



D E V E L O P M E N T

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Greenwood Village, CO 80111
Main 720.602.4999 + **Fax** 713.965.0044
▶ HRGREEN.COM

January 24, 2025

Aurora Water | City of Aurora
26791 E. Quincy Avenue
Aurora, CO 80016

Re: Kings Point South Subdivision Filing No. 2 Utility Conformance Letter

The purpose of this letter is to confirm Kings Point South Subdivision Filing No. 2 is in conformance with the approved *Kings Point South Master Utility Report* EDN 223003MU1, by HR Green Development, LLC dated December 2022. Kings Point South Subdivision Filing No. 2 is the second phase of the Kings Point South development and is entirely on the east side of E-470.

The total acreage of the Filing No. 2 Subdivision is 150.3 acres, which is more than the 139.6 acres analyzed in the master report. Residential and parks are the designated land uses for the five planning areas on site. These land uses are different than the Master Utility Report because a school was analyzed as one of the land uses in the master report and is no longer included in this project. The lot count for the Kings Point File No. 2 site is 433 units which is less than the 458 units reported in the Master Utility Report. The offsite lot count from the Vistas at Kings Point Master Utility Report (EDN 224280MU1) by Terracina Design is 358 units plus an additional 30 units from the Overlook at Kings Point South just south of the Vistas site.

Offsite sanitary sewer flow from the Vistas site enters the Kings Point South Filing No. 2 from the east and has been considered in the sanitary demand calculations. The total peak flow plus infiltration rate was calculated to be 0.673 MGD as it leaves the KPS site which is higher than the calculated flow of 0.612 MGD from the MUR.

The total average day water demand for the Filing 2 Subdivision plus the offsite flow is 0.155 MGD which is higher than the 0.142 MGD calculated in the MUR.

The sanitary and water demands calculated in this report are higher than what was anticipated in the MUR because the lot counts from the offsite property to the east in the Master Utility Report are less than the actual number of units on the Vistas at Kings Point Site. Although the flow rates in this report are higher than anticipated, the calculations show that the pipe sizes will remain the same in this report as shown in the MUR while remaining within the criteria for velocity and percent full.

All other assumptions made with the Master Utility Report including connection points and utility line sizes remain unchanged from the Master Utility Report.

If there are any questions or comments on the contents, please do not hesitate to contact me directly at 720-390-4235.



D E V E L O P M E N T

Sincerely,

HR GREEN, INC.

A handwritten signature in blue ink that reads 'Kristine House'.

Kristine House, P.E., CFM

Associate | Lead Engineer – Land Development



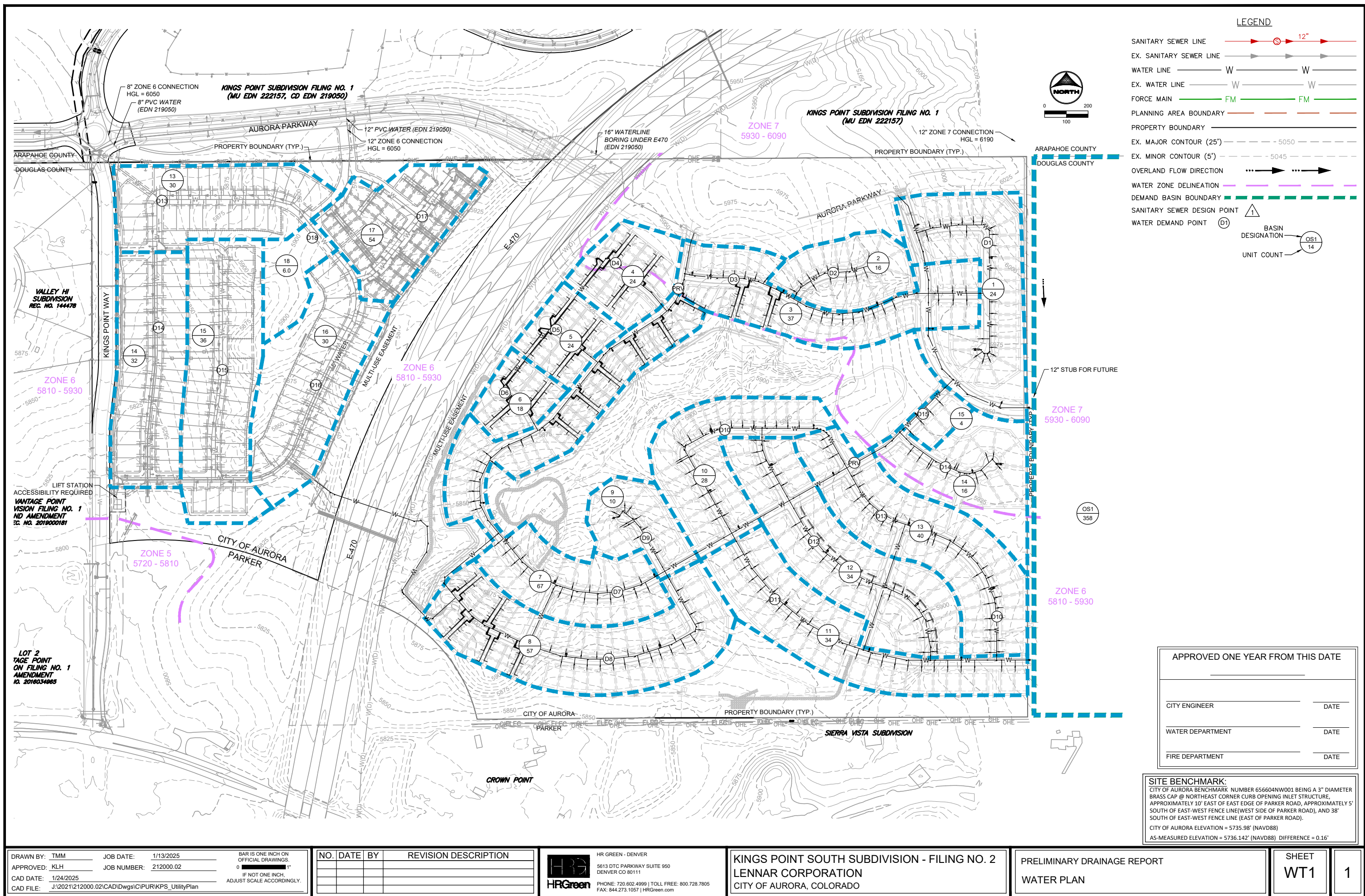
PROJECTED WATER DEMAND GENERATION

Project #: **212000.02**
 Project: **Kings Point South**
 Location: **Aurora, CO**
 Plan Date: **Conformance Utility Report**

By: **T. McMunn**
 Checked: **K. House**
 Date: **1/23/2025**

RESIDENTIAL WATER USE 101 GPCD SINGLE-FAMILY POPULATION DENSITY 2.77 PERSONS/UNIT
 PARKS & GREEN BELTS 1,800 GPD/ACRE RESIDENTIAL FIRE FLOW 1,500 GPM FOR 2 HRS
 MAX. DAY / AVG. DAY 2.80
 MAX. HOUR / FLOW RATIO 4.50

