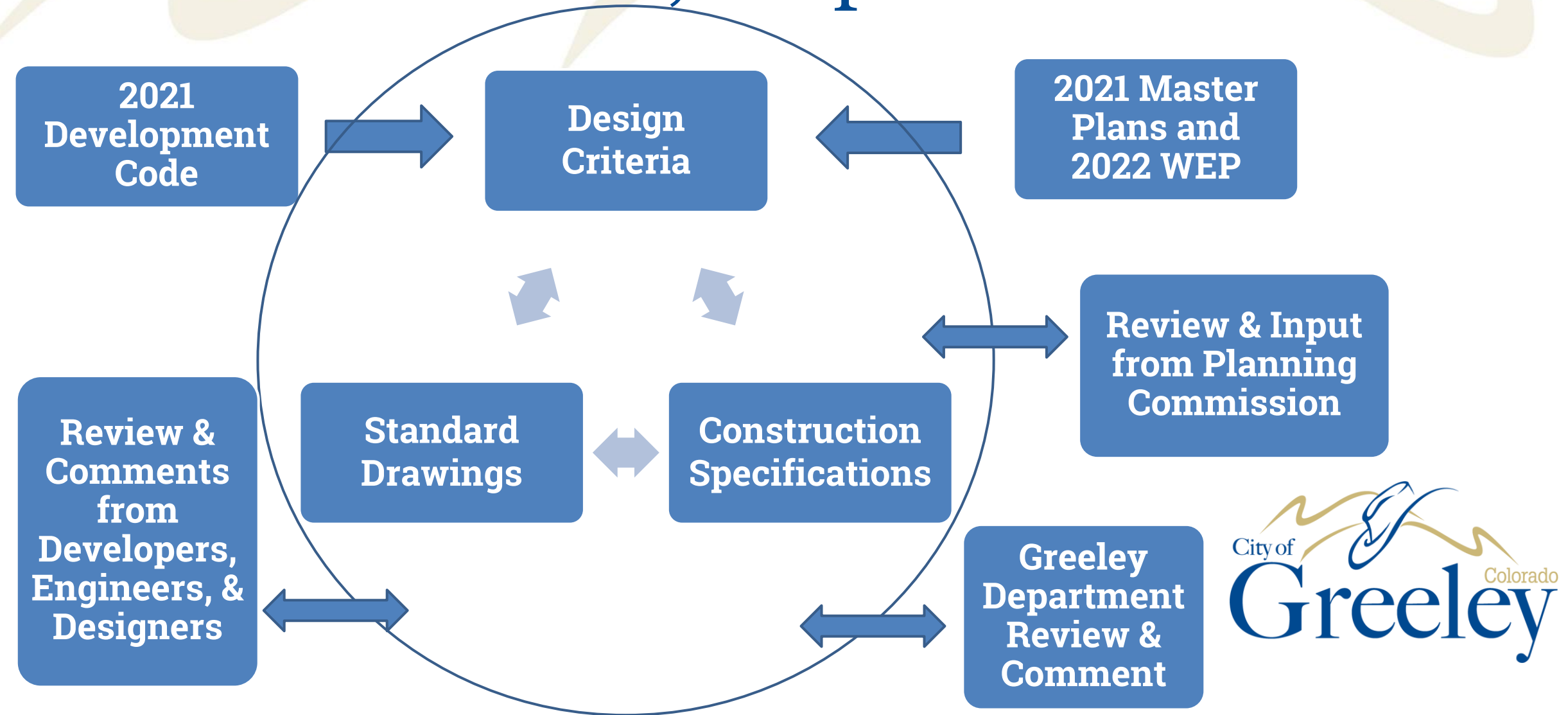


Water and Sewer Department: Design Criteria Standards and focus on Chapter 6 commercial landscape and irrigation criteria

