

FINAL UTILITY REPORT
FOR
DAWSON TRAIL BLVD (SOUTH)
FILING 1 INFRASTRUCTURE
TOWN OF CASTLE ROCK, COLORADO
CD23-0034

Prepared for:

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February 21, 2025



DEVELOPMENT SERVICES
APPROVED

By tkucewesky
on 04/21/2025
Approved CD23-0034 Final Utility Report.pdf
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UTILITY REPORT APPROVAL BLOCKS

Engineer's Statement:

The enclosed utility report, and exhibits, were prepared by me or under my direct supervision and is correct to the best of my knowledge and belief. Said utility report has been prepared in accordance with applicable Town of Castle Rock criteria and is in conformance with the master utility plans for the affected area. I accept responsibility for any liability caused by negligent acts, errors, or omissions on my part in preparing this report.

Signature: Byron J. Glenn
Registered Professional Engineer
State Of Colorado No. 31485
(Affix Seal)



Owner/Developer's Statement:

As Owner/Developer of Land(s) identified within this report; I agree to proceed, implement and comply with all recommendations and requirements outlined herein.

Acme Dawson Trails LLC
Name of Developer

[Signature]
Authorized Signature



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1. PROJECT LOCATION AND DESCRIPTION

A. General

The purpose of this Master Utility Report is to present the design of the water and wastewater distribution systems for the Dawson Trails Blvd (South) Filing 1 Infrastructure. Final Utility Reports will be prepared for the various phases of the project as the project progresses through the Town's development process. This Final Utility Report analyzes the proposed infrastructure associated with the development of Dawson Trails Blvd (South) Filing 1 Infrastructure, hereon referred to as the "Site".

B. Site Location

The Site is approximately centered within Section 22, Township 8 South, Range 67 West of the Sixth Principal Meridian. The Site is bounded by Interstate 25 to the east, Twin Oaks Subdivision to the west, an undeveloped Douglas County parcel to the north, and Crystal Valley Interchange to the south. A vicinity map for the site can be found in Appendix A.

C. Project Description

The purpose of this report is to analyze potential future densities of the development to ensure that proper infrastructure is accounted for and will be installed to accommodate the ultimate build-out of the project. Per the approved Planned Development Plan, dated September 2022 the Site will consist of 173.9 acres of mixed use and commercial development. This includes planning areas: F1, F2, E1, OSP-06, OSP-05, PL-1.07, PL-1.08, PL-2.04-2.06. The proposed Costco Wholesale warehouse is within the Dawson Trails planned development. At present the site is vacant land and is not accessible by public roads. It is 0.05 miles west of the BSNF railroad and 0.10 miles north of Territorial Road. Early phases of infrastructure around the site will construct the following improvements:

- Dawson Trails BLVD from Crystal Valley Interchange, north to the project boundary.
- Collector A running west to east through the middle of the site.
- Collector B runs north to south along the east side of the site and connects to Dawson Trails BLVD.
- Sanitary sewer connection to the existing sanitary sewer interceptor.
- Water line main throughout the site from Feed 1 (Tank 8), Feed 2 (Tank 4), and Feed 3 (Tank 19)

The above improvements will be constructed prior to or concurrent with the Costco project, and all intended to be complete by the conclusion of construction on the Costco site.

This report proposes conceptual locations and sizes for the water and wastewater systems and analyzes the proposed networks using criteria from the Town of Castle Rock Water System Design 2018 Criteria Manual and Wastewater Collection Design 2018 Criteria Manual.

This report analyzes the proposed water and sanitary sewer systems which will be constructed as part of the development, as well as the connections to the surrounding existing infrastructure. The utility design will conform to the current Town of Castle Rock standards. Easements will be provided for utilities that fall out of the public right-of-way. These will be dedicated on the final plat or at the time of final design/construction documents. The proposed water line will be accessible within the site, predominantly within the proposed roadways.

2. WATER SYSTEM

A. General

The water system will be served by a network of Red and Blue Zone water distribution lines operated by Castle Rock Water, primarily located within the backbone road system within the Site. In addition, this project will contain a blue to red zone pump station, located on the eastern edge of the site. An Overall Water Map has been included in Appendix E.

B. Master Plan: Water Distribution System

The layout and design of the major water distribution system proposed in this report generally conforms with the Town of Castle Rock 2017 Water Master Plan. The Site spans over two (2) different water zones – the Red and Blue Zone. The water distribution system bringing potable water to the Site is shown on the Overall Water Map in Appendix E and will consist of the following:

- An existing waterline connection at Plum Creek Parkway served by Tank 8 (Feed 1). This connection is not essential for the construction of the Costco site. For future developments as part of Filing 1 Infrastructure will require this connection to the designated pump station for proper looping.
- An existing waterline connection North Crystal Valley Parkway and under I-25 served by Tank 4. Also marked as Feed 2, will need to be constructed to establish a Blue Zone connection.
- Pressure Reducing Valves between zones
- Water Booster Pump from the Blue Zone to Red Zone
- Tank 19 or Feed 3. A Red Zone connection as part of Filing 2 infrastructure. This connection and looping will need to be constructed prior or concurrently with the construction of the Costco site. Tank 19 has not been constructed. This tank will need to be designed and located before high water and low water levels are established in Filing 2 infrastructure. See Appendix E for an Overall Water Plan Map.

Raw Water

A future three (3) acre well site is anticipated to be located within Dawson Trails Filing No.1. Specific location is located near the northern corner of the site in PL-1.07, as shown in the Land Use Map in Appendix E. The well's respective transmission line to convey the raw water to a water treatment plant would also be constructed. These raw water facilities will be maintained and operated by the Town. Any potential supply to the distribution system is not included in the model.

C. Regional Offsite Improvements

The Costco Wholesale development will require three (3) offsite improvements located within the vicinity of the development. The first offsite improvement is a connection to a 24" Blue Zone water main boring under I-25, a proposed waterline by EMK, supplied by Tank 4. This connection will feed into the designated pump station. The second offsite improvement will be a 24" connection to Tank 19 that will be constructed in Filing 2 prior or concurrently to the construction of Costco. If there is a difference in HGL in Tank 4 than that of Tank 19, a PRV in Prairie Hawk will be required of which being the third offsite improvement. This water line is anticipated to be constructed within the Plum Creek Parkway Waterline phase.

D. Phasing

The construction of the water infrastructure will be completed in one phase. The phase an approximation and is subject to change based on the developer's discretion and further analysis

during final design. The general phasing of the development transpires in a North to South and East to West direction, rising from the Blue to Red Zone as well as associated infrastructure for each.

Future infrastructure including Tank 19 will be designed and constructed with Filing 2 Infrastructure plans. Filing 1 infrastructure lies within both the Blue and Red Zones. The water main will have a minimum of two (2) points of connection to the town's existing system, providing adequate looping for the development. The first connection is to a 24" Blue Zone water main boring under I-25, a proposed waterline by EMK, supplied by Tank 4. The second connection is to a 16" Blue Zone water main supplied by the Meadows Tank, Tank 8, at Plum Creek Parkway as a part of the Plum Creek Parkway Waterline development phase. It is to be noted that the connection to Tank 8 is not required for opening of Costco. Although both existing connections are in the Blue Zone, Tank 8 has a higher HGL than that of Tank 4, so a PRV will be needed to balance pressures to the development.

Tank 19, a proposed Red Zone tank, will be essential to the initial phases of the Dawson Trails development, and will be designed and constructed in Filing 2 Infrastructure. It is assumed that Tank 19 will be located in the vicinity of the existing water tank near the central part of the development. The total Red Zone tank volume at buildout is approximately 5.04 million gallons; the initial tank volume will be determined during the design phase of this facility. A new Red Zone Booster Pump Station will be designed and constructed. It is currently planned near the intersection of Dawson Trails Boulevard and Territorial Road at the interface between the Blue and Red Zones. The proposed pump station will be sized to supply the required flows in the Red Zone. In addition, the distribution system will have PRVs at all connections between the Red and Blue Zones.

E. Demand Categories, Design Criteria

Water consumption demands from Section 4.4.1 Design Demands were used for the Average Day Demands (ADD) and peaking factors as shown in Table 2.1: Water System Design Values from the Town of Castle Rock Water System Design 2018 Criteria Manual.

Table 2.1: Water System Design Values

Criteria	Value
Average Day Demand (ADD) per SFE	265 gallons per day (gpd)
Maximum Daily Demand (MDD) Factor	2.5 times ADD
Peak Hour Demand (PHD) Factor	5.5 times ADD
Minimum Static Pressure with Zero Demand (20% Tank Stage)	43 psi
Maximum Static Pressure with Zero Demand (100% Tank Stage)	125 psi

The following Single-Family Equivalents were used to calculate water demands.

Table 2.2: Single Family Equivalents

Criteria	Value
Single Family Residential and Duplexes	1.0 / dwelling unit
Multi-family Residential (Townhomes and Apartments)	0.65 / dwelling unit
Industrial / Commercial	3.0 / acre
Schools	0.85 / school-acre
Parks	Varies

Parameters used with the model of the Dawson Trails Water System are now as follows:

- **Average Day Demand (ADD)** is the total water use during a year divided by the number of days in a year (365).
- **Maximum Day Demand (MDD)** is the average demand in the month with the overall highest usage during the year (typically July or August). MDD is used to size water pipelines when combined with fire flows. MDD is also used to size water storage tanks (along with fire flow volumes).
- **Peak Hour Demand (PHD)** is the highest hourly demand occurring during the year. PHD is used to evaluate the required size of distribution pipelines. Known irrigation demands were applied at all junctions for public area irrigation and are consistent with the landscaping and irrigation construction documents.

The anticipated Costco Development will be located in Planning Area F-2 within Filing 1. Water demands and pressure requirements from the Costco Wholesale Development Requirements, December 18, 2020 can be found in Appendix D.

In addition to the parameters above, fire flows were analyzed (along with the Maximum Day Demand) as follows:

- **Fire Flow Demand (FFD)** – Fire flow requirements within Town of Castle Rock are dictated by the Town's Fire Department and the latest edition of the International Fire Code (IFC). Fire flow demands (FFD) vary depending on building usage (residential versus commercial), building square footage, and type of building construction which are defined in Appendix B of the IFC. A 50 percent reduction in required fire flow may be allowed for approved residential sprinkler systems, and a 75 percent reduction may be allowed for approved commercial sprinkler systems at the discretion of the Town of Castle Rock Fire Chief. The minimum fire flow for the water distribution system should not be less than 1,500 gpm.

F. Water System Modeling and Analysis

The water system was modeled by MSK Consulting, LLC. using InfoWater software. The InfoWater results are included in Appendix B along with a Vicinity Map in Appendix A for the simulation. Simulations were run for the following scenarios:

- Minimum and Maximum Static Pressures with Zero Demand (20% and 100% Tank level)
- Peak Hour Demand (PHD)
- Max Day Demand + Fire Flow (MDD+FF)
- Extended Period Simulation (EPS)

The steady-state simulations (PHD and MDD+FF) were run separately for each pressure zone since booster pump stations and pressure reducing valves will isolate one zone from another. For the EPS scenario, all three pressure zones were modeling concurrently.

Static Pressure with Zero Demand

Prior to applying any demands, the static pressures at each junction were evaluated for two conditions: 20% full tank and 100% full tank. The 20% full condition determines the low static pressure and the 100% full scenario reveals the maximum station pressure. For this analysis, the following tank levels were used:

Table 2.3 Tank Water Levels

Tank	20% Full Elevation	100% Full Elevation
Blue Zone	6490 ft	6508 ft
Red Zone	6662 ft	6680ft

The majority of the junctions have a static pressure within the required range (43 psi to 125 psi). There are a few junctions in each pressure zone that will need to be raised or lowered during the final design process. Results are provided in Appendix B.

Peak Hour Demand

A PHD scenario was performed on each pressure zone assuming full buildout and the tank levels at 20% full. The PHD factors were applied to average day demands and the model output was evaluated for junction pressure and pipe velocity. A summary of the results is provided below, and full output is included in Appendix B.

MDD+FF

A maximum day demand plus fire flow (MDD+FF) scenario for each pressure zone was performed. As stated previously, the fire flow demand for all commercial, multi-family, or school development is assumed to be 3,000 gpm. The fire flow for all single-family residential developments is 1,500 gpm. Fire flows were applied during the MDD condition, and all fire hydrant junctions satisfied the CRW's requirement of a minimum of 20 psi residual pressure. A summary of the results is provided below, and complete results are in Appendix B.

Table 2.5 MDD+FF Results

Zone	Lowest Residual Pressure (PSI)
Blue	28.79 (J12)
Red	62.39 (J108)

Table 2.6 Costco MDD+FF Results

Serviced By Zone	Fire Flow Demand	Residual Pressure
Red	4,000 GPM	105.87 PSI
Red	2,150 GPM	130.31 PSI

Note: If connected to the Red Zone, the Costco static pressure will exceed 125 psi.

Extended Period Simulation

An Extended Period Simulation (EPS) was performed to analyze the distribution system during a 24-hour period during a maximum day condition. CRW provided the 24-hour diurnal curve (included in Appendix B) that were applied to the calculated MDD. As stated previously, the EPS scenario evaluated the three (3) pressure zones concurrently. The Red Zone tank was inputted into the model. The inputs included the total volume at buildout and the tank levels. The booster pump stations included a pump curve to allow for the analysis of discharge flows and pressures.

The EPS scenario provides a complete full day's analysis of the distribution system, including a "tank-filling" situation. It provides the upper end of each pump stations' output and the junction pressures and pipe velocities during those conditions. Generally, the demands in the EPS analysis are lower than either the PHD or MDD+FF scenarios. However, it was included in the water system

analysis to provide initial results on the tanks' and booster pump stations' performances. In particular, the Red Zone Booster Pump Station was evaluated because this facility will be responsible for conveying the flows to meet the demands of both the Red Zone. Results from the EPS analysis are included in Appendix B, but they are considered preliminary because pump curves for actual pumps were not used and the tank volumes are for full buildout. A more specific analysis will be performed during the design of each booster pump station and tank.

3. WASTEWATER COLLECTION SYSTEM

A. General

The wastewater collection system will be served with gravity sanitary sewer lines, lift station(s), and force mains operated by the Town of Castle Rock. The main lines will run within the backbone road system, in access roads along the perimeter of the tracts and through tracts where need be. Generally running west to east, while the interceptor will be running south to north along the east edge of the site. These runs are graphically shown in the Overall Sanitary Sewer Map in Appendix E. The anticipated total wastewater load for the Site is 16.7 gallons per minute. A summary of loads to both residential and non-residential are shown in Table 3.1.

Table 3.1 Land Use Summary Table

	Use	Quantities	Totals
Non-Residential	Industrial (SF)	1,000,000	1,505,000
Non-Residential	Retail / Office (SF)	505,000	1,505,000
Non-Residential	Parks (SFE)	2	1,505,000
Non-Residential	Car Wash/Pump Station (SFE)	4	1,505,000
Non-Residential	Fuel Stations (SFE)	1	1,505,000
Residential	Multifamily (DU)	400	400

B. Master Plan: Wastewater Collection System

The plan is in general accordance with the Castle Rock Water 2016 Wastewater Master Plan Update. The main discrepancy from the Master Plan is rather than a 15-inch pipe at the downstream end of the interceptor, further analysis concluded that a 24-inch pipe will be needed to accommodate for the density and magnitude of the Site. Additionally, the Town is responsible for reconnecting the sanitary sewer main across Plum Creek Parkway to tie into the existing wastewater collection system. The Town is anticipating upsizing these interceptors to adequately convey the flows of the ultimate buildout. The wastewater collection system serving the Dawson Trails Development will consist of the following:

- 8"/10"/12"/15"/18"/21"/24" gravity sanitary sewer
- Lift station(s)
- Sanitary sewer force main(s)

Routing

As shown in the Overall Wastewater Map. Flows from the Site will be accepted at Junctions 6, 7A, 7, 7B, 8, 9A, 9, 9B as highlighted in the Overall Wastewater Map shown in Appendix E. The flows will enter a 24" offsite sanitary interceptor to the east and taken north. A hydraulic capacity and routing of the proposed pipes was done using a CORE developed spreadsheet. The results of this analysis can be found in Appendix C.

C. Regional and Offsite Improvements

The Town of Castle Rock currently has an existing 12 and 15-inch sanitary sewer gravity mains serving the southwest quadrant of Town and terminates at Territorial Road and Interstate-25. The existing mains will be removed and replaced with a 24-inch sanitary sewer interceptor running north along the west side of the I-25 Frontage Road to Plum Creek Parkway. See the Overall Wastewater Map in Appendix E for the proposed conceptual alignment.

D. Phasing

The Overall Utility and Phasing Map can be found in Appendix E. The phasing generally moves in a north to south and east to west direction, in other words a downstream to upstream fashion. The northern portion of the sanitary interceptor bounding the east property line of the site will be constructed initially, while later phased mains and associated upstream interceptor lines will tie into it. Phasing locations and associated planning areas are discussed in Section 2.D of this report and additional phasing information can be found in the Approved PDP in Appendix D.

E. Demand Categories, Design Criteria

Wastewater demands, were taken from 4.4.1.1 Wastewater System Average Daily Flow (ADF) of the Town of Castle Rock Wastewater Collection Design 2018 Criteria Manual.

Table 3.1 – Wastewater Collection System Evaluation Parameters

Flow Parameters	
Average Daily Flow (ADF)	200 gpd / dwelling unit
Peaking Factor (PF)	$PF = 3.65 * [(ADF)^{-0.168}]$ Maximum PF = 5
Infiltration and Inflow (I/I)	$I/I = 0.1 * ADF$
Peak Design Flow (PDF)	$PDF = ADF * PF + (I/I)$
Gravity Flow Pipe Parameters	
Minimum Pipe Size	8-inch
Manning's Roughness Coefficient	0.011
Minimum Velocity	2.0 ft/s
Maximum Velocity	10.0 ft/s
Maximum Flow in Pipe (d/D)	0.75
Force Main Parameters	
Minimum Pipe Size	4-inch
Minimum Velocity	3.0 ft/s
Maximum Velocity	7.0 ft/s

The following Single-Family Equivalents were used to calculate Sanitary Demands.

Criteria	Value
Industrial / Commercial	3.0 / acre

Parameters used with the model of the Costco Warehouse collection system are as follows:

- **Average Daily Flow (ADF)** are the total wastewater flows generated in year divided by the number of days in a year (365). Average Daily Flows, or base flows, are contributed to the collection system from residential, industrial, commercial, and schools.
- **Peak Design Flow (PDF)** is the highest hourly demand occurring during the year. These flows were used for the analysis of the sanitary sewer system.

F. Wastewater System Modeling and Analysis

The wastewater system was modeled using an Excel spreadsheet shown in Appendix C. The runs are included in the Overall Sanitary Sewer Map in Appendix C. Preliminary road grades have been designed, therefore sanitary sewer slopes have been analyzed at a slope less than that of its associated roadway grade for a conservative evaluation.

4. CONCLUSIONS

Executive Summary

This Utility Report is intended to provide analysis and guidance to ensure the various filings and phases of the development are constructed in accordance with the overall needs and requirements of the development, and that the proposed infrastructure considers the full build-out condition.

The Town of Castle Rock currently does not have any domestic water connections to Dawson Trails. The connections to the Blue Zone will be from Plum Creek Parkway and Crystal Valley Parkway. The Red Zone will need to construct new tanks for service. There will be booster pumps and pressure reducing valves connecting the zones to each other.

According to the 2010 Wastewater Master Plan, the existing 12" and 15" will need to be upsized to 15" and 18", respectively. However, the calculations within this report and conversations with the Town concluded that the sanitary sewer needs to be removed and replaced with a 24-inch interceptor based on the density from the Dawson Trails Planned Development Plan, approved in September of 2022.

The developers and design engineers will continue to work closely with the Town of Castle Rock as the various phases of the project are designed and constructed to ensure adequate infrastructure is provided to ultimately serve the full build-out of the development.

Compliance with Master Plans

The proposed water and wastewater layouts presented in the report provide systems which are in substantial conformance with the 2016 and 2017 Master Plan Updates.

Final Utility Report

The layout and design of the water and wastewater system proposed in this report, although in conformance with the Town of Castle Rock Water and Wastewater Collection System Design Criteria Manuals, is general in nature. Once a more refined design for the future development is available, a Final Utility Report shall be prepared and submitted with a final plat and construction drawings for each portion of the development.

REFERENCES

Costco Wholesale. December 18, 2020. [Costco Wholesale Development Requirements](#)

TOCR (Town of Castle Rock). December 4, 2018. [Town of Castle Rock Water System Design Criteria Manual](#).

TOCR (Town of Castle Rock). December 4, 2018. [Town of Castle Rock Wastewater Collection System Design Criteria Manual](#).

TOCR (Town of Castle Rock). 2016, [Town of Castle Rock, 2016 Wastewater Master Plan](#).

TOCR (Town of Castle Rock). 2017. [Town of Castle Rock, 2017 Water Master Plan Update](#).

[Dawson Trails Planned Development Plan](#). September 2022.

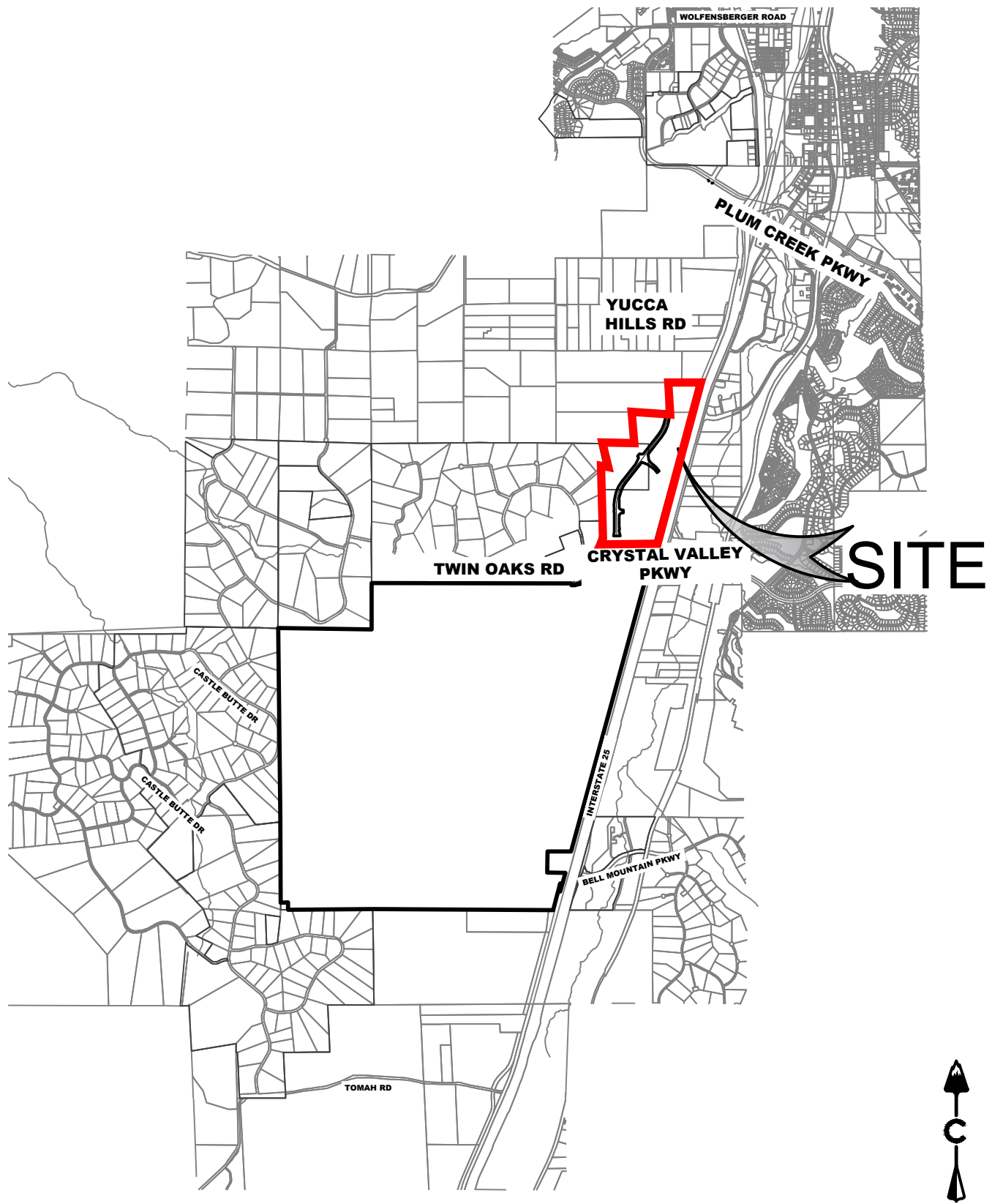
Computer Modeling Programs:

Bentley Systems, Inc., Version 2018. [WaterCAD](#)

Excel by Microsoft, Inc.

