectfully submitted,
On behalf of Arcadia Creek LLC
Brightlighter Engineering LLC



Response to TRC 1st Review Comments dated 1/17/24

1. Existing and proposed flow rates and change in flow rates.

In the existing condition, 100-year runoff generated from Christensen Lane and transported to Coon Creek, via existing storm sewer, is 2.3 CFS.

Once improved, the 100-year runoff captured from Christensen Lane and transported to Coon Creek, via the existing storm sewer, is 2.9 CFS.

The increase is due to the additional paving required to improve Christensen Lane. Additionally, the proposed road improvements discharge the additional runoff into inlets along the north side of the lane. No additional runoff is being transported across lot lines of the Fox Hollow subdivision as a result of this lane development.

The additional paving on Christensen Lane, combined with Lane's crown being shifted to the south, and the improved storm sewer inlets account for the increase in stormwater captured and transported to Coon Creek. These improvements also mitigate any additional runoff from traveling south across lot lines of the Fox Hollow subdivision.

2. Discuss how the un-detained flows will impact Coon Creek and Dutch Creek.

Undetained flows will have a negligible impact on the adjacent watercourses. The existing storm infrastructure in Christensen Lane has not been maintained and no erosion control measures are currently provided at the outlet of the existing storm sewer into Coon Creek. The proposed development of the lane includes improvements to the existing storm outfall, including properly designed energy dissipation and erosion control measures to mitigate impacts to Coon Creek.

3. Discuss how this flow impacts the peak within Coon Creek

Per effective flood insurance study for the subject area, the peak 100-year discharge directly downstream from the Christensen Lane outfall is 2,958 CFS. The additional 0.6 CFS being discharged into the Creek upstream of this location is approximately 0.02% of the total, a negligible increase.

4. How much detention volume would be required to detain the flows.

The Christensen Lane basin that drains to Coon Creek is relatively small, approximately 0.41-ac. However, the existing offsite basins from Coventry Subdivision that are captured by the Christensen Lane inlets are approximately 10.3-ac. Since flows from Coventry Subdivision and Christensen Lane are comingled, a pond treating both flows would be necessary. To provide detention, per ACSMM Code Section 13.1.4, for all runoff entering

the existing storm sewer would require a pond volume of approximately 0.933 ac-ft, or 40,641 cu. ft. This equates to a pond with a depth of 4-ft and horizontal dimension of 100-ft x 100-ft, or iteration thereof.

As discussed previously in this letter, the existing flood zone AE and floodway prevent placement of a pond this large. Additionally, the base flood elevation of the creek would be above a proposed pond outfall, which does not work hydraulically.

5. Was any offset provided with the ponds in Jefferson County for the flows that go to Coon Creek? For example, did any flows that went to Coon Creek get transferred to Dutch Creek and included in the pond volumes?

We have evaluated the drainage condition of the subject property during preparation of the drainage reports for Jefferson and Arapahoe Counties. The results of these reports are detailed below.

In the existing condition, the un-detained 100-year runoff from both Jefferson and Arapahoe Counties into Coon Creek is 9.08 CFS.