Planning Commission- December 13, 2022



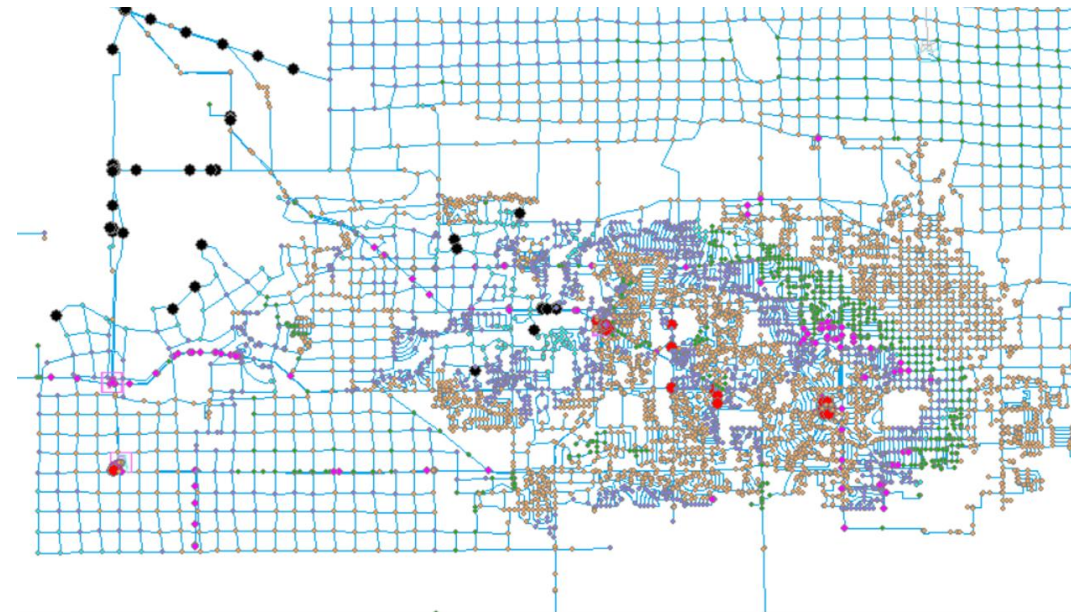
Process for Updating Design Criteria, Standards Details, & Specifications



Design Criteria

Goals

- **Alignment with W&S master plans published 2021.**
- **Align criteria with current W&S standards**
(Updated technology and equipment)
- **Consistency across standards**
- **Coordination with other departments**
- **Potential for cost savings and reduced frequency of project RFI's**
- **Conformance to the new statewide Subsurface Utility Engineering (SUE) Laws**



Design Criteria: Sections 1-6

Section 1: General Requirements of Development

Section 2: Submittal Requirements

Section 3: Potable Water

Section 4: Sanitary Sewer

Section 5: Non-potable water

Section 6: Landscape and Irrigation



Section 1

General Requirements of Development

- **There were no substantive changes to this section**
- **Alignment with Engineering Development Review**



Section 2

Submittal Requirements

- **Hydraulic models in a format that can be integrated with the City's overall models – InfoWater & InfoSWMM**
- **Implementing stricter measurement tolerances for survey verifications and as-built drawings**
- **Provided more detail for reimbursement of oversized public infrastructure, particularly sanitary sewer lift stations and non-potable ponds and pump stations.**



Section 3

Potable Water

- Provides guidance for development when assumptions are made on future customers
- Updated future flows more accurately using zoning, acreages, and building footprints
- Updated connections standards
- Updated details and specifications
- Aligns with wastewater for consistency

Residential			
Zoning based on <i>City of Greeley Charter and Code, Chapter 24.401, Zoning District Development Standards.</i>			
Use	Units Per Acre*	Occupancy	Peak Hour Demand
R-E	3	3.1 persons	1.9 gpm/unit
R-L	5	3.1 persons	1.9 gpm/unit
R-M	10	2.7 persons	1.7 gpm/unit
R-H	20	1.7 persons	1.1 gpm/unit
R-MH	15	1.7 persons	1.1 gpm/unit
*Use these unit per acre values unless specific unit counts are known			
Commercial			
Where uses are known, use the specific demand values. Commercial demands based on 1000 ft ² of building area unless noted otherwise. Otherwise use the appropriate zoning demand values.			
Use	Average Day Demand without Irrigation		
C-L	1500 gpd per acre		
C-H	3000 gpd per acre		
I-L & I-M	1500 gpd per acre		
I-H	3000 gpd per acre		
Use	Average Day Demand		
Restaurant	500 gpd		
Retail/Offices	200 gpd		
Grocery Store	430 gpd		
Laundry, Dry Cleaning	1000 gpd		
Auto Dealer, Repair/Service	115 gpd		
Car Wash with Water Reuse	1500 gpd		
Hospital	380 gpd		
Hotel/Motel	350 gpd		
Retirement & Nursing Home	350 gpd		
School	12 gpd/student without showers 36 gpd/student with showers		
Religious Building	300 gpd		
Warehouse (Non-industrial)	25 gpd		
Irrigation	25 gpm per acre		