Appendix A

Figures



Appendix B

Water Modeling / Calculations / Irrigation Charts

Dawson Trails for Westside**Potable Water Model**

Water Demands-Phase 1

Date: June 2024

MSK Project #: 52-001-01

Calc'd by: DLT

PRELIMINARY**6/27/24****Assumptions:**

Average Day Demand (ADD) per SFE: 265.0 gpd [7/17/23 Lowered by CRW per ordinance]

Max Day Demand (MDD) Factor: 2.5 x ADD

Peak Hour Demand (PHD) Factor: 5.5 x ADD

Irrigation ADD: 3,750 gpd/irrigated acre

Table B1-1: Potable Water Demands for Phase 1 (w/ Irrigation)

A	B	C	D	E	F	G	H	I	J	K	L
No.	Planning Area	Pressure Zone	Total SFEs	ADD (gpd)	MDD (gpd)	MDD (gpm)	PHD (gpm)	Irrigated Area (ac)	Irrigation ADD (gpd)	Irrigation ADD (gpm)	Junction
1	F-1	Blue	0.0	0	0	0.0	0.0				J28
2	F-1	Blue	0.0	0	0	0.0	0.0				J18
3	F-1	Blue	0.0	0	0	0.0	0.0				J20
4	F-1	Blue	0.0	0	0	0.0	0.0				J20
5	E-1	Blue	0.0	0	0	0.0	0.0				J12
Blue Zone Totals			0.0	0	0	0.0	0.0	0.0	0.0	0.0	
6	F-2 (Ph. 1)	Red	0.0	0	0	0.0	0.0	2.29	8,595.6	5.97	J10
7	F-2 (Ph. 1)	Red	102.0	27,030	67,575	46.9	103.2				J14
8	F-3 (Ph. 1)	Red	62.5	16,563	41,406	28.8	63.3				J94
9	F-3	Red	0.0	0	0	0.0	0.0				J96
10	B-1 (Ph. 1)	Red	233.0	61,745	154,363	107.2	235.8				J140
11	D (Ph. 1)	Red	274.0	72,610	181,525	126.1	277.3				J98
12	D	Red	0.0	0	0	0.0	0.0				J24
13	D	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J112
14	D	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J114
15	D	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J120
16	D	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J102
17	D	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J58
18	D	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J118
19	C-2	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J108
20	C-2	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J106
21	C-2	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J126
22	C-2	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J124
23	C-2	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J66
24	C-2	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J122
25	G-1	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J110
26	G-1	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J116
27	G-2	Red	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J64
Red Zone Totals			671.5	177,948	444,869	308.9	679.7	2.3	8,595.6	6.0	
28	B-1	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J134
29	C-2	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J130
30	C-2	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J44
31	C-2	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J74
32	C-1	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J132
33	C-1	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J128
34	C-1	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J42
35	B-2	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J138
36	A	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J136
37	A	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J48
38	A	Green	0.0	0	0	0.0	0.0	0.0	0.0	0.0	J62
Green Zone Totals			0.0	0	0	0.0	0.0	0.0	0.0	0.0	
Buildout Totals (All Zones)			671.5	177,948	444,869	308.9	679.7	2.3	8,595.6	6.0	

Note:

1. The development composition in each Planning Area is preliminary and may change.

WESTSIDE PROPERTY**Dawson Trails Scenario #0 - Ph1, Static-no demands, Feed 1 OFF, Feed 2 OFF, PS OFF**

Water Model Junction Report

Model Run Date: June 29, 2024

Table B2-1: Water Model Junction Report

ID	Description (Char)	SFE	Zone (Char)	Phase (Int)	Elevation (ft)	PHD Demand Applied (gpm)	RZ Tank at 20%=6662.0		RZ Tank at 100%=6680.0	
							Head (ft)	Pressure (psi)	Head (ft)	Pressure (psi)
J10			Red	1	6,367.00	0.00	295.00	127.82	313.00	135.62
J100			Red	1	6,549.09	0.00	112.91	48.92	130.91	56.72
J102	FH	0.0	Red	1	6,498.44	0.00	163.56	70.87	181.56	78.67
J106	FH	0.0	Red	1	6,492.07	0.00	169.93	73.63	187.93	81.43
J108	FH	0.0	Red	1	6,496.31	0.00	165.69	71.79	183.69	79.59
J14	FH	102.0	Red	1	6,381.00	0.00	281.00	121.75	299.00	129.55
J140	FH	233.0	Red	1	6,467.50	0.00	194.50	84.27	212.50	92.07
J15		0.0	Red	1	6,381.00	0.00	281.00	121.75	299.00	129.55
J16			Red	1	6,350.00	0.00	312.00	135.18	330.00	142.98
J161			Red	1	6,386.00	0.00	276.00	119.58	294.00	127.38
J22			Red	1	6,433.62	0.00	228.38	98.95	246.38	106.75
J24	FH	274.0	Red	1	6,471.80	0.00	190.20	82.41	208.20	90.21
J50			Red	1	6,377.00	0.00	285.00	123.48	303.00	131.28
J54			Red	1	6,425.00	0.00	237.00	102.69	255.00	110.49
J70			Red	1	6,490.00	0.00	172.00	74.52	190.00	82.32
J76	Tank		Red	1	6,646.85	0.00	15.15	6.56	33.15	14.36
J78	Red-Green PS		Red	1	6,607.50	0.00	54.50	23.61	72.50	31.41
J92			Red	1	6,380.00	0.00	282.00	122.18	300.00	129.98
J94	FH	62.5	Red	1	6,395.02	0.00	266.98	115.68	284.98	123.47
J96	FH	0.0	Red	1	6,444.45	0.00	217.55	94.26	235.55	102.06
J98	FH	0.0	Red	1	6,443.18	0.00	218.82	94.81	236.82	102.61
671.5						0.00				

WESTSIDE PROPERTY

Dawson Trails Scenario #3 - Ph1, SS, PHD, Feed 1 OFF, Feed 2 OFF, PS OFF, RZ Tank=6662.0

Dawson Trails Scenario #4B - Ph1, SS, MDD+FF, Costco FF Alternative (2,150 gpm)

Water Model Junction Report

Model Run Date: June 29, 2024

ADD: 265.0 gpd/SFE
MDD: 2.5 x ADD
PHD: 5.5 x ADD

Minimum pressure= 6.74

Table B2-2: Water Model Junction Report

[Scenario #3 Results]										
PHD DMD = 685.6 gpm										
PHD Demand										
ID	Description (Char)	SFE	Zone (Char)	Phase (Int)	Elevation (ft)	Irrigation ADD (gpm)	Applied (gpm)	PHD + IRR ADD (gpm)	Head (ft)	Pressure (psi)
J10			Red	1	6,367.00	5.97	0.00	5.97	6,662.01	127.83
J100			Red	1	6,549.09		0.00	0.00	6,662.30	49.05
J102	FH	0.0	Red	1	6,498.44		0.00	0.00	6,662.20	70.96
J106	FH	0.0	Red	1	6,492.07		0.00	0.00	6,662.19	73.71
J108	FH	0.0	Red	1	6,496.31		0.00	0.00	6,662.06	71.82
J14	FH	102.0	Red	1	6,381.00		103.24	103.24	6,662.00	121.76
J140	FH	233.0	Red	1	6,467.50		235.83	235.83	6,662.08	84.31
J15		0.0	Red	1	6,381.00		0.00	0.00	6,662.01	121.76
J16			Red	1	6,350.00		0.00	0.00	6,662.01	135.19
J161			Red	1	6,386.00		0.00	0.00	6,662.01	119.59
J17		0.0	Blue	1	6,351.40		0.00	0.00	6,493.00	61.35
J22			Red	1	6,433.62		0.00	0.00	6,661.96	98.94
J24	FH	274.0	Red	1	6,471.80		277.33	277.33	6,661.92	82.38
J50			Red	1	6,377.00		0.00	0.00	6,662.00	123.49
J54			Red	1	6,425.00		0.00	0.00	6,661.98	102.68
J70			Red	1	6,490.00		0.00	0.00	6,662.18	74.60
J76	Tank		Red	1	6,646.85		0.00	0.00	6,662.40	6.74
J78	Red-Green PS		Red	1	6,607.50		0.00	0.00	6,662.36	23.77
J88	Blue-Red PS		Blue	1	6,350.00		0.00	0.00	6,493.00	61.96
J92			Red	1	6,380.00		0.00	0.00	6,662.01	122.20
J94	FH	62.5	Red	1	6,395.02		63.26	63.26	6,662.00	115.68
J96	FH	0.0	Red	1	6,444.45		0.00	0.00	6,661.97	94.25
J98	FH	0.0	Red	1	6,443.18		0.00	0.00	6,661.97	94.80
		671.5				5.97	679.66	685.63		

WESTSIDE PROPERTY

Dawson Trails Scenario #3 - Ph1, SS, PHD+Irr, Feed 1 OFF, Feed 2 OFF, PS OFF, RZ Tank=6662.0

Dawson Trails Scenario #4B - Ph1, SS, MDD+FF+Irr, Costco FF Alternative (2,150 gpm)

Water Model Pipe Report

Model Run Date: June 29, 2024

Max Velocity Criteria = 10 ft/sec

Max Velocity = 0.53 ft/sec

Criteria met? yes

Table B2-3: Water Model Pipe Report

[Scenario #3 Results]

									PHD OUTPUT				
ID (Char)	Description (Char)	Zone (Char)	Phase (Int)	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status
P-1		Red	1	J15	J161	83.66	12	120	95.75	0.27	0	0.04	Open
P-11		Red	1	J50	J16	1,423.65	12	120	-32.27	0.09	0.01	0	Open
P-18		Red	1	J76	J78	879.01	24	120	685.63	0.49	0.04	0.05	Open
P-2		Red	1	J10	J16	777.55	24	120	32.27	0.02	0	0	Open
P-29	Zone Bndy	Red	1	J88	J16	126.82	24	120	0.00	0	0	0	Closed
P294	Zone Bndy	Red	1	P1_PH1	J16	64.44	24	120	0.00	0	0	0	Open
P-30		Red	1	J94	J92	930.51	16	120	-137.31	0.22	0.02	0.02	Open
P-31		Red	1	J54	J94	1,101.20	16	120	-113.89	0.18	0.01	0.01	Open
P-32		Red	1	J96	J54	685.74	16	120	-113.89	0.18	0.01	0.01	Open
P-33		Red	1	J98	J96	257.42	16	120	-113.89	0.18	0	0.01	Open
P-35		Red	1	J102	J100	970.07	12	120	-163.44	0.46	0.1	0.1	Open
P-36		Red	1	J106	J102	144.99	12	120	-163.44	0.46	0.02	0.1	Open
P-37		Red	1	J70	J106	87.97	12	120	-163.44	0.46	0.01	0.1	Open
P-38		Red	1	J108	J70	1,096.69	12	120	-163.44	0.46	0.11	0.1	Open
P-39		Red	1	J24	J108	1,454.20	12	120	-163.44	0.46	0.15	0.1	Open
P-4		Red	1	J22	J24	781.22	12	120	113.89	0.32	0.04	0.05	Open
P-40		Red	1	J22	J98	1,043.14	16	120	-113.89	0.18	0.01	0.01	Open
P-66		Red	1	J140	J78	3,778.95	20	120	-522.19	0.53	0.28	0.07	Open
P-67		Red	1	J92	J140	2,723.50	20	120	-286.36	0.29	0.07	0.02	Open
P-68		Red	1	J78	J100	2,188.12	16	120	163.44	0.26	0.06	0.03	Open
P-69		Red	1	J10	J15	1,497.69	24	120	-53.31	0.04	0	0	Open
P-71		Red	1	J15	J92	570.16	24	120	-149.05	0.11	0	0	Open
P-72		Red	1	J161	J14	526.76	12	120	55.90	0.16	0.01	0.01	Open
P-74		Red	1	J14	J50	503.93	12	120	-32.27	0.09	0	0.01	Open
P-75		Red	1	J94	J161	1,617.47	12	120	-39.85	0.11	0.01	0.01	Open
P-91		Red	1	J10	J14	1,111.51	8	120	15.07	0.1	0.01	0.01	Open
SUPPLY3	Supply 3	Red	1	FEED3	J76	1.00	24	120	685.63	0.49	0	0	Open

WESTSIDE PROPERTY
Dawson Trails Scenario #4A - Ph1, SS, MDD+FF+Irr (standard), Feed 1 OFF, Feed 2 OFF, PS OFF, RZ Tank=6662.0
Water Model Fire Flow Report
Model Run Date: June 29, 2024

Table B2-4: Water Model Fire Flow Report

ID	Description (Char)	Junction of Interest	Zone (Char)	Elevation (ft)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)	Hydrant Pressure at Available Flow (psi)	Pass /Fail
J102	FH	no	Red	6,498.44	0	71.02	6,662.35	3,000	63.63	8,664.90	20	Pass
J106	FH	no	Red	6,492.07	0	73.78	6,662.35	1,500	71.53	8,689.12	20	Pass
J108	FH	no	Red	6,496.31	0	71.93	6,662.32	3,000	62.39	7,641.77	20	Pass
J14	FH	yes	Red	6,381.00	46.93	121.89	6,662.31	2,000	118.73	13,958.05	20	Pass
J140	FH	no	Red	6,467.50	107.2	84.42	6,662.32	1,500	83.51	17,266.15	20	Pass
J24	FH	no	Red	6,471.80	126.06	82.54	6,662.29	3,000	73.32	8,845.14	20	Pass
J94	FH	no	Red	6,395.02	28.75	115.81	6,662.30	3,000	110.99	15,916.55	20	Pass
J96	FH	no	Red	6,444.45	0	94.39	6,662.30	3,000	87.84	11,597.58	20	Pass
J98	FH	no	Red	6,443.18	0	94.95	6,662.30	3,000	88.18	11,436.70	20	Pass

WESTSIDE PROPERTY

Dawson Trails Scenario #3 - Ph1, SS, PHD, Feed 1 OFF, Feed 2 OFF, PS OFF, RZ Tank=6662.0

Dawson Trails Scenario #4B - Ph1, SS, MDD+FF, Costco FF Alternative (2,150 gpm)

Water Model Junction Report

Model Run Date: June 29, 2024

Table B2-2: Water Model Junction Report

							[Scenario #4B Results]			
671.5							MDD DMD = 2,464.9 gpm			
ID	Description (Char)	SFE	Zone (Char)	Phase (Int)	Elevation (ft)	Irrigation ADD (gpm)	Demand Applied (gpm)	MDD + IRR ADD (gpm)	Head (ft)	Pressure (psi)
J10			Red	1	6,367.00	5.97	0.00	5.97	6,656.53	125.45
J100			Red	1	6,549.09		0.00	0.00	6,661.41	48.67
J102	FH	0.0	Red	1	6,498.44		0.00	0.00	6,660.47	70.21
J106	FH	0.0	Red	1	6,492.07		0.00	0.00	6,660.33	72.91
J108	FH	0.0	Red	1	6,496.31		0.00	0.00	6,659.19	70.58
J14	FH	102.0	Red	1	6,381.00		2196.93	2196.93	6,654.04	118.31
J140	FH	233.0	Red	1	6,467.50		107.20	107.20	6,658.85	82.91
J15		0.0	Red	1	6,381.00		0.00	0.00	6,656.66	119.45
J16			Red	1	6,350.00		0.00	0.00	6,656.50	132.80
J161			Red	1	6,386.00		0.00	0.00	6,656.43	117.18
J17		0.0	Blue	1	6,351.40		0.00	0.00	6,493.00	61.35
J22			Red	1	6,433.62		0.00	0.00	6,657.32	96.93
J24	FH	274.0	Red	1	6,471.80		126.06	126.06	6,657.79	80.59
J50			Red	1	6,377.00		0.00	0.00	6,654.68	120.32
J54			Red	1	6,425.00		0.00	0.00	6,657.03	100.54
J70			Red	1	6,490.00		0.00	0.00	6,660.25	73.77
J76	Tank		Red	1	6,646.85		0.00	0.00	6,662.40	6.74
J78	Red-Green PS		Red	1	6,607.50		0.00	0.00	6,661.93	23.58
J88	Blue-Red PS		Blue	1	6,350.00		0.00	0.00	6,493.00	61.96
J92			Red	1	6,380.00		0.00	0.00	6,656.86	119.96
J94	FH	62.5	Red	1	6,395.02		28.75	28.75	6,656.87	113.46
J96	FH	0.0	Red	1	6,444.45		0.00	0.00	6,657.13	92.15
J98	FH	0.0	Red	1	6,443.18		0.00	0.00	6,657.17	92.72
671.5							5.97	2,458.94	2,464.91	

WESTSIDE PROPERTY

Dawson Trails Scenario #3 - Ph1, SS, PHD+Irr, Feed 1 OFF, Feed 2 OFF, PS OFF, RZ Tank=6662.0

Dawson Trails Scenario #4B - Ph1, SS, MDD+FF+Irr, Costco FF Alternative (2,150 gpm)

Water Model Pipe Report

Model Run Date: June 29, 2024

Max Velocity Criteria = 5 ft/sec
 Max Velocity = 3.58 ft/sec
 Criteria met? **yes**

Table B2-3: Water Model Pipe Report

[Scenario #4B Results]

									MDD OUTPUT				
ID (Char)	Description (Char)	Zone (Char)	From Phase (Int)	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status	
P-1	Zone Bndy	Red	1	J15	J161	83.66	12	120	984.86	2.79	0.24	2.85	Open
P-11		Red	1	J50	J16	1,423.65	12	120	-636.81	1.81	1.81	1.27	Open
P-18		Red	1	J76	J78	879.01	24	120	2,464.91	1.75	0.47	0.53	Open
P-2		Red	1	J10	J16	777.55	24	120	636.81	0.45	0.03	0.04	Open
P-29		Red	1	J88	J16	126.82	24	120	0.00	0	0	0	Closed
P294		Red	1	P1_PH1	J16	64.44	24	120	0.00	0	0	0	Open
P-30		Red	1	J94	J92	930.51	16	120	115.32	0.18	0.01	0.01	Open
P-31		Red	1	J54	J94	1,101.20	16	120	422.04	0.67	0.16	0.15	Open
P-32		Red	1	J96	J54	685.74	16	120	422.04	0.67	0.1	0.15	Open
P-33		Red	1	J98	J96	257.42	16	120	422.04	0.67	0.04	0.15	Open
P-35	Red	1	J102	J100	970.07	12	120	-548.10	1.55	0.94	0.96	Open	
P-36	Red	1	J106	J102	144.99	12	120	-548.10	1.55	0.14	0.97	Open	
P-37	Red	1	J70	J106	87.97	12	120	-548.10	1.55	0.08	0.97	Open	
P-38	Red	1	J108	J70	1,096.69	12	120	-548.10	1.55	1.06	0.97	Open	
P-39	Red	1	J24	J108	1,454.20	12	120	-548.10	1.55	1.4	0.97	Open	
P-4	Red	1	J22	J24	781.22	12	120	-422.04	1.2	0.46	0.59	Open	
P-40	Red	1	J22	J98	1,043.14	16	120	422.04	0.67	0.15	0.15	Open	
P-66	Red	1	J140	J78	3,778.95	20	120	-1,916.81	1.96	3.08	0.81	Open	
P-67	Red	1	J92	J140	2,723.50	20	120	-1,809.61	1.85	1.99	0.73	Open	
P-68	Red	1	J78	J100	2,188.12	16	120	548.10	0.87	0.52	0.24	Open	
P-69	Red	1	J10	J15	1,497.69	24	120	-940.07	0.67	0.13	0.09	Open	
P-71	Red	1	J15	J92	570.16	24	120	-1,924.93	1.37	0.19	0.34	Open	
P-72	Red	1	J161	J14	526.76	12	120	1,262.83	3.58	2.39	4.53	Open	
P-74	Red	1	J14	J50	503.93	12	120	-636.81	1.81	0.64	1.27	Open	
P-75	Red	1	J94	J161	1,617.47	12	120	277.97	0.79	0.44	0.27	Open	
P-91	Red	1	J10	J14	1,111.51	8	120	297.29	1.9	2.49	2.24	Open	
SUPPLY3	Supply 3	Red	1	FEED3	J76	1.00	24	120	2,464.91	1.75	0	0.49	Open

WESTSIDE PROPERTY

Dawson Trails Scenario #0 - Buildout, Static-no demands, Feed 1 OFF, Feed 2 OFF, PS OFF,

Water Model Junction Report

Model Run Date: June 29, 2024

Table B2-7: Water Model Junction ReportTank at 20%.Tank at 100%.BZ=6490.0.BZ=6508.0.RZ=6662.0.RZ=6618.0.GZ=6806.0GZ=6824.0

ID	Description (Char)	SFE	Zone (Char)	Phase (Int)	Elevation (ft)	Demand (gpm)	Head (ft)	Pressure (psi)	Pressure Head (ft)	Pressure (psi)	Pressure Head (ft)	Pressure (psi)
J10			Red	1	6,367.00	0.00	295.00	127.82	6,367.00	2758.67	313.00	135.62
J100			Red	1	6,549.09	0.00	112.91	48.92	6,549.09	2837.56	130.91	56.72
J102	FH	216.0	Red	1	6,498.44	0.00	163.56	70.87	6,498.44	2815.62	181.56	78.67
J106	FH	102.0	Red	1	6,492.07	0.00	169.93	73.63	6,492.07	2812.86	187.93	81.43
J108	FH	17.0	Red	1	6,496.31	0.00	165.69	71.79	6,496.31	2814.69	183.69	79.59
J110	FH	68.0	Red		6,432.18	0.00	229.82	99.58	6,432.18	2786.91	247.82	107.37
J112	FH	517.0	Red		6,433.00	0.00	229.00	99.22	6,433.00	2787.26	247.00	107.02
J114	FH	688.0	Red		6,460.00	0.00	202.00	87.52	6,460.00	2798.96	220.00	95.32
J116	FH	101.0	Red		6,452.69	0.00	209.31	90.69	6,452.69	2795.79	227.31	98.49
J118	FH	191.0	Red		6,450.00	0.00	212.00	91.85	6,450.00	2794.63	230.00	99.65
J12	FH	20.0	Blue	1	6,370.48	0.00	119.52	51.79	6,370.48	2760.17	137.52	59.58
J120	FH	2.0	Red		6,458.83	0.00	203.17	88.03	6,458.83	2798.45	221.17	95.83
J122	FH	5.0	Red		6,440.00	0.00	222.00	96.19	6,440.00	2790.29	240.00	103.99
J124	FH	189.0	Red		6,515.38	0.00	146.62	63.53	6,515.38	2822.95	164.62	71.33
J126	FH	114.0	Red		6,528.47	0.00	133.53	57.86	6,528.47	2828.63	151.53	65.65
J128	FH	222.0	Green		6,597.16	0.00	208.84	90.49	6,597.16	2858.39	226.84	98.28
J130	FH	169.0	Green		6,593.11	0.00	212.89	92.24	6,593.11	2856.63	230.89	100.04
J132	FH	92.0	Green		6,595.46	0.00	210.54	91.22	6,595.46	2857.65	228.54	99.02
J134	FH	239.0	Green		6,565.00	0.00	241.00	104.42	6,565.00	2844.45	259.00	112.22
J136	FH	333.0	Green		6,679.27	0.00	126.73	54.91	6,679.27	2893.96	144.73	62.71
J138	FH	228.0	Green		6,602.50	0.00	203.50	88.17	6,602.50	2860.70	221.50	95.97
J14	FH	102.0	Red	1	6,381.00	0.00	281.00	121.75	6,381.00	2764.73	299.00	129.55
J140	FH	245.0	Red	1	6,467.50	0.00	194.50	84.27	6,467.50	2802.21	212.50	92.07
J15		0.0	Red	1	6,381.00	0.00	281.00	121.75	6,381.00	2764.73	299.00	129.55
J16			Red	1	6,350.00	0.00	312.00	135.18	6,350.00	2751.30	330.00	142.98
J161			Red	1	6,386.00	0.00	276.00	119.58	6,386.00	2766.90	294.00	127.38
J17			Blue		6,351.40	0.00	138.60	60.05	6,351.40	2751.91	156.60	67.85
J18	FH	4.0	Blue	1	6,370.48	0.00	119.52	51.79	6,370.48	2760.17	137.52	59.58
J20	FH	36.0	Blue		6,352.61	0.00	137.39	59.53	6,352.61	2752.43	155.39	67.33
J22			Red	1	6,433.62	0.00	228.38	98.95	6,433.62	2787.53	246.38	106.75
J24	FH	148.0	Red	1	6,471.80	0.00	190.20	82.41	6,471.80	2804.07	208.20	90.21
J26	FH		Blue		6,320.51	0.00	169.49	73.44	6,320.51	2738.52	187.49	81.23
J28	FH	90.0	Blue		6,341.09	0.00	148.91	64.52	6,341.09	2747.44	166.91	72.32
J42	FH	167.0	Green		6,591.59	0.00	214.41	92.90	6,591.59	2855.97	232.41	100.70
J44	FH	334.0	Green		6,578.02	0.00	227.98	98.78	6,578.02	2850.10	245.98	106.58
J46			Green		6,637.06	0.00	168.94	73.20	6,637.06	2875.68	186.94	81.00
J48	FH	2.0	Green		6,701.21	0.00	104.79	45.40	6,701.21	2903.47	122.79	53.20
J50			Red	1	6,377.00	0.00	285.00	123.48	6,377.00	2763.00	303.00	131.28
J54			Red	1	6,425.00	0.00	237.00	102.69	6,425.00	2783.80	255.00	110.49
J56			Red		6,500.00	0.00	162.00	70.19	6,500.00	2816.29	180.00	77.99
J58	FH	384.0	Red		6,471.27	0.00	190.73	82.64	6,471.27	2803.84	208.73	90.44
J60	Tank		Green		6,806.00	0.00	0.00	0.00	6,806.00	2948.87	18.00	7.80
J62	FH	138.0	Green		6,642.50	0.00	163.50	70.84	6,642.50	2878.03	181.50	78.64
J64	FH	13.0	Red		6,430.00	0.00	232.00	100.52	6,430.00	2785.96	250.00	108.32
J66	FH	25.0	Red		6,492.95	0.00	169.05	73.25	6,492.95	2813.24	187.05	81.04
J68			Red		6,440.00	0.00	222.00	96.19	6,440.00	2790.29	240.00	103.99
J70			Red	1	6,490.00	0.00	172.00	74.52	6,490.00	2811.96	190.00	82.32
J72			Green		6,533.66	0.00	272.34	118.00	6,533.66	2830.88	290.34	125.80
J74	FH	17.0	Green		6,582.76	0.00	223.24	96.72	6,582.76	2852.15	241.24	104.52
J76	RZ Tank		Red	1	6,646.85	0.00	15.15	6.56	6,646.85	2879.92	33.15	14.36
J78	GZBPS		Red	1	6,607.50	0.00	54.50	23.61	6,607.50	2862.87	72.50	31.41
J80			Green		6,607.54	0.00	198.46	85.99	6,607.54	2862.89	216.46	93.79
J82			Green		6,593.54	0.00	212.46	92.05	6,593.54	2856.82	230.46	99.85
J84			Blue	1	6,339.66	0.00	150.34	65.14	6,339.66	2746.82	168.34	72.94
J86			Blue	1	6,286.00	0.00	204.00	88.39	6,286.00	2723.57	222.00	96.19
J88	RZBPS		Blue		6,350.00	0.00	140.00	60.66	6,350.00	2751.30	158.00	68.46
J90			Blue	1	6,346.49	0.00	143.51	62.18	6,346.49	2749.78	161.51	69.98
J92			Red	1	6,380.00	0.00	282.00	122.18	6,380.00	2764.30	300.00	129.98
J94	FH	509.0	Red	1	6,395.02	0.00	266.98	115.68	6,395.02	2770.81	284.98	123.47
J96	FH	678.0	Red	1	6,444.45	0.00	217.55	94.26	6,444.45	2792.22	235.55	102.06
J98	FH	470.0	Red	1	6,443.18	0.00	218.82	94.81	6,443.18	2791.67	236.82	102.61

