



## Castle Rock Water Commission Agenda - Final

David Hammelman, Chair  
Tony Rathbun, Vice Chair  
Angie Brown  
Brian Gaddie  
KiKi Miller  
Melanie Penoyar-Perez  
Cortland Wolfe

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Wednesday, October 30, 2024

6:00 PM

Castle Rock Water  
175 Kellogg Ct., Bldg. 171  
Castle Rock, CO 80109

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This meeting is open to the public and will be held in a hybrid format in accordance with Town Council Electronic Participation, Connected, and Hybrid Meeting Policy. The in-person meeting will be held at 171 Kellogg Ct. Castle Rock CO 80109 or this meeting can be accessed online at: <https://crgov.webex.com/crgov/j.php?>

MTID=m2647c6e12770d31e3f47fcf2341e78d0 the Meeting password: Oct23CRWC (62823279 from video systems) or phone in by calling (720) 650-7664, meeting code 2490 791 3501. One or more Council members may also attend this meeting, during which the items listed herein will be discussed.

6:00 pm CALL TO ORDER / ROLL CALL

COUNCIL UPDATE

COMMISSION COMMENTS

DOUGLAS COUNTY WATER COMMISSION UPDATE

ADMINISTRATIVE BUSINESS

1. [WC 2024-104](#) WEFTEC Utility of the Future Today Award  
Town Council Agenda Date: NA  
  
**Attachments:** [Attachment A: Award](#)  
[Attachment B: Receiving the award](#)
2. [WC 2024-105](#) Approval of the September 25, 2024 Meeting. Minutes  
  
**Attachments:** [Attachment A September 25, 2024 Mtg. Minutes.pdf](#)
3. [WC 2024-106](#) Pine Canyon Update  
Town Council Agenda Date: NA
4. [WC 2024-107](#) Castle Rock Water Customer Mailer 2024  
  
**Attachments:** [Attachment A Community Survey Results.pdf](#)  
[Attachment B: Mailer](#)

ACTION ITEMS (HIGH PRIORITY / TIME CRITICAL)

5. [WC 2024-108](#) An Ordinance Amending Title 15.48 of the Castle Rock Municipal Code Adopting by Reference as Primary Code the Town of Castle Rock, Colorado 2025 Landscape and Irrigation Criteria Manual [Entire Castle Rock Service Area] - DRAFT
- Attachments:** [Exhibit 1: 2025 Landscape Irrigation Criteria Manual - Redlines.docx](#)  
[Attachment B: Summary of Changes.docx](#)
6. [WC 2024-109](#) Resolution Approving a Construction Contract Between the Town of Castle Rock and 53 Corporation, LLC, for the McMurdo Gulch Stream Reclamation Priority 3 Project. [McMurdo Gulch south of the intersection of Castle Oaks Drive and Autumn Sage Street]
7. [WC 2024-110](#) Resolution Approving the Third Amendment to the Participation Agreement between the Cherry Creek Basin Water Quality Authority (CCBWQA) and the Town of Castle Rock for the Design and Construction of Stream Reclamation Improvements for McMurdo Gulch [Near the intersection of Castle Oaks Drive and Autumn Sage Drive]
8. [WC 2024-111](#) Resolution Approving a Second Amendment to the Service Agreement with Dewberry Engineers Inc. for the Young American Infrastructure Improvements, Bell Mountain Raw Pipeline, and Bell Mountain Flow Meter Vault Upgrade Projects [Young American neighborhood and Bell Mountain Ranch]
- Attachments:** [Attachment B: Location Map for Young American Waterline Replacements](#)  
[Attachment C: Location Map for Bell Mountain Raw Water Pipeline](#)

#### **DIRECTOR FOLLOW-UP AND INFORMATIONAL / UPDATE ITEMS**

9. [WC 2024-112](#) Artificial Intelligence (AI) Leak Detection, Equipment and Services Acquisition Agreement with Digital Underground Solutions
10. [WC 2024-113](#) Key Performance Indicators
11. [WC 2024-114](#) Upcoming Town Council Items

#### **COMMISSIONER MEETING COMMENTS**



# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 1. File #: WC 2024-104**

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water

**WEFTEC Utility of the Future Today Award  
Town Council Agenda Date: NA**

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### Executive Summary

Castle Rock Water received the Utility of the Future Today Award at the Water Environment Federation Technical Exhibition and Conference (WEFTEC), October 8, 2024 in New Orleans, LA.

The Utility of the Future Today Recognition Program seeks to reach deeply into the water sector to form and motivate a community of like-minded water utilities engaged in advancing resource efficiency and recovery, developing proactive relationships with stakeholders, and establishing resilient, sustainable, and livable communities. The Recognition Program, through the aggregation and sharing of utility advancements and experiences, enables participants across a broad continuum of capacities and capabilities to learn from each other and continually grow and sustain their efforts to be, and continually advance the concept of, the Utility of the Future.

The Recognition Program seeks to encourage utilities to embed the principles of the Utility of the Future within their organization, beginning with Organizational Culture. Organizational Culture is the foundation by which all other Utility of the Future Activity Areas are sustainably supported.

Utilities receiving recognition through this program are expected to share their practices and experiences to create a community of practice around the Utility of the Future Today, and to enable other utilities to continually learn from each other and evolve as a sector.

### Attachments

Attachment A: Award  
Attachment B: Receiving the award



## CERTIFICATE OF RECOGNITION - 2024

The partners of the Utility of the Future Today Recognition Program celebrate the progress and exceptional performance of:

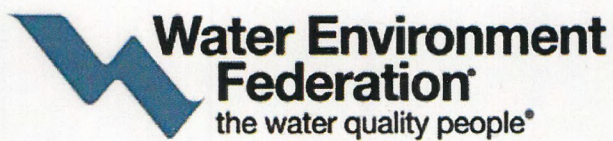
### Castle Rock Water

Castle Rock, Colorado

Area of Performance:

**Water Reuse**

for innovative and forward-thinking practices that provide sustainable, efficient, and value-added services to their community.



THE  
Water  
Research  
FOUNDATION



US Water  
Alliance



WATERREUSE





# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 2. File #: WC 2024-105**

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water

**Approval of the September 25, 2024 Meeting Minutes  
Town Council Agenda Date: NA**

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### **Executive Summary**

Attached are the meeting minutes for the September 25, 2024 Water Commission Meeting.

### **Proposed Motion**

*"I move to approve the Minutes as presented"*

### **Attachments**

Attachment A: September 25, 2024 Meeting Minutes



**Castle Rock Water Commission  
Meeting Minutes - Draft**

David Hammelman, Chair  
Tony Rathbun, Vice Chair  
Angie Brown  
Brian Gaddie  
KiKi Miller  
Melanie Penoyar-Perez  
Cortland Wolfe

**Wednesday, September 25, 2024**

**6:00 PM**

**Castle Rock Water  
175 Kellogg Ct., Bldg. 171  
Castle Rock, CO 80109**

**This meeting is open to the public and will be held in a hybrid format in accordance with Town Council Electronic Participation, Connected, and Hybrid Meeting Policy. The in-person meeting will be held at 171 Kellogg Ct. Castle Rock CO 80109 or this meeting can be accessed online at:**

**<https://crgov.webex.com/crgov/j.php?MTID=ma80efd2dcf006454e5a35a6f45f8ffa> the Meeting password: Sep25CRWC (73725279 from video systems) or phone in by calling (720) 650-7664, meeting code 2492 089 6924. One or more Council members may also attend this meeting, during which the items listed herein will be discussed.**

**CALL TO ORDER / ROLL CALL**

**COUNCIL UPDATE**

- Present** 7 - Chair David Hammelman, Vice Chair Tony Rathbun, Angie Brown, Brian Gaddie, KiKi Miller, Melanie Penoyar-Perez, and Cortland Wolfe
- Attendance** 8 - Jason Gray, Nichol Bussey, Paul Rementer, Roy Gallea, Josh Hansen, Matt Benak, David Van Dellen, and MaryJo Reese

**COMMISSION COMMENTS**

Time was allowed for Mr. Van Dellen to share a council update.

**DOUGLAS COUNTY WATER COMMISSION MTG. UPDATE**

Time was allowed for Commissioner Comments.

[WC 2024-093](#)

**Pine Canyon Water Appeal**

**Town Council Agenda Date: NA**

Mr. Van Dellen shared an update on the Pine Canyon Water Appeal and the next steps.

**ADMINISTRATIVE BUSINESS**

[WC 2024-094](#)

**November/December Water Commission Meeting Date**

**Town Council Agenda Date: NA**

Ms. Reese explained that a couple of individuals have conflicts with the December 4th Water Commission meeting and asked if the meeting could be moved.

**I move to cancel the December 4, 2024 Water Commission meeting and hold a Special meeting on December 11, 2024.**

**Yes:** 5 - Chair Hammelman, Brown, Gaddie, Penoyar-Perez, and Wolfe

**Not Present:** 2 - Vice Chair Rathbun, and Miller

[WC 2024-095](#)      **Approval of the August 28, 2024 Meeting Minutes  
Town Council Agenda Date: NA**

**I move to approve the Minutes as presented.**

**Yes:** 5 - Chair Hammelman, Brown, Gaddie, Penoyar-Perez, and Wolfe

**Not Present:** 2 - Vice Chair Rathbun, and Miller

[WC 2024-096](#)      **Boards & Commissions Appreciation Event  
Town Council Agenda Date: NA**

Ms. Reese reminded the Commissioners that the Town is hosting an Appreciation Event for all of the Town’s boards and commissions on October 8th from 6 pm to 7:30 pm at the Millhouse. If you are able to attend please RSVP to the email invite that you received.

**ACTION ITEMS (HIGH PRIORITY / TIME CRITICAL)**

[WC 2024-097](#)      **Resolution Approving a Spot Water Lease Agreement  
between the Town of Castle Rock and Central Colorado  
Water Conservancy District [*Chatfield Reservoir, Douglas  
County*]  
Town Council Agenda Date: October 15, 2024**

Mr. Benak shared that Central Colorado Water Conservancy District would like to lease some of the Town’s surplus water stored in Chatfield Reservoir to increase their storage supplies within Chatfield and have additional water to make projections for their well pumping augmentation plans. The Town currently has about 1,464 acre-feet (AF) of water stored in Chatfield with additional supplies coming in daily. Central is requesting 800 AF. This transaction would be a book over into Central’s Chatfield Reservoir storage account.

The price for this water is \$110 AF with the potential revenue being \$88,000.

**I move to recommend to Town Council approval of the Resolution as presented.**

**Yes:** 5 - Chair Hammelman, Brown, Gaddie, Penoyar-Perez, and Wolfe

**Not Present:** 2 - Vice Chair Rathbun, and Miller

[WC 2024-098](#)      **Resolution Approving the Infrastructure Development and  
Purchase Agreement and Water Lease Agreement between**



**the Town of Castle Rock, acting by and through the Castle Rock Water Enterprise, and Tallgrass Colorado Municipal Water, LLC [Lost Creek area of Weld County, Colorado]**

**Town Council Agenda Date:** October 1, 2024

Mr. Benak explained that this is part of the Box Elder project and is a Public/Private Partnership. The idea behind the Box Elder project is to gather raw water from the Lost Creek wells and deliver that water to the Box Elder property for augmentation and then delivery to East Cherry Creek Valley's (ECCV) Water Treatment Plant.

By entering into this agreement Tallgrass would construct the pipeline gathering system, improve all eleven wells, develop a telemetry system and tie the wells into the Tallgrass system for lease of the water. The agreement also states that the two parties will continue to negotiate towards a larger deal where Tallgrass will construct the other necessary infrastructure in phases and the Town would pay down the construction costs over time.

The entire infrastructure is anticipated to cost \$80 to \$100 million to implement over the next ten years.

The key terms of the agreement are:

Key Terms of the Infrastructure Development and Purchase Agreement:

- Tallgrass to manage, design, permit, & construct well gathering system (47,150 feet of pipe and appurtenances and 11 new wells, pumps, controls and appurtenances);
- Term - 1 year from execution;
- Construction completion within 6 months;
- Phase 1B and 2 negotiated or if no agreement \$15,000,000 purchase
- Concurrent water lease agreement;
- Partial assignment of Castle Rock easements valued at \$775,000;
- Castle Rock Water maintains ownership of wells throughout;
- Operation and maintenance costs include primarily *Ad Valorem* taxes and insurance \$100k;
- Parental guaranty;
- Warranty of 1 year from acceptance by Castle Rock Water.

Key terms of the Water Lease Agreement

- Lease up to 4,476 AF - potential value of \$6,944,961;
- Term is a little more than 3 years through 12/31/27;
- Price is \$1,551.60/AF vs. \$44/AF for agricultural leases;
- Firm take or pay of 257 AF or \$398,750;
- Right of first refusal if we want to lease to others;
- As is / where is lease;
- Metering and calibration of meters to be done by Tallgrass;

- Monthly billing.

If the Town and Tallgrass cannot come to agreement to continue to negotiate a deal, the Town will owe \$15 million by October 2025 (one year following the execution of the Infrastructure Development and Purchase Agreement). Per the Water Lease Agreement, the Town expects a minimum of \$398,750 of revenue from water leases to Tallgrass over the three-year lease term and potentially up to \$6 million if Tallgrass takes full advantage of our water right volumes for their oil and gas development operations. While Tallgrass owns the gathering system, Castle Rock will be responsible for operations and maintenance costs which primarily include Ad Valorem taxes and insurance at a cost of approximately \$100,000 per year. Once Castle Rock owns the system the tax component of approximately \$90,000 per year could potentially go away based on our tax-exempt status.

Commissioner Wolfe asked what percentage of our total water will this be? Mr. Benak explained that it would be about 15% of our future water use.

Commissioner Gaddie asked if there would be any type of warranty? Mr. Benak explained that there would be a one-year warranty attached.

Commissioner Penoyar-Perez asked what the potential downside would be to the project? Mr. Van Dellen explained that if something should happen and Tallgrass would not complete the project there is a parental agreement to guarantee payment or completion of project.

Commissioner Brown asked if CRW staff would be responsible for the upkeep and repair of the infrastructure? Mr. Benak explained that the goal would be to have a couple of operators that were assigned to this area.

**I move to recommend to Town Council approval of the Resolution as presented.**

**Yes:** 5 - Chair Hammelman, Brown, Gaddie, Penoyar-Perez, and Wolfe

**Not Present:** 2 - Vice Chair Rathbun, and Miller

[WC 2024-099](#)

**Resolution Approving a Variance Pursuant to Chapter 9.16.070E of the Castle Rock Municipal Code for the Cobblestone Ranch Water Storage Tank 18 Project [Pleasant View Drive and Antelope Place]**  
**Town Council Agenda Date:** October 1, 2024

Mr. Hansen reported that the purpose of this item is to request a variance to allow overnight construction work for the Cobblestone Ranch Water Storage Tank 18 Project. In order to complete this project DN Tanks needs to install an interior tank liner. Night installation is necessary as the liner requires declining ambient temperatures during the application to allow the coating to cure correctly.

The work will be from 4 pm to 3 am over a two-week period. This project will only affect two County residents. If the project is too disruptive CRW can offer to put the residents up in a hotel. Commissioner Brown asked if adding the liner was part of the original plan or if it was due to the issues with the tank? Mr. Hansen explained that is an additional item due to the ground settling issues with the original tank construction. Commissioner Brown asked what the life expectancy of the liner was? Mr. Hansen explained that he researched other utilities that have this lining and they haven't had any problems and have had these liners for approximately 25 years.

**I move to recommend to Town Council approval of the Resolution as presented.**

**Yes:** 5 - Chair Hammelman, Brown, Gaddie, Penoyar-Perez, and Wolfe

**Not Present:** 2 - Vice Chair Rathbun, and Miller

[WC 2024-100](#)

**Resolution Approving an Intergovernmental Agreement between the Town of Castle Rock and Parker Water and Sanitation District for the Platte Valley Water Partnership**  
*[located in Morgan, Washington, Logan and Sedgwick Counties]*  
**Town Council Agenda Date:** October 15, 2024

Mr. Benak reported this is an Intergovernmental Agreement with Parker Water and Sanitation District (PWSD) for the Platte Valley Water Partnership (PVWP). The purpose of this project is to develop a raw water storage and conveyance system on the lower South Platte River. The project will consist of diversion structures, a reservoir, storage facilities, pumping stations, pipelines and treatment facilities.

This agreement is for the preconstruction phase. This phase will include design, engineering, permitting, land acquisition, financial planning, construction bid, and support for our water court application.

The total estimated project cost is \$1.3 Billion with Castle Rock Water currently a 25% partner. The goal is to start permitting and land acquisition in 2025 with the total project completion in 2045.

**I move to recommend to Town Council approval of the Resolution as presented.**

**Yes:** 5 - Chair Hammelman, Brown, Gaddie, Penoyar-Perez, and Wolfe

**Not Present:** 2 - Vice Chair Rathbun, and Miller

**DIRECTOR FOLLOW-UP AND INFORMATIONAL / UPDATE ITEMS**

[WC 2024-101](#)

**Update: Water Court Cases** *[Cases located in Douglas County, Weld County and other areas near the Lower South Platte River]*  
**Town Council Agenda Date:** October 15, 2024

Mr. Benak shared an explanation of the current Water Court Cases that the Town of Castle Rock is involved in.

[WC 2024-102](#)

**Rates and Fees follow-up, outcome and request for proposal (RFP) for next year**

**Town Council Agenda Date:** Na

Mr. Rementer shared a follow-up on the outcome of the 2025 Rates & Fees discussion at Town Council and what the next steps will be.

Ms. Bussey explained that CRW will be going out to bid for a Rates & Fees Consultant. It has been a few years since the process has been done and staff felt that it was time.

[WC 2024-103](#)

**Upcoming Town Council Items**

**Town Council Agenda Date:** NA

This is a standing item that will be used to share information about projects that are being worked on at the time of the meeting but that staff doesn't have information ready yet.

There were no items at this time.

**COMMISSIONER MEETING COMMENTS**

Time was allowed for Commissioner Comments.



# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 3. File #: WC 2024-106**

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water

**Pine Canyon Update**

**Town Council Agenda Date: NA**

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### Executive Summary

This will be an update only item.



# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 4. File #: WC 2024-107**

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**To:** Members of the Castle Rock Water Commission  
**From:** Mark Marlowe, P.E., Director of Castle Rock Water  
Sandra Sandman, Customer Relations Program Manager

**Castle Rock Water Customer Mailer 2024**  
**Town Council Agenda Date: NA**

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### Executive Summary

The Town of Castle Rock conducts a statistically significant customer survey every other year. Though satisfaction for water topics remains high, confidence slipped slightly in 2023 with most of this attributed to growth. A comprehensive mailer was designed to answer the questions regarding water quality, conservation programs, managing long-term water supplies and the value of services for rates paid (see **Attachment A**) for the survey results regarding water services).

This mailer, (see **Attachment B**) is scheduled to be mailed late November 2024 to all Town of Castle Rock addresses. Mailing is done a via a 'direct' bulk mail and will include delivery to the extraterritorial areas of Bell Mountain Ranch, Macanta and others. Timing was deliberate with several considerations. First, this piece will be received prior to the start of the 2025 survey to gauge any changes in confidence. This is also after the Nov. 4 election, and thus, it does not interfere with messaging about the Town's proposed tax increase for fire and police. This timing is also before any water rate increases may be seen.

The mailer messaging and graphics will be utilized in outreach in subsequent months in other avenues (e.g., social media, email marketing) to reinforce the messaging. Direct mail, email newsletter and social media were identified in the survey as being the primary avenues residents would like to receive Town information.

### Budget

Based on a similar piece from Development Services, the cost of the mailer is estimated at \$13,500, with printing at \$7,000 and postage at \$6,500. These monies will come from the Castle Rock Water marketing budget with 25% coming from each fund This project was allocated for in the 2024 budget as one or two Town-wide informational mailings from Castle Rock Water are typical each year.

### Attachments

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**Item #: 4. File #: WC 2024-107**

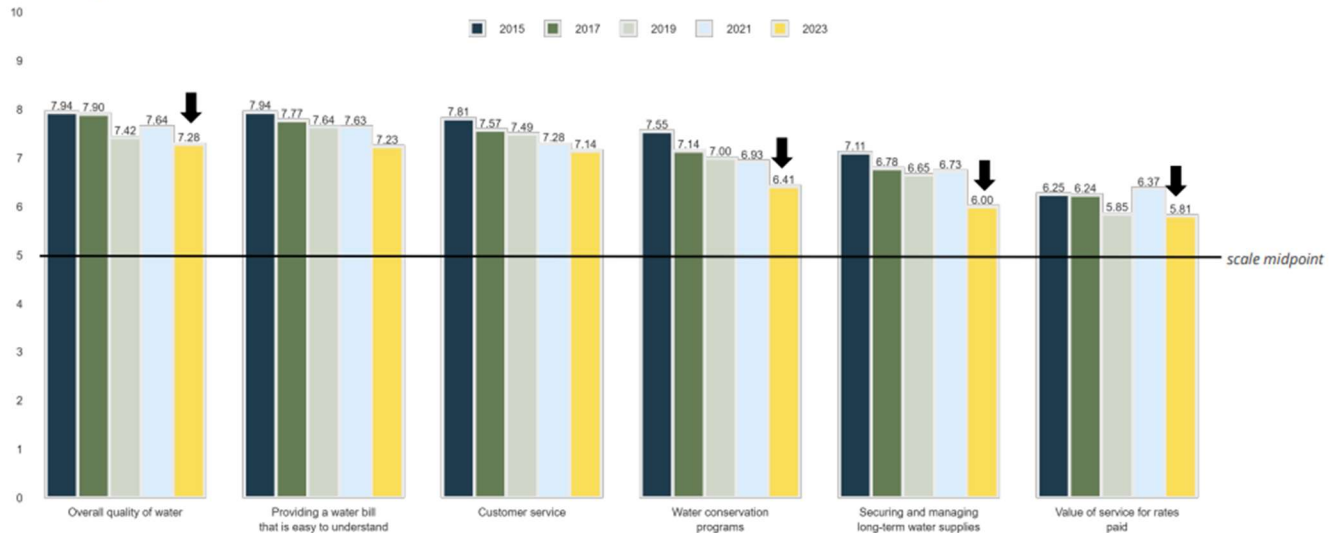
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Attachment A: Survey Results

Attachment B: Castle Rock Water 2024 mailer

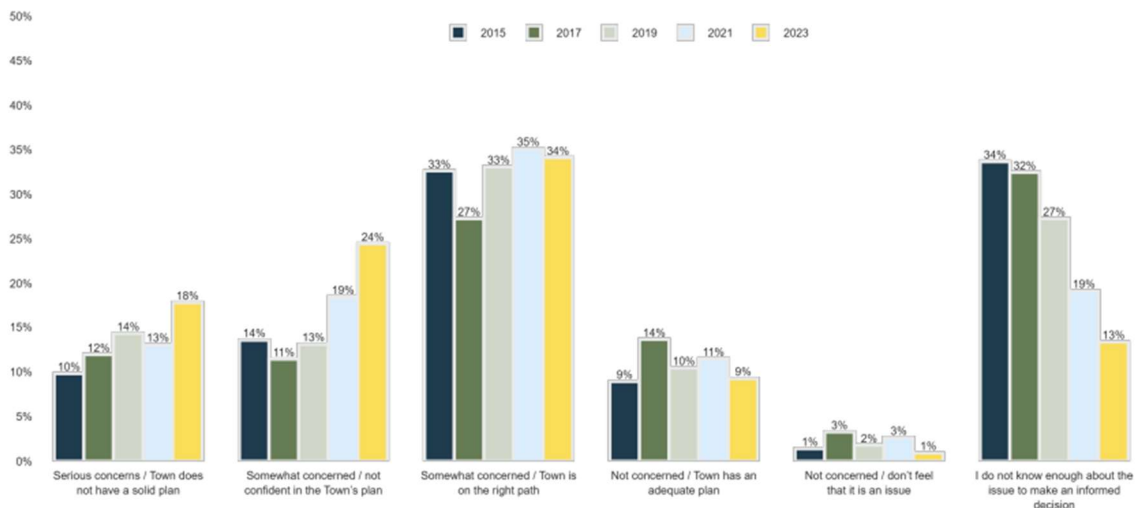
## Castle Rock Water Services

- Four aspects of water service declined significantly from 2021: overall quality of water, water conservation programs, securing and managing long-term water supplies, and value of service for rates paid.
- The two aspects of Castle Rock's water service that did not change significantly from 2021 are "providing a water bill that is easy to understand" and "customer service".



## Long-Term Water Issues

Respondents are becoming increasingly informed about long-term water issues. About a quarter of respondents are both *concerned and not confident* in the Town's long-term water plans. This is a statistically significant increase from 2021 levels. About a third of respondents are *concerned but confident* in the Town's long-term water plans.

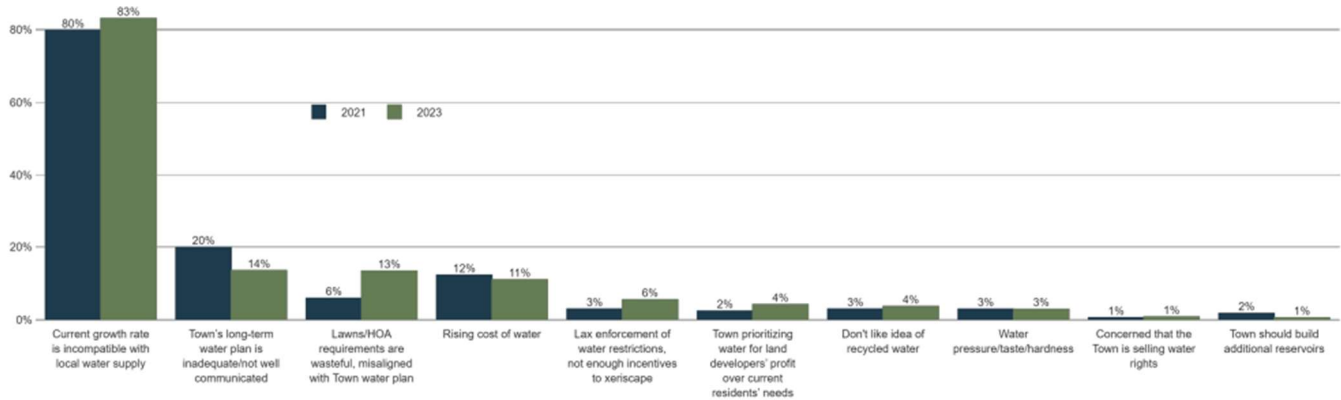




# Specific Water Concerns

Respondents were even more concerned in 2023 than 2021 that Castle Rock's water supply cannot keep with housing and business developments. The most common themes among these comments:

- The Town is prioritizing developers over current residents by restricting water use but allowing new developments
- HOA lawn regulations (and Town landscaping) are counterproductive and must be addressed
- Castle Rock does not have a sustainable long-term water solution that provides for its growing population
- Water bills are high regardless of actual consumption; not enough incentive to save water



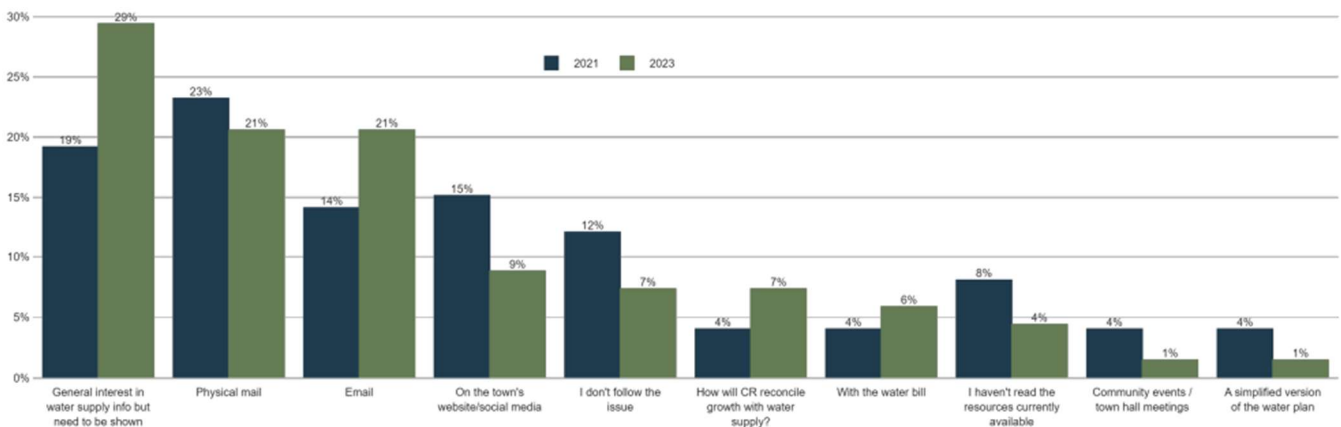
TOWN OF CASTLE ROCK  
2023 Community Survey

*What specific concerns do you have about the Town's plan to address long-term water?  
Open ends in Appendix, page 161*

Page 70

# Communicating the Town's Long-Term Water Plan

Respondents are generally interested in receiving more information about the Town's long-term water plan. Physical mail and email were the most commonly listed methods of desired communication. There were no significant changes in these categories between 2021 and 2023 due to the relatively small number of respondents who gave an open-ended response.



TOWN OF CASTLE ROCK  
2023 Community Survey

*What information would be useful in helping you understand the Town's long-term water plan, and what is the best way for the Town to ensure you get the information you need?  
Open ends in Appendix, page 184*

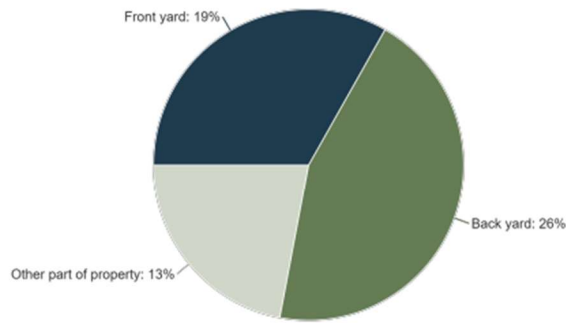
Page 71

# ColoradoScape Rebate - Awareness

Prior to reading about it in the 2023 survey, 42% of respondents (n=639) were aware of the ColoradoScape rebate program.

Of the 43% of respondents who said they currently have ColoradoScaped property (n=626), 45% (n=296) were aware of the rebate program. Only 7% of those with ColoradoScaped property took advantage of the rebate program (n=43).

Is any portion of your property "ColoradoScaped"?  
(Multi-select - not mutually exclusive)



**Most respondents with ColoradoScaped property weren't aware of the rebate program.** The vast majority of those who were aware of the program still did not participate.

These responses indicate a large opportunity to increase **knowledge of and participation in** the rebate program.

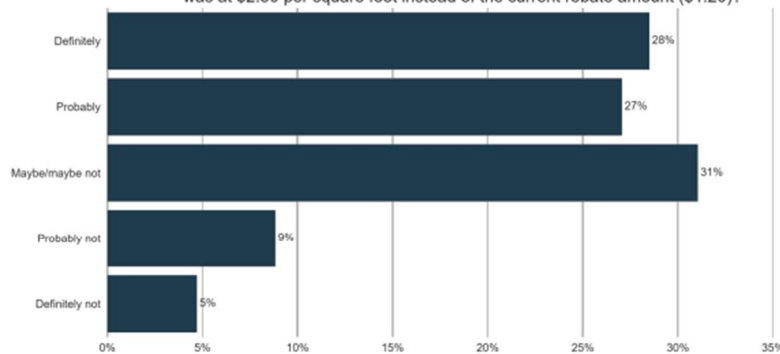
# ColoradoScape Rebate - Incentives

45% of respondents did not ColoradoScape any part of their property.

8% of respondents did not have a yard or were not in charge of their yard.

69% of those who did not ColoradoScape say that free design services and expertise would help incentivize them to do so.