Section 4

Sanitary Sewer

- **Defines wastewater flows for:**
 - **Commercial & Industrial customers based on zoning**
- **Provides guidance for development when assumptions are made on future customers**
- **Calculates future wastewater flows more accurately using zoning, acreages and building footprints**
- **Removes underdrains below sanitary sewer lines**
- **Detailed Lift station criteria**
- **Aligns with potable water for consistency**

Residential			
Zoning based on City of Greeley Charter and Code, Chapter 24.401, Zoning District Development Standards			
Use	Units Per Acre	Occupancy	Average Day Wastewater Flows*
R-E	3	3.1 persons	0.22 gpm/unit
R-L	5	3.1 persons	0.22 gpm/unit
R-M	10	2.7 persons	0.19 gpm/unit
R-H	20	1.7 persons	0.12 gpm/unit
Commercial			
Use		Average Day Wastewater Flows*	
C-L (not specified)		1,500 gpd/acre (minimum)	
C-H (not specified)		3,000 gpd/acre (minimum)	
Retail/Offices		200 gpd/1,000 SF	
Hotels/Motels		350 gpd/1,000 SF	
Restaurants		500 gpd/1,000 SF	
Bars and Lounges		300 gpd/1,000 SF	
Neighborhood Stores		200 gpd/1,000 SF	
Department Stores		200 gpd/1,000 SF	
Laundry and Dry Cleaning		1,000 gpd/1,000 SF	
Banks		300 gpd/1,000 SF	
Nursing Homes		350 gpd/1,000 SF	
Warehouses		25 gpd/1,000 SF	
Car Washes		1,500 gpd/1,000 SF	
Auto Dealer/Repair/Service		115 gpd/1,000 SF	
Grocery Store		430 gpd/1,000 SF	
Religious Buildings		300 gpd/1,000 SF	
Factories		800 gpd/1,000 SF	
Hospitals		380 gpd/1,000 SF	
Schools (without showers)		12 gpd/student	
Schools (with showers)		36 gpd/student	
Industrial			
Use		Average Day Wastewater Flows*	
I-L (not specified)		1,500 gpd/acre	
I-M (not specified)		1,500 gpd/acre	
I-H (not specified)		3,000 gpd/acre	

*1cfs = 448.33 gpm

Average day wastewater flow per capita = 60 gpcd

Section 5: Non-Potable Water

- **Comprehensive**
 - **Covers every aspect of non-pot system design.**
 - **Updated the process for flow calculations**
- **Easy to Follow**
 - **Simplified & logical progression.**
- **Aligns with NP Master Plan**
- **Regional Systems & Oversizing**
- **Predesign Meetings w/Stakeholders**