6,875.0

0.00

WESTSIDE PROPERTY

Dawson Trails Scenario #11 - Buildout, SS, PHD+Irr, Feed 1, 3, 4 ON, Feed 2 OFF, RZ and GZ PS OFF, RZ Tank=6662.4

Dawson Trails Scenario #12B - Buildout, SS, MDD+FF+Irr, Costco FF Alternative (2,150 gpm)

Water Model Junction Report

ADD: 265.0 gpd/SFE

Model Run Date: June 30, 2024

MDD: 2.5 x ADD

PHD 5.5 x ADD

Table B2-8: Water Model Junction Report

[Scenario #11 Results]

PHD DMD = 7,765.5 gpm

ID	Description (Char)	SFE	Zone (Char)	Phase (Int)	Elevation (ft)	Irrigation ADD (gpm)	PHD Demand Applied (gpm)	PHD + IRR ADD (gpm)	Head (ft)	Pressure (psi)
J10			Red	1	6,367.00	5.97	0.00	5.97	6,650.66	122.91
J100			Red	1	6,549.09		0.00	0.00	6,650.95	44.14
J102	FH	216.0	Red	1	6,498.44	35.67	218.63	254.30	6,645.86	63.88
J106	FH	102.0	Red	1	6,492.07	35.67	103.24	138.91	6,645.34	66.41
J108	FH	17.0	Red	1	6,496.31	35.67	17.21	52.88	6,644.52	64.22
J110	FH	68.0	Red		6,432.18	35.67	68.83	104.50	6,643.06	91.38
J112	FH	517.0	Red		6,433.00	35.67	523.28	558.95	6,643.24	91.10
J114	FH	688.0	Red		6,460.00	35.67	696.36	732.03	6,639.87	77.94
J116	FH	101.0	Red		6,452.69	35.67	102.23	137.90	6,639.84	81.09
J118	FH	191.0	Red		6,450.00	35.67	193.32	228.99	6,639.84	82.26
J12	FH	20.0	Blue	1	6,370.48		20.24	20.24	6,492.80	53.00
J120	FH	2.0	Red		6,458.83	35.67	2.02	37.69	6,639.85	78.44
J122	FH	5.0	Red		6,440.00	35.67	5.06	40.73	6,639.99	86.66
J124	FH	189.0	Red		6,515.38	35.67	191.30	226.97	6,640.82	54.35
J126	FH	114.0	Red		6,528.47	35.67	115.39	151.06	6,640.79	48.67
J128	FH	222.0	Green		6,597.16	23.02	224.70	247.72	6,715.14	51.12
J130	FH	169.0	Green		6,593.11	23.02	171.05	194.07	6,714.77	52.71
J132	FH	92.0	Green		6,595.46	23.02	93.12	116.14	6,714.77	51.70
J134	FH	239.0	Green		6,565.00	23.02	241.90	264.92	6,714.91	64.96
J136	FH	333.0	Green		6,679.27	23.02	337.05	360.07	6,716.58	16.17
J138	FH	228.0	Green		6,602.50	23.02	230.77	253.79	6,720.56	51.16
J14	FH	102.0	Red	1	6,381.00		103.24	103.24	6,650.58	116.81
J140	FH	245.0	Red	1	6,467.50		247.98	247.98	6,654.35	80.96
J15		0.0	Red	1	6,381.00		0.00	0.00	6,650.66	116.85
J16			Red	1	6,350.00		0.00	0.00	6,650.66	130.27
J161			Red	1	6,386.00		0.00	0.00	6,650.58	114.64
J17			Blue		6,351.40		0.00	0.00	6,492.80	61.27
J18	FH	4.0	Blue	1	6,370.48	12.72	4.05	16.77	6,492.80	53.00
J20	FH	36.0	Blue		6,352.61		36.44	36.44	6,492.80	60.75
J22			Red	1	6,433.62		0.00	0.00	6,643.82	91.08
J24	FH	148.0	Red	1	6,471.80		149.80	149.80	6,643.93	74.59
J26	FH		Blue		6,320.51		0.00	0.00	6,492.80	74.65
J28	FH	90.0	Blue		6,341.09		91.09	91.09	6,492.80	65.74
J42	FH	167.0	Green		6,591.59	23.02	169.03	192.05	6,717.65	54.62
J44	FH	334.0	Green		6,578.02	23.02	338.06	361.08	6,716.14	59.85
J46			Green		6,637.06		0.00	0.00	6,725.13	38.16
J48	FH	2.0	Green		6,701.21	23.02	2.02	25.04	6,720.95	8.55
J50			Red	1	6,377.00		0.00	0.00	6,650.60	118.55
J54			Red	1	6,425.00		0.00	0.00	6,646.11	95.81
J56			Red		6,500.00		0.00	0.00	6,640.97	61.08
J58	FH	384.0	Red		6,471.27	35.67	388.67	424.34	6,639.88	73.06
J60	Tank		Green		6,806.00		0.00	0.00	6,805.99	-0.01
J62	FH	138.0	Green		6,642.50	23.02	139.68	162.70	6,731.13	38.40
J64	FH	13.0	Red		6,430.00	35.67	13.16	48.83	6,640.16	91.06
J66	FH	25.0	Red		6,492.95	35.67	25.30	60.97	6,640.78	64.05
J68			Red		6,440.00		0.00	0.00	6,642.82	87.88
J70			Red	1	6,490.00		0.00	0.00	6,645.10	67.20
J72			Green		6,533.66		0.00	0.00	6,717.64	79.72
J74	FH	17.0	Green		6,582.76	23.02	17.21	40.23	6,717.64	58.44
J76	RZ Tank		Red	1	6,646.85		0.00	0.00	6,662.40	6.74
J78	GZBPS		Red	1	6,607.50		0.00	0.00	6,660.40	22.92
J80			Green		6,607.54		0.00	0.00	6,714.81	46.48
J82			Green		6,593.54		0.00	0.00	6,714.81	52.54
J84			Blue	1	6,339.66		0.00	0.00	6,492.84	66.37
J86			Blue	1	6,286.00		0.00	0.00	6,493.00	89.69
J88	RZBPS		Blue		6,350.00		0.00	0.00	6,492.80	61.88
J90			Blue	1	6,346.49		0.00	0.00	6,492.81	63.40
J92			Red	1	6,380.00		0.00	0.00	6,650.69	117.29
J94	FH	509.0	Red	1	6,395.02		515.19	515.19	6,648.70	109.92
J96	FH	678.0	Red	1	6,444.45		686.24	686.24	6,644.50	86.68
J98	FH	470.0	Red	1	6,443.18		475.71	475.71	6,644.24	87.12

6,875.0

806.90

6,958.55 7,765.53

WESTSIDE PROPERTY

Dawson Trails Scenario #11 - Buildout, SS, PHD+Irr, Feed 1, 3, 4 ON, Feed 2 OFF, RZ and GZ PS OFF, RZ Tank=6662.4

Dawson Trails Scenario #12B - Buildout, SS, MDD+FF, Costco FF Alternative

Water Model Pipe Report

Max Velocity Criteria = 10 ft/sec

Max Velocity = 6.29 ft/sec

Criteria met? yes

Model Run Date: June 30, 2024

Table B2-9: Water Model Pipe Report

Table B2-9: Water Model Pipe Report									[Scenario #11 Results]					
									PHD OUTPUT					
ID	Description (Char)	Zone (Char)	Phase (Int)	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status	
P-1		Red	1	J15	J161	83.66	12	120	565.73	1.6	0.09	1.03	Open	
P-10		Green		J46	J48	2,269.53	12	120	776.51	2.2	4.18	1.84	Open	
P-11		Red	1	J50	J16	1,423.65	12	120	-97.62	0.28	0.06	0.04	Open	
P-13		Red		J56	J58	1,156.14	12	120	542.78	1.54	1.1	0.95	Open	
P-14		Green		J60	J62	5,824.79	12	120	2,217.81	6.29	74.85	12.85	Open	
P-141	Supply 4	Green		T2-GZ	J60	1.00	12	120	0.00	0	0	0.00	Closed	
P-15		Red		J64	J66	2,301.39	12	120	-273.92	0.78	0.61	0.27	Open	
P-16		Red		J68	J70	2,127.41	12	120	-579.19	1.64	2.27	1.07	Open	
P-17		Green		J72	J74	945.67	12	120	0.00	0	0	0	Open	
P-18		Red	1	J76	J78	879.01	24	120	5,383.19	3.82	1.99	2.27	Open	
P-181	Supply 3	Red		T1-RZ	J76	1.00	24	120	0.00	0	0	0	Closed	
P-19		Green		J80	J82	227.74	12	120	0.00	0	0	0	Open	
P-2		Red	1	J10	J16	777.55	24	120	97.63	0.07	0	0	Open	
P-20		Blue	1	J84	J86	6,218.83	16	120	-164.55	0.26	0.16	0.03	Open	
P-21		Blue		J26	J88	1,436.03	12	120	-8.98	0.03	0	0	Open	
P-22		Blue		J28	J90	342.27	12	120	-82.11	0.23	0.01	0.03	Open	
P-23		Blue	1	J90	J84	1,172.78	16	120	-164.55	0.26	0.03	0.03	Open	
P-24		Blue	1	J18	J90	1,011.16	16	120	-82.44	0.13	0.01	0.01	Open	
P-25		Blue		J17	J88	1,707.01	24	120	0.00	0	0	0	Open	
P-26		Blue		J88	J20	253.09	16	120	-13.16	0.02	0	0	Open	
P-27		Blue	1	J12	J18	1,454.96	12	120	-16.07	0.05	0	0	Open	
P-29	Zone Bndy	Red	1	J88	J16	126.82	24	120	0.00	0	0	0	Closed	
P-291	Zone Bndy	Blue		J88	P1	68.07	24	120	0.00	0	0	0	Open	
P-292	Zone Bndy	Red		P1	J16	61.69	24	120	0.00	0	0	0	Open	
P293	Zone Bndy	Blue	1	J88	P1_PH1	64.87	24	120	0.00	0	0	0	Open	
P294	Zone Bndy	Red	1	P1_PH1	J16	64.44	24	120	0.00	0	0	0	Open	
P-3		Blue		J18	J20	646.08	16	120	49.60	0.08	0	0	Open	
P-30		Red	1	J94	J92	930.51	16	120	-1,797.18	2.87	2	2.14	Open	
P-31		Red	1	J54	J94	1,101.20	16	120	-1,887.67	3.01	2.59	2.35	Open	
P-32		Red	1	J96	J54	685.74	16	120	-1,887.67	3.01	1.61	2.35	Open	
P-33		Red	1	J98	J96	257.42	16	120	-1,201.43	1.92	0.26	1.02	Open	
P-34		Red		J100	J56	2,226.75	12	120	1,255.70	3.56	9.98	4.48	Open	
P-35		Red	1	J102	J100	970.07	12	120	-1,367.43	3.88	5.09	5.25	Open	
P-36		Red	1	J106	J102	144.99	12	120	-1,113.13	3.16	0.52	3.58	Open	
P-37		Red	1	J70	J106	87.97	12	120	-974.22	2.76	0.25	2.8	Open	
P-38		Red	1	J108	J70	1,096.69	12	120	-395.03	1.12	0.58	0.53	Open	
P-39		Red	1	J24	J108	1,454.20	12	120	-342.15	0.97	0.59	0.4	Open	
P-4		Red	1	J22	J24	781.22	12	120	-192.35	0.55	0.11	0.14	Open	
P-40		Red	1	J22	J98	1,043.14	16	120	-725.72	1.16	0.42	0.4	Open	
P-41		Red		J110	J112	393.61	12	120	-359.12	1.02	0.17	0.44	Open	
P-42		Red		J112	J22	233.82	12	120	-918.07	2.6	0.59	2.51	Open	
P-43		Red		J68	J110	1,036.73	12	120	-254.62	0.72	0.24	0.23	Open	
P-44		Red		J114	J68	1,405.64	12	120	-833.81	2.37	2.95	2.1	Open	
P-45		Red		J116	J114	738.3	12	120	-101.78	0.29	0.03	0.04	Open	
P-46		Red		J118	J116	148.99	12	120	36.12	0.1	0	0.01	Open	
P-47		Red		J120	J118	481.07	12	120	80.75	0.23	0.01	0.03	Open	
P-48		Red		J58	J120	435.82	12	120	118.44	0.34	0.02	0.06	Open	
P-49		Red		J122	J118	1,191.76	12	120	184.36	0.52	0.15	0.13	Open	
P-5		Blue		J26	J28	227.24	12	120	8.98	0.03	0	0	Open	
P-50		Red		J64	J122	917.58	12	120	225.09	0.64	0.17	0.19	Open	
P-51		Red		J66	J56	505.3	12	120	-334.89	0.95	0.2	0.39	Open	
P-52		Red		J56	J124	323.43	12	120	378.03	1.07	0.16	0.48	Open	
P-53	Zone Bndy	Red		J126	J72	384.78	12	120	0.00	0	0	0	Closed	
P-54		Red		J124	J126	327.74	12	120	151.06	0.43	0.03	0.09	Open	
P-55		Green		J74	J42	355.34	12	120	-40.23	0.11	0	0.01	Open	
P-56		Green		J44	J128	1,616.96	12	120	431.45	1.22	1	0.62	Open	
P-57		Green		J130	J128	2,911.06	12	120	-183.73	0.52	0.37	0.13	Open	
P-58		Green		J132	J130	186.16	12	120	10.34	0.03	0	0	Open	
P-59		Green		J80	J132	633.30	12	120	126.48	0.36	0.04	0.06	Open	
P-60		Green		J134	J80	1,597.08	12	120	126.48	0.36	0.1	0.06	Open	
P-61		Green		J136	J134	3,230.69	12	120	391.40	1.11	1.67	0.52	Open	
P-62		Green		J48	J136	2,523.92	12	120	751.47	2.13	4.37	1.73	Open	
P-63		Green		J138	J42	948.27	12	120	1,024.81	2.91	2.92	3.08	Open	
P-64		Green		J46	J138	985.08	12	120	1,278.60	3.63	4.56	4.63	Open	
P-65		Green		J62	J46	538.12	12	120	2,055.11	5.83	6	11.16	Open	
P-66		Red	1	J140	J78	3,778.95	20	120	-2,760.06	2.82	6.05	1.6	Open	
P-661		Red		J78	P2	100.00	12	120	0.00	0	0	0	Open	
P-662		Green		P2	J82	100.00	12	120	0.00	0	0	0	Open	
P-67		Red	1	J92	J140	2,723.50	20	120	-2,512.08	2.57	3.66	1.34	Open	
P-68		Red	1	J78	J100	2,188.12	16	120	2,623.13	4.19	9.45	4.32	Open	
P-69		Red	1	J10	J15	1,497.69	24	120	-149.17	0.11	0	0	Open	
P-70		Blue		J12	J88	1,592.12	12	120	-4.17	0.01	0	0	Open	
P-71		Red	1	J15	J92	570.16	24	120	-714.90	0.51	0.03	0.05	Open	
P-72		Red	1	J161	J14	526.76	12	120	-39.94	0.11	0	0.01	Open	
P-74		Red	1	J14	J50	503.93	12	120	-97.62	0.28	0.02	0.04	Open	
P-75		Red	1	J94	J161	1,617.47	12	120	-605.67	1.72	1.88	1.16	Open	
P-9		Green		J42	J44	788.06	12	120	792.53	2.25	1.51	1.91	Open	
P-91		Red		J10	J14	1,111.51	8	120	45.57	0.29	0.08	0.07	Open	
SUPPLY1	Supply 1	Blue	1	FEED1	J86	1.00	16	120	164.55	0.26	0	0	Open	
SUPPLY2	Supply 2	Blue		FEED2	J17	887.22	24	120	0.00	0	0	0	Closed	
SUPPLY3	Supply 3	Red	1	FEED3	J76	1	24	120	5,383.19	3.82	0	1.95	Open	
SUPPLY4	Supply 4	Green		FEED4	J60	1	12	120	2,217.81	6.29	0.01	12.70	Open	

WESTSIDE PROPERTY

Dawson Trails Scenario #12A - Buildout, SS, MDD+Hrr, Feed 1, 3, 4 ON, Feed 2 OFF, RZ and GZ PS OFF, RZ Tank=6662.4

Water Model Fire Flow Report

Model Run Date: June 30, 2024

Table B2-4A: Water Model Fire Flow Report

ID	Description (Char)	Junction of Interest	Zone (Char)	Elevation (ft)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)	Hydrant Pressure at Available Flow (psi)	Pass /Fail
J102	FH	no	Red	6,498.44	135.05	68.94	6,657.55	3,000	59.51	8,869.82	20	Pass
J106	FH	no	Red	6,492.07	82.6	71.64	6,657.40	1,500	67.84	9,061.21	20	Pass
J108	FH	no	Red	6,496.31	43.49	69.71	6,657.20	3,000	57.1	7,176.87	20	Pass
J110	FH	no	Red	6,432.18	66.95	97.33	6,656.79	3,000	86.04	10,433.17	20	Pass
J112	FH	no	Red	6,433.00	273.53	97	6,656.88	3,000	86.72	11,405.42	20	Pass
J114	FH	no	Red	6,460.00	352.2	84.77	6,655.63	3,000	67.64	7,478.28	20	Pass
J116	FH	no	Red	6,452.69	82.14	87.91	6,655.58	3,000	69.84	7,166.17	20	Pass
J118	FH	no	Red	6,450.00	123.54	89.08	6,655.58	3,000	70.93	7,264.98	20	Pass
J12	FH	no	Blue	6,370.48	9.2	53.06	6,492.95	3,000	28.79	3,565.97	20	Pass
J120	FH	no	Red	6,458.83	36.59	85.25	6,655.58	3,000	65.92	6,600.10	20	Pass
J122	FH	no	Red	6,440.00	37.97	93.42	6,655.60	3,000	71.14	6,371.18	20	Pass
J124	FH	no	Red	6,515.38	122.62	60.86	6,655.84	1,500	53.13	4,748.52	20	Pass
J126	FH	no	Red	6,528.47	88.12	55.18	6,655.83	1,500	46.47	3,890.35	20	Pass
J128	FH	no	Green	6,597.16	125.16	78.92	6,779.29	1,500	31.58	1,883.88	20	Pass
J130	FH	no	Green	6,593.11	100.77	80.62	6,779.18	1,500	31.63	1,850.43	20	Pass
J132	FH	no	Green	6,595.46	65.35	79.61	6,779.18	1,500	30.57	1,792.94	20	Pass
J134	FH	no	Green	6,565.00	132.98	92.82	6,779.23	1,500	43.87	2,125.17	20	Pass
J136	FH	no	Green	6,679.27	176.22	43.52	6,779.72	1,500	-3.65	1,058.46	20	Fail
J138	FH	no	Green	6,602.50	127.92	77.28	6,780.86	1,500	35.17	2,008.38	20	Pass
J14	FH	yes	Red	6,381.00	46.93	120.5	6,659.10	2,000	115.68	13,959.07	20	Pass
J140	FH	no	Red	6,467.50	112.72	83.48	6,660.16	1,500	81.52	17,084.32	20	Pass
J18	FH	no	Blue	6,370.48	14.56	53.06	6,492.95	3,000	32.93	3,959.71	20	Pass
J20	FH	no	Blue	6,352.61	16.56	60.81	6,492.95	3,000	40.2	4,387.72	20	Pass
J24	FH	no	Red	6,471.80	68.09	80.29	6,657.09	3,000	68.29	8,417.70	20	Pass
J26	FH	no	Blue	6,320.51	0	74.72	6,492.95	3,000	53.53	5,055.76	20	Pass
J28	FH	no	Blue	6,341.09	41.41	65.8	6,492.95	3,000	45.29	4,711.25	20	Pass
J42	FH	no	Green	6,591.59	99.85	81.64	6,780.00	1,500	37.39	2,011.05	20	Pass
J44	FH	no	Green	6,578.02	176.68	87.34	6,779.58	1,500	41.79	2,168.43	20	Pass
J48	FH	no	Green	6,701.21	23.94	34.55	6,780.95	3,000	-83.6	647.83	20	Fail
J58	FH	no	Red	6,471.27	212.34	79.87	6,655.59	3,000	60.06	6,326.06	20	Pass
J62	FH	no	Green	6,642.50	86.51	61.29	6,783.95	1,500	25.85	1,767.15	20	Pass
J64	FH	no	Red	6,430.00	41.65	97.77	6,655.64	3,000	74.31	6,354.92	20	Pass
J66	FH	no	Red	6,492.95	47.17	70.57	6,655.82	3,000	50.65	5,503.20	20	Pass
J74	FH	no	Green	6,582.76	30.84	85.46	6,780.00	3,000	-36.16	1,990.73	20	Fail
J94	FH	no	Red	6,395.02	234.18	114.2	6,658.57	3,000	107.22	16,567.25	20	Pass
J96	FH	no	Red	6,444.45	311.93	92.24	6,657.34	3,000	83.59	12,419.25	20	Pass
J98	FH	no	Red	6,443.18	216.23	92.76	6,657.25	3,000	83.95	12,237.14	20	Pass

WESTSIDE PROPERTY

Dawson Trails Scenario #11 - Buildout, SS, PHD+Irr, Feed 1, 3, 4 ON, Feed 2 OFF, RZ and GZ PS OFF, RZ Tank=6662.4

Dawson Trails Scenario #12B - Buildout, SS, MDD+FF+Irr, Costco FF Alternative (2,150 gpm)