How likely would you be to ColoradoScape if the rebate offered was at \$2.50 per square foot instead of the current rebate amount (\$1.20)?



**Over half** of respondents who did not ColoradoScape say that increasing the incentive to \$2.50/sqft would **probably or definitely** incentivize them to do so.

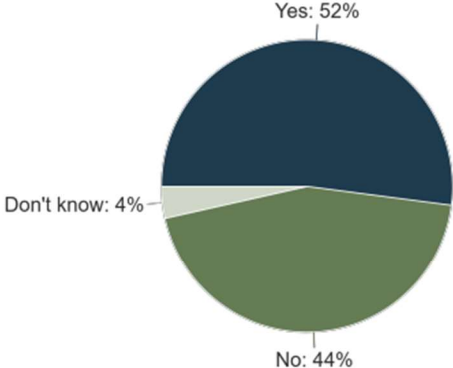
**Roughly half of eligible respondents weren't aware of the rebate**, and only 14% of those who were both eligible and aware actually took advantage of it.

There appears to be room to double public awareness of the rebate program. There also appears to be room to increase the rebate amount to boost usage among those who already know about it.

# Online Water Billing System

About half of respondents said they had used the Town's new online water billing system.

*Have you accessed the new online water billing system which was updated in January 2023?*



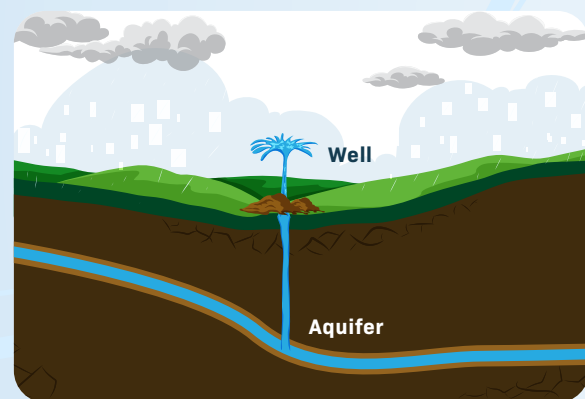
Renewable water and conservation are two primary ways to protect our nonrenewable groundwater.

### Managing our water supply today and for the future

Castle Rock, like the State of Colorado, is experiencing strong population growth, which is coupled with increasing periods of drought. With those two factors in play, it's no surprise that our water supplies are stressed. However, Castle Rock Water is planning for the future, taking into account projected buildout scenarios ranging from 105,000 to 155,000 residents. The Town's current high-end buildout population projection is 143,000. Castle Rock Water's approach is frequently recognized in news outlets across the western United States as forward-thinking. One strategy we employ to increase resiliency is diversifying our water supplies. In 2023, the Town reached major milestones in diversifying water supply sources, conserving groundwater and implementing impactful regulations.

**Renewable water**  
Replenished each year and includes surface creek water, reuse water and imported water

**Nonrenewable water**  
Deep groundwater aquifer



CREEK

IMPORTED



**REUSE**  
One-third of the Town water supply is reuse water.



175 Kellogg Court, Castle Rock, CO 80109  
Phone: 720-733-6000  
(After hours emergency, press 1)  
Email: [Water@CRgov.com](mailto:Water@CRgov.com)  
[CRgov.com/Water](http://CRgov.com/Water) | [CRconserve.com](http://CRconserve.com)

Take a deeper dive



Castle Rock Water  
175 Kellogg Court  
Castle Rock, CO 80109

\*\*\*\*\*ECRWSS/EDDM\*\*\*\*\*  
Postal Customer  
Castle Rock, CO

PRSR STD  
U.S. POSTAGE  
**PAID**  
CASTLE ROCK, CO  
PERMIT NO. 18

The aquifer that Castle Rock gets water from is running dry.

You want us to conserve water just so we can build more.

Development is causing my water bill to increase.

Castle Rock is running out of water.

Castle Rock's water quality has gone downhill.

Have you heard some of these **MYTHS** about the Town's water supply? Find the **TRUTH** inside.



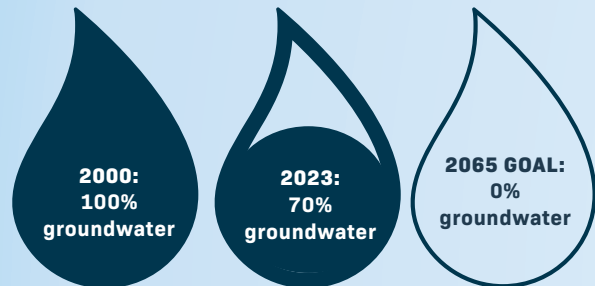
# DELIVERING MORE THAN WATER FROM YOUR TAP

Castle Rock Water provides drinking water, wastewater service and stormwater infrastructure for an integrated water solution. Securing water now and for the future, ensuring superior water quality and keeping infrastructure in prime working order is why we have become an award-winning water provider. Read on to learn about the contributions we're making to a high quality of life in Castle Rock.



# SECURING OUR FUTURE DROP BY DROP

Diversifying supplies means we are not reliant on a single source of water.



## Sustainable long-term water

Over the years, the Town of Castle Rock has planned for, and made accommodations for, the needs of a changing community. This long-term planning is ongoing, and several major milestones have already been reached. In 2023, Castle Rock Water secured additional renewable surface water, reuse water and imported renewable water from the WISE project — a partnership among Denver Water, Aurora Water and 10 other South Metro water providers to provide a sustainable water supply. We have storage in nearby reservoirs and are implementing strong conservation measures. We continue to protect our deep groundwater aquifers so that this nonrenewable water supply remains available for drought or other high-demand situations.

We are in a strong position with our current and future water supplies and continue to plan for a variety of projected population and water-demand scenarios. Our plans include investments that maximize our supplies and associated infrastructure.

## Did you know growth helps pay for itself, and supports a sustainable water future?

By using water supply forecasting, Castle Rock Water has already planned for the Town's current rate of growth and projected buildout. Since new renewable water supplies and ongoing investments in infrastructure are needed regardless of growth, development is helping our community, with additional water rights and funding to ensure sustainable water for current and future Castle Rock residents.

- Developers must deed the Town at least twice as much water as their subdivision will use in 100 years
- System development fees are required and are used to build capital projects like water tanks, treatment plants, pump stations and renewable water rights
- Builders pay about \$44,000 per home in system development fees to tap into Castle Rock Water's services
- A developer is required to pay for and install all water, sewer and stormwater infrastructure within their neighborhood and any infrastructure required to get water and sewer services to their neighborhood

Water forecasting already includes these approved developments.

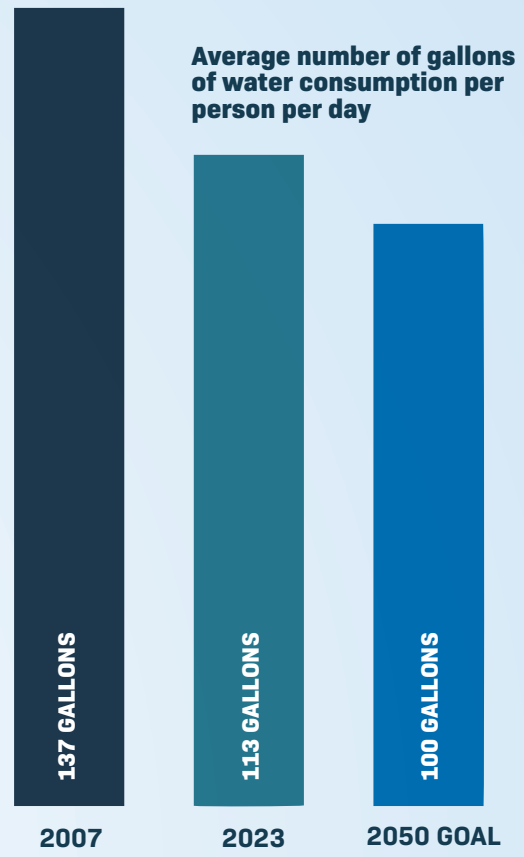
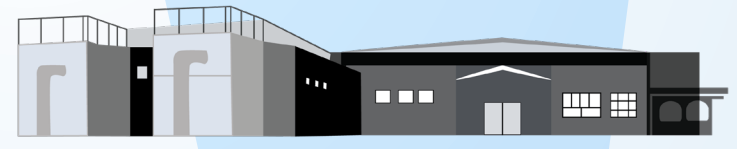
The Town's projected buildout population is estimated by closely tracking what the Town refers to as "entitlements," or approved development rights.

Most entitlements that exist today were approved in the 1980s, and we have been planning for water supply based on these future development rights. Learn more at [CRgov.com/Entitlements](http://CRgov.com/Entitlements).

The Plum Creek Water Purification Facility is one of the most advanced in the nation. And, work is underway to double the treatment capacity to purify 12 million gallons per day.

## Award-winning water quality

Having a variety of water sources means there are unique conditions for each supply. The award-winning, state-of-the-art Plum Creek Water Purification Facility produces some of the best-quality water in the country. The facility treats for contaminants that are not yet regulated by the State nor the Environmental Protection Agency — and at levels that are almost too minuscule to detect.



Find conservation tips, weather data, low-water landscape designs and more at [CRconserve.com](http://CRconserve.com).

## Conservation is a water source

The less water we use now, the less we have to pay for in the future. Conservation is considered a water supply, and we factor it into forecasting models at various rates. Castle Rock Water passed regulations in 2022 that require new developments to use ColoradoScape instead of grass lawn for front-yard landscapes. And, Castle Rock Water is on target to reduce usage by another 18% by 2050, thanks to our customers, who have answered the call to conserve water.

**Goal:** 100 gallons per capita daily by 2050  
**Savings:** at least \$70 million in future infrastructure and water rights investments

Castle Rock Water's rates remain mid-range compared to other Front Range water providers.

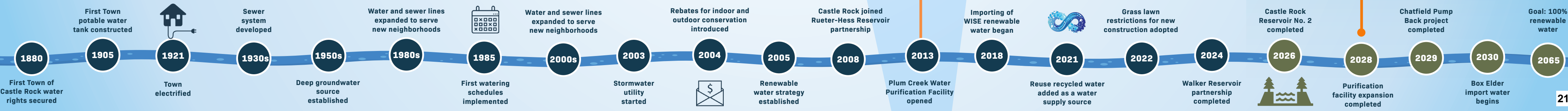
## There's a plan for the next 40+ years

Water rates and fees are projected through 2065, and Castle Rock Water conducts an annual rates and fees study for a timely and effective response to economic conditions. Rates and fees are expected to continue to increase at a slow rate due to economic factors like rising energy costs, inflation and the price of materials.

Customer payments are primarily used for the treatment of 3.2 billion gallons of water annually and for the operation and maintenance of six water treatment plants, 517 miles of water mains and 80 wells.

Development fees pay for a large portion of the estimated \$425 million needed for future renewable water supply and associated infrastructure projects.

● Anticipated dates for planned projects:





# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

**Item #: 5. File #: WC 2024-108**

**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water  
David Van Dellen, Assistant Director  
Matt Benak, P.E. Water Resources Manager  
Rick Schultz, Water Efficiency Supervisor  
Courtney Convy, Water Efficiency Specialist

**An Ordinance Amending Title 15.48 of the Castle Rock Municipal Code Adopting by Reference as Primary Code the Town of Castle Rock, Colorado 2025 Landscape and Irrigation Criteria Manual [Entire Castle Rock Service Area]  
Town Council Agenda Date: November 19, 2024**

### Executive Summary

The purpose of this memorandum is to seek Town Council approval of an Ordinance (**Attachment A**) amending Title 15.48 of the Castle Rock Municipal Code adopting by reference as a Primary Code the Town of Castle Rock, Colorado 2025 Landscape and Irrigation Criteria Manual - First Reading. The Landscape and Irrigation Criteria Manual (Manual) is a key document that helps Castle Rock Water (CRW) meet its long-term water efficiency goals. The Manual outlines landscape and irrigation criteria that reduces water waste, improves watering efficiency, and supports landscapes that are native, regionally adaptive, functional, and appealing to the senses as a ColoradoScape design.

The major changes to the Landscape and Irrigation Criteria Manual focus on updating the minimum criteria for ColoradoScape design requirements to improve functionality, overall value, and appeal in residential applications. A summary of changes is outlined below and provided in **Attachment B**. The Town implemented a ColoradoScape ordinance for new development on January 1, 2023. This ordinance eliminated turf grass in the front yard and limited turf grass in the backyard for new single-family detached homes requiring ColoradoScape instead to ensure that water-efficient landscapes were being installed for new development. Homes installed under the ordinance are meeting the water efficiency goals that were established for the original ordinance. To date, 892 single-family residential homes have been installed under the ColoradoScape ordinance. A recent review of the ColoradoScapes for a large sampling of those homes identified that additional requirements were necessary in the Manual to meet the spirit and intent of the original ordinance from a functional and visual standpoint.

### **Notification and Outreach Efforts**

Castle Rock Water staff discussed proposed changes during the EDC Water Subcommittee on August 16, 2024, and October 11, 2024; the Castle Rock Contractor Luncheon on September 17, 2024 and the Developer Roundtable Meeting held on August 21, 2024. No significant concerns were expressed during any of this outreach regarding the proposed changes. Changes in cost were identified as an area for CRW to further explore.

### **History of Past Town Council, Boards & Commissions, or Other Discussions**

The No Turf Ordinance was first presented to the CRW Commission on February 23, 2022, and March 23, 2022, as part of a presentation on the 2021 Water Resources Strategic Master Plan. At that time, the CRW Commission was supportive of the concept. It was introduced to Town Council on April 19, 2022, as part of the discussion and approval of the 2021 Water Resources Strategic Master Plan. CRW Commission reviewed the ordinance at the August 31, 2022 meeting and recommended Council approval of the ordinance as introduced by staff. Town Council approved the ordinance on First Reading at the September 20, 2022 meeting by a vote of 7 to 0. Town council approved the ordinance on the Second Reading on October 18, 2022.

Town Council last adopted revisions to the Manual by Ordinance No. 2024-006 on May 7, 2024 which then went into effect on May 7, 2024.

### **Discussion**

The last revision of the Manual went into effect on May 7, 2024. The Landscape and Irrigation Criteria Manual works in conjunction with the Water Efficiency Master Plan and the Water Use Management Plan to ensure the overall goals are implemented through efficient landscape and irrigation design, installation, and maintenance. These plans outline the need for additional water conservation efforts to meet the long-term water demands of the community and minimize the need to acquire additional renewable water resources to meet peak summer demands.

The Landscape and Irrigation Criteria Manual outlines residential and non-residential landscape and irrigation efficiency requirements. All new development, renovations, and ongoing maintenance activities must follow the criteria in these standards.

Listed below are the major proposed changes.

- ✓ Updating the Defensible Space definition to include a link to the CSU Extension Low Flammability Landscape Plants fact sheet.
- ✓ Updating surety percentage to 115% of the remaining work to be completed. This will provide an adequate amount should the project not be completed and the Town is required to finish.
- ✓ Redefining irrigable area for purposes of residential ColoradoScape design.
- ✓ Adding functionality as a criterion for residential front and backyard access.
- ✓ Enhancing plant quantities and varieties required to improve the visual appearance and vegetative cover.
- ✓ Expanding non-vegetative landscape materials to include required categories enhancing the visual interest and diversity.

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**Item #: 5. File #: WC 2024-108**

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- ✓ Providing flexibility and adding diversity of backyard landscaping, larger areas of native or alternative grasses may be considered but must not exceed the established water budget of a 500-square-foot area of Texas Hybrid grass.

Town Staff including, CRW, Development Services, Parks and Recreation, and Fire all worked to review, provide input, and update the Criteria.

**Budget Impact**

There are no significant anticipated additional costs to the Town from these proposed changes. These updates to the Manual are primarily for clarification purposes so that landscapes are more functional and visually appealing as a ColoradoScape. The minimum standards outline specific requirements regarding vegetation quantity and hardscape material. Although there will be a cost associated with these requirements, these changes are meant to raise the quality of some of the residential landscapes produced within the last few years that did not meet the intent of the required front yard landscaping nor justified the discounted System Development Fees given by CRW to builders that agreed to landscape the backyard. Additionally, by raising the overall quality of the ColoradoScape installed, residents should get additional value from these homes. CRW is updating this Criteria as a way to assist the development community in integrating quality, low-water-use landscaping that will conserve water and reduce future costs of meeting community water needs.

**Staff Recommendation**

Staff recommends approving an Ordinance to amend Title 15.48 of the Castle Rock Municipal Code adopting by reference as a Primary Code the Town of Castle Rock, Colorado 2025 Landscape and Irrigation Criteria Manual.

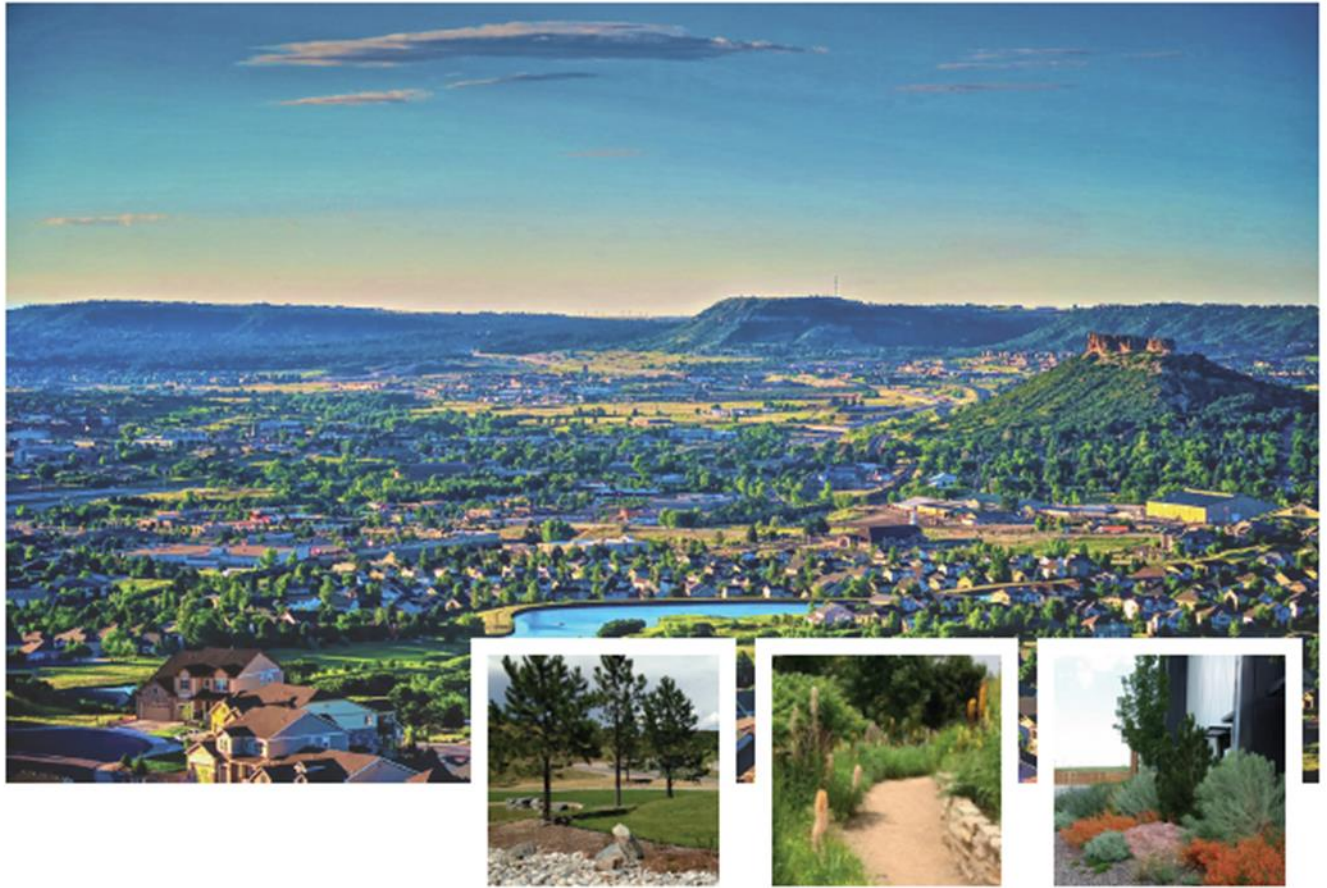
**Proposed Motion**

*“I move to recommend to Town Council approval of the Ordinance as presented”*

**Attachments**

Attachment A: Ordinance  
Exhibit 1: 2025 L&I Criteria Manual - Redlines  
Attachment B: Summary of Changes





TOWN OF CASTLE ROCK

# Landscape and Irrigation Criteria Manual

May 7, 2025



## Acknowledgements

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The changes to this Landscape and Irrigation Criteria Manual were a collaborative stakeholder effort led by staff at Castle Rock Water. The following people have made significant contributions of time and input to this document:

- Matt Benak, PE, Water Resources Manager
- Brad Boland, AICP, Planner II
- Courtney Stoddard, Water Efficiency Specialist
- Tim Dagg, Water Efficiency Technician
- Diane Maki, Plan Review Technician
- Logan Snell, Landscape and Irrigation Plan Reviewer
- Ian Hamilton, Parks/Open Space Supervisor
- Mark Marlowe, PE, Director of Castle Rock Water
- Rick Schultz, Water Efficiency Supervisor
- Sandy Vossler, Senior Planner
- Jeff Smullen, Assistant Director of Parks
- Brian Peterson, Parks Planning and Construction Manager



*Published by  
Town of Castle Rock  
100 N. Wilcox St.  
Castle Rock, CO 80104*



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## Section 1: General Provisions

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These performance standards, criteria, and regulations, together with all future amendments, shall be known as the Town of Castle Rock Landscape and Irrigation Criteria Manual (hereafter called “Criteria”). All landscape and irrigation design, installation, and maintenance performed as a requirement of Castle Rock Municipal Code, Town of Castle Rock Development Procedures Manual, Building and Construction Code, and any other regulation, policy, or criteria adopted by the Town of Castle Rock, shall comply with these Criteria.

All new or qualifying renovated landscaping within the Town limits, including remodels requiring an irrigation, building, or plumbing permit which change irrigation demands or water quality control, shall comply with these Criteria. It is the purpose and intent of these Criteria to establish landscape and irrigation performance standards and criteria that will reflect the Town identity and the desire of the community as expressed through the Town’s Vision and Comprehensive Master Plan to:

### Promote water conservation

- Demonstrate and recognize the need to invest in future water and other resources as efficiently as possible
- Assist in reducing the overall per capita use of water within the Town’s service area
- Reduce peak summer water usage
- Reduce or eliminate outdoor water waste
- Assist with water budget rate structure compliance
- Promote the conservation of water supplies through the use of landscape and irrigation design and materials that can have a beneficial effect on water conservation

### Encourage appropriate use of materials

- Promote the values and benefits of natural, indigenous, non-invasive, and regionally adapted landscapes for new landscape projects within the Town’s service area
- Provide for the protection of and implementation of native vegetation
- Promote the conservation of energy resources through the use of landscape design and materials that can have a beneficial effect on energy conservation

### Increase public safety

- Increase street safety by reducing or eliminating the potential of water and ice on all paved surfaces resulting from irrigation-related water waste
- Reduce damage to publicly owned streets caused by irrigation-related water waste
- Increase awareness of defensible space for fire mitigation

### Facilitate successful projects

- Establish a procedure for designing, installing and maintaining water-efficient landscapes in new projects and assist with the conversion to low water use vegetation
- Establish a regulatory framework for the administration of landscape and irrigation design, plan review, installation, inspection, and maintenance

## 1.1 GOVERNING REGULATIONS

Unless the Town expressly approves a specific technical criteria variance or deviation, these Criteria and all applicable Town of Castle Rock secondary codes shall govern in all cases where plans or approvals are required.

The Town of Castle Rock makes every attempt to provide a thorough and accurate landscape and irrigation plan review and inspection. In the event an item or items are missed in the plan review or during inspections, it does not relieve the applicant or permit holder from meeting all requirements as identified in the Landscape and Irrigation Criteria Manual, the Water Use Management Plan, or Municipal Code.

Town Parks. As we focus on reducing water use to conserve our resources across the Town, the Town recognizes and understands the importance of consolidating high water use areas into public shared spaces. This allows for the use of natural turf sports fields that are professionally managed and irrigated for the general public. Town's Parks guidelines can be referenced in the Parks, Trails, and Open Space Development Standards.

Town Parks shall be designed and managed by the Town's Parks and Recreation Department which will strive to provide high-quality parks and open spaces while ensuring efficient and water-conscious irrigation use to preserve and maintain our public spaces for generations.

## 1.2 JURISDICTION

These Criteria shall apply to all public and private lands located within or served by the Town of Castle Rock, including:

1. New development or construction
2. Currently approved development plans which are changed by amendments subsequent to the effective date of this document
3. Any change of land use and conversion of land, whether residential or non-residential, public or private
4. When conditions exist for joint or multiple land uses concurrent on a single site or development property, landscaping that is most consistent with the primary, prescriptive land use shall apply
5. Redevelopment, renovation, or retrofit projects that impact twenty-five (25) percent or greater of a landscaped area associated with a single water service connection (one tap)
6. Redevelopment, renovation, or retrofit projects which impact ten thousand (10,000) square feet or greater of landscaped area associated with one or more service connections (one or more taps)
7. Maintenance: Through the course of routine maintenance, all replacement landscape material and irrigation equipment shall meet current criteria

These Criteria shall govern over privately enforced guidelines or requirements related to landscaping and irrigation (i.e., business association, metropolitan district, homeowner association design guidelines, regulations and requirements, etc.)

### **1.3 PURPOSE**

Presented in these Criteria are the policies, procedures, performance standards, and minimum criteria for the design, installation, and maintenance of landscaping and irrigation within the Town's service area. These Criteria provide comprehensive water-efficient design, installation, and maintenance standards for landscaping and irrigation within the Town's service area in a manner that balances quality of life and social awareness with the overall responsibilities of the Town as the water provider.

All landscaping and irrigation plans submitted for approval under the provisions of these Criteria shall include appropriate landscape and irrigation planning, analysis, and design. All landscaping and irrigation plans shall meet or exceed these Criteria.

### **1.4 AMENDMENT**

These Criteria may be amended as new technology or other industry-related standards or best management practices are developed, or if experience gained in the use and application of these Criteria indicates a need for revision. Minor revisions will require the approval of the Director of Castle Rock Water.

All major revisions will require Town Council adoption, by Resolution, following a Public Hearing thereon. The Director of Castle Rock Water, or designee thereof, shall monitor the performance and effectiveness of these Criteria and will recommend amendments and revisions as necessary.

### **1.5 ENFORCEMENT RESPONSIBILITY**

The Town shall review all landscape, irrigation, and maintenance reports, plans, analyses, designs, and installations for compliance with these Criteria. The Criteria are enforced by the Town or authorized representative.

### **1.6 REVIEW AND APPROVAL**

The Town shall review all submittals for compliance with these Criteria. An approval by the Town does not relieve the owner, designer, installer, or maintenance contractor from the responsibility of ensuring the design, plans, specifications, construction, maintenance, and/or record drawings are in compliance with these Criteria.

### **1.7 INTERPRETATION**

The following shall govern the interpretation and application for the provisions of the criteria:

1. These provisions shall be regarded as the minimum criteria for the design, installation, and maintenance of landscape and irrigation.
2. Whenever a provision of these Criteria and any other provision of the Town of Castle Rock Municipal Code or any provision in any law, ordinance, resolution, rule, or regulation of any kind, contains any requirements covering any of the same subject matter, the requirements that are more restrictive or impose higher standards shall govern. In the event there is a discrepancy in the interpretation

of these Criteria, the Director of Castle Rock Water, or designee thereof, shall make the final determination of the intent of these Criteria.

3. These Criteria shall not abrogate or annul any binding agreements, issued permits, or approved landscape and irrigation construction plans, either recorded or approved by the Town, before the effective date of these Criteria.

## **1.8 RELATIONSHIP TO OTHER CRITERIA**

If the State, Federal government, or other applicable regulatory agency imposes stricter criteria, standards, or requirements than those contained herein, such provisions shall apply and shall be subsequently incorporated into the Town's requirements after due process and public hearing(s) to modify the Town's regulations and these Criteria.

## **1.9 VARIANCE AND DEVIATION**

Refer to the Town Development Procedures Manual for information regarding technical criteria variances and deviations from these Criteria.

## **1.10 SUPPLEMENTAL INFORMATION TO THESE CRITERIA**

Supplemental information, forms, checklists, notes, etc., listed below, are available on the Town of Castle Rock website (CRgov.com) and shall be referenced or submitted per the requirements outlined in these Criteria. Contact the Director of Castle Rock Water, or designee thereof, with any questions regarding the downloading of these files. It is the responsibility of the owner/applicant and designer, installer, or maintenance contractor to obtain the latest version of any submitted document, as the Town will periodically update these items.

1. Checklists and Forms
2. Drawing Submittal Requirements
3. Electronic Data Submittal Layer Requirements
4. General Construction Drawing Cover Sheet Notes
5. Overlay Districts (Municipal Code Chapter 17)
6. Record Drawing Checklists
7. Registered Landscape Professional list
8. Signature Block
9. Site Development Plan General Notes
10. Standard Construction Notes
11. Standard Details
12. Technical Criteria Variance Request Form
13. Temporary Irrigation Criteria
14. Town of Castle Rock Approved Plant List
15. Water Use Management Plan

## 1.11 VIOLATIONS AND PENALTIES

Refer to the Castle Rock Municipal Code for information regarding violations and penalties.

## 1.12 ACRONYMS

As used in the Town's Landscape and Irrigation Criteria Manual, the following acronyms shall apply:

|           |  |
|-----------|--|
| BMP, BMPs | Best Management Practice(s)            |
| CD, CDs   | Construction Document(s)               |
| CLIA      | Certified Landscape Irrigation Auditor |
| CO        | Certificate of Occupancy               |
| ET        | Evapotranspiration                     |
| FPS       | Feet per Second, referencing velocity  |
| GPM       | Gallons per Minute                     |
| IA        | Irrigation Association                 |
| K         | Potassium                              |
| N         | Nitrogen                               |
| P         | Phosphorus                             |
| PD        | Planned Development                    |
| PDP       | Planned Development Plan               |
| PIA       | Property Improvement Agreement         |
| PRV       | Pressure Regulating Valve              |
| PSI       | Pounds per Square Inch                 |
| QWEL      | Qualified Water Efficient Landscaper   |
| PLA       | Professional Landscape Architect       |
| RLP       | Registered Landscape Professional      |
| ROW       | Right-of-way                           |
| RP, RPA   | Reduced Pressure Principal Assembly    |
| SDI       | Subsurface Drip Irrigation             |
| SDP       | Site Development Plan                  |
| SDT       | Sight Distance Triangle                |
| SIA       | Subdivision Improvement Agreement      |
| TCO       | Temporary Certificate of Occupancy     |
| TCR, TOCR | Town of Castle Rock                    |
| TESC      | Temporary Erosion and Sediment Control |
| WEP       | Water Efficiency Plan                  |



### 1.13 DEFINITIONS OF TERMS

**ACTIVE PARK:** A public common area for public recreation. This may include programmed or programmable sports fields or lawns, playgrounds, gathering areas, etc.

**ALTERNATIVE TURF:** Grasses cultivated in very close proximity, to form a living surface at the ground plane, generally intended to be mowed regularly, forming a dense growth of leaf blades and roots, including grasses other than bluegrass or bluegrass blends. These may include fescue hybrids, blue grama, and buffalo grasses propagated as turf.

**ANNUAL:** A type of plant material, typically flowers, that require replanting each season.

**APPLICANT:** The individual or organization applying for land use or permitting action.

**APPLICATION RATE:** The amount and frequency water are applied to landscaping by the irrigation system, usually measured in inches per hour.

**ARTIFICIAL TURF:** A non-living material typically used in place of a living turf/lawn. The appearance mimics a green, living turf during the growing season.