LAND USE	NO. OF SF UNITS OR ACERAGE	AVG. DAY DEMAND (GPD)	AVG. DAY DEMAND (GPM)	MAX. DAY DEMAND (GPM)	MAX. HOUR DEMAND (GPM)	MAX. DAY + FIRE FLOW (GPM)	DEMAND BASIN	JUNCTION
RESIDENTIAL	24	6,714	4.66	13.06	20.98	1,513	1	D1
RESIDENTIAL	16	4,476	3.11	8.70	13.99	1,509	2	D2
RESIDENTIAL	37	10,351	7.19	20.13	32.35	1,520	3	D3
RESIDENTIAL	24	6,714	4.66	13.06	20.98	1,513	4	D4
RESIDENTIAL	24	6,714	4.66	13.06	20.98	1,513	5	D5
RESIDENTIAL	18	5,036	3.50	9.79	15.74	1,510	6	D6
RESIDENTIAL	67	18,745	13.02	36.45	58.58	1,536	7	D7
RESIDENTIAL	57	15,947	11.07	31.01	49.83	1,531	8	D8
RESIDENTIAL	10	2,798	1.94	5.44	8.74	1,505	9	D9
RESIDENTIAL	28	7,834	5.44	15.23	24.48	1,515	10	D10
RESIDENTIAL	34	9,512	6.61	18.50	29.73	1,518	11	D11
RESIDENTIAL	34	9,512	6.61	18.50	29.73	1,518	12	D12
RESIDENTIAL	40	11,191	7.77	21.76	34.97	1,522	13	D13
RESIDENTIAL	16	4,476	3.11	8.70	13.99	1,509	14	D14
RESIDENTIAL	4	1,119	0.78	2.18	3.50	1,502	15	D15
TOTALS	433	121,140	84	236	379	1,536	N/A	N/A





SANITARY SEWER DEMAND CALCULATIONS

Project Number: **212000.02**
Project: **Kings Points South Filing No. 2**

Location: **Aurora, CO**
Plan Date:

By: **T. McMunn**
Checked: **K. House**

Date: **1/23/2025**
Date:

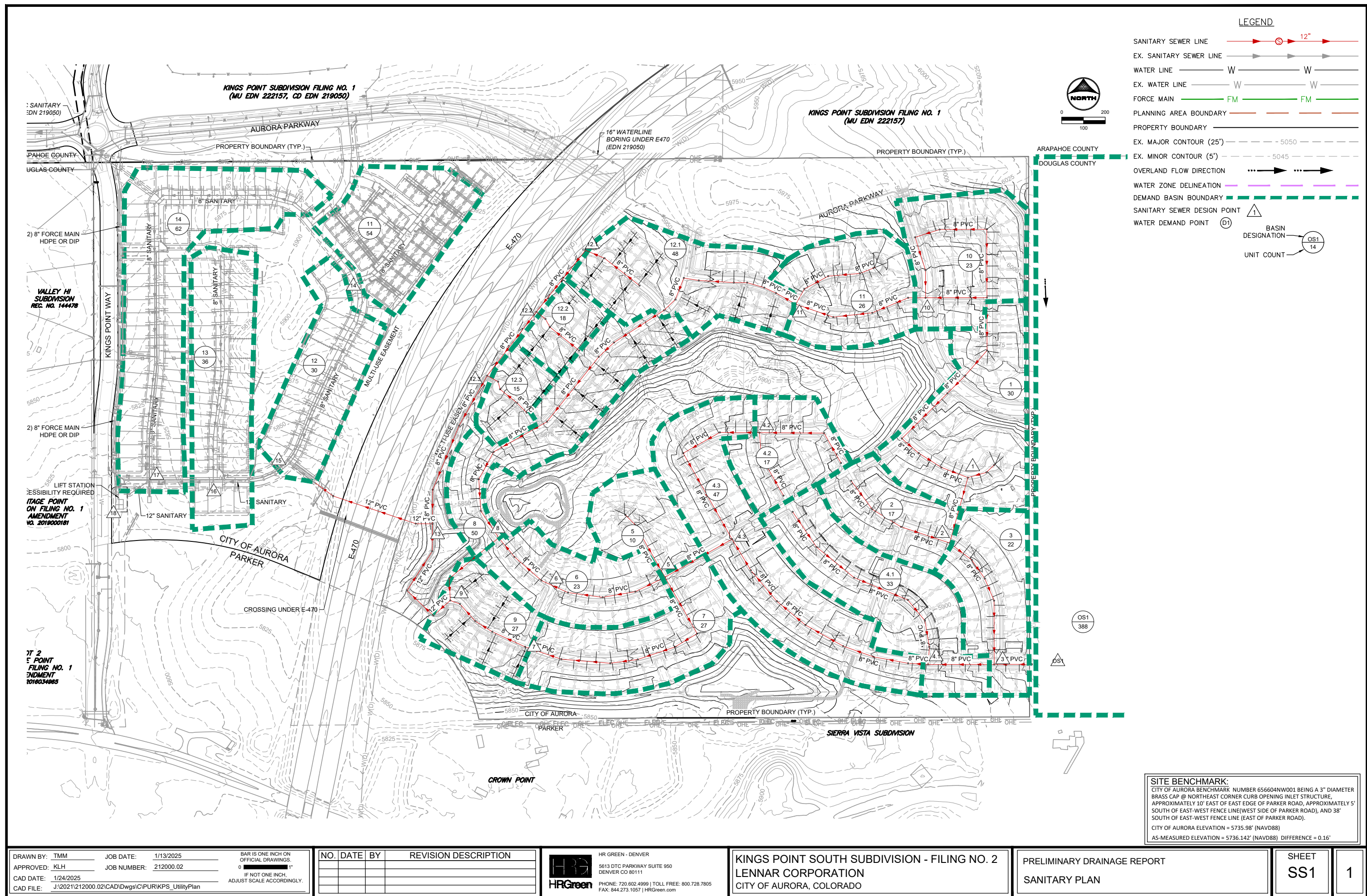
Average Day Loading Rates		
Zoning	(gpcd)	People per Unit
Residential	68	2.77

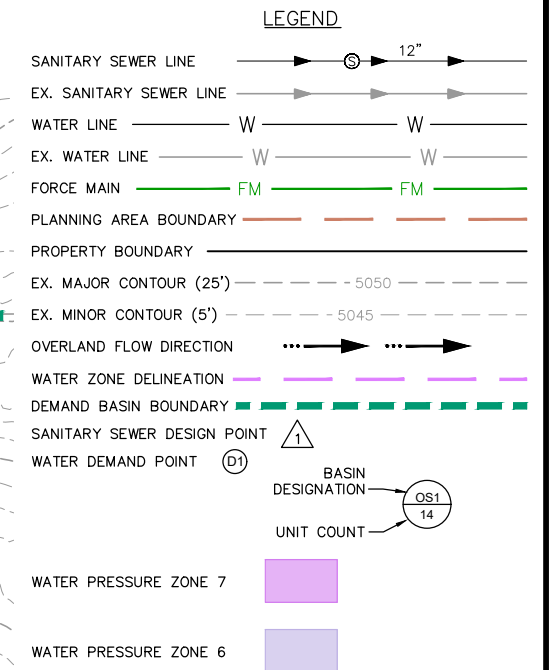
Zoning	(gpd/acre)	Equivalent Population
Schools / Industrial	1,200	18

