November 11, 2026

Town of Castle Rock Development Services

Dawson Trail Tract F Utility Conformance Letter
Town of Castle Rock Project No. SDP26-0010

This letter has been prepared in support of the Dawson Trail Tract F Project and provides utility information for the proposed development located within Tract F, Dawson Trails Filing No. 2. Tract F is located within Planning Area D of the approved Dawson Trails PDP. The water demands and wastewater flows for this project, combined with Filing 2, Amendment 2, are within the Planning Area D allocations in the approved Filing 2 Infrastructure Utility Report (CD23-0045), as shown in the Sanitary Sewer System and Water System sections of this letter. The purpose of this letter is to demonstrate that the planned improvements associated with this project conform to the Town of Castle Rock's current utility requirements, design criteria, and standard engineering practices.

The Dawson Trail Tract F project is a residential development situated west of Dawson Trail Boulevard in Castle Rock, Colorado. The proposed development will include 324 multifamily residential units, paved alleys, concrete walks and pans, and associated landscaped areas.

The site will be served by Town of Castle Rock water and sanitary sewer utilities. The proposed buildings will require a 6-inch fire service line, a 2-inch domestic water service, and a 6-inch sanitary service. The final meter size will be based on water supply fixture units at the time of building permitting. Sanitary sewer service will be provided by extending an 8-inch sanitary main from the existing 8-inch sanitary stub line located north of the site. A 6-inch sanitary service line will then connect the proposed buildings to the extended 8-inch sanitary main. Easements necessary for utilities will be provided at the time of either platting or at the time of final design/construction documents, in accordance with Town standards.

Sanitary Sewer System

The Site will be serviced by an existing 8" Sanitary line in Blanca Peak Parkway. The sewer calculations used in this letter were based on the following criteria:

- Demand per Dwelling Unit:
  - Multifamily Residential = 130 gpd/du
  - Single Family Residential = 200 gpd/du
- Peak Factor – PF = 3.65 * (ADF^-0.168), max. = 5.0

- Infiltration/inflow – I = 0.10 * Average Flow
- Peak Design Flow – PDF = (PF * ADF) + (Infiltration/Inflow)

The Master Utility Report named "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants, dated 2025 (CD23-0045), anticipated 300 MF & 167 SFD at J-4.06 (0.112 cfs) and 133 SFD at J-4.05 (0.041 cfs) for a combined total 300 MF & 300 SFD (0.153 cfs) to be shared amongst Dawson Trails and Filing 2, Amendment 2 (F2A2). Although anticipated flows have shifted from node J-4.05 to J-4.06, the total combined flows from both developments remain less than anticipated, as shown in the table below.

The adjacent development, Filing 2, Amendment 2, to the west incorporates 256 total units (166 single-family detached and 90 attached) designed to feed directly into nodes J-4.05 and J-4.06. This residential expansion builds upon the original utility study, which previously allocated 300 multi-family and 167 SFD units to node J-4.06 and 133 SFD to node J-4.05 for a portion of Planning Area D in the "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants, dated 2025 (Appendix D).

The calculated sanitary flow for our proposed site has been summarized in the table below in comparison to the Filing 2, Amendment 2 development and the anticipated development of a portion of Planning Area D in the "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants, dated 2025 (Appendix D). The table below analyzes J4.05 and J4.06 together and shows that F2A2 and Dawson Trails are under the expected capacity in the Master Report.

Development	***ACRES***	***AVG DAY* (GPD)**	***AVG DAY* (GPM)**	***PEAK DESIGN* (GPM)**	***PEAK DESIGN* (GPD)**	***AVG DAY* (cfs)**	***PEAK DESIGN* (cfs)**
Proposed Development	12.7	45,887	31.87	162.52	234,024	0.071	0.362
Filing 2, Amendment 2	56.0	44,900	31.18	159.02	228,990	0.069	0.354
EMK Anticipated Development	68.7	99,000	68.75	350.63	504,900	0.153	0.781
Excess Capacity	N/A	8,213	5.7	29.1	41,886	0.013	0.065

Based on the comparison in the table above, our proposed site is well within the expectations of the "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants, dated 2025.

The wastewater system was modeled using Autodesk Storm and Sanitary Analysis (SSA), shown in Appendix C. The runs are included in the Overall Sanitary Sewer Map in Appendix C.

The upstream reach serving only the clubhouse (P-16, SS MH-08 to SS MH-07) is laid at the 0.40% minimum slope and does not reach the 2.0 ft/s minimum velocity ([1.2] ft/s)

due to the low flow from a single building. This reach is the pinch point of the on-site system. Once flows combine at SS MH-07, all downstream reaches exceed 2.0 ft/s.

Water System

The existing 12-inch water main in Dawson Plaza & 16-inch water main in Dawson Trails Blvd will serve the site. The Site is within Castle Rocks' red water pressure zone. Water usage was estimated using the Town of Castle Rock's standard design criteria for average daily demand (ADD), maximum day demand (MDD), and peak hour demand (PHD).

- The Average Daily Demand is based on 260 gpd/du.
- The Maximum Day Demand was determined by applying a peak factor of 2.5.
- The Peak Hour Demand was calculated using a peak hour factor of 5.5.

The Master Utility Report named "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants, dated 2025 (CD23-0045), anticipated 517 SFE for the portion of Planning Area D on the south side of Blanca Peak Pkwy (523.28 gpm) and 148 SFE for the portion of Planning Area D on the north side of Blanca Peak Pkwy (149.80 gpm) for a combined total of 665 SFE (673.08 gpm) to be shared amongst Dawson Trails and Filing 2, Amendment 2 (F2A2). Although anticipated flows have shifted, the total combined flows from both developments remain less than anticipated, as shown in the table below.

The adjacent property, Filing 2, Amendment 2 development, incorporates a total of 256 units (166 single-family detached and 90 attached). This represents a portion of the originally anticipated single-family equivalents (SFE), which initially allocated a capacity of 665 SFE for the portions of Planning Area D north and south of Blanca Peak Parkway. The current plan ensures the existing infrastructure can comfortably accommodate the proposed residential site.

The calculated water demand for our proposed site has been summarized in the table below in comparison to the Filing 2, Amendment 2 development and the anticipated development of a portion of Planning Area D in the "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants, dated 2025 (Appendix D).

PARCEL	***USE***	***DU***	***AVG DAY (GPD/DU)***	***AVG DAY (GPD)***	***AVG DAY (GPM)***	***MAX DAY (MDD) (GPM)***	***PEAK HOUR (PHD) (GPM)***
Proposed Development	Residential	324	260	103,328	71.76	179.39	394.65
Filing 2, Amendment 2	Residential	256	265	67,840	47.11	117.78	259.11
EMK Anticipated Development	Residential	665	265	176,225	122.38	305.95	673.08
Excess Capacity				5,057	3.51	8.78	19.32

Based on the comparison in the table above, our proposed site is well within the expectations of the "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants, dated 2025.
On-site water storage must accommodate this emergency fire demand concurrently with the maximum daily domestic use. The peak fire demand requires a fire flow of 2,000 gpm sustained over a 2-hour duration. When combined with the estimated maximum daily domestic, the facility's water system must be capable of meeting both requirements. See table below:

MAX DAY (MDD)	MAX DAY (MDD)	Fire Flow	Fire Flow	Total Storage
(GPM)	(MG)	(GPM)	(MG)	(MG)
179.39	0.26	2,000	0.24	**0.50**

The six residential buildings are fully sprinklered (NFPA 13R, Type V-A construction) and require a fire flow of 1,500 gallons per minute (gpm); the non-sprinklered clubhouse and detached garages (Type V-B) require 2,000 gpm. The water system is designed around the most demanding scenario: sustaining a peak fire flow of 2,000 gpm for 2 hours. See table below:

Fire Flow							
Building	**Type**	**Total Area**	**Cons. Type**	**Sprinklers**	**Fire Flow**	**Fire Flow Reduction**	**Duration**
Building 1	Type 2	66,207	V-A	Yes	4750	1,500	2-hour
Building 2	Type 3	73,201	V-A	Yes	4750	1,500	2-hour
Building 3	Type 1	59,308	V-A	Yes	4500	1,500	2-hour
Building 4	Type 3	73,201	V-A	Yes	4750	1,500	2-hour
Building 5	Type 2	66,207	V-A	Yes	4750	1,500	2-hour
Building 6	Type 1	59,308	V-A	Yes	4500	1,500	2-hour
Clubhouse		6,763	V-B	No	2000		2-hour
Maintenance		693	V-B	No	1500		2-hour
Garage	Type 1	5,631	V-B	No	2000		2-hour
Garage	Type 2	5,284	V-B	No	2000		2-hour

See Fire Flow memo in Appendix E for more information regarding the Fire Flow calculations.

If you have any questions, please do not hesitate to call me at 720-854-9456

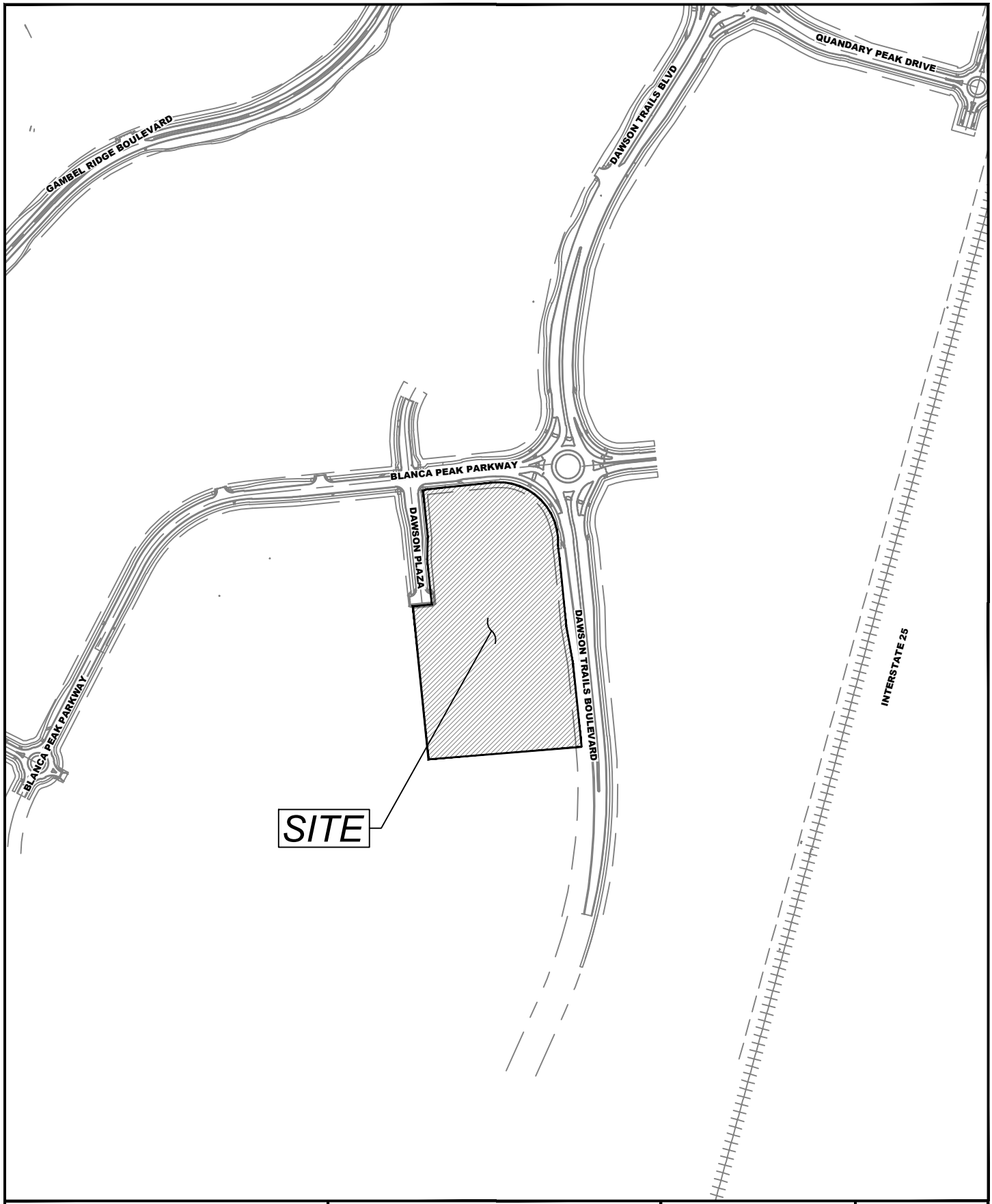
Sincerely,
Terracina Design



Martin Metsker, PE
Project Manager

APPENDIX A
GENERAL MAPS

Vicinity Map



terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

DAWSON TRAIL
VICINITY MAP

TOWN OF CASTLE ROCK DATE: 2/9/2026

0 500'

1" = 500'

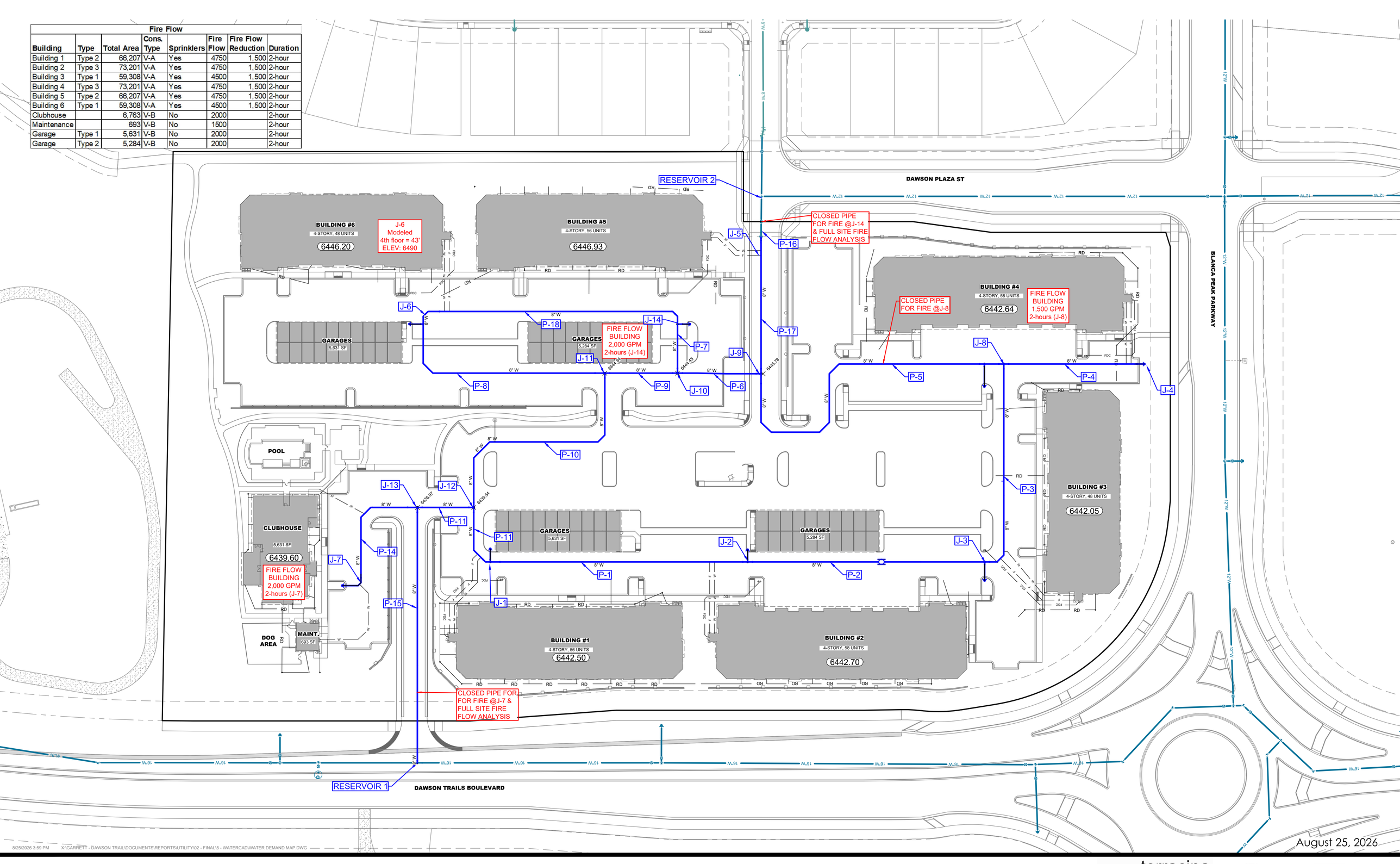
N

2/9/2026 12:55 PM ; X:\GARRETT - DAWSON TRAIL\DOCUMENTS\REPORTS\DRAINAGE\00 - PHASE 2\A1 - MAPS (VIC-FEMA-SOILS)\VICINITYMAP.DWG;

APPENDIX B
WATER DEMANDS

Water CAD Map
Water Demand Calculations
Water CAD Junction Table
Building Fire Flow Calculations
Water CAD Tables