**AS-BUILT DRAWINGS:** The approved Town of Castle Rock stamped landscape and irrigation construction plans are updated electronically with any changes or deviations. Final disposition, location, with dimensions of the installed landscape and irrigation equipment shall be shown on the as-built drawing and submitted at project completion.

**BACKFLOW PREVENTION ASSEMBLY:** A mechanical device is installed at the beginning of the irrigation system to prevent a reverse water flow and contamination of the potable water supply.

**BERM:** An earthen mound intended for visual interest or screening of undesirable views. A berm is effective in buffering between differing land uses and reducing noise. The maximum slope of berms shall not exceed 4:1 (twenty-five (25) percent).

**BLUEGRASS:** Any grass of the genus *Poa*, having dense tufts of bluish-green blades and creeping rhizomes. Examples include, but are not limited to: Kentucky bluegrass, *Poa pratensis*, and Canada bluegrass, *Poa compressa*.

**CALIPER:** The measurement in diameter of a tree trunk measured six (6) inches above the ground.

**CERTIFIED IRRIGATION AUDITOR:** A person who has successfully completed formal training, certification, licensing, or other similar qualifications by the Irrigation Association or Qualified Water Efficient Landscaper (QWEL) to perform irrigation audits.

**CHECK VALVE:** A device that prevents a reverse water flow in pipes and sprinkler heads, commonly used in sprinkler heads or emitter systems to prevent low head drainage.

**COLORADOSCAPE:** A natural landscape that uses low to very low water (less than ten (10) inches of water per year) plant material that blends in with the native Castle Rock landscapes. Plant material must be maintained in its natural form, utilizing a combination of hardscape and landscape materials which provide a variety of colors, textures, sizes, shapes, and seasonal interest.

**COMMON AREA:** A land area within a development, intended for joint, private, or public, ownership and use, including pocket parks, passive parks, and active parks. These areas are often maintained by a homeowner's association or business association. HOA/Metro District Pocket parks, passive use areas, and active parks are considered common areas for the purposes of these standards and criteria. Town-owned Parks and Open Spaces.

**COMPOST:** Fully finished, stabilized, and mature product, derived from organic materials such as leaves, grass clippings, wood chips, and other yard wastes. Finished compost is dark and crumbly, does not resemble the original contents, and has an earthy smell. Acceptable compost will not contain any human or animal waste.

**CONIFEROUS:** A tree or shrub that bears cones and evergreen foliage.

**CONTROLLER:** An electric timing device that operates each zone of an irrigation system for a predetermined time and frequency.

**CONTROL VALVE:** Valves that turn the water on and off to the individual zones of sprinklers or drip emitters.

**COVERAGE:** The extent of the area where water is applied by sprinkler heads. This is used in the context of proper head spacing. Head-to-head coverage must be achieved while minimizing over-spray and eliminating water waste.

**CROSS CONNECTION:** Any point in a water distribution system where chemical, biological, or radiological contaminants may come into contact with potable water. During a backflow event, these contaminants can be drawn or pushed back into the potable water system. A backflow prevention device installed at every point of cross connection prevents contaminated water from entering the potable water distribution system.

**CU-Structural Soil™** (U.S. Patent # 5,849,069): A two-part system comprised of a rigid stone "lattice" to meet engineering requirements for load-bearing soil, and a quantity of soil, to meet tree requirements for root growth. The lattice of load-bearing stones provides stability as well as interconnected voids for root penetration, and air and water movement.

**CYCLE:** An interval of time during which an irrigation system is operated for one sequence of a regularly recurring succession of watering events.

**DECIDUOUS:** A plant or tree with foliage that is shed annually.

**DEFENSIBLE SPACE:** Zone One (1), Zone Two (2), Zone Three (3) For more information, see CSU Extension fact sheet #6.305: [Low Flammability Landscape Plants 6.305 - Extension \(colostate.edu\)](http://colostate.edu)

- Zone 1: zero to five (0-5) feet in distance from a residence. The area nearest the home. This zone requires the most vigilant work to reduce or eliminate ember ignition and direct flame contact with the home.
- Zone 2: five to thirty (5-30) feet in distance from a residence. The area transitioning away from the home where fuels should be reduced. This zone is designated to minimize a fire's intensity and its ability to spread while significantly reducing the likelihood that a structure ignites because of radiant heat.

- **Zone 3:** thirty to one hundred (30-100) feet in distance from a residence. The area farthest from the home. It extends 100 feet from the home on relatively flat ground. Efforts in this zone are focused on ways to keep the fire on the ground and to get a fire that may be active in tree crowns (crown fire) to move to the ground (surface fire), where it will be less intense.

**DEVELOPED AREAS:** Any area on which a site improvement or change is made including buildings, landscaping, parking, streets, and/or utilities.

**DEVELOPER:** Person, persons, or organization responsible for the development of land, buildings, and/or related improvements – often for the purpose of sale to a subsequent owner. The developer may be the property owner.

**DOWNTOWN STREETSCAPE:** A combination of hardscape, window boxes, planters, trees, shrubs, perennials, annuals, and groundcovers, as appropriate to enhance building entries and buffer streets. Refer to the Downtown Castle Rock Streetscape Palette for additional information.

**DRAIN VALVE:** A valve used to drain an irrigation system for repairs or freeze protection.

**DRIP EMITTER:** A small irrigation device that emits a drop of water at very low pressure with flows measuring in gallons per hour.

**DRIPLINE:** An imaginary vertical line extending downward from the tips of the outermost branches of a tree or shrub to the ground.

**DROUGHT:** Periods or seasons with below-average precipitation.

**DROUGHT RESISTANT:** A plant's ability to endure drought by being unstressed and maintaining normal appearance and health, similar to drought avoidance.

**DROUGHT TOLERANT:** A plant's ability to withstand drought without dying.

**DRYLAND SEED MIXTURE:** A native or regionally adapted seed mixture that does not require ongoing supplemental irrigation, but may benefit from temporary irrigation for establishment.

**DWELLING:** Any building or portion thereof that provides complete independent living facilities for a family or individual, including permanent provisions for living, sleeping, eating, cooking, and sanitation, but not including hotels, motels, tourist courts, clubs, hospitals, or similar uses.

**DWELLING, MULTI-FAMILY:** A building, or portion thereof, designed for occupancy by three or more families living independently of each other.

**APARTMENT:** A building containing three or more suites of rooms, with toilet and culinary accommodations, used or designed for use as a dwelling by a family or individual with shared areas and facilities.

**CONDOMINIUM:** A building containing three or more suites of rooms, with toilet and culinary accommodations, used or designed for use as a dwelling by a family or individual with shared areas and facilities. Each dwelling is individually owned and shared areas and facilities are commonly owned.

**TOWNHOME:** A building containing three or more dwellings, which is part of a structure in which each dwelling has a private entrance and each dwelling is attached horizontally, in a linear arrangement, and has an exposed front and rear wall to be used for access, light, and ventilation.

**DWELLING, TWO-FAMILY:** A building designed exclusively for occupancy by two families, living independently of each other.

**PAIRED HOME:** A building containing two dwellings attached by a wall.

**SINGLE-FAMILY ATTACHED:** A building containing two dwellings attached by a wall.

**DWELLING, SINGLE-FAMILY:** A building designed exclusively for occupancy by one family.

**SINGLE-FAMILY DETACHED:** A building containing one dwelling unit.

**EASEMENT:** The right to use lands owned by other parties for the purposes of maintenance, access, drainage, or other use, as specified in an agreement between parties.

**ENTRY STREET:** A main access to a subdivision.

**ESTABLISHMENT IRRIGATION:** Temporary irrigation is used for the establishment of seed or other plant material.

**ESTABLISHMENT PERIOD:** The period of time required for a plant to seed, germinate, and establish a healthy root system, which promotes long-term health and growth.

**EVAPORATION:** The change by which water is converted from a liquid to a vapor.

**EVAPOTRANSPIRATION (ET):** A calculation of water loss due to evaporation from the soil surface and transpiration through plant foliage.

**EVERGREEN:** A plant with foliage that persists and remains green year-round.

**EVERGREEN TREES:** A tree with foliage that persists and remains green year-round.

**FABRIC:** A porous geotextile material installed underneath rock mulch that is manufactured specifically to reduce the growth of weeds within planting bed areas. Also known as the weed barrier.

**FIELD CHANGE ORDER (FCO):** Paperwork and justification for a change to landscape and/or irrigation construction documents once a project is under construction.

**FINAL GRADE:** The finished ground surface or contour after construction, prepared for plants.

**FINAL PD SITE PLAN:** The Final Planned Development (PD) Site Plan is the detailed development plan of a property which generally indicates the final planned use of the property, building and parking locations, building elevations, service connections, landscape, and other site improvements. Now known as a Site Development Plan (SDP).

**FLOW SENSOR:** A device that measures the rate of water flow in an irrigation system quantified in gallons per minute (GPM).

**GALLONS PER MINUTE (GPM):** The flow rate of water, and volume for a period of time.

**GOLF COURSE:** The ground or course over which golf is played.

**GROSS SITE AREA:** The total square footage of the property associated with a development plan that includes landscape and/or irrigation installation and/or renovation.

**GROUND COVER:** Living plant material that grows low to the ground, usually under twelve inches in height, often of a spreading nature.

**GROWING SEASON:** The five-month period of May through September.

**HARDSCAPE:** Non-living site improvements at the ground plane such as a building, pavement, walkways, and parking areas – including those of crushed stone, patios, decks, mulch areas (exclusive of mulch area in shrub and perennial beds), and other similar improvements as determined by the Town. The hardscape area does not include artificial turf unless otherwise approved in this document.

**HEAD-TO-HEAD COVERAGE:** Sprinkler heads are spaced so that they overlap from head to head. The spacing of heads shall not exceed ninety percent of the nozzle-specified radius.

**HEAT ISLAND EFFECT:** An “island” of higher temperatures caused by changing surfaces from permeable to impermeable as a result of development. See the United States Environmental Protection Agency website at <http://www.epa.gov/> for more information.

**HEIGHT:** for the purposes of these Criteria is determined as typically measured by National Nursery Association Standards.

**HIGH WATER USE:** Any plant material requiring over fifteen (15) inches of supplemental irrigation during each growing season (May through September).

**HYDROZONE:** Landscape, containing vegetation requiring similar water needs and exposure. Each hydrozone shall be serviced by a single irrigation zone. For the purposes of this document, hydrozones are broken into four (4) categories:

**VERY LOW HYDROZONE:** Plant materials that require five inches or less of supplemental water applied during the growing season. The plant materials within this zone are typically drought-tolerant natives. This hydrozone is designated by the letter “V”.

**LOW HYDROZONE:** Plant materials that require over five (5) inches and up to or equal to ten (10) inches of supplemental water applied during the growing season. This hydrozone shall be designated by the letter “L”.

**MODERATE HYDROZONE:** Plant materials that require over ten (10) inches or up to or equal to fifteen (15) inches of supplemental water applied during the growing season. The plant materials within this zone are typically native hydrophilic or exotic species. This hydrozone is designated by the letter “M”.

**HIGH HYDROZONE:** Plant materials that require over fifteen (15) inches of supplemental water applied during the growing season. The plant materials within this zone are intended for high pedestrian traffic areas such as sports fields or community gathering spaces. Plant materials using up to nineteen (19) inches may be used in qualifying passive-use common areas, with approval.

**INORGANIC MATTER:** A non-naturally occurring and/or manufactured product such as perlite, used to enhance the soil texture and/or water holding capacity of soils.

**INTERFACE LANDSCAPING:** Landscaping between changing land uses, such as between residential and commercial, residential and industrial, or dissimilar residential properties. Such areas shall require increased landscaping to create buffers between uses.

**IRRIGABLE AREA:** All pervious surfaces within the lot.

**IRRIGATED AREA:** The actual area covered by plant material at mature size and with permanently installed irrigation that is served by.

**IRRIGATED PUBLIC AREA:** A land area that is not native or natural open space and in which healthy vegetative growth is maintained by the application of water through an irrigation system. Irrigated public areas shall include, but are not limited to, any and all irrigated areas associated with irrigated public lands and easements owned by the Town and/or any metropolitan district or homeowner's association within the Town. Irrigated public areas include public street entrances, parking lots, rights-of-way, public parks, and recreation areas, and all areas whether owned, maintained, or irrigated at public expense by the Town, metropolitan district, or homeowner's association.

**IRRIGATION:** An automatic, permanent, or temporary, watering system designed to transport and distribute water to landscape plants.

**IRRIGATION ASSOCIATION:** A non-profit North American organization formed to improve the products and practices used to manage water resources and to help shape the business environment of the irrigation industry.

**IRRIGATION AUDIT:** A procedure to collect and present information concerning the uniformity and rate of application, and general condition of an irrigation system and its components. This procedure includes a visual site inspection of the installed irrigation system for performance according to design criteria.

**IRRIGATION DESIGN:** Creation of a drawing and associated information depicting irrigation system components and details.

**IRRIGATION EFFICIENCY:** A quantitative measurement of distribution uniformity as determined through an irrigation audit. Also includes maintenance and management of the irrigation system.

**IRRIGATION PLAN:** A plan drawn to scale that indicates the irrigation components and their specifications as related to a specific landscape plan. This is a two-dimensional plan drawn to scale that shows the layout of irrigation components, specifications, and hydrozones.

**IRRIGATION SEASON:** The period during which supplemental irrigation is generally used to maintain plant health, for purposes of these Criteria shall mean May through September.

**INVASIVE PLANT:** a plant that is non-native and able to establish, growing quickly, and spreading to the point of disruption of plant communities and/or ecosystems.

**LANDSCAPE:** Any combination of living plants, such as trees, shrubs, vines, groundcovers, flowers and/or grass, natural features such as land and water forms, rock, stone, bark chips or shavings, and structural features including but not limited to outdoor artwork, walls, fences or benches.

**LANDSCAPE ARCHITECT:** A professional licensed to practice landscape architecture by the State of Colorado. Also referred to as a Professional Landscape Architect (PLA).

**LANDSCAPE AREA:** The area within a lot or property not comprised of hardscape, measured at the ground plane. The landscape area will not include bare dirt or weeds. The landscape area will consist of living groundcover, including turf or other groundcover, or shrub bed area which is permanently irrigated.

**LANDSCAPE BUFFER:** A landscape area intended to physically and visually separate one land use from another.

**LANDSCAPE DESIGNER:** A professional who has successfully completed formal study or training in the field of landscape design, culminating in either certification, licensing, or degree.

**LANDSCAPE GRADING PLAN:** A plan drawn to scale that shows the designed landscape gradient and elevation using one-foot or two-foot contour lines with a numeric notation of elevations.

**LANDSCAPE IMPROVEMENTS:** All elements typically used or existing in the designed landscape such as, but not limited to, soil, compost, rock, plant material, edging, weed barrier, mulch, and irrigation system.

**LANDSCAPE ISLAND:** Shall refer to a landscape area in a parking lot typically surrounded on four sides by parking spaces or drives.

**LANDSCAPE PLAN:** A plan drawn to scale that shows the layout of all landscape components and their specifications for a development site.

**LANDSCAPE PROFESSIONAL:** A landscape or irrigation designer, installer, or maintenance contractor who possesses the qualifications associated with the specific discipline of landscape or irrigation design, installation, or maintenance of landscape and irrigation systems.

**LANDSCAPE SETBACK:** An area reserved for the primary use of landscaping measured by the horizontal distance between two points of reference. Oftentimes landscape setback area refers to a distance of landscape area located between the property line and a building, parking area, or other hardscape. Sidewalks located within a landscape setback area will necessitate a corresponding increase in the setback.

**LAND USE:** The designation in these Criteria such as single-family, two-family, multi-family, non-residential, or other types of land use designation, as defined by the Town of Castle Rock in master planning and/or municipal code.

**LARGE CANOPY DECIDUOUS SHADE TREE:** A deciduous tree that has a mature height equal to or greater than thirty (30) feet and provides shade.

**LATERAL:** Piping between the control valve and the sprinkler head or other emission device.

**LOW HEAD DRAINAGE:** A situation where water drains partially or completely out of the lateral line through the sprinkler head or other emission device after each irrigation cycle is complete. This causes water waste, and check valves shall be used to mitigate this situation.

**LOW WATER USE PLANT MATERIAL:** Plants that require more than five inches and up to ten (10) inches of supplemental irrigation per season, May through September, to maintain optimum health and appearance.

**MAINLINE:** Piping upstream of the control valve in an irrigation system.

**MAINTENANCE:** Any activity undertaken to prevent the deterioration, impairment, or need for repair of an area, structure, rights-of-way, or land use, including but not limited to management, repair, or replanting of plant materials, landscape materials, and/or irrigation system.

**MAJOR MODIFICATION:** Changes in live plant material coverage and/or square footage; and/or changes to irrigation service line sizes, drastic relocation of irrigation mainlines, changes in irrigation water application methods between overhead and sub-surface, and irrigation head types.

**MAJOR REVISION:** A revision to this manual that involves policy changes, technical criteria variances, and/or major construction detail revisions.

**MASTER VALVE:** The valve that turns water on and off for the entire irrigation system.

**MEDIAN:** An area that separates lanes of traffic traveling in opposing directions.

**MINOR REVISION:** A change to this manual that involves grammar, submittal requirement changes, clarifications, and construction detail revisions for clarification, and/or minor modifications.

**MOBILE HOME:** A transportable structure suitable for year-round single-family occupancy and having water, electrical, and sewage connections similar to those of conventional single-family dwellings.

**MODERATE WATER USE PLANT MATERIAL:** A plant material that requires over ten (10) inches and less than fifteen (15) inches of supplemental irrigation per season, May through September, to maintain optimum health and appearance.

**MULCH:** Non-living organic or inorganic material such as bark or rock material typically in a loose condition, used in the landscape industry to cover bare ground.

**NATIVE AREA:** An area of plant materials that are indigenous to Castle Rock. Do not accept the following strike-out.

**NATIVE PLANT:** A plant that is part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem.

**NATIVE SEED:** Seed of native grasses.



**NATIVE SEED CONVERSION:** Native grasses can be irrigated for establishment only. Once established, native grasses are to be maintained and managed to support the natural development and managed to support the natural development of the vegetation in their natural state.

**NATIVE SOIL:** Soil that is indigenous to Castle Rock that has developed over hundreds or thousands of years.

**NATURALIZED PLANT:** Also referred to as regionally adapted. A non-native plant that does not need human help to reproduce and maintain itself over time in an area where it is not native.

**NITROGEN (N):** As used in the context of these Criteria, refers to this nutrient as used by plants as part of photosynthesis, promoting green plant growth.

**NON-LIVING MATERIAL:** Area covered by mulch, pavers, brick, or crusher fines that do not contain plant material.

**NON-NATIVE PLANT:** A plant that is introduced with human help (intentionally or accidentally) to a new place or new type of habitat where it was not previously found.

**NON-RESIDENTIAL:** Commercial development, such as a business, industrial, governmental, school, religious institution, or mixed uses (see **Section 7**). HOA or common areas are defined as non-residential for watering schedule purposes.

**NOXIOUS WEED:** An alien plant or parts of an alien plant that has been designated by rule as being noxious or has been declared a noxious weed by a state, county, or local regulatory agency, meeting one or more of the following criteria:

- Aggressively invades or is detrimental to economic crops or native plant communities
- Is poisonous to livestock
- Is a carrier of detrimental insects, diseases, or parasites
- The direct or indirect effect of the presence of this plant is detrimental to the environmentally sound management of natural or agricultural ecosystems

**NOZZLE:** A short duct that is used to direct the flow of water from a sprinkler head.

**OPERATING PRESSURE:** The pressure at any point in the irrigation system when the system is functioning. Operating pressure is measured with flow in the line. Also known as dynamic pressure.

**ORGANIC MATTER:** Leaves, grass clippings, wood chips, and other yard wastes.

**ORNAMENTAL TREE:** A small canopy deciduous tree providing variety and interest by flower display, attractive fruit, or fall color.

**PARK:** An area of land offered for public use and rest and recreation.

**PARKING LOT:** The paved area used to accommodate vehicles associated with non-residential and multi-family uses. The area of the parking lot used to calculate parking area landscape requirements excludes roadway, aisles leading to and from the parking lot, and landscape area abutting the parking lot. It is measured from the back of the curb to the back of the curb and may include landscape islands between parking spaces or drive areas and peninsulas (measured from ground plane back of the abutting curb).

**PARKING LOT CORNER:** A landscape area in a parking lot surrounded on two (2) sides by parking.

**PARKING LOT ISLAND:** A landscape area in a parking lot surrounded on four (4) sides by parking spaces or drive isles.

**PARKING LOT PENINSULA:** A landscape area typically surrounded on three (3) sides by parking spaces or drive isles.

**PASSIVE USE OPEN SPACE:** A public common area used for passive activities such as walking, hiking, biking, picnicking, and wildlife viewing.

**PASSIVE RECREATION AREA:** A common area used by multi-family complexes, or localized neighborhoods that is used for non-programmed athletic activities, picnic areas, playground equipment, or other recreational / play areas.

**PERENNIAL:** A herbaceous plant that blooms and produces seed for each year, exceeding two years. A short-lived perennial lives for approximately three (3) to five (5) years. Long-lived perennials are likely to live much longer and can remain for over twenty (20) years.

**PERFORMANCE STANDARD:** Outlines an expectation of results, through identification of a benchmark against which performance is measured.

**PERMITTEE:** The party making an application for a permit.

**PHOSPHORUS (P) (Used in the context of these Criteria):** A nutrient used by plants as part of photosynthesis, nutrient transport, and energy transfer. Phosphorus assists with stable root system development, growth, and flowering.

**PLANT HEIGHT (for the purposes of this document):** Is determined as typically measured by the National Nursery Association Standards. See the Town of Castle Rock plant list for plant heights.

**PLANTING AREA:** An area in which plants are to be installed, surrounded by mulch, and separated from other planting areas. Such areas may be irrigated on the same zone, provided they encompass a single hydrozone, and are required to have individual operational indicators.

**PLANT MATERIALS:** Living plants such as trees, shrubs, groundcovers, and vines, and shall not include weeds or other undesirable plants as determined by the Town.

**POTABLE WATER:** Water that has been treated and is suitable for drinking.

**POTASSIUM (K)** (as used in the context of these Criteria): A nutrient used by plants to assist with water uptake and drought resistance, as well as to promote strong roots, stems, leaves, and fruits.

**PRECIPITATION RATE:** The quantity of water applied to the ground measured in inches per hour; also used in place of “application rate”.

**PRESSURE (PSI):** The force that moves water through a pipe or piping system and is measured in pounds per square inch (PSI) or feet of head. One foot of water depth equals 0.433 PSI, and one PSI equals 2.31 feet of head.

**PRESSURE GAUGE:** A device used for measuring water pressure.

**PRESSURE REGULATING VALVE (PRV):** A valve used to control pressure within a piping system.

**PUBLIC IRRIGATION WATER ORDINANCE:** Chapter 13.20 in the Municipal Code references limitations on high water use plant materials.

**QUALIFIED WATER EFFICIENT LANDSCAPER (QWEL):** An individual who has successfully completed the Qualified Water Efficient Landscaper training and certification program. The QWEL program is a comprehensive in-depth training and certification program, emphasizing irrigation, landscape, water management, and horticultural best management practices.

**RAIN SENSOR OR RAIN SHUTOFF DEVICE:** A device connected to an irrigation controller that interrupts scheduled irrigation when precipitation has been detected.

**RECORD DRAWINGS:** Town approved construction plan that depicts the final disposition, and location, with dimensions of the installed landscape and irrigation equipment. The contractor shall keep record drawings current as the project progresses.

**REDEVELOPMENT:** Any man-made change to improved or unimproved real estate including any material change in the use or appearance of any structure, physical improvement, grading, landscaping, or in the land itself.

**REGISTERED LANDSCAPE COMPANY:** Landscape and irrigation design, installation, or maintenance company, working on non-residential / commercial properties within the Town of Castle Rock service area. A company must register with Castle Rock Water, designate one or more Responsible Landscape Professional(s), and indicate current properties under their control.

**REGISTERED LANDSCAPE PROFESSIONAL (RLP):** Landscape and/or irrigation design, installation, and maintenance professionals that hold a current registration issued by Castle Rock Water.

**RESPONSIBLE LANDSCAPE PROFESSIONAL:** The person or persons designated by a landscape design, installation, or maintenance company to represent and ensure all activities comply with Town of Castle Rock regulations.

**RETROFIT:** An umbrella term that refers to the modification of something for more efficiency. In the case of water conservation, retrofit refers to modifications to plumbing fixtures, landscaping, and/or irrigation to increase water use efficiency.

**RIGHT-OF-WAY (ROW):** A public street, way, alley, sidewalk, easement, tract, and Town-owned lands, or any other public property owned and controlled by the Town, or dedicated to public use.

**RISER:** An upright piece of pipe used to support nozzles, heads, emitters, backflow preventers, and valves.

**ROOT ZONE:** The depth of the plant roots in the soil; the area in which plant roots grow.

**ROUGH GRADE:** The ground surface or contour that is not the final preparation for plants.

**ROUND-A-BOUT:** A circular junction in which road traffic must travel in one direction around a central island.

**SCOPE OF WORK AREA:** The gross site area of a parcel, and/or the property to which landscape improvements are being proposed. See definition of “gross site area”. If a project involves a public or common area that is not referenced by a parcel or lot, the scope of work areas may be referenced by the area served by a single dedicated irrigation service, or as identified by right-of-way, and/or public common areas.

**SEMI-ARID CLIMATE:** A climate characterized by ten (10) to fifteen (15) inches of annual precipitation; very dry with little rainfall and scrubby vegetation. Castle Rock is located in a semi-arid climate.

**SERVICE LINE:** A privately owned and maintained small diameter pipe used to connect from a water main through a small tap to a water meter at the user’s location. Also known as “tap”.

**SETBACK:** The required minimum horizontal distance between the location of structures or uses and the front, side, or rear lot line measured perpendicular to such lot line.

**SHRUB:** A self-supporting woody plant either evergreen or deciduous of low to medium height with multiple stems arising at or near the ground.

**SHUT OFF VALVE (isolation valve):** A valve within an irrigation system that shuts off the entire system or isolates a portion of the system.

**SIGHT DISTANCE TRIANGLE (SDT):** The minimum visibility clearance provided at all access point locations, intersection of adjoining streets, and entrance drives. Landscape type, height, and opacity are limited in these areas. Also known as the visibility distance triangle.

**SITE DEVELOPMENT PLAN (SDP):** The purpose and intent of the Site Development Plan is to depict the general layout of a residential subdivision or the site layout, site improvements, and building configuration of a multi-family residential, commercial, industrial, or mixed-use development.

**SLOPE:** The degree of change from the horizontal plane. Often slope is calculated as a ratio of “horizontal run” to “vertical rise”, or as a fraction (“run” over “rise”) in which run is the horizontal distance and rise is the vertical distance.

**SMALL CANOPY DECIDUOUS TREE:** A tree of smaller size that has a mature height of less than thirty (30) feet. Also known as “ornamental tree”.

**SMART IRRIGATION CONTROLLER:** A controller that automatically adjusts the programmed run time or watering frequency based on changes in weather or soil moisture.

**SOIL AMENDMENT:** Organic material added to the soil to improve texture, moisture holding capacity, nutrient capacity, and water and air infiltration.

**SPORTS FIELD:** A field on which sports are actively programmed and played.

**STREET:** Any public or private road.

**STREETSCAPE:** Pedestrian and landscape improvements parallel to the roadway, which include at minimum the required width sidewalk, and the minimum required planting strip for trees, shrubs, and irrigation. The streetscape is typically located within the ROW but may be located on adjacent private property as appropriate.

**STREET TREE PLANTING STRIP:** The area intended for planting to include street trees, between a detached sidewalk and street curb. Also known as “planting strip”.

**SUBSURFACE DRIP IRRIGATION (SDI):** Drip tubing with inline emitters, evenly spaced in a grid pattern, usually installed under turf or ground cover.

**TECHNICAL CRITERIA VARIANCE:** A design or portion of a design, for landscape and/or irrigation that is a diversion from criteria contained in these Criteria. The variance request shall meet the intent of the criteria. A variance requires formal approval by the Director of Castle Rock Water and/or the Director of Development Services.

**TEMPORARY EROSION AND SEDIMENT CONTROL (TESC):** The TESC Permit Program is mandated by legislation, including the Federal Clean Water Act’s National Pollutant Discharge Elimination System (NPDES) Stormwater Phase II Regulations, and the Colorado Water Quality Control Act. See the Temporary Erosion and Sediment Control manual.

**TEMPORARY IRRIGATION:** A temporary watering system designed to transport and distribute water to landscape plants. Temporary irrigation systems are installed above grade and are to be removed at the end of the establishment period. For sod to native seed conversion, existing subgrade irrigation may remain in place and 12” irrigation heads installed for the native seed establishment.

**TEXAS HYBRID BLUEGRASS:** A hybrid turf variety created by combining Kentucky Bluegrass (*Poa pratensis* L.) and Texas Bluegrass (*Poa arachnifera* Torr.). Such hybrids demonstrate lower water use requirements than Kentucky Bluegrass (*Poa pratensis* L.) while being drought and heat-tolerant.

**TOPSOIL:** Native soil, may also refer to imported soil material where native is substandard or non-existent, that is used for soil material in landscaped areas, not considered an organic component for soil amendment or soil preparation.

**TOWN (in reference to these Criteria):** The Town of Castle Rock.

**TRACT:** A parcel of land that is created for common ownership and use by two (2) or more property owners; ownership and use by an association or government entity; or an impermanent status where property intended for further division can be platted and transferred, but where no building permits can be issued.

**TRANSPIRATION:** The process of water moving through the leaf surface of a plant and vaporizing, and is utilized by the plant to cool its leaves.

**TREE:** A woody plant with leaves or needles that grows to achieve height usually above the human form, often providing shade.

**TURF:** A grouping of grasses that grow in very close proximity to form a living surface at the ground plane, is regularly mowed forming a dense growth of leaf blades and roots.

**URBAN AREA:** A focused development that has limited open space, primarily contains a variety of non-residential uses, but may also integrate residential uses, that combine the uses in a way which considers character, local identity, heritage, pedestrians, and traffic. Urban Areas include the Downtown Overlay District, the Wolfensberger North Zoning Overlay District, or other dense mixed-use areas as determined by the Town.

**USDA Hardiness Zone:** A geographically defined area in which a specific category of plant life is capable of growing as defined by climatic conditions, including its ability to withstand the minimum temperatures of the zone. Castle Rock is a USDA Hardiness zone 5b.

**VEGETATION:** Plants, in general, or the sum total of plant life in an area.

**VELOCITY (for these Criteria):** The rate of water flow calculated in feet per second (FPS).

**VERY LOW WATER USE PLANT MATERIAL:** Plant materials that require five (5) inches or less of supplemental water applied during the growing season, May through September.

**WATERING RESTRICTIONS:** Limitations on when irrigation may take place, and may include day and time.

**WATER WASTE:** The application of water to impervious surfaces, over-irrigation resulting in runoff or pooling, and non-beneficial use of water.

**WEED:** Plant materials identified by local or county code, or state statute.

**YARD OR YARD AREA:** All portions of a lot not covered by impervious area. The yard area is typically broken down into front, rear, and side yard areas.

**ZONE (IRRIGATION):** A group of sprinkler heads, drip emitters, bubblers, or sub-surface driplines connected to a control valve.

**ZONE (LANDSCAPE OR PLANT HARDINESS):** Zones that are broadly defined by the plant communities that occur at approximate elevations. Colorado State University defines five (5) life zones. The United States Department of Agriculture references hardiness zones. Plants used in Castle Rock shall be consistent with the appropriate life or hardiness zone.

## Section 2: Professional Registration

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### 2.0 INTRODUCTION

This section describes the classifications, associated qualifications, and the Town's registration process for landscape and irrigation design, installation, and maintenance professionals. It outlines the responsibilities and compliance aspects of being a Registered Landscape Professional (RLP) in the Town.