Peaking Factor			
PF = 5/(p^0.167)		Where p = Population in thousands	
Min. PF =	1.7	Max. PF =	4.0

Pipe Capacity (mgd) (n=.011)		
75 % FULL	Pipe Size (in)	0.4% Slope
	8	0.53
	10	0.97
	12	1.57

Design Point	Basin	Planning Area	No. of Units	No. of Acres	Population Density (people/unit)	Equivalent Population	Average Flow Generation (gpcpd)	Average Day Flow (mgd)	Infil. @ 10% (mgd)	Cumulative Population	Peak Factor	Peak Flow (mgd)	Peak Flow + Infil. (mgd)	Peak Flow + Infil. (cfs)	Estimated Pipe Slope (%)	Actual Pipe Slope (%)	Estimated Size at Given Slope (in)	Pipe Velocity (ft/sec)	Percent Full at Given Slope
1	1		30		2.77	83	68	0.006	0.001	83	4.0	0.023	0.023	0.036					
	Total DP1		30					0.006	0.001	83	4.0	0.023	0.023	0.036	0.4%	5.5%	8	3.12	7.3%
2	2		17		2.77	47	68	0.003	0.000	47	4.0	0.013	0.013	0.020					
	Total DP1 + DP2		47					0.009	0.001	130	4.0	0.035	0.036	0.056	0.4%	0.4%	8	1.44	16.8%
3	3		22		2.77	61	68	0.004	0.000	61	4.0	0.017	0.017	0.026					
	OS-1	The Vistas	388		2.77	1,075	68	0.073	0.007	1,075	4.0	0.292	0.300	0.464					
	Total DP1 - DP3 + DPOS1		457					0.086	0.009	1,266	4.0	0.344	0.353	0.546	0.4%	3.5%	8	6.01	30.7%
4.1	4.1		33		2.77	91	68	0.006	0.001	91	4.0	0.025	0.025	0.039					
	Total DP1 - DP4.1 + DPOS1		490					0.092	0.009	1,357	4.0	0.369	0.378	0.585	0.4%	1.0%	8	3.89	44.5%
4.2	4.2		17		2.77	47	68	0.003	0.000	47	4.0	0.013	0.013	0.020					
	Total DP4.2		17					0.003	0.000	47	4.0	0.013	0.013	0.020	0.4%	4.0%	8	2.35	6.0%
4.3	4.3		47		2.77	130	68	0.009	0.001	130	4.0	0.035	0.036	0.056					
	Total DP1 - DP4.3 + DPOS1		554					0.104	0.010	1,535	4.0	0.417	0.428	0.662	0.4%	0.8%	8	3.60	52.1%
5	5		10		2.77	28	68	0.002	0.000	28	4.0	0.008	0.008	0.012					
	Total DP1 - DP5 + DPOS1		564					0.106	0.011	1,562	4.0	0.425	0.436	0.674	0.4%	0.8%	8	3.62	52.7%
6	6		23		2.77	64	68	0.004	0.000	64	4.0	0.017	0.018	0.027					
	Total DP1 - DP6 + DP0S1		587					0.111	0.011	1,626	4.0	0.442	0.453	0.701	0.4%	2.7%	8	5.57	41.4%
7	7		27		2.77	75	68	0.005	0.001	75	4.0	0.020	0.021	0.032					
	Total DP1 - DP7 + DP0S1		614					0.116	0.012	1,701	4.0	0.463	0.474	0.734	0.4%	0.5%	8	3.20	67.0%
8	8		50		2.77	139	68	0.009	0.001	139	4.0	0.038	0.039	0.060					
	Total DP8		50					0.009	0.001	139	4.0	0.038	0.039	0.060	0.4%	0.5%	8	3.20	67.0%
9	9		27		2.77	75	68	0.005	0.001	75	4.0	0.020	0.021	0.032					
	Total DP1 - DP9 + DPOS1		691					0.140	0.014	2,053	4.0	0.558	0.572	0.885	0.4%	5.5%	8	7.94	33.9%
10	10		23		2.77	64	68	0.004	0.000	64	4.0	0.017	0.018	0.027					
	TOTAL DP10		23					0.004	0.000	64	4.0	0.017	0.018	0.027	0.4%	4.0%	8	2.59	7.0%
11	11		26		2.77	72	68	0.005	0.000	72	4.0	0.020	0.020	0.031					
	TOTAL DP10 + DP11		49					0.009	0.001	136	4.0	0.037	0.038	0.059	0.4%	0.4%	8	1.46	17.3%
12.1	12.1		48		2.77	133	68	0.009	0.001	133	4.0	0.036	0.037	0.057					
	Total DP10 - DP12.1		97					0.018	0.002	269	4.0	0.073	0.075	0.116	0.4%	6.3%	8	4.70	12.3%
12.2	12.2		18		2.77	50	68	0.003	0.000	50	4.0	0.014	0.014	0.022					
	Total DP10 - DP12.2		115					0.022	0.002	319	4.0	0.087	0.089	0.137	0.4%	1.8%	8	4.31	14.7%
12.3	12.3		15		2.77	42	68	0.003	0.000	42	4.0	0.011	0.012	0.018					
	Total DP10 - DP12.3		130					0.024	0.002	360	4.0	0.098	0.100	0.155	0.4%	7.2%	8	5.37	13.7%
13	Total DP1 - DP13 + DPOS1		821					0.164	0.016	2,413	4.0	0.656	0.673	1.041	0.4%	2.2%	12	3.40	39.6%
Total not including offsite			433					0.072	0.007	1,061	4.0	0.289	0.296	0.458					
Kings Point South Filing No. 2 Total + Offsite			821					0.164	0.016	2,413	4.0	0.656	0.673	1.041					