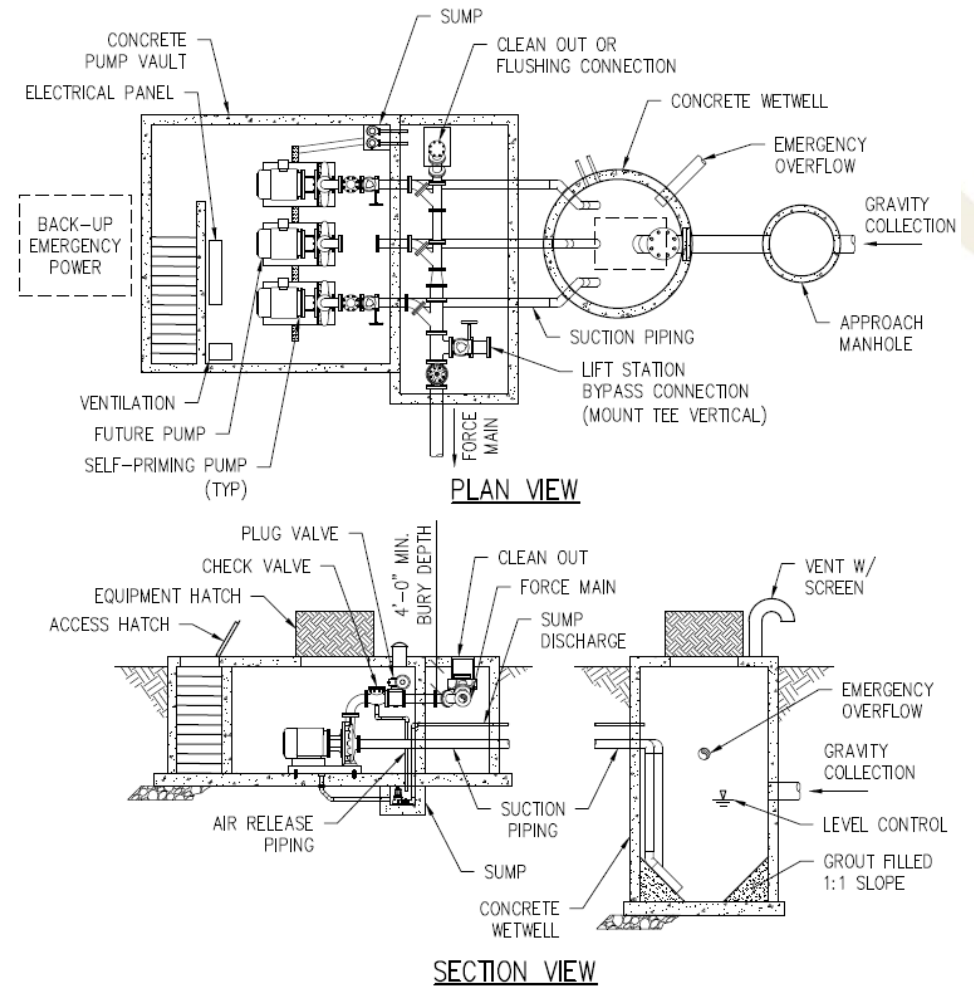


Standard Drawings

Sections 1-5

Key Updates

- Updated details based on current materials and equipment
- Condensed meter vault details across non-potable and potable water meters
- Added standard lift station drawings to the sanitary sewer drawings
- Added utility locating details in accordance with the new SUE law in Colorado (SB 18-167)



Section 6

Landscape and Irrigation

New Criteria:

- **Support existing City Plans**
- **Promotes water conservation**
- **Guides non-residential landscape design**
- **Support attractive and sustainable landscapes**

Applicable to:

- **Common areas**
- **Right-of-ways**
- **Municipal buildings**
- **Non-residential (commercial/industrial)**
- **Multi-family residential**



Why a landscape and irrigation criteria?

- **Providing long range water wise planning**
- **Water for a livable community with healthy landscape and tree canopy for current and future Greeley residents**



Why a landscape and irrigation criteria?

Following:

- **CRS 1973 § 31- 23-207, revised 1977**
- **City Ordinance 40, 2015 - Landscape Policy Plan for Water Efficiency**
- **2015 Water Conservation Plan**
- **2018 Comprehensive Plan**
- **Supports current Chapter 8 - Landscape Standards**



Section 6-Landscape and Irrigation

Hydrozones


- An area within a landscape where the plant materials require a similar amount of water.
- Four hydrozones
- Hydrozone breakdowns are the same as the irrigation water dedication requirements outlined in code
- Grouping plantings by hydrozone reduces overwatering