Fire Flow							
Building	Type	Total Area	Cons. Type	Sprinklers	Fire Flow	Fire Flow Reduction	Duration
Building 1	Type 2	66,207	V-A	Yes	4750	1,500	2-hour
Building 2	Type 3	73,201	V-A	Yes	4750	1,500	2-hour
Building 3	Type 1	59,308	V-A	Yes	4500	1,500	2-hour
Building 4	Type 3	73,201	V-A	Yes	4750	1,500	2-hour
Building 5	Type 2	66,207	V-A	Yes	4750	1,500	2-hour
Building 6	Type 1	59,308	V-A	Yes	4500	1,500	2-hour
Clubhouse		6,763	V-B	No	2000		2-hour
Maintenance		693	V-B	No	1500		2-hour
Garage	Type 1	5,631	V-B	No	2000		2-hour
Garage	Type 2	5,284	V-B	No	2000		2-hour



8/25/2026 3:59 PM X:\GARRETT - DAWSON TRAIL\DOCUMENTS\REPORTS\UTILITY\02 - FINAL\5 - WATERCAD\WATER DEMAND MAP.DWG

August 25, 2026

DAWSON TRAILS

WATER CAD MAP

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 40' 80'

1" = 40'

Dawson Trail

Water and Sanitary Sewer Utlity Conformance Letter

Potable Water Demand Calcualtion

PARCEL NO.	*USE*	*AC or SF*	*DWELLING UNITS (DU)*	*ADD/UNIT (GPD/DU)*	*ADD/UNIT (GPD/ACorSF)* [2]	DEMANDS *AVG DAY (GPD)*	*AVG DAY (GPM)*	*MAX DAY (MDD) (GPM)*	*PEAK HOUR (PHD) (GPM)* [3]
Proposed Development									
a) Buildings									
Building 1	Multi-Family	0.84	56	260	3750	17,723	12.31	30.77	67.69
Building 2	Multi-Family	0.84	58	260	3750	18,243	12.67	31.67	69.68
Building 3	Multi-Family	0.84	48	260	3750	15,643	10.86	27.16	59.75
Building 4	Multi-Family	0.84	58	260	3750	18,243	12.67	31.67	69.68
Building 5	Multi-Family	0.84	56	260	3750	17,723	12.31	30.77	67.69
Building 6	Multi-Family	0.84	48	260	3750	15,643	10.86	27.16	59.75
Gym/Office/Pool/Dog		5631.0	N/A		0.02	113	0.08	0.20	0.43
c) Sub-Total (a+b)			**324**			**103,328**	**71.76**	**179.39**	**394.65**
Filing 2, Amendment 2									
d) Filing 2, Amendment 2	Residential		256	265*	N/A	67,840	47.11	117.78	259.11
e) Sub-Total (d)			**256**		N/A	**67,840**	**47.11**	**117.78**	**259.11**
*from "Final Utility Report for Dawson Trails - Filing 2 Amendment 2" by EMK Consultants									
Anticipated Development									
d) Anticipated Development	Residential		665	265*	N/A	176,225	122.38	305.95	673.08
e) Sub-Total (d)			**665**		N/A	**176,225**	**122.38**	**305.95**	**673.08**
*from "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants									
f) Remaining Demand (e-c)						**5,057**	**3.51**	**8.78**	**19.32**

PEAKING FACTOR	
MAX DAY (MDD)	**2.5**
PEAK HOUR (PHD)	**5.5**

Assumptions:

(1) Multifamily Land Use (demands based on TOCR standards: 400 gpd/du x 0.65/dwelling unit =260 gpd/du

(2) Irrigation Demand based on 3,750 gpd/irrigated acre per TOCR Water System Design 2018 Criteria Manual

(3) Peaking Hour Demands (PHD) determined per TOCR Water section 4.4.1.2 equation: PHD = Domestic ADD x PHF

- Tank Elevations used from Master Filing 2 Red Tank
- Peaking factor of 2.5 was used to obtain MDD
- Peaking factor of 5.5 was used to obtain PHD
- Total irrigated area for the site divided evenly among the 6 buildings

WaterCAD Table

Junction	Notes	Average Day	Max Day	Peak Hour
1	Building 1	12.31	30.77	67.69
2	Building 2	12.67	31.67	69.68
3	Building 3	10.86	27.16	59.75
4	Building 4	12.67	31.67	69.68
5	Building 5	12.31	30.77	67.69
6	Building 6	10.86	27.16	59.75
7	Clubhouse	0.08	0.20	0.43
Total		71.76	179.39	394.65

Fire Flow								
Building	**Type**	**Total Area**	**Cons. Type**	**Sprinklers**	**Fire Flow**	**Fire Flow Reduction**	**Duration**	**Junction**
Building 1	Type 2	66,207	V-A	Yes	4750	1,500	2-hour	NA
Building 2	Type 3	73,201	V-A	Yes	4750	1,500	2-hour	NA
Building 3	Type 1	59,308	V-A	Yes	4500	1,500	2-hour	NA
Building 4	Type 3	73,201	V-A	Yes	4750	1,500	2-hour	J-8
Building 5	Type 2	66,207	V-A	Yes	4750	1,500	2-hour	NA
Building 6	Type 1	59,308	V-A	Yes	4500	1,500	2-hour	NA
Clubhouse		6,763	V-B	No	2000		2-hour	J-7
Maintenance		693	V-B	No	1500		2-hour	NA
Garage	Type 1	5,631	V-B	No	2000		2-hour	J6 J14
Garage	Type 2	5,284	V-B	No	2000		2-hour	J1-J3

Dawson Trails

100% Static Condition

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,680.00	0.00	6,680.00
R-2	6,680.00	0.00	6,680.00

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia (in)	Mat.	Hazen	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
P-1	264	J-1	J-2	8.0	PVC	120	0.00	0.00	0.000	Open
P-2	263	J-2	J-3	8.0	PVC	120	0.00	0.00	0.000	Open
P-3	203	J-3	J-8	8.0	PVC	120	0.00	0.00	0.000	Open
P-4	142	J-8	J-4	8.0	PVC	120	0.00	0.00	0.000	Open
P-5	253	J-8	J-9	8.0	PVC	120	0.00	0.00	0.000	Open
P-6	86	J-9	J-10	8.0	PVC	120	0.00	0.00	0.000	Open
P-7	71	J-10	J-14	8.0	PVC	120	0.00	0.00	0.000	Open
P-8	247	J-6	J-11	8.0	PVC	120	0.00	0.00	0.000	Open
P-9	72	J-11	J-10	8.0	PVC	120	0.00	0.00	0.000	Open
P-10	260	J-11	J-12	8.0	PVC	120	0.00	0.00	0.000	Open
P-11	69	J-12	J-1	8.0	PVC	120	0.00	0.00	0.000	Open
P-12	55	J-12	J-13	8.0	PVC	120	0.00	0.00	0.000	Open
P-14	121	J-13	J-7	8.0	PVC	120	0.00	0.00	0.000	Open
P-15	265	J-13	R-1	8.0	PVC	120	0.00	0.00	0.000	Open
P-16	88	R-2	J-5	8.0	PVC	120	0.00	0.00	0.000	Open
P-17	96	J-5	J-9	8.0	PVC	120	0.00	0.00	0.000	Open
P-18	245	J-14	J-6	8.0	PVC	120	0.00	0.00	0.000	Open

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Notes
J-1	6,442.53	0.00	6,680.00	102.74	B1 Demands & FF
J-2	6,442.70	0.00	6,680.00	102.67	B2 Demands & FF
J-3	6,442.05	0.00	6,680.00	102.95	B3 Demands & FF
J-4	6,442.64	0.00	6,680.00	102.69	B4 Demands
J-5	6,446.93	0.00	6,680.00	100.84	B5 Demands
J-6	6,490.00	0.00	6,680.00	82.20	B6 Demands & FF / Modeled at 4th floor
J-7	6,439.60	0.00	6,680.00	104.01	Clubhouse Demands
J-8	6,442.64	0.00	6,680.00	102.69	B4 Fire Flow
J-9	6,445.78	0.00	6,680.00	101.34	
J-10	6,444.53	0.00	6,680.00	101.88	
J-11	6,444.86	0.00	6,680.00	101.73	
J-12	6,439.54	0.00	6,680.00	104.04	
J-13	6,436.89	0.00	6,680.00	105.18	
J-14	6,446.93	0.00	6,680.00	101.71	B5 Fire Flow

Dawson Trails
20% Static

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,662.00	0.00	6,662.00
R-2	6,662.00	0.00	6,662.00

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia (in)	Mat.	Hazen	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
P-1	264	J-1	J-2	8.0	PVC	120	0.00	0.00	0.000	Open
P-2	263	J-2	J-3	8.0	PVC	120	0.00	0.00	0.000	Open
P-3	203	J-3	J-8	8.0	PVC	120	0.00	0.00	0.000	Open
P-4	142	J-8	J-4	8.0	PVC	120	0.00	0.00	0.000	Open
P-5	253	J-8	J-9	8.0	PVC	120	0.00	0.00	0.000	Open
P-6	86	J-9	J-10	8.0	PVC	120	0.00	0.00	0.000	Open
P-7	71	J-10	J-14	8.0	PVC	120	0.00	0.00	0.000	Open
P-8	247	J-6	J-11	8.0	PVC	120	0.00	0.00	0.000	Open
P-9	72	J-11	J-10	8.0	PVC	120	0.00	0.00	0.000	Open
P-10	260	J-11	J-12	8.0	PVC	120	0.00	0.00	0.000	Open
P-11	69	J-12	J-1	8.0	PVC	120	0.00	0.00	0.000	Open
P-12	55	J-12	J-13	8.0	PVC	120	0.00	0.00	0.000	Open
P-14	121	J-13	J-7	8.0	PVC	120	0.00	0.00	0.000	Open
P-15	265	J-13	R-1	8.0	PVC	120	0.00	0.00	0.000	Open
P-16	88	R-2	J-5	8.0	PVC	120	0.00	0.00	0.000	Open
P-17	96	J-5	J-9	8.0	PVC	120	0.00	0.00	0.000	Open
P-18	245	J-14	J-6	8.0	PVC	120	0.00	0.00	0.000	Open

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Notes
J-1	6,442.53	0.00	6,662.00	94.95	B1 Demands & FF
J-2	6,442.70	0.00	6,662.00	94.88	B2 Demands & FF
J-3	6,442.05	0.00	6,662.00	95.16	B3 Demands & FF
J-4	6,442.64	0.00	6,662.00	94.91	B4 Demands
J-5	6,446.93	0.00	6,662.00	93.05	B5 Demands
J-6	6,490.00	0.00	6,662.00	74.42	B6 Demands & FF / Modeled at 4th floor
J-7	6,439.60	0.00	6,662.00	96.22	Clubhouse Demands
J-8	6,442.64	0.00	6,662.00	94.91	B4 Fire Flow
J-9	6,445.78	0.00	6,662.00	93.55	
J-10	6,444.53	0.00	6,662.00	94.09	
J-11	6,444.86	0.00	6,662.00	93.95	
J-12	6,439.54	0.00	6,662.00	96.25	
J-13	6,436.89	0.00	6,662.00	97.39	
J-14	6,446.93	0.00	6,662.00	93.93	B5 Fire Flow

Dawson Trails

Max Daily Demand (MDD) +Irrigation

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,662.00	71.58	6,662.00
R-2	6,662.00	107.82	6,662.00

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia (in)	Mat.	Hazen	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
P-1	264	J-1	J-2	8.0	PVC	120	43.50	0.28	0.000	Open
P-2	263	J-2	J-3	8.0	PVC	120	11.83	0.08	0.000	Open
P-3	203	J-3	J-8	8.0	PVC	120	-15.33	0.10	0.000	Open
P-4	142	J-8	J-4	8.0	PVC	120	31.67	0.20	0.000	Open
P-5	253	J-8	J-9	8.0	PVC	120	-47.00	0.30	0.000	Open
P-6	86	J-9	J-10	8.0	PVC	120	30.05	0.09	0.000	Open
P-7	71	J-10	J-14	8.0	PVC	120	13.68	0.04	0.000	Open
P-8	247	J-6	J-11	8.0	PVC	120	-13.48	0.09	0.000	Open
P-9	72	J-11	J-10	8.0	PVC	120	-16.38	0.05	0.000	Open
P-10	260	J-11	J-12	8.0	PVC	120	2.89	0.01	0.000	Open
P-11	69	J-12	J-1	8.0	PVC	120	74.27	0.21	0.000	Open
P-12	55	J-12	J-13	8.0	PVC	120	-71.38	0.20	0.000	Open
P-14	121	J-13	J-7	8.0	PVC	120	0.20	0.00	0.000	Open
P-15	265	J-13	R-1	8.0	PVC	120	-71.58	0.20	0.000	Open
P-16	88	R-2	J-5	8.0	PVC	120	107.82	0.31	0.000	Open
P-17	96	J-5	J-9	8.0	PVC	120	77.05	0.22	0.000	Open
P-18	245	J-14	J-6	8.0	PVC	120	13.68	0.09	0.000	Open

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Notes
J-1	6,442.53	30.77	6,661.99	94.95	B1 Demands & FF
J-2	6,442.70	31.67	6,661.97	94.87	B2 Demands & FF
J-3	6,442.05	27.16	6,661.97	95.15	B3 Demands & FF
J-4	6,442.64	31.67	6,661.97	94.89	B4 Demands
J-5	6,446.93	30.77	6,662.00	93.05	B5 Demands
J-6	6,490.00	27.16	6,661.99	74.41	B6 Demands & FF / Modeled at 4th floor
J-7	6,439.60	0.20	6,661.99	96.22	Clubhouse Demands
J-8	6,442.64	0.00	6,661.97	94.90	B4 Fire Flow
J-9	6,445.78	0.00	6,661.99	93.55	
J-10	6,444.53	0.00	6,661.99	94.09	
J-11	6,444.86	0.00	6,661.99	93.94	
J-12	6,439.54	0.00	6,661.99	96.24	
J-13	6,436.89	0.00	6,661.99	97.39	
J-14	6,446.93	0.00	6,661.99	93.05	B5 Fire Flow

Dawson Trails

Peak Hour Demand (PHD)

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,662.00	230.43	6,662.00
R-2	6,662.00	164.24	6,662.00

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia (in)	Mat.	Hazen	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
P-1	264	J-1	J-2	8.0	PVC	120	104.13	0.66	0.000	Open
P-2	263	J-2	J-3	8.0	PVC	120	34.45	0.22	0.000	Open
P-3	203	J-3	J-8	8.0	PVC	120	-25.30	0.16	0.000	Open
P-4	142	J-8	J-4	8.0	PVC	120	69.68	0.44	0.000	Open
P-5	253	J-8	J-9	8.0	PVC	120	-94.98	0.61	0.000	Open
P-6	86	J-9	J-10	8.0	PVC	120	1.57	0.01	0.000	Open
P-7	71	J-10	J-14	8.0	PVC	120	27.82	0.08	0.000	Open
P-8	247	J-6	J-11	8.0	PVC	120	-31.93	0.20	0.000	Open
P-9	72	J-11	J-10	8.0	PVC	120	26.25	0.17	0.000	Open
P-10	260	J-11	J-12	8.0	PVC	120	-58.18	0.37	0.000	Open
P-11	69	J-12	J-1	8.0	PVC	120	171.82	0.49	0.000	Open
P-12	55	J-12	J-13	8.0	PVC	120	-230.00	0.65	0.000	Open
P-14	121	J-13	J-7	8.0	PVC	120	0.43	0.00	0.000	Open
P-15	265	J-13	R-1	8.0	PVC	120	-230.43	0.65	0.000	Open
P-16	88	R-2	J-5	8.0	PVC	120	164.24	1.05	0.001	Open
P-17	96	J-5	J-9	8.0	PVC	120	96.55	0.62	0.000	Open
P-18	245	J-14	J-6	8.0	PVC	120	27.82	0.18	0.000	Open

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Notes
J-1	6,442.53	67.69	6,661.93	94.92	B1 Demands & FF
J-2	6,442.70	69.68	6,661.85	94.81	B2 Demands & FF
J-3	6,442.05	59.75	6,661.83	95.09	B3 Demands & FF
J-4	6,442.64	69.68	6,661.82	94.83	B4 Demands
J-5	6,446.93	67.69	6,661.93	93.02	B5 Demands
J-6	6,490.00	59.75	6,661.90	74.37	B6 Demands & FF / Modeled at 4th floor
J-7	6,439.60	0.43	6,661.95	96.20	Clubhouse Demands
J-8	6,442.64	0.00	6,661.84	94.84	B4 Fire Flow
J-9	6,445.78	0.00	6,661.91	93.51	
J-10	6,444.53	0.00	6,661.91	94.05	
J-11	6,444.86	0.00	6,661.91	93.91	
J-12	6,439.54	0.00	6,661.94	96.22	
J-13	6,436.89	0.00	6,661.95	97.37	
J-14	6,446.93	0.00	6,661.91	93.01	B5 Fire Flow