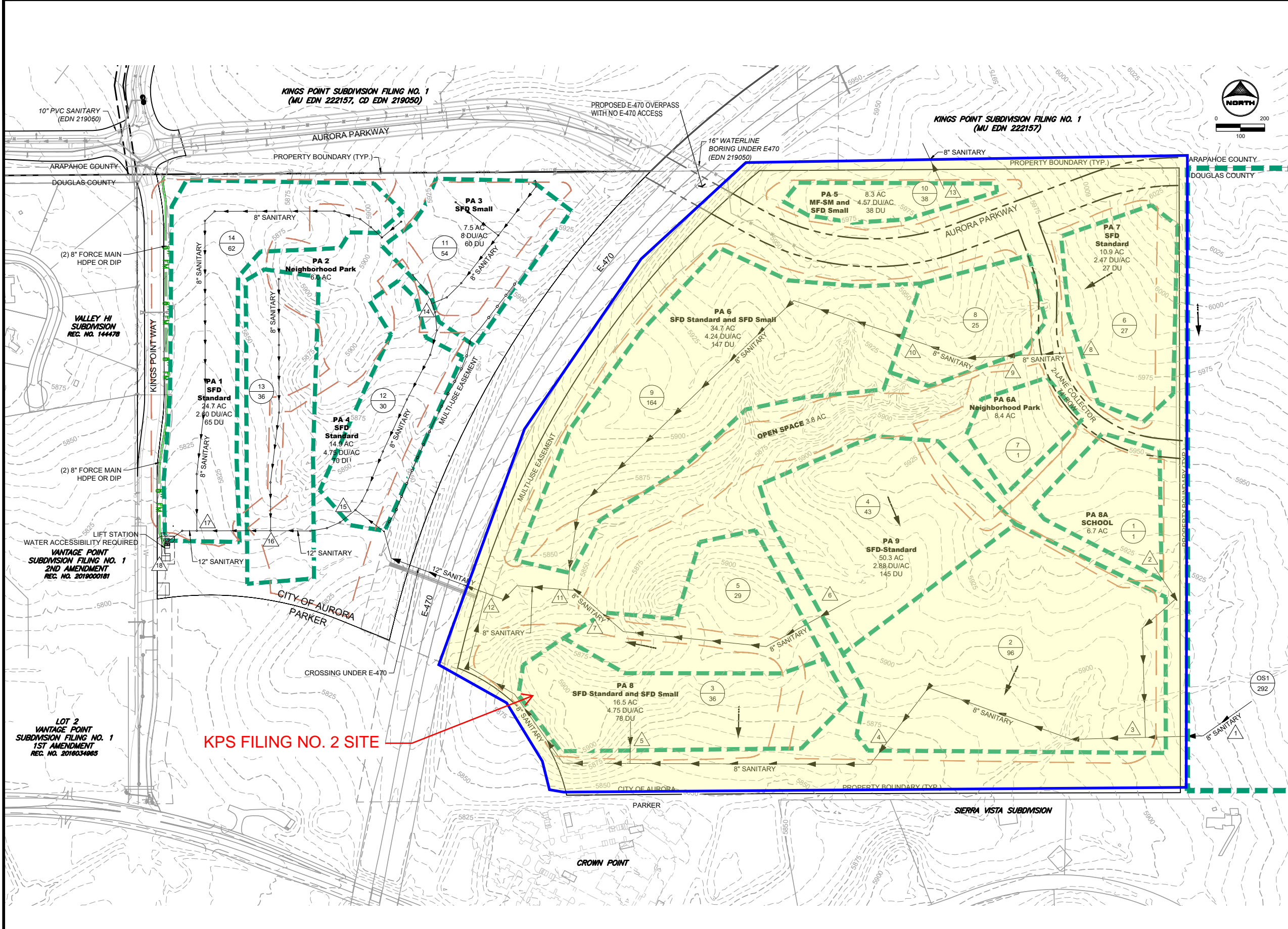





BENCHMARK
NGS CONTROL POINT CRAIN BEING A 3" BRASS CAP SET IN CONCRETE BLOCK LOCATED ON THE WEST SIDE OF PARKER ROAD, AND 2,800' NORTHWEST OF THE INTERSECTION OF PARKER ROAD AND COTTONWOOD DRIVE. ELEVATION = 5734.55' (NAV/D88)


SHEET WT1	1
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2
223003





LEGEND


SANITARY SEWER LINE  12"


EX. SANITARY SEWER LINE 


WATER LINE  W


EX. WATER LINE  W


FORCE MAIN  FM


PLANNING AREA BOUNDARY 


PROPERTY BOUNDARY 


EX. MAJOR CONTOUR (25')  5050


EX. MINOR CONTOUR (5')  5045


OVERLAND FLOW DIRECTION 


WATER ZONE DELINEATION 

DEMAND BASIN BOUNDARY 


SANITARY SEWER DESIGN POINT 

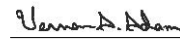
WATER DEMAND POINT 


BASIN DESIGNATION  OS1

UNIT COUNT  14

APPROVED ONE YEAR FROM THIS DATE
01/05/2023


CITY ENGINEER
DATE 01/04/2023


WATER DEPARTMENT
DATE 12/30/2022

FACSIMILE
This electronic plan is a facsimile of the signed and sealed pdf set.

Kristine L. House
Date 12-21-22

BENCHMARK
NGS CONTROL POINT CRAIN BEING A 3" BRASS CAP SET IN CONCRETE BLOCK, LOCATED ON THE WEST SIDE OF PARKER ROAD, AND 2,800' NORTHWEST OF THE INTERSECTION OF PARKER ROAD AND COTTONWOOD DRIVE. ELEVATION = 5734.55' (NAVD88)

DRAWN BY: KLH
APPROVED: RWL
CAD DATE: 11/30/2022
CAD FILE: J:\2021\1212000.01\CAD\DWGS\CIMUR\KPS_MasterUtilityPlan

JOB DATE: 9/21/2022
JOB NUMBER: 212000.01

BAR IS ONE INCH ON OFFICIAL DRAWINGS.
0" = 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

HRGreen
HR GREEN - DENVER
5619 DTC PARKWAY SUITE 1150
DENVER CO 80111
PHONE: 720.602.4999 | TOLL FREE: 800.728.7805
FAX: 844.273.1057 | HRGreen.com

KINGS POINT SOUTH SUBDIVISION - FILING NO. 1
LENNAR CORPORATION
CITY OF AURORA, COLORADO

MASTER UTILITY REPORT
MASTER SANITARY SEWER PLAN

SHEET
SS1
2



PROJECTED WATER DEMAND GENERATION

Project #: **212000.01**

Project: **Kings Point South**

Location: **Aurora, CO**

Plan Date: **Master Utility Report**

By: **K House**

Checked: **R Littleton**

Date: **9/21/2022**

RESIDENTIAL WATER USE	101	GPCD	SINGLE-FAMILY POPULATION DENSITY	2.77	PERSONS/UNIT
SCHOOL (INDUSTRIAL) WATER USE	1,200	GPD/ACRE	MULTI-FAMILY POPULATION DENSITY	2.77	PERSONS/UNIT
PARKS & GREEN BELTS	1,800	GPD/ACRE	RESIDENTIAL FIRE FLOW	1,500	GPM FOR 2 HRS
MAX. DAY / AVG. DAY	2.80		SCHOOL (INDUSTRIAL) FIRE FLOW	3,500	GPM FOR 3 HRS
MAX. HOUR / FLOW RATIO	4.50				