### 2.1 GENERAL REQUIREMENTS

State of Colorado Registered Professional Landscape Architect (PLA) license is required for landscape design (with the exception of single-family and multi-family up to four (4) units – not including common area).

Registration with the Town of Castle Rock, through Castle Rock Water, is required to conduct:

- Landscape design (unless licensed by the State of Colorado)
- Irrigation design
- Supervision of landscape or irrigation installation
- Supervision of landscape or irrigation maintenance of non-residential properties

Before the issuance of a permit, all landscape companies are required to be registered through the Town of Castle Rock, Development Services, Building Division

A Registered Landscape Professional (RLP) designation applies to individuals, not companies or organizations. Registered Landscape Professionals must obtain, and keep current, a Qualified Water Efficient Landscaper (QWEL) certification and be registered through Castle Rock Water. One or more RLP who represent the company is directly responsible for all work conducted on a project under his/her supervision and ensures compliance with all criteria outlined in the Water Use Management Plan and the Landscape and Irrigation Criteria Manual. The RLP representative must be present at all landscape and irrigation inspections.

#### 2.1.1 REGISTRATION REQUIRED

1. Registration of Landscape Professionals expedites plan review, permitting, inspection, and approval of qualifying landscapes. Landscape Professionals are required to have a working knowledge of current industry-related best management practices and technologies. They are also required to have a working knowledge of these Criteria and other applicable codes and policies and be able to incorporate them into landscape and irrigation design, installation, and maintenance.
2. All land uses, except for installations done by individual residential homeowners (individual residential homeowners do not include developers/home builders), require a State Licensed or Town registered professional for landscape and irrigation design, installation, and maintenance of landscaping and irrigation systems.
3. Any landscape designer, irrigation designer, or installation contractor performing work or service in the design, construction, installation, maintenance, addition, alteration, repair, equipping, moving, removal, conversion, or demolition of any landscape or irrigation governed by these Criteria must possess a current Colorado Professional Landscape Architect license or be registered through Castle Rock Water. The type and size of landscape designs are governed by the State of Colorado.

4. Permits for construction will only be issued to registered professionals.
5. A current professional (Colorado State or Castle Rock Water) registration number and name shall be present on all applications, drawings, and permits.

## 2.1.2 REGISTERED PROFESSIONAL CLASSIFICATIONS

### Landscape Design Professional

To register as a Landscape Design Professional, an applicant must certify they meet the requirements for plan preparation by providing professional qualifications. Colorado State law governs the sizes and types of projects that unlicensed individuals can design independent of Town requirements. For those projects exempt from State licensure, applicants must successfully complete a Town registration workshop, and obtain the Qualified Water Efficient Landscaper (QWEL) certification.

### Irrigation Design, Landscape and Irrigation Installation, and Maintenance Professionals

To be eligible to perform irrigation design, landscape, and irrigation installation, or maintenance, an applicant must certify they are qualified to prepare the type of plans they submit by completing the following requirements:

1. Attendance at a registration workshop; and
2. Passing score (seventy-five (75) percent or better) on a test formatted to identify the level of knowledge of the Water Use Management Plan and Town of Castle Rock Landscape and Irrigation Criteria Manual.
3. All Town of Castle Rock updates and revisions will be emailed to currently Registered Landscape Professionals and must be acknowledged and accepted.
4. Successful completion of the Qualified Water Efficient Landscaper (QWEL) training and certification program.
5. QWEL certification must remain current and in good standing.

## 2.2 EXPIRATION

All registrations in good standing shall be valid through April 30 of the following year.

To keep registration in good standing, qualifying Landscape Professionals shall comply with all requirements identified in these Criteria.

### 2.2.1 RENEWAL

A fee may be charged for registration renewal and shall be outlined in the applicable fee schedule.

For Registered Landscape Professionals in good standing, renewal may be issued by updating contact information and acknowledging updates to policies, criteria, or other applicable codes, in place of seminar attendance and testing. Renewal must be completed by April 30<sup>th</sup> of each calendar year.

Non-compliance with these Criteria may deem a Registered Landscape Professional (RLP) ineligible for renewal. In such cases, seminar attendance and testing will be required before registration renewal.



## 2.3 COMPLIANCE

The Registered Landscape Professional (RLP) is responsible for performing the activity authorized in a proficient manner consistent with industry standards, these Criteria, and related Town policies and codes. Failure to comply with this requirement shall be cause for the denial, suspension, revocation, or restriction of registration.

### 2.3.1 WORK WITHOUT CURRENT REGISTRATION

When design, installation, or maintenance work is commenced without first obtaining a Landscape Professionals registration through Castle Rock Water, or when the registration has expired, a special investigation may be conducted. An investigation fee equal to the amount of the registration fee may be assessed.

Landscape or irrigation plans submitted by individuals without a current Colorado Licensed Landscape Architect license or Landscape Professionals registration through Castle Rock Water will not be accepted for review. Landscape or irrigation construction or maintenance performed by individuals without a current registration shall not be eligible for inspection or additional permit issuance.

### 2.3.2 DENIAL, SUSPENSION, REVOCATION OR RESTRICTION OF REGISTRATION

The Director of Castle Rock Water, or designee thereof, shall have the authority to deny, suspend, revoke, or place restrictions on a Landscape Professional's registration under any of the following circumstances:

1. False or misleading information was provided on the registration application.
2. Fails to provide reasonable information or documentation of knowledge and experience required by the registration classification applied for.
3. Provides false or misleading information on permit applications.
4. Fails to comply with any of these Criteria.
5. Knowingly allows the registration to be used by another person, firm, or corporation.
6. Commits any conduct constituting fraud in or connected with any activity relating to construction, which is governed by these Criteria or other Town policies, regulations, and/or codes.
7. The Responsible Landscape Professional and the Registered Landscape Professional will be notified of any instance of non-compliance and given the opportunity to correct all inconsistencies.
8. Non-residential areas shall complete necessary repairs within twenty-four (24) hours of notification or at a minimum before the system is used again.
9. Failure to correct inconsistencies, or more than one notice of non-compliance, will result in suspension of the Landscape Professionals Registration.
10. Providing false or misleading permit fee charges to a customer or to the Town.

When the Director of Castle Rock Water, or designee thereof, deems that such registration shall be denied, suspended, revoked, or restricted, the procedures shall be as follows:

1. The applicant or registrant shall be notified in writing, at least seven (7) calendar days prior to the denial, suspension, revocation, or restriction. Notice shall include the reason for the action and shall be delivered to the address of record.

2. The applicant or registrant may appeal the suspension or revocation. Such request shall be in writing and delivered to the Director of Castle Rock Water, or designee thereof, within ten (10) calendar days of the receipt of the notice. The appeal letter shall include a thorough explanation of why the Registered Landscape Professional believes it was issued in error. Any appeal received after this time will not be considered.
3. The Director of Castle Rock Water, or designee thereof, shall provide the applicant or registrant with written findings and a ruling within fifteen (15) business days after review of the appeal.
4. Any decision rendered by the Director of Castle Rock Water, or designee thereof, shall take effect upon the expiration of the ten (10) day appeal period.

### **Emergency suspension**

If the Director of Castle Rock Water, or designee thereof, finds an emergency cause exists for suspension or revocation of a registration, he/she may enter an order for immediate suspension of such registration, pending further investigation.

### **Period of suspension**

If a registration is revoked, the applicant shall not be eligible to register with the Town for six (6) months after the revocation or any final decision from an appeal thereof.

### **Effect of revocation**

Registration reinstatement can be accomplished by successfully completing the landscape professionals test and paying the associated registration fee.

### **Provisions concerning work in progress**

The suspension or revocation of registration may include reasonable orders or conditions with which the Landscape Professional must comply to protect the work in progress as well as the intent of these Criteria.

## Section 3: Landscape and Irrigation Submittal Requirements

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### 3.0 INTRODUCTION

The requirements presented in this section shall be used to aid the applicant, designer, installer, and maintenance contractor in the analysis, design, installation, and maintenance of landscape and irrigation. The requirements presented herein are the minimum necessary for landscape and irrigation plan submittals and should be considered in conjunction with the requirements set forth by the Town's Development Services Department.

### 3.1 REVIEW PROCESS

#### 3.1.1 PRE-APPLICATION MEETING

A pre-application meeting with the Town's Development Services Department is required for any type of development, redevelopment, or renovation. The purpose of this meeting is to discuss general information about the project, pertinent aspects of the criteria, the required scope, and any special procedures, analyses, and submittal requirements that may be applicable.

#### 3.1.2 LANDSCAPE AND IRRIGATION SUBMITTAL REQUIREMENTS

Landscaping shall be designed as an important part of the overall site design. Landscaped areas shall enhance the building design and public views, provide buffers and transitions between adjacent land uses, and provide screening. A general landscape plan shall be included with the Site Development Plan (SDP) submittal and a more detailed landscape and irrigation plan shall be submitted with the Construction Document (CD) submittal. All plans shall include the designer's name, contact information, State license number, and Landscape Professionals registration number, where applicable. Plans must be scaled, electronically reviewable, and printable at a twenty-four (24) inch x thirty-six (36) inch size with a scale of one (1) inch = twenty (20) feet and no greater than one (1) inch = forty (40) feet.

All forms, checklists, and plant lists can be found online at the Town's website ([CRgov.com/landscapeforms](http://CRgov.com/landscapeforms)).

##### 3.1.2.1 SITE DEVELOPMENT PLAN (SDP)

1. Landscape plan. A general landscape plan is to be provided with the SDP submittal and is considered along with the overall development goals for the project, sets forth design parameters, and recognizes special conditions that may exist within the proposed project. The general landscape plan shall establish tree and shrub quantities, tree and shrub locations, tree and shrub types, and hydrozones. The following site and use analysis should be considered:

a. Site Analysis

Site analysis consists of inventory and analysis of all existing features that may influence landscape design. This includes the direction of prevailing winds, exposures, topography (slopes and swales), drainage areas, existing features (utilities, trees, shrubs, walkways, and structures), and views. The site analysis must consider local zoning and codes related to utility easements, site distance requirements, and interface buffering. Hatch keys, north arrow, and scale are required.

b. Use Analysis

Use analysis consists of identifying the typical functions and activities that occur on the site and assists with landscape material selection and irrigation design. This includes the overall theme of the site and neighborhood, identifying future building projects, onsite traffic patterns, activity areas, service areas, and any other use that will affect the landscape design. Interface landscaping, when necessary, shall be shown on the SDP.

2. Irrigation Plans are not required with the SDP submittal. A complete irrigation design is necessary to determine the water service connection and meter size. Irrigation plans are to be provided with Construction Document (CD) submittal.
3. Required forms, charts, and notes to be included on the general landscape plan:
  - a. Landscape Site Inventory form
    - i. Non-residential shall complete and include the Commercial Landscape Site Inventory Form.
    - ii. Multi-family residential shall complete the Multi-family Landscape Site Inventory form.
  - b. Streetscape landscape chart
  - c. Tract landscape chart
  - d. TCR standard landscape notes for site development plans
  - e. TCR SDP Plant Schedule. Only general plant categories, hydrozone, quantities, and size at planting are to be included with the SDP submittal. No species-specific plant names are to be provided on SDP.

### 3.1.2.2 CONSTRUCTION DOCUMENTS (CD)

1. Landscape Plan. A detailed landscape plan is to be provided with the CD submittal. The detailed landscape plan shall conform to the tree and shrub quantities, tree and shrub locations, and hydrozones established in the landscape plan in the approved SDP. The landscape plan will also include tree and shrub species as well as other plant species and landscape material.
  - a. Design elements shall include (as applicable):
    - i. Plant materials (trees, shrubs, living groundcovers, grasses, vines, annuals, and perennial flowers) - locate, identify, and draw at mature size

- ii. Structures (buildings, fences, retaining walls, gazebos/patios, and other visual features) – locate and identify  
Hardscapes such as any pavement, concrete, or other type of material used within the design and landscape plan.
  - iii. Grading and contours (all slopes equal to 3:1 are to be called out on landscape sheets. Slopes greater than 3:1 are not permitted)
  - iv. Minimum soil amendments as required by the Town
  - v. Special features
  - vi. Mulch types (inorganic or organic) and depth in inches
- b. Include Town of Castle Rock standard landscape notes for construction documents and planting details.
  - c. Within the plant schedule, list quantities, types, and sizes of the planting material to be used, including specific species in seed mixes. Plant material shall be listed by both common and scientific names. Complete Town of Castle Rock Plant Schedule. Plants are to be called out by legend abbreviation and quantities in parenthesis on the landscape plan.
  - d. Include a summary table identifying the square footage of each area by type of landscape cover (e.g., non-irrigated native, turf, groundcover, shrubs, trees, and mulches). Non-residential properties shall complete the Town of Castle Rock Commercial Landscape Site Inventory form and multi-family residential projects shall complete the multi-family Landscape Site Inventory form.
  - e. Town of Castle Rock planting details are required and can be found online at the Town’s website ([CRgov.com/1711/Landscape-Forms](http://CRgov.com/1711/Landscape-Forms)), including methods of soil preparation, soil and vegetation removal, and stockpiling and reuse.
  - f. Locate and identify all significant areas of existing natural vegetation, specimen trees, wildlife habitat, and landscape features to be preserved and/or improved. See CD checklist for additional requirements.
  - g. Where a site abuts a natural amenity such as a floodplain, trail corridor, park, or other open space, the landscape plan shall complement the natural character and integrity of the amenity.
  - h. Show and label all property lines and right-of-way areas.
  - i. Show and label all existing and proposed easements and utility lines. Wet utilities such as water, sanitary sewer, and stormwater lines shall be labeled. Wet utility or drainage easements shall be called out with dimensions.
  - j. Show sight distance triangles (SDT) - these areas must be kept free of visually obstructing landscape features (thirty (30) inches or taller) at mature size. All plant material within sight distance triangles shall be labeled with common and scientific names and mature height as shown on the Town of Castle Rock plant list ([www.CRgov.com/landscapeforms](http://www.CRgov.com/landscapeforms)).
  - k. Label all existing plant material to be removed or to remain then delineate on Construction Documents.

2. Irrigation Plan to include:
  - a. Plan elements
    - Irrigation diagram showing:
      - i. Head layout
      - ii. Drip layout
      - iii. Hydrozones
      - iv. Scaled appropriately to match the landscape plan
      - v. Irrigation legend
      - vi. Service line location and size
      - vii. Irrigation meter location and size
      - viii. Backflow prevention assembly location and size
      - ix. Existing and proposed utility easement location and information
  - b. TCR standard construction document irrigation notes.
  - c. TCR Irrigation Details.
  - d. TCR Hydraulic Worksheet.
  - e. TCR Irrigation Chart.
3. Record Drawings. Landscape and irrigation improvements shall be approved by the Town. Drawings reflecting the final installation of landscape and irrigation components shall be submitted following the Town's Regulations and "Drawing and Digital Submittal Requirements" before final approval. Such record drawings shall contain all required information as outlined in the latest version of the applicable checklist. The digital submittal shall include the geospatial layer reflecting the irrigated area(s).

### **3.1.3 CHECKLISTS AND FORMS**

Required checklists and forms are available on the Town of Castle Rock website (CRgov.com), and must be included with each plan submittal. Appropriate notations shall be provided with the checklist to assist the reviewer in determining whether the submittal is complete. For example, if a specific item is not addressed or not applicable, an explanation must be provided.

### **3.1.4 SUBMITTAL ADEQUACY**

Any submittal with incomplete or missing information may result in the plan being returned without review. The Town reserves the right to request additional information pertaining to specific landscape and irrigation plans beyond the general requirements in these Criteria.

## **3.2 APPROVAL**

### **3.2.1 FINAL LANDSCAPE AND IRRIGATION PLAN REQUIRED FOR CONSTRUCTION**

The final landscape and irrigation plan shall be included in the CDs and shall be approved by Castle Rock Water prior to the construction of any landscape and irrigation improvements.

### **3.2.2 ONE YEAR APPROVAL LIMITATION FOR FINAL LANDSCAPE AND IRRIGATION PLAN**

The final landscape and irrigation plan shall be valid for one year from the date of Town approval of the final approved construction documents. If the improvements have not been constructed and accepted by the Town within one year, or extended in conformance with the Town requirements, the plan shall be deemed invalid and resubmittal required. To be re-approved, it must be demonstrated that the concepts, designs, analyses, and calculations presented in the plan are consistent with the current Town's criteria.

## Section 4: General Requirements

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### 4.0 INTRODUCTION

This section describes the minimum necessary general performance standards and criteria of landscape and irrigation for all land uses. State-licensed and Town Registered Landscape Professionals, homebuilders, and homeowners shall use this information for the design, construction, installation, and maintenance of all land uses. All forms, checklists, and plant lists can be found online at the Town's website (CRgov.com).

### 4.1 APPLICATION

This section applies to all properties within the Town's service area.

#### 4.1.1 APPLICABLE USES

1. Multi-family properties as outlined in **Section 5**
2. Single-family and two-family residential properties as outlined in **Section 6**
3. Non-residential properties/business / industrial/governmental / schools / religious institutions / mixed-use properties as outlined in **Section 7**
4. Urban Areas as outlined in **Section 8**
5. Streetscape, rights-of-way, and tracts along rights-of-way, as outlined in **Section 9**
6. Parks, Sports Fields, and Golf Courses as outlined in **Section 10**

#### 4.1.2 APPLICABLE LANDSCAPE AND IRRIGATION

1. Gross site area
2. Front, back, and side yard, including setbacks and utility easements.
3. Parking lot
4. Common areas
5. Streetscape

These Criteria shall apply when there is a renovation of any non-residential landscaped property in existence before the adoption of these Criteria.

1. Projects which impact twenty-five (25) percent or greater of a landscaped area associated with a single water service connection (one tap)
2. Projects which impact ten thousand (10,000) square feet or greater of landscaped area associated with one or more water service connections (taps).



The area that shall be considered for development of the percentage of the impacted area shall include:

1. By lot – All landscape improvements on one (1) lot.
2. By metered service – All landscape improvements are irrigated by a single meter.
3. By approved site plan - The percentage shall not be calculated on the entire approved site plan unless the entire project is served by a single irrigation meter.

The Town reserves the right to require renovations to meet current criteria, regardless of the impacted area. Current criteria must also be met where additional interface is required, or there is a change to existing final approved construction documents or plans for the lot, project, or site plan.

#### **4.1.3 NOT APPLICABLE. This section shall not apply to:**

1. Homeowner repair of an existing irrigation system.
2. Renovation of existing irrigation systems that do not include the addition of an irrigation zone.
3. Renovated areas less than twenty-five (25) percent of the existing landscaped area. Existing landscaped area shall mean the landscaped area on a single lot, or serviced by a single irrigation meter. The existing landscaped area shall not mean the entire approved site plan area unless the project is served by a single irrigation meter.

## **4.2 GENERAL DESIGN REQUIREMENTS**

This section identifies the minimum general performance standards and criteria for landscape design, irrigation design, and maintenance.

## **4.3 GENERAL PERFORMANCE STANDARDS AND DESIGN CRITERIA**

All landscape and irrigation design, installation, and maintenance shall be evaluated against these performance standards and criteria. Project approval is based on meeting the intent, performance thresholds, requirements, expectations, and level of quality defined within the performance standards, and the specific criteria.

### **4.3.1 PERFORMANCE STANDARD #1: Efficient Water Use**

1. Conserve water through the application of water-wise, ColoradoScape design principles, and current industry-related best management practices.
2. Water allocation for irrigation shall be consistent with plant material requirements.
3. No individual plant may have water demand greater than fifteen (15) inches per growing season. For Town managed parks reference Parks, Trails, and Open Space Development Standards.

4. Water allocation for the irrigation of parks, sports fields, and golf courses shall vary by use of the area, see Section 10. Uses in this category shall be subject to
5. All allocations refer to inches of irrigation allocation per growing season. See Town Municipal Code Chapter 13.20 Irrigated Public Area Water Conservation for more information on CLWUR calculations.
6. Schools may be allowed additional seasonal irrigation of up to nineteen (19) inches for approved passive-use common areas that facilitate high public use. These areas shall meet specific criteria to qualify for this additional seasonal irrigation (See **Section 10**).
7. Allocated water shall be used as efficiently as possible. When an overhead irrigation system is installed, system efficiency shall achieve a distribution uniformity of seventy-five (75) percent or greater. This level of efficiency shall be demonstrated through an independent audit performed after installation by a Certified Irrigation Auditor or as certified by the Irrigation Designer and accepted via the Town's Irrigation Design Affidavit.
8. The irrigation system shall be designed, installed, and maintained to eliminate run-off from landscaped areas and shall not damage street, sidewalk, or utility infrastructure.
9. Water waste is not allowed. Water shall not be applied to impervious surfaces.

#### **4.3.2 PERFORMANCE STANDARD #2: Environmental Sustainability**

1. The project shall conserve water, and use the water that is applied efficiently.
2. The project shall seek to apply Low Impact Development (LID) stormwater mitigation techniques. Refer to the Town's Stormwater requirements.
3. The project shall alleviate the urban heat island effect by shading paved surfaces and rooftops where possible, as well as embracing and promoting other techniques and technologies to achieve this goal, as approved by the Town.

#### **4.3.3 PERFORMANCE STANDARD #3: Aesthetics and Quality of Life**

1. The design, installation, and maintenance of the project shall enhance the visual aesthetics of the landscape.
2. The project shall provide for an enriched quality of life by promoting an enhanced level of design, installation, and maintenance that fits the unique natural character and beauty of the Town, coupled with high-quality land development.
3. The project shall preserve Castle Rock's natural resources, such as, but not limited to: views, nature, wildlife, habitat, flora, and fauna.
4. The project shall provide year-round diversity of color and texture in plant material.

## 4.4 LANDSCAPE DESIGN

Unless otherwise specified within a particular land use, the criteria within this section shall apply to all land uses.

### 4.4.1 SOIL EVALUATION

Soil tests determine the conditions of the soil related to texture, acidity, salts, and nutrient availability.

1. A soil analysis shall be conducted by a professional soil scientist at a certified soils laboratory.
2. Soil sample(s) shall be taken after over-lot grading, if applicable, and prior to landscaping.
3. The soil sample must represent a uniform area. Differences in texture (sand, silt, or clay), color, slope, degree of erosion, drainage, past management practices, and types of plant material designed for each area should be taken into account when collecting the sample. The soil scientist shall determine the sample sites, depth, and frequency necessary to reflect a representative sample of the site and to coincide with the plant material intended for the area in the design. Recommended sampling frequency is no less than one sample per five thousand (5,000) square feet. Any sampling less than this frequency shall be justified by the soil scientist.
4. The soil analysis shall determine the organic and inorganic composition of native/indigenous soil in landscaped areas, and shall include:
  - a. Soil texture
  - b. Total exchange capacity
  - c. Conductivity
  - d. Organic matter
  - e. pH level
  - f. Content of Nitrogen, Phosphorus, Potassium, Zinc, Iron, Copper, Manganese, Calcium, Magnesium and Lime

### 4.4.2 STOCKPILING

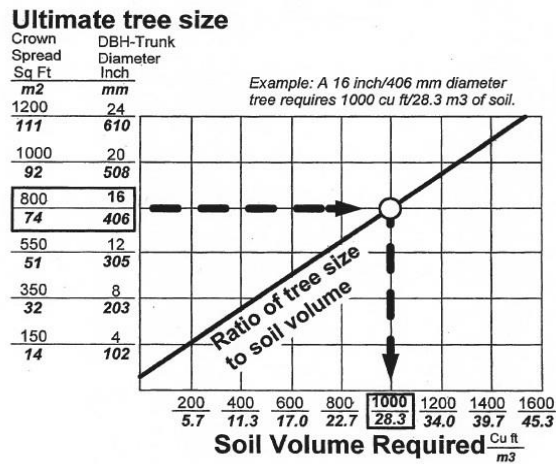
When stripping of topsoil occurs, stockpiling shall be required during construction (except as waived by Town staff). The replacement of this soil, plus additional soil amendments is critical to successful plant material establishment, ongoing health, and efficient use of water throughout the life of the project.

### 4.4.3 SOIL AMENDMENT

1. The soil analysis shall include specific recommendations based on the soil test results for the type of plant material to be grown in each landscaped area. The type and volume of soil amendment shall be determined by the soil scientist and be consistent with the indigenous soil and the needs of the plant material in each area of the landscape.

2. A minimum of four cubic yards of organic matter soil amendment per one thousand (1,000) square feet of landscaped area shall be required for turf grass, trees, shrubs, perennials, and annuals. See **Table 4-1** for soil volumes for trees. Soil amendments for native seed areas must be consistent with TESC detail #17.
3. Soil amendment organic matter shall consist of compost, as defined in **Section 1**.
4. Source water, such as non-potable water should be considered.

**TABLE 4-1: Tree Soil Volume by Tree Size**



Calculating soil volumes for each tree

#### 4.4.4 SOIL PREPARATION

1. Amendment shall be tilled to a minimum depth of six (6) inches.
2. Site shall be graded to within two-tenths (2/10th) of a foot.
3. Slopes greater than 3:1 are not permitted.
4. The site shall be free of rocks, dirt clods, and debris over three-quarter inch (3/4-inch) diameter in size.
5. Dry-land seed areas may contain dirt clods up to two (2) inch diameter in size.

#### 4.4.5 STRUCTURAL SOIL

1. Cornell University (CU) Structural Soil™ is required for all approved narrow tree planting strips less than eight (8) feet in width (measured back of curb to edge of walk), as well as in tree grates. The minimum tree planting area is six (6) feet in width. See standard Details for structural soil requirements.
2. All applicable soil criteria and standards shall be noted on drawings.

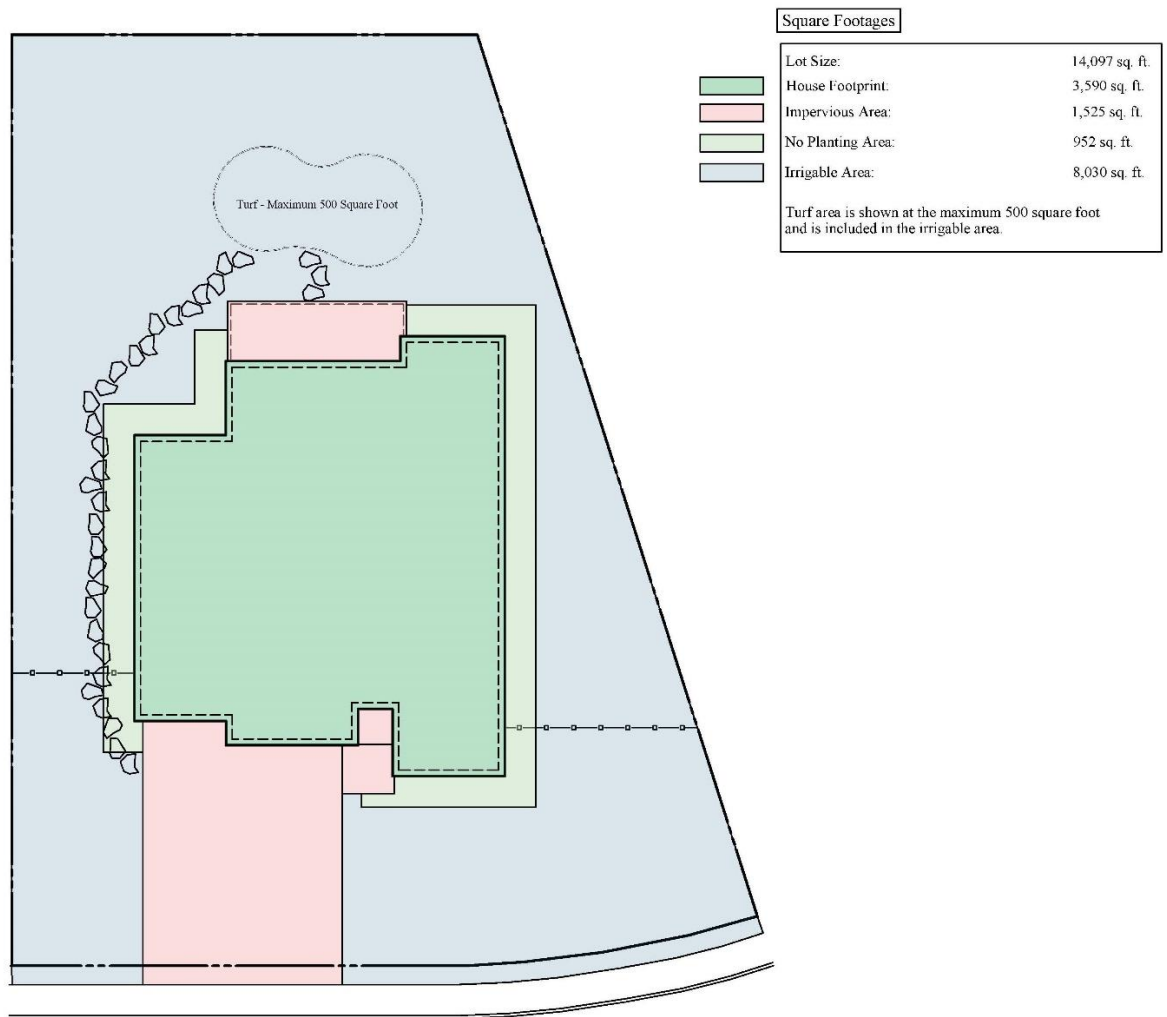
#### 4.4.6 INSPECTIONS

1. Inspections are required before installation of plant material, and shall include review of adherence to all criteria. Written documentation reflecting the approved volume and type of soil amendment is required upon request. See [CRgov.com/landscapeforms](http://CRgov.com/landscapeforms) for current inspection requirements.
2. All landscape and irrigation inspections are weather-dependent. Due to the extreme variability and unpredictability in temperatures, precipitation, vegetation reaching dormancy, and reduced daylight hours, inspections will not be performed between October 1<sup>st</sup> and March 1<sup>st</sup>.
3. **Residential** inspections include, but are not limited to the following:
  - a. Compost and finish grade inspection, to include soil till depth
  - b. WI-FI enabled smart controller
  - c. Rain sensor
  - d. No overhead irrigation in any area less than ten (10) feet
  - e. Curb stop box must be installed no more than one and one half (1 ½) inches above finish grade.
4. **Non-residential** inspections include, but are not limited to the following:
  - a. Pre-construction meeting
  - b. Point of connection (IR-9 detail)
  - c. Compost
  - d. Finish grade inspection, including soil till depth
  - e. No slopes greater than 3:1
  - f. No overhead irrigation in any area less than ten (10) feet
  - g. Subsurface irrigation, as necessary
  - h. Final landscape
  - i. Final irrigation
5. Certificate of Occupancy (CO) will not be issued until all inspections have been completed, punch list items have been addressed, the final letter of acceptance has been issued, and the irrigation permit has been closed. For Town managed parks reference Parks, Trails, and Open Space Development Standards.
6. To receive the CO, before completion of all permit requirements, the applicant may post a surety. For Town managed parks reference Parks, Trails, and Open Space Development Standards.
7. Surety required is 115% of the remaining work to be completed, and will be determined as a percentage of the owner's landscape and irrigation construction contract for items incomplete as determined by the approved plans unless a lower surety amount is outlined in the Subdivision Improvement Agreement (SIA) or Property Improvement Agreement (PIA). For Town managed parks, reference Parks, Trails, and Open Space Development Standards.