Dawson Trails

Fire Flow at J-14 + MDD + P-16 Closed

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,662.00	2,179.40	6,662.00
R-2	6,662.00	0.00	6,662.00

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia (in)	Mat.	Hazen	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
P-1	264	J-1	J-2	8.0	PVC	120	720.98	4.60	0.012	Open
P-2	263	J-2	J-3	8.0	PVC	120	689.31	4.40	0.011	Open
P-3	203	J-3	J-8	8.0	PVC	120	662.15	4.23	0.010	Open
P-4	142	J-8	J-4	8.0	PVC	120	31.67	0.20	0.000	Open
P-5	253	J-8	J-9	8.0	PVC	120	630.48	4.02	0.009	Open
P-6	86	J-9	J-10	8.0	PVC	120	599.71	3.83	0.008	Open
P-7	71	J-10	J-14	8.0	PVC	120	1,422.40	9.08	0.041	Open
P-8	247	J-6	J-11	8.0	PVC	120	-604.76	3.86	0.008	Open
P-9	72	J-11	J-10	8.0	PVC	120	822.69	5.25	0.015	Open
P-10	260	J-11	J-12	8.0	PVC	120	-1,427.45	9.11	0.041	Open
P-11	69	J-12	J-1	8.0	PVC	120	751.75	4.80	0.012	Open
P-12	55	J-12	J-13	8.0	PVC	120	-2,179.20	13.91	0.090	Open
P-14	121	J-13	J-7	8.0	PVC	120	0.20	0.00	0.000	Open
P-15	265	J-13	R-1	8.0	PVC	120	-2,179.40	13.91	0.090	Open
P-16	88	R-2	J-5	8.0	PVC	120	0.00	0.00	0.000	Closed
P-17	96	J-5	J-9	8.0	PVC	120	-30.77	0.20	0.000	Open
P-18	245	J-14	J-6	8.0	PVC	120	-577.60	3.69	0.008	Open

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Notes
J-1	6,442.53	30.77	6,632.46	82.17	B1 Demands & FF
J-2	6,442.70	31.67	6,629.40	80.78	B2 Demands & FF
J-3	6,442.05	27.16	6,626.61	79.85	B3 Demands & FF
J-4	6,442.64	31.67	6,624.60	78.73	B4 Demands
J-5	6,446.93	30.77	6,622.32	75.88	B5 Demands
J-6	6,490.00	27.16	6,620.61	56.51	B6 Demands & FF / Modeled at 4th floor
J-7	6,439.60	0.20	6,638.24	85.94	Clubhouse Demands
J-8	6,442.64	0.00	6,624.60	78.73	B4 Fire Flow
J-9	6,445.78	0.00	6,622.32	76.38	
J-10	6,444.53	0.00	6,621.62	76.62	
J-11	6,444.86	0.00	6,622.67	76.93	
J-12	6,439.54	0.00	6,633.31	83.84	
J-13	6,436.89	0.00	6,638.24	87.11	
J-14	6,446.93	2,000.00	6,618.73	74.33	B5 Fire Flow

Dawson Trails

Fire Flow at J-8 + MDD + P-5 Closed

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,662.00	947.73	6,662.00
R-2	6,662.00	731.67	6,662.00

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia (in)	Mat.	Hazen	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
P-1	264	J-1	J-2	8.0	PVC	120	1,590.50	10.15	0.050	Open
P-2	263	J-2	J-3	8.0	PVC	120	1,558.83	9.95	0.048	Open
P-3	203	J-3	J-8	8.0	PVC	120	1,531.67	9.78	0.047	Open
P-4	142	J-8	J-4	8.0	PVC	120	31.67	0.20	0.000	Open
P-5	253	J-8	J-9	8.0	PVC	120	0.00	0.00	0.000	Closed
P-6	86	J-9	J-10	8.0	PVC	120	700.90	4.47	0.011	Open
P-7	71	J-10	J-14	8.0	PVC	120	181.89	1.16	0.001	Open
P-8	247	J-6	J-11	8.0	PVC	120	154.73	0.99	0.001	Open
P-9	72	J-11	J-10	8.0	PVC	120	-519.01	3.31	0.006	Open
P-10	260	J-11	J-12	8.0	PVC	120	673.74	4.30	0.010	Open
P-11	69	J-12	J-1	8.0	PVC	120	1,621.27	10.35	0.052	Open
P-12	55	J-12	J-13	8.0	PVC	120	-947.53	6.05	0.019	Open
P-14	121	J-13	J-7	8.0	PVC	120	0.20	0.00	0.000	Open
P-15	265	J-13	R-1	8.0	PVC	120	-947.73	6.05	0.019	Open
P-16	88	R-2	J-5	8.0	PVC	120	731.67	4.67	0.012	Open
P-17	96	J-5	J-9	8.0	PVC	120	700.90	4.47	0.011	Open
P-18	245	J-14	J-6	8.0	PVC	120	181.89	1.16	0.001	Open

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Notes
J-1	6,442.53	30.77	6,652.31	90.76	B1 Demands & FF
J-2	6,442.70	31.67	6,639.10	84.97	B2 Demands & FF
J-3	6,442.05	27.16	6,626.43	79.77	B3 Demands & FF
J-4	6,442.64	31.67	6,616.95	75.42	B4 Demands
J-5	6,446.93	30.77	6,660.96	92.60	B5 Demands
J-6	6,490.00	27.16	6,658.68	72.98	B6 Demands & FF / Modeled at 4th floor
J-7	6,439.60	0.20	6,656.92	94.02	Clubhouse Demands
J-8	6,442.64	1,500.00	6,616.95	75.42	B4 Fire Flow
J-9	6,445.78	0.00	6,659.91	92.64	
J-10	6,444.53	0.00	6,658.96	92.77	
J-11	6,444.86	0.00	6,658.51	92.44	
J-12	6,439.54	0.00	6,655.86	93.59	
J-13	6,436.89	0.00	6,656.92	95.20	
J-14	6,446.93	0.00	6,658.90	91.71	B5 Fire Flow

Dawson Trails

Fire Flow at J-7 + MDD + P-15 Closed

Reservoir Table - Time: 0.00 hours

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,662.00	0.00	6,662.00
R-2	6,662.00	2,179.40	6,662.00

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia (in)	Mat.	Hazen	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
P-1	264	J-1	J-2	8.0	PVC	120	-726.39	4.64	0.012	Open
P-2	263	J-2	J-3	8.0	PVC	120	-758.06	4.84	0.013	Open
P-3	203	J-3	J-8	8.0	PVC	120	-785.22	5.01	0.014	Open
P-4	142	J-8	J-4	8.0	PVC	120	31.67	0.20	0.000	Open
P-5	253	J-8	J-9	8.0	PVC	120	-816.89	5.21	0.015	Open
P-6	86	J-9	J-10	8.0	PVC	120	1,331.74	8.50	0.036	Open
P-7	71	J-10	J-14	8.0	PVC	120	337.98	2.16	0.003	Open
P-8	247	J-6	J-11	8.0	PVC	120	310.82	1.98	0.002	Open
P-9	72	J-11	J-10	8.0	PVC	120	-993.76	6.34	0.021	Open
P-10	260	J-11	J-12	8.0	PVC	120	1,304.58	8.33	0.035	Open
P-11	69	J-12	J-1	8.0	PVC	120	-695.62	4.44	0.011	Open
P-12	55	J-12	J-13	8.0	PVC	120	2,000.20	12.77	0.076	Open
P-14	121	J-13	J-7	8.0	PVC	120	2,000.20	12.77	0.076	Open
P-15	265	J-13	R-1	8.0	PVC	120	0.00	0.00	0.000	Closed
P-16	88	R-2	J-5	8.0	PVC	120	2,179.40	13.91	0.090	Open
P-17	96	J-5	J-9	8.0	PVC	120	2,148.63	13.71	0.087	Open
P-18	245	J-14	J-6	8.0	PVC	120	337.98	2.16	0.003	Open

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Notes
J-1	6,442.53	30.77	6,632.90	82.36	B1 Demands & FF
J-2	6,442.70	31.67	6,635.99	83.63	B2 Demands & FF
J-3	6,442.05	27.16	6,639.32	85.35	B3 Demands & FF
J-4	6,442.64	31.67	6,642.07	86.28	B4 Demands
J-5	6,446.93	30.77	6,654.15	89.66	B5 Demands
J-6	6,490.00	27.16	6,641.76	65.66	B6 Demands & FF / Modeled at 4th floor
J-7	6,439.60	2,000.20	6,618.69	77.48	Clubhouse Demands
J-8	6,442.64	0.00	6,642.07	86.29	B4 Fire Flow
J-9	6,445.78	0.00	6,645.76	86.52	
J-10	6,444.53	0.00	6,642.66	85.72	
J-11	6,444.86	0.00	6,641.16	84.93	
J-12	6,439.54	0.00	6,632.15	83.34	
J-13	6,436.89	0.00	6,627.95	82.66	
J-14	6,446.93	0.00	6,642.46	84.60	B5 Fire Flow

Dawson Trails

Fire Flow Analysis + P-16 Closed

Fire Flow Results Table - Time: 0.00 hours

Label	Fire Flow (Needed) (gpm)	Velocity of Maximum Pipe (ft/s)	Pipe w/ Maximum Velocity	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
J-1	2,000.00	13.92	P-15	2,001.00	2,030.77	2,031.77	80.75	61.47	61.47	J-6
J-7	2,000.00	13.92	P-15	2,001.00	2,000.20	2,001.20	81.92	64.08	64.08	J-6
J-2	2,000.00	13.92	P-15	2,001.00	2,031.67	2,032.67	76.94	60.38	60.38	J-6
J-3	2,000.00	13.92	P-15	2,001.00	2,027.16	2,028.16	75.70	59.47	59.47	J-6
J-6	2,000.00	13.92	P-15	2,001.00	2,027.16	2,028.16	54.61	75.24	75.24	J-14
J-14	2,000.00	13.92	P-15	2,001.00	2,000.00	2,001.00	74.31	56.49	56.49	J-6
J-8	1,500.00	10.73	P-15	1,501.00	1,500.00	1,501.00	82.92	64.74	64.74	J-6
J-11	0.00	1.15	P-15	1.00	0.00	1.00	93.80	74.27	74.27	J-6
J-4	0.00	1.15	P-15	1.00	31.67	32.67	94.75	74.27	74.27	J-6
J-5	0.00	1.15	P-15	1.00	30.77	31.77	92.90	74.27	74.27	J-6
J-9	0.00	1.15	P-15	1.00	0.00	1.00	93.40	74.27	74.27	J-6
J-10	0.00	1.15	P-15	1.00	0.00	1.00	93.94	74.27	74.27	J-6
J-12	0.00	1.15	P-15	1.00	0.00	1.00	96.12	74.27	74.27	J-6
J-13	0.00	1.15	P-15	1.00	0.00	1.00	97.29	74.27	74.27	J-6

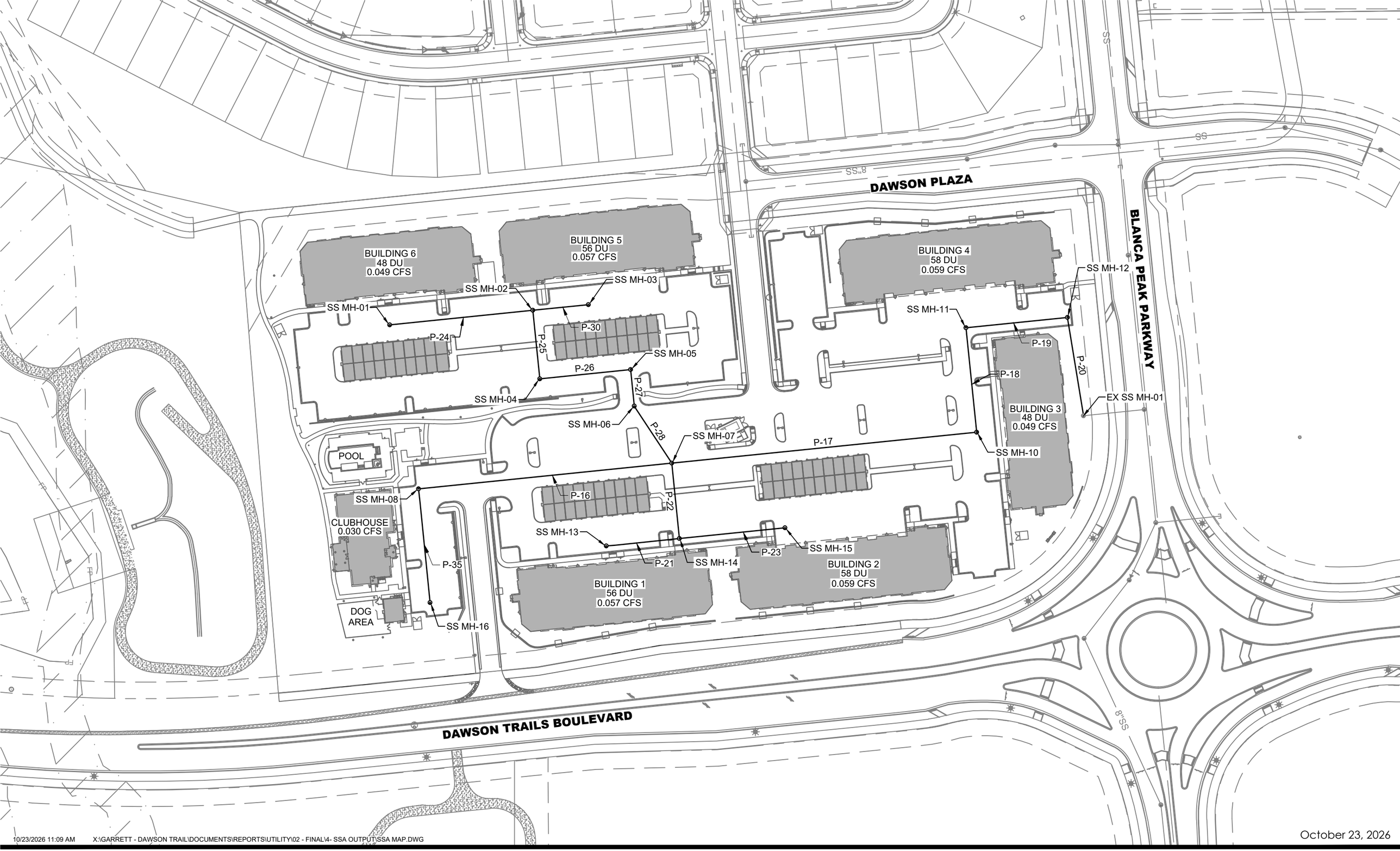
Fire Flow Analysis + P-15 Closed

Fire Flow Results Table - Time: 0.00 hours

Label	Fire Flow (Needed) (gpm)	Velocity of Maximum Pipe (ft/s)	Pipe w/ Maximum Velocity	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
J-1	2,000.00	13.92	P-16	2,001.00	2,030.77	2,031.77	81.56	65.79	65.79	J-6
J-2	2,000.00	13.92	P-16	2,001.00	2,031.67	2,032.67	80.72	66.21	66.21	J-6
J-3	2,000.00	13.92	P-16	2,001.00	2,027.16	2,028.16	81.75	66.58	66.58	J-6
J-6	2,000.00	13.92	P-16	2,001.00	2,027.16	2,028.16	62.55	83.35	83.35	J-14
J-14	2,000.00	13.92	P-16	2,001.00	2,000.00	2,001.00	82.55	64.55	64.55	J-6
J-7	2,000.00	13.92	P-16	2,001.00	2,000.20	2,001.20	77.47	65.65	65.65	J-6
J-8	1,500.00	10.73	P-16	1,501.00	1,500.00	1,501.00	87.78	69.76	69.76	J-6
J-10	0.00	1.15	P-16	1.00	0.00	1.00	94.02	74.35	74.35	J-6
J-13	0.00	1.15	P-16	1.00	0.00	1.00	97.32	74.35	74.35	J-6
J-4	0.00	1.15	P-16	1.00	31.67	32.67	94.83	74.35	74.35	J-6
J-5	0.00	1.15	P-16	1.00	30.77	31.77	93.02	74.35	74.35	J-6
J-9	0.00	1.15	P-16	1.00	0.00	1.00	93.49	74.35	74.35	J-6
J-11	0.00	1.15	P-16	1.00	0.00	1.00	93.88	74.35	74.35	J-6
J-12	0.00	1.15	P-16	1.00	0.00	1.00	96.17	74.35	74.35	J-6

APPENDIX C
SANITARY DEMANDS

Storm & Sanitary Analysis Map
Sanitary Demand Calculations
Storm & Sanitary Analysis Output Tables



10/23/2026 11:09 AM X:\GARRETT - DAWSON TRAIL\DOCUMENTS\REPORTS\UTILITY\02 - FINAL\4- SSA OUTPUT\SSA MAP.DWG

October 23, 2026

DAWSON TRAILS

SSA MAP

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 100' 200'