LAND USE	NO. OF SF UNITS OR ACERAGE	AVG. DAY DEMAND (GPD)	AVG. DAY DEMAND (GPM)	MAX. DAY DEMAND (GPM)	MAX. HOUR DEMAND (GPM)	MAX. DAY + FIRE FLOW (GPM)	DEMAND BASIN	JUNCTION
RESIDENTIAL	27	7,554	5.25	14.69	23.61	1,515	1	D-1
RESIDENTIAL	25	6,994	4.86	13.60	21.86	1,514	2	D-2
RESIDENTIAL	68	19,024	13.21	36.99	59.45	1,537	3	D-3
RESIDENTIAL	96	26,858	18.65	52.22	83.93	1,552	4	D-4
RESIDENTIAL	35	9,792	6.80	19.04	30.60	1,519	5	D-5
RESIDENTIAL	27	7,554	5.25	14.69	23.61	1,515	6	D-6
RESIDENTIAL	38	10,631	7.38	20.67	33.22	1,521	7	D-7
RESIDENTIAL	42	11,750	8.16	22.85	36.72	1,523	8	D-8
RESIDENTIAL	62	17,346	12.05	33.73	54.21	1,534	9	D-9
PARK-B	8.4	15,120	10.50	29.40	47.25	29	10	D-10
SCHOOL	6.7	8,040	5.58	15.63	25.13	3,516	11	D-11
RESIDENTIAL	38	10,631	7.38	20.67	33.22	1,521	12	D-12
RESIDENTIAL	30	8,393	5.83	16.32	26.23	1,516	13	D-13
RESIDENTIAL	32	8,953	6.22	17.41	27.98	1,517	14	D-14
RESIDENTIAL	36	10,072	6.99	19.58	31.47	1,520	15	D-15
RESIDENTIAL	30	8,393	5.83	16.32	26.23	1,516	16	D-16
RESIDENTIAL	54	15,108	10.49	29.38	47.21	1,529	17	D-17
PARK-A	6.0	10,800	7.50	21.00	33.75	21	10	D-18
TOTALS	640	202,213	140	393	632	3,516	N/A	N/A
RESIDENTIAL	640		124.34	348.16	559.54	1,552		
SCHOOL	6.7		5.58	15.63	25.13	3,516		
PARKS	14.4		18.0	50.4	81.0	N/A		



SANITARY SEWER DEMAND CALCULATIONS

Project #: **212000.01** Location: **Aurora, CO**
 Project: **Kings Point South** Plan Date:

By: **K House** Date: **9/21/2022**
 Checked: **R Littleton** Date: **9/22/2022**

LOADING RATES		
Zoning	Average Day (gpcd)	People per Unit
Residential	68	2.77

Zoning	Average Day (gpd/acre)	Equivalent Population
Schools / Industrial	1,200	18

PEAKING FACTOR			
PF = $5/(p^{0.167})$		Where p = Population in thousands	
Min. PF =	1.7	Max. PF =	4.0

PIPE CAPACITY (mgd) (n=.011)				
75 % FULL	PIPE SIZE (IN)	0.4% SLOPE	1.0% SLOPE	2.5% SLOPE
	8	0.53	0.84	1.33
	10	0.97	1.53	2.41
	12	1.57	2.48	3.92

Design Point	Basin	Planning Area	Development Type	No. of Units	No. of Acres	Population Density (people/unit)	Equivalent Population	Average Flow Generation (gpcpd)	Average Day Flow (mgd)	Infil. @ 10% (mgd)	Cumulative Population	Peak Factor	Peak Flow (mgd)	Peak Flow + Infil. (mgd)	Peak Flow + Infil. (cfs)	Estimated Pipe Slope (%)	Estimated Size at Given Slope	Pipe Velocity (ft/sec)	Percent Full at Given Slope
Kings Point South - Filing 2																			
1	OS-1	Offsite / 2.5 du-ac		292	117	2.77	809	68	0.055	0.006	809	4.0	0.220	0.226	0.349	0.4%	8		
2	1	School		1	6.7	18.00	121	67	0.008	0.001	121	4.0	0.032	0.033	0.051	0.4%	8		
3	Total at Design Point								0.063	0.006	929	4.0	0.252	0.258	0.400	0.4%	8		
4	2	PA-9	SFD - Standard	96	N/A	2.77	266	68	0.018	0.002	266	4.0	0.072	0.074	0.115	0.4%	8		
	Total at Design Point								0.081	0.008	1,195	4.0	0.324	0.333	0.515	0.4%	8		
5	3	PA-8	SFD - Standard	36		2.77	100	68	0.007	0.001	100	4.0	0.027	0.028	0.043	0.4%	8		
	Total at Design Point								0.088	0.009	1,295	4.0	0.352	0.360	0.558	0.4%	8	2.7	56.8%
6	4	PA-9	SFD - Standard	43		2.77	119	68	0.008	0.001	119	4.0	0.032	0.033	0.051	0.4%	8		
7	5	PA-8	SFD - Standard	29		2.77	80	68	0.005	0.001	80	4.0	0.022	0.022	0.035	0.4%	8		
	Total at Design Point								0.014	0.001	199	4.0	0.054	0.056	0.086	0.4%	8		
8	6	PA-7	SFD - Standard	27		2.77	75	68	0.005	0.001	75	4.0	0.020	0.021	0.032	0.4%	8		
9	7	PA-6A	Park	1												0.4%	8		
	Total at Design Point								0.005	0.001	75	4.0	0.020	0.021	0.032	0.4%	8		
10	8	PA-6	SFD - Standard	25		2.77	69	68	0.005	0.000	69	4.0	0.019	0.019	0.030	0.4%	8		
	Total at Design Point								0.010	0.001	144	4.0	0.039	0.040	0.062	0.4%	8		
11	9	PA-6	SFD - Standard	164		2.77	454	68	0.031	0.003	454	4.0	0.124	0.127	0.196	0.4%	8		
	Total at Design Point								0.054	0.005	798	4.0	0.217	0.222	0.344	0.4%	8	2.4	42.7%
12	Total at Design Point			420					0.142	0.014	2,093	4.0	0.569	0.583	0.902	0.4%	10	3.1	53.0%



MASTER UTILITY REPORT

FOR

THE VISTAS AT KINGS POINT
AURORA, COLORADO

Prepared for:

KINGS POINT INVESTMENTS, LLC
2707 E. Willamette Lane
Greenwood Village, CO 80121
Contact: Tim Sanford
Email: Tim@Sanford-Elliott.com

Prepared by:

Terracina Design
10200 E. Girard Ave., Suite A-314
Denver, CO 80231
Contact: David Bacci, PE
Phone: 303-632-8867

FACSIMILE

THIS ELECTROMIC PLAN IS A
FACSIMILE OF THE SIGNED AND
SEALED PDF SET.

July 2024

A blue ink signature of David Bacci, written in a cursive style.

07/01/2024

DAVID BACCI, PE, CFM

DATE

APPROVED ON THIS DATE

10/18/2024

A blue ink signature of a representative from Aurora Water, written in a cursive style.

Aurora Water

09/21/2024

Date

A black ink signature of a representative from the Fire Department, written in a cursive style.

Fire Department

10-15-2024

Date

B. Proposed Development

The Site is situated on 95.18 acres of undeveloped land that will be single-family, multi-family residential, a park, and open space as outlined in the Vistas at Kings Point South Master Plan prepared by Terracina Design. Once fully developed, the Vistas at Kings Point is estimated to have 166 single-family homes and 192 multi-family units. For the purpose of this report, the dwelling units per acre gathered from the Vistas at Kings Point South Master Plan was used to assume the maximum buildout of the Site. No phasing has been anticipated for the multiple planning areas being proposed within the Site. The Site will require an approved looped water line at all times during the individual phasing of the development and throughout construction. The purpose of this Master Utility Report is to accompany the Vistas at Kings Point Master Plan submittal.

There have been no previous reports that investigated the Site in its entirety. The Master Utility Report for Kings Point South by HR Green, dated December 2022 calculated an anticipated sanitary demand discharging the Site as well as two internal water main connections between the two developments. The Site will utilize existing E-470 utility crossings the Master Utility Report for Kings Point South prepared by HR Green. Further details are presented within this report.