Water Model Junction Report

Model Run Date: June 30, 2024

Table B2-8: Water Model Junction Report

[Scenario #12B Results]										
MDD DMD = 6,120.0 gpm										
ID	Description (Char)	SFE	Zone (Char)	Phase (Int)	Elevation (ft)	Irrigation ADD (gpm)	MDD + FF Demand Applied (gpm)	MDD+ FF + IRR ADD (gpm)	Head (ft)	Pressure (psi)
J10			Red	1	6,367.00	5.97	0.00	5.97	6,649.36	122.35
J100			Red	1	6,549.09		0.00	0.00	6,655.01	45.89
J102	FH	216.0	Red	1	6,498.44	35.67	99.38	135.05	6,651.52	66.33
J106	FH	102.0	Red	1	6,492.07	35.67	46.93	82.60	6,651.11	68.91
J108	FH	17.0	Red	1	6,496.31	35.67	7.82	43.49	6,650.21	66.69
J110	FH	68.0	Red		6,432.18	35.67	31.28	66.95	6,649.21	94.04
J112	FH	517.0	Red		6,433.00	35.67	237.86	273.53	6,649.18	93.67
J114	FH	688.0	Red		6,460.00	35.67	316.53	352.20	6,649.03	81.91
J116	FH	101.0	Red		6,452.69	35.67	46.47	82.14	6,649.05	85.08
J118	FH	191.0	Red		6,450.00	35.67	87.87	123.54	6,649.07	86.26
J12	FH	20.0	Blue	1	6,370.48		9.20	9.20	6,492.95	53.06
J120	FH	2.0	Red		6,458.83	35.67	0.92	36.59	6,649.11	82.45
J122	FH	5.0	Red		6,440.00	35.67	2.30	37.97	6,649.16	90.63
J124	FH	189.0	Red		6,515.38	35.67	86.95	122.62	6,649.76	58.23
J126	FH	114.0	Red		6,528.47	35.67	52.45	88.12	6,649.75	52.55
J128	FH	222.0	Green		6,597.16	23.02	102.14	125.16	6,779.29	78.92
J130	FH	169.0	Green		6,593.11	23.02	77.75	100.77	6,779.18	80.62
J132	FH	92.0	Green		6,595.46	23.02	42.33	65.35	6,779.18	79.61
J134	FH	239.0	Green		6,565.00	23.02	109.96	132.98	6,779.23	92.82
J136	FH	333.0	Green		6,679.27	23.02	153.20	176.22	6,779.72	43.52
J138	FH	228.0	Green		6,602.50	23.02	104.90	127.92	6,780.86	77.28
J14	FH	102.0	Red	1	6,381.00		2196.93	2196.93	6,646.84	115.19
J140	FH	245.0	Red	1	6,467.50		112.72	112.72	6,654.13	80.87
J15		0.0	Red	1	6,381.00		0.00	0.00	6,649.50	116.34
J16			Red	1	6,350.00		0.00	0.00	6,649.33	129.7
J161			Red	1	6,386.00		0.00	0.00	6,649.20	114.04
J17			Blue		6,351.40		0.00	0.00	6,492.95	61.33
J18	FH	4.0	Blue	1	6,370.48	12.72	1.84	14.56	6,492.95	53.06
J20	FH	36.0	Blue		6,352.61		16.56	16.56	6,492.95	60.81
J22			Red	1	6,433.62		0.00	0.00	6,649.19	93.41
J24	FH	148.0	Red	1	6,471.80		68.09	68.09	6,649.47	76.99
J26	FH		Blue		6,320.51		0.00	0.00	6,492.95	74.72
J28	FH	90.0	Blue		6,341.09		41.41	41.41	6,492.95	65.8
J42	FH	167.0	Green		6,591.59	23.02	76.83	99.85	6,780.00	81.64
J44	FH	334.0	Green		6,578.02	23.02	153.66	176.68	6,779.58	87.34
J46			Green		6,637.06		0.00	0.00	6,782.19	62.89
J48	FH	2.0	Green		6,701.21	23.02	0.92	23.94	6,780.95	34.55
J50			Red	1	6,377.00		0.00	0.00	6,647.49	117.2
J54			Red	1	6,425.00		0.00	0.00	6,649.23	97.16
J56			Red		6,500.00		0.00	0.00	6,649.81	64.91
J58	FH	384.0	Red		6,471.27	35.67	176.67	212.34	6,649.17	77.09
J60	Tank		Green		6,806.00		0.00	0.00	6,806.00	0
J62	FH	138.0	Green		6,642.50	23.02	63.49	86.51	6,783.95	61.29
J64	FH	13.0	Red		6,430.00	35.67	5.98	41.65	6,649.27	95.01
J66	FH	25.0	Red		6,492.95	35.67	11.50	47.17	6,649.68	67.91
J68			Red		6,440.00		0.00	0.00	6,649.37	90.72
J70			Red	1	6,490.00		0.00	0.00	6,650.89	69.72
J72			Green		6,533.66		0.00	0.00	6,780.00	106.74
J74	FH	17.0	Green		6,582.76	23.02	7.82	30.84	6,780.00	85.46
J76	RZ Tank		Red	1	6,646.85		0.00	0.00	6,662.40	6.74
J78	GZBPS		Red	1	6,607.50		0.00	0.00	6,660.73	23.06
J80			Green		6,607.54		0.00	0.00	6,779.19	74.38
J82			Green		6,593.54		0.00	0.00	6,779.19	80.44
J84			Blue	1	6,339.66		0.00	0.00	6,492.96	66.42
J86			Blue	1	6,286.00		0.00	0.00	6,493.00	89.69
J88	RZBPS		Blue		6,350.00		0.00	0.00	6,492.95	61.94
J90			Blue	1	6,346.49		0.00	0.00	6,492.95	63.46
J92			Red	1	6,380.00		0.00	0.00	6,649.71	116.87
J94	FH	509.0	Red	1	6,395.02		234.18	234.18	6,649.34	110.2
J96	FH	678.0	Red	1	6,444.45		311.93	311.93	6,649.16	88.7
J98	FH	470.0	Red	1	6,443.18		216.23	216.23	6,649.16	89.25
6,875.0						806.90	5,312.98	6,119.96		

WESTSIDE PROPERTY

Dawson Trails Scenario #11 - Buildout, SS, PHD+Irr, Feed 1, 3, 4 ON, Feed 2 OFF, RZ and GZ PS OFF, RZ Tank=6662.4

Dawson Trails Scenario #12B - Buildout, SS, MDD+FF, Costco FF Alternative

Water Model Pipe Report

Max Velocity Criteria = 5 ft/sec

Max Velocity = 3.56 ft/sec

Criteria met? yes

Model Run Date: June 30, 2024

Table B2-9: Water Model Pipe Report

Table B2-9: Water Model Pipe Report									[Scenario #12B Results]				
									MOD+FF OUTPUT				
ID	Description (Char)	Zone (Char)	Phase (Int)	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)	Status
P-1		Red	1	J15	J161	83.66	12	120	1,106.66	3.14	0.3	3.55	Open
P-10		Green		J46	J48	2,269.53	12	120	402.91	1.14	1.24	0.55	Open
P-11		Red	1	J50	J16	1,423.65	12	120	-641.32	1.82	1.84	1.29	Open
P-13		Red		J56	J58	1,156.14	12	120	405.02	1.15	0.64	0.55	Open
P-14		Green		J60	J62	5,824.79	12	120	1,146.22	3.25	22.05	3.78	Open
P-141	Supply 4	Green		T2-GZ	J60	1.00	12	120	0	0	0	0	Closed
P-15		Red		J64	J66	2,301.39	12	120	-220.26	0.62	0.41	0.18	Open
P-16		Red		J68	J70	2,127.41	12	120	-466.69	1.32	1.52	0.72	Open
P-17		Green		J72	J74	945.67	12	120	0.00	0	0	0	Open
P-18		Red	1	J76	J78	879.01	24	120	4,892.03	3.47	1.67	1.9	Open
P-181	Supply 3	Red		T1-RZ	J76	1.00	24	120	0.00	0	0	0	Closed
P-19		Green		J80	J82	227.74	12	120	0.00	0	0	0	Open
P-2		Red	1	J10	J16	777.55	24	120	641.33	0.45	0.03	0.04	Open
P-20		Blue	1	J84	J86	6,218.83	16	120	-81.72	0.13	0.04	0.01	Open
P-21		Blue		J26	J88	1,436.03	12	120	-2.04	0.01	0	0	Open
P-22		Blue		J28	J90	342.27	12	120	-39.37	0.11	0	0.01	Open
P-23		Blue	1	J90	J84	1,172.78	16	120	-81.72	0.13	0.01	0.01	Open
P-24		Blue	1	J18	J90	1,011.16	16	120	-42.36	0.07	0	0	Open
P-25		Blue		J17	J88	1,707.01	24	120	0.00	0	0	0	Open
P-26		Blue		J88	J20	253.09	16	120	-4.34	0.01	0	0	Open
P-27		Blue	1	J12	J18	1,454.96	12	120	-6.90	0.02	0	0	Open
P-29	Zone Bndy	Red	1	J88	J16	126.82	24	120	0.00	0	0	0	Closed
P-291	Zone Bndy	Blue		J88	P1	68.07	24	120	0.00	0	0	0	Open
P-292	Zone Bndy	Red		P1	J16	61.69	24	120	0.00	0	0	0	Open
P293	Zone Bndy	Blue	1	J88	P1_PH1	64.87	24	120	0.00	0	0	0	Open
P294	Zone Bndy	Red	1	P1_PH1	J16	64.44	24	120	0.00	0	0	0	Open
P-3		Blue		J18	J20	646.08	16	120	20.90	0.03	0	0	Open
P-30		Red	1	J94	J92	930.51	16	120	-726.67	1.16	0.37	0.4	Open
P-31		Red	1	J54	J94	1,101.20	16	120	-342.94	0.55	0.11	0.1	Open
P-32		Red	1	J96	J54	685.74	16	120	-342.94	0.55	0.07	0.1	Open
P-33		Red	1	J98	J96	257.42	16	120	-31.01	0.05	0	0	Open
P-34		Red		J100	J56	2,226.75	12	120	883.19	2.51	5.2	2.34	Open
P-35		Red	1	J102	J100	970.07	12	120	-1,116.08	3.17	3.49	3.6	Open
P-36		Red	1	J106	J102	144.99	12	120	-981.03	2.78	0.41	2.84	Open
P-37		Red	1	J70	J106	87.97	12	120	-898.43	2.55	0.21	2.41	Open
P-38		Red	1	J108	J70	1,096.69	12	120	-431.74	1.22	0.68	0.62	Open
P-39		Red	1	J24	J108	1,454.20	12	120	-388.25	1.1	0.74	0.51	Open
P-4		Red	1	J22	J24	781.22	12	120	-320.16	0.91	0.28	0.36	Open
P-40		Red	1	J22	J98	1,043.14	16	120	185.22	0.3	0.03	0.03	Open
P-41		Red		J110	J112	393.61	12	120	138.59	0.39	0.03	0.08	Open
P-42		Red		J112	J22	233.82	12	120	-134.94	0.38	0.02	0.07	Open
P-43		Red		J68	J110	1,036.73	12	120	205.54	0.58	0.16	0.16	Open
P-44		Red		J114	J68	1,405.64	12	120	-261.15	0.74	0.34	0.24	Open
P-45		Red		J116	J114	738.3	12	120	91.05	0.26	0.03	0.03	Open
P-46		Red		J118	J116	148.99	12	120	173.19	0.49	0.02	0.11	Open
P-47		Red		J120	J118	481.07	12	120	156.09	0.44	0.05	0.09	Open
P-48		Red		J58	J120	435.82	12	120	192.68	0.55	0.06	0.14	Open
P-49		Red		J122	J118	1,191.76	12	120	140.64	0.4	0.09	0.08	Open
P-5		Blue		J26	J28	227.24	12	120	2.04	0.01	0	0	Open
P-50		Red		J64	J122	917.58	12	120	178.61	0.51	0.11	0.12	Open
P-51		Red		J66	J56	505.3	12	120	-267.43	0.76	0.13	0.26	Open
P-52		Red		J56	J124	323.43	12	120	210.74	0.6	0.05	0.16	Open
P-53	Zone Bndy	Red		J126	J72	384.78	12	120	0.00	0	0	0	Closed
P-54		Red		J124	J126	327.74	12	120	88.12	0.25	0.01	0.03	Open
P-55		Green		J74	J42	355.34	12	120	-30.84	0.09	0	0	Open
P-56		Green		J44	J128	1,616.96	12	120	221.50	0.63	0.29	0.18	Open
P-57		Green		J130	J128	2,911.06	12	120	-96.34	0.27	0.11	0.04	Open
P-58		Green		J132	J130	186.16	12	120	4.43	0.01	0	0	Open
P-59		Green		J80	J132	633.30	12	120	69.78	0.2	0.01	0.02	Open
P-60		Green		J134	J80	1,597.08	12	120	69.77	0.2	0.03	0.02	Open
P-61		Green		J136	J134	3,230.69	12	120	202.75	0.58	0.49	0.15	Open
P-62		Green		J48	J136	2,523.92	12	120	378.97	1.08	1.23	0.49	Open
P-63		Green		J138	J42	948.27	12	120	528.87	1.5	0.86	0.9	Open
P-64		Green		J46	J138	985.08	12	120	656.79	1.86	1.33	1.35	Open
P-65		Green		J62	J46	538.12	12	120	1,059.71	3.01	1.76	3.27	Open
P-66		Red	1	J140	J78	3,778.95	20	120	-2,892.75	2.95	6.6	1.75	Open
P-661		Red		J78	P2	100.00	12	120	0.00	0	0	0	Open
P-662		Green		P2	J82	100.00	12	120	0.00	0	0	0	Open
P-67		Red	1	J92	J140	2,723.50	20	120	-2,780.03	2.84	4.42	1.62	Open
P-68		Red	1	J78	J100	2,188.12	16	120	1,999.27	3.19	5.71	2.61	Open
P-69		Red	1	J10	J15	1,497.69	24	120	-946.70	0.67	0.14	0.09	Open
P-70		Blue		J12	J88	1,592.12	12	120	-2.30	0.01	0	0	Open
P-71		Red	1	J15	J92	570.16	24	120	-2,053.36	1.46	0.22	0.38	Open
P-72		Red	1	J161	J14	526.76	12	120	1,256.21	3.56	2.36	4.48	Open
P-74		Red	1	J14	J50	503.93	12	120	-641.32	1.82	0.65	1.29	Open
P-75		Red	1	J94	J161	1,617.47	12	120	149.55	0.42	0.14	0.09	Open
P-9		Green		J42	J44	788.06	12	120	398.18	1.13	0.42	0.53	Open
P-91		Red		J10	J14	1,111.51	8	120	299.40	1.91	2.52	2.27	Open
SUPPLY1	Supply 1	Blue	1	FEED1	J86	1.00	16	120	81.72	0.13	0	0	Open
SUPPLY2	Supply 2	Blue		FEED2	J17	887.22	24	120	0.00	0	0	0	Closed
SUPPLY3	Supply 3	Red	1	FEED3	J76	1	24	120	4,892.03	3.47	0	1.95	Open
SUPPLY4	Supply 4	Green		FEED4	J60	1	12	120	1,146.22	3.25	0	3.91	Open

Dawson Trails for Westside

Potable Water Model

Water Model Scenarios Summary

Date: June 2024

MSK Project #: 52-001-01

Calc'd by: DLT

PRELIMINARY
Not for the report
6/30/24

Assumptions:

- 1. These scenarios are based on the lower ADD value of 265 gpd/SFE requested by CRW to account for the Town's landscaping ordinance.
- 2. CRW does not want dedicated FF pumps in the RZ BPS. Fire flows will be handled by the tanks.

Summary of Scenario Results

A		B		C	D	E		F	G	H	I	J	K	L	M	N	O	Pass/Fail	Notes	
No.	Run	Model Date	Development Area	Model Type	Demand Scenario	Max FF Demand	Red Zone Tank	Red Zone BPS	Blue Zone FEED1	Blue Zone FEED2	ID(s)	Pressure	Pass/Fail	ID(s)	Velocity	Pass?				
0	yes	6/30/24	Phase 1	SS	static - no demands	n/a	online	offline	16", closed	24", closed	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
3	yes	6/29/24	Phase 1	SS	PHD+IRR	n/a	online	offline	16", closed	24", closed			see report	n/a	0.53	yes				
4A	yes	6/29/24	Phase 1	SS	MDD+IRR+FF	standard	online	offline	16", closed	24", closed			see report	n/a						Costco (J14) FF=2,000 gpm
4B	yes	6/29/24	Phase 1	SS	MDD+IRR+FF (Costco Alt)	2,150 (J14)	online	offline	16", closed	24", closed			see report	n/a	3.58	yes				Residual pressure at J14 must be 65 psi or higher
11	yes	6/30/24	Buildout	SS	PHD+IRR	n/a	online	offline	16", open	24", closed	n/a	n/a	see report	n/a	n/a	see report				Rez 1, 3, 4 are open. All PS are closed. Rez is closed
12A	yes	6/30/24	Buildout	SS	MDD+IRR+FF	standard	online	offline	16", open	24", closed	n/a	n/a	see report	n/a	n/a	n/a	n/a			Costco (J14) FF=2,000 gpm
12B	yes	6/30/24	Buildout	SS	MDD+IRR+FF (Costco Alt)	2,150 (J14)	online	offline	16", open	24", closed	J14	update	see report	n/a	n/a	n/a	n/a			Residual pressure at J14 must be 65 psi or higher

Model History:

No.	Date	Changes from Previous Model	Scenarios Run
5	6/30/24	Update pipes/junctions in Phase 1 and BZ feed (only FEED2 for Ph 1). Added irrigation demand to Ph 1 and buildout.	See above
4	6/8/24	Move J10, added 8" line within Costco area, close 16" FEED, open 24" FEED2	5A
3	10/7/23	Found P-71 was closed in Scenarios 11,12,13; opened and reran. Changed P-293 and P-294 to 24".	11,12,13
2	9/29/23	Responded to TCR comments on Crystal Valley Connection Submittal by EMK. Added the revised RZBPS location to J-88 and associated BZ and RZ pipe changes. Also increased FEED1 pipe to 16" based on Master Plan.	3,4,5,11,12,13
1	7/20/23, 7/24/23	Revised RZBPS pumping scenarios to MDD demand over a 12-hour period based on CRW's comments. Reduced ADD to 265 gpd/SFE also based on CRW's comments, which changed MDD and PHD. Revised for both Ph 1 and buildout. Adjusted pipe sizes to meet criteria.	3,4,5,11,12,13

<h2 style="text-align: center;">Irrigation System Hydraulic Worksheet</h2>									
Project Name:	Dawson Trails Infrastructure - North						Date:	12.20.2024	
Project Location:	1- 1/2" Irrigation meter located on Costco Lane, approximately 400' East of Dawson Trails Blvd								
Prepared by:	Jason Naughtin						Current TOCR Registration #	19-3239	
Tap Size	1.50"				Source of Pressure	24" Main off Costco Lane			
Static Water Pressure:	145 psi								
Hydraulic Grade At Zone:	6382				Company	Norris Design			
	Ft. of Copper		Pipe Size (")		K Copper	Friction Loss (from chart)	Flow-GPM	Loss/Gain	
Service Line (tap to meter):	12	LF	1.50		K Copper	14.41 /100 FT	40	1.73	
Water Meter:			1.50			1.00	40	1.00	
Service Line (meter to backflow):	5	LF	1.50		K Copper	14.41 /100 FT	40	0.72	
Backflow:	1		1.50			13.5	40	13.50	
Master Valve:			1 1/2			2	40	2.00	
Pressure Required at Head:									45
Lateral Allowance:									4.50
Control Valve Allowance:									3.50
Mainline Allowances:									
Length of Mainline	Pipe Material	Size	Gals.						
	2550 LF CL200BE	2.500 "@	40		GPM	0.39 /100 FT		9.95	
	0 LF CL200BE	0.000 "@	40		GPM-Looped	0.00 /100 FT		0.00	
Elevation:									
	Tap elevation	6,382				High/Low:	6,382	0.00	
Green shading indicates required information you must provide									
Total System requirements (PSI)									81.89
Available System Pressure (PSI)									145.00
<i>Town of Castle Rock provides a minimum of 43 psi</i>									
Total irrigated area for tap # 1 is 174,562 sq. ft.									

<div style="display: inline-block; vertical-align: middle;"> <h2 style="margin: 0;">Irrigation System Hydraulic Worksheet</h2> </div>										
Project Name:		Dawson Trails Infrastructure - North (2) Temporary Hydrant						Date:		12.20.2024
Project Location:		2" Temporary Irrigation hydrant meter located 56' west of POC #1 on Costco Lane								
Prepared by:		Jason Naughtin						Current TOCR Registration #		19-3239
Tap Size		2.00 "		Source of Pressure		24" Main off Costco Lane				
Static Water Pressure:		145 psi								
Hydraulic Grade At Zone:		6382		Company		Norris Design				
		Ft. of Copper		Pipe Size (")		K Copper	Friction Loss (from chart)	Flow-GPM	Loss/Gal	
Service Line (tap to meter):		12	LF	2.00		K Copper	14.41 /100 FT	70	1.7	
Water Meter:				2.00			1.00	70	1.0	
Service Line (meter to backflow):			LF	2.00		K Copper	14.41 /100 FT	70	0.0	
Backflow:		1		1.50			13.5	70	13.5	
Master Valve:				2			2	70	2.0	
Pressure Required at Head:									4	
Lateral Allowance:									4.5	
Control Valve Allowance:									3.5	
Mainline Allowances:										
Length of Mainline	Pipe Material	Size		Gals.		GPM	1.00 /100 FT		5.4	
549	LF CL200BE	2.000 " @		70		GPM-Looped	0.00 /100 FT		0.0	
0	LF CL200BE	0.000 " @		70						
Elevation:										
Tap elevation		6,382				High/Low:		6,396		
Green shading indicates <u>required</u> information you must provide										
Total System requirements (PSI)									82.78	
Available System Pressure (PSI)									145.00	
Town of Castle Rock provides a minimum of 43 psi										
Total Irrigated area for tap #		HM	is	278,524	sq. ft.					

IRRIGATION CHART - CONTROLLER 'A'

Registered Professional Jason Naughtin Registration # 19-3239 Date 12.19.2024
 Company Name Norris Design Address 1101 Bannock St., Denver, CO 80204
 Phone 303.892.1166 Email jnaughtin@norris-design.com Clock Make Rain Bird Model ESP-1XIVMP

Zone	Hydrozone	Plant Type	Head Type	Nozzle	App. Rate	Sequence	GPM (Per Zone and/or Seq.)	Inches/Month (Average May - September)	Run Time (Minutes/ Month)	Run Time (Minutes Every Third Day)	Water Usage (Gallons per month)
		Very Low <5" Low 5-10" Medium 10-15" High >15"	(Rotors, Sprays, Bubblers, Drip, SDI, etc.)	(Nozzle/Emitter size)	(inches/hour)						
A1	LOW	TREE	RB XFS-CV	0.9	0.5	1	3.50	2	240	24	840
A2	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A3	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A4	LOW	TREE	RB XFS-CV	0.9	0.5		1.50	2			360
A5	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A6	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A7	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A8	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A9	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
							40.00				
A10	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5	2	5.00	2	240	24	1200
A11	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A12	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A13	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A14	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A15	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		4.00	2			960
A16	LOW	TREE	RB XFS-CV	0.9	0.5		5.25	2			1260
A17	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
							39.25				
A18	LOW	TREE	RB XFS-CV	0.9	0.5	3	3.25	2	240	24	780
A19	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A20	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A22	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A23	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A26	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A27	LOW	TREE	RB XFS-CV	0.9	0.5		1.50	2			360
A28	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
							34.75				
A32	LOW	TREE	RB XFS-CV	0.5, 1.0 GPH	0.5	4	0.75	2	240	24	180
A33	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		2.50	2			600
A34	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		3.50	2			940
A35	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A36	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		5.00	2			1200
A37	LOW	SHRUBS	DRIP	0.5, 1.0 GPH	0.5		3.00	2			720
A38	LOW	SHRUBS	DRIP								



IRRIGATION CHART - CONTROLLER 'A'

(TEMPORARY) PROGRAM

Registered Professional Jason Naughtin
Registration # 19-3239
Date 12.20.2024

Company Name Norris Design
Address 1101 Bannock St., Denver, CO 80204

Phone 303.892.1166
Email j_naughtin@norris-design.com
Clock Make Rain Bird
Model ESP-1XIVMP

Zone	Hydrozone	Plant Type (Turf, Native, Shrubs, Perennials, Trees, Annuals, etc.)	Head Type (Robots, Sprays, Bubblers, Drip, SDI, etc.)	Nozzle (Nozzle/Emitter size)	App. Rate (Inches/hour)	Sequence	GPM (Per Zone and/or Seq.)	Inches/Month (Average May - September)	Run Time (Minutes/ Month)	Run Time (Minutes Every Third Day)	Water Usage (Gallons per month)
B1	LOW	TEMP NATIVE	RB 5000	#4	0.5	1A	39.20	2	240	24	940
B2	LOW	TEMP NATIVE	RB 5000	#4	0.5	2A	39.20	2	240	24	700
B3	LOW	TEMP NATIVE	RB 5000	#4	0.5	3A	34.30	2	240	24	823
B4	LOW	TEMP NATIVE	RB 5000	#4	0.5	4A	34.30	2	240	24	960
B5	LOW	TEMP NATIVE	RB 5000	#4	0.50	5A	40.00	2	240	24	866
B6	LOW	TEMP NATIVE	RB 5000	#4	0.50	6A	36.10	2	240	24	866
B7	LOW	TEMP NATIVE	RB 5000	#4	0.50	7A	36.10	2	240	24	960
B8	LOW	TEMP NATIVE	RB 5000	#4	0.50	8A	40.00	2	240	24	770
B9	LOW	TEMP NATIVE	RB 5000	#4	0.50	9A	32.10	2	240	24	674
B11	LOW	TEMP NATIVE	RB 5000	#4	0.50	10A	28.10	2	240	24	748
B12	LOW	TEMP NATIVE	RB 5000	#4	0.50	11A	31.20	2	240	24	892
							37.20	2	240	24	
Total									2640	264	9204
									Min/Month	Min/cycle	Gallons/Mo

DEVELOPMENT SERVICES	DATE
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150^{SHEET}
OF 170