#### 4.4.7 IRRIGABLE AREA

1. The irrigable area for the front yard and the irrigable area for the backyard must be defined in the landscape plan that is submitted for plan review and is representative of the area available for plantings and separate from the following:
  - a. Lot size
  - b. Structure footprint
  - c. Impervious surfaces
  - d. Drainage
  - e. Easements
  - f. Defensible Space, Zone 1

Figure 4-2: Landscape Plan defining the Irrigable Area



#### 4.4.a PLANT MATERIAL SPECIFICATIONS AND PLANTING STANDARDS

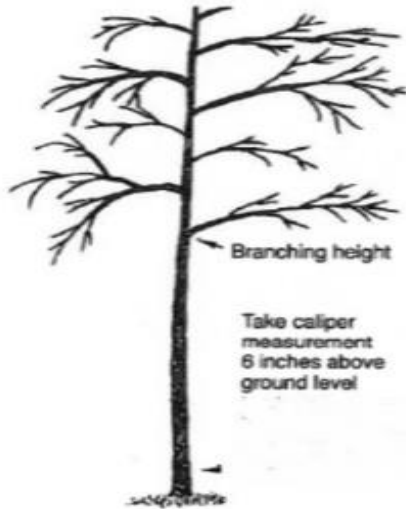
1. Minimum plant material quality
  - a. Plant material shall be selected from the Town of Castle Rock approved plant list. Any plant material not on the approved plant list must be submitted for review and approval. Submissions must be consistent with Development Services procedures and shall include water requirements,

USDA hardiness zone information, and plant flammability rating. Plant material shall be adaptable to the local environment and capable of naturalizing.

- b. A minimum coverage of seventy-five (75) percent living plant material, at maturity, is required. No more than twenty-five (25) percent may be non-living material, including organic mulch and rock. Plant material shall meet or exceed the plant quality and species standards of the current American Standard for Nursery Stock.
  - c. Selected plant material shall be nursery-grown in accordance with proper horticultural practice. Plants shall be healthy, well-branched vigorous stock with a growth habit normal to the species and variety, free of disease, insects, and injuries.
  - d. Plant material that is banned for use by the Town of Castle Rock, Douglas County, and/or the State of Colorado shall not be used. This applies to all builders, installers, owners, and, individual homeowners. Please see the [Colorado Department of Agriculture website](#) for a detailed list of restrictions.
  - e. Plants are to be hydrozoned with plants that have a similar water requirement. Plants of a very low hydrozone are not to be planted in a moderate to high hydrozone.
2. Minimum plant material size - All plant material shall meet the following requirements:
- a. Large canopy deciduous shade trees shall be a minimum of two (2) inches in caliper, measured six (6) inches above the ground. Large canopy deciduous shade trees shall be three (3) inch caliper when in a grate, or planted in areas less than eight (8) feet in width.



**FIGURE 4-2: Tree measurement**



- b. Ornamental and flowering trees shall be a minimum of one and one half (1½) inches in caliper measured six (6) inches
  - c. Evergreen trees shall be a minimum of six (6) feet tall, measured to the mid-point of the most recent year's growth.
  - d. Shrubs shall be fully rooted, a minimum of a #5 container in size, and spaced to provide seventy-five (75) percent ground cover within five (5) growing seasons. See the Town of Castle Rock Plant List for specific growth characteristics.
  - e. Ornamental grasses may be used to meet the shrub requirement; all plant material must meet the minimum size requirements for shrubs listed above.
  - f. Perennials, ground covers, and vines shall be a minimum of a #1 container in size. Such shall be spaced to provide seventy-five (75) percent ground cover within three (3) growing seasons.
  - g. Annuals shall be sized appropriately to the application, whether flats, four (4) inch pots, or larger, and spaced to provide seventy-five (75) percent ground cover.
  - h. Grass seed planting quality and quantity in irrigated areas shall comply with nursery standards and shall provide a minimum ground cover of eighty (80) percent within the first growing season. For non-irrigated native areas, see Temporary Erosion and Sediment Control Requirements.
3. Minimum planting standards
- a. Landscaping shall comply with the Town of Castle Rock planting details.
  - b. Plant materials shall be spaced appropriately to allow adequate room for the root zone and vegetation at maturity.
  - c. A minimum distance of ten (10) feet shall be provided between large canopy trees and buildings or trees and fences. The space provided must allow adequate room for mature trees.

- d. Tree rings shall be provided for all trees within turf areas subject to mowing operations. Tree rings for evergreen trees shall extend to the dripline of the tree to avoid limbing up of evergreen trees.
  - e. Standard planting areas for large canopy deciduous shade trees shall be no less than eight (8) feet in width.
  - f. When an eight (8) foot width planting area is not possible, such as in urban areas or overlay districts, large canopy deciduous shade trees may be planted in areas less than eight (8) feet wide and shall require CU-Structural Soil™.
  - g. Small canopy trees shall be planted in a landscape strip no less than six (6) feet in width (not including curb and gutter).
  - h. No plant material other than trees shall be planted in native grass areas.
4. Minimum amount of plant material.
- a. Tree requirements cannot be exchanged for other types of plant material. Fifty (50) percent of the gross site area tree requirement must include large canopy deciduous shade trees.
  - b. Diversity requirements for trees and shrubs are contained in **Table 4-3**.

**Table 4-3: Diversity Requirement Scale**

| <b>Deciduous Tree or Shrub Plant</b> |                                 |
|--------------------------------------|---------------------------------|
| Number of Plants                     | Maximum % of Single Species     |
| 1 to 5                               | Can have 100% of single species |
| 6 to 10                              | Maximum of 50% of one species   |
| 11 to 15                             | Maximum of 33% of one species   |
| 16 to 20 or more                     | Maximum of 25% of one species   |
| <b>Evergreen Tree or Shrub</b>       |                                 |
| Number of Plants                     | Maximum % of Single Species     |
| 1 to 2                               | Can have 100% of single species |
| 3 to 6                               | Maximum of 50% of one species   |
| 7 to 12                              | Maximum of 33% of one species   |
| 13 to 40                             | Maximum of 20% of one species   |

#### **4.4.9 NON-LIVING LANDSCAPE MATERIAL**

- 1. Organic mulch, includes bark and wood chips
  - a. Shall be applied at one (1) cubic yard per eighty (80) square feet at a depth of four (4) inches, and as appropriate to each species.
  - b. Shall be applied to the soil surface, not against the plant stem or base of tree trunks, to minimize disease.

- c. For all applications including residential and commercial, wood mulch is not allowed in drainage swales or areas of ponding water such as detention ponds. Rock mulch or other approved means of stabilization designed in accordance with the Storm Drainage Design and Technical Criteria Manual is required in areas of concentrated runoff.
- 2. Inorganic mulch includes rock, gravel, or cobble.
  - a. Rock mulch shall have a minimum depth of two (2) inches.
  - b. Recycled rubber for landscape use is discouraged.
- 3. Landscape fabric may be used underneath mulch to reduce weeds. Plastic is not allowed.
- 4. Artificial plant material is permitted. Materials such as artificial turf may be used. Homeowners Associations and other private restrictions may apply.
  - a. Artificial turf must be installed and maintained per manufacturer specifications.
- 5. Edging shall be consistent with industry standards. The metal edging shall be rolled or capped to eliminate sharp edges.
- 6. Water features shall recirculate water and be designed to reduce evaporation. Water features shall be on a separate service connection from the domestic water service. Water demand for the feature shall be defined and included in service connection sizing requirements. Wind shut-off devices are required.
- 7. Landscapes must be designed for functionality and visual appeal by incorporating a variety of organic and inorganic non-living landscape materials. At a minimum, each front yard landscape needs to incorporate one item from each column.

Table 4-4: Non-living Landscape Material

| In-Organic Mulch  | Organic Mulch                                  | Large Rock mulch/ Boulders                                  |
|---|--|---|
| Decomposed granite<br>Rock Mulch 1/8" – 1 1/2"<br>River Rock<br>Pea Gravel<br>Granite<br>Breeze | Tree Bark<br>Wood Chips<br>Shredded Wood Mulch | Rock Mulch 2" or Larger<br>Cobble<br>River Rock<br>Boulders |

#### 4.5 IRRIGATION DESIGN

This section identifies criteria for irrigation service connections, control, methods, equipment,

and system efficiency.

#### **4.5.1 GENERAL DESIGN**

Unless otherwise specified within a particular land use, the criteria within this section shall apply to all land uses.

1. Landscaped areas five hundred (500) square feet or less, including pots and planters, do not require permanent irrigation. These areas may be watered by bulk water service or from the building through a combined service line and must be well-maintained.
2. Landscaped areas greater than five hundred (500) square feet require permanent irrigation systems.
  - a. Irrigated areas between five hundred (500) and five thousand (5,000) square feet shall be served from the building through a combined service line.
  - b. Irrigated areas greater than five thousand (5,000) square feet shall require a dedicated irrigation service line. This requirement does not apply to single-family lots.
  - c. Irrigation shall be hydrozoned, grouping similar water demands by irrigation zone.
3. Irrigation is not allowed in areas less than four (4) feet in width.

4. Only drip and subsurface irrigation systems are allowed in areas between four (4) feet and ten (10) feet in width.
5. Generally, trees, shrubs, perennials, and ground cover shall be irrigated with drip irrigation. See Irrigation System Design for additional specific criteria. Native grass may be permanently irrigated on slopes not to exceed 3:1 (Slopes steeper than 3:1 are not permitted). Native areas shall be maintained in a manner consistent with native or regionally adapted low or very low plant material. Native areas shall not be irrigated or maintained as traditional turf.
6. Native grass may be temporarily irrigated for establishment purposes. See the Town of Castle Rock Temporary Irrigation Criteria (Appendix A). These criteria are required to be shown on the landscape or irrigation sheets submitted for construction document review.

#### **4.5.2 WATER SERVICE CONNECTION**

Water service connections for irrigated areas greater than five thousand (5,000) square feet shall be completed consistent with all Town regulations.

1. Irrigation shall be served from a dedicated irrigation service connection to the Town's water distribution system, separate from the domestic water service.
2. All irrigation water shall be metered and have appropriate backflow prevention as identified by Town regulations. Backflow prevention assemblies must be installed no further than five (5) feet from the irrigation meter.
3. The irrigation water service connection shall be sized appropriately to accommodate irrigation during the hours and days outlined in the Town's Water Use Management Plan.
4. The mainline or lateral line from a single irrigation service connection shall not cross lot lines.
5. Maximum velocity shall not exceed seven and one half (7.5) feet per second through the service line and meter.
6. Mainline pressure
  - a. System design shall consider minimum and maximum allowable mainline pressure as provided by the Town.
  - b. Minimum pressure provided shall be forty-three (43) psi, and maximum pressure shall be one hundred and twenty-five (125) psi.
  - c. Site water pressure shall be identified by Castle Rock Water prior to irrigation system design and shall be noted on irrigation plans. Actual on-site pressure may vary based on water system demand at the time of the pressure test, subsequent development placing additional demand on the water system, etc.
7. Irrigation service connections (taps) shall not interconnect downstream of the meter. Irrigation mains cannot intersect with other irrigation mains serviced off another service connection.
8. The irrigation service line shall be the same size as the tap from the Town water main through the point of connection, as outlined in the IR-9 detail.

### 4.5.3 IRRIGATION SYSTEM CONTROL

1. WI-FI-enabled smart irrigation controllers are required and shall be installed according to manufacturer recommendations. They shall apply the appropriate amount of water to maintain healthy growing conditions.
2. Due to common power outages, battery backup or non-volatile memory is required on all controllers.
3. Central Control Systems are recommended for larger irrigated areas, ten thousand (10,000) square feet or larger.

### 4.5.4 IRRIGATION SYSTEM DESIGN

1. A resilient shut-off valve with manual drain, or stop and waste valve, is required downstream of the meter.
2. All irrigation systems shall be contained by the appropriate backflow prevention assembly. See the Town's Cross-Connection Control requirements in the Town code and associated policy manual(s). A passing backflow prevention test is required for the issuance of a certificate of occupancy.
3. Master valves are required, and must be installed in a standard rectangular irrigation valve box.
4. Flow sensors are required on non-residential service connections, and must be installed in a standard rectangular irrigation valve box.
5. Rain sensors are required.
6. Overhead irrigation.
  - a. Overhead irrigation is not allowed in areas less than ten (10) feet in width/length.
  - b. Temporary irrigation is allowed on slopes not to exceed 3:1. Refer to Temporary Irrigation Criteria in Appendix A.
  - c. There shall be no overhead irrigation in parking lot peninsulas, islands, or entryways.
  - d. Pop-up height shall be consistent with the mature height of the plant material being irrigated. A pop-up height of six (6) inches is required for turf areas. A pop-up height of twelve (12) inches is required for native, wildflower, or perennial areas.
  - e. Pop-up spray heads shall be equipped with internal check valves, internal pressure regulation (Pressure regulation must be consistent with manufacturer's recommendations for the selected nozzle), and matched precipitation rate spray or rotary nozzles. Variable arc spray nozzles are not allowed.
  - f. Rotors shall be equipped with internal check valves and pressure regulation.

## 7. Drip irrigation

- a. Drip irrigation is required in areas greater than four (4) feet, and less than ten (10) feet.
  - b. Drip irrigation shall be point-source drip or sub-surface drip irrigation for all trees, shrubs, perennials, and annual beds.
  - c. Drip emitters and sub-surface drip shall be equipped with internal check valves at each emitter.
  - d. All (Residential and non-residential) point-source drip, sub-surface drip, dripper line, and bubblers must be installed with an operational indicator in each planting area and a flush valve, with an operational indicator at every dead end. Operational indicators that use one-quarter ( $\frac{1}{4}$ ) inch tubing (spaghetti tubing) are not allowed. Operational indicators are to be installed flush with grade.
  - e. All drip emitters shall be installed on stakes and placed above the mulch, around the perimeter of the plant.
  - f. Lateral lines and tubing shall be concealed underneath the required ground cover.
8. Bubblers may be substituted for drip emitters where necessary to provide adequate supplemental irrigation to plant material in certain locations (i.e., trees in native grass areas).
9. There shall be no irrigation within street medians or roundabouts.
- a. All material proposed within street medians or roundabouts shall be designed to minimize dislodging and obstructing travel lanes and be compatible with Town maintenance operations. Proposed material must be shown on plan submittals. The final selected material must be approved by the Town.
10. Irrigation charts and hydraulic worksheets are required for irrigation plan submittal on construction documents.

### 4.5.5 IRRIGATION SYSTEM INSTALLATION

Installation of irrigation system shall be consistent with approved plans and meet Town performance standards and criteria before issuance of certificate of occupancy or other Town approval. Release of bonding or surety, if applicable, shall be withheld until approval is given.

1. Irrigation system installation shall be consistent with the approved system design.
2. Irrigation system efficiency
  - a. The irrigation system shall achieve a seventy-five (75) percent distribution uniformity efficiency rating as demonstrated through an independent audit performed after installation by a Certified Irrigation Auditor, or as certified by the Irrigation Designer and accepted via the Town's Irrigation Design Affidavit.

- b. The irrigation audit shall result in a representative sample of the irrigation zones, and at a minimum shall include evaluation of a random sampling of no less than twenty-five (25) percent of overhead irrigation zones, to include a minimum of two (2) spray zones and two (2) rotor zones. At the discretion of Castle Rock Water, the minimum number of zones may be increased depending on the size and complexity of the irrigation system.
  - c. The Town reserves the right to conduct follow-up audits as deemed necessary at the expense of the customer.
  - d. The irrigation system shall consist of high-efficiency nozzles, with an application rate not to exceed one and one quarter (1.25) inches/hour.
  - e. When nozzles are installed on spray head bodies (either fixed spray nozzles or rotary nozzles), the spray head body must be equipped with internal pressure regulation consistent with the manufacturer's recommended design pressure.
  - f. The irrigation system design and installation must include head-to-head coverage, without overspray onto impervious surfaces at final inspection.
3. Backflow prevention assembly testing
- a. A passing backflow prevention assembly test is required prior to the issuance of a certificate of occupancy. This shall include a mechanical test of the assembly, validation of protection for the degree of hazard present, and proper installation according to the manufacturer's recommendations and Town of Castle Rock requirements.

#### **4.5.6 IRRIGATION SYSTEM OPERATION**

All irrigation shall occur according to the specifications of the Town's Water Use Management Plan, including hours, days, and application rates. Irrigation systems shall be operated and maintained in a manner that meets efficient irrigation performance standards. Temporary establishment and permanent irrigation methods, as well as timing and application rates, shall be included in irrigation plans.

- 1. Establishment irrigation – to be defined for each plant material type (including turf types, naturalized grasses, trees, shrubs, perennials, annuals, ground covers, etc.)
  - a. Identify temporary, establishment irrigation methods.
  - b. Identify application rates, and monthly, and annual water demand totals for the establishment period.
- 2. Permanent irrigation – to be defined for and by each plant material type (including turf types, naturalized grasses, trees, shrubs, perennials, annuals, ground covers, etc.).
  - a. Dedicated water service connections have designated watering days determined by address or location.
  - b. Permissible hours of irrigation will be consistent with those outlined in the Water Use Management Plan.



- c. Seasonal application rates shall be consistent with plant water requirements identified in the Town of Castle Rock Plant List.

## **4.6 GENERAL MAINTENANCE**

### **4.6.1 IRRIGATION**

1. Regular maintenance of the irrigation system includes backflow prevention assembly testing, leak repair, damaged part replacement, head adjustment, filter and strainer cleaning or replacement, and application rate adjustment.
2. A completed, passing backflow prevention assembly test, consistent with the parameters outlined in the Town's cross-connection control standards is required within ten (10) days of irrigation system start-up each season. Proper assembly operation shall also be verified through a passing backflow prevention assembly test when the assembly is taken out of service for maintenance or repair.

### **4.6.2 LANDSCAPE**

1. All landscape improvements, indigenous plant material, and irrigation system components shall meet performance standards and supporting criteria. Violation of these standards or criteria shall be considered a code violation.
2. Maintenance requirements shall be noted on landscape and irrigation plans.
3. Regular maintenance shall be consistent with the needs of the plant material and may include pruning, mowing, fertilization, and weeding.

### **4.6.3 TURF, WOODY PLANTS, NATIVE GRASSES AND FERTILIZATION**

1. Turf
  - a. Turf shall be maintained in a manner consistent with its growth characteristics and intended use. It shall optimize sustainability through maintenance practices that encourage root development and overall plant health.
  - b. Preferred mowing height is three and one-half (3-1/2) inches, to promote root growth and reduce water requirements.
  - c. Adjust mowing frequency throughout the growing season to remove between one-quarter (1/4) and one-third (1/3) of the grass height per mowing, improving turf condition and reducing mowing equipment emissions.
  - d. Maintain mowing equipment by sharpening mower blades, or checking reel-type mowers for proper blade-to-bed knife adjustment
  - e. Thatch build-up shall be addressed for plant health purposes and to reduce run-off.
  - f. Spring and fall aeration are recommended.

## 2. Woody plant material

- a. The mature size of woody plant material shall be considered during the design process so that pruning should only be necessary due to damage or health conditions, and to encourage a natural growth habit for hedges and topiaries.
- b. Pruning practices consistent with the type of tree or shrub. It is recommended to not remove more than one-third 1/3 of the branch growth.
- c. Eliminate dead and diseased plant material. If this causes significant disfigurement, replacement is necessary.
- d. Encourage naturalistic habits and reduce crowding, while controlling scale related to landscape and size relative to safety parameters (site distances, etc.).

## 3. Native Grasses

- a. Native grasses must be maintained in their natural form. Native grasses should NOT be mowed and maintained as turf grass. Mowing of native grasses should only be on an as-needed basis for items like winter management prep, weed control, or along paths for sight visibility
- b. Native grasses may be temporarily irrigated for establishment purposes but should not receive regular irrigation.
- c. Management of weeds is necessary in native grass stands.

## 4. Fertilization

- a. Fertilizer composition is consistent with soil test recommendations, amended soil condition, and plant material requirements.
- b. Fertilizer is applied on an as-needed basis, and excess application is avoided. Low phosphorus fertilizers are recommended.
- c. The fertilization program shall be submitted with construction document landscape plans.

### **4.6.4 WEED, PEST, AND DISEASE CONTROL**

Shall be consistent with the approved maintenance plan for the property, and shall comply with all Town, County, and State regulations.

1. All landscape areas shall be installed and maintained free of invasive species and noxious weeds.
2. Pest and disease control measures shall be taken, when needed.

### **4.6.5 DEAD PLANT MATERIAL**

Dead plant material shall be removed and replaced with healthy plant material of comparable size and species that meet the original intent of the approved landscape design within forty-five (45) days of the Town being notified of a problem, or sooner in the

event of a contagious disease or invasive insect species. If seasonal conditions prohibit removal and replacement, a property owner may request a deferral of installation.

Deferral request shall be in written form with an estimated date of installation and must be approved by the Town.

The Town is not responsible for plant damage due to insects, disease, winter injury, irrigation malfunctions, or other environmental factors.

#### **4.6.6 Non-living Landscape Material**

Nonliving landscape material such as rock, stone, bark chips, and shavings that no longer cover the area in which they were originally installed, shall be regularly replenished to maintain the full coverage to a minimum depth of two (2) inches for rock mulch and four (4) inches for wood mulch. Additionally, the irrigation system shall be maintained so lateral tubing and piping is secured in place and do not become a trip hazard.

## Section 5: Multi-Family Residential

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### 5.0 INTRODUCTION

This section describes the minimum necessary performance standards and criteria for multi-family residential land uses. Unless specifically called out in this section, the general performance standards and criteria in **Section 4** shall apply.

### 5.1 APPLICATION

#### 5.1.1 APPLICABLE DWELLINGS

This section applies to multi-family residential properties within the Town limits, or served by Castle Rock Water, and includes the following:

1. Apartment complexes
2. Townhomes and condominiums
3. Mobile home dwelling complexes or parks
4. Residential properties found in the R-3 Multi-Family Residence District or as similarly zoned by a Planned Development. See Town of Castle Rock Municipal Code Title 17 for zoning information.

#### 5.1.2 APPLICABLE LANDSCAPE AND IRRIGATION

1. Gross site area
2. Front, back, and side yard, including setbacks and utility easements
3. Parking lot
4. Common area
5. Associated facilities
6. Streetscapes and rights-of-way (ROW), included with the project shall adhere to the performance standards and criteria in **Section 9**.

### 5.2 DESIGN REQUIREMENTS

This section identifies the minimum performance standards and criteria for landscape design for this land use.

#### 5.2.1 LANDSCAPE DESIGN

##### 5.2.1.1 SITE REQUIREMENTS

1. Gross Site Requirements

A minimum of twenty (20) percent of the gross site area shall receive landscape

improvements. The gross site area shall exclude the right-of-way. ROW landscaping is required for adjacent streets, but is not included in the required calculation for the site. See **Section 9** for associated ROW and streetscape requirements. The gross site area may include the area required for parking lot landscaping improvements. The area required for parking lot landscaping improvements must be provided independent of other required improvements.

### 5.2.1.2 PARKING LOT REQUIREMENTS

#### 1. Performance Standards

- a. Trees shall reduce urban heat-island effect.
- b. Trees shall not cause snow build-up or ice problems.
- c. Plant material shall accommodate environmental conditions associated with parking lots, including heat-island effect and snow storage.
- d. Trees shall not interfere with driver visibility of pedestrians or drive-aisle traffic.
- e. Design, plant materials, and hardscape material shall consider levels of foot traffic and shall not create pedestrian safety hazards.

#### 2. Criteria

- a. A minimum of ten (10) percent of the parking lot area shall be landscaped. (This requirement is included within and counts toward the minimum gross site area requirements).
- b. A minimum of two (2) large canopy deciduous shade trees and four (4) shrubs for each one thousand (1,000) square feet of required landscaped area shall be provided. See Table 5-1

**TABLE 5-1: Required trees and/or shrubs**

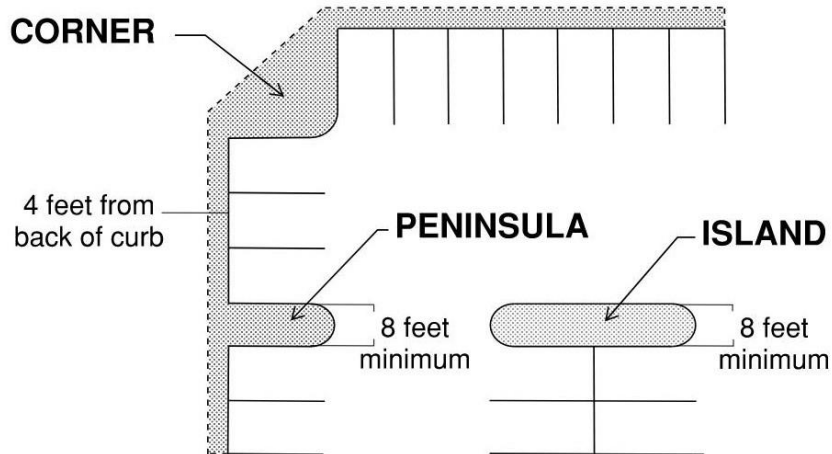
| AREA       | TOTAL AREA<br>Square Feet (sf) | REQUIRED LANDSCAPE AREA | REQUIRED TREES *                   | PROPOSED TREES | REQUIRED SHRUBS **                    | PROPOSED SHRUBS |
|------------|--------------------------------|-------------------------|------------------------------------|----------------|---------------------------------------|-----------------|
| Gross Site | 50,000 sf                      | 20% =<br>10,000 sf      | (10,000 sf / 1,000 sf)<br>x 2 = 20 | 20             | (10,000 sf /<br>1,000 sf) x 4<br>= 40 | 40              |
| Parking    | 5,000 sf                       | 10% =<br>500 sf         | (500 sf / 1,000)<br>x 2 = 1        | 1              | (500 sf / 1,000<br>sf) x 4 = 2        | 2               |

\* Required Trees = one (1) tree per one thousand (1,000) sf of landscaped area

\*\* Required Shrubs = four (4) shrubs per one thousand (1,000) sf of landscaped area

- c. Parking lots containing more than forty (40) spaces shall provide parking lot islands and/or peninsulas. When required, there shall be no more than fifteen (15) adjacent parking stalls between parking lot islands and peninsulas.
    - i. A minimum of one (1) large canopy deciduous shade tree and four (4) shrubs shall be provided for each parking lot island and peninsula.
      - 1. One (1) additional large canopy deciduous shade tree may be substituted in place of each of the four (4) required shrubs.
      - 2. Large canopy deciduous shade tree requirements cannot be exchanged for small canopy trees.
    - ii. A minimum width of eight (8) feet is required for parking lot islands and peninsulas.
3. Measuring the parking lot area and parking lot landscape area
- a. The measured parking lot area includes the paved area and parking lot curb. It does not include right-of-way and aisles leading to and from the parking lot. See Figure 5-1
  - b. The measured parking lot landscaped area includes parking lot islands, peninsulas, and corners (not including curbs) and may include a four (4) foot-wide landscaped area abutting the parking lot. It does not include right-of-way or detention areas.
    - i. Islands may only be considered part of the parking lot landscaped area when surrounded on four (4) sides by parking spaces or drive aisles.
    - ii. Peninsulas may only be considered part of the parking lot landscaped area when surrounded on three (3) sides by parking spaces or drive aisles.
    - iii. Corners may only be considered part of the parking lot landscaped area when surrounded on two (2) sides by parking. Landscaped corners are calculated creating a triangle using the two sides adjacent to the parking lot spaces or drive aisle and making the third triangle leg by connecting the curb corners.
    - iv. A four (4) foot wide landscaped area may only be considered when abutting the parking lot as measured from the back of the parking lot curb. See Figure 5-2

**FIGURE 5-2: Parking Lot Landscape Requirements**



**Shaded areas may be counted towards parking lot landscape requirement**

4. Other

- a. Evergreen trees shall not be located in parking lot islands, peninsulas, or any area that would cause snow or ice buildup on the parking lot.
- b. Evergreen trees shall not be located in parking lot islands, peninsulas, or any area that would block sight lines.
- c. Landscape plantings at mature size and landscape features over thirty (30) inches high above the flow line are not permitted in sight distance triangles adjacent to parking space access aisles.
- d. Plant material located within snow storage areas shall be chosen for tolerance to snow storage.

**5.2.1.3 PASSIVE RECREATION AREA**

Passive Recreation Areas: Multi-family land uses may have Passive Recreation Areas, a type of Common Area, for their residents. Such areas may be used for non-programmed athletic activities and may include picnic areas, small pavilions, benches, playgrounds, recreation, or play areas. These areas shall be designed to support such intended activities of the area, including pedestrian access and layout. For Town managed parks, **see Section 10**.

## Section 6: Single-Family and Two-Family Residential

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### 6.0 INTRODUCTION

This section describes minimum necessary performance standards and criteria for single and two-family residential land uses and recommendations for existing dwellings owned by individual homeowners. Unless specifically called out in this section, the general performance standards and criteria in **Section 4** shall apply.

### 6.1 APPLICATION

#### 6.1.1 APPLICABLE DWELLINGS

Applicable dwellings are new homes constructed by a developer, residential homebuilder, organization, custom homebuilder, semi-custom homebuilder, and homeowners.

This section applies to single-family and two-family residential properties within the Town limits, or served by Castle Rock Water, and includes the following:

1. Single-family, detached
2. Single-family, attached
3. Paired home
4. This includes the types of residential properties found in the R-1 and R-2 Single-family Residence District or as similarly zoned by a Planned Development. (See Town of Castle Rock Municipal Code Title 17 for zoning information).

#### 6.1.2 APPLICABLE LANDSCAPE AND IRRIGATION

1. Front, back, and side yards where landscape or irrigation are provided in new home construction, renovation, or maintenance.
2. All setbacks and utility easements were provided in new home construction, renovation, or maintenance.

### 6.2 DESIGN REQUIREMENTS

This section identifies the minimum performance standards and criteria for landscape design, irrigation design, and maintenance for this land use.

Landscaping or landscape materials shall be no more than thirty (30) inches above the flow line when located in a sight-distance triangle.

The front and backyard landscape and irrigation must be designed by the homebuilder as part of the construction process. All landscape and irrigation installation must be completed by a Registered Landscape Professional. The front and back yard landscape and irrigation must be designed by the builder. Front yard landscaping must be installed by the builder. The backyard can be installed by a builder or homeowner but must be stated clearly on the plans.



When present, swimming pools and water features will reduce the total amount of turf allowed by an equal area.

## 6.2.1 LANDSCAPE DESIGN

### 1. Site Requirements

#### a. Trees

- i. All pervious areas equal to or greater than four hundred (400) square feet shall have a minimum of one (1) large canopy deciduous shade tree provided in the setback. All pervious areas less than four hundred (400) square feet shall have a minimum of one (1) small canopy deciduous shade tree. Tree requirements cannot be exchanged for other types of plant material. Small canopy trees cannot be exchanged for required large canopy deciduous shade trees. NOTE: Sizing requirements for residential front yard trees shall be adhered to by all builder installations.
- ii. Diversity requirements for trees and shrubs are contained in Table 6-1 and apply to the installation of new home landscaping.

#### b. Front yard

- i. No turf allowed in front yards. The front yard landscape shall utilize a ColoradoScape design. Minimum 75% plant coverage at maturity (3 years).
- ii. In order to achieve the 75% minimum vegetation coverage, the following formulas will be used to determine minimum quantities of shrubs and perennials.
  1. The minimum quantity of shrubs (5 gallon size) is equal to the total irrigable area x 0.02 rounded up to the next whole number.
    - a. Example:  $775 \text{ ft}^2 \times 0.02 = 15.5$ , rounded up to 16 shrubs minimum.
  2. The minimum quantity of perennials is equal to the total irrigable area x 0.03 rounded up to the next whole number.
    - a. Example,  $775 \text{ ft}^2 \times 0.03 = 23.25$ , rounded up to 24 perennials minimum

#### c. Back yard:

Irrigated turf areas are only allowed in backyards, and cannot exceed 500 square feet. Larger areas of lower water use turf may be considered on a case-by-case basis, however, water budgets will not exceed the water requirements of 19 inches per season equivalent to 500 ft<sup>2</sup> of Texas Hybrid Bluegrass turf. Property owners requesting this option must be informed about the maintenance and management characteristics of the proposed alternative turf variety.