1" = 100'

Dawson Trail
Water and Sanitary Sewer Utlity Conformance Letter
Sanitary Sewer Demand Calcualtion

Peaking Factor = 5.0

PARCEL Filing 19 - Lot 2 North	USE	SF	DU (EA)	DEMAND AVG DAY (GPD/DU) [1]	AVG DAY (GPD)	AVG DAY (GPM)	PEAK DESIGN (GPM) [2][3]	PEAK DESIGN (GPD)	AVG DAY (cfs)	PEAK DESIGN (cfs)	Peaking Factor Check ADF (MGD)	 Calc PF [4]
											0.007	8.35
Proposed Development												
a. Proposed Dawson Trail	Buidling 1		56	130	7,280.00	5.06	25.78	37,128.00	0.011	0.0574		
	Buidling 2		58	130	7,540.00	5.24	26.70	38,454.00	0.012	0.0595		
	Buidling 3		48	130	6,240.00	4.33	22.10	31,824.00	0.010	0.0492		
	Buidling 4		58	130	7,540.00	5.24	26.70	38,454.00	0.012	0.0595		
	Buidling 5		56	130	7,280.00	5.06	25.78	37,128.00	0.011	0.0574		
	Buidling 6		48	130	6,240.00	4.33	22.10	31,824.00	0.010	0.0492		
	Gym/Office/Pool/Dog	7,534		0.5	3,767.00	2.62	13.34	19,211.70	0.006	0.0297		
Sub-Total		**7534.0**	**324.00**	**N/A**	**45,887.00**	**31.87**	**162.52**	**234,023.70**	**0.07**	**0.3621**		
Filing 2, Amendment 2												
b. Filing 2, Amendment 2	Multi-Family		90.00	130	11,700.00	8.13	41.44	59,670.00	0.018	0.0923		
	Single-Family Detached		166.00	200	33,200.00	23.06	117.58	169,320.00	0.051	0.2620		
Sub-Total		**0.0**	**256**	**N/A**	**44,900.00**	**31.18**	**159.02**	**228,990.00**	**0.069**	**0.3543**		
Anticipated Development												
c. Anticipated Development	Multi-Family		300.00	130	39,000.00	27.08	138.13	198,900.00	0.060	0.3077		
	Single-Family Detached		300.00	200	60,000.00	41.67	212.50	306,000.00	0.093	0.4735		
Sub-Total		**0.0**	**600**	**N/A**	**99,000.00**	**68.75**	**350.63**	**504,900.00**	**0.153**	**0.7812**		
e. Proposed Dawson Trail (a)			324.0	130.0	45,887.00	31.9	162.5	234,023.70	0.071	0.3621		
f. Filing 2, Amendment 2 (b)			256.0	N/A	44,900.00	31.2	159.0	228,990.00	0.069	0.3543		
g. Anticipated Development (c)			600.0	N/A	99,000.00	68.8	350.6	504,900.00	0.153	0.7812		
Remaining Demand (g-e-f)			**1180.0**	**N/A**	**8,213.00**	**5.7**	**29.1**	**41,886.30**	**0.013**	**0.0648**		

*from "Final Utility Report for Dawson Trails - Filing 2 Amendment 2" by EMK Consultants

*from "Final Utility Report for Dawson Trails Filing 2 Infrastructure" by EMK Consultants

Assumptions:
(1) Residential (demands based on dwelling units: Multifamily Residential = 130 gpd/du / Single Family Residential = 200 gpd/du)
(2) Peaking Factor of 5 used
(3) Peak Design Flow determined from TOCR Wastewater section 4.4.1.3 equation: PDF = peak base flow + I/I allowance = (ADF*PF) + (0.1*ADF)
(4) Peaking Factor check from TOCR Wastewater section 4.4.1.2 equation: PF = 3.65 (ADF^(-0.168)); Max PF = 5.0

STORM & SANITARY ANALYSIS OUTPUT TABLES PEAK + INFILTRATION SANITARY ANALYSIS

Conduit Table

SN	Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Manning's Roughness	Peak Flow (cfs)	Max Flow Velocity (ft/sec)	Design Flow Capacity (cfs)	Max Flow Depth (ft)	Percent Full (%)
1	P-16	SS MH-08	SS MH-07	309.14	6429.98	6428.74	0.4000	8.040	0.0110	0.03	1.20	0.91	0.08	11.94%
2	P-17	SS MH-07	SS MH-10	372.13	6428.44	6426.95	0.4000	8.040	0.0110	0.25	2.22	0.90	0.24	35.82%
3	P-18	SS MH-10	SS MH-11	127.50	6426.65	6426.14	0.4000	8.040	0.0110	0.30	2.33	0.90	0.26	38.81%
4	P-19	SS MH-11	SS MH-12	123.85	6425.84	6425.34	0.4000	8.040	0.0110	0.36	2.44	0.90	0.29	43.28%
5	P-20	SS MH-12	EX SS MH-01	120.94	6425.04	6424.56	0.4000	8.040	0.0110	0.36	2.44	0.90	0.29	43.28%
6	P-21	SS MH-13	SS MH-14	64.47	6430.96	6429.96	1.5600	8.040	0.0110	0.06	2.34	1.79	0.08	11.94%
7	P-22	SS MH-14	SS MH-07	92.01	6429.66	6428.74	1.0000	8.040	0.0110	0.12	2.46	1.43	0.13	19.40%
8	P-23	SS MH-15	SS MH-14	128.82	6431.25	6429.96	1.0000	8.040	0.0110	0.06	2.02	1.43	0.09	13.43%
9	P-24	SS MH-01	SS MH-02	152.13	6435.50	6433.74	1.1500	8.040	0.0110	0.05	2.01	1.54	0.08	11.94%
10	P-25	SS MH-02	SS MH-04	83.47	6433.44	6432.61	1.0000	8.040	0.0110	0.11	2.40	1.43	0.12	17.91%
11	P-26	SS MH-04	SS MH-05	110.83	6432.31	6431.20	1.0000	8.040	0.0110	0.11	2.40	1.43	0.12	17.91%
12	P-27	SS MH-05	SS MH-06	44.64	6430.90	6430.26	1.4400	8.040	0.0110	0.11	2.70	1.71	0.11	16.42%
13	P-28	SS MH-06	SS MH-07	82.84	6429.96	6428.75	1.4600	8.040	0.0110	0.11	2.72	1.73	0.11	16.42%
14	P-30	SS MH-03	SS MH-02	57.65	6434.36	6433.74	1.0800	8.040	0.0110	0.06	2.04	1.48	0.09	13.43%
15	P-35	SS MH-16	SS MH-08	112.93	6430.81	6430.36	0.4000	8.040	0.0110	0.03	1.23	0.94	0.08	11.94%

STORM & SANITARY ANALYSIS OUTPUT TABLES PEAK + INFILTRATION SANITARY

Outfall Table

SN	Element ID	Description	Invert Elevation (ft)	Peak Inflow (cfs)	Maximum HGL Depth Attained (ft)	Maximum HGL Elevation Attained (ft)
1	EX SS MH-01	4' DIA MH	6424.26	0.36	0.59	6424.84

STORM & SANITARY ANALYSIS OUTPUT TABLES PEAK + INFILTRATION SANITARY

Junction Table

SN	Element ID	Description	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Peak Inflow (cfs)	Maximum HGL Depth Attained (ft)
1	SS MH-01	4' DIA MH	6435.27	6444.75	0.05	0.31
2	SS MH-02	4' DIA MH	6433.44	6445.40	0.11	0.39
3	SS MH-03	4' DIA MH	6434.36	6444.75	0.06	0.09
4	SS MH-04	4' DIA MH	6432.31	6444.51	0.11	0.42
5	SS MH-05	4' DIA MH	6430.90	6444.49	0.11	0.42
6	SS MH-06	4' DIA MH	6429.96	6442.50	0.11	0.41
7	SS MH-07	4' DIA MH	6428.44	6440.99	0.25	0.43
8	SS MH-08	4' DIA MH	6432.19	6438.07	0.03	0.07
9	SS MH-10	4' DIA MH	6426.65	6439.90	0.30	0.54
10	SS MH-11	4' DIA MH	6425.84	6440.78	0.36	0.56
11	SS MH-12	4' DIA MH	6425.04	6440.40	0.36	0.59
12	SS MH-13	4' DIA MH	6430.96	6440.64	0.06	0.08
13	SS MH-14	4' DIA MH	6429.66	6441.32	0.12	0.39
14	SS MH-15	4' DIA MH	6431.25	6441.63	0.06	0.09
15	SS MH-16	4' DIA MH	6430.85	6438.23	0.03	0.08

APPENDIX D

References

Excerpts From "Final Utility Report For Dawson Trails Filing 2 Infrastructure" By EMK Consultants, Dated 2025

Excerpts From "Final Utility Report For Dawson Trails - Filing 2 Amendment 2" By EMK Consultants, Dated 2025

EXCERPTS FROM "FINAL UTILITY REPORT FOR DAWSON TRAILS FILING 2 INFRASTRUCTURE" BY EMK CONSULTANTS, DATED 2025.

FINAL UTILITY REPORT

FOR

DAWSON TRAILS FILING 2 INFRASTRUCTURE
TOWN OF CASTLE ROCK, COLORADO
CD23-0045

Prepared for:

ACM Dawson Trails VIII JV LLC
4100 E Mississippi Ave, Ste 500
Glendale, CO 80246
Contact: Lawrence Jacobson
Phone: 303-984-9800

TOWN OF CASTLE ROCK COLORADO

DEVELOPMENT SERVICES
APPROVED
By tkucewesky
on 10/21/2025
Approved-CD23-0045 Util Rpt.pdf
Record Document on File

Prepared by:

EMK Consultants, Inc.
7006 S. Alton Way, Bldg F
Centennial, CO 80112
Contact: Gary A. Walter
Phone: 303-694-1520
EMK Job No 13466

July 2025

D. Phasing

The utilities proposed with this Final Utility Report will be completed in one phase. The Overall Utility & Phasing Map for all of Dawson Trails Development can be found in Appendix E. The timeline of each phase is not yet determined. The phasing of the water infrastructure is 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, Red, then Green Zone as well as associated infrastructure for each.

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. Please see Appendix B for Filing 2 demand calculations.

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)	48.92 psi
Minimum Static Pressure with Zero Demand (100% Tank Stage)	56.72 psi
Minimum Dynamic Pressures (based on 20% Tank Stage) **Max Daily Demand + Fire Flow** **Peak Hour Demand**	 20 psi 35 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	Varies
Parks	9.38 SF/acre

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 to all junctions for public area irrigation and are consistent with

the force main(s) will be built in this phase with stub outs on both ends to provide connections for Phase 6 development.

Phase 5

Phase 5 of the Dawson Trails development will entail gravity main lines conveying flow east, connecting to existing stub outs at the upstream end of Junctions 1, 2, and 3's main lines constructed in Phase 3. A stub out for Phase 6 at the upstream end of Junction 1 and 2's main line should be constructed. A portion of the force main(s) will be built in this phase, if deemed necessary, with stub outs on both ends to provide connections for Phase 6 development.

Phase 6

Phase 6 of the Dawson Trails development will include gravity mains conveying flows either to the north to the lift station(s) or east to existing sanitary sewer mains, depending on the final grading. A force main conveying flows from the lift station(s) to the existing gravity main on the Site will be constructed. Efforts will be made to minimize the number of lift stations required to service the development as operation and maintenance costs will be assessed. Flows developed from Phase 6 development have been accounted for in both Junction 1 and 3's runs.

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
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	Varies
Parks	No demand

EXCERPTS FROM "FINAL UTILITY REPORT FOR DAWSON TRAILS FILING 2 INFRASTRUCTURE" BY EMK CONSULTANTS, DATED 2025.

Dawson Trails for Westside
Potable Water Model
Water Demands-Buildout
Date: December 2024
MSK Project #: 52-001-01
Calc'd by: DLT

PRELIMINARY
6/26/24

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 at Buildout (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	90.0	23,850	59,625	41.4	91.1				J28	
2	F-1	Blue	4.0	1,060	2,650	1.8	4.0	4.89	18,323.6	12.7	J18	x
3	F-1	Blue	3.0	795	1,988	1.4	3.0				J20	
4	F-1	Blue	33.0	8,745	21,863	15.2	33.4				J20	
5	E-1	Blue	20.0	5,300	13,250	9.2	20.2				J12	
Blue Zone Totals			**150.0**	**39,750**	**99,375**	**69.0**	**151.8**	**4.9**	**18,323.6**	**12.7**		
6	F-2 (Ph. 1)	Red	0.0	0	0	0.0	0.0	2.29	8,595.6	6.0	J10	x
7	F-2 (Ph. 1)	Red	102.0	27,030	67,575	46.9	103.2				J14	
8	F-3 (Ph. 1)	Red	509.0	134,885	337,213	234.2	515.2				J94	
9	F-3	Red	678.0	179,670	449,175	311.9	686.2				J96	
10	B-1 (Ph. 1)	Red	245.0	64,925	162,313	112.7	248.0				J140	
11	D (Ph. 1)	Red	470.0	124,550	311,375	216.2	475.7				J98	
12	D	Red	148.0	39,220	98,050	68.1	149.8				J24	
13	D	Red	517.0	137,005	342,513	237.9	523.3	13.7	51,363.8	35.7	J112	x
14	D	Red	688.0	182,320	455,800	316.5	696.4	13.7	51,363.8	35.7	J114	x
15	D	Red	2.0	530	1,325	0.9	2.0	13.7	51,363.8	35.7	J120	x
16	D	Red	216.0	57,240	143,100	99.4	218.6	13.7	51,363.8	35.7	J102	x
17	D	Red	384.0	101,760	254,400	176.7	388.7	13.7	51,363.8	35.7	J58	x
18	D	Red	191.0	50,615	126,538	87.9	193.3	13.7	51,363.8	35.7	J118	x
19	C-2	Red	17.0	4,505	11,263	7.8	17.2	13.7	51,363.8	35.7	J108	x
20	C-2	Red	102.0	27,030	67,575	46.9	103.2	13.7	51,363.8	35.7	J106	x
21	C-2	Red	114.0	30,210	75,525	52.4	115.4	13.7	51,363.8	35.7	J126	x
22	C-2	Red	189.0	50,085	125,213	87.0	191.3	13.7	51,363.8	35.7	J124	x
23	C-2	Red	25.0	6,625	16,563	11.5	25.3	13.7	51,363.8	35.7	J66	x
24	C-2	Red	5.0	1,325	3,313	2.3	5.1	13.7	51,363.8	35.7	J122	x
25	G-1	Red	68.0	18,020	45,050	31.3	68.8	13.7	51,363.8	35.7	J110	x
26	G-1	Red	101.0	26,765	66,913	46.5	102.2	13.7	51,363.8	35.7	J116	x
27	G-2	Red	13.0	3,445	8,613	6.0	13.2	13.7	51,363.8	35.7	J64	x
Red Zone Totals			**4,784.0**	**1,267,760**	**3,169,400**	**2,201.0**	**4,842.1**	**207.7**	**779,051.8**	**541.0**		
28	B-1	Green	239.0	63,335	158,338	110.0	241.9	8.8	33,142.5	23.0	J134	x
29	C-2	Green	169.0	44,785	111,963	77.8	171.1	8.8	33,142.5	23.0	J130	x
30	C-2	Green	334.0	88,510	221,275	153.7	338.1	8.8	33,142.5	23.0	J44	x
31	C-2	Green	17.0	4,505	11,263	7.8	17.2	8.8	33,142.5	23.0	J74	x
32	C-1	Green	92.0	24,380	60,950	42.3	93.1	8.8	33,142.5	23.0	J132	x
33	C-1	Green	222.0	58,830	147,075	102.1	224.7	8.8	33,142.5	23.0	J128	x
34	C-1	Green	167.0	44,255	110,638	76.8	169.0	8.8	33,142.5	23.0	J42	x
35	B-2	Green	228.0	60,420	151,050	104.9	230.8	8.8	33,142.5	23.0	J138	x
36	A	Green	333.0	88,245	220,613	153.2	337.0	8.8	33,142.5	23.0	J136	x
37	A	Green	2.0	530	1,325	0.9	2.0	8.8	33,142.5	23.0	J48	x
38	A	Green	138.0	36,570	91,425	63.5	139.7	8.8	33,142.5	23.0	J62	x
Green Zone Totals			**1,941.0**	**514,365**	**1,285,913**	**893.0**	**1,964.6**	**97.2**	**364,567.5**	**253.2**		
Buildout Totals (All Zones)			**6,875.0**	**1,821,875**	**4,554,688**	**3,163.0**	**6,958.6**	**309.9**	**1,161,942.9**	**806.9**		

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

Red Zone BPS Buildout Pumping Capacity:
Total Max Day flow: 4,455,313 gpd (Red and Green Zones)