JASON NAUGHTIN TOCR #19-3239

Appendix C

Sanitary Calculations

PROJECTED FLOW DETERMINATION																										SEWER DESIGN														
DESIGN POINT						RESIDENTIAL			NON-RESIDENTIAL							PEAK FLOW			INFILTRATION & INFLOW		CUMULATIVE TOTAL FLOW						Pipe Size (in)	Number of Pipes	Min Design Pipe Slope (ft/100 ft)	Max Design Pipe Slope (ft/100 ft)	Min Pipe Slope (ft/100 ft)	Max Pipe Slope (ft/100 ft)	Capacity (gpm) @ 75% depth @ Min Pipe Slope	Capacity (gpm) @ 75% depth @ Max Slope	Capacity @ 75% depth (gpm) @ Design Slope	Capacity Remaining (gpm)	Percent Capacity (75% Max)	Min Velocity (fps)	Max Velocity (fps)	
Design Point Location	PLANNING AREA	Phase	Contributing Flow 1	Contributing Flow 2	Contributing Flow 3	Multi Family (DU's)	Single Family (DU's)	Average Daily Flow (GPD)	School (EA.)	Parks (SFE)	Car Wash/Pump Station (SFE)	Industrial (Gross SF)	Fuel Station (SFE.)	Restaurants (Gross SF)	Retail / Office (Gross SF)	Average Daily Flow (GPD)	Total Average Daily Flow (GPD)	Total Average Flow (gpm)	Peak Hour Flow (gpm)	Infiltration & Inflow (GPD)	Infiltration & Inflow (gpm)	Total Peak Sewage Flow (gpm)	Contributing Flow 1	Contributing Flow 2	Contributing Flow 3	Cumulative Total Peak Flow (gpm)														Cumulative Total Peak Flow (cfs)
						a	b	c	d	dd	ddd	e	ee	f	ff	g	h	i	j	k	m	n	o	p	q	r	rr	s	t		u	w	x	y	z	aa	bb	cc		
						Map	Map	130*a + 200*b	Map	Map	Map	Map	Map	Map	Map	3.375*d + 200*dd +5.000*ddd +0.05*e + 0.18*ee + 1.5*f + 0.1*ff	c + g	h/24/60	i * 5	0.1*h	k/(24*60)	j + m	r	r	r	n+o+p+q	r / 0.1337*60								aa - r					
J-6.01	E-2														80,000	8,000	8,000	5.56	27.78	800	0.56	28.4				28.4	0.06	8	1	2.5	7.50	0.40	7.50	374	1619	1,615	1,586	12%	2.67	7.25
J-6.02	F-3					400		52,000				450,000			100,000	12,479	64,479	44.78	223.89	6,448	4.48	228.4				228.4	0.51	8	1	2.5	7.50	0.40	7.50	374	1619	1,615	1,386	33%	5.07	7.25
J-6																						228.4	4819.9			5048.3	11.25	24	1	0.59	1.80	0.08	1.80	3131	14850	14,810	9,762	53%	6.65	4.50
J-7A.01	F-2		J-6.02								3		1		150,000	30,800	30,800	21.39	106.94	3,080	2.14	109.1				109.1	0.24	8	1	5	7.50	0.40	7.50	374	1619	1,615	1,506	19%	5.07	5.69
J-7A																						109.1	5048.3			5157.4	11.49	24	1	0.28	1.80	0.08	1.80	3131	14850	14,810	9,653	68%	5.01	10.13
J-7.01	E-1													25,000	25,000	40,000	40,000	27.78	138.89	4,000	2.78	141.7				141.7	0.32	8	1	2.9	7.50	0.40	7.50	374	1619	1,615	1,473	26%	4.50	6.59
J-7.02	F-2		J-7.01												10,000	1,000	1,000	0.69	3.47	100	0.07	3.6	141.7			145.3	0.32	8	1	0.94	7.50	0.40	7.50	374	1619	1,615	1,470	33%	3.22	6.75
J-7.03	F-2		J-7.02												20,000	2,000	2,000	1.39	6.94	200	0.14	7.1	145.3			152.4	0.34	8	1	3.93	7.50	0.40	7.50	374	1619	1,615	1,462	24%	5.27	6.37
J-7			J-7A.01	J-7.03																		152.4	5157.4			5309.8	11.83	24	1	1.67	1.80	0.08	1.80	3131	14850	14,810	9,501	40%	9.92	10.25
J-7B.01	F-2		J-7												20,000	2,000	2,000	1.39	6.94	200	0.14	7.1				7.1	0.02	10	1	1	5.50	0.25	5.50	536	2514	2,507	2,500	6%	1.18	1.65
J-7B																						7.1	5309.8			5316.9	11.85	24	1	1.94	1.80	0.08	1.80	3131	14850	14,810	9,493	39%	10.44	10.09
J-8.01	PL-1.07									1						200	200	0.14	0.69	20	0.01	0.8				0.8	0.00	8	1	3	7.50	0.40	7.50	374	1619	1,615	1,614	3%	0.58	0.58
J-8.02	F-1		J-8.01												100,000	10,000	10,000	6.94	34.72	1,000	0.69	35.5	0.8			36.3	0.08	8	1	2.5	7.50	0.40	7.50	374	1619	1,615	1,579	13%	2.87	4.14
J-8.03	PL-1.08		J-8.02								1					5,000	5,000	3.47	17.36	500	0.35	17.8	36.3			54.1	0.12	8	1	2.5	7.50	0.40	7.50	374	1619	1,615	1,561	16%	3.20	4.28
J-8			J-8.03	J-7B.01																		54.1	5316.9			5371.0	11.97	24	1	0.59	1.80	0.08	1.80	3131	14850	14,810	9,439	55%	6.76	10.20
J-9A.01	F-1		J-8									183,333				1,010	1,010	0.70	3.51	101	0.07	3.6				3.6	0.01	10	1	0.5	5.50	0.25	5.50	536	2514	2,507	2,504	5%	0.84	1.28
J-9A																						3.6	5371.0			5374.6	11.97	24	1	1.29	1.80	0.08	1.80	3131	14850	14,810	9,436	44%	8.99	10.20
J-9.01	PL-1.07									1						200	200	0.14	0.69	20	0.01	0.8				0.8	0.00	8	1	2	7.50	0.40	7.50	374	1619	1,615	1,614	3%	0.58	0.58
J-9.02	F-1		J-9.01									183,333				1,010	1,010	0.70	3.51	101	0.07	3.6	0.8			4.4	0.01	8	1	0.5	7.50	0.40	7.50	374	1619	1,615	1,610	7%	0.82	1.76
J-9			J-9.02	J-9A.01																		4.4	5374.6			5379.0	11.98	24	1	0.36	1.80	0.08	1.80	3131	14850	14,810	9,431	64%	5.59	10.21
J-9B.01	F-1		J-9									183,333				1,010	1,010	0.70	3.51	101	0.07	3.6				3.6	0.01	10	1	2.52	5.50	0.25	5.50	536	2514	2,507	2,504	4%	1.28	1.28
J-9B																						3.6	5379.0			5382.6	11.99	24	1	0.25	1.80	0.08	1.80	3131	14850	14,810	9,428	74%	4.81	10.22
TOTAL						400		52,000	-	2	4	999,999	1	25,000	505,000	114,710	166,710	115.77	578.85	16,671	11.58					5379.0	11.98										64%			

JUNCTION TABLE				
JUNCTION	RESIDENTIAL (GPD)	NON-RESIDENTIAL (GPD)	TOTAL PEAK FLOW (GPM)	CUMULATIVE TOTAL PEAK FLOW (GPM)
J-6.01	-	8,000	28	28
J-6.02	52,000	12,479	228	228
J-7A.01	-	30,800	109	109
J-7A	-	-	109	5,157
J-7.01	-	40,000	142	142
J-7.02	-	1,000	4	145
J-7.03	-	2,000	7	152
J-7	-	-	152	5,310
J-7B.01	-	2,000	7	7
J-7B	-	-	7	5,317
J-8.01	-	200	1	1
J-8.02	-	10,000	36	36
J-8.03	-	5,000	18	54
J-8	-	-	54	5,371
J-9A.01	-	1,010	4	4
J-9A	-	-	4	5,375
J-9.01	-	200	1	1
J-9.02	-	1,010	4	4
J-9	-	-	4	5,379
J-9B.01	-	1,010	4	4
J-9B	-	-	4	5,383
TOTAL	52,000	114,710	925	5,383

SUMMARY TABLE			
	USE	QUANITIES	TOTALS
RESIDENTIAL	MULTIFAMILY (DU)	400	400
	SINGLE FAMILY (DU)	-	
NON-RESIDENTIAL	SCHOOL (EA)	-	1,505,000
	PARKS (SFE)	2	
	CAR WASH (AC)	4	
	INDUSTRIAL (SF)	999,999	
	FUEL STATIONS (EA.)	1	
	RETAIL/ OFFICE (SF)	505,000	

Appendix D

Excerpts



Excerpts from
"Costco
Wholesale
Development
Requirements"
Prepared by
Costco Wholesale
Dated December
18, 2020

DEVELOPMENT REQUIREMENTS

**Version 2020
December 18, 2020**

SUMMARY OF CHANGES **(Highlighted)**

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COSTCO WHOLESALE DEVELOPMENT REQUIREMENTS

SECTION 06 SITE UTILITIES (WET AND DRY)

- a) At the latest, dry utilities shall be in service by the required racking date, or Day sixty-five (65) of the project schedule, whichever is earlier.
 - b) For Building Only Projects (Site Delivery Option #4), wet utilities shall be installed by the Developer and ready for use at the time Costco Wholesale General Contractor mobilizes onto the site.
 - c) Required wet utilities include water (potable, irrigation and fire protection), sanitary sewer, and storm drainage.
 - d) Minimum pipe slope for gravity piping is one-half (0.5%) percent.
 - e) At a minimum, pipe invert elevations shall be set at a depth that provides frost cover protection equal to the local frost depth, as determined by the Costco Wholesale Geotechnical Engineer. See Detail: 06_03 Typical Utility Inverts.
 - f) Gravity service connections must pass beneath the structural footings and provide a minimum six (6") inch separation between the bottom of the footing and the outer wall of the pipe. Coordinate final invert elevations with the Costco Wholesale Mechanical Engineer and Structural Engineer. See Detail: 06_03 Typical Utility Inverts.
- 2) **Sanitary Sewer**
- a) **Sanitary sewer laterals shall be a minimum of six (6) inches (152 mm).**
 - b) Sanitary sewer design shall be in accordance with the authority having jurisdiction, including provisions for oil / water separation, effluent concentrations, flow velocity, and maintenance/operations provisions.
 - c) Confirm depth downstream connection to existing system is at an adequate depth to allow sewer service connections to pass beneath structural footings (below frost).
 - Line inverts shall be sufficiently deep as to receive all building flow by gravity (without pumping).
 - **All gravity sanitary sewer conveyance lines serving the Costco Wholesale facilities must have a gradient of one-half (0.5%) percent or greater.**
 - d) NO PUMP STATIONS – unless prior approval is received from Costco Wholesale.
 - e) At a minimum, provide nine (9) six (6) inch (152 mm) waste connections along the Warehouse exterior. Refer to the utility plan for specific locations. **Provide for a Sewer flow range of five**

COSTCO WHOLESALE DEVELOPMENT REQUIREMENTS

SECTION 06 SITE UTILITIES (WET AND DRY)

Castle Rock Requires 600 GPD/ AC for Industrial/ Other Commercial. With Costco being about 150,000 SF of retail/office space (15,000 GPD) ToCR is more conservative and therefore utilized in the calculations.

thousand and five hundred (5,500) gallons (20,814 L) to eight thousand and five hundred (8,500) gallons (32,173 l) per day of waste.

- See Detail: 06_01 Typical Utility Plan, 06_06 Sewer and Water Service Availability Letter, 06_13 Typical Sanitary Sewer Point of Connection Plan, and 06_13A Typical Sanitary Sewer Point of Connection Plan – with Liquor Sales
 - f) Provide two (2) grease interceptors. One minimum volume of one thousand fifteen (1,500) gallons (5,676 L) at the Fresh Line and the second minimum volume of one thousand (1,000) gallons (3,785 L) at the Food Service. Verify with minimum size and acceptable manufacturer and obtain final approval from AHJ prior to installation.
 - g) Provide one (1) oil and sand separator capable of handling a load of approximately eight hundred (800) gallons (3,027 L).
 - h) Provide one (1) oil / water separator, waste oil storage tank and associated piping for the Tire Installation bays in accordance with the local jurisdiction's requirement, where required.
 - i) Evaluate requirements for sanitary sewer service to the Fuel Facility and / or the compactor drain and provide sewer service as required by the jurisdiction.
 - j) Verify with the architect if a sanitary sewer connection needs to be provided to the sprinkler riser room.
- 3) Water – Domestic Service
- a) Provide a Domestic Water service to the Warehouse at the location shown on the Utility Plan, or as determined by Costco Wholesale. Clearly identify the location and type of the Domestic water meter.
 - b) The Domestic water service shall be connected directly to the local public water system infrastructure or onsite (public) water system and shall be metered separately from irrigation and fire service connections and Fuel Facility. Connection of the Costco Wholesale domestic water service to a closed (stagnant) system, with backflow preventing free-flowing circulation with the adjacent public water system is not allowed.
 - c) Clarify whether the Onsite Water System is public (with easements) or private (with backflow at property line).
 - d) Confirm backflow and metering requirements.

COSTCO WHOLESALE DEVELOPMENT REQUIREMENTS

SECTION 06 SITE UTILITIES (WET AND DRY)

- e) The Domestic water service shall be a minimum size of three (3) inch (76.2 mm) and have minimum static pressure of seventy (70) pounds per sq. inch (482.6 kPa) downstream of backflow prevention.
- See Detail: 06_01 Typical Utility Plan, 06_07 Water Service Availability Letter, 06_12 Typical Water System Point of Connection Plan, and 06_12A Typical Water System Point of Connection Plan- with Liquor Sales.
 - For Canada projects, domestic water supply is typically provided by a sixty-five (65) mm service delivering three hundred and eighty (380) liters per minute at 5.2 bar.
 - For all other countries, verify availability.
- f) Approval from Costco Wholesale is required for lower pressure service.
- g) Provide a pressure reducing valve (PRV) if required due to high system pressures.
- h) Provide backflow prevention as required by the authority having jurisdiction.
- Identify available water pressure after applying required backflow protection device losses.
 - Coordinate with the Costco Wholesale Architect and Mechanical Engineer.
- 4) Water – Irrigation Service
- a) Provide irrigation water service (separate from domestic service) at a location as determined by Costco Wholesale. Irrigation service is to be metered separately from Domestic and Fire Protection services. Clearly identify the location and type of Irrigation water meter.
- b) The irrigation water service shall be as recommended by the Landscape Architect and approved by Costco Wholesale. Confirm backflow and metering requirements.
- c) Identify anticipated water pressure at the Irrigation System connection and coordinate with the Landscape Architect. Provide a pressure reducing valve (PRV) if required due to high pressure systems. Coordinate with landscape architect for project-specific requirements.
- d) Provide necessary water meter (separate from domestic) and backflow prevention device as required by the authority having jurisdiction. Verify that the irrigation water usage does not impact the sanitary sewer billing.
- 5) Water – Fire Protection Service

COSTCO WHOLESALE DEVELOPMENT REQUIREMENTS

SECTION 06 SITE UTILITIES (WET AND DRY)

- a) Verify availability of fire protection water service capable of providing a minimum delivery pressure of seventy-five (75) pounds per square inch (517.11 kPa).
- b) For a non-boosted system, provide a minimum of two thousand one hundred and fifty (2,150) gallons per minute (8,138 Lpm) at a residual pressure of sixty-five (65) pounds per square inch (448 kPa) and a general firefighting flow of four thousand (4,000) gallons per minute (15,142 Lpm) at a residual pressure of twenty (20) pounds per square inch (137.95 kPa), or as required by the jurisdiction.
- c) Verify that a pump is not required.
- d) Verify connection and impact fees and provide a detailed and itemized breakdown to the Costco Wholesale Development Director.
- e) The below referenced criteria shall be conducted by an Engineer certified in the state in which the project is sited. The hydrant flow test information shall be accompanied by the stamp and signature of the professional Engineer certifying that the water flow test has been completed in accordance with NFPA 291.
- f) A hydraulic analysis of the Onsite Water system and corresponding connections to the adjacent water system(s) shall be completed by both the Civil Engineer responsible for onsite water system design and Costco Wholesale Fire Protection consultant to determine the available water pressure at base of riser (BOR).
 - The analysis should clearly identify if the onsite water system is public or private.
 - Hydraulic modeling for design of the onsite water system and determining the available water pressure at the base of riser shall account for required back flow protection location and type, and water meter (if required for Fire flows).
- g) All fire protection designs, plans and Specifications shall be reviewed and approved by the Costco Wholesale Fire Protection Consultant.
- h) Complete all designs in accordance with the Costco Wholesale design criteria and the requirements of the authority having jurisdiction. Where discrepancies occur between the standards, the more restrictive shall apply. For any location where an ESFR Fire System will be installed, Costco Wholesale Risk Management Department is to be notified.
- i) Adequacy of service, site piping design, pressure and flow shall be verified with the regulating authority and these requirements. Provide water mains of sufficient size to adequately supply

COSTCO WHOLESALE DEVELOPMENT REQUIREMENTS

SECTION 06 SITE UTILITIES (WET AND DRY)

both fire protection and domestic demands simultaneously, or separate lines, if required by local authorities.

- j) Provide an eight (8) inch (203 mm) minimum onsite water system, with sufficient isolation valves to facilitate maintenance/operations. Include an appropriately sized connection to the fire protection system riser and onsite fire hydrants. The location of the fire protection stub connection and base of riser shall be at a location and elevation specified per Costco Wholesale requirements.
 - k) Hydraulic analysis design of the onsite water system shall evaluate the hydraulic benefits of looping the system around the Warehouse, upsizing of the connections to the existing system and/or onsite water system piping.
 - All available water system design configurations shall be evaluated prior to proposing a pump.
 - Provide a separate meter for the fire protection water service only if required.
 - l) Confirm whether a water meter is required on the Fire Protection service. If required, clearly identify the location and type of the Fire Protection water meter.
 - m) Design Water system so that the fire sprinkler system does not require a pump or onsite storage tank. Any design requiring a pump and/or storage tank must be accepted in writing by Costco Wholesale.
- 6) Water – Fire Hydrants
- a) Provide fire hydrants at a maximum of three hundred (300) foot, (91.44 m) intervals around the building, or as required by the authority having jurisdiction. Confirm whether there is also a minimum distance from the Warehouse.
 - b) Provide one (1) fire hydrant within one hundred (100) feet (30.48 m) of the Costco Wholesale Fire Department Connection (FDC) or as required by the authority having jurisdiction. Verify location of FDC and nearest hydrant with the local fire official.
 - Where a Fuel Facility is included, provide one (1) fire hydrant within one hundred (100) feet (30.48 m) of the Fuel Facility. Verify exact location with Costco Wholesale.
 - Verify with the local fire official if additional hydrants are required. If additional hydrants are required, identify their location and coordinate with Site Utility Plan.

COSTCO WHOLESALE DEVELOPMENT REQUIREMENTS

SECTION 06 SITE UTILITIES (WET AND DRY)

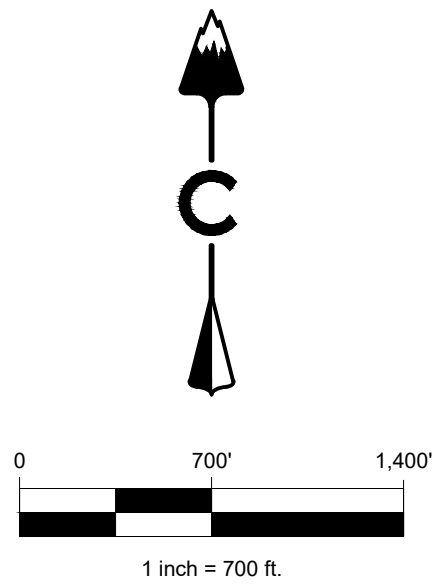
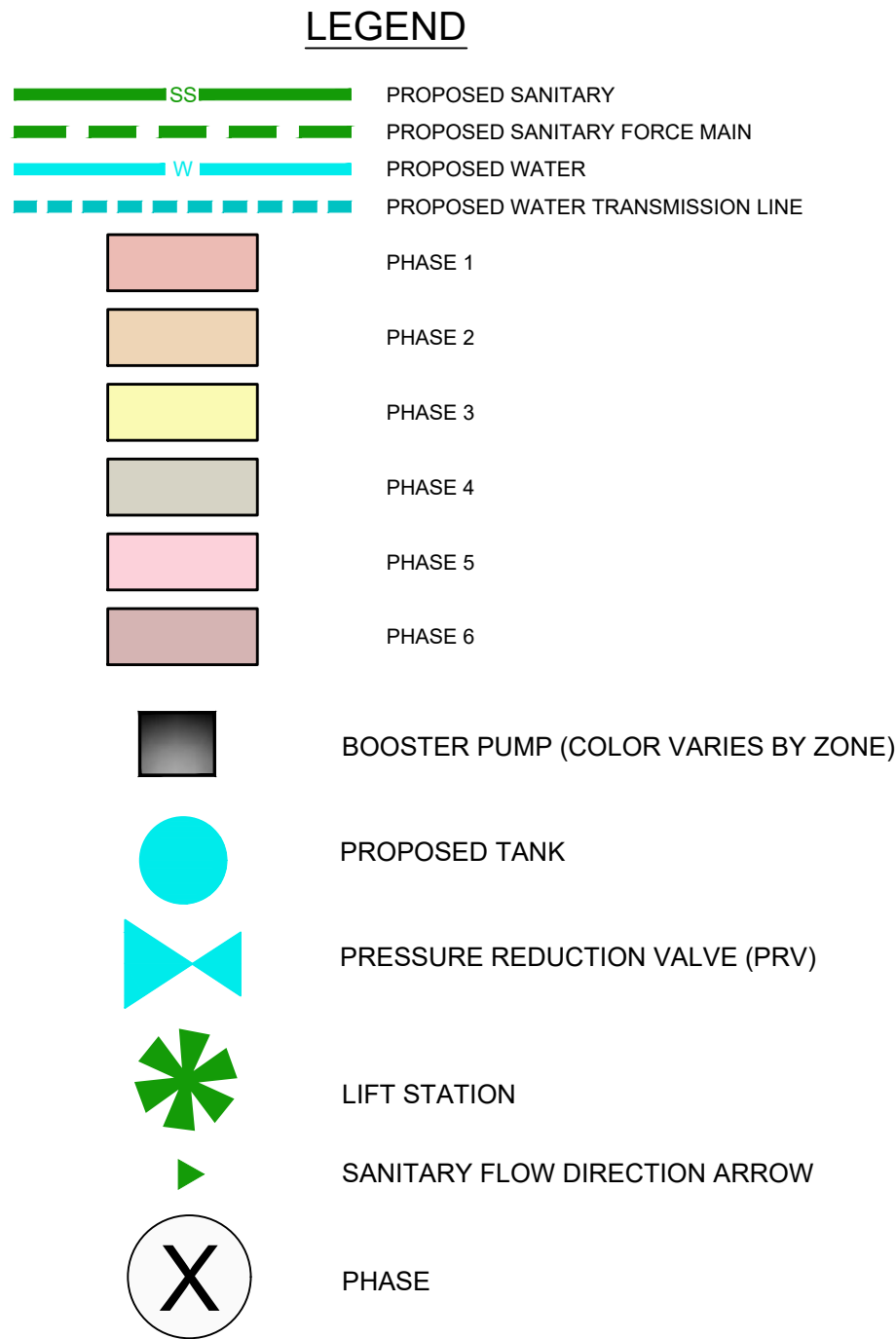
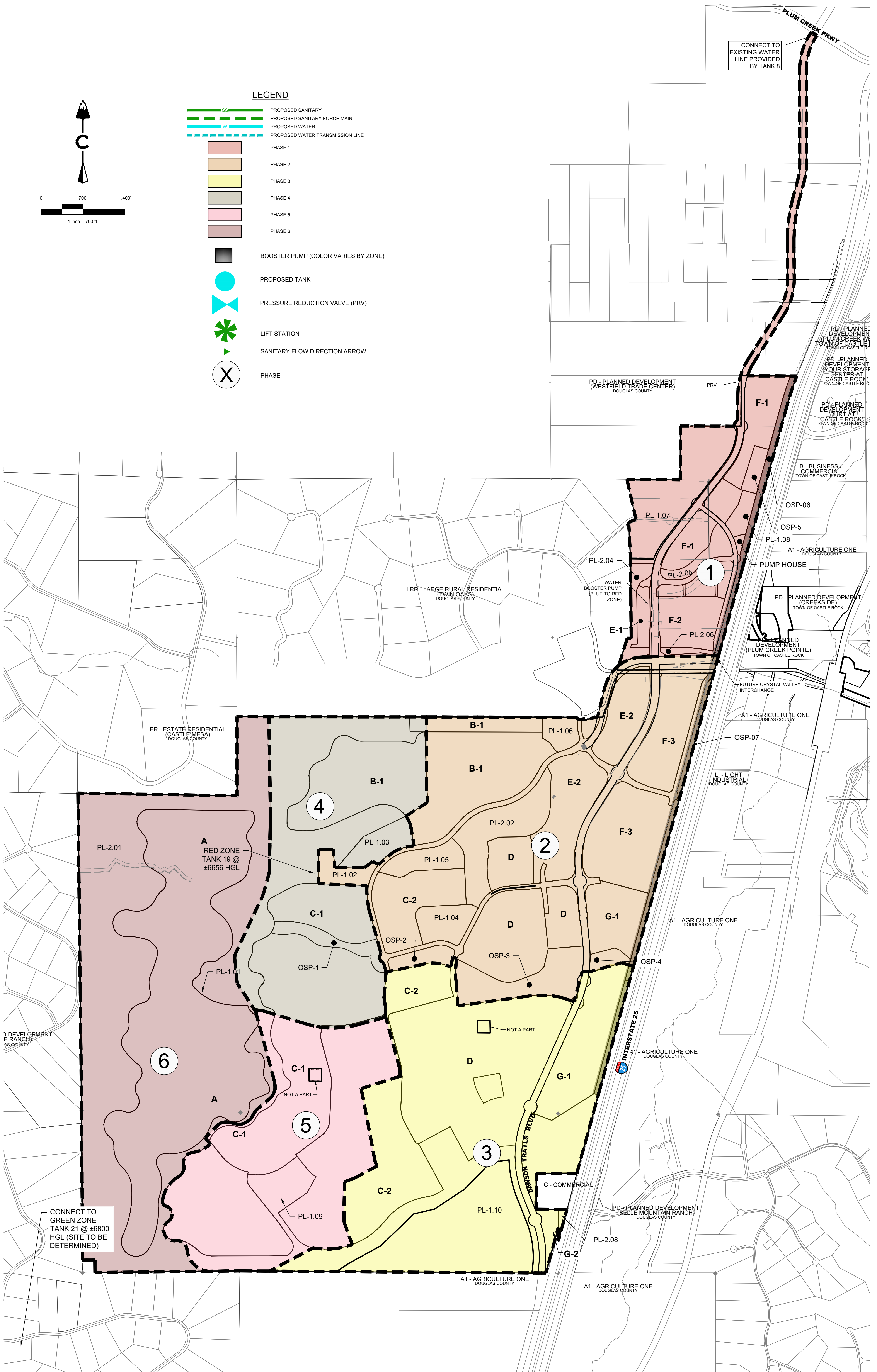
- c) Verify with the local fire official if a Post Indicator Valve (PIV) is required, and the type of Fire Hydrant connection(s).
 - Confirm local Fire Protection standards for hydrant nuts and valve.
 - Provide copy of local Fire Hydrant standards and details.
- 7) Water – Fire Backflow Protection
 - a) Provide backflow protection in accordance with the authority having jurisdiction. Identify the size, type, manufacturer and model for the backflow protection device(s) proposed for use.
 - b) Verify if location of backflow is inside Warehouse, or out at property line, and whether the unit is to be installed below grade (in buried vault) or above grade.
 - If above grade, confirm if screening is required.
 - If installed outside of Warehouse, confirm whether frost-protection is required. Identify necessary provisions for an insulated “Hot-Box” structure, and coordinate other utilities (drains, electric power, etc.) as required.
 - The location of the backflow protection device is typically dependent on whether the onsite water system is private, or public (with easements).
 - c) Based on this, it should be determined early in the process whether the onsite water system is to be private or public, so that the appropriate backflow protection and metering can be designed.
- 8) Storm Drainage - See Section 07 Site Storm Drainage for requirements.