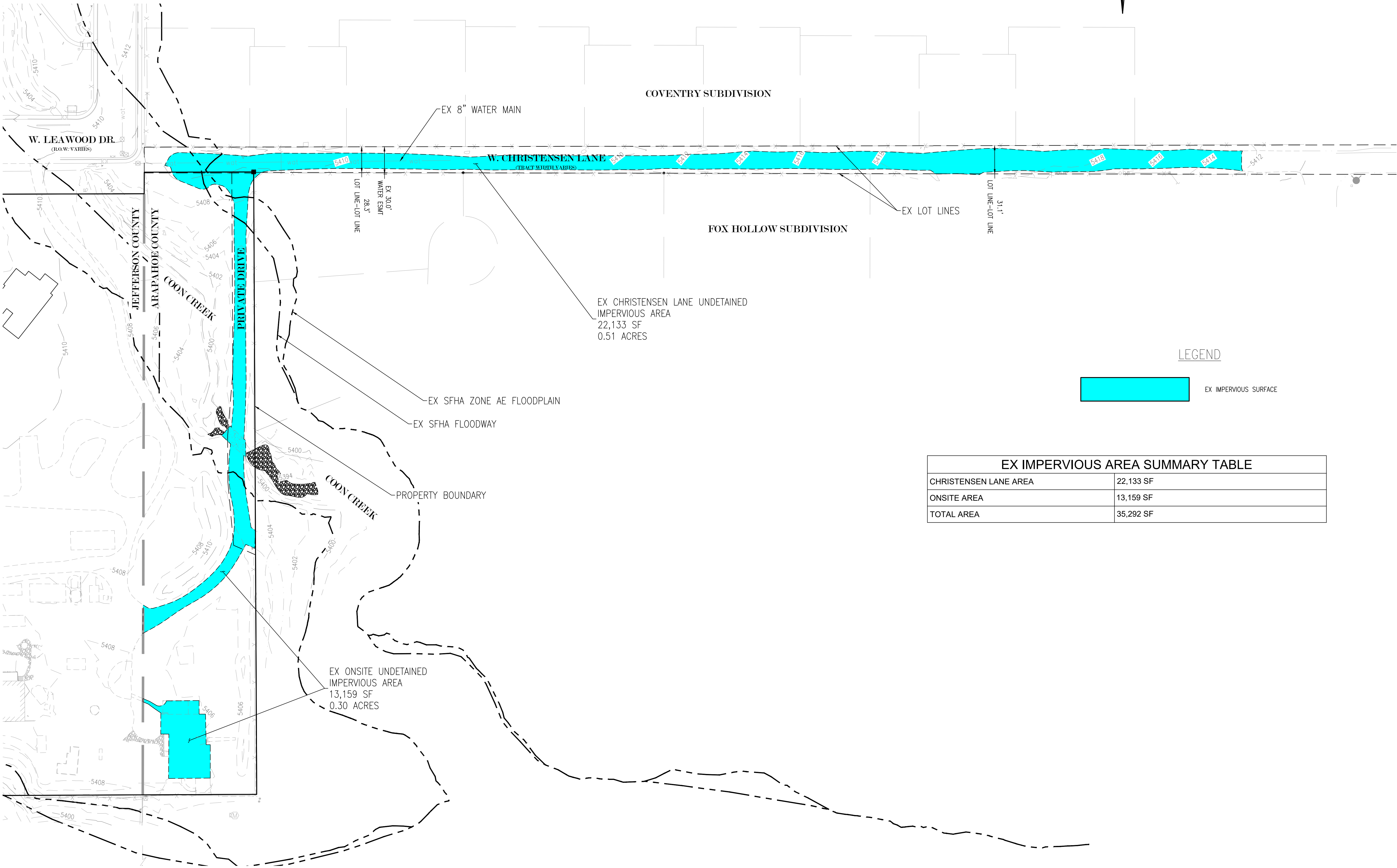
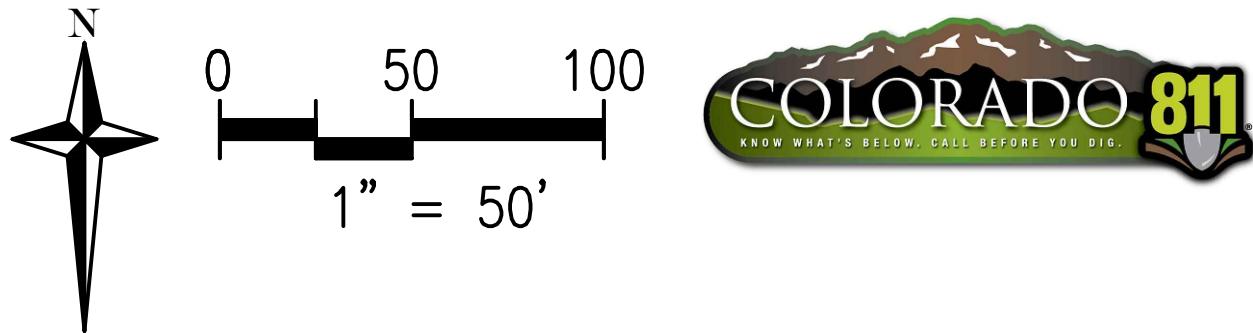
In the proposed condition, the un-detained 100-year runoff from both Jefferson and Arapahoe Counties to Coon Creek is 7.66 CFS.