When present, swimming pools and water features will reduce the total amount of turf allowed by an equal area. Approved moderate and low water use turf or alternative turf are required. 100% Kentucky Bluegrass, and turf varieties that use more than nineteen (19) inches of water per growing season are not

allowed

i. Plant Material Requirements

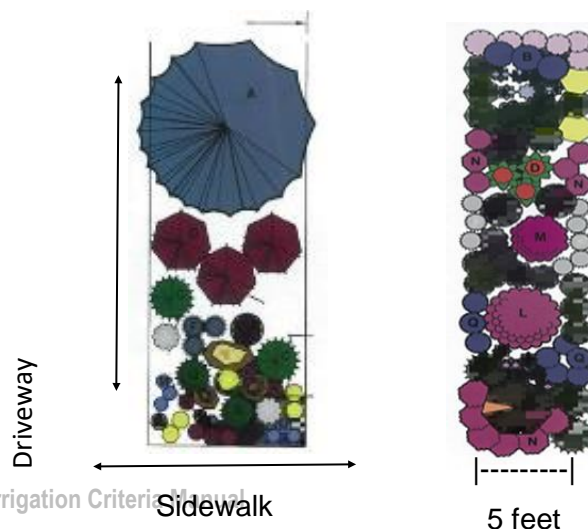
1. A minimum of two (2) trees.
2. The minimum quantity of shrubs (5 gallon size) will be calculated using the following formula.
  - a. Total backyard irrigable area, minus the total area of turfgrass installed, multiplied by x 0.01, and rounded up to the next whole number.
  - b. Example  $(1,245 \text{ ft}^2 - 500 \text{ ft}^2 \text{ of turf}) \times 0.01 = 7.45$ , rounded up to 8 shrubs minimum
3. The minimum quantity of ornamental grasses or perennials is calculated using the following formula.
  - a. Total backyard irrigable area minus the total area of turfgrass installed x 0.015, and rounded up to the next whole number.
  - b. Example  $(1,245 \text{ ft}^2 - 500 \text{ ft}^2) \times 0.015 = 11.175$ , rounded up to 12 ornamental grasses or perennials minimum

**TABLE 6-1: Diversity Requirement for Back Yard**

| Deciduous Tree or Shrub Plant |                                 |
|-------------------------------|---------------------------------|
| Number of Plants              | Maximum % of Single Species     |
| 1 to 3                        | Can have 100% of single species |
| 4 to 7                        | Maximum of 50% of one species   |
| 8 to 12                       | Maximum of 33% of one species   |
| 12 or more                    | Maximum of 25% of one species   |

**FIGURE 6-2**

Potential narrow strip design options featuring ColoradoScape plant materials and drip irrigation.





- d. Areas devoted to the cultivation of native or naturalized grasses shall be exempt from square footage limitations. These areas can be temporarily irrigated for establishment only. The establishment period is not to exceed one full growing season.

### 6.2.2 Non-Living Landscape Material (gates and walking paths) - Functionality

1. Non-living landscape materials used for walking paths must be designed and installed to be functional, safe, and accessible.
  - a. There must be a safe path for access during all seasons from the front yard to the back yard that will allow for pedestrian traffic and transport of basic yard maintenance equipment including push mowers, fertilizer spreaders, and aerators.
  - b. Where there is a porch / deck, stair landing, or walkout basement, a functional path is required to provide access to turf areas .
  - c. In locations where there is a gate separating the front yard from the back yard, the gate must be able to fully open and close without obstruction from landscape material.
2. Non-living landscape materials must be designed and installed to be appropriate and functional based on slope conditions and the physical terrain of each lot.
  - a. Walkway surfaces must be constructed utilizing:
    - i. Concrete
    - ii. Crusher fines
    - iii. Precast pavers
    - iv. Flagstone
    - v. Or other equal materials as approved.
  - b. Slopes greater than 3:1 are not permitted.
  - c. Where there are slope conditions that would compromise footing, pavement or landscape materials with structural integrity must be used in place of other materials that would erode and become non-functional.

### 6.2.3 IRRIGATION DESIGN

This section identifies performance standards and criteria for single-family and two-family residential irrigation systems including control, methods, equipment, and system efficiency.

#### 1. General Design

Unless otherwise specified within a particular land use, the criteria within this section shall apply to design and installations by developers, home builders and homeowners.

- a. Landscaped areas shall have a permanent water-efficient irrigation system providing full coverage to all plant material. Unless otherwise approved, this irrigation shall be an automatic irrigation system.
- b. The water service connection that provides water for irrigation shall be sized appropriately to accommodate irrigation during the hours and days outlined in the Town's Water Use Management Plan.
- c. All water used for irrigation shall be metered and have appropriate backflow

prevention as identified by Town regulations. Cross-connection control requirements shall be adhered to by all installations within this category, including homeowner installations.

- d. Maximum velocity should be determined by American Water Works Association standards, Town water criteria, Town-adopted plumbing code, and meter manufacturer operating standards. Flow rates should average no more than five (5) feet per second and shall not exceed seven and one-half (7½) feet per second for intermittent flow.
  - e. Irrigation mains cannot intersect with other irrigation mains serviced off another service connection.
  - f. Irrigation shall be hydrozoned, grouping similar water demands and exposure by irrigation zone.
  - g. Irrigation methods:
    - i. Only drip or sub-surface irrigation systems will be allowed in areas less than ten (10) feet in width.
    - ii. Irrigation is not allowed in areas less than four (4) feet in width.
2. Irrigation System Control
- a. WI-FI enabled smart irrigation controllers, capable of interval watering, are required. This requirement shall be adhered to by all installations within this category, including homeowner installations.

Due to common power outages, battery backup or non-volatile memory is required on all controllers. This requirement shall be adhered to by all installations within this category, including homeowner installations.

- b. Upon installation the landscape/irrigation installer shall program the controller to meet Water Use Management Plan requirements.
- c. Irrigation exemptions for the establishment of plant material may be granted. Should the installer set the controller in accordance with an irrigation exemption for plant material establishment, the installer shall return to re-program the controller upon expiration of the exemption, or instruct the homeowner to do so.
- d. The builder or landscaper should assist in educating the customer about watering restrictions in Castle Rock. The homeowner shall be responsible for compliance with water restriction regulations.

3. Irrigation System Design

- a. Resilient shutoff valve with manual drain, or stop and waste, is required to isolate the irrigation system from the domestic plumbing system.
- b. All irrigation systems shall be contained by the appropriate backflow prevention assembly. See the Town's Cross-Connection Control requirements in the Town Municipal Code Chapter 13.06.
- c. Backflow prevention assemblies shall not exceed sixty (60) inches above the ground.
- d. A Pressure Vacuum Breaker (PVB) shall be installed a minimum of twelve

- (12) inches higher than the highest possible outlet.
- e. Master valves are required. Master valves shall be housed in a 12-inch rectangular valve box.
  - f. Rain sensors are required.
  - g. Flow sensors are recommended.
  - h. Overhead irrigation.
    - i. Overhead irrigation is not allowed in areas less than ten (10) feet.
    - ii. Pop-up height shall be consistent with the mature height of the plant material being irrigated. A minimum pop-up height of six (6) inches or higher is required for plant material unless the plant material is natively maintained native grass or wildflowers, where a minimum pop-up height of twelve (12) inches is required.
    - iii. Pop-up spray heads shall be equipped with internal check valves, internal pressure regulation, and matched precipitation rate spray or rotary nozzles. Pressure regulation must be consistent with the manufacturer's recommendations for the selected nozzle.
    - iv. Rotors shall be equipped with internal check valves and pressure regulation.

- i. Drip irrigation
  - i. Drip irrigation shall be point source drip or sub-surface drip irrigation for all trees, shrubs, perennials, and annual beds.
  - ii. Drip emitters and sub-surface drip shall be equipped with internal check valves at each emitter.
  - iii. Sub-surface drip irrigation may be used for turf or grass areas and is required in areas less than ten (10) feet in width.
  - iv. All point-source drip, sub-surface drip, dripper line, and bubblers must be installed with an operational indicator in each planting area and a flush valve, with an operational indicator at every dead end. Operational indicators that use one-quarter (¼) inch tubing (spaghetti tubing) are not allowed.
- j. Bubblers may be substituted for drip emitters where necessary to provide adequate irrigation to plant material in certain locations (i.e., trees in native grass areas).
- k. Irrigation charts and hydraulic worksheets may be required for plan submittal.

#### 4. Irrigation system installation

The irrigation system shall meet Town performance standards and criteria prior to the issuance of a certificate of occupancy or other Town approval. Release of bonding or surety shall be withheld until approval is given.

- a. Irrigation system installation shall be consistent with the approved system design.
- b. A passing backflow prevention assembly test is required before issuance of a Certificate of Occupancy or other Town approval. The results shall include a mechanical test of the assembly, validation of protection for the degree of hazard present, and proper installation according to the manufacturer's recommendations and Town of Castle Rock requirements. Homeowner installations shall adhere to Cross-Connection Control requirements.

#### 5. Irrigation system operation

All irrigation shall occur according to the specifications of the Town's Water Use Management Plan including hours, days, and application rates. Irrigation systems shall be operated and maintained in a manner that meets efficient irrigation performance standards. Temporary establishment, and permanent irrigation methods, timing, and application rates shall be included in irrigation plans.

- a. Temporary irrigation (establishment) is defined for each plant material type (including turf types, naturalized grasses, trees, shrubs, perennials, annuals, ground covers, etc.).
  - i. Identify temporary establishment irrigation methods.
  - ii. Duration of establishment period to be determined by the temporary irrigation criteria.

- iii. Identify application rates and monthly and annual water demand totals for the establishment period.
- b. Permanent irrigation is to be defined for and by each plant material type (including turf types, naturalized grasses, trees, shrubs, perennials, annuals, ground covers, etc.).
  - i. Watering days and times are to be outlined in the Town of Castle Rock Water Use Management Plan.
  - ii. Seasonal application rates shall be consistent with the Town of Castle Rock Plant List.



## Section 7: Non-Residential Properties

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### 7.0 INTRODUCTION

This section describes minimum necessary standards and criteria for non-residential properties such as commercial development, business, industrial, governmental, school, religious institution, or mixed-use. Unless specifically called out in this section, the general performance standards and criteria in **Section 4** shall apply.

### 7.1 APPLICATION

#### 7.1.1 APPLICABLE USES

This section applies to non-residential properties and zoning districts within the Town limits, and/or served by Castle Rock Water, such as, but not limited to the following:

1. Business/commercial district use
2. Industrial
3. Governmental
4. Schools
5. Religious institutions
6. Mixed use containing one or more of the above uses
7. This includes the types of Non-residential properties found in the following zoning districts: B Business Commercial District, I-1 Light Industrial District, I-2 General Industrial District, similarly zoned by a Planned Development or an Overlay District. (See Town of Castle Rock Municipal Code Title 17 for zoning information).

#### 7.1.2 APPLICABLE LANDSCAPE

1. Gross site area
2. Areas, including setbacks and utility easements
3. Parking lot
4. Common area

Streetscapes included with the project shall adhere to the performance standards and criteria in **Section 9**.

Depending on the design, schools with passive parks passive recreation areas, and/or active sports fields, may require adherence to the performance standards and criteria in **Section 10**.

## 7.2 DESIGN REQUIREMENTS

### 7.2.1 LANDSCAPE DESIGN

Unless otherwise specified within a particular land use, the performance standards and criteria shall apply to all non-residential land uses within this section.

#### 7.2.1.1 SITE REQUIREMENTS

1. Performance Standards
  - a. Plant material diversity creates visual appeal and limits disease and other environmental problems.
  - b. Plant material diversity creates a seasonal appearance of greenery throughout the year.
2. Criteria
  - a. A minimum of ten (10) percent of the gross site area shall receive landscape improvements.
    - i. Gross site area does not include adjacent streetscapes or rights-of-way. Plantings in these areas must follow the standards in **Section 9**.
    - ii. Plantings in adjacent streetscapes, rights-of-way, or tracts along rights-of-way do not count toward the site requirements herein.
    - iii. Landscaping in the parking lot may be counted toward the minimum gross site area requirement.
  - b. A minimum of two (2) trees and four (4) shrubs for each one thousand (1,000) square feet of required landscaped area shall be provided. See the example in **Table 7-1**. Town Parks are excluded from this requirement, refer to **Section 10**.
    - i. Fifty (50) percent of the tree requirement must include large canopy deciduous shade trees.
    - ii. One (1) additional large canopy deciduous shade tree may be substituted in place of each of the four (4) required shrubs.
    - iii. Tree requirements cannot be exchanged for other types of plant material.
  - c. Plant material requiring more than ten (10) inches of water is not allowed. Plant material for non-residential areas must be hydrozone one (1) or two (2) from the Town of Castle Rock plant list.
    - i. Native grasses can be temporarily irrigated for establishment.
    - ii. Permanently installed overhead irrigation is not allowed.
    - iii. Traditional turf areas are not allowed
  - d. Water features are not allowed.**

### 7.2.1.2 PARKING LOT REQUIREMENTS

1. Performance Standards
  - a. Trees shall reduce urban heat-island effect.
  - b. Trees shall not cause snow build-up or ice problems.
  - c. Plant material shall accommodate environmental conditions associated with parking lots, including heat-island effect and snow storage.
  - d. Trees shall not interfere with driver visibility of pedestrians or drive-aisle traffic.
  - e. Design, plant materials, and hardscape material shall consider levels of foot traffic and shall not create pedestrian safety hazards.
2. Criteria
  - a. A minimum of ten (10) percent of the parking lot area shall be landscaped. (This requirement is included within and counts toward the minimum gross site area requirements).
  - b. A minimum of two (2) large canopy deciduous shade trees and four (4) shrubs for each one thousand (1,000) square feet of required landscaped area shall be provided. **See Table 7-1.**

**Table 7-1: Required trees and shrubs calculation**

| AREA       | TOTAL AREA IN SQUARE FEET (sf) | REQUIRED AREA (10%) | REQUIRED TREES *                                      | PROPOSED TREES | REQUIRED SHRUBS **                                       | PROPOSED SHRUBS |
|------------|--------------------------------|---------------------|---|----------------|--|-----------------|
| Gross Site | 50,000 sf                      | 5,000 sf            | $(5,000 \text{ sf} / 1,000 \text{ sf}) \times 2 = 10$ | 10             | $(5,000 \text{ sf} / 1,000 \text{ sf}) \times 4$<br>= 20 | 20              |
| Parking    | 5,000 sf                       | 500 sf              | $(500 \text{ sf} / 1,000) \times 2 = 1$               | 1              | $(500 \text{ sf} / 1,000 \text{ sf}) \times 4$<br>= 2    | 2               |

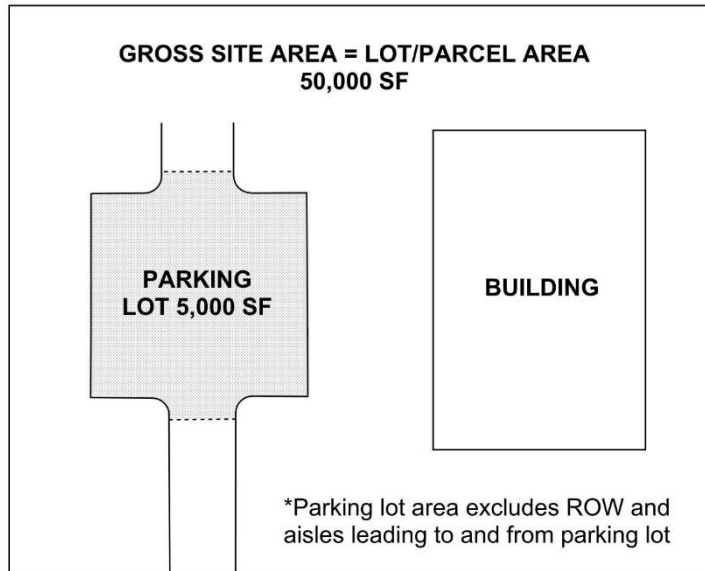
\* Required Trees = 2 trees per 1,000 sf of required area

\*\* Required Shrubs = 4 shrubs per 1,000 sf of required area

- c. Parking lots containing more than forty (40) spaces shall provide parking lot islands and/or peninsulas. When required, there shall be no more than fifteen (15) adjacent parking stalls between parking lot islands and peninsulas.
  - i. A minimum of one (1) large canopy deciduous shade tree and four (4) shrubs shall be provided for each parking lot island and peninsula.
    1. One (1) additional large canopy deciduous shade tree may be substituted in lieu of each of the four (4) required shrubs.
    2. Large canopy deciduous shade tree requirements cannot be exchanged for small canopy trees.

- ii. A minimum width of eight (8) feet is required for parking lot islands and peninsulas.
3. Measuring the parking lot area and parking lot landscape area
- a. The measured parking lot area includes the paved area and parking lot curb. It does not include right-of-way and aisles leading to and from the parking lot. **See Figure 7-1**

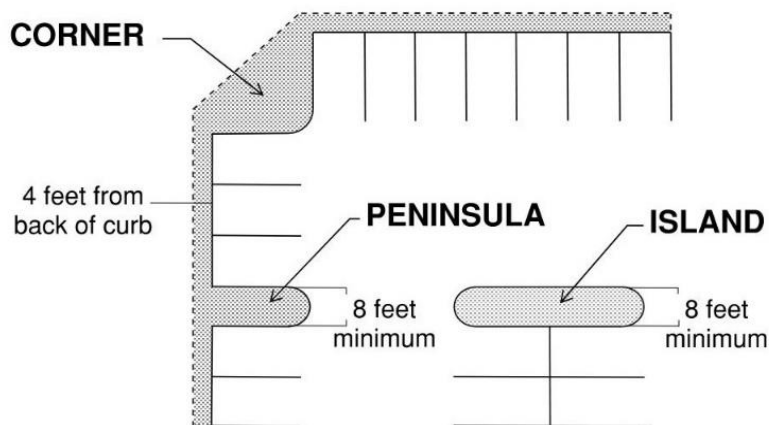
**FIGURE 7-1: Measured parking lot area**



- b. The measured parking lot landscape area includes parking lot islands, peninsulas, and corners (not including curbs) and may include a four (4) foot-wide landscaped area abutting the parking lot. It does not include right-of-way or detention areas.
  - i. Islands may only be considered part of the parking lot landscaped area

- when surrounded on four (4) sides by parking spaces or drive aisles.
- ii. Peninsulas may only be considered part of the parking lot landscaped area when surrounded on three (3) sides by parking spaces or drive aisles.
- iii. Corners may only be considered part of the parking lot landscaped area when surrounded on two (2) sides by parking. Landscaped corners are calculated creating a triangle using the two sides adjacent to the parking lot spaces or drive aisle and making the third triangle leg by connecting the curb corners.
- iv. A four (4) foot wide landscaped area may only be considered when abutting the parking lot as measured from the back of the parking lot curb. See **Figure 7-2**.

**FIGURE 7-2: Parking Lot Landscape Requirements**



**Shaded areas may be counted towards parking lot landscape requirement**

- c. Other
  - i. Evergreen trees shall not be located in parking lot islands, peninsulas, or any area that would cause snow or ice buildup on the parking lot.
  - ii. Evergreen trees shall not be located in parking lot islands, peninsulas, or any area that would block sight lines.
  - iii. Landscape plantings at mature size and landscape features over thirty (30) inches high above the flow line are not permitted in sight distance triangles adjacent to parking space access aisles.
  - iv. Plant material located within snow storage areas shall be chosen for tolerance to snow storage.

- v. The parking lot area landscape plan shall include large canopy deciduous shade trees to reduce the urban heat island effect.

## Section 8: Urban Areas

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### 8.0 INTRODUCTION

An Urban Area is a focused development that has limited open space, and primarily contains a mix of non-residential uses, but may integrate residential uses, that combine the uses in a way which considers character, local identity, heritage, pedestrians, and traffic. Urban Areas include the Downtown Overlay district, the Wolfensberger North Zoning Overlay district, or other dense mixed-use areas as determined by the Town.

This section describes minimum necessary performance standards and criteria for site and streetscape landscaping for Urban area uses not specifically addressed within the Castle Rock Municipal Code. Unless specifically called out in this section, the general performance standards and criteria in **Section 4**, **Section 5**, **Section 7**, and **Section 9** shall apply.

### 8.1 APPLICATION

#### 8.1.1 APPLICABLE USES

This section applies to Urban Areas as determined by the Town, or served by Castle Rock Water. Urban and vertical uses with approved Overlay District criteria shall adhere to all standards and criteria herein unless otherwise called out in approved Overlay District criteria. Refer to the Municipal Code for specific Overlay District requirements.

### 8.2 DESIGN REQUIREMENTS

#### 8.2.1 LANDSCAPE DESIGN

Unless otherwise specified within a particular land use, the criteria within this section shall apply to all land uses within this section.

1. Performance Standards
  - a. Landscaping shall create an aesthetically pleasing, pedestrian-friendly, urban environment for people to live, work, and shop.
  - b. Landscape plantings shall focus on building frontage and pedestrian corridors.
  - c. Streets shall be lined with trees, focusing on large canopy deciduous shade trees.
  - d. A tree canopy between on-street parking and storefronts creates a separation between cars and sidewalks and provides shade.
  - e. Shrubs provide for screening.
  - f. Perennials provide color and texture.
  - g. Groundcovers provide texture, depth, and soil cooling.

- h. Adequate growing space and soil amendment support the establishment and mature growth of plant material.

## 2. Criteria

### a. Minimum Planting Requirements

#### i. Downtown Overlay District – Municipal Code 17.42.080

All developments shall adhere to the following landscaping requirements with a focus on the pedestrian space and sidewalk areas as well as the criteria outlined in the Downtown Streetscape Palette guidelines landscaping plan will be required with all site plans, showing the proposed landscaping for the site. One (1) large canopy tree will be required for every twenty-two (22) linear feet (on center) or one (1) small canopy tree will be required for every fifteen (15) linear feet (on center) of property fronting along a public roadway. The landscaping plan is subject to approval by Castle Rock Water and Public Works Departments. Routine tree maintenance, such as trimming, thinning, watering, and, if necessary, tree replacement may be needed to ensure the quality of the streetscape. The following landscaping provisions include a ratio relationship between the number of plantings required, based upon the number of trees required. All shrub plants must be a minimum size of five (5) gallons at planting and all flowering perennial plants must be a minimum of one (1) gallon at planting. For every required tree, a corresponding number of plantings or trees, from either Subparagraph a, b, or c below, will be required for each site plan:

- a. Shrubs: Five (5) per required tree.
- b. Perennial plants: Seven (7) per required tree.
- c. Trees: One (1) per required tree.

#### ii. Front Street Overlay District – Municipal Code 17.43.060

Xeriscape and water-wise vegetation are encouraged in the FSOD while recognizing the historic landscaping of the Craig and Gould neighborhood. All developments shall adhere to the following landscaping requirements, with a focus on the pedestrian space and sidewalk areas. A landscaping plan will be required with all site plans, showing the proposed landscaping for the site. One (1) large canopy tree will be required for every twenty-two (22) linear feet (on center) or one (1) small canopy tree will be required for every fifteen (15) linear feet (on center) of property fronting along a public roadway. Seventy-five percent (75%) of the tree plantings must be large canopy trees. The landscaping plan is subject to approval by Castle Rock Water and Public Works Departments. Routine tree maintenance, such as trimming, thinning, watering, and, if necessary, tree replacement, may be needed to ensure the quality of the streetscape. The following landscaping provisions include a ratio relationship between the number of plantings required, based upon the number of trees required. All shrubs and plants must be a minimum size of five (5) gallons at planting, and all flowering perennial plants must be a minimum of one (1) gallon at planting. For every required tree, a corresponding number



of plantings or trees from either Subparagraph a, b, or c below will be required for each site plan:

- a. Shrubs: Five (5) per required tree.
  - b. Perennial plants: Seven (7) per required tree.
  - c. Trees: One (1) per required tree.
- iii. Wolfensberger Overlay District – Municipal Code 17.46.070

Landscaping. All developments shall adhere to the following landscaping requirements. A landscaping plan will be required with all site plans, showing the proposed landscaping for the site. For every two thousand (2,000) square feet of property, one tree will be required. The following landscaping provisions include a ratio relationship between the number of plantings required, based upon the number of trees required. All bush plants must be a minimum of five (5) gallons at planting, and all flowering perennial plants and other plantings must be a minimum of one (1) gallon at planting. For every required tree, a corresponding number of plantings or trees from either Subparagraph a, b, or c below will be required for each site plan:

- a. Shrubs: Three (3) per required tree.
  - b. Flowering plants: Six (6) per required tree.
  - c. Trees: One (1) per required tree.
- iv. For other Urban Areas, as determined by the Town, see **Section 7** for minimum tree and shrub requirements for the site, and **Section 9** for minimum tree and shrub requirements for the streetscape.

b. Trees

- i. Large canopy deciduous shade trees shall be spaced no more than forty (40) feet apart in the streetscape.
- ii. Tree planting strips less than eight (8) feet wide shall have CU™ Structural Soil.
- iii. Minimum tree planting width is six (6) feet.

c. Street Trees

- i. There shall be four (4) shrubs for every tree.

d. Tree Grates, excluding Town Parks

- i. Tree grates or similar planting sections are allowed in Urban Area streetscapes only and shall accommodate mature tree canopy.
- ii. Tree grates shall be a minimum of six (6) feet by six (6) feet. Grates shall be secured in place and installed flush with the walking surface.
- iii. All trees in grates shall be a minimum of three (3) inch caliper, measured six (6) inches above the ground.
- iv. Tree species shall be hydrozone one (1) or two (2) from the Town of Castle Rock plant list, and suitable for urban environments and narrow street tree planting strips.

- e. Overlay District potted plant requirement:
  - i. One percent of the total landscaped area is required to be planted in a summer flowering xeric perennial or annual plant.
  - ii. Flowering plants should be planted in window boxes, clay pots, or raised beds.
  - iii. Containers shall be able to drain water and contain the necessary amount of soil to grow healthy plants, however shall not create water waste.
  - iv. Flowers shall face the street or sidewalk adjacent to the property or the business entrance.
- f. Other
  - i. Plant material, other than trees, may be installed in areas less than four feet in width. Mature plant sizes shall be utilized to design urban planting areas. See the Town of Castle Rock Plant list for mature plant sizes.
  - ii. Provide adequate plant material for eighty (80) percent coverage within five (5) years.
  - iii. Provide a mechanism for the specific needs for long-term maintenance of landscaping within the urban environment.
  - iv. Provide regularity of watering, especially in planting vault situations with CU™ Structural Soil, as CU™ Structural Soil does not hold water as well as standard soil.
  - v. Areas less than four (4) feet in width along collector or arterial streets shall be hardscaped with stamped concrete, unit pavers, grouted cobble, or flagstone.
  - vi. Permanently irrigated planters shall not be less than three (3) feet in width.

## 8.2.2 IRRIGATION DESIGN

- i. See **Section 4**.

## Section 9: Streetscapes, Rights-of-Way and Tracts along the Rights-of Way

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### 9.0 INTRODUCTION

This section describes minimum necessary performance standards and criteria for streetscapes, rights-of-way, and tracts along rights-of-way. Unless specifically called out in this section, the general performance standards and criteria in **Section 4** shall apply. For minimum necessary performance standards and criteria for Urban Area streetscapes see **Section 8**. This section shall not apply to Town of Castle Rock Capital Improvement Program projects.

### 9.1 APPLICATION

#### 9.1.1 APPLICABLE USES

This section applies to all streetscapes, rights-of-way, and tracts along rights-of-way within the Town limits or served by Castle Rock Water.

1. Streetscapes
2. Rights-of-way
3. Tracts along rights-of-way within the Town limits and/or areas served by Castle Rock Water

#### 9.1.2 APPLICABLE LANDSCAPE AND IRRIGATION

1. Street tree planting strips
2. Right-of-way area between sidewalk and private property
3. Tracts along rights-of-way
4. Planting strips on private property, along rights-of-way
5. Entry streets

### 9.2 DESIGN REQUIREMENTS

This section identifies the minimum performance standards and criteria for landscape design and irrigation design for streetscapes, rights-of-way, and tracts along rights-of-way.

#### 9.2.1 LANDSCAPE DESIGN

Unless otherwise specified within a particular land use, the criteria within this section shall apply to all land uses within this section. In addition, Overlay Districts shall adhere to these performance standards and criteria unless specifically called out otherwise in the Overlay District.

## 1. Overall

### a. Performance Standards

- i. Plant material diversity creates visual appeal and limits disease and other environmental problems.
- ii. Plant material shall create a seasonal appearance of greenery throughout the year.
- iii. Plant material shall accommodate environmental conditions associated with streetscapes and rights-of-way, including heat, salts, chemicals, pollution, and snow removal.
- iv. Sight distance triangles are free from visual obstructions and provide a safe view of traffic and pedestrians.
- v. Town water, sanitary sewer, and drainage infrastructure are protected and able to be maintained or replaced.
- vi. Design shall accommodate efficient irrigation and eliminate run-off.
- vii. Medians and roundabouts in rights-of-way provide visual appeal, using inorganic material.
- viii. Plant material for entry streets enhance neighborhood character.
- ix. Promote ColoradoScape design elements.
- x. Evergreen trees shall not be located in any area that would cause snow or ice buildup in lanes of traffic or sidewalks.
- xi. Water features are not allowed.

### b. Criteria

- i. Living plant material, which requires irrigation, is not permitted within medians and roundabouts in rights-of-way.
- ii. Traditional turf grass is prohibited. Native grasses must be maintained in their natural form.
- iii. Plant material within the streetscape must be hydrozone one (1) or two (2) from the Town of Castle Rock plant list.
- iv. Maximum number of species per deciduous and evergreen plantings shall follow diversity requirements in **Section 4**.
- v. Slopes steeper than 3:1 are not permitted.
- vi. Landscaping or landscape features over thirty (30) inches high above the flow line are not permitted in sight distance triangles. Length of sight distance triangles are dependent upon street classification. For length calculation information see Intersection Safety Triangles in the Transportation Design Criteria Manual.
- vii. Trees, large shrubs, or permanent objects are not permitted within wet utility easements.

- viii. When implementing ColoradoScape design, soil amendment shall be four (4) cubic yards of organic material per one thousand (1,000) square feet, rototilled to a minimum depth of six (6) inches.
- ix. A minimum coverage of seventy-five (75) percent live plant material (at maturity) is required; no more than twenty-five (25) percent may be non-living materials, including organic mulch and rock.

2. Street Trees

a. Performance Standards

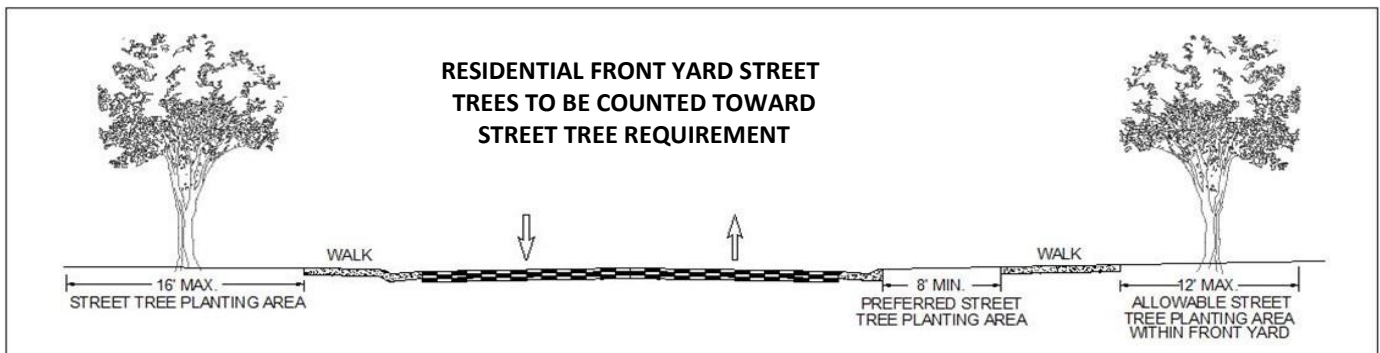
- i. Tree type and spacing provide a continuous tree canopy over the streetscape.
- ii. Trees do not interfere with driver visibility of pedestrians, oncoming traffic, traffic control devices, or regulatory signs.
- iii. Trees are planted within adequate space and soil to provide for healthy mature spread.
- iv. A clear and safe walking zone between trees and pedestrians, and trees and structures, including buildings and fences, is provided.
- v. Trees provide shade but do not cause snow build-up or icing on the street, sidewalk, or right-of-way, particularly for north-facing areas.

b. Criteria

i. Required Street Trees.