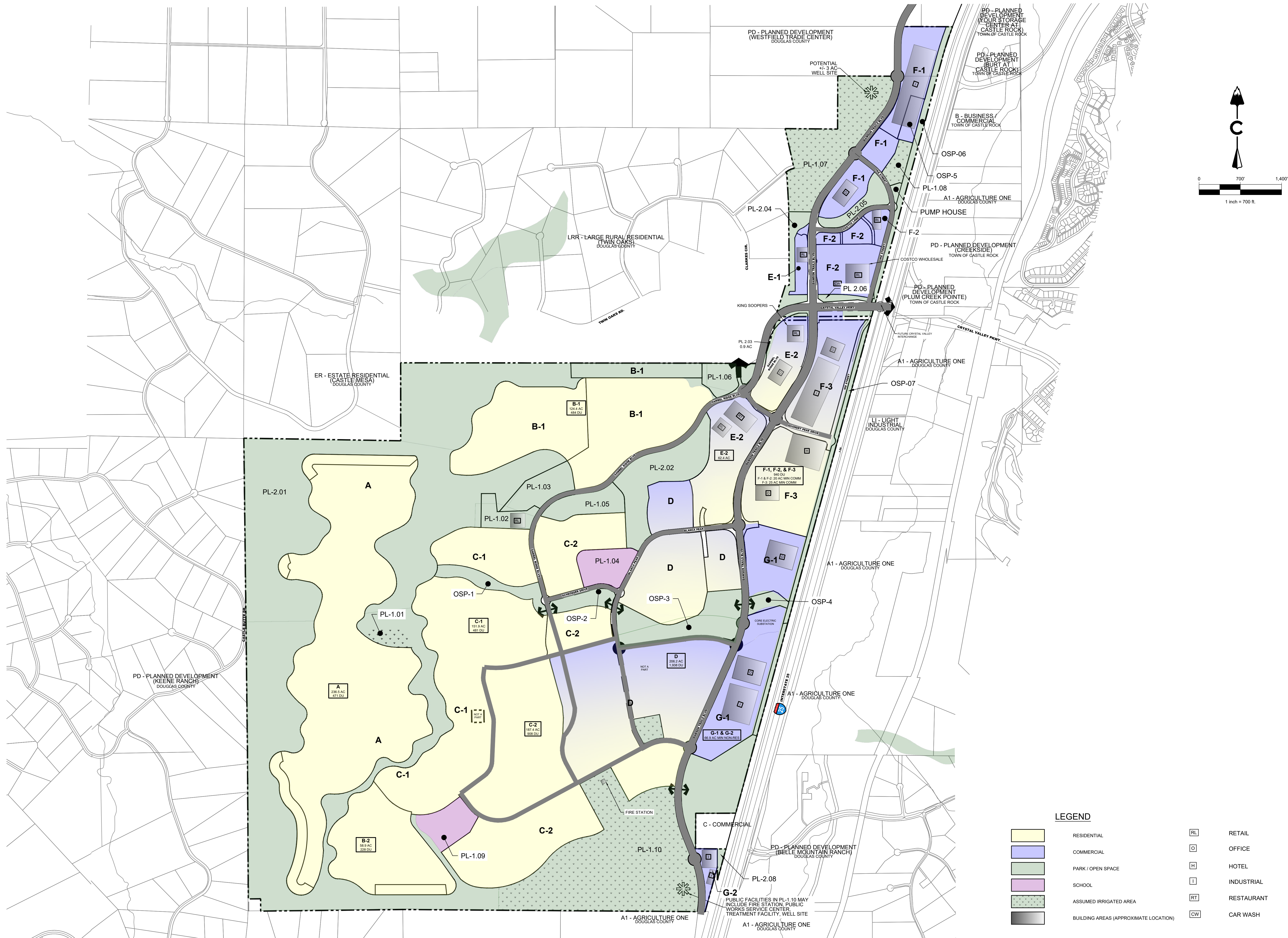
D. Dry Utilities

- 1) Dry utilities are necessary to operate a Costco Wholesale Warehouse and Fuel Facility (where included). The responsibility of providing these utility services may involve several different consultants; therefore, documentation of all correspondence with utility providers is essential. See Detail: 06_10 Dry Utility Matrix for purposes of tracking permits and approvals.
 - a) Required dry utilities include electric power, telephone/computer and natural gas. When a Fuel Facility is to be constructed, Communications Conduits between the Controller Enclosure and the Warehouse EDP Room are also required.

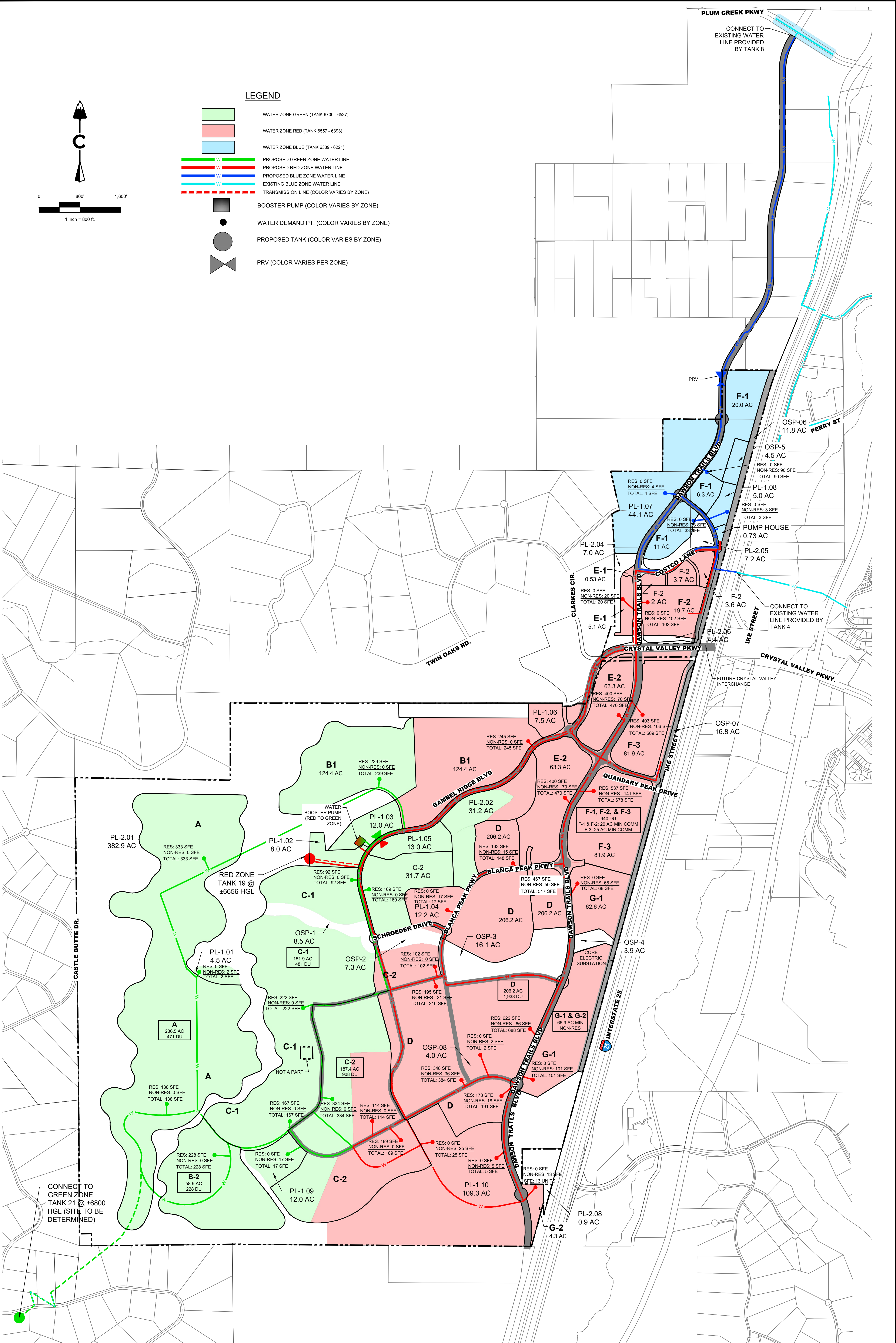
Appendix E

Maps





2024.05.11 4:38 PM X:\2024 Dawson\Civil\Reports_Overall\Utility\Master Map.dwg OVERALL WATER MAP.dwg Tony Yuan



CORE CONSULTANTS, INC.
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LIVEYOURCORE.COM

LAND DEVELOPMENT
ENERGY
PUBLIC INFRASTRUCTURE

DAWSON TRAILS

OVERALL WATER MAP

DATE: 9/18/2024
CREATED BY: CGV
JOB NO. 20-224
SHEET
3 OF 5

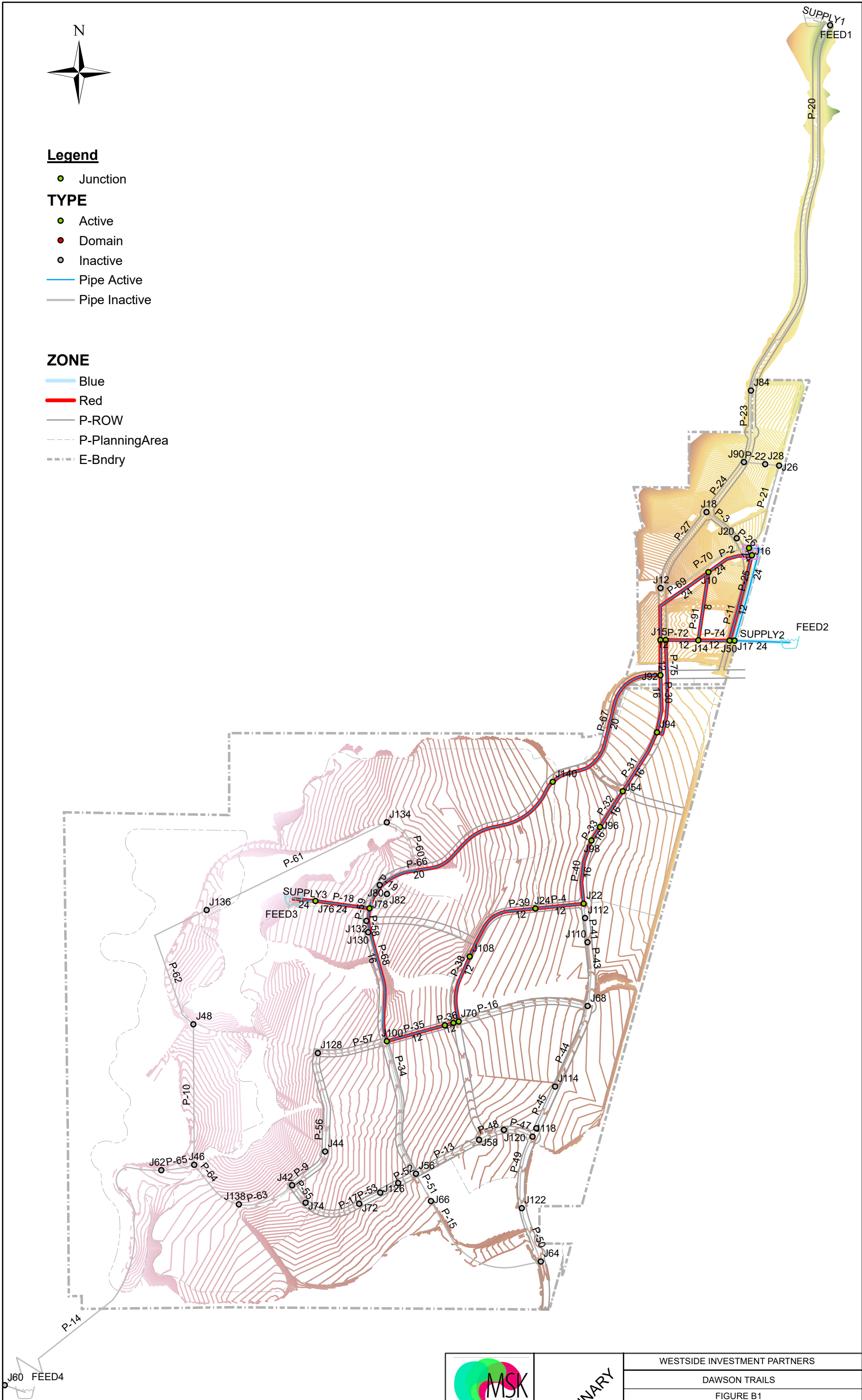


Legend

- Junction
- TYPE
 - Active
 - Domain
 - Inactive
- Pipe Active
- Pipe Inactive

ZONE

- Blue
- Red
- P-ROW
- P-PlanningArea
- E-Bndry

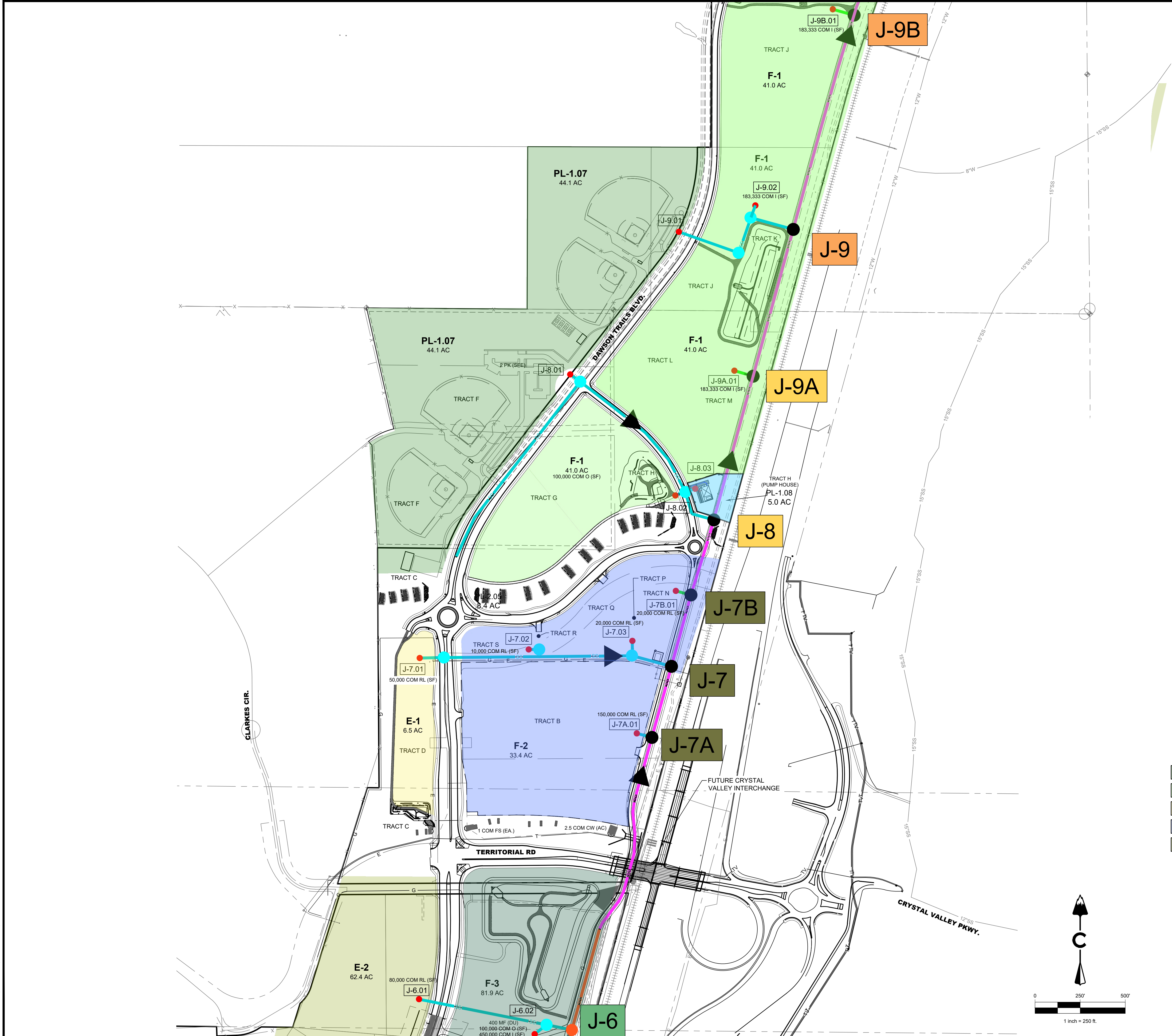




7157 S. Andes Cir
Centennial, CO 80016
303-903-0918

PRELIMINARY

WESTSIDE INVESTMENT PARTNERS	
DAWSON TRAILS	
FIGURE B1	
PHASE 1 WATER DISTRIBUTION SYSTEM MODEL	
PIPE & JUNCTION ID	
JUNE 2023	JN: 52-001-01



JUNCTION TABLE				
JUNCTION	RESIDENTIAL (GPD)	NON-RESIDENTIAL (GPD)	TOTAL PEAK FLOW (GPM)	CUMULATIVE TOTAL PEAK FLOW (GPM)
J-6.01	-	8,000	28	28
J-6.02	52,000	12,479	228	228
J-7A.01	-	30,800	109	109
J-7A	-	-	109	5,157
J-7.01	-	40,000	142	142
J-7.02	-	1,000	4	145
J-7.03	-	2,000	7	152
J-7	-	-	152	5,310
J-7B.01	-	2,000	7	7
J-7B	-	-	7	5,317
J-8.01	-	200	1	1
J-8.02	-	10,000	36	36
J-8.03	-	5,000	18	54
J-8	-	-	54	5,371
J-9A.01	-	1,010	4	4
J-9A	-	-	4	5,375
J-9.01	-	200	1	1
J-9.02	-	1,010	4	4
J-9	-	-	4	5,379
J-9B.01	-	1,010	4	4
J-9B	-	-	4	5,383
TOTAL	52,000	114,710	925	5,383

SUMMARY TABLE			
	USE	QUANTITIES	TOTALS
RESIDENTIAL	MULTIFAMILY (DU)	400	400
	SINGLE FAMILY (DU)	-	
NON-RESIDENTIAL	SCHOOL (EA)	-	1,505,000
	PARKS (SFE)	2	
	CAR WASH (AC)	4	
	INDUSTRIAL (SF)	999,999	
	FUEL STATIONS (EA.)	1	
	RETAIL/ OFFICE (SF)	505,000	

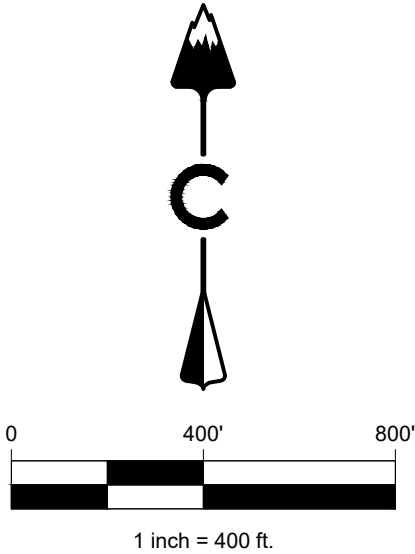
NOTES:
1. SEE APPENDIX C FOR DETAILED SANITARY SEWER CALCULATIONS

LEGEND

	BASIN 1
	BASIN 2
	BASIN 3
	BASIN 4
	BASIN 5

LEGEND

8" PROPOSED SANITARY	
10" PROPOSED SANITARY	
12" PROPOSED SANITARY	
15" PROPOSED SANITARY	
18" PROPOSED SANITARY	
21" PROPOSED SANITARY	
24" PROPOSED SANITARY	
27" PROPOSED SANITARY	
FORCE MAIN SANITARY	
FLOW DIRECTION ARROW	
HIGH POINT	
LOW POINT	
SANITARY JUNCTION	
SANITARY INPUT PT.	
LIFT STATION	



I HEREBY AFFIRM THAT THESE FINAL CONSTRUCTION PLANS WERE PREPARED UNDER MY DIRECT SUPERVISION, IN ACCORDANCE WITH ALL APPLICABLE TOWN OF CASTLE ROCK AND STATE OF COLORADO STANDARDS AND STATUTES, RESPECTIVELY; AND THAT I AM FULLY RESPONSIBLE FOR ALL DESIGN AND REVISIONS RELATIVE TO SAID PLANS.

BYRON J. GLENN, P.E. DATE
STATE OF COLORADO # 31485

TOWN OF CASTLE ROCK APPROVAL
PLANS ARE HEREBY APPROVED FOR ONE YEAR FROM DATE OF DEVELOPMENT SERVICES APPROVAL.