A reduction of runoff to Coon Creek is approximately 1.42 CFS. This reduction is due to the fact we are detaining a portion of the basin that in the historic condition drains to Coon Creek. The two detention ponds in Jefferson County detain this flow and release into Dutch Creek. The Jefferson County ponds are designed to release below historic rates into Dutch Creek. The result of this development is a reduction in runoff to both tributaries.

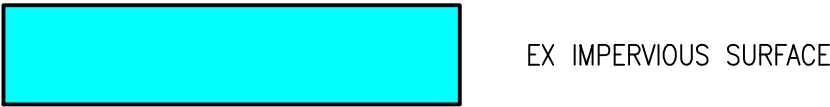
ARCADIA CREEK

A PART OF LOT 1, BLOCK 30, LEAWOOD SUBDIVISION FILING NO. 5, SITUATED IN THE SE1/4 OF SECTION 24, T.5S., R.69W., AND A PARCEL OF LAND SITUATED IN THE SE1/4 OF SECTION 24, T.5S., R.69W.,OF THE 6TH P.M. CITY OF LITTLETON, COUNTIES OF JEFFERSON AND ARAPAHOE, STATE OF COLORADO

NOT FOR CONSTRUCTION



LEGEND



EX IMPERVIOUS AREA SUMMARY TABLE

CHRISTENSEN LANE AREA	22,133 SF
ONSITE AREA	13,159 SF
TOTAL AREA	35,292 SF

PROJECT #	AC2130
PROJECT DATE	07/14/22
DESIGNER	EMR
REVIEWER	CWK



DETENTION VARIANCE EXHIBIT

ARCADIA CREEK
5234 LEAWOOD DRIVE
LITTLETON, CO 80123
CHARLES KEENER JR

REVISION NUMBER	REVISION DESCRIPTION	DATE

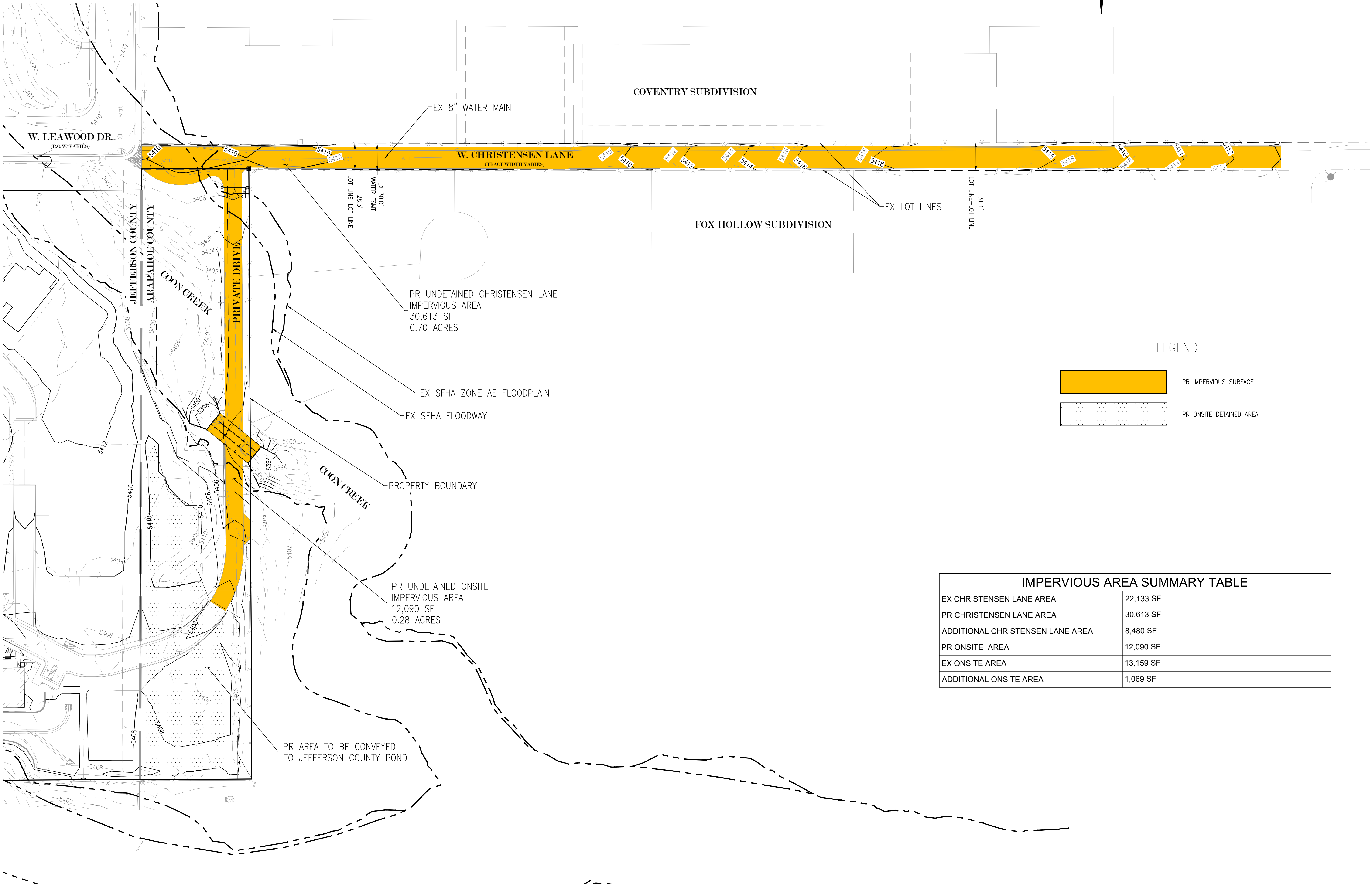
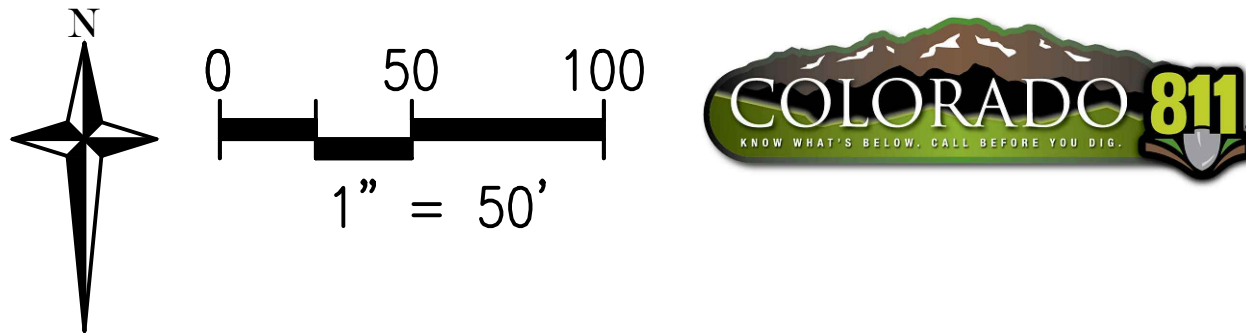
DETENTION VARIANCE EXHIBIT



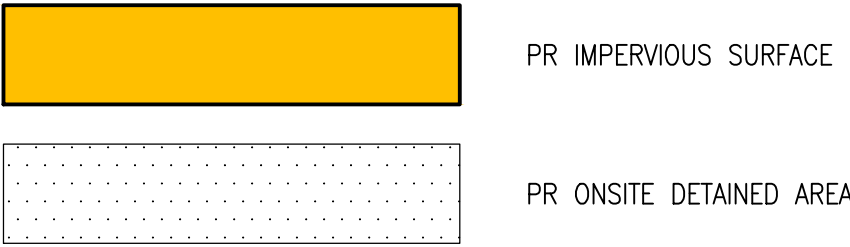
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NOT FOR CONSTRUCTION