PROJECT: DAWSON TRAILS

12/20/24 Date
CGV Initials

Town of Castle Rock Criteria	Typical ADF/ Unit	Unit Conversions
Single Family Residential and Duplexes	200 GPD/DU	
Multi-Family Residential (Townhomes and Condos)	130 GPD/DU	
Retail/ Offices*	0.1 GPD/SF	
Restaurants*	1.5 GPD/SF	
Hotel**	75 GPD/Room	0.18 GPD/SF
Industrial***	600 GPD/AC	0.01 GPD/SF
Car Wash	5,000 GPD/AC	
Elementary School	3,375 GPD/School	
Parks	200 GPD/SFE	

*Restaurant area anticipated to be 10-15% of the allocated restaurant, retail and office space
**Assuming 115 rooms/ hotel and average 48,000 SF hotel
***Assuming 40% building area

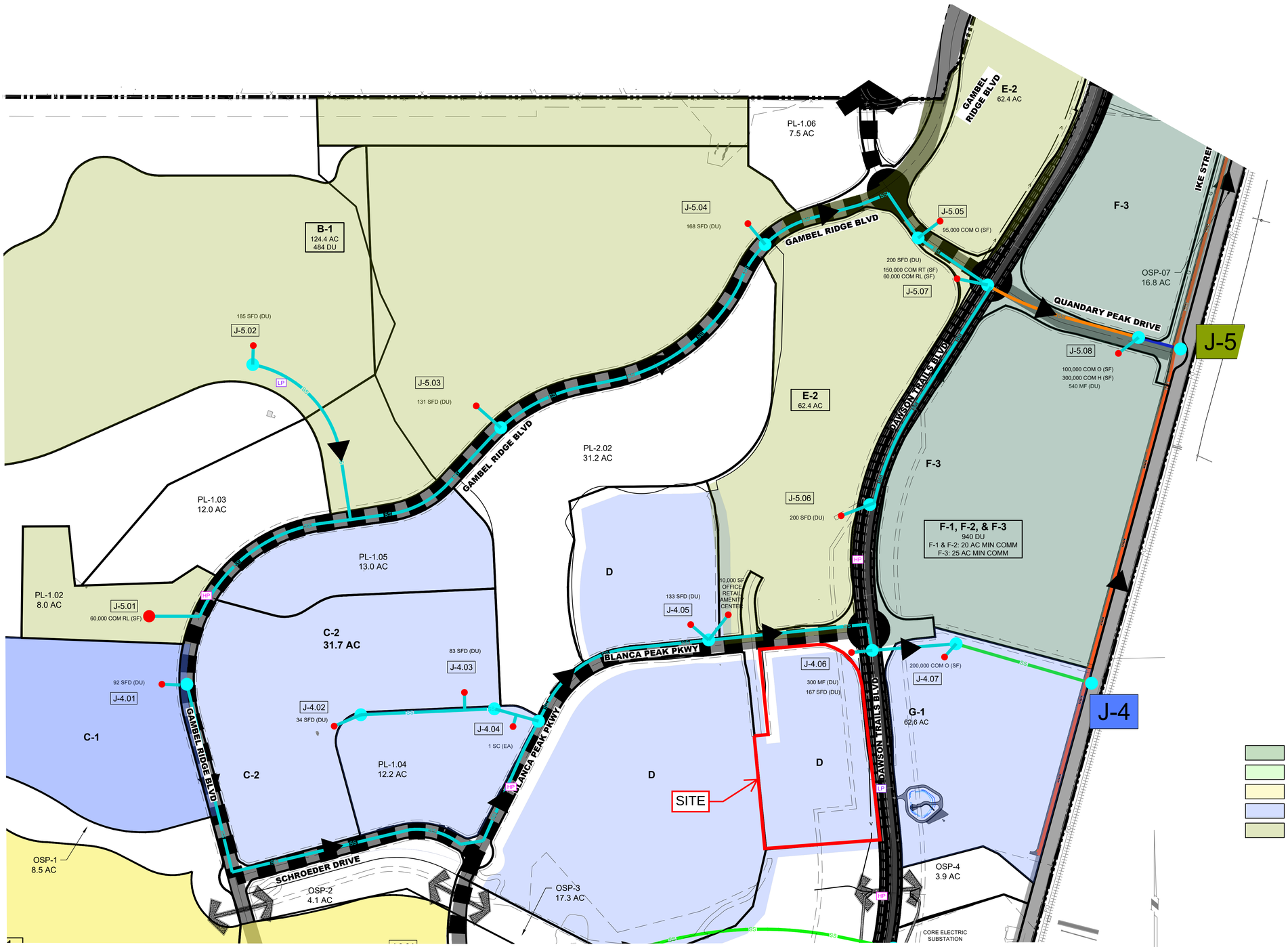
Design Criteria	Slope		Capacity (gpm)	
Pipe (in)	Min	Max	Min	Max
8	0.40%	7.50%	374	1,619
10	0.28%	5.50%	536	2,514
12	0.22%	4.50%	780	3,698
15	0.15%	3.50%	1,224	5,913
18	0.11%	2.50%	1,705	8,126
21	0.09%	2.00%	2,326	10,964
24	0.08%	1.80%	3,131	14,850
27	0.07%	1.50%	4,009	18,559
30	0.06%	1.30%	4,916	22,882

PROJECTED FLOW DETERMINATION

DESIGN POINT						RESIDENTIAL			NON-RESIDENTIAL								PEAK FLOW			INFILTRATION & INFLOW		CUMULATIVE TOTAL FLOW						SEWER DESIGN							
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 (AC)	Industrial (Gross SF)	Hotel (Gross SF)	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)	Pipe Size (in)	Number of Pipes	Approximate 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)
						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-4.01	C-1	1B & 2					92	18,400									18,400	12.78	63.89	1,840	1.28	65.2				65.2	0.15	8	1	2.50	0.40	7.50	374	1619	932	867	18%
J-4.02	C-2	1B	J-4.01				34	6,800									6,800	4.72	23.61	680	0.47	24.1	65.2			89.3	0.20	8	1	2.50	0.40	7.50	374	1619	932	843	21%
J-4.03	C-2	1B	J-4.02				83	16,600									16,600	11.53	57.64	1,660	1.15	58.8	89.3			148.1	0.33	8	1	2.50	0.40	7.50	374	1619	932	784	27%
J-4.04	PL-1.04	1B	J-4.03						1							3,375	3,375	2.34	11.72	338	0.23	12.0	148.1			160.1	0.36	8	1	2.00	0.40	7.50	374	1619	834	674	29%
J-4.05	D	1B	J-4.04				133	26,600							10,000	1,000	27,600	19.17	95.83	2,760	1.92	97.8	160.1			257.9	0.57	8	1	2.00	0.40	7.50	374	1619	834	576	38%
J-4.06	D	1B	J-4.05			300	167	72,400									72,400	50.28	251.39	7,240	5.03	256.5	257.9			514.4	1.15	8	1	1.00	0.40	7.50	374	1619	590	75	69%
J-4.07	G-1	1B	J-4.06												200,000	20,000	20,000	13.89	69.44	2,000	1.39	70.9	514.4			585.3	1.30	10	1	1.00	0.28	5.50	536	2514	1,069	484	50%
J-4			J-4.07	J-3																			585.3	2362.8		2948.1	6.57	21	1	0.20	0.09	2.00	2326	10964	3,458	510	67%
J-5.01	PL-1.02	4													60,000	6,000	6,000	4.17	20.83	600	0.42	21.3				21.3	0.05	8	1	0.40	0.40	7.50	374	1619	373	352	16%
J-5.02	B-1	4	J-5.01				185	37,000									37,000	25.69	128.47	3,700	2.57	131.1	21.3			152.4	0.34	8	1	0.40	0.40	7.50	374	1619	373	221	44%
J-5.03	B-1	1B	J-5.02				131	26,200									26,200	18.19	90.97	2,620	1.82	92.8	152.4			245.2	0.55	8	1	2.00	0.40	7.50	374	1619	834	589	36%
J-5.04	B-1	1B	J-5.03				168	33,600									33,600	23.33	116.67	3,360	2.33	119.0	245.2			364.2	0.81	8	1	2.00	0.40	7.50	374	1619	834	470	45%
J-5.05	E-2	1B	J-5.04												95,000	9,500	9,500	6.60	32.99	950	0.66	33.7	364.2			397.9	0.89	8	1	1.50	0.40	7.50	374	1619	722	324	51%
J-5.06	E-2	1B				200		26,000									26,000	18.06	90.28	2,600	1.81	92.1				92.1	0.21	8	1	0.50	0.40	7.50	374	1619	417	325	32%
J-5.07	E-2	1B	J-5.05	J-5.06		200		26,000						150,000	60,000	231,000	257,000	178.47	892.36	25,700	17.85	910.3	397.9	92.1		1400.3	3.12	12	1	0.75	0.22	4.50	780	3698	1,506	105	72%
J-5.08	F-3	1B	J-5.07			540		70,200					300,000		100,000	63,906	134,106	93.13	465.65	13,411	9.31	475.0	1400.3			1875.3	4.18	15	1	1.00	0.15	3.50	1224	5913	3,152	1,277	53%
J-5			J-5.08	J-4																			1875.3	2948.1		4823.4	10.75	21	1	0.50	0.09	2.00	2326	10964	5,467	644	69%

EXCERPTS FROM "FINAL UTILITY REPORT FOR DAWSON TRAILS FILING 2 INFRASTRUCTURE" BY EMK CONSULTANTS, DATED 2025.

EXCERPTS FROM "FINAL UTILITY REPORT FOR DAWSON TRAILS FILING 2 INFRASTRUCTURE" BY EMK CONSULTANTS, DATED 2025.



JUNCTION TABLE				
JUNCTION	RESIDENTIAL (GPD)	NON-RESIDENTIAL	TOTAL PEAK FLOW (GPM)	CUMULATIVE TOTAL PEAK
J-4.01	18,400	-	65	65
J-4.02	6,800	-	24	89
J-4.03	16,600	-	59	148
J-4.04	-	3,375	12	160
J-4.05	26,600	1,000	98	258
J-4.06	72,400	-	257	514
J-4.07	-	20,000	71	585
J-4	-	-	-	2,948
J-5.01	-	6,000	21	21
J-5.02	37,000	-	131	152
J-5.03	26,200	-	93	245
J-5.04	33,600	-	119	364
J-5.05	-	9,500	34	398
J-5.06	26,000	-	92	92
J-5.07	26,000	231,000	910	1,400
J-5.08	70,200	63,906	475	1,875
J-5	-	-	-	4,823

SUMMARY TABLE			
	USE	QUANITIES	TOTALS
RESIDENTIAL	MULTIFAMILY (DU)	1,240	2,233
	SINGLE FAMILY (DU)	993	
NON-RESIDENTIAL	SCHOOL (EA)	1	
	PARKS (SFE)	-	
	CAR WASH (AC)	-	
	INDUSTRIAL (SF)	-	975,000
	HOTEL (SF)	300,000	
	RESTAURANTS (SF)	150,000	
	RETAIL/ OFFICE (SF)	525,000	

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

EMK CONSULTANTS, INC.
ENGINEERING SURVEYING
LAND DEVELOPMENT
SERVICES AND SOLUTIONS
7006 SOUTH ALTON WAY, BLDG. F
CENTENNIAL, COLORADO 80112-2019
(303)694-1520
www.EMKcc.com

OVERALL WASTEWATER MAP (1 OF 1)

DAWSON TRAILS

8/15/2024

CREATED BY: CGV

JOB NO. 20-224

SHEET 1 OF 1

2022-10-10 (4:13 PM) David Ott C:\Users\dott\Desktop\20-224 Dawson\Civil\Reports\Final Utility Report\Wastewater Drawings\20-224 OVERALL WASTEWATER MAP-F1.dwg

EXCERPTS FROM "FINAL UTILITY REPORT FOR DAWSON TRAILS FILING 2 INFRASTRUCTURE" BY EMK CONSULTANTS, DATED 2025.

0 800' 1,600'

1 inch = 800 ft.

LEGEND

- WATER ZONE GREEN (TANK 6700 - 6537)
- WATER ZONE RED (TANK 6557 - 6393)
- WATER ZONE BLUE (TANK 6389 - 6221)
- PROPOSED GREEN ZONE WATER LINE
- PROPOSED RED ZONE WATER LINE
- PROPOSED BLUE ZONE WATER LINE
- EXISTING BLUE ZONE WATER LINE
- TRANSMISSION LINE (COLOR VARIES BY ZONE)
- BOOSTER PUMP (COLOR VARIES BY ZONE)
- WATER DEMAND PT. (COLOR VARIES BY ZONE)
- PROPOSED TANK (COLOR VARIES BY ZONE)
- PRV (COLOR VARIES PER ZONE)

PLUM CREEK PKWY

CONNECT TO EXISTING WATER LINE PROVIDED BY TANK 8

PRV

F-1 20.0 AC

OSP-06 11.8 AC

PERRY ST

OSP-5 4.5 AC

RES: 0 SFE
NON-RES: 90 SFE
TOTAL: 90 SFE

DAWSON TRAILS BLVD

RES: 0 SFE
NON-RES: 4 SFE
TOTAL: 4 SFE

F-1 6.3 AC

PL-1.08 5.0 AC

RES: 0 SFE
NON-RES: 3 SFE
TOTAL: 3 SFE

PL-1.07 44.1 AC

RES: 0 SFE
NON-RES: 33 SFE
TOTAL: 33 SFE

PUMP HOUSE 0.73 AC

F-1 11 AC

PL-2.04 7.0 AC

PL-2.05 7.2 AC

COSTCO LANE

E-1 0.53 AC

F-2 3.7 AC

CLARKES CIR.

RES: 0 SFE
NON-RES: 20 SFE
TOTAL: 20 SFE

F-2 2 AC

F-2 19.7 AC

RES: 0 SFE
NON-RES: 102 SFE
TOTAL: 102 SFE

F-2 3.6 AC

CONNECT TO EXISTING WATER LINE PROVIDED BY TANK 4

E-1 5.1 AC

PL-2.06 4.4 AC

IKE STREET

CRYSTAL VALLEY PKWY

CRYSTAL VALLEY PKWY.

FUTURE CRYSTAL VALLEY INTERCHANGE

TWIN OAKS RD.

E-2 63.3 AC

RES: 400 SFE
NON-RES: 70 SFE
TOTAL: 470 SFE

RES: 403 SFE
NON-RES: 106 SFE
TOTAL: 509 SFE

OSP-07 16.8 AC

F-3 81.9 AC

PL-1.06 7.5 AC

RES: 245 SFE
NON-RES: 0 SFE
TOTAL: 245 SFE

B1 124.4 AC

RES: 239 SFE
NON-RES: 0 SFE
TOTAL: 239 SFE

GAMBEL RIDGE BLVD

PL-2.02 31.2 AC

RES: 537 SFE
NON-RES: 141 SFE
TOTAL: 678 SFE

QUANDRY PEAK DRIVE

F-1, F-2, & F-3
940 DU
F-1 & F-2: 20 AC MIN COMM
F-3: 25 AC MIN COMM

WATER BOOSTER PUMP (RED TO GREEN ZONE)

PL-1.03 12.0 AC

PL-1.05 13.0 AC

D 206.2 AC

RES: 133 SFE
NON-RES: 15 SFE
TOTAL: 148 SFE

A

PL-2.01 382.9 AC

RES: 333 SFE
NON-RES: 0 SFE
TOTAL: 333 SFE

PL-1.02 8.0 AC

C-2 31.7 AC

BLANCA PEAK PKWY

RES: 467 SFE
NON-RES: 50 SFE
TOTAL: 517 SFE

RES: 0 SFE
NON-RES: 68 SFE
TOTAL: 68 SFE

G-1 62.6 AC

RED ZONE TANK 19 @ ±6656 HGL

RES: 92 SFE
NON-RES: 0 SFE
TOTAL: 92 SFE

RES: 169 SFE
NON-RES: 0 SFE
TOTAL: 169 SFE

RES: 0 SFE
NON-RES: 17 SFE
TOTAL: 17 SFE

C-1

PL-1.04 12.2 AC

SCHROEDER DRIVE

OSP-1 8.5 AC

C-1 151.9 AC 481 DU

OSP-3 16.1 AC

SITE

OSP-2 7.3 AC

RES: 102 SFE
NON-RES: 0 SFE
TOTAL: 102 SFE

CORE ELECTRIC SUBSTATION

OSP-4 3.9 AC

PL-1.01 4.5 AC

RES: 0 SFE
NON-RES: 2 SFE
TOTAL: 2 SFE

RES: 195 SFE
NON-RES: 21 SFE
TOTAL: 216 SFE

RES: 222 SFE
NON-RES: 0 SFE
TOTAL: 222 SFE

A 236.5 AC 471 DU

RES: 622 SFE
NON-RES: 66 SFE
TOTAL: 688 SFE

G-1 & G-2
66.9 AC MIN
NON-RES

RES: 0 SFE
NON-RES: 2 SFE
TOTAL: 2 SFE

OSP-08 4.0 AC

RES: 348 SFE
NON-RES: 36 SFE
TOTAL: 384 SFE

RES: 0 SFE
NON-RES: 101 SFE
TOTAL: 101 SFE

RES: 173 SFE
NON-RES: 18 SFE
TOTAL: 191 SFE

INTERSTATE 25

C-1 NOT A PART

C-2 187.4 AC 908 DU

RES: 138 SFE
NON-RES: 0 SFE
TOTAL: 138 SFE

RES: 167 SFE
NON-RES: 0 SFE
TOTAL: 167 SFE

RES: 334 SFE
NON-RES: 0 SFE
TOTAL: 334 SFE

RES: 114 SFE
NON-RES: 0 SFE
TOTAL: 114 SFE

RES: 189 SFE
NON-RES: 0 SFE
TOTAL: 189 SFE

RES: 0 SFE
NON-RES: 25 SFE
TOTAL: 25 SFE

RES: 0 SFE
NON-RES: 5 SFE
TOTAL: 5 SFE

RES: 228 SFE
NON-RES: 0 SFE
TOTAL: 228 SFE

B-2 58.9 AC 228 DU

RES: 0 SFE
NON-RES: 17 SFE
TOTAL: 17 SFE

PL-1.09 12.0 AC

PL-1.10 109.3 AC

RES: 0 SFE
NON-RES: 13 SFE
SFE: 13 UNITS

PL-2.08 0.9 AC

G-2 4.3 AC

CONNECT TO GREEN ZONE TANK 21 @ ±6800 HGL (SITE TO BE DETERMINED)

CASTLE BUTTE DR.