- 1. A minimum of one (1) deciduous tree for every forty (40) linear feet of landscaped area within ROW is required.
- 2. A tree planted within the front yard of a private property may be counted toward the minimum tree requirement.
  - a. For streets with attached sidewalks, a tree planted within sixteen (16) feet from the back of the street curb.
  - b. For streets with detached sidewalks, a tree planted within twelve (12) feet from the back of the sidewalk. See **Figure 9-1**.

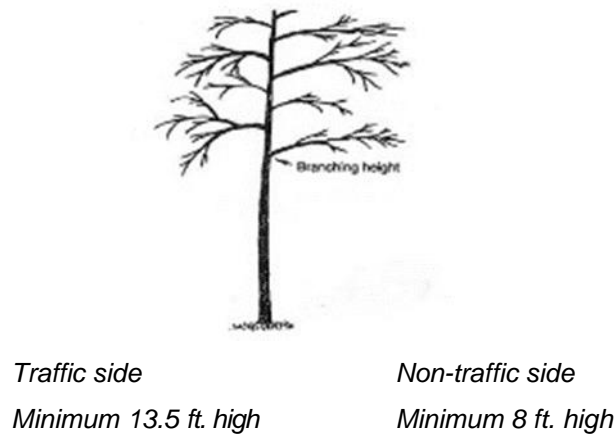
**FIGURE 9-1: Tree Planting requirement along streets**



3. 75% of street trees shall be large canopy deciduous shade trees.
  4. Alternative plant material cannot be substituted for any tree requirement.
  5. All deciduous large and small canopy trees must be permanently irrigated.
- ii. Street Tree Spacing.
1. Trees, when possible, shall be regularly spaced no more than forty (40) feet apart.
  2. Deciduous ornamental (small canopy) trees shall be spaced no more than twenty-five (25) feet apart.
  3. Spacing may be adjusted for driveways and streetlights.
  4. Grouping of trees may be permitted where regular spacing cannot be accomplished or to achieve a desired design aesthetic.
  5. There shall be no gap between trees greater than one hundred and twenty (120) feet.
- iii. Street Tree Planting Location
1. Trees shall be planted on both sides of a detached sidewalk, where feasible.
  2. Trees shall be planted a minimum of forty-two (42) inches from the face of a street curb, whenever possible.
  3. Trees shall not be planted closer than thirty (30) feet from the face of a street curb at intersections and street corners.
  4. Under no circumstance shall trees be planted within sight distance triangles. Evergreen trees shall be planted away from sight distance triangles to not cause encroachment of branches into sight distance triangles.
  5. For non-residential properties, trees shall not be planted closer than ten (10) feet from streetlights.
  6. Evergreen trees shall be planted away from the street and sidewalk edge and should be positioned north of sidewalks to not cause snow build-up or icing problems.
  7. A minimum distance of ten (10) feet shall be provided between trees and buildings or trees and fences.
  8. Trees and large shrubs shall not be planted in wet utility easements, or within ten (10) feet of water, wastewater, or stormwater infrastructure.
  9. Trees planted near sidewalks shall be fruitless.
- iv. Street Tree Branching Height
1. On the traffic side of the sidewalk, the branching height of mature trees shall be no less than thirteen and one-half (13 ½) feet above the street.

2. On the non-traffic side of the sidewalk, the branching height of mature trees shall be no less than eight (8) feet above the sidewalk. See **Figure 9-2**.

**FIGURE 9-2: Branching height requirements for clear zone**

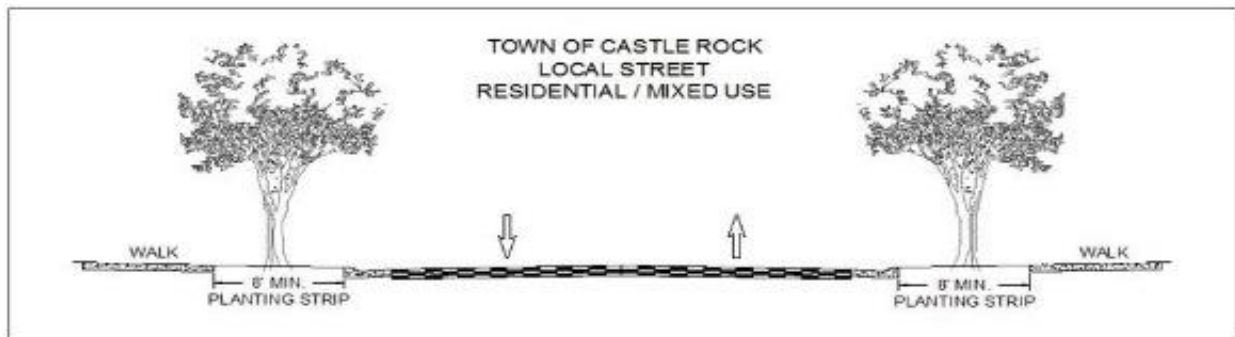


v. Street Tree Planting Strips

1. Large Canopy Deciduous Shade Trees

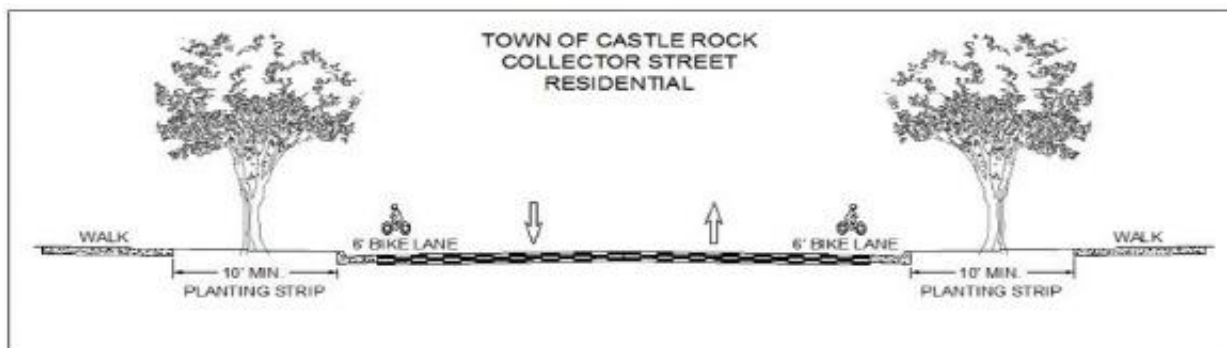
- a. For local streets the minimum width of planting strips, to include large canopy deciduous shade trees, shall be eight (8) feet. See **Figure 9-3**.

**FIGURE 9-3: Minimum Planting Strip Requirements for Local Residential/Mixed-Use Streets**



- b. For connecting and arterial streets, the minimum width of planting strips, including large canopy deciduous shade trees, shall be ten (10) feet. See **Figure 9-4**.

**FIGURE 9-4: Minimum Planting Strip Requirements for Residential Collector Streets**



- c. If and when permitted, large canopy deciduous shade trees planted in areas less than eight (8) feet are required to use CU™ Structural Soil. For Urban Areas, see **Section 8**.
- d. Minimum tree planting width is six (6) feet.

2. Ornamental Trees

- a. For local, collector, and arterial streets the minimum width of planting strips for ornamental trees shall be six (6) feet.

3. Streetscape Shrubs

a. Performance Standards

- i. Shrubs shall not interfere with driver visibility of pedestrians, oncoming traffic, traffic control devices, or regulatory signs.
- ii. Shrubs shall provide a variety of height and color variations to create visual appeal and limit disease, and other environmental problems.
- iii. Shrubs shall be planted within adequate space and soil to provide for healthy mature spread.

b. Criteria

i. Required Shrubs

1. A minimum of four (4) shrubs per one (1) tree is required.
2. One (1) ornamental grass of equal size at planting may be substituted for one (1) shrub.
3. One (1) additional tree may be substituted for four (4) shrubs.
4. Large shrubs shall not be planted in vehicular access easements or wet utility easements.
5. Where an easement does not exist, large shrubs must not be within ten (10) feet of water, wastewater, or stormwater infrastructure.



#### 4. Groundcover

##### a. Performance Standards

- i. Groundcover design and materials shall consider levels of foot traffic and shall not create pedestrian safety hazards.
- ii. Ground cover shall create a consistent coverage of material.

##### b. Criteria

- i. Traditional turf grass is prohibited.
- ii. All streetscape plant material must be hydrozone one (1) or two (2) from the Town of Castle Rock plant list.
- iii. Areas less than four (4) feet in width along local streets shall contain inorganic mulch, (rock, gravel, or cobble).
- iv. Cobble is discouraged in areas of pedestrian ingress and egress.
- v. Cobble shall be grouted for safety as determined by the Town.

### 9.2.2 IRRIGATION DESIGN

This section describes minimum necessary performance standards and criteria for streetscapes, rights-of-way, and tracts along rights-of-way land uses. Unless specifically called out in this section, the general irrigation design requirements in **Section 4** shall apply.

#### 1. Overall Performance Standards

- a. All plant material shall be irrigated per hydrozone as listed in the Town of Castle Rock Plant List.
- b. Irrigation provides an appropriate amount of water based on the water demands of groups of plantings. These groups of plantings shall maintain optimal health and appearance.
- c. The irrigation design accommodates efficient irrigation and eliminates run-off onto streets or sidewalks.

#### 2. Criteria

- a. Drip or sub-surface irrigation is required in areas greater than four (4) feet and less than ten (10) feet in width. Overhead irrigation is not permitted in these areas.
- b. Permanent irrigation is not permitted in areas less than four (4) feet in width.
- c. Permanent irrigation is not permitted in medians or roundabouts.
- d. Irrigation shall be hydrozoned, grouping similar water demands by irrigation zone.
- e. Irrigation design shall meet the requirements of the Composite Landscape) per Town of Castle Rock Municipal Code Chapter 13.20.

### 9.3 RESPONSIBLE PARTY

This section describes who is responsible for the design, installation, and maintenance of landscape and irrigation of streetscape, rights-of-way, and tracts along rights-of-way land uses by street type.

#### 9.3.1 DESIGN AND INSTALLATION OF LANDSCAPE AND IRRIGATION RESPONSIBILITY

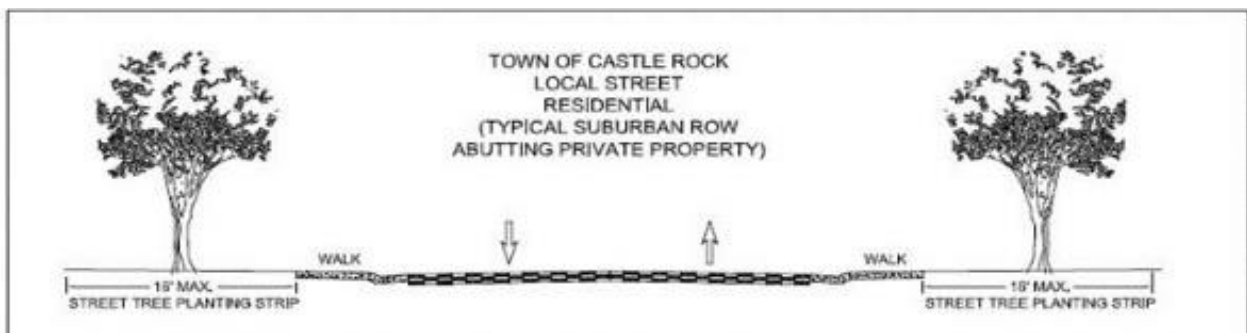
1. Local Streets
  - a. Residential
    - i. With an attached sidewalk – the Builder or adjacent homeowner
    - ii. With detached sidewalk – the Developer or Builder
  - b. Non-residential including Mixed-use / residential – the Developer or Builder
2. Arterial and Collector streets – the vertical Developer of the individual parcel adjacent to the right-of-way.
3. Entry streets, Medians and Round-a-bouts – the vertical Developer of the individual parcel adjacent to the right-of-way.
4. Design and installation of utility and irrigation sleeving is the responsibility of the initial Developer and must be completed before the construction of streets, curb and gutter, and sidewalk.

#### 9.3.2 MAINTENANCE OF LANDSCAPE AND IRRIGATION

Maintenance of Landscape and Irrigation shall comply with approved plans and adhere to all standards and criteria herein.

1. Local streets
  - a. Residential
    - i. With the attached sidewalk – the adjacent homeowner shall be responsible for maintenance of the streetscape in the right-of-way area, between the sidewalk and private property, and/or planting strips on private property along the right-of-way. See **Figure 9-5**.

**FIGURE 9-5: Local Residential Street with typical suburban row abutting private property**



- ii. With detached sidewalk – an HOA, Metro District, or other similar entity.
  - b. Non-residential, including Mixed-use / residential – the adjacent property owner or a property maintenance association, Metro District, or other similar entity.
- 2. Arterial and Collector streets – an HOA, Metro District, or other similar entity.
  - a. Entry Streets, Medians, and Roundabouts – an HOA, Metro District, or other similar entity.

## Section 10: Parks, Sports Fields and Golf

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### 10.0 INTRODUCTION

This section describes the minimum necessary performance standards and criteria for design, and maintenance responsibility for parks, sports fields, and golf course land uses. Unless specifically called out in this section, the general performance standards and criteria in **Section 4** shall apply. For the design construction and maintenance of Town-owned parks see the Parks, Trails, and Open Space Development Standards.

### 10.1 APPLICATION

#### 10.1.1 APPLICABLE USES

This section applies to public or private parks, sports fields, and golf courses within the Town limits or served by Castle Rock Water, and includes the following:

1. Passive Parks
2. Passive Recreation Areas
3. Active Parks
4. Sports Fields
5. Golf courses

#### 10.1.2 APPLICABLE LANDSCAPING AND IRRIGATION

1. Passive Parks
2. Passive Recreation Areas
3. Active Parks
4. Sports Fields
5. Golf Courses
6. Trails within these areas

### 10.2 DESIGN REQUIREMENTS

This section identifies the minimum performance standards and criteria for landscape and irrigation design for parks, sports fields, and golf courses.

#### 10.2.1 LANDSCAPE DESIGN

Unless otherwise specified within a particular land use, these Criteria shall apply to all land uses within this section. Urban and vertical uses with approved overlay district criteria shall adhere to all standards and criteria unless called out in approved overlay district criteria.

## 1. Passive Parks and Passive Recreation Areas.

### a. Performance Standards

- i. These areas shall be designed to support such intended activities of the area, including layout and pedestrian access.
- ii. Tree type and placement is intended to provide shade.
- iii. A seasonal appearance of greenery throughout the year shall be provided.

### b. Criteria

- i. Publicly owned and managed passive - use areas shall meet the minimum site requirement of no less than three thousand (3,000) square feet of turf. The following uses may not be counted toward the square foot requirement: streetscapes, islands, buffers, building setbacks, parking areas, detention ponds, or other areas not intended and designed for these uses. For Town managed parks reference Parks, Trails, and Open Space Development Standards.
- ii. Privately owned and managed passive - use areas shall meet the minimum site requirement of no less than one thousand (1,000) square feet and no more than three thousand (3,000) square feet of turf. The following uses may not be counted toward the square foot requirement: streetscapes, islands, buffers, building setbacks, parking areas, detention ponds, or other areas not intended and designed for these uses.
- iii. The square footage turf configuration shall be such to support non-programmed athletic activities, such as volleyball, softball, or other recreational activities.
- iv. The following uses do not qualify as passive recreation areas: streetscapes, medians, landscape buffers, setbacks, parking areas, or other areas not intended or designed for recreational use.
- v. Plant material used in passive recreation areas shall be consistent with the level of use by the residents.
- vi. Water requirements for turf used for passive recreation areas shall not exceed nineteen (19) inches of irrigation per growing season. Other plant material water demands shall not exceed fifteen (15) inches of irrigation per growing season.
- vii. A minimum of one (1) large canopy deciduous shade tree per one thousand (1,000) square feet of permanently irrigated area shall be provided. For renovation projects, the square footage shall be calculated based on the proposed improvements, not the entire park.
- viii. Where native grasses are permitted, trees and shrubs must have the same Hydrozone as the native grasses if not irrigated separately.

2. Town-owned Active Parks and Sports Fields. Such areas are used for programmed athletic activities and other high-traffic uses and may include baseball, softball, football, soccer, or other programmed sports activities.
  - a. Performance Standards
    - i. These areas shall be designed to support such intended activities of the area, including layout and pedestrian access.
    - ii. Tree type and placement are intended to provide shade.
    - iii. A seasonal appearance of greenery throughout the year shall be provided.
    - iv. The use of artificial turf on sports fields is encouraged.
    - v. Plant material shall tolerate high traffic and active use
    - vi. Surrounding areas may be used for more passive recreation activities and site access.
  - b. Criteria
    - i. For Active Parks, a minimum of one (1) large canopy deciduous shade tree per one thousand (1,000) square feet of permanently irrigated area is required. For renovation projects, the square footage shall be calculated based on the proposed improvements, not the entire park.
    - ii. Where native grasses are permitted, trees and shrubs must have the same Hydro-zone as the native grasses, if not irrigated separately. The Performance Standards and Criteria for Golf Courses are approved on a case-by-case basis, usually through a development agreement.

## 10.2.2 IRRIGATION DESIGN

1. Passive Parks and Passive Recreation Areas.
  - a. Criteria
    - i. All plant material in these areas shall be permanently irrigated by a dedicated irrigation service connection with an automatic irrigation system.
    - ii. All water requirements for turf shall not exceed nineteen (19) inches of irrigation per growing season.
2. Aesthetic and ornamental plant material water demands shall not exceed fifteen (15) inches of irrigation per growing season. Note: The area shall be included in the Active Parks and Sports Fields.
  - a. Criteria
    - i. All plant material in these areas shall be permanently irrigated by a dedicated irrigation service connection with an automatic irrigation system.

- ii. Water allocation for Active Parks and Sports Fields shall provide for plant materials that tolerate high traffic and active use. Note: Area shall be included in.
- 3. Golf Courses.
  - a. Criteria
    - i. All plant materials in golf courses shall be permanently irrigated by a dedicated irrigation service connection with an automatic irrigation system.
    - ii. Irrigation of golf courses shall be accomplished by a non-potable water source, as approved by the Town.

## 10.3 MAINTENANCE

### 10.3.1 PASSIVE PARKS AND PASSIVE RECREATION AREAS

1. Areas owned by a homeowner's association (HOA), a metro district, or other similar entity shall maintain landscape and irrigation to standards and criteria contained herein.
2. Areas owned and maintained by the Town shall maintain landscape and irrigation to the standards and criteria defined by the Town Parks and Recreation Department.

### 10.3.2 ACTIVE PARKS AND SPORTS FIELDS

1. Areas owned and maintained by a homeowner's association (HOA), a metro district, or other similar entity shall maintain landscape and irrigation to standards and criteria contained herein.
2. Areas owned and maintained by the Town shall maintain landscape and irrigation to standards and criteria defined by the Town Parks and Recreation Department.
3. Areas owned and maintained by a school district shall maintain landscape and irrigation to the standards and criteria contained herein.

### 10.3.3 GOLF COURSES

1. Areas owned and maintained by a homeowner's association (HOA), a metro district, or other similar entity shall maintain landscape and irrigation to standards and criteria contained herein.
2. Areas owned and maintained by the Town shall maintain landscape and irrigation to the standards and criteria defined by the Town Parks and Recreation Department.

## Appendix A: Temporary Irrigation Criteria



## TEMPORARY IRRIGATION

### 1. Criteria

The purpose of temporary irrigation is to germinate native seed and establish native vegetation, it is not intended for continuous use during the establishment period (assumed to be two (2) years). This means that the temporary system will not be operated on a three (3) day per week watering schedule after the initial thirty (30) day irrigation exemption period.

- a. The native soil must be amended with three (3) cu yds. of organic compost per one thousand (1,000) sq. ft.
- b. This amendment must be incorporated into the soil via tractor ripping.

### 2. Seeding

Seeding shall take place as recommended by the Town. Seasonal weather conditions shall be taken into consideration when scheduling seed and mulch installation. Seeding shall not occur between June 15th and September 1st. Coordinate with Castle Rock Water's Conservation Division for guidance. Generally, if a Red Flag Warning and/or local fire restriction has been issued, no seeding shall commence until such time that the warnings/restrictions have been released.

- a. Drill seeding is required.
- b. Slopes steeper than 3:1 are not permitted.
- c. Temporary irrigation systems and irrigation exemptions will meet the following specifications:
  - i. The irrigation system must be above ground and removed at the end of the approved establishment period.
  - ii. Sprinkler heads used for temporary irrigation must have an application rate not to exceed .75"/hour. Traditional spray heads/nozzles are not allowed.
  - iii. The irrigation exemption shall not exceed thirty (30) days.
  - iv. Seed ticket(s) for areas temporarily irrigated are to be provided to Castle Rock Water.
  - v. The Town of Castle Rock hydraulic worksheet (required on construction documents) will show both permanent and temporary irrigated areas. These should be listed separately and not combined.
  - vi. Tap sizing will be determined by the permanent irrigated plant material.

### 3. Irrigation

Watering shall occur between the hours of 12 a.m. and 8 a.m. No watering will be permitted outside of these times.

- a. A hydrant meter issued by the Town may be used to meter temporary irrigation water. The hydrant meter assembly shall be secured with an anti-theft cage and protected from freezing. The hydrant meter shall be connected to a 2" fitting on a hydrant. The 4" fitting shall be reserved



for the fire department to use in fighting fires. The hydrant meter assembly will be removed at the end of the growing season and returned to the Town. The applicant will follow hydrant meter permit requirements.

- b. Water will be billed at the applicable tier two (2) irrigation rate (see current year rates and fees). An establishment water budget will be implemented as follows:
- i. For the first four weeks:
    - Two 9 minute cycles per zone @ .4"/hour = .12" of water per day
    - .12"/day x 7 days/week = .84"/week
    - .84"/week x 4 weeks = 3.36" for the first 4 weeks
    - 3.36" x .62 = 2.0832 gallons / square foot
    - 2.0832 gallons/square foot x 43,560 square feet in an acre = 90,744 gallons/acre
  - ii. For the second four weeks (transition to fixed three days per week as indicated on the standard non-residential schedule):
    - One 15 minute cycle per zone @ .4"/hour = .1" of water per day
    - .1"/day x 3 days/week = .3"/week
    - .3"/week x 4 weeks = 1.2" for the second 4 weeks
    - 1.2" x .62 = .744 gallons / square foot
    - .744 gallons/square foot x 43,560 square feet in an acre = 32,409 gallons/acre
  - iii. Moving forward continue to transition to as-needed only, not to exceed 1" per month:
    - 1" per month x .62 = .62 gallons per square foot
    - .62 gallons per square foot x 43,560 square feet in an acre = 27,007 gallons per acre

All water used in excess of the budget will be billed at the applicable tier three (3) excess rate. These rates are subject to change annually based on an annual rates and fees study by the Town.

- c. A waterproof sign measuring a minimum of 2 feet by 2 feet shall be visible from each adjacent road. The sign shall contain:
- **TEMPORARY IRRIGATION.**
  - Dates of the temporary irrigation.
  - Contractor's contact information.
- (See example on next page)

#### 4. Conclusion

- a. The contractor must contact Castle Rock Water, Stormwater hotline at 720-733-2235, a minimum of one week prior to the expiration of the temporary irrigation exemption to evaluate the level of establishment.
- b. Upon expiration of the approved establishment period, all components of the temporary irrigation system must be removed. Equipment to be removed includes an irrigation controller, control valves, manual ball valves, all fittings used to connect valves to the mainline, valve boxes, above-ground lateral piping, sprinkler heads, and all associated staking materials. Below-ground irrigation mainline and wiring can be abandoned in place.

# **TEMPORARY IRRIGATION**

**05/01/2025 - 05/21/2025**

**ABC BUILDER, 303-555-5555**

## Appendix C: Approved Sod Table

| <b>Texas Hybrid Bluegrass Blends</b> | <b>Tall Fescue Blends</b>          | <b>Warm Season Grasses</b> | <b>Seed Blends</b> |
|--------------------------------------|------------------------------------|----------------------------|--------------------|
| Texas Hybrid                         | RTF Tall Fescue                    | Tahoma 31 (bermuda grass)  | SPF-30 Texas Blue  |
| HTN Hybrid Texas Bluegrass           | 90/10 Blend Fescue                 | Blue Grama                 | Buffalo Grass      |
| Colorado's Hyper Blue                | Colorado Black Beauty              |                            |                    |
| Hybrid Blue                          | Turf Type Fescue                   |                            |                    |
| Thermal Blue                         | BTF Fescue Mix 90/10 (10% TX Blue) |                            |                    |
| VorTEX Hybrid                        | Black Beauty                       |                            |                    |
| SPF-30 Texas Bluegrass Blend         | 90/10 Fescue Mix (10% TX Blue)     |                            |                    |
| BTF Texas                            | EviroTurf                          |                            |                    |
|                                      | Cowboy Turf (10% TX Blue)          |                            |                    |
|                                      | 90/10 Fescue Blend                 |                            |                    |
|                                      | 90/10 Fescue                       |                            |                    |

**Attachment B: Summary of Changes to the Manual 2025**

| <b>Criteria Amendment Location</b> | <b>Addition(s)</b> | <b>Removal(s)</b> | <b>Reasoning</b> |
|------------------------------------|--------------------|-------------------|------------------|
|------------------------------------|--------------------|-------------------|------------------|

|  |   |                                 |   |
|--|---|---------------------------------|---|
| 1.13 Definitions   | Link to, “Low Flammability Landscape Plants”  |                                 | Incorporated CSU document for further information   |
| 4.4.6 Inspections  | Adjusted inspections timeframe to not include October 1 <sup>st</sup> through March 1st   |                                 | Due to the dormancy of vegetation and inclement weather landscape and irrigation inspections cannot be guaranteed during this timeframe.                      |
| 4.4.6 Inspections  | Surety amount of 115%   | Bond 100%, Letter of Credit 75% | Percentage change to ensure remaining work will be completed, or cover cost to the Town   |
| 4.4.7 Irrigable Area                                       | Section added Figure 4-2 Landscape Plan showing Irrigable Area of the front and backyards   |                                 | The concept of Irrigable Area is defined as it relates to landscape requirements.   |
| 4.4.8 Plant Material Specifications and Planting Standards | Plant flammability rating   |                                 | Added this requirement to be included in a landscape plan   |
| 4.4.8 Plant Material Specifications and Planting Standards | Link to, “Colorado Department of Agriculture website”   |                                 | The link provided to reference State / County banned plant list   |
| 4.4.8 Plant Material Specifications and Planting Standards | In native grass areas, no other plant material is allowed other than trees  |                                 | Specification added to prevent shrubs/ornamentals from being planted in native grass areas which cannot be maintained properly and is not visually enhancing. |
| 4.4.9 Non-Living Landscape Material                        | Landscapes must be designed for functionality and visual appeal by incorporating a variety of organic and inorganic non-living landscape materials. |                                 | Emphasizing functionality and visual appeal concerning non-living landscape materials   |
| 4.4.9 Non-Living Landscape Material                        | Table 4-4: Non-Living Landscape Material  |                                 | At a minimum, each front yard landscape needs to incorporate  |

## Attachment B: Summary of Changes to the Manual 2025

| Criteria Amendment Location       | Addition(s)  | Removal(s) | Reasoning  |
|-----------------------------------|--|------------|--|
|                                   |  |            | one item from each column.   |
| 4.5.4 Irrigation System Design    | Flow sensors must be installed in a 12-inch rectangular valve box.   |            | Requirement added to allow for room in valve box for proper maintenance.   |
| 6.2.1 Landscape Design Front yard | Front yard vegetation requirements:<br>Minimum shrub count = Total front yard irrigable area x 0.02  |            | To enhance vegetation requirement  |
| 6.2.1 Landscape Design Front yard | Front yard vegetation requirements:<br>minimum perennial count = Total front yard irrigable area x 0.03  |            | To enhance vegetation requirement  |
| 6.2.1 Landscape Design Backyard   | Larger areas of lower water use turf may be considered on a case-by-case basis, however, water budgets will not exceed the water requirements of 19 inches per season, equivalent to 500ft <sup>2</sup> of turf. Property owners requesting this option must be informed about the characteristics of the proposed alternative turf variety. |            | To encourage diversity and allow the option to have more square footage of a low-water-use grass variety, while requiring homeowners that apply to be informed of maintenance needs and characteristics of the type of turf they are requesting. |
| 6.2.1 Landscape Design Backyard   | Increased minimum tree quantities from 1 tree to 2 trees.  |            | To enhance backyard vegetation with additional canopy plant coverage   |
| 6.2.1 Landscape Design Backyard   | Backyard vegetation requirements:<br>Minimum shrub count = (Total backyard irrigable area – turf area) x 0.01  |            | To enhance backyard vegetation with additional plant coverage  |
| 6.2.1 Landscape Design Backyard   | Backyard vegetation requirements:<br>minimum ornamental  |            | To enhance backyard vegetation with  |

## Attachment B: Summary of Changes to the Manual 2025

| Criteria Amendment Location                       | Addition(s)   | Removal(s) | Reasoning                                    |
|---|---|------------|--|
|   | and perennial = (Total backyard irrigable area – turf area) x 0.015                     |            | additional plant coverage                    |
| 6.2.2 Non-Living Landscape Material Functionality | Requirement added, a reasonably safe path from the front to the back yard               |            | To allow for pedestrian and equipment access |
| 6.2.2 Non-Living Landscape Material Functionality | Requirement added, a path from the walk-out basement to turf areas                      |            | To allow for pedestrian and equipment access |
| 6.2.2 Non-Living Landscape Material Functionality | Requirement specified, gates must function without obstruction from landscape materials |            | To allow for pedestrian and equipment access |
| 6.2.2 Non-Living Landscape Material Functionality | Requirement specified, landscape materials must be appropriate to the slope             |            | To allow for pedestrian and equipment access |
| Appendix C: Approved Sod Table                    | Table updated   |            | Approved sod varieties                       |



# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 6. File #: WC 2024-109**

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water  
Roy Gallea, P.E., Engineering Manager  
Frank N. Main, Project Manager

**Resolution Approving a Construction Contract between the Town of Castle Rock and 53 Corporation, LLC, for the McMurdo Gulch Stream Reclamation Priority 3 Project**  
*[McMurdo Gulch south of the intersection of Castle Oaks Drive and Autumn Sage Street]*  
**Town Council Agenda Date: November 19, 2024**

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### Executive Summary

Castle Rock Water is seeking Town Council approval of a Resolution (**Attachment A**) awarding a Construction Contract to 53 Corporation, LLC (53 Corp) for the McMurdo Gulch Stream Reclamation Priority 3 Project in the amount of \$2,412,127 plus approximately a 2% Town-managed contingency in the amount of \$48,000 for a total authorization of \$2,460,127.

The project is located adjacent to Castle Oaks Drive; at four sites south of the intersection of Castle Oaks Drive and Autumn Sage Street. Improvements generally include stream channel improvements at the McMurdo Gulch - multiple locations (Reaches 1, 2 and 3) and (Tributaries 5 and 6), consisting of Grading, Water Control, Unclassified Excavation, Boulder Cascade, Bank Protection, Riffle Drops and Pools, Type H Void-Filled Riprap, Type M Void-Filled Riprap, Boulder Steps, Landscape, Erosion Control, Sediment Control and related Appurtenances. This project will mitigate impact and preserve the natural drainageway within the project area (see **Attachment B**).