Section 6-Landscape and Irrigation

Water Budget Chart

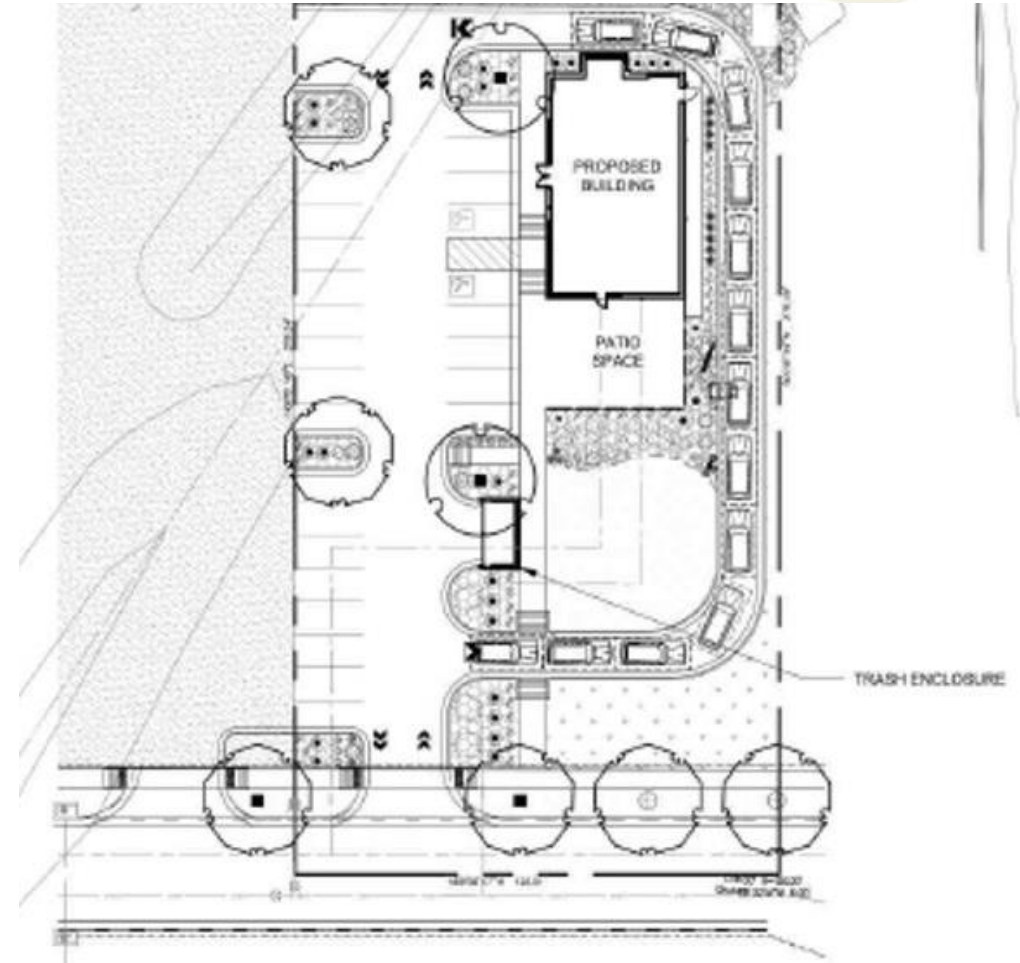
- Upfront knowledge of average water demand for landscape.
- Equal the water dedication required for irrigation taps.
- Limits average irrigation to 15 gallons per square foot per year.

		Water Budget Chart			
ZONE ID for Tap	Irrigated Area Calculated (SF)	Percentage of each zone	Hydrozone (select one)	Water Need (gallons/SF)	Annual Water Use (gallons)
	10,000	25%	High	18	180,000
	10,000	25%	Moderate	14	140,000
	10,000	25%	Low	7	70,000
	10,000	25%	Very Low	0	-
			High	18	-
			Moderate	14	-
			Low	7	-
			Very Low	0	-
			High	18	-
			Moderate	14	-
			Low	7	-
			Very Low	0	-
			High	18	-
			Moderate	14	-
			Low	7	-
			Very Low	0	-
			High	18	-
			Moderate	14	-
			Low	7	-
			Very Low	0	-
			High	18	-
			Moderate	14	-
			Low	7	-
Subtotal	40,000				390,000
Average (Gallons/SqFt)		9.8			