LEGEND



IMPERVIOUS AREA SUMMARY TABLE	
EX CHRISTENSEN LANE AREA	22,133 SF
PR CHRISTENSEN LANE AREA	30,613 SF
ADDITIONAL CHRISTENSEN LANE AREA	8,480 SF
PR ONSITE AREA	12,090 SF
EX ONSITE AREA	13,159 SF
ADDITIONAL ONSITE AREA	1,069 SF

PROJECT #	AC2130
PROJECT DATE	07/14/22
DESIGNER	EMR
REVIEWER	CWK



DETENTION VARIANCE EXHIBIT

ARCADIA CREEK
5234 LEAWOOD DRIVE
LITTLETON, CO 80123
CHARLES KEENER JR

REVISION NUMBER	REVISION DESCRIPTION	DATE

DETENTION VARIANCE EXHIBIT

Flood Hazard Area Delineation

Dutch Creek, Coon Creek, Lilley Gulch, and Three Lakes Tributary

March 2008



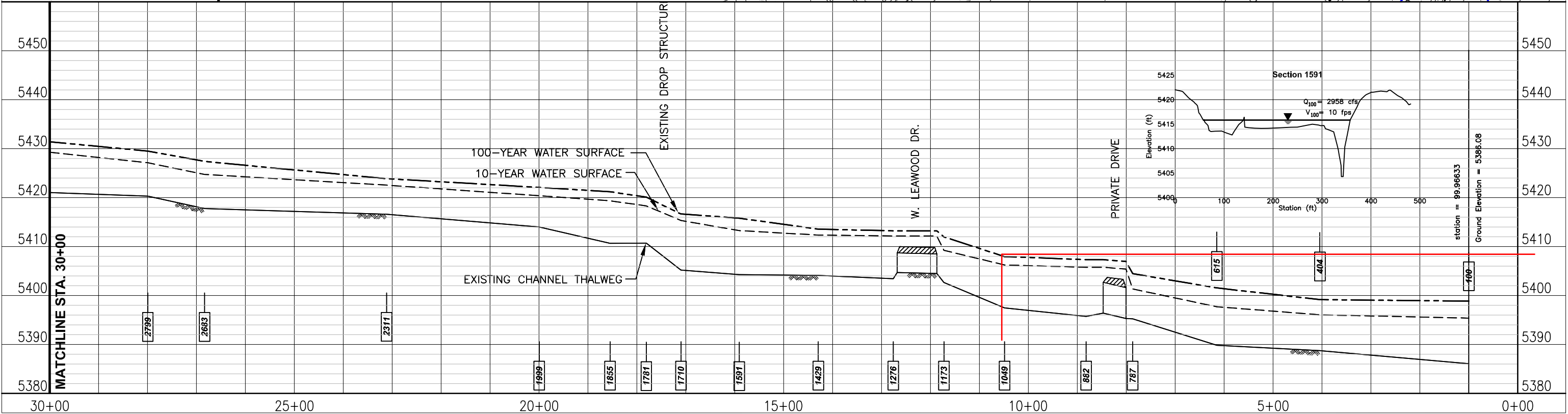
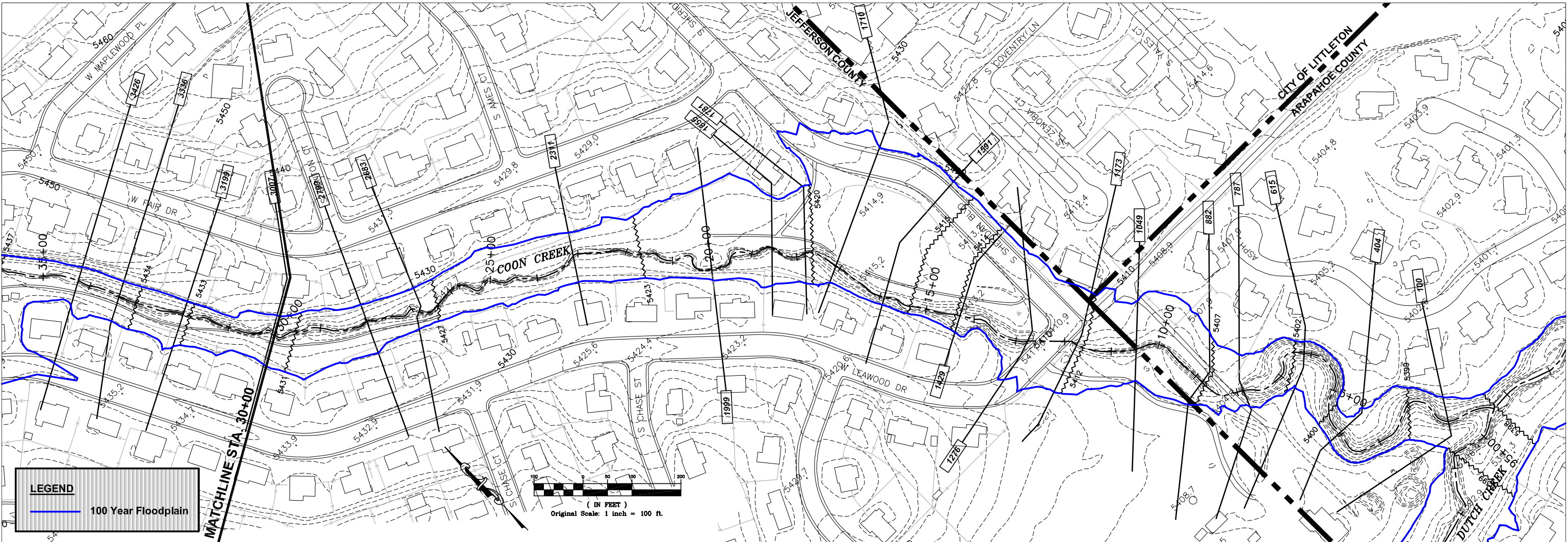
Prepared for:
Urban Drainage and Flood Control District
Arapahoe County • Jefferson County • City and County of Denver • Town of Columbine Valley
Southeast Metro Stormwater Authority