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

LAND DEVELOPMENT
ENERGY
PUBLIC INFRASTUCTURE

DAWSON TRAILS

OVERALL WATER MAP

DATE: 8/21/2024
CREATED BY: CGV
JOB NO. 20-224
SHEET 3 OF 5

2021-09-11 (4:36 PM) Tony Yuan X:\20-224 Dawson\Civil\Reports_Overall\Utility\Master Utility Report\E - Utility Maps OVERALL WATER MAP.dwg

EMK CONSULTANTS, INC. LAND DEVELOPMENT
ENGINEERING SURVEYING SERVICES AND SOLUTIONS
7006 S. Alton Way, Building F Centennial, Colorado 80112-2019 (303)694-1520 www.EMKC.com

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

FINAL UTILITY REPORT
FOR
DAWSON TRAILS – FILING 2, AMENDMENT 2

Castle Rock, Colorado
Town of Castle Rock Project CD25-0009

February 26, 2025
Revised: August 8, 2025
Revised: November 10, 2025
Revised: December 11, 2025

EMK Job. No. 13393

Prepared For:
ACM Dawson Trails VIII JV LLC
8350 East Crescent Parkway, Suite 200
Greenwood Village, CO 80111
Attention: Lawrence Jacobson
303-748-5466
ljacobson@westsideinv.com

Prepared By:
EMK Consultants, Inc.
7006 S. Alton Way, Bldg F
Centennial, CO 80112
Contact: Eric R. McDaniel
Phone: (303) 694-1520

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

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.

COLORADO LICENSED
DAVID J. OTT
01/20/2026
38935
PROFESSIONAL ENGINEER

Signature: _____

Registered Professional Engineer

State Of Colorado No. 38935

(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.

ACM Dawson Trails VIII IV LLC
Name of Developer

Authorized Signature

TOWN OF CASTLE ROCK COLORADO
DEVELOPMENT SERVICES
APPROVED
By jkirkpatrick
on 01/21/2026
APPROVED-CD25-0009 Final Util Rpt.pdf
Record Document on File

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

I. Project Location and Description

A. Site Location

Filing 2, Amendment 2 of Dawson Trails is located west of Interstate 25, just south of the proposed Crystal Valley Interchange. More specifically, it is located in the east half of section 28, Township 8 South, Range 67 West of the 6th Principal Meridian in the Town of Castle Rock. A site location map is included in Appendix F. Paved streets from a defunct development project in the 1980s exist in the area. Future phases of the Dawson Trails development will surround Filing 2, Amendment 2.

B. Description of Property and Land Use

Filing 2, Amendment 2 covers approximately 56 acres, distributed across a northern area and southern area. No phasing is planned with this portion of the project.

The proposed land use consists of approximately 256 lots, with 166 of those being a single-family detached product and 90 being an attached product.

No schools, commercial buildings or industrial buildings are planned for the site.

A stock pond fed by the North Dawson tributary exists on the southern fringe of Filing 2, Amendment 2. This stock pond will be removed and the major drainageway will be improved as part of a separate project.

II. Calculated Water Demands

A. Average Daily Demands (ADD)

Average daily demand is calculated based upon section 4.4.1 of the *Town of Castle Rock Water System Design 2018 Criteria Manual.* Per the latest technical memorandum for the *Dawson Trails – Crystal Valley Water Connection* by MSK Consulting, the average daily demand for Dawson Trails has been reduced to 265 gpd per/SFE. This lower value accounts for the water conservation requirements within Dawson Trails and the Town's ordinance that limits the amount of outdoor irrigated area per new home. Demand calculations can be found in Appendix A.

The common irrigation system for Parcel D will serve 8.01 acres of common space landscape, including 4.12 acres of permanent irrigation, and 3.89 acres of temporary native seed irrigation. Four (4) irrigation taps are proposed for Parcel D: one 3/4-inch tap with a maximum flow rate of 10 gallons per minute; and three 1-inch taps with a maximum flow rate of 18 gallons per minute each. See Appendix for irrigation watering chart and hydraulic calculations.

B. Max Day Demands (MDD)

A peaking factor of 2.5 is applied to ADD to calculate MDD per section 4.4.1.2 of the water manual. Irrigation is added per the criteria at 3750 gpd/acre.

C. Peak Hour Demands (PHD)

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

A peaking factor of 5.5 is applied to ADD to calculate PHD per section 4.4.1.2 of the water manual. Irrigation is added per the criteria at 3750 gpd/acre.

III. Existing Water System

A. Existing Distribution System

The site does not have an active water system. Portions of an old water system that was installed as part of a development project in the 1980s still exists on the site. This existing system is not operational and will be abandoned or removed.

B. Existing Supply Facilities

A water tank that was part of the defunct 1980s development project still exists on the site. This tank, Tank 19, will be removed and replaced with a new tank at the same location.

IV. Proposed Water System

A. Proposed Distribution System

Piping in residential streets will deliver water to individual lots. A 12-inch red zone water main is proposed in Blanca Peak Parkway that runs through Tract O and H. Eight-inch distribution pipes in the northern and southern sections of Filing 2, Amendment 2 will connect to this 12-inch watermain. Both the north and south systems will have two connection points to provide looping. Filing 2, Amendment 2 is included in an overall area identified as area 47 in Figure 3.7 of the *Town of Castle Rock Water Master Plan 2023*. Filing 2, Amendment 2 will be one piece of the overall Dawson Trails development. Any future development of the existing water infrastructure needed to serve this site is the responsibility of the developer.

B. Proposed Supply Facilities

The Dawson Trails development will be fed by water supply infrastructure from the north. A 24-inch blue zone pipe is proposed across I-25 from Crystal Valley Ranch. A red zone pump station will use the proposed 24-inch connection to feed Dawson Trails water infrastructure to the south. Red zone Tank 19 and green zone Tank 21 will be constructed as part of a separate project to serve Dawson Trails.

C. Land Dedication Requirements

No land dedication is required for the Filing 2, Amendment 2 portion of the development.

V. Proposed Water System Analysis and Modeling

A. Hydraulic Models

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

Bentley WaterCAD was used to evaluate the hydraulic characteristics of the system. Water demands were applied at the junctions in the system that were closest to blocks of proposed lots. Demand calculations and junctions that these demands were applied to can be found in Appendix A.

The Filing 2, Amendment 2 water system is part of an overall Dawson Trails system being studied as part of a separate project by MSK Consulting. Assumed HGLs were obtained from MSK Consulting and used in the Filing 2, Amendment 2 model.

B. Hydraulic Modeling Scenarios

The four scenarios prescribed by the *Town of Castle Rock Water System Design 2018 Criteria Manual* were studied in this report. These scenarios are and their pressure requirements are presented in the following table.

Hydraulic Condition	Pressure (psi)
Minimum static pressure with zero demand (20% tank stage)	**43**
Maximum static pressure with zero demand (100% tank stage)	**125**
Minimum dynamic pressures (based on 20% tank stage):	
Max Daily Demand + fire flow (see note below)	**20**
Peak Hour Demand (see note below)	**35**

Note: Pressure and Velocity criteria listed above for the MDD plus fire flow and PHD conditions shall be satisfied with one critical distribution loop out of service.

C. Hydraulic Modeling Output and Required Schematics

A summary of the results of the hydraulic analysis in these four scenarios is presented in the following paragraphs. A model schematic, along with output tables for each scenario, are included in Appendix C.

Scenario 1 – Minimum Static Pressure with zero demand (20% tank storage)

The min static pressure scenario results indicated pressures ranging from 67 – 94 psi. The HGL for this model was set at 6,662.40', which is 20% of the total height of the tank above the finished floor elevation of 6658'. Detailed output from the modeling of this scenario is presented in Appendix C.

Scenario 2 – Maximum Static Pressure with zero demand (100% tank storage)

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

The max static pressure scenario results indicated pressures ranging from 74 – 101 psi. The HGL for this model was set at 6,680', which is 22' above the tank finished floor elevation of 6658'. Detailed output from the modeling of this scenario is presented in Appendix C.

Scenario 3a – Maximum Daily Demand + Fire Flow

The Maximum Daily Demand + Fire Flow demand scenario indicated pressures ranging from 54 – 94 psi. The Fire Flow Report indicates that all of the junctions in the model could be supplied with a fire flow of 1500 gpm (approved fire flow is 1000 gpm for 1 hour) while keeping the system pressure above 20 psi and the maximum pipe velocity below 15 ft/sec. Detailed output from the modeling of this scenario is presented in Appendix C.

Scenario 3b – Maximum Daily Demand + Fire Flow at J-22 with P-12 closed

The results from Scenario 3a indicate that junction J-22 typically reports the minimum pressure and pipe P-12 typically reports the maximum velocity during fire flow analysis. Therefore, this scenario was developed to test a flow of 1500 gpm at J-22 with pipe P-12 closed. The minimum reported pressure under this scenario was 47 psi at J-22 and the maximum pipe velocity was 10.3 ft/sec in pipes P-6 and P-7.

Scenario 4 – Peak Hour Demand

The Peak Hour demand scenario indicated pressures ranging from 66 – 93 psi. Velocities were well below the maximum allowable velocity of 10 ft/sec, with 1.5 ft/sec being the maximum velocity reported by the model. Pipe P-12 was taken out of service for this run. Detailed output from the modeling of this scenario is presented in Appendix C.

VI. Calculated Wastewater Flows

A. Average Day Wastewater Flows (ADF)

Average daily flows are calculated based upon Section 4.4.1 of the *Town of Castle Rock Wastewater System Design 2018 Criteria Manual.* Calculations contained in Appendix C indicate an average daily flow of 0.0534 MGD for 256 single family residential/duplex units at 200 gpd/dwelling unit.

B. Peaking Factor

A peaking factor of 5 was calculated based upon section 4.4.1.2 of the manual. See calculations in Appendix D.

C. Peak Design Flows (PDF)

A peak design flow of 0.27 MGD was calculated based upon section 4.4.1.3 of the manual. See calculations in Appendix D.

VII. Existing Wastewater System

A. Existing Collection System

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

An existing sanitary sewer main extends from the proposed Dawson Trails development north to Plum Creek Parkway. Details of this existing main are covered in the *Final Utility Report for Dawson Trails Offsite Sanitary Sewer* by Core Consultants. This utility report discusses how the overall Dawson Trails development fits in with to the town's wastewater master plan.

VIII. Proposed Wastewater System

A. Proposed Collection System

Development in Filing 2, Amendment 2will tie into an 8-inch sanitary main proposed in Blanca Peak Parkway to be constructed by others. Capacity of this main has been analyzed in the *Final Utility Report for Dawson Trails Offsite Sanitary Sewer*. A figure from this report included in Appendix E indicates that the proposed Filing 2, Amendment 2 development fits within the design assumptions of the utility report. There are 256 single family detached units (SFD) or townhomes proposed to feed into nodes J-4.05 and J-4.06, with 300 SDF units allocated for in the utility study. Additional wastewater collection capacity exists for up to 350 MF units in Filing 2, Amendment 2 for the east area of future development.

All streets in Filing 2, Amendment 2 will be adequately served by an 8-inch sanitary collection main.

B. Proposed Wastewater Facilities

No lift stations, force mains or pretreatment facilities will be required to service the Filing 2, Amendment 2 development.

C. Land Dedication Requirements

No land dedication is required for wastewater facilities in Filing 2, Amendment 2.

IX. Proposed Wastewater System Analysis and Modeling

A. Hydraulic Models

Modeling for the entire Dawson Trails site was performed in the *Final Utility Report for Dawson Trails Offsite Sanitary Sewer*. Please see this report for details.

B. Hydraulic Modeling Scenarios

Modeling for the entire Dawson Trails site was performed in the *Final Utility Report for Dawson Trails Offsite Sanitary Sewer*. Please see this report for details.

C. Hydraulic Modeling Output and Required Schematics

Modeling for the entire Dawson Trails site was performed in the *Final Utility Report for Dawson Trails Offsite Sanitary Sewer*. Please see this report for details.

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

X. Potential Permitting Requirements

Permitting for the project will be covered by a separate project for the overall Dawson Trails site.

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

XI. References

1. Town of Castle Rock Water Master Plan, 2023.

2. Town of Castle Rock Wastewater Master Plan, 2022.

3. Town of Castle Rock Water System Design 2018 Criteria Manual.

4. Town of Castle Rock Wastewater Collection Design 2018 Criteria Manual.

5. Final Utility Report for Dawson Trails Offsite Sanitary Sewer, Prepared by EMK Consultants, July 2025.

6. Conceptual Utility Letter for Dawson Trails, Prepared by Core Consultants, May 2022.

7. Technical Memorandum – Dawson Trails – Crystal Valley Water Connection, prepared by MSK Consulting, August 15, 2023.

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

associated with the Town's Concept, Preliminary, and Final Development Packages are documented in Chapter 3 of these Criteria.

Use 265 gpd/du for both of these. Per the latest technical memorandum for the Dawson Trails – Crystal Valley Water Connection by MSK Consulting, the average daily demand for Dawson Trails has been reduced to 265 gpd per/SFE. This lower value accounts for the water conservation requirements within Dawson Trails and the Town's ordinance that limits the amount of outdoor irrigated area per new home.

4.4.1. Design Demands

The tabulation below provides the Average Daily Demand (ADD) rates that shall be applied to compute the demands associated with the various types of land use within the development. Demands shall be computed for intermediate and full build-out phases of the development, and shall be assigned to the appropriate design points within the model to accurately reflect the geographical distribution of land use throughout the site.