APPROVED BY:

DEVELOPMENT SERVICES DATE



DESIGNED BY: GKP
DRAWN BY: CT
CHECKED BY: BJG

JOB NO.
20-224

SHEET
42 OF 170

DAWSON TRAILS BLVD (SOUTH)-FILING 1 INFRASTRUCTURE
CASTLE ROCK, COLORADO
CONSTRUCTION DOCUMENTS
OVERALL UTILITY PLAN INDEX

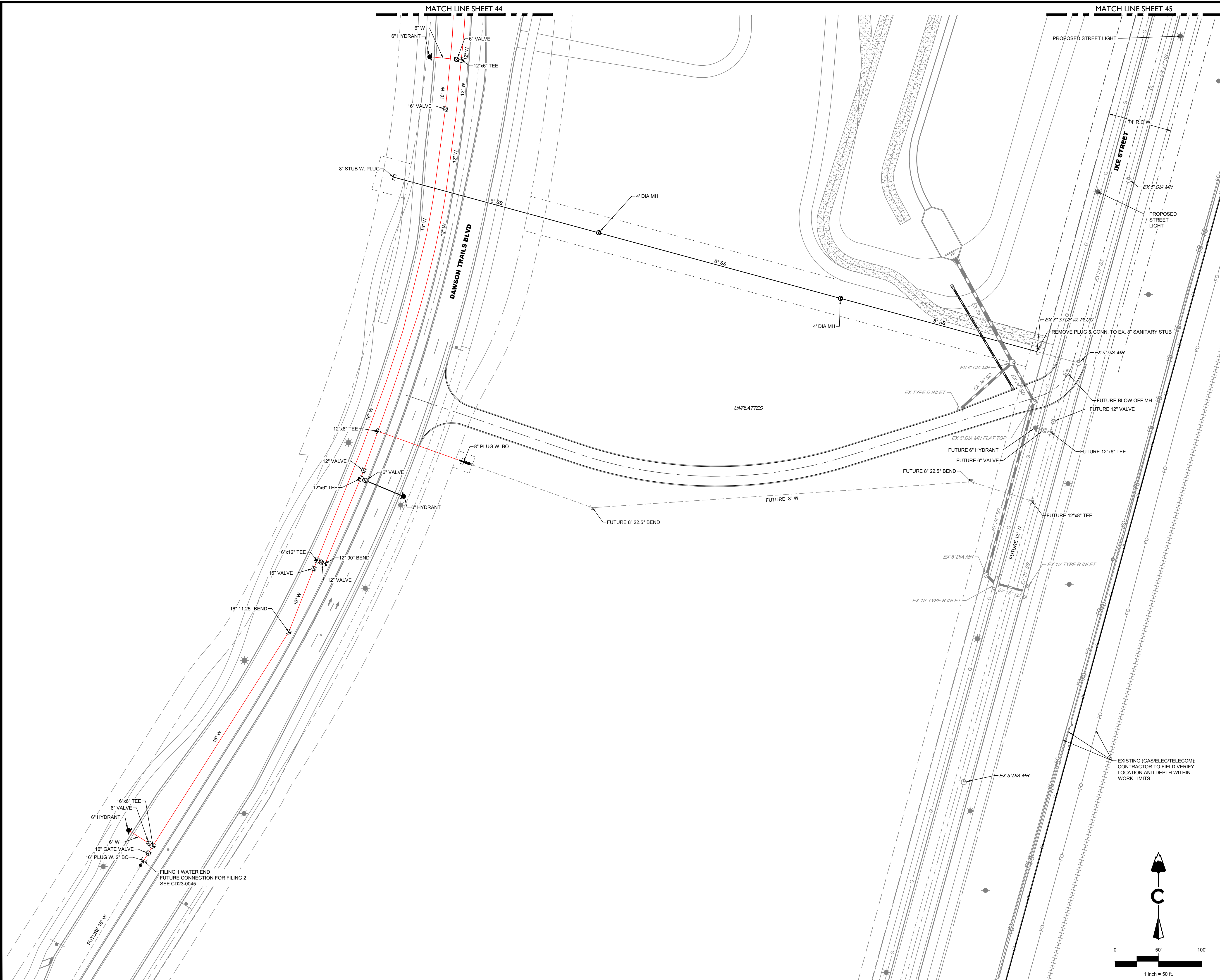
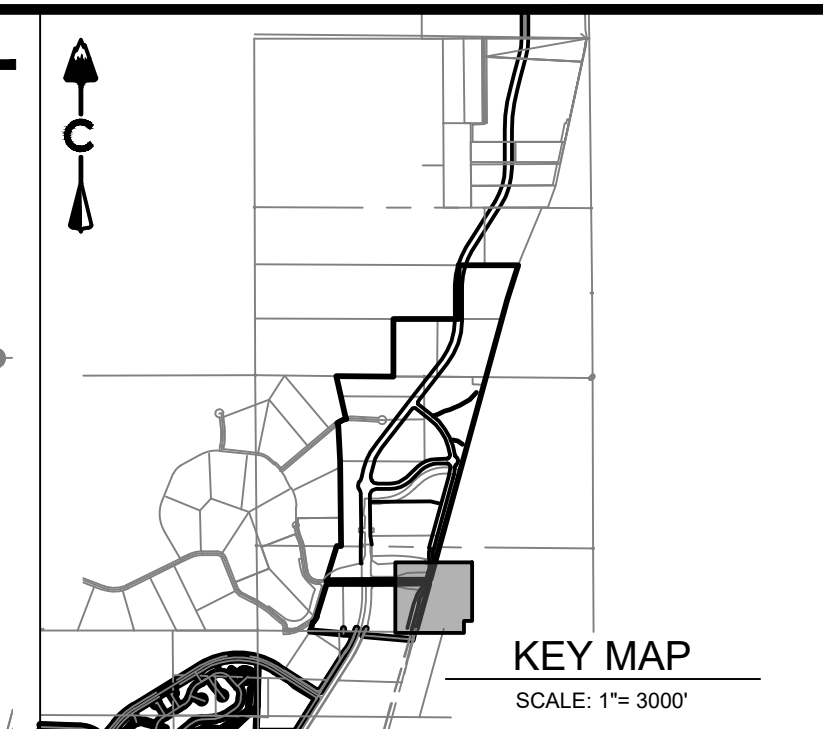


#	REVISION DESCRIPTION	DATE	BY
1	1ST SUBMITTAL	8/29/2023	BJG
2	2ND SUBMITTAL	7/13/2024	BJG
3	3RD SUBMITTAL	10/4/2024	BJG
4	4TH SUBMITTAL	12/20/2024	BJG
5	5TH SUBMITTAL	2/21/2025	BJG



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LAND DEVELOPMENT
ENERGY
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LEGEND

	EASEMENT
	RIGHT OF WAY (R.O.W.)
	CENTERLINE
	PROJECT BOUNDARY
	PROPOSED CURB & GUTTER
	PROPOSED IRRIGATION & STUB OUT
	PROPOSED STORM & STUB OUT
	PROPOSED SANITARY & STUB OUT
	PROPOSED BLUE ZONE WATER
	PROPOSED RED ZONE WATER
	EXISTING STORM & STUB OUT
	EXISTING SANITARY & STUB OUT
	EXISTING WATER & STUB OUT
	FUTURE IRRIGATION & STUB OUT
	FUTURE SANITARY & STUB OUT
	FUTURE STORM & STUB OUT
	FUTURE WATER & STUB OUT
	IRRIGATION SERVICE
	SANITARY SERVICE
	WATER SERVICE
	STREET LIGHT POLES
	SANITARY MANHOLES
	SANITARY CLEAN OUT
	WATER VALVES
	BEND AND THRUST BLOCK
	FIRE HYDRANTS
	WATERLINE REDUCER
	WATER STUB WITH BLOW OFF
	AIR RELEASE VALVE MH & VENT PIP
	STORM MANHOLES
	STORM INLETS
	FES, FOREBAY, & TRICKLE CHANNEL
	OUTLET STRUCTURE
	CRUSHER FINES
	MAINTENANCE ACCESS
	RIPRAP
	EXISTING ELECTRIC
	EXISTING TELEPHONE
	EXISTING FIBER OPTIC
	EXISTING GAS
	EXISTING OVER HEAD ELECTRIC
	STORM UNDERDRAIN
	100 YEAR FLOODPLAIN
	WETLAND
	FUTURE CURB & GUTTER

NOTES:

1. EXISTING VALVE BOXES, MANHOLE RIMS, DRAINAGE STRUCTURES, UTILITY ACCESS STRUCTURES, VAULT LIDS, ETC., SHALL BE BROUGHT TO THE FINISHED SURFACE AT THE TIME OF PAVEMENT PLACEMENT IN ACCORDANCE WITH TOWN STANDARD DETAILS
2. CONTRACTOR SHALL PROVIDE A MINIMUM SEVENTY TWO (72) HOURS NOTICE TO THE ON-SITE TCR CONSTRUCTION INSPECTOR, (720) 733-2200, PRIOR TO MAKING ANY ALTERATIONS OR CHANGES TO EXISTING WATER, SANITARY SEWER, AND/OR STORM SEWER SYSTEMS PROVIDED THAT THE UTILITY TIE-IN DOES NOT DISRUPT SERVICE TO EXISTING OR WATER CUSTOMERS. IF THE TIE-IN REQUIRES A LINE SHUTDOWN OR WILL DISRUPT UTILITY SERVICE, THEN CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS' NOTICE TO THE TCR CONSTRUCTION INSPECTOR TO ALLOW TIME FOR CR WATER TO PROVIDE WRITTEN NOTIFICATION TO EXISTING CUSTOMERS AND BY THE TIE-IN, TO THE TOWN. WRITTEN NOTICE MUST BE APPROVED BY CR WATER PRIOR TO COMMENCING WORK.

I HEREBY AFFIRM THAT THESE FINAL CONSTRUCTION PLANS WERE PREPARED UNDER MY DIRECT SUPERVISION, IN ACCORDANCE WITH ALL APPLICABLE TOWN OF CASTLE ROCK AND STATE OF COLORADO STANDARDS AND STATUTES, RESPECTIVELY; AND THAT I AM FULLY RESPONSIBLE FOR ALL DESIGN AND REVISIONS RELATIVE TO SAID PLANS.

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DATE OF DEVELOPMENT SERVICES APPROVAL.

APPROVED BY:

DEVELOPMENT SERVICES	DATE
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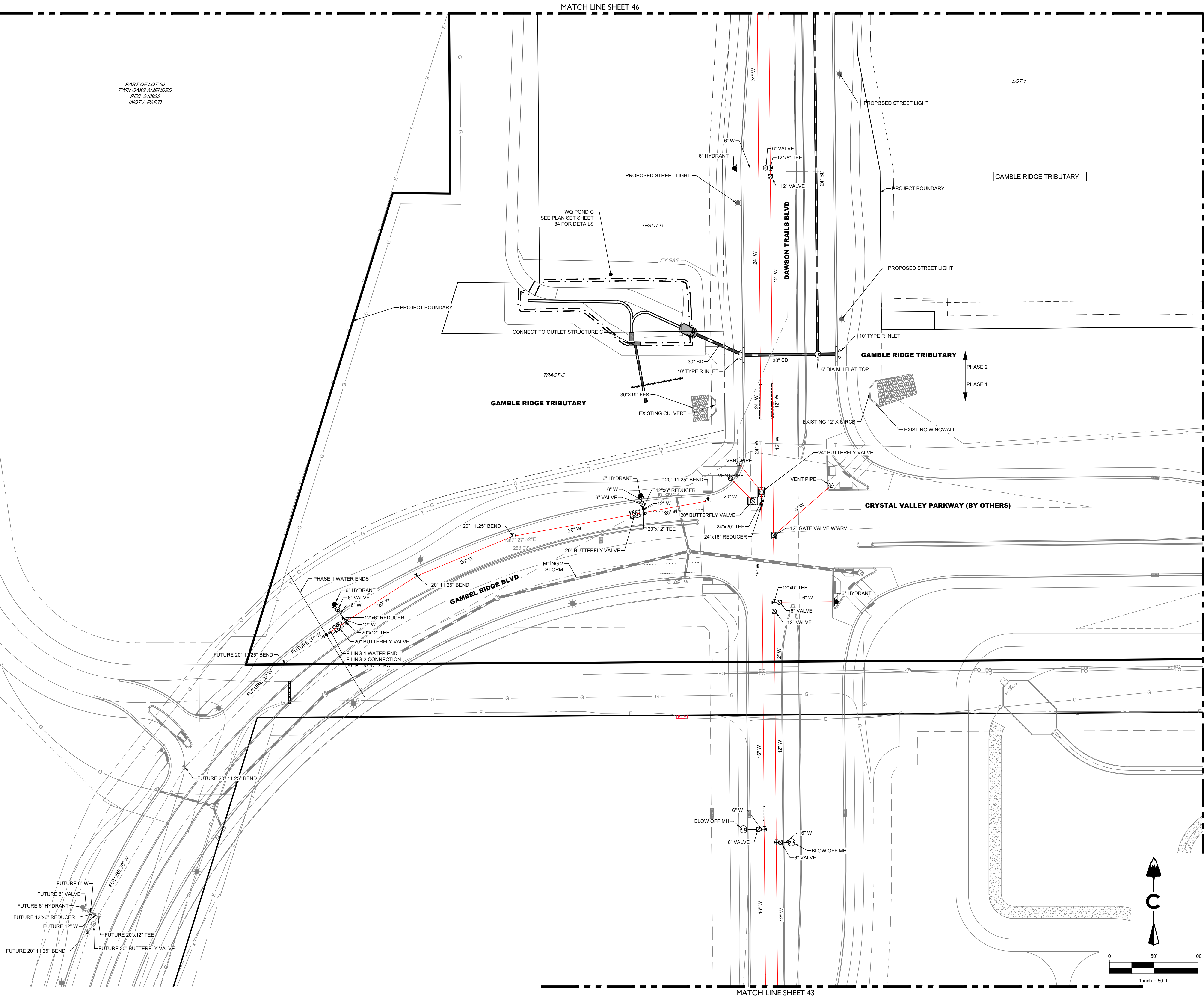
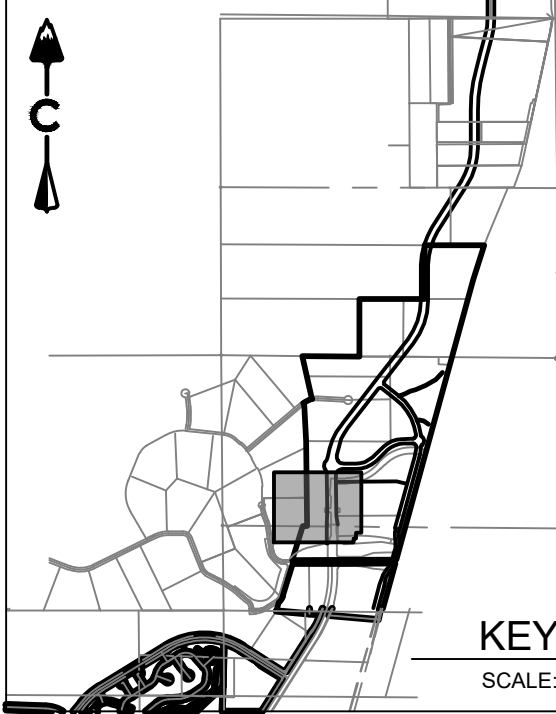
DAWSON TRAILS BLVD (SOUTH)-FILING 1 INFRASTRUCTURE
CASTLE ROCK, COLORADO
CONSTRUCTION DOCUMENTS
OVERALL UTILITY PLAN (1 OF 9)



DESIGNED BY: GKP
DRAWN BY: CT
CHECKED BY: BJG

JOB NO.
20-224

SHEET
43 OF 170



LEGEND	
	EASEMENT
	RIGHT OF WAY (R.O.W.)
	CENTERLINE
	PROJECT BOUNDARY
	PROPOSED CURB & GUTTER
	PROPOSED IRRIGATION & STUB OUT
	PROPOSED STORM & STUB OUT
	PROPOSED SANITARY & STUB OUT
	PROPOSED BLUE ZONE WATER
	PROPOSED RED ZONE WATER
	EXISTING STORM & STUB OUT
	EXISTING SANITARY & STUB OUT
	EXISTING WATER & STUB OUT
	FUTURE IRRIGATION & STUB OUT
	FUTURE SANITARY & STUB OUT
	FUTURE STORM & STUB OUT
	FUTURE WATER & STUB OUT
	IRRIGATION SERVICE
	SANITARY SERVICE
	WATER SERVICE
	EXISTING STREET LIGHT POLES
	PROPOSED STREET LIGHT POLES
	EXISTING SANITARY MANHOLES
	PROPOSED SANITARY MANHOLES
	EXISTING SANITARY CLEAN OUT
	PROPOSED SANITARY CLEAN OUT
	EXISTING WATER VALVES
	PROPOSED WATER VALVES
	EXISTING BEND AND THRUST BLOCK
	PROPOSED BEND AND THRUST BLOCK
	EXISTING FIRE HYDRANTS
	PROPOSED FIRE HYDRANTS
	EXISTING WATERLINE REDUCER
	PROPOSED WATERLINE REDUCER
	EXISTING WATER STUB WITH BLOW OFF
	PROPOSED WATER STUB WITH BLOW OFF
	EXISTING AIR RELEASE VALVE MH & VENT PIPE
	PROPOSED AIR RELEASE VALVE MH & VENT PIPE
	EXISTING STORM MANHOLES
	PROPOSED STORM MANHOLES
	EXISTING STORM INLETS
	PROPOSED STORM INLETS
	EXISTING FES, FOREBAY, & TRICKLE CHANNEL
	PROPOSED FES, FOREBAY, & TRICKLE CHANNEL
	EXISTING OUTLET STRUCTURE
	PROPOSED OUTLET STRUCTURE
	EXISTING CRUSHER FINES
	PROPOSED CRUSHER FINES
	EXISTING MAINTENANCE ACCESS
	PROPOSED MAINTENANCE ACCESS
	EXISTING RIPRAP
	PROPOSED RIPRAP
	EXISTING ELECTRIC
	PROPOSED ELECTRIC
	EXISTING TELEPHONE
	PROPOSED TELEPHONE
	EXISTING FIBER OPTIC
	PROPOSED FIBER OPTIC
	EXISTING GAS
	PROPOSED GAS
	EXISTING OVER HEAD ELECTRIC
	PROPOSED OVER HEAD ELECTRIC
	EXISTING STORM UNDERDRAIN
	PROPOSED STORM UNDERDRAIN
	EXISTING 100 YEAR FLOODPLAIN
	PROPOSED 100 YEAR FLOODPLAIN
	EXISTING WETLAND
	PROPOSED WETLAND
	EXISTING FUTURE CURB & GUTTER
	PROPOSED FUTURE CURB & GUTTER

- NOTES:**
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BYRON J. GLENN, P.E. STATE OF COLORADO # 31485	DATE
TOWN OF CASTLE ROCK APPROVAL PLANS ARE HEREBY APPROVED FOR ONE YEAR FROM DATE OF DEVELOPMENT SERVICES APPROVAL.	
APPROVED BY:	
DEVELOPMENT SERVICES	DATE

CORE CONSULTANTS, INC.
3473 S. BROADWAY
DENVER, CO 80113
303.703.4444
LIVEYOURCORE.COM

CORE

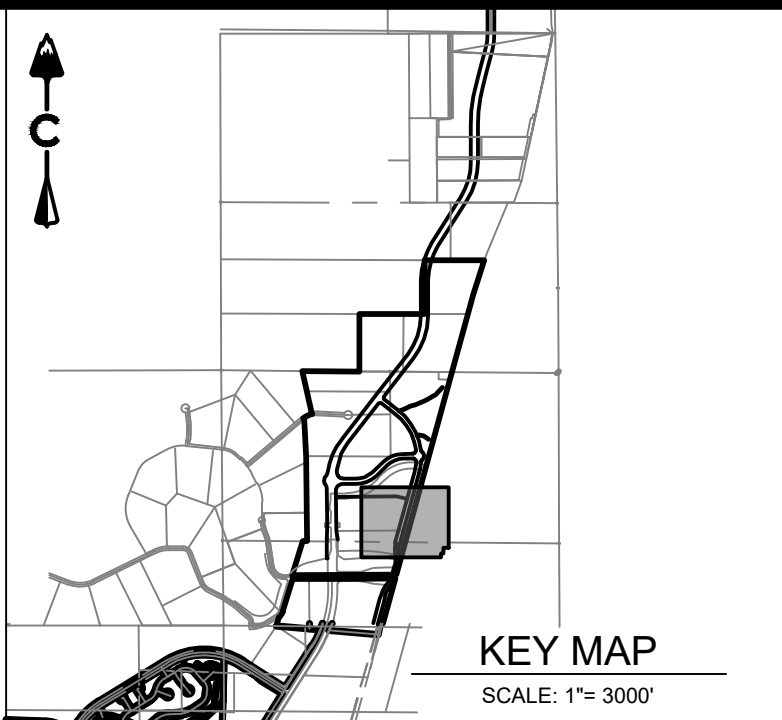
Know what's below.
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811

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DAWSON TRAILS BLVD (SOUTH)-FILING 1 INFRASTRUCTURE
CASTLE ROCK, COLORADO
CONSTRUCTION DOCUMENTS
OVERALL UTILITY PLAN (2 OF 9)

WESTSIDE

DESIGNED BY: GKP	DRAWN BY: CT
CHECKED BY: BJG	
JOB NO. 20-224	SHEET 44 OF 170



LEGEND

---	EASEMENT
---	RIGHT OF WAY (R.O.W.)
---	CENTERLINE
---	PROJECT BOUNDARY
---	PROPOSED CURB & GUTTER
---	PROPOSED IRRIGATION & STUB OUT
---	PROPOSED STORM & STUB OUT
---	PROPOSED SANITARY & STUB OUT
---	PROPOSED BLUE ZONE WATER
---	PROPOSED RED ZONE WATER
---	EXISTING STORM & STUB OUT
---	EXISTING SANITARY & STUB OUT
---	EXISTING WATER & STUB OUT
---	FUTURE IRRIGATION & STUB OUT
---	FUTURE SANITARY & STUB OUT
---	FUTURE STORM & STUB OUT
---	FUTURE WATER & STUB OUT
---	IRRIGATION SERVICE
---	SANITARY SERVICE
---	WATER SERVICE

EXISTING

---	STREET LIGHT POLES
---	SANITARY MANHOLES
---	SANITARY CLEAN OUT
---	WATER VALVES
---	BEND AND THRUST BLOCK
---	FIRE HYDRANTS
---	WATERLINE REDUCER
---	WATER STUB WITH BLOW OFF
---	AIR RELEASE VALVE MH & VENT PIPE
---	STORM MANHOLES
---	STORM INLETS
---	FES, FOREBAY, & TRICKLE CHANNEL
---	OUTLET STRUCTURE
---	CRUSHER FINES
---	MAINTENANCE ACCESS
---	RIPRAP

PROPOSED

---	EXISTING ELECTRIC
---	EXISTING TELEPHONE
---	EXISTING FIBER OPTIC
---	EXISTING GAS
---	EXISTING OVER HEAD ELECTRIC
---	STORM UNDERDRAIN
---	100 YEAR FLOODPLAIN
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- NOTES:**
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APPROVED BY:	
DESIGNED BY: GKP DRAWN BY: CT CHECKED BY: BJG	
DEVELOPMENT SERVICES	DATE

DAWSON TRAILS BLVD (SOUTH)- FILING 1 INFRASTRUCTURE

CASTLE ROCK, COLORADO

CONSTRUCTION DOCUMENTS

OVERALL UTILITY PLAN (3 OF 9)

CORE

CONSTRUCTION DOCUMENTS

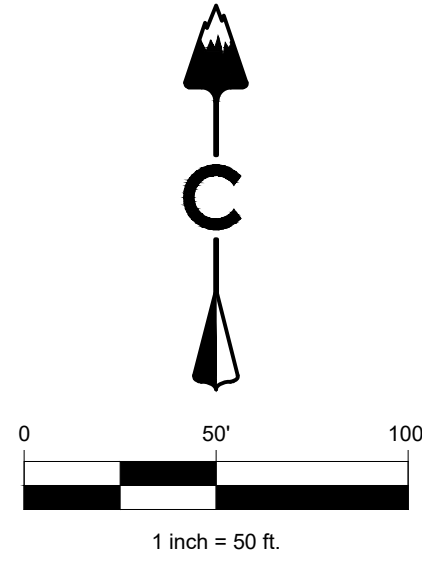
OVERALL UTILITY PLAN (3 OF 9)

LAND DEVELOPMENT
ENERGY
PUBLIC INFRASTRUCTURE

CORE CONSULTANTS, INC.
3473 S. BROADWAY
DENVER, CO 80113
303.703.4444
LIVEYOURCORE.COM

JOB NO.
20-224

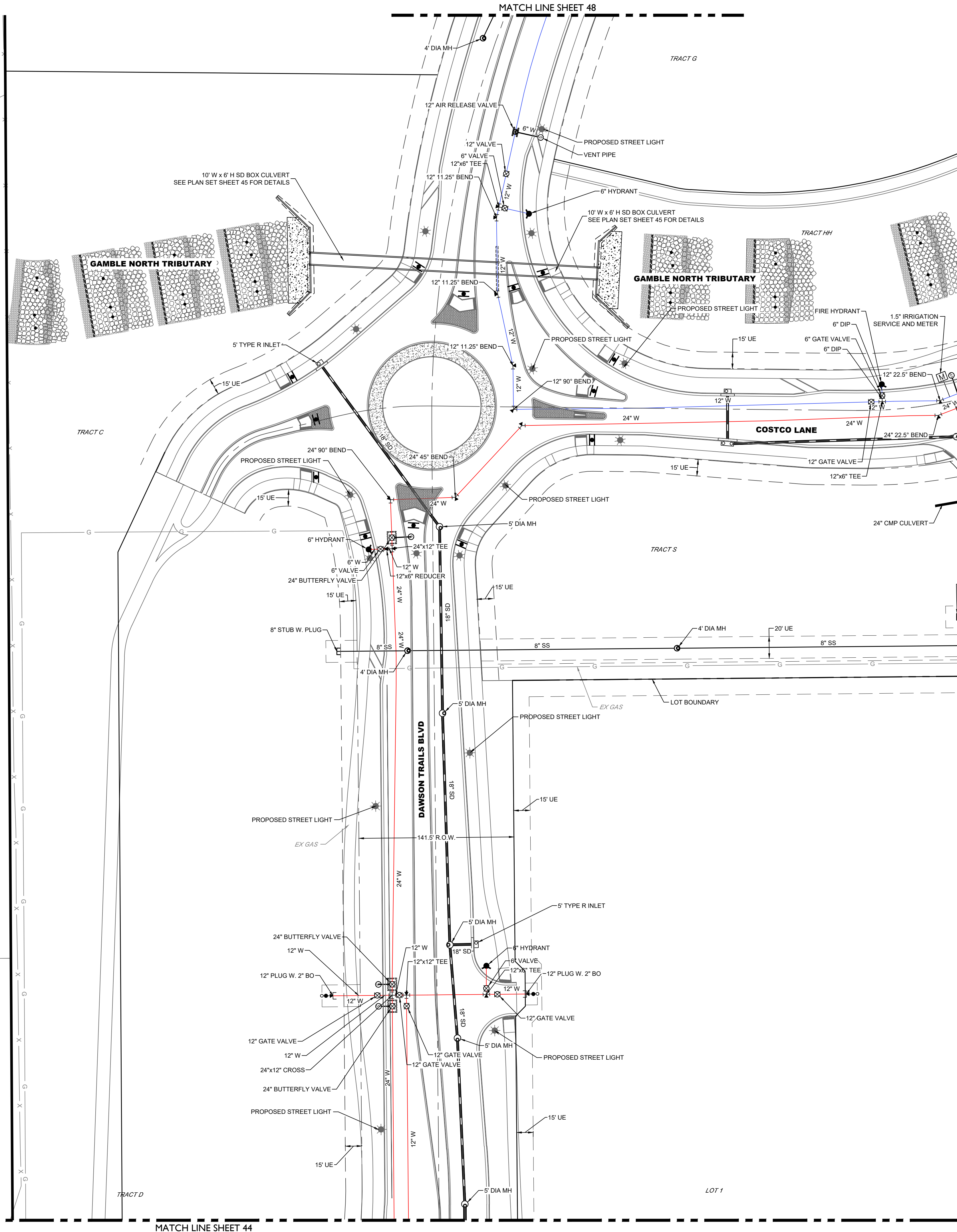
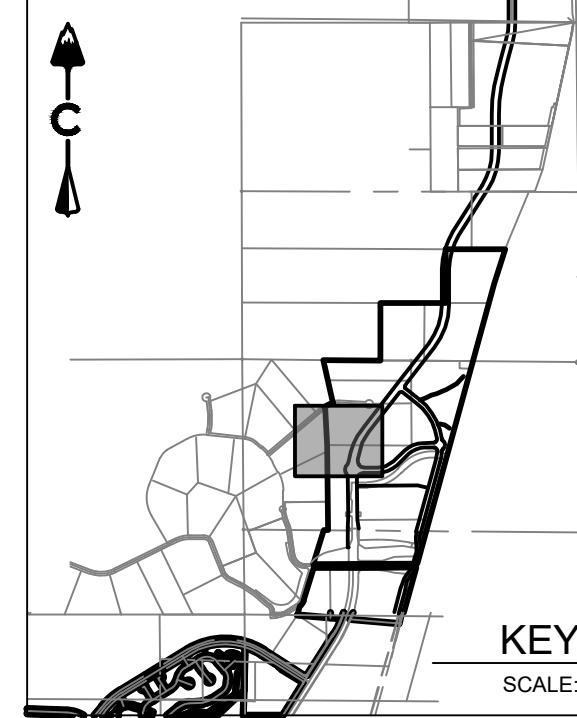
SHEET
45 OF 170