4601 DTC Boulevard
Suite 700
Denver, CO 80237

Town of Columbine Valley







ARAPAHOE COUNTY
COLORADO'S FIRST

Public Works and Development

6924 South Lima Street
Centennial, Colorado 80112-3853
Phone: 720-874-6500
Fax: 720-874-6611
TDD: 720-874-6574
www.arapahoe.gov
publicworks@arapahoe.gov

February 7, 2024

Charles Keener, P.E.
Bright Lighter Engineering

RE: PM22-006

- **A variance request to ACSMM Section 13.1.1 for the Provision of On-site detention for a new development and redevelopment**

Dear Charles,

The Arapahoe County Technical Review Committee (TRC) met on February 7, 2024, for a regularly scheduled meeting to discuss your variance/waiver requests.

The TRC supported and approved the variance request on clarification to questions listed below:

- Existing and proposed flow rates and change in flow rates.
- Discuss how the un-detained flows will impact Coon Creek and Dutch Creek.
- Discuss how this flow impacts the peak within Coon Creek.
- How much detention volume would be required to detain the flows.
- Was any offset provided with the ponds in Jefferson County for the flows that go to Coon Creek? For example, did any flows that went to Coon Creek get transferred to Dutch Creek and included in the pond volumes.

Decisions of the TRC may be appealed to the Director of Public Works and Development, Bryan Weimer. If you wish to appeal the decision of the TRC, please submit a written request to my attention. Within six working days, you will be notified of a date and time for the appeal meeting with the Director of Public Works and Development. This process is further outlined in Arapahoe County's IDCS, section 3.2.2.

If the development intentions deviate from that which was represented in these requests, a new request or requests shall be sought from the Engineering Services Division.

If you have any questions, please feel free to contact me at 720-874-6500.

Sincerely,
Joseph Boateng, PE

cc: Charles V. Haskins, Manager, Engineering Services Division

MISSION

Enhancing your quality of life through exceptional delivery of services and efficient use of public funds.