See the Vistas at Kings Point South Master Plan prepared by Terracina Design located in Appendix A and the Public Improvement Plans (PIP) for additional details on the activation infrastructure requirements for the individual planning areas.

II. DOMESTIC WATER

A. System Layout

The City of Aurora (COA) water system will provide service to the Site. The planned development falls primarily within Pressure Zone 7 with portions of Pressure Zone 6 encroaching the property at the southwest and portions of Pressure Zone 8 encroaching the property to the southeast, as indicated on the City of Aurora's Capital Improvement Plan for Aurora Water, dated April 2018. The current ground elevations on the site range from roughly 6190' to 5778'. Pressure zones and Hydraulic Grade Lines (HGLs) are defined below:

Table 1 – Water Pressure Zones

Pressure Zone	HGL (ft)	Top Elevation (ft)	Bottom Elevation (psi)	Minimum Static Pressure (ft)	Maximum Static Pressure (psi)
6	6050	5930	5810	52	104
7	6190	6090	5930	43	113
8	6300	6185	6023	50	120

The domestic water supplied to the Site is dependent on the construction of Aurora Parkway and the 16 inch water line that will be located within Aurora Parkway. A minimum of two connections to the surrounding future domestic water infrastructure will need to be established to maintain a looped system during construction of the individual planning areas. At least one connection will be made to the future 16 inch water line located in Aurora Parkway, while two internal connections will be made to the future Kings Point South development situated west of the property, and one connection will be made to the Overlook at Kings Point South development located to the southwest of the Site. The suggested water system has currently

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been modeled with 8-inch and 12-inch PVC water lines interior to the Site. The majority of the Site is located within Pressure Zone 7. A visual representation of these lines can be found in the accompanying Water Demand Map.

B. Water System Design Criteria

The proposed water system to serve the Site conforms to the guidelines outlined in Section 5.00 of the City of Aurora Water, Sanitary Sewer, and Storm Drainage Infrastructure Standards and Specifications (COA Standards and Specifications) dated January 2023. Below are the relevant criteria used in the preliminary design of the water infrastructure:

- The water distribution system shall be analyzed to meet the Maximum Day demand plus Fire Flow Demand with a residual pressure of no less than 20 psi at any point within the water distribution system. Fire flow demand for residential use is 1,500 gpm (2250 was used within this report for a conservative estimate) for 2 hours and for industrial/school is 3,500 gpm.
- The minimum diameter for water mains in a single family detached residential area shall be 8-inch.
- 4-inch, 10-inch and 14-inch water mains are not allowed for the water infrastructure.
- The maximum velocity in waterlines 6-inch or smaller during the Maximum Hour Demand shall not exceed 2.5 fps.
- The maximum velocity in 8-inch to 12-inch mains during the Maximum Hour Demand shall not exceed 3.0 foot per second (fps)
- The design of the water distribution system should hold to the ratios of 4.5:1 for Maximum Hour Demand to Average Day Demand, and 2.8:1 for Max Day Demand to Average Day Demand.
- Water pipe material shall be DIP or PVC pipe exclusively.

C. Water Demand Calculations

The water demand calculations have been completed and applied to the proposed water model in accordance with the COA Standards and Specifications. For the purpose of this report, the dwelling units per acre gathered from the Vistas at Kings Point South Master Plan created by Terracina Design was used to assume the maximum unit count of the Site.

The calculation of domestic water demand for residential development assumes an average of 101 gallons per capita per day (gpc/day) and assumes an occupancy of 2.77 people per unit. Industrial and school water usage is estimated at 1,200 gallons per day per acre (gpd/acre), while parks require 1,800 gpd/acre. A summary of system-wide water demands is provided in the table below, with detailed calculations included in Appendix B.

Table 2 – Water Demands Based on Capita

Planning Area	Zoning	Dwellings		Avg Day	Max Day	Peak Hour
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Node	Elevation (ft)	Demand (gpm)	Pressure (psi)	Max Velocity (ft/s)	Demand (gpm)	Pressure (psi)	Max Velocity (ft/s)	Demand (gpm)	Pressure (psi)	Max Velocity (ft/s)
J-1	6048	18.61	61.44	0.1	52.11	61.43	0.27	83.75	61.43	0.43
J-2	6035	3.75	67.06	0.03	10.50	67.06	0.07	16.88	67.05	0.12
J-7	6022	18.61	72.68	0.04	52.11	72.68	0.12	83.75	72.67	0.19
J-8	5986	5.83	88.26	0.06	16.32	88.26	0.16	26.23	88.25	0.26
J-9	6056	13.24	57.97	0.03	37.06	57.97	0.10	59.56	57.96	0.22
J-10	5951	13.24	103.40	0.02	37.06	103.40	0.13	59.56	103.40	0.20

To ensure that the water system meets the necessary requirements for fire safety, the Max Day Demand Fire Flow Scenario was modeled in accordance with COA Standards and Specifications. This analysis applied fire flow to junctions in the system located at strategic locations throughout the site.

The model utilized a residential fire flow requirement of 2,250 gallons per minute was used within this report for a conservative estimate and a townhome fire flow requirement of 2,500 gallons per minute. All junctions examined in the model have a minimum residual pressure of 20 psi during the fire flow scenario.

III. SANITARY SEWER

A. System Layout

Sanitary sewer will be provided via 8-inch mains located in the proposed collector and local streets. The Site consists of four basins and all wastewater flow from the Site will discharge at the southwest portion of the site towards the future Kings Point South development at Design Point 1. Once the flows exits the Site, it will be conveyed through Kings Point South property and under Highway E-470 to a lift station, eventually being lifted to Kings Point Subdivision Filing No. 1 by dual force mains as shown on the Kings Point South Master Utility Report by HR Green, dated December 2022.

The lift station (west of E-470), force mains (west of E-470), extension of a main across E-470 and adjacent developments sanitary infrastructure must be in place before the Site can be served. No lift stations, force mains, etc. are being proposed as part of this development. The proposed gravity system and proposed connection will sufficiently serve the site. Any sanitary sewer not located within a public right-of way will be within a dedicated utility easement for access and maintenance. Any future development of the existing wastewater infrastructure needed to serve this site is the responsibility of the developer.