This project will be funded through the Stormwater Enterprise Fund, a developer contribution and through a Participation Agreement from the Cherry Creek Basin Water Quality Authority (Authority). Construction Notice to Proceed is scheduled for December 2024 with a construction completion projected in August 2025.

### Notification and Outreach Efforts

The project is generally located within Town owned open space and vacant land. Town staff will provide project details and updates on the Town website, CRgov.com.

### **History of Past Town Council, Boards & Commissions, or Other Discussions**

October 20, 2020 Town Council approved Resolution No. 2020-105, approving the Participation Agreement in the amount of \$34,000 between the Cherry Creek Basin Water Quality Authority and the Town of Castle Rock for the Design of Stream Reclamation Improvements for the McMurdo Gulch Priority 2 Project.

October 8, 2021 - Town Council approved a Subdivision Improvement Agreement with Stratus Terrain, LLC for the Terrain North Basin, which obligated funds for this project in the amount of \$1,770,250.

December 7, 2021 - Town Council approved Resolution No. 2021-113 approving the First Amendment to the Participation Agreement resulting in the Authority contributing \$386,000 toward construction of the Priority 2 Project.

January 4, 2022 - Town Council approved Resolution No 2022-005, approving a Service Agreement Between the Town of Castle Rock and Muller Engineering Company, Inc., for the McMurdo Gulch Stream Reclamation Priority 3 Project in the amount of \$499,803 plus a 10% Town-managed contingency in the amount of \$49,980 for a total authorization of \$549,783.

June 21, 2022 - Town Council approved Resolution No. 2022-068 approving the Second Amendment to the Participation Agreement resulting in the Authority contributing a total of \$170,121 toward design of the Priority 3 Project.

January 17, 2024 - Town Council approved Resolution No. 2024-005, approving a Service Agreement to Muller Engineering Company, Inc., for the McMurdo Gulch Stream Reclamation Project Priority No. 3 Supplemental Design, Bid Construction and Post Construction Services in the amount of \$359,956.

Town Council is considering a Resolution for the Third Amendment to the Participation Agreement with the Cherry Creek Basin Water Quality Authority (CCBWQA) for Design and Construction of Stream Reclamation Improvements for the McMurdo Gulch in the amount of \$1,120,226 which is a combination of \$251,380 currently held by the Town and not spent for the construction of the Priority 1 and 2 Improvements and \$868,846 in new funds budgeted for the Project for 2024.

### **Discussion**

McMurdo Gulch is a western tributary to Cherry Creek, extending along the eastern edge of the Town. The entire McMurdo Gulch channel is approximately 6.7 miles long from the headwaters to the confluence with Cherry Creek and encompasses a tributary area of approximately 6.5 square miles. The McMurdo Gulch Stream Reclamation Priority 3 Project is a continuation of the work previously completed in the McMurdo Gulch (Priority 1 & 2) in the years 2020/2021/2022. The Project sponsors are CCBWQA and the Town of Castle Rock which is the project lead. A Developer contributed \$1,770,250 to the Town for the Project through a Development Agreement. The Town is



**Item #: 6. File #: WC 2024-109**

entering into a third Amendment to the Participation Agreement with CCBWQA for additional funding for construction of the project, this third Amendment is being considered concurrently with this construction contract. The proposed stream improvements benefit the water quality in McMurdo Gulch and the Cherry Creek Reservoir by reducing bed and bank erosion and immobilizing Phosphorus in the adjacent soils. It is estimated that this 0.7 mile long-project will immobilize 63 pounds of phosphorus annually.

Following approval of the design documents, the project was advertised for public bid September 10, 2024 on the Town's Rocky Mountain Bid Net site. Bids were received from six contractors on Thursday September 26, 2024. Upon review of the bids, project budget and project scope, Stormwater staff is recommending to proceed with award of a construction contract with 53 Corp. Below are the results of the bids received:

| <b>Contractor</b>             | <b>Total</b>          |
|-------------------------------|-----------------------|
| <b>L4 Construction</b>        | <b>\$4,380,153.45</b> |
| <b>Monks Construction</b>     | <b>\$4,073,122.75</b> |
| <b>53 Corporation</b>         | <b>\$2,412,127.00</b> |
| <b>Meridiam Partners</b>      | <b>\$3,796,759.76</b> |
| <b>Frontier Environmental</b> | <b>\$3,707,799.00</b> |
| <b>FNF</b>                    | <b>\$3,557,963.35</b> |
| <b>Engineers Estimate</b>     | <b>\$3,343,965.80</b> |

The 53 Corp. bid was determined to be the lowest qualified bid. 53 Corp. has successfully completed multiple stream stabilization and drainage projects for the Town. Previous projects completed by 53 Corp. have come in within budget, with minimal change orders.

It is noted that the bid received from 53 Corp. is much lower than the other contractors' bids as well as the engineer's estimate. As a result, the design engineer for this project along with Town staff and 53 Corp. have fully reviewed the bids and are confident 53 Corp. will successfully complete the job within budget and on schedule.

Construction Notice to Proceed is anticipated in December 2024, and the project will be substantially complete by August 2025, weather permitting.

**Budget Impact**

The Table below provides a breakdown of planned funding by sponsors for the McMurdo Gulch Stream Reclamation Priority 3 Project.

| Sponsor | Previous Project Contributions | New Funding Contribution 2024 | Transfer of leftover funds from McMurdo Priority 1 &2 | Total Contribution | Percent Contribution |
|---------|--------------------------------|-------------------------------|---|--------------------|----------------------|
|         |                                |                               |   |                    |                      |

**Item #: 6. File #: WC 2024-109**

|                                |           |             |           |             |      |
|--------------------------------|-----------|-------------|-----------|-------------|------|
| Developer Contribution         | \$225,000 | \$1,545,250 | -----     | \$1,770,250 | 34%  |
| CCBWQA                         | \$170,121 | \$868,846   | \$251,380 | \$1,290,347 | 25%  |
| Town of Castle Rock Stormwater | \$285,362 | \$1,140,696 | \$675,345 | \$2,101,403 | 41%  |
| Total Project Cost             | \$680,483 | \$3,554,792 | \$926,725 | \$5,162,000 | 100% |

*Funds for this Construction Contract will be charged to the Stormwater capital account below. Sufficient stormwater funds for this project are included in the 2024 budget.*

| <b>Fund Description</b>          | <b>Account Number</b>     | <b>Amount</b>      | <b>Contingen<br/>cy</b> | <b>Total</b>       | <b>2024<br/>Budget<br/>Balance</b> |
|----------------------------------|---------------------------|--------------------|-------------------------|--------------------|------------------------------------|
| <i>McMurdo Gulch Stream Stbl</i> | <i>212-4475-444.75-51</i> | <i>\$2,412,127</i> | <i>\$48,000</i>         | <i>\$2,460,127</i> | <i>\$3,170,961</i>                 |

**Staff Recommendation**

Staff recommends Town Council approval of a Resolution awarding a Construction Contract with 53 Corporation, LLC for the McMurdo Gulch Stream Reclamation Priority 3 Project at a cost of **\$2,412,127** plus a 2% Town-managed contingency in the amount of \$48,000 for a total authorization in the amount of \$2,460,127.

**Proposed Motion**

*"I move to recommend to Town Council approval of the Resolution as presented"*

**Attachments**

- Attachment A: Resolution (Not Attached)
- Exhibit 1: Construction Contract (Not Attached)
- Attachment B: Project Site Map (Not Attached)



# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 7. File #: WC 2024-110**

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water  
Roy Gallea, P.E., Engineering Manager  
Frank N. Main, Project Manager

**Resolution Approving the Third Amendment to the Participation Agreement between the Cherry Creek Basin Water Quality Authority (CCBWQA) and the Town of Castle Rock for the Design and Construction of Stream Reclamation Improvements for McMurdo Gulch [Near the intersection of Castle Oaks Drive and Autumn Sage Drive]**  
**Town Council Agenda Date:** November 19, 2024

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### Executive Summary

The purpose of this memo is to request Town Council authorization of a Resolution approving the Third Amendment to the Participation Agreement between the Cherry Creek Basin Water Quality Authority (CCBWQA) and the Town of Castle Rock (Town), for the Design and Construction of Stream Reclamation Improvement for McMurdo Gulch (see **Attachment A**). The Town has partnered with the CCBWQA on a number of projects since 2011 on McMurdo Gulch, with the CCBWQA contributing over \$1,470,000 to date. In 2017, the Town completed a stream assessment of McMurdo Gulch that prioritized areas where McMurdo Gulch needed stream channel improvements. In 2020, the Town and the CCBWQA partnered to complete the Priority 1 improvements under separate agreement from the one being considered in this memo.

The Town entered into this Participation Agreement with the Authority in October 2020 for design of the Priority 2 stream reclamation improvements for McMurdo Gulch, followed by the First Amendment that authorized construction of the Priority 2 Improvements in December 2021. Second Amendment to the Participation Agreement approved June 2022 included a contribution for the design of the Priority 3 Improvements in the amount of \$170,129. This Third Amendment to the Participation Agreement includes a contribution for construction of the Priority 3 Improvements in the amount of \$1,290,347, which includes transfer of the remaining balance of funds from the Priority 1 and 2 Improvements in the amount of \$251,380 and an additional contribution of \$868,846 (see **Exhibit 1 of Attachment A**).

### Notification and Outreach Efforts

The construction project will follow Town policy regarding public notification.

**History of Past Town Council, Boards & Commissions, or Other Discussions**

October 20, 2020 - Town Council approved Resolution No. 2020-105 approving the Participation Agreement in the amount of \$34,000 between the Authority and Town for the Design of Stream Reclamation Improvements for the McMurdo Gulch Priority 2 Project.

December 7, 2021 - Town Council approved Resolution No. 2021-113 approving the First Amendment to the Participation Agreement resulting in the Authority contributing \$386,000 for construction of the Priority 2 Project.

June 21, 2022 - Town Council approved Resolution No. 2022-068 approving the Second Amendment to the Participation Agreement resulting in the Authority contributing a total of \$170,121 for design of the Priority 3 Project.

**Discussion**

McMurdo Gulch is a western tributary to Cherry Creek, extending along the eastern edge of the Town. The entire McMurdo Gulch channel is approximately 6.7 miles long from the headwaters to the confluence with Cherry Creek and encompasses a tributary area of approximately 6.5 square miles. Since 2011, the Town and Authority have partnered on multiple projects on McMurdo Gulch.

The Priority 3 Project is a continuation of the successful phasing of improvements on McMurdo Gulch based on priorities identified in the 2017 Report, see **Attachment B**. The Priority 3 Project includes stream channel improvements at the McMurdo Gulch - multiple locations (Reaches 1, 2 and 3) and (Tributaries 5 and 6). The construction is anticipated to begin in December 2024 and be substantially completed by August 2025, weather Permitting.

Under the terms of this agreement, funds will be received following the execution of this agreement amendment, to implement construction of the McMurdo Gulch Stream Reclamation Priority 3 Project. The CCBWQA will participate as an active partner to ensure a jointly agreeable project. Any funds not spent of the CCBWQA's contribution will be refunded back to the CCBWQA. Funds in excess of this agreement are the responsibility of the Town.

**Budget Impact**

The Table below provides breakdown of planned funding by sponsors for the McMurdo Gulch Stream Reclamation Priority 3 Project.

| Sponsor                | Previous Project Contributions | New Funding Contribution 2024 | Transfer of leftover funds from McMurdo Priority 1 &2 | Total Contribution | Percent Contribution |
|------------------------|--------------------------------|-------------------------------|---|--------------------|----------------------|
| Developer Contribution | \$225,000                      | \$1,545,250                   | -----   | \$1,770,250        | 34%                  |

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**Item #: 7. File #: WC 2024-110**

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|                                |           |             |           |             |      |
|--------------------------------|-----------|-------------|-----------|-------------|------|
| CCBWQA                         | \$170,121 | \$868,846   | \$251,380 | \$1,290,347 | 25%  |
| Town of Castle Rock Stormwater | \$285,362 | 1,140,696   | \$675,345 | \$2,101,403 | 41%  |
| Total Project Cost             | \$680,483 | \$3,554,792 | \$926,725 | \$5,162,000 | 100% |

Under this Amendment, the CCBWQA contribution is \$868,846. Also, Town shall transfer the Authority funds held by the Town for the Construction of Priority 1 and 2 Improvements to this Project in the amount of \$251,380. These funds will be credited to the Stormwater Capital Revenue Account No. 212-4475-395.10-00.

**Staff Recommendation**

Staff recommends Town Council authorization of a Resolution between the CCBWQA and the Town, approving the Third Amendment to the Participation Agreement for Design and Construction of Stream Reclamation Improvements for McMurdo Gulch.

**Proposed Motion**

*"I move to recommend to Town Council approval of the Resolution as presented"*

**Attachments**

- Attachment A: Resolution (Not Attached)
- Exhibit 1: Agreement (Not Attached)



# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 8. File #: WC 2024-111**

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water  
Roy Gallea, P.E., Engineering Manager  
Erin Evans, P.E., Project Manager

**Resolution Approving a Second Amendment to the Service Agreement with Dewberry Engineers Inc. for the Young American Infrastructure Improvements, Bell Mountain Raw Pipeline, and Bell Mountain Flow Meter Vault Upgrade Projects [Young American neighborhood and Bell Mountain Ranch]**  
**Town Council Agenda Date:** November 5, 2024

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### Executive Summary

Castle Rock Water (CRW) is seeking Town Council approval of a resolution approving a Second Amendment to the Service Agreement (**Attachment A**) with Dewberry Engineers, Inc. (Dewberry) for design of the Young American Infrastructure Improvements, Bell Mountain Raw Pipeline, and Bell Mountain Flow Meter Vault Upgrade Project. In an effort to reduce administrative and contracting costs, gain economies of scale and generate more competitive engineering bids, CRW staff initially combined three separate but smaller design projects into one request for proposals. Location maps of the three project areas are included in **Attachments B and C**.

The current authorization for this Service Agreement includes Dewberry's project cost for design in the amount of \$623,784, with a contingency of \$31,189, for a total authorization of \$654,973. Previously, a first amendment to the service agreement was approved to add contract time only to continue with further development of the designs for each of the projects through December 31, 2024. Additional scope and fee is needed to complete the Young American Infrastructure Improvements design. The total added fee for Dewberry under Amendment 2 is \$138,653. This project will encumber the remaining project contingency of \$31,189 and staff requests approval of an additional \$107,464 for a total revised authorization amount of \$762,437 for Dewberry's services. The scope of services to be completed by Dewberry is detailed in an attachment to the agreement (**Exhibit 1**). CRW staff have reviewed the scope and cost and believe the fee proposed by Dewberry to be reasonable.

Dewberry shall undertake the work upon execution of the agreement and shall complete the work by December 31, 2025.

### **Notification and Outreach Efforts**

The project information will be posted on the Town's Development Activity map as Water Projects. CRW is working with the contractors to provide public notice as needed for the Bell Mountain and Young American projects as they approach the construction phase.

### **History of Past Town Council, Boards & Commissions, or Other Discussions**

The design services agreement was approved through Resolution No. 23-103 by Town Council on August 15, 2023 in the amount of \$623,784, plus a Town owned contingency in the amount of \$31,189.

On May 28, 2024 the First Amendment was approved by the Town Manager which extended the schedule for completion to December 31, 2024.

### **Discussion**

The Young American Infrastructure Improvement design phase includes water distribution and sanitary collection systems replacement and/or rehabilitation planning for this neighborhood. This project has been designed in a phased approach for constructability and budgeting considerations, initially separating the Waterline Replacements into three phases and one phase for the Sanitary Sewer Rehabilitation. Through the design process, it was determined that the proposed scope for phase 1 of the waterline replacement would exceed the 2025 allocated budget.

Dewberry was then tasked with re-phasing the entire project into more phases to more closely align with budgeting through completion of the project. Public Works was also brought into the design process of the Young American waterline improvements project to allow collaboration with their Pavement Management Program (PMP) to minimize impacts to the neighborhood with multiple projects. CRW staff identified two more locations that needed critical upgrades, which were added to Dewberry's scope; Hillside Drive and Overlook Road. Additional potholing for phases 2 and 3 will also be included in the scope of the waterline replacement design in the second amendment. Including the rephasing efforts and Public Works PMP coordination will also require an extension of the service agreement to December 31, 2025.

The Sanitary Sewer Rehabilitation and Bell Mountain Flow Meter Vault Upgrade design has been completed and both projects are currently under construction.

The Bell Mountain Raw Pipeline Project design is progressing on schedule. An alignment has been determined, which has narrowed down the locations where easements are required to execute the project. Easement legal descriptions were not included in the initial scope for this project, so they are also included in this second amendment.

The existing pipes in the Young American neighborhood are 4-inch and 6-inch cast iron pipe, which need to be upsized to 8-inch to meet the Town's current standards for water mains. The majority of the waterline replacements in this project include upsizing the existing mains to 8-inch. South Street

will be upsized to 12-inch in order to improve system capacity and distribution in this area as shown in the phasing map in **Attachment B**. As part of the additional scope in Amendment 2 both sanitary sewer and waterline replacements for Overlook Road have been added to the project. Even though the street, sanitary sewer and water main on Overlook Road are currently privately owned, CRW has frequently been called out to perform maintenance and repairs on these aging utilities by the local property owners. As part of this project, it was determined that CRW would take over operations and maintenance of these lines, perform the replacements and obtain an access easement on the private road to provide a better service for the property owners in the area. Waterline replacements for Hillside Drive were also added to the scope of this project as this area historically has had issues with failing valves and maintenance concerns. Phases 2 and 3 of waterline replacements will also require additional potholing due to the congested utility corridors and an increase in number of utility crossings by the new 8-inch waterline identified in the initial stages of design.

As part of the design process, staff tasked Dewberry with providing milestone Engineer's Opinion of Probable Construction Cost (EOPCC) estimates. The 100% design milestone estimate for the waterline replacement was approximately \$2,000,000. Using this estimate, it was determined that the proposed scope for phase 1 of the Young American Waterline Replacements project would exceed the \$1,000,000 allocated in the 2025 budget for this project. Dewberry was then tasked with re-phasing the project into smaller phases to more closely align with annual budgeting through completion of the entire project. Public Works was also brought in during design to initiate collaboration between their PMP projects and this CRW project as their upgrades in this location are planned for 2027. In the interest of limiting impacts to the residents in the neighborhood, CRW has partnered with Public Works to identify overlap between their PMP and this project and create a plan to execute both projects at the same time starting in 2025 by providing an interfund loan to Public Works to front the costs of street reconstruction until 2027 when this work is budgeted.

Castle Rock Water recently acquired the Bell Mountain water system, including the two Denver Basin Wells. Castle Rock Water also has partial water rights on three other Denver Basin Wells in the Bell Mountain Ranch area that currently discharge to East Plum Creek. A raw water pipeline is needed between the two well sites (Arapahoe well and Dawson well on one site and Denver well on the other site) to direct this water supply to the Bell Mountain Water Treatment Plant for use within our service area. The alignment (shown in **Attachment C**) has been determined for this pipeline and several easement locations have been identified that will need to be acquired. Legal descriptions for permanent and temporary easements have been added to Dewberry's scope in Amendment 2 as well.

Incorporating the Public Works improvements into the overall Young American project scope as well as performing more robust potholing and rephasing of this project will require additional time for Dewberry to complete. The agreement completion date will need to be extended to December 31, 2025.

### **Budget Impact**

The Dewberry proposal fee for Amendment 2 is \$138,653. This project will encumber the remaining project contingency of \$31,189. Staff requests approval of an additional \$107,464 for a total contract amount of \$762,437. The project will be funded from the remaining contingency in the accounts



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**Item #: 8. File #: WC 2024-111**

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shown below:

| Project                                  | Account            | Amount   |
|--|--------------------|----------|
| Water Rehab                              | 210-4275-442.75-35 | \$8,909  |
| Sewer Rehab                              | 213-4575-445.75-62 | \$8,909  |
| BMR Pipeline Connection & BMR Well Vault | 210-4275-442.75-39 | \$13,373 |
| Total                                    |                    | \$31,189 |

The remaining cost for this amendment will be funded from the account shown below:

| Project                               | Account            | Amount    |
|---------------------------------------|--------------------|-----------|
| Amdmt 2 Services - Yng American Rehab | 210-4275-442.79-26 | \$107,464 |

**Staff Recommendation**

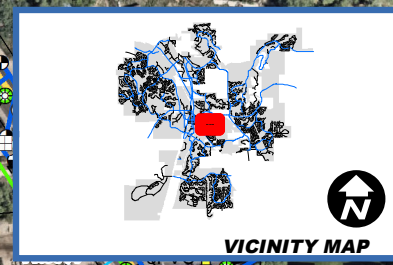
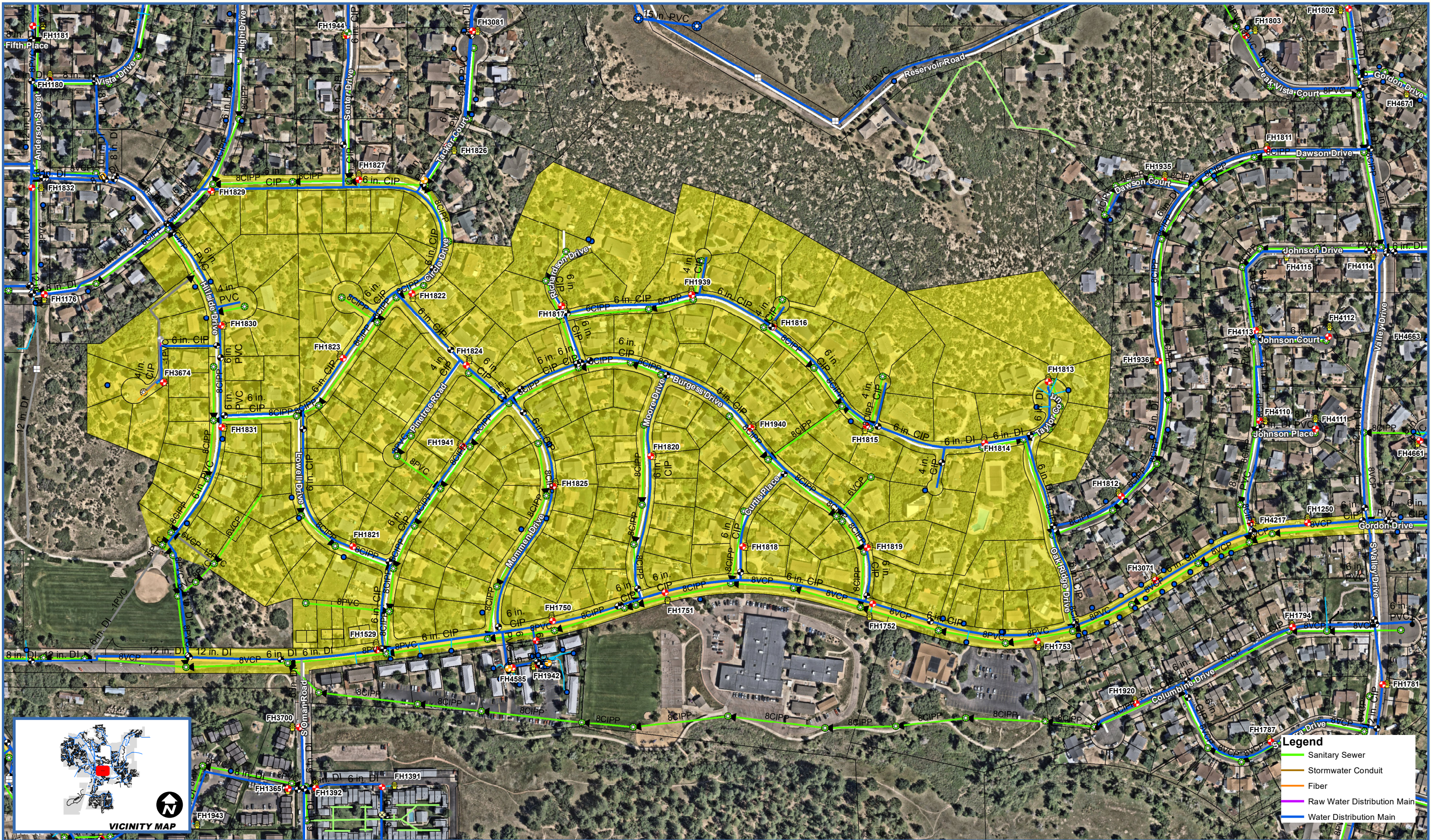
Staff recommends Town Council approval of the resolution approving the Second Amendment to the Services Agreement between the Town of Castle Rock and Dewberry for the design of the Young American Infrastructure Improvements, Bell Mountain Raw Pipeline, and Bell Mountain Flow Meter Vault Upgrades Projects in amount of an additional \$138,653 for a total budget of \$762,437.

**Proposed Motion**

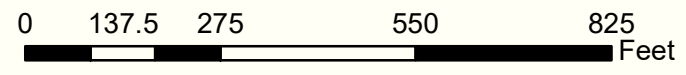
*"I move to recommend to Town Council approval of the Resolution as presented"*

**Attachments**

- Attachment A: Resolution (Not Attached)
- Exhibit 1: Agreement (Not Attached)
- Attachment B: Location Map for Young American Waterline Replacements
- Attachment C: Location Map for Bell Mountain Raw Water Pipeline



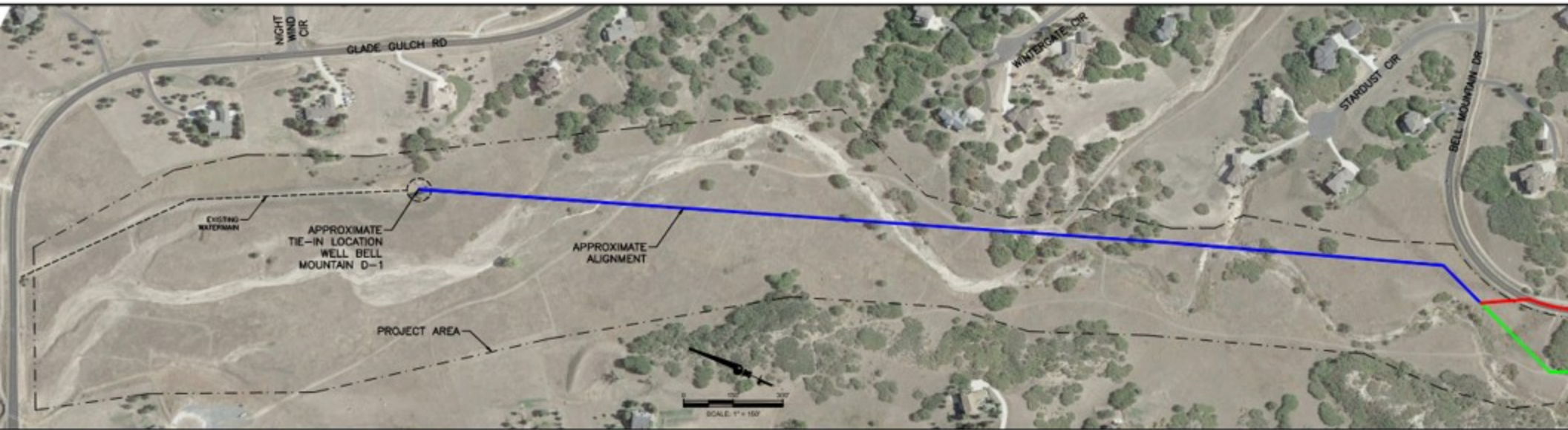
| Legend                                |                             |
|---------------------------------------|-----------------------------|
| <span style="color: green;">—</span>  | Sanitary Sewer              |
| <span style="color: blue;">—</span>   | Stormwater Conduit          |
| <span style="color: orange;">—</span> | Fiber                       |
| <span style="color: purple;">—</span> | Raw Water Distribution Main |
| <span style="color: red;">—</span>    | Water Distribution Main     |



Date: 10/23/2024

Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent in supplying this product to the Town of Castle Rock and the user assumes no liability for its use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6000. Copyright 2024, Town of Castle Rock Utilities Mapping.

**CASTLE ROCK UTILITIES MAP (INTERNAL USE ONLY)**





# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 9. File #: WC 2024-112**

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water  
David Van Dellen, P.E., Assistant Director  
Roy Gallea, P.E., Engineering Manager

**Artificial Intelligence (AI) Leak Detection, Equipment and Services Acquisition Agreement with Digital Underground Solutions  
Town Council Agenda Date: 2025**

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### Executive Summary

The purpose of this memo is to request Town Manager's approval of an equipment and services agreement (**Attachment A**) with Digital Water Solutions for leak detection technology using acoustical loggers installed on fire hydrants. The technology uses the data from the acoustical loggers to identify and locate water leaks in the distribution system. The initial implementation of this technology will be used as a pilot study in the Cobblestone Ranch subdivision. The cost for the initial phase of this project is \$89,444 including 79,705 for eight permanent loggers for fire hydrants and \$9,739 for software and training. Staff also requests a town managed contingency of \$8,900.

### Discussion

Castle Rock Water (CRW) is looking to evaluate the potential to use AI technology for leak detection. Staff met with several vendors to evaluate their leak detection technology. Each vendor provided a demonstration of the capabilities of their technology. Staff determined that the Digital Water Solutions' solution was the best fit for CRW's goals. The technology uses pressure/acoustic sensors installed on hydrants within the distribution system. These sensors listen for the acoustic signature of leaks in the distribution system. Using multiple sensors, the AI technology can identify the magnitude and location of the leak within tens of feet. These leaks can be identified before they surface and repaired. This technology will also allow us to incorporate our advanced metering infrastructure (AMI) and supervisory control and data acquisition (SCADA) data to create district meter zones to track water balances and use within specific areas of the distribution system.

The goal of this software is to help reduce real water loss seen within the distribution system and ultimately capture lost revenue of produced water from these losses. CRW's annual real losses from leaks in our distribution system range from 133.3 million gallons or 409.3 AF to 240.0 million gallons or 736.8 AF over the last five years. The value of this water is \$410,770 to \$643,070 based on an average sales price of \$3.08 per thousand gallons. Reducing these water losses also helps to

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**Item #: 9. File #: WC 2024-112**

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reduce the amount of water supply CRW has to develop to meet future demands. A rough cost for development of renewable water supplies is \$50,000 per acre foot (AF) over and above the lost revenue. This project will allow CRW to evaluate the potential of this technology for use across the whole distribution system to save water supplies, ensure revenues for all water produced, use the supplies more efficiently, and reduce future water supply purchases.

**Staff Recommendation**

Staff recommends approval of a services agreement with Digital Water Solutions for AI hydrant leak detection. The cost for the first phase of the project is \$89,444, plus a 10% Town managed contingency of \$8,900 for a total authorization of \$98,344. Funds will be authorized from the 2024 Distribution System Upgrades Account, 210-4275-442-75-38.

**Attachments**

Attachment A: Services Agreement



# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #:** 10. **File #:** WC 2024-113

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water  
Nichol Bussey, Business Solution Manager  
Paul Rementer, Enterprise Fund Analyst

**Key Performance Indicators**  
**Town Council Agenda Date:** NA

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### Executive Summary

This will be a presentation only item.



# Town of Castle Rock

## Agenda Memorandum

**Agenda Date: 10/30/2024**

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**Item #: 11. File #: WC 2024-114**

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**To:** Members of the Castle Rock Water Commission

**From:** Mark Marlowe, P.E., Director of Castle Rock Water

**Upcoming Town Council Items**  
**Town Council Agenda Date: NA**

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### **Executive Summary**

This item is an informational update only, and is designed to give Commission a preview of time critical items that may need to go to Council prior to review at a Commission Meeting.

***Items for this month include:***

There are no items at this time.