Land Use	Typical ADD/Unit	Typical SFEs/Unit
Single Family Residential and Duplexes	400 gpd/dwelling unit	1.00/dwelling unit
Multi-Family Residential (Townhomes and	260 gpd/dwelling unit	0.65/dwelling unit
Retail/Offices	0.2 gpd/SF	0.0005/SF
Hotels/Motels	75 gpd/room	0.19/room
Restaurants	3.0 gpd/SF	0.0075/SF
Car Washes	5,000 gpd/facility	12.5/facility
Industrial / Other Commercial	1,200 gpd/acre	3.0/acre
Institutional	800 gpd/acre	2.0/acre
Rates for Typical Douglas County		
School Sizes:		
Elementary (10 ac, 675 students)	3,375 gpd/school	8.44/school
Middle (25 ac, 850 students)	8,500 gpd/school	21.25/school
High (50 ac, 1,700 students)	17,000 gpd/school	42.50/school
Rates for Alternate School Sizes:		
Elementary – Domestic	5 gpd/student	0.013/student
Middle – Domestic	10 gpd/student	0.025/student
High – Domestic	10 gpd/student	0.025/student
Elementary Schools – Irrigation	3,000 gpd/total acreage	7.5/total acreage
Middle Schools – Irrigation	5,250 gpd/total acreage	13.1/total acreage
High Schools – Irrigation	4,400 gpd/total acreage	11.0/total acreage
Churches	600 gpd/church	1.5/church
Gym/Fitness Center	0.5 gpd/SF	0.00125 SFE/SF
Irrigated Land (Sports Fields and School Sites Excluded)	3,750 gpd/ irrigated acre	9.38/acre

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

Water Service Demand Calculations - Tract O and H
Calculated by: DJO
Date: 11/10/2025

Junction ID	Blocks to Junction	Number of Dwelling Units	Average Day (gal/day)	Average Day (gpm)	Irrigation Average Day (gal/day)	Irrigation Average Day (gpm)	Maximum Day (gal/day)	Maximum Day (gpm)	Peak Hour (gal/day)	Peak Hour (gpm)	Notes
J-1			0	0.0			0	0.0	0	0.0	
J-2			0	0.0	5700	4.0	5700	4.0	5700	4.0	Irrigation POC #10 (1.52 acres, 18 gpm highest flowrate)
J-3			0	0.0			0	0.0	0	0.0	
J-4			0	0.0			0	0.0	0	0.0	
J-5			0	0.0			0	0.0	0	0.0	
J-6	13	18	4770	3.3	13050	9.1	24975	17.3	39285	27.3	Irrigation POC #11 (3.48 acres, 18 gpm highest flowrate)
J-7	14, 15, 21	38	10070	7.0			25175	17.5	55385	38.5	
J-8	16	4	1060	0.7			2650	1.8	5830	4.0	
J-9	17	11	2915	2.0			7287.5	5.1	16032.5	11.1	
J-10			0	0.0	10613	7.4	10612.5	7.4	10612.5	7.4	Irrigation POC #13 (2.83 acres, 18 gpm highest flowrate)
J-11			0	0.0			0	0.0	0	0.0	
J-12	1, 2	20	5300	3.7			13250	9.2	29150	20.2	
J-13	4	7	1855	1.3			4637.5	3.2	10202.5	7.1	
J-14	5, 6	7	1855	1.3			4637.5	3.2	10202.5	7.1	
J-15	18	13	3445	2.4			8612.5	6.0	18947.5	13.2	
J-16	19, 24	26	6890	4.8			17225	12.0	37895	26.3	
J-17	22, 23	25	6625	4.6			16562.5	11.5	36437.5	25.3	
J-18	10, 20	41	10865	7.5			27162.5	18.9	59757.5	41.5	
J-19	11, 12	12	3180	2.2			7950	5.5	17490	12.1	
J-20			0	0.0	638	0.4	638	0.4	638	0.4	Irrigation POC #12 (0.17 acres, 10 gpm highest flowrate)
J-21	7, 8	13	3445	2.4			8612.5	6.0	18947.5	13.2	
J-22	9	9	2385	1.7			5962.5	4.1	13117.5	9.1	
J-23	1a	6	1590	1.1			3975	2.8	8745	6.1	
J-24	3	6	1590	1.1			3975	2.8	8745	6.1	

Notes:
1. Average Day Demand = 265 gal-day/dwelling unit (This is different from the ToCR water manual because new regulations allow for less landscaping)
2. Maximum Day Demand = 2.5 x Average Day Demand
3. Peak Hour Demand = 5.5 x Average Day Demand
4. Irrigation applied at 3750 gpd/irrigated acre

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

Water Storage Calculations

	Gallons per Minute (GPM)	Gallons Per Day (GPD)	Million Gallons per Day (MGD)
Total Max Day Demand	138.6	199601	0.200
Required Fire Flow (1,000 gpm for 120 min)	1000	120000	0.12
Required Storage		319601	0.320
Required Storage without Fire Flow		199601	0.200

4.4.2 Storage Requirements

The required storage volume associated with a particular development shall be computed as follows:

Storage Volume (MG) = Maximum Day Demand (MG) + Fire Flow (MG)

Example Calculation:

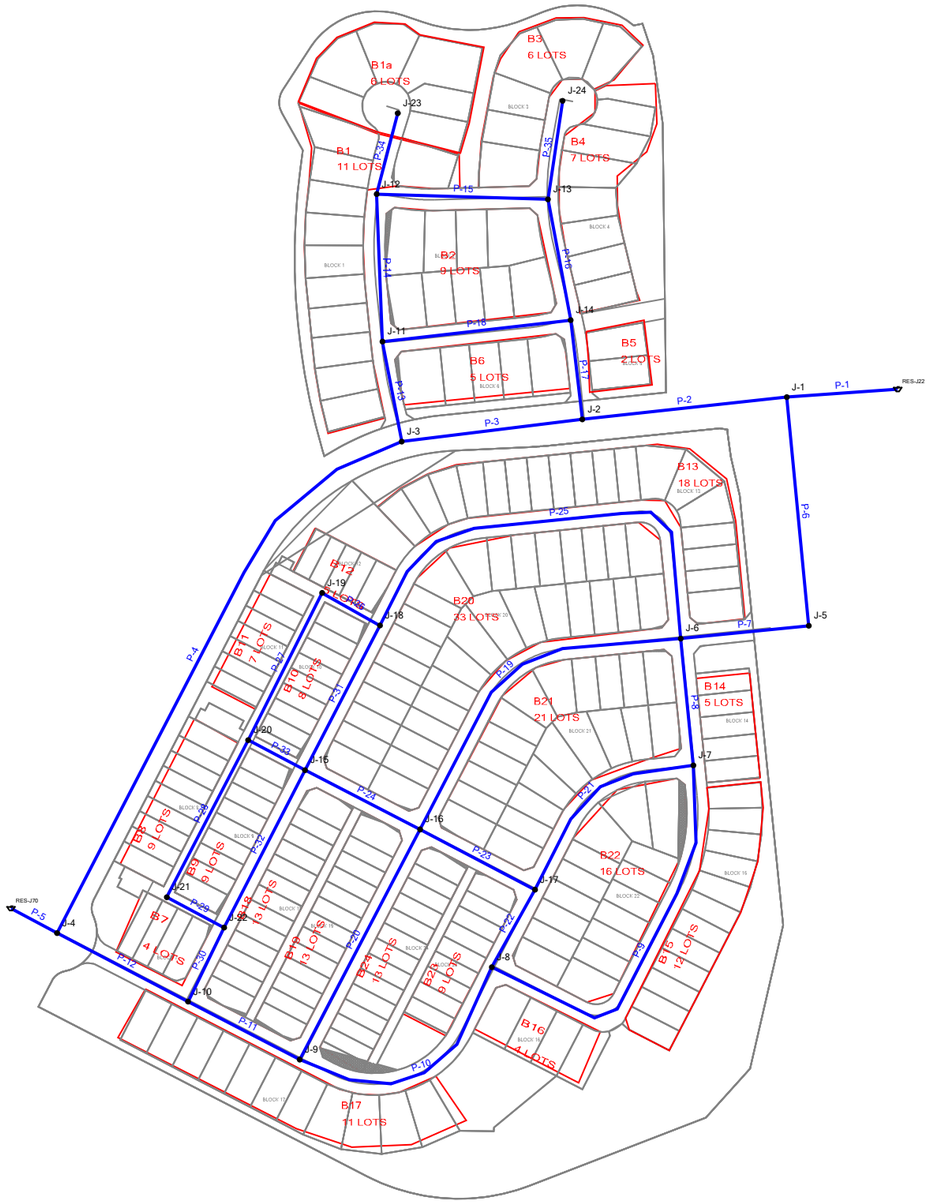
Based on an assumed 1500 gpm two-hour fire and an MDD rate of 75 gpm, the storage requirement would be:

75 gpm x 60 min/hr x 24 hrs =	108,000 gallons
+ 1500 gpm x 60 min/hr x 2 hrs =	180,000 gallons
Total required storage =	288,000 gallons (0.288 MG)

Based on the computed storage volume, Castle Rock Water will evaluate whether the development is compatible with the location and magnitude of the existing and master-planned storage volume within the pressure zone, or if additional storage must be considered to provide the appropriate level of service to the development. Due to hydraulic constraints and limitations within the service area, fire storage within the pressure zone may need to be duplicated as determined by Castle Rock Water.

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

WATERCAD SCHEMATIC - DAWSON TRAILS TRACT O AND H



Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

Wastewater Flow Calculations - Dawson Trails Tract D

Single Family Res and Duplexes	Average Daily Flow (gpd/du) (gpd/du)	Average Daily Flow (gpd)	Average Daily Flow (MGD)	Peaking Factor	I/I allowance (MGD)	Peak Daily Flow (PDF) (MGD)
256	200	51200	0.0512	5	0.00512	0.26112

4.4.1.1 Wastewater System Average Daily Flow (ADF)

Land Use	Typical ADF/Unit	Typical SFEs/Unit
Single Family Residential and Duplexes	200 gpd/dwelling unit	1.00/dwelling unit
Multi-Family Residential (Townhomes and Condos)	130 gpd/dwelling unit	0.65/dwelling unit
Retail/Offices	0.1 gpd/SF	0.0005/SF
Hotels/Motels	75 gpd/room	0.375/room
Restaurants	1.5 gpd/SF	0.0075/SF
Car Washes	5,000 gpd/acre	25.0/acre
Industrial/Other Commercial	600 gpd/acre	3.0/acre
Institutional	400 gpd/acre	2.0/acre
Churches	300 gpd/church	1.5/church
Gym/Fitness Center	0.5 gpd/SF	0.00125 SFE/SF
Irrigated Land	0 gpd/acre	0.0/acre
Rates for Typical Douglas County School Sizes:		
Elementary (10 ac, 675 Students)	3,375 gpd/school	16.88/school
Middle (25 ac, 850 students)	8,500 gpd/school	42.50/school
High (50 ac, 1700 students)	17,000 gpd/school	85.00/school
Rates for Alternate School Sizes:		
Elementary	5 gpd/student	0.025/student
Middle	10 gpd/student	0.050/student
High	10 gpd/student	0.050/student

4.4.1.2 Peaking Factor

The portion of the Peak Design Flow calculation exclusive of I/I shall be determined by multiplying the ADF in the preceding section by a peaking factor (PF). The PF is a function of ADF, and shall be computed as follows: $PF = 3.65 \times [(ADF)^{-0.168}]$.

The maximum PF shall be 5.0, and ADF shall be expressed in units of million gallons per day (MGD).

4.4.1.3 Peak Design Flow Rate

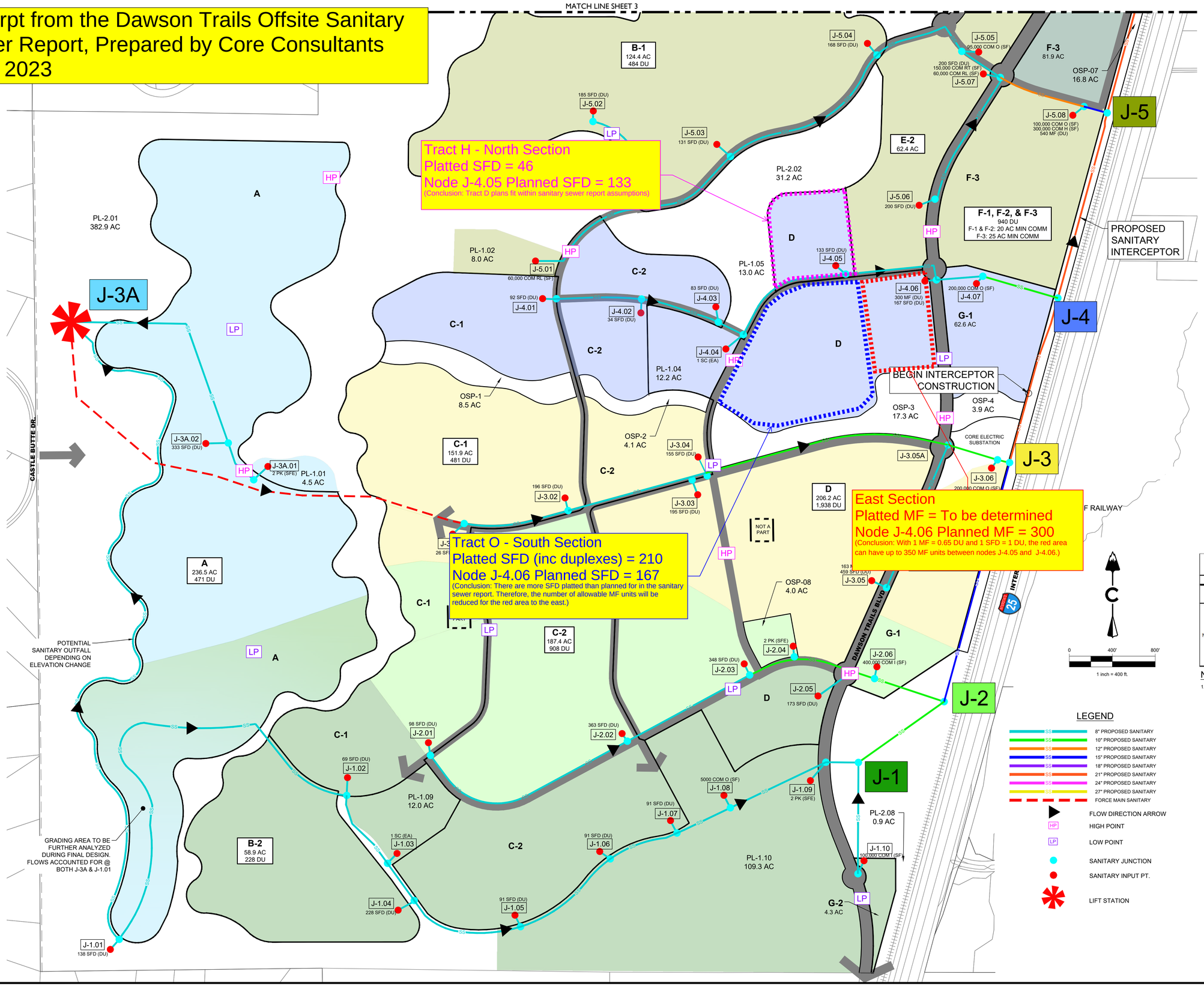
The Peak Design Flow (PDF) shall be computed at all pertinent design points throughout the system, and used to size the corresponding wastewater facilities. The PDF shall be determined by multiplying the ADF by the calculated peaking factor (PF), plus an I/I allowance equal to ten percent of the ADF as expressed by the following formula:

PDF = peak base flow + I/I allowance = (ADF*PF) + (0.1*ADF)

Once computed, the PDF shall be used to determine the sizes of the facilities in accordance with the criteria established below.

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.

Excerpt from the Dawson Trails Offsite Sanitary Sewer Report, Prepared by Core Consultants June 2023



JUNCTION TABLE

JUNCTION	RESIDENTIAL (GPD)	NON-RESIDENTIAL (GPD)	TOTAL PEAK FLOW (GPM)	CUMULATIVE TOTAL PEAK FLOW (GPM)
J-1.01	27,600	-	98	98
J-1.02	13,800	-	49	147
J-1.03	-	3,375	12	159
J-1.04	45,600	-	162	320
J-1.05	18,200	-	65	385
J-1.06	18,200	-	65	449
J-1.07	18,200	-	65	514
J-1.08	-	500	2	516
J-1.09	-	400	2	517
J-1.10	-	551	2	2
J-1	-	-	-	519
J-2.01	19,600	-	70	70
J-2.02	72,600	-	257	327
J-2.03	69,600	-	247	573
J-2.04	-	400	2	575
J-2.05	34,600	-	123	697
J-2.06	-	2,204	8	705
J-2	-	-	-	1,224
J-3A.01	-	400	2	2
J-3A.02	66,600	-	236	237
J-3A	-	-	-	335
J-3.01	5,200	-	19	354
J-3.02	39,200	-	139	493
J-3.03	39,000	-	138	631
J-3.04	31,000	-	110	741
J-3.05	92,340	-	327	327
J-3.05A	-	-	-	1,068
J-3.06	-	20,000	71	1,139
J-3	-	-	-	2,363
J-4.01	18,400	-	65	65
J-4.02	6,800	-	24	89
J-4.03	16,600	-	59	148
J-4.04	-	3,375	12	160
J-4.05	26,600	-	94	254
J-4.06	72,400	-	257	511
J-4.07	-	20,000	71	582
J-4	-	-	-	2,945
J-5.01	-	6,000	21	21
J-5.02	37,000	-	131	152
J-5.03	26,200	-	93	245
J-5.04	33,600	-	119	364
J-5.05	-	9,500	34	398
J-5.06	26,000	-	92	92
J-5.07	26,000	231,000	910	1,400
J-5.08	70,200	63,906	475	1,875
J-5	-	-	-	4,820
J-6.01	-	8,000	28	28
J-6.02	52,000	12,479	228	257
J-6	-	-	-	5,077
J-7.01	-	40,000	142	142
J-7.02	-	5,000	18	160
J-7.03	-	27,500	97	257
J-7	-	-	-	5,334
J-8.01	-	400	2	2
J-8.02	-	10,000	36	37
J-8.03	-	400	2	39
J-8	-	-	-	5,372
J-9.01	-	3,030	11	11
J-9	-	-	-	5,383
TOTAL	1,023,140	468,421	-	5,383

SUMMARY TABLE

	USE	QUANITIES	TOTALS
RESIDENTIAL	MULTIFAMILY (DU)	2,098	5,850
	SINGLE FAMILY (DU)	3,752	
NON-RESIDENTIAL	SCHOOL (EA)	2	3,200,000
	PARKS (SFE)	10	
	CAR WASH (AC)	3	
	INDUSTRIAL (SF)	1,500,000	
	HOTEL (SF)	300,000	
	RESTAURANTS (SF)	175,000	
	RETAIL/ OFFICE (SF)	1,225,000	

NOTES:

1. SEE APPENDIX C FOR DETAILED SANITARY SEWER CALCULATIONS

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
- HP HIGH POINT
- LP LOW POINT
- SANITARY JUNCTION
- SANITARY INPUT PT.
- LIFT STATION

LEGEND

- BASIN 1
- BASIN 2
- BASIN 3A
- BASIN 3B
- BASIN 4
- BASIN 5
- BASIN 6
- BASIN 7
- BASIN 8
- BASIN 9

- X SFD (DU) SINGLE FAMILY (UNITS)
- X MF (DU) MULTI-FAMILY (UNITS)
- X SC (EA) SCHOOL (UNITS)
- X COM (SF) COMMERCIAL (UNITS)
  - RL RETAIL
  - O OFFICE
  - H HOTEL
  - I INDUSTRIAL
  - RT RESTAURANT
  - CW CAR WASH
- X PK (SFE) PARK (UNITS)

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

LAND DEVELOPMENT | ENERGY | PUBLIC INFRASTUCTURE

CORE

DETAILED WASTEWATER MAP

DAWSON TRAILS OFFSITE SANITARY SEWER

DATE: 3/24/23

CREATED BY: CGV

JOB NO. 20-224

SHEET 2 OF 5

2022-10-10 (4:13 PM) Caroline Van Horn X:\20-224 Dawson\Civil\CAD\Plans\Sanitary Offsite\Utility Detailed Wastewater Maps.dwg

Excerpt from the "Final Utility Report For Dawson Trails - Filing 2, Amendment 2" by EMK Consultants, dated 2025.