LOT 1
TWIN OAKS
REC. 161972
(NOT A PART)

LOT 1
TWIN OAKS
REC. 161972
(NOT A PART)

PART OF LOT 60
TWIN OAKS AMENDED
REC. 248925
(NOT A PART)



LEGEND	
	EASEMENT
	RIGHT OF WAY (R.O.W.)
	CENTERLINE
	PROJECT BOUNDARY
	PROPOSED CURB & GUTTER
	PROPOSED IRRIGATION & STUB OUT
	PROPOSED STORM & STUB OUT
	PROPOSED SANITARY & STUB OUT
	PROPOSED BLUE ZONE WATER
	PROPOSED RED ZONE WATER
	EXISTING STORM & STUB OUT
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	EXISTING WATER & STUB OUT
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	FUTURE SANITARY & STUB OUT
	FUTURE STORM & STUB OUT
	FUTURE WATER & STUB OUT
	IRRIGATION SERVICE
	SANITARY SERVICE
	WATER SERVICE
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	PROPOSED STREET LIGHT POLES
	EXISTING SANITARY MANHOLES
	PROPOSED SANITARY MANHOLES
	EXISTING SANITARY CLEAN OUT
	PROPOSED SANITARY CLEAN OUT
	EXISTING WATER VALVES
	PROPOSED WATER VALVES
	EXISTING BEND AND THRUST BLOCK
	PROPOSED BEND AND THRUST BLOCK
	EXISTING FIRE HYDRANTS
	PROPOSED FIRE HYDRANTS
	EXISTING WATERLINE REDUCER
	PROPOSED WATERLINE REDUCER
	EXISTING WATER STUB WITH BLOW OFF
	PROPOSED WATER STUB WITH BLOW OFF
	EXISTING AIR RELEASE VALVE MH & VENT PIPE
	PROPOSED AIR RELEASE VALVE MH & VENT PIPE
	EXISTING STORM MANHOLES
	PROPOSED STORM MANHOLES
	EXISTING STORM INLETS
	PROPOSED STORM INLETS
	EXISTING FES, FOREBAY, & TRICKLE CHANNEL
	PROPOSED FES, FOREBAY, & TRICKLE CHANNEL
	EXISTING OUTLET STRUCTURE
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	EXISTING ELECTRIC
	PROPOSED ELECTRIC
	EXISTING TELEPHONE
	PROPOSED TELEPHONE
	EXISTING FIBER OPTIC
	PROPOSED FIBER OPTIC
	EXISTING GAS
	PROPOSED GAS
	EXISTING OVER HEAD ELECTRIC
	PROPOSED OVER HEAD ELECTRIC
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34733 S. BROADWAY
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CORE

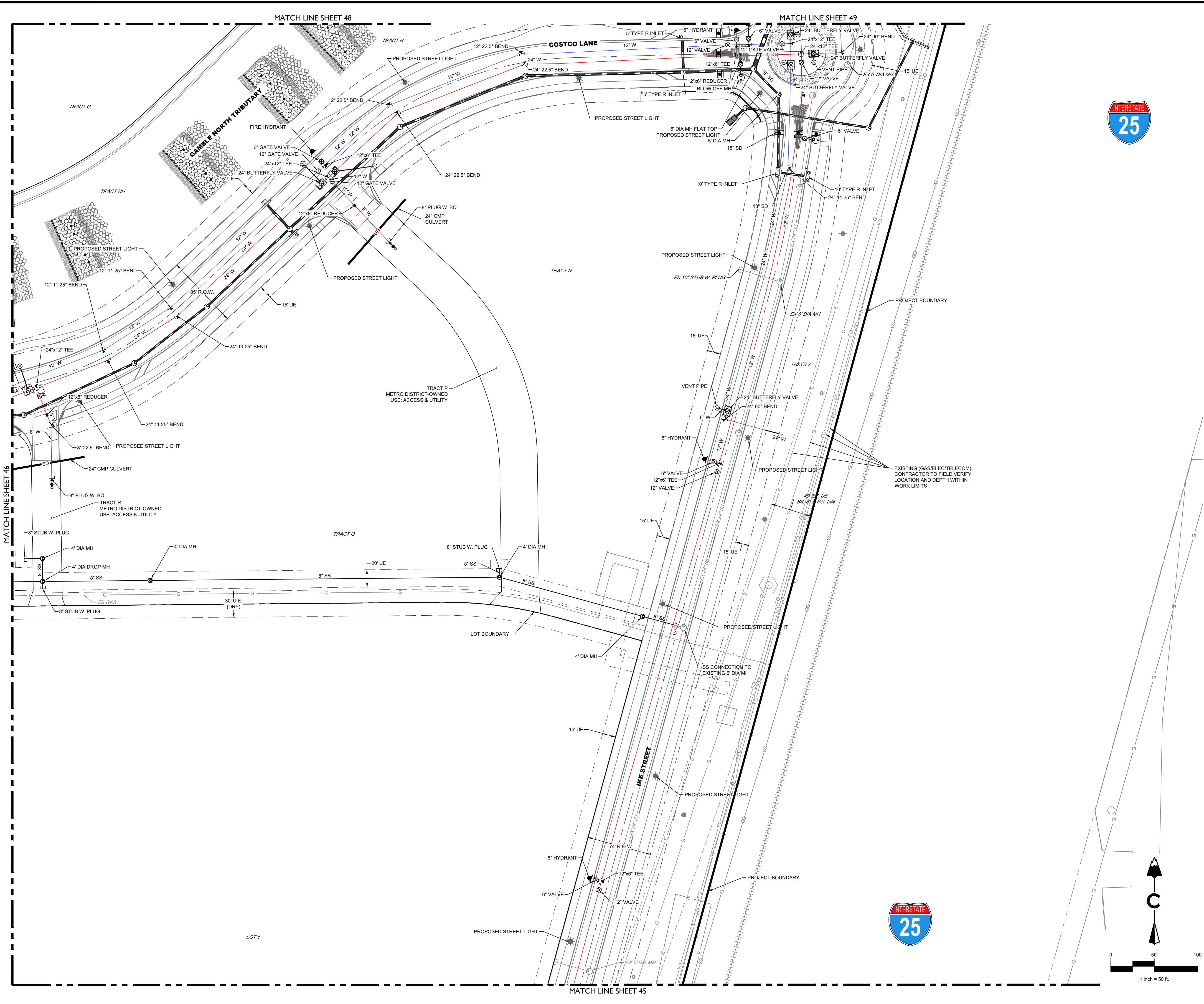
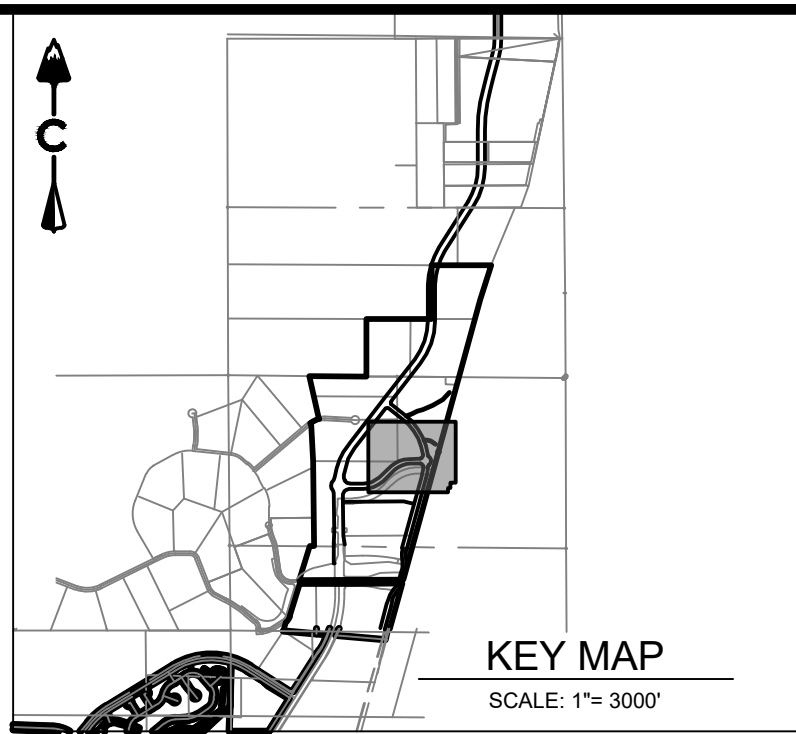
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DAWSON TRAILS BLVD (SOUTH)-FILING 1 INFRASTRUCTURE
CASTLE ROCK, COLORADO
CONSTRUCTION DOCUMENTS
OVERALL UTILITY PLAN (4 OF 9)

DESIGNED BY: GKP
DRAWN BY: CT
CHECKED BY: BJG

JOB NO.
20-224
SHEET
46 OF 170



LEGEND	
	EASEMENT
	RIGHT OF WAY (R.O.W.)
	CENTERLINE
	PROJECT BOUNDARY
	PROPOSED CURB & GUTTER
	PROPOSED IRRIGATION & STUB OUT
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	PROPOSED SANITARY & STUB OUT
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	EXISTING STORM & STUB OUT
	EXISTING SANITARY & STUB OUT
	EXISTING WATER & STUB OUT
	FUTURE IRRIGATION & STUB OUT
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	EXISTING SANITARY CLEAN OUT
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STATE OF COLORADO # 31485

TOWN OF CASTLE ROCK APPROVAL
PLANS ARE HEREBY APPROVED FOR ONE YEAR FROM DATE OF DEVELOPMENT SERVICES APPROVAL.

APPROVED BY: _____

DESIGNED BY: GKP
DRAWN BY: CT
CHECKED BY: BJG

JOB NO. 20-224
SHEET 47 OF 170

DEVELOPMENT SERVICES DATE

LAND DEVELOPMENT
ENERGY
PUBLIC INFRASTRUCTURE

CORE CONSULTANTS, INC.
2473 S. BROADWAY
DENVER, CO 80113
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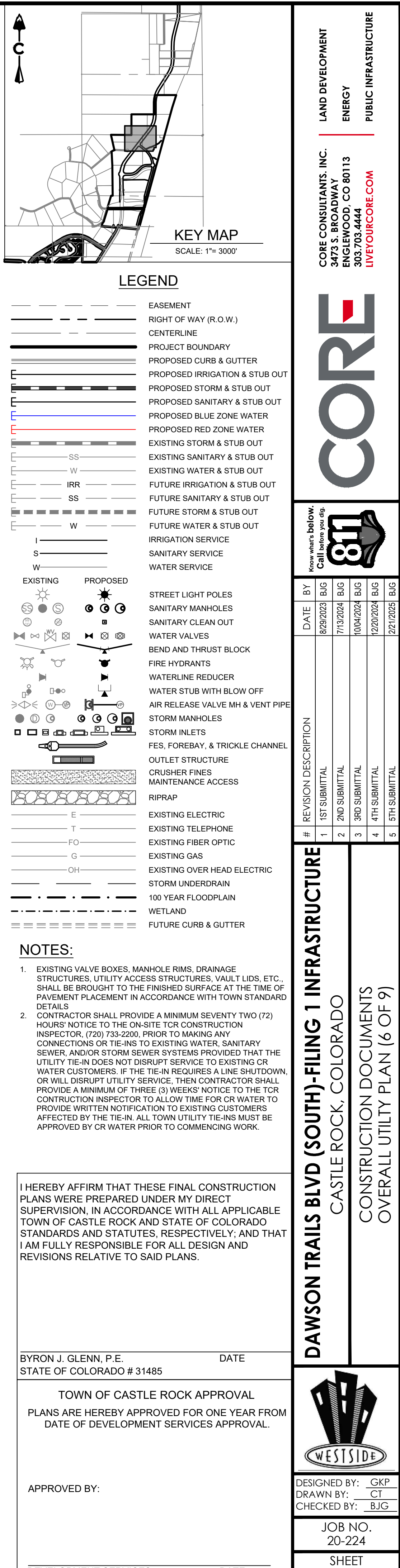
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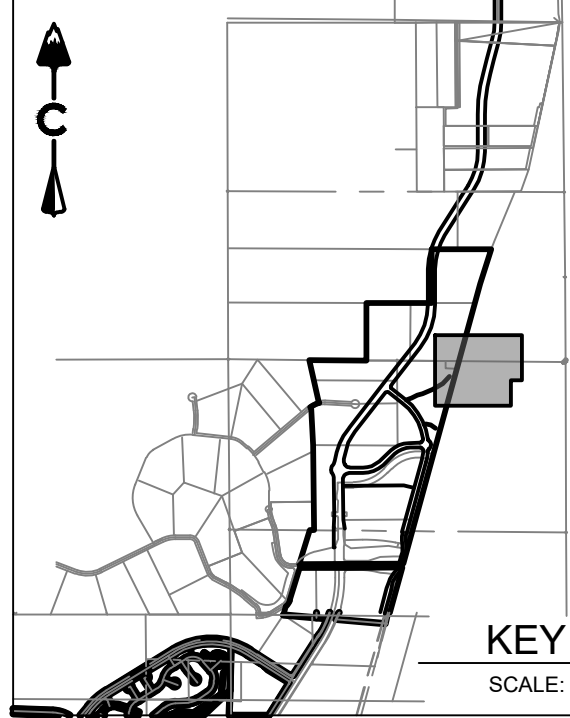
DAWSON TRAILS BLVD (SOUTH)- FILING 1 INFRASTRUCTURE
CASTLE ROCK, COLORADO
CONSTRUCTION DOCUMENTS
OVERALL UTILITY PLAN (5 OF 9)

WESTSIDE

DESIGNED BY: GKP
DRAWN BY: CT
CHECKED BY: BJG

JOB NO. 20-224
SHEET 47 OF 170





LEGEND

---	EASEMENT
---	RIGHT OF WAY (R.O.W.)
---	CENTERLINE
---	PROJECT BOUNDARY
---	PROPOSED CURB & GUTTER
---	PROPOSED IRRIGATION & STUB OUT
---	PROPOSED STORM & STUB OUT
---	PROPOSED SANITARY & STUB OUT
---	PROPOSED BLUE ZONE WATER
---	PROPOSED RED ZONE WATER
---	EXISTING STORM & STUB OUT
---	EXISTING SANITARY & STUB OUT
---	EXISTING WATER & STUB OUT
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---	FUTURE STORM & STUB OUT
---	FUTURE WATER & STUB OUT
---	IRRIGATION SERVICE
---	SANITARY SERVICE
---	WATER SERVICE
---	EXISTING
---	PROPOSED
---	STREET LIGHT POLES
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---	MAINTENANCE ACCESS
---	RIPRAP
---	EXISTING ELECTRIC
---	EXISTING TELEPHONE
---	EXISTING FIBER OPTIC
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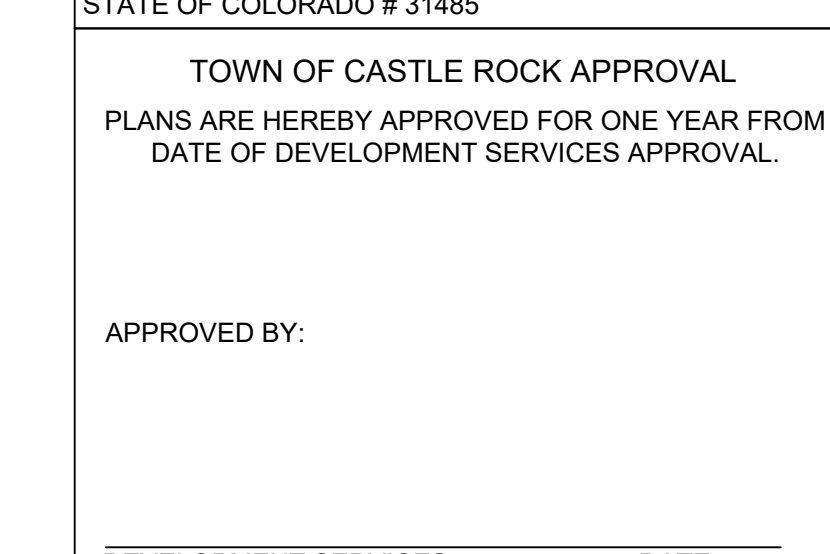
LAND DEVELOPMENT
ENERGY
PUBLIC INFRASTRUCTURE

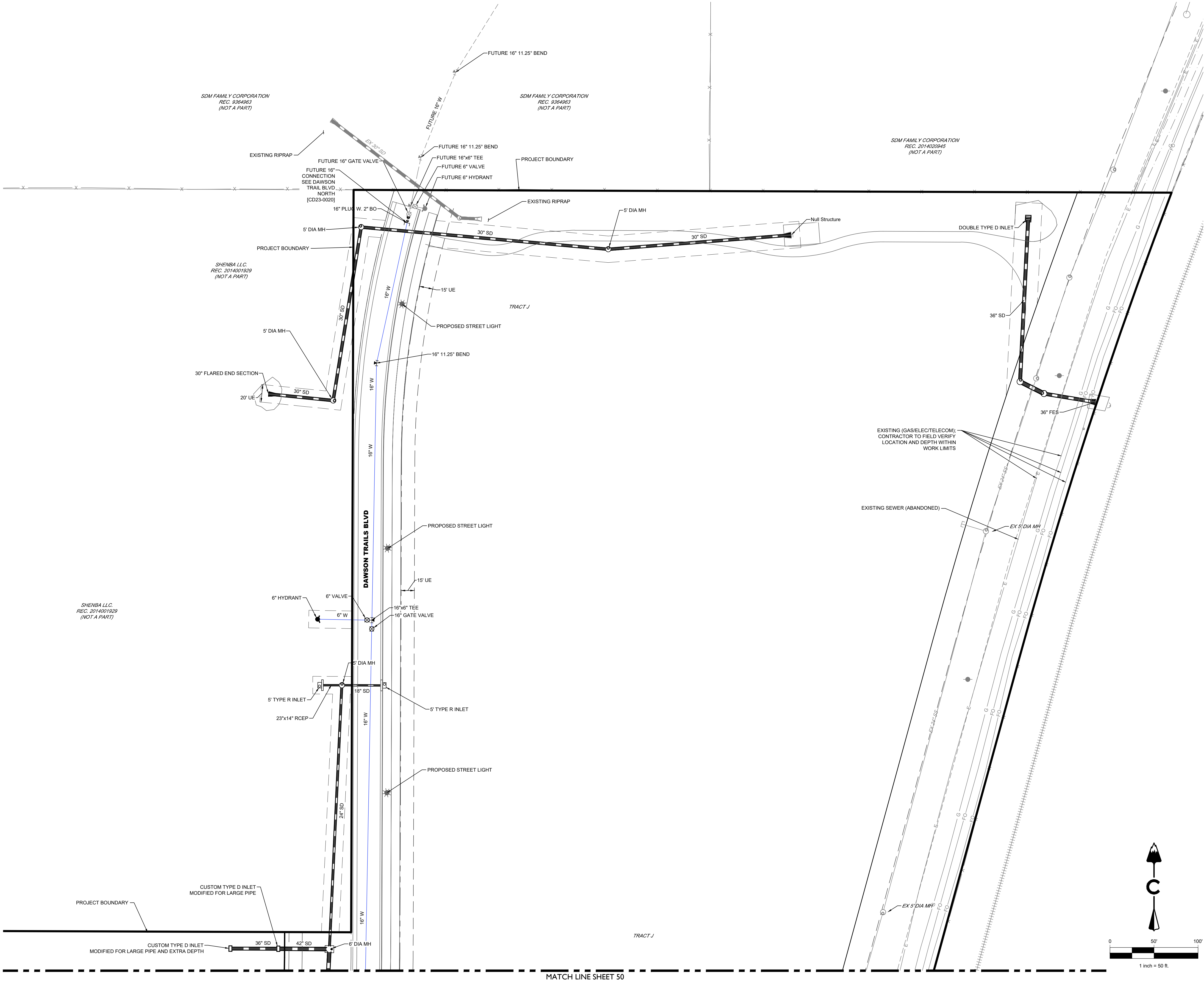
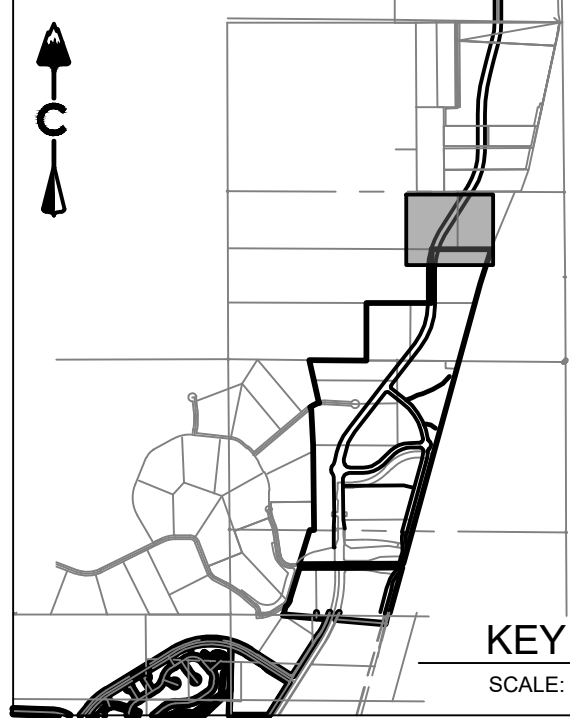
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DAWSON TRAILS BLVD (SOUTH)-FILING 1 INFRASTRUCTURE
CASTLE ROCK, COLORADO
CONSTRUCTION DOCUMENTS
OVERALL UTILITY PLAN (7 OF 9)

DESIGNED BY: GKP
DRAWN BY: CT
CHECKED BY: BJG

JOB NO.
20-224
SHEET
49 OF 170





LEGEND	
	EASEMENT
	RIGHT OF WAY (R.O.W.)
	CENTERLINE
	PROJECT BOUNDARY
	PROPOSED CURB & GUTTER
	PROPOSED IRRIGATION & STUB OUT
	PROPOSED STORM & STUB OUT
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TOWN OF CASTLE ROCK APPROVAL PLANS ARE HEREBY APPROVED FOR ONE YEAR FROM DATE OF DEVELOPMENT SERVICES APPROVAL.	
APPROVED BY:	
DEVELOPMENT SERVICES	DATE

CORE CONSULTANTS, INC.
3473 S. BROADWAY
DENVER, CO 80113
303.703.4444
LIVEYOURCORE.COM

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Know what's below.
Call before you dig.
811

#	REVISION DESCRIPTION	DATE	BY
1	1ST SUBMITTAL	8/29/2023	B.JG
2	2ND SUBMITTAL	7/13/2024	B.JG
3	3RD SUBMITTAL	10/4/2024	B.JG
4	4TH SUBMITTAL	12/20/2024	B.JG
5	5TH SUBMITTAL	2/21/2025	B.JG

DAWSON TRAILS BLVD (SOUTH)-FILING 1 INFRASTRUCTURE
CASTLE ROCK, COLORADO
CONSTRUCTION DOCUMENTS
OVERALL UTILITY PLAN (9 OF 9)

DESIGNED BY: GKP
DRAWN BY: CT
CHECKED BY: B.JG

JOB NO.
20-224
SHEET
51 OF 170