Section 6-Landscape and Irrigation

Landscape & Irrigation Design and Plans

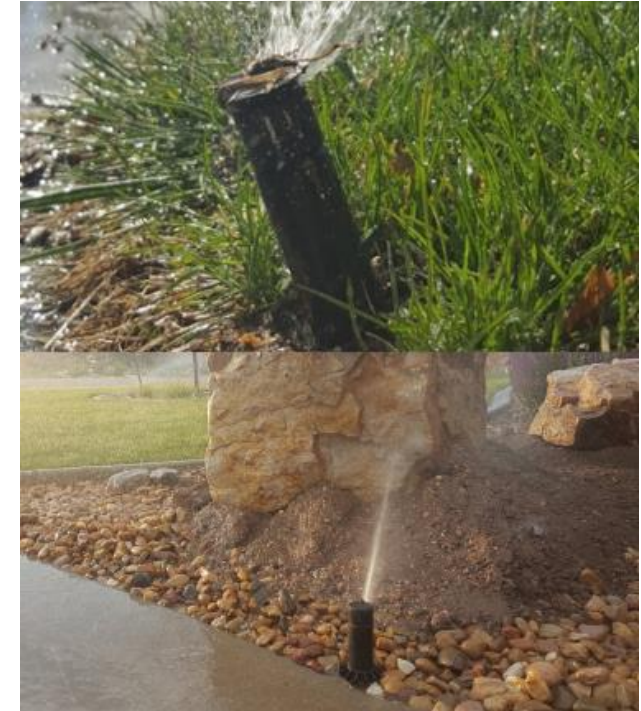
- Site Plan – General Landscape Plan
- Construction Drawings – Detailed Landscape Plan
- Must be stamped by Colorado registered landscape architect
- Methods and configurations are guided by landscape plan's hydrozones
- Heads and nozzles in a single zone must have matched precipitation rates



Section 6-Landscape and Irrigation

Irrigation System Installation and Performance Audit

- **Required prior to final approvals and release of landscaping bonding or surety where applicable**
- **Can be performed by Water & Sewer Conservation staff or private auditor**
 - **Certified Landscape Irrigation Auditor (CLIA)**
 - **Qualified Water Efficient Landscaper (QWEL)**
 - **City staff cheaper but limited availability**



Section 6-Landscape and Irrigation

Maintenance

- **Landscape maintenance following**
 - Chapter 8- Landscape Requirements
 - Mow policy from Natural Areas and Trails
 - Best management practices
- **Irrigation Maintenance**
 - Annual checkup
 - Leak repairs
 - Replacement of damage systems
 - Head adjustments
 - Seasonal adjustments to irrigation controller
 - Suggested checkup every 5 years



Section 6- Highlighted Changes

Refined definitions

Mulch and weed barriers

Added specifications on irrigation equipment:

- **Separate zones for medians/islands**
- **Smart controller, flow sensors, valves and pressure regulators to reduce water waste**
- **Sleeving**
- **Identification of purple infrastructure for non-potable**

Irrigation Design Plans and Install

- **Water windows**
- **Certified irrigation designer**

Irrigation Installation

- **Field supervisor**
- **Wiring**
- **Testing clarification**

Water audit guidelines

Irrigation system maintenance



Engagement & Review

- **Introduced to Builders, Realtors, Developers - July 19, 2021**
- **Reviewed and Coordinated with other City Departments throughout process**
- **Reviewed by Engineering Development Review & Civil Inspections Staff**
- **Presented to Planning Commission to get Input and Feedback – March, August, November 2022**
- **Meetings & Review Comments from Engineers, Developers, Landscape designers, & Community members - March to June, 2022**
 - **155 comments and questions tracked and addressed**
 - **Additional meetings with external key member(s) September 30, 2022, November 8, 2022 and December 5, 2022.**



Staff Recommendation

- **Approve and recommend to City Council the Adoption of the January 2023 Water & Sewer Design Criteria, Standard Details, and Construction Specifications**



Questions?