B. Sanitary Sewer Design Criteria

Wastewater demands were calculated based on standards set by the City of Aurora's Design Criteria and Construction Plans of the City of Aurora Water, Sanitary Sewer and Storm Drainage Infrastructure Standards and Specifications (COA Standards and Specifications) Section 5.03, dated September 2019. Section 5.03 relevant criteria is below:

- "Residential" use has a typical equivalent of 2.77 people per unit and a loading 68 gallons per capita per day

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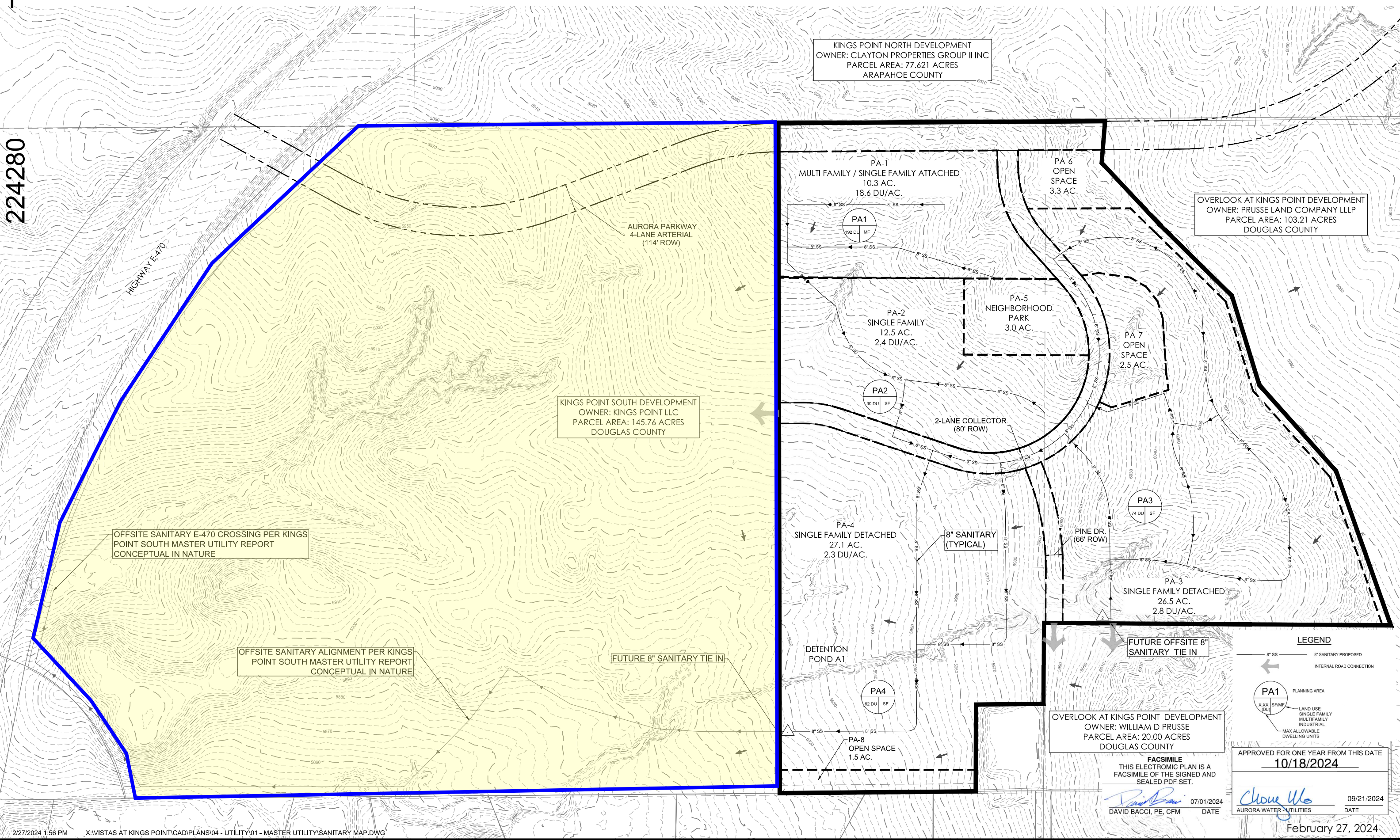
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- Industrial use (including schools) a typical equivalent of 18 people per acre or a loading of 1,200 gallons per day per acre
- Peaking factor is based on Curve "A" where Curve "A" = $5 / \text{population}^{0.167}$ or a maximum peaking factor of 4 and a minimum peaking factor of 1.7
- Infiltration is 10% of average flow and is added to the peak flow calculation
- Assume a Manning's value of 0.011 for new PVC pipes
- Minimum pipe slope of 0.4% for all sanitary pipes
- Pipes 12-inches or smaller should not exceed 75% of flow capacity
- All pipes must have a minimum velocity of 2 feet per second

C. Sanitary Sewer Demand Calculations

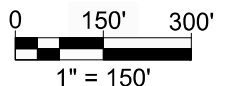
Sanitary sewer demand calculations have been completed and applied to the proposed sanitary system in accordance with COA Standards and Specifications. This report addresses only the portion of the sanitary sewer system that services the Site. Wastewater flows for the Site are projected to be higher than what was anticipated in the Kings Point South Master Utility Report prepared by HR Green, dated December 2022. Discrepancies in the sanitary flows between the Master Plan and this report can be attributed to the assumption of unit densities for the Site. The current equivalent unit projection for the Site is 387 units compared to 292 units assumed in the Kings Point South Master Utility Report. The Kings Point South Master Utility Report assumed off site demand from the Site at Design Point 1. It was calculated within this report that a Total Peak Flow of 0.46 cfs would flow from the Site at Design Point 1, an increase of 0.111 cfs as stated within the Kings Point South report. As shown on the Master Utility Report for Kings Point South by Core Consultants, dated 01/11/2023, located within Appendix D, the two design points that will be utilized for the ultimate sanitary outfall for Kings Point South and the Site are Design Points 15 and 32. The design points have allowable capacity remaining of 827 gpm (2.213 cfs) and 549 gpm (1.469 cfs) respectively, and will have adequate capacity to handle the 0.111 cfs increase in sanitary flows leaving the Site.