DAWSON TRAILS - TRACT O AND H
SITE LOCATION MAP

(NTS)

N

APPENDIX E

Supporting Documents

PCWRA Form
Fire Flow Memo

Commercial Business Building Permit

Grease Interceptor Requirement

All Commercial Business Building Permits for new business and construction of new buildings, remodels, or tenant improvement permits will be required to comply with Town Code 13.05, Grease Interceptors Required. Applicant will be required to submit an Industry Information Questionnaire through the Plum Creek Water Reclamation Authority (PCWRA) to verify if the business will require an oil/grease interceptor. Please go to PCWRA website at:

https://www.pcwracolorado.org/commercial-businesses

CONSTRUCTION DRAWINGS

Please note PCWRA requires all new commercial buildings to provide a stub-out for a separate waste line for future interceptor installation, if not proposed with the project. All drainage fixtures and grease waste lines that are tied to the oil/grease must be shown in the construction drawings as well as the location of the oil/grease interceptor.

ACKNOWLEDGEMENT

The applicant must sign and date this form to acknowledge that the applicant has read and understands the Town's Code requirement regarding Grease Interceptors, PCWRA's requirement to complete an Industry Information Questionnaire and Food Service Application, and the Town's requirement that a letter from PCWRA must be provided with the Town of Castle Rock Building Permit. This signed form is required to be included in the Utility Report with the Predevelopment Plan (PDP), Site Development Plan (SDP) and Construction Document (CD) submittals.

Garrett Multifamily Dawson Trails - PA D - Tract F

Name of Project

Dawson Trails Filing 2- PA D - Tract F

Address of property, if known

Sean Reisman

Digitally signed by Sean Reisman
DN: C=US, E=sreisman@thegarrettco.com, CN=Sean Reisman
Date: 2026.05.05 15:11:09-06'00'

Signature

5/5/2026

Date

Castle Rock Fire and Rescue Department
300 Perry Street
Castle Rock, CO 80104

04/28/2026

RE: Garrett Dawson Trails SDP26-0010 - Confirmation Memo of Required Fire Flow

To Life Safety Division,

Please accept the following required fire flow evaluation(s) based upon the currently adopted 2018 International Fire Code for review and confirmation for each of the following proposed buildings.

Building Name: Type 1 Building
Building Address:

Total Fire Flow Calculation Area: 59,308 square feet
Building Construction Type: V-A
Are fire sprinklers provided throughout this building? Yes, 13R
Are you proposing a reduction in Required Fire Flow for fire sprinklers? Yes
Are Fire walls provided in this building? No

Reference Appendix B, Table B105.1
Required Fire Flow: 4,500 gpm at 20-psi Flow Duration: 4-hours
If applicable, Calculated Fire Flow including reduction for sprinklers 1500 gpm at 20-psi
Flow Duration: 2 hours

Building Name: Type 2 Building
Building Address:

Total Fire Flow Calculation Area: 66,207 square feet
Building Construction Type: V-A
Are fire sprinklers provided throughout this building? Yes, 13R
Are you proposing a reduction in Required Fire Flow for fire sprinklers? Yes
Are Fire walls provided in this building? No

Reference Appendix B, Table B105.1
Required Fire Flow: 4,750 gpm at 20-psi Flow Duration: 4-hours
If applicable, Calculated Fire Flow including reduction for sprinklers: 1500 gpm at 20-psi
Flow Duration: 2 hours

terracina design

Landscape Architecture ▪ Planning ▪ Civil Engineering
10200 E. Girard Avenue, A-314. Denver, CO 80231 ph: 303.632.8867

Building Name: Type 3 Building
Building Address:

Total Fire Flow Calculation Area: 73,201 square feet
Building Construction Type: V-A
Are fire sprinklers provided throughout this building? Yes, 13R
Are you proposing a reduction in Required Fire Flow for fire sprinklers? Yes
Are Fire walls provided in this building? No

Reference Appendix B, Table B105.1
Required Fire Flow: 4,750 gpm at 20-psi Flow Duration: 4-hours
If applicable, Calculated Fire Flow including reduction for sprinklers: 1500 gpm at 20-psi
Flow Duration: 2 hours

Building Name: Clubhouse Building
Building Address:

Total Fire Flow Calculation Area: 5,631 square feet
Building Construction Type: V-B
Are fire sprinklers provided throughout this building? No
Are you proposing a reduction in Required Fire Flow for fire sprinklers? No
Are Fire walls provided in this building? No

Reference Appendix B, Table B105.1
Required Fire Flow: 2,000 gpm at 20-psi Flow Duration: 2-hours

Building Name: Maintenance Building
Building Address:

Total Fire Flow Calculation Area: 693 square feet
Building Construction Type: V-B
Are fire sprinklers provided throughout this building? No
Are you proposing a reduction in Required Fire Flow for fire sprinklers? No
Are Fire walls provided in this building? No

Reference Appendix B, Table B105.1
Required Fire Flow: 1,500 gpm at 20-psi Flow Duration: 2-hours

Building Name: Detached Garage Building – Type 1
Building Address:

Total Fire Flow Calculation Area: 5,631 square feet
Building Construction Type: V-B
Are fire sprinklers provided throughout this building? No
Are you proposing a reduction in Required Fire Flow for fire sprinklers? No
Are Fire walls provided in this building? No

Reference Appendix B, Table B105.1
Required Fire Flow: 2,000 gpm at 20-psi Flow Duration: 2-hours

Building Name: Detached Garage Building – Type 2
Building Address:
Total Fire Flow Calculation Area: 5,284 square feet
Building Construction Type: V-B
Are fire sprinklers provided throughout this building? No
Are you proposing a reduction in Required Fire Flow for fire sprinklers? No
Are Fire walls provided in this building? No

Reference Appendix B, Table B105.1
Required Fire Flow: 2,000 gpm at 20-psi Flow Duration: 2-hours

Reference Appendix C, Table C105.1
Required Number of Fire Hydrants: 1 Maximum Average Spacing: 400
Maximum Distance from Fire Hydrant to Building: N/A feet, as a fire truck would drive (Note in sprinkled buildings, a hydrant shall be located within 100-ft of the FDC)

Design Engineers Signature: _____ Date: 4/28/2026

The determined Required Fire Flow, Number of Fire Hydrants and Hydrant Spacing as shown above satisfy the fire protection requirements of the Castle Rock Fire and Rescue Department.

Final fire hydrant placement will be determined and approved during the Site Development (SDP) and/or Construction Document (CD) review phase.

Castle Rock Fire Signature: Kevin Sullivan _____ Date: 08-30-2024

Digitally signed by Kevin Sullivan
DN: C=US, E=ksullivan@crgov.com, O="Castle Rock Fire and Rescue Department ", CN=Kevin Sullivan
Reason: I agree to the terms defined by the placement of my signature on this document
Date: 2026.05.06 18:28:22-06'00'

Fire Department Plan Review Number: Fire Flow #2026-0012

Supplemental Information (DO NOT INCLUDE WITH REVIEW SUBMITTAL):

Fire Flow Calculation Area or Fire Area (2018 IFC, Definitions) – The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or horizontal assemblies of a building. If a fire wall/barrier is included, then the total fire flow calculation area provided on the memo shall include the total square footage on "each side" of the wall.

Reduction for Fire Sprinklers (2018 IFC, Section B105.2) –A reduction in fire flow up to 75% may be granted by the Fire Code Official for the installation of an NFPA 13 or NFPA 13R fire sprinkler, whether

they are required or not. Any reduction must be approved by the Fire Code Official (Fire Marshal) after review of the building, water distribution system, and use of the building.

> Example: If the building requires 5000-gpm per Table B105, and the building is sprinklered, then the required fire flow may be reduced to 2500-gpm. The required number of hydrants and spacing will be determined by the reduced fire flow. The minimum flow accepted for commercial building is 1500-gpm. When reducing the fire flows, you will occasionally end up with an odd number such as 1825-gpm, in these cases you should round up to the nearest 250-gpm.

Multiple Buildings on One Site – If multiple buildings are proposed on one site (ie. Apartment Complex), then each "building" shall be evaluated based on the largest building and a single memo using the recommended format repeated for each individual structure.

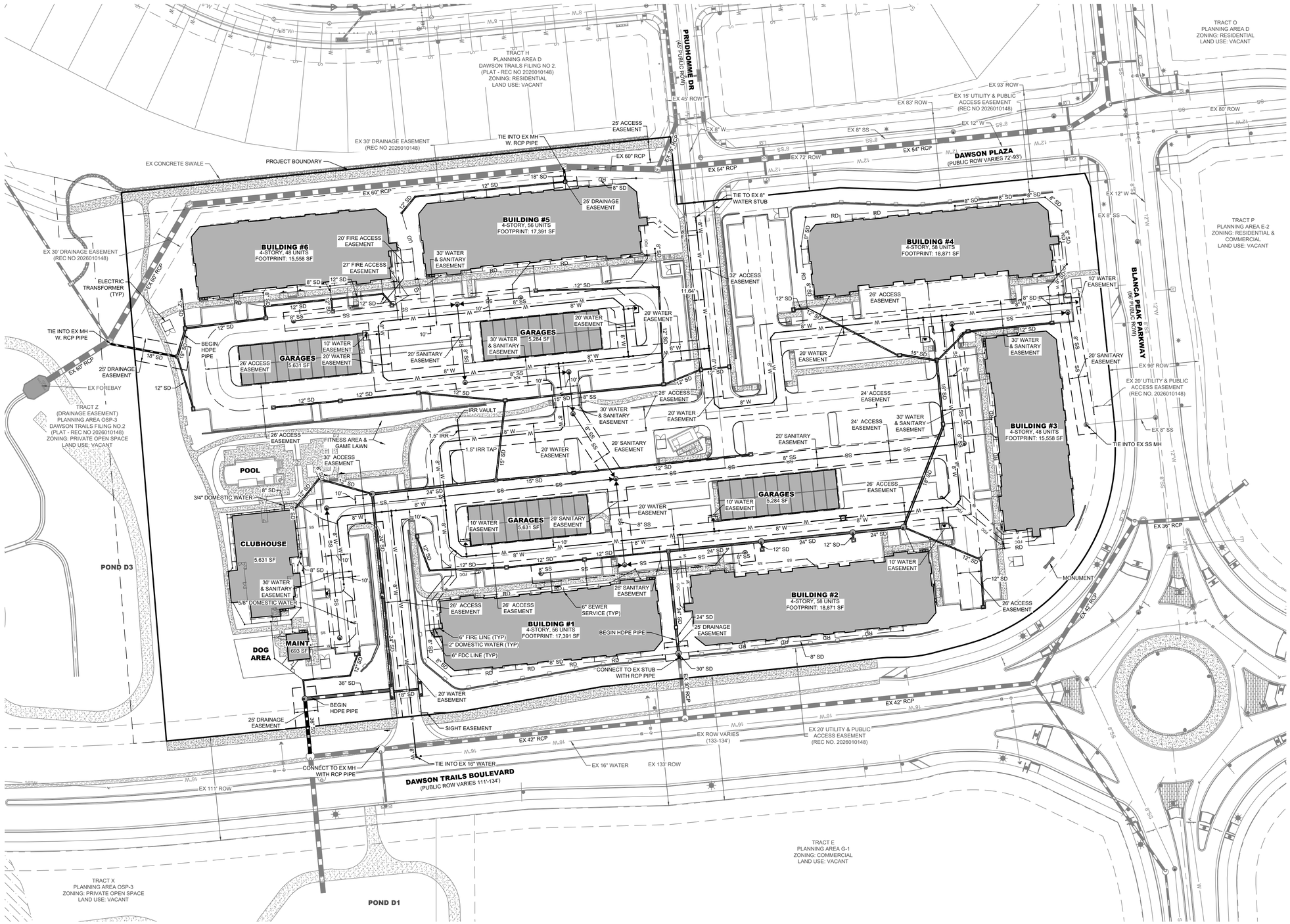
Alayna Moore AMoore@crgov.com

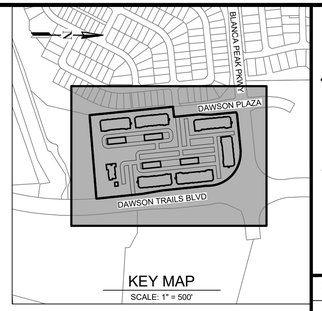
APPENDIX F

Plans

Overall Utility Plan

SITE DEVELOPMENT PLAN
TRACT F, DAWSON TRAILS FILING NO. 2
A PORTION OF SECTION 27 & 28, TOWNSHIP 8 SOUTH, RANGE 67 WEST
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
SCALE: 1" = 500'

0 50' 100'
1 inch = 50'

LEGEND

- STORM DRAIN PRIVATE (12" MIN HDPE)
- STORM DRAIN PUBLIC (RCP)
- RD — ROOF DRAIN PRIVATE (8" PVC)
- UD — 6" PERFORATED PIPE
- NYLOPLAST MH & NYLOPLAST INLET
- SANITARY
- SS — 8" PVC SANITARY LINE
- SS — SS — 6" SANITARY SERVICE
- WATER (HYDRANT, VALVE, BEND, ARV)
- W — WATER LINE
- W — W — W — 6" WATER SERVICE
- F — F — F — 6" DIP FIRE LINE
- FDC — FDC — 6" DIP FDC LINE
- FIRE DEPARTMENT CONNECTION (FDC)
- UE — UNDERGROUND ELECTRIC
- X — EXISTING FENCE
- FO — EXISTING FIBER OPTIC
- G — EXISTING GAS
- T — EXISTING TELEPHONE
- W — EXISTING WATER
- EXISTING SWALE
- EXISTING SANITARY CLEAN OUT
- EX WATER VALVE & HYDRANT
- EXISTING STREET LIGHT
- EXISTING STREET SIGNS

UTILITY NOTES

1. THIS SITE IS LOCATED WITHIN THE TOWN OF CASTLE ROCK RED WATER PRESSURE ZONE.
2. ALL PROPOSED EASEMENTS MUST BE RECORDED PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS.
3. ALL UTILITY EASEMENTS FOR WATER AND WASTEWATER LINES SHALL BE FOR THE EXCLUSIVE USE OF THE TOWN SO THAT ACCESS AND MAINTENANCE MAY BE PERFORMED.
4. THE MINIMUM SEPARATION BETWEEN WATERLINES, SANITARY SEWER AND STORM SEWER LINES IS 10 FEET.
5. THE MINIMUM SEPARATION BETWEEN WATER SERVICE LINES IS 5 FEET.
6. ANY TIE-IN, CROSSING OR LOWERING OF TOWN CRITICAL INFRASTRUCTURE WILL REQUIRE A TIME AND MATERIALS PERMIT (TMU) WITH FEES REQUIRED PRIOR TO CONSTRUCTION.

TRACT F, DAWSON TRAILS FILING NO. 2
SITE DEVELOPMENT PLAN
PROJECT # SDP26-0010

terracina design
PLANNING
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE

#	REVISION DESCRIPTION	DATE	BY
1	1ST SUBMITTAL	04/16/2026	JF
2	2ND SUBMITTAL	05/08/2026	JF
3	3RD SUBMITTAL	09/11/2026	JF
4	4TH SUBMITTAL	10/16/2026	JF

NOT FOR CONSTRUCTION

TRACT F, DAWSON TRAILS FILING NO. 2
CASTLE ROCK, COLORADO

SITE DEVELOPMENT PLAN
OVERALL UTILITY PLAN

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

SHEET
8 OF 36

10/16/2026 10:01 AM X:\GARRETT - DAWSON TRAIL\CAD\PLANS\01 - SDP\ UTILITY PLAN - DAWSON.DWG SDP