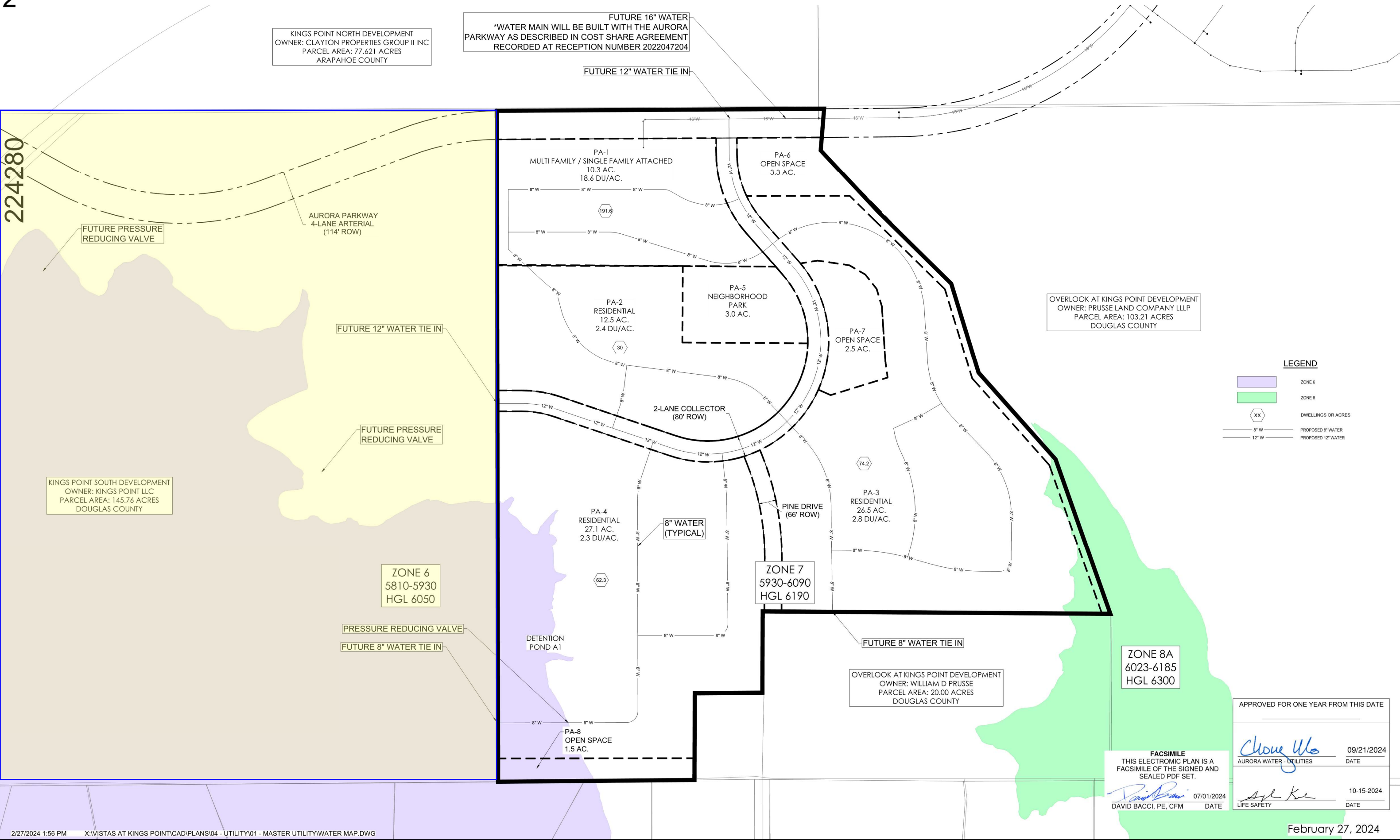
All sanitary sewer calculations can be found in Appendix C. A brief summary of the sanitary flows for the site are below:



VISTAS AT KINGS POINT

SANITARY DEMAND MAP





VISTAS AT KINGS POINT

WATER DEMAND MAP





**Vistas at Kings Point Preliminary
Water and Sanitary Sewer Utility Report
Water Demand Calculation**

TD # 14-003
1/16/2024
MJG

PLANNING AREA	USE	ACRES	DENSITY (DU/AC)	DWELLINGS UNITS (DU)	PEOPLE PER UNIT	AVG DAY PER CAPITA FLOW (GPD)
		a	b	c	d	e
PA-1	Multi-Family	10.3	18.6	191.6	2.77	101
PA-2	Single-Family	12.50	2.4	30	2.77	101
PA-3	Single-Family	26.50	2.8	74.2	2.77	101
PA-4	Single-Family	27.10	2.3	62.3	2.77	101

PLANNING AREA	USE	ACRES	AVG DAY (GPD/AC)	DWELLINGS UNITS (DU)	PEOPLE PER UNIT	AVG DAY PER CAPITA FLOW (GPD)
		a	b	c	d	e
PA-5	Park	3.0	1800			
TOTAL				358		

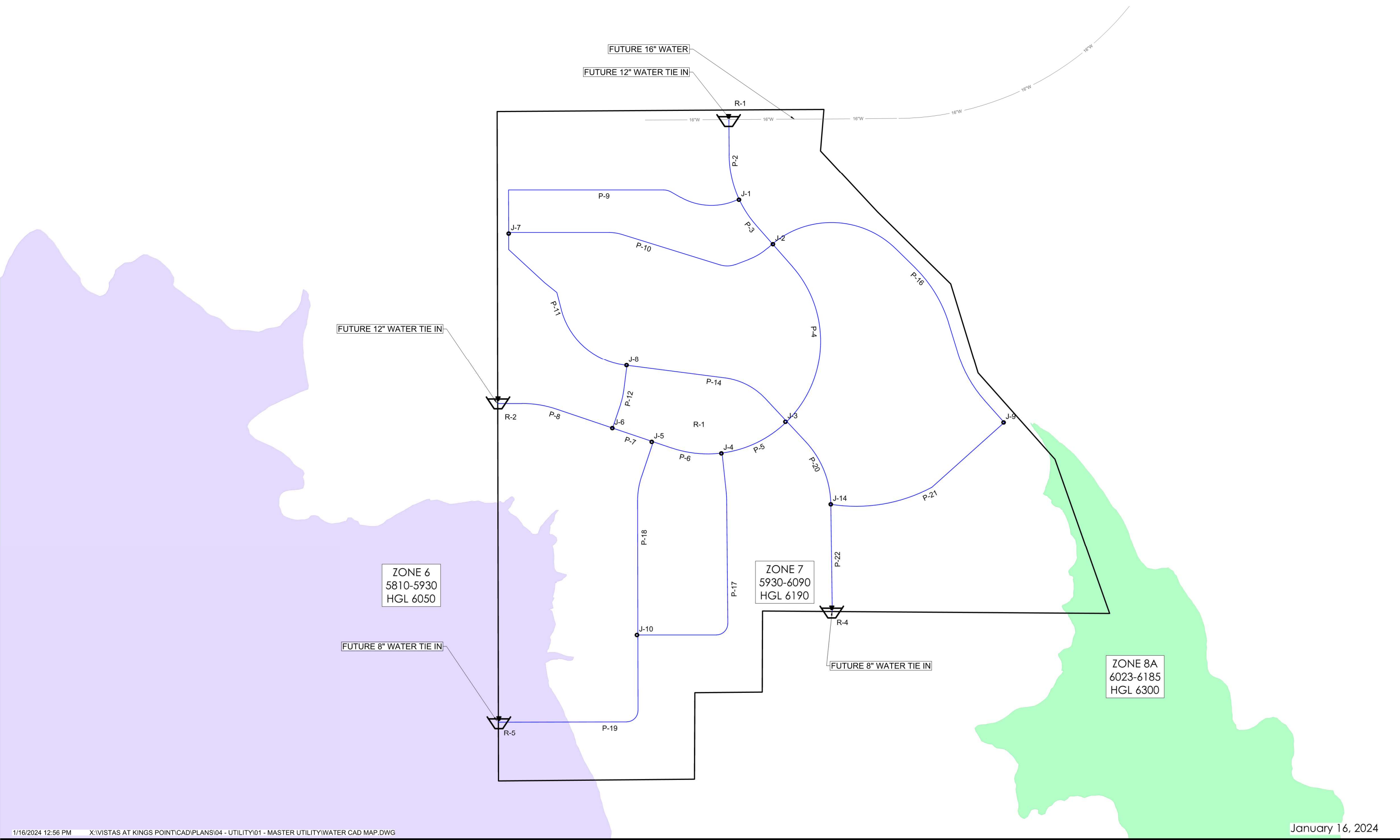
PEAKING FACTOR
MAX DAY (MDD)
PEAK HOUR (PHD)

DEMAND			
AVG DAY (GPD)	AVG DAY (GPM)	MAX DAY (MDD)	PEAK HOUR (PHD)
f	g	h	i
c x d x e	f/24/60	g x 2.8	g x 4.5
53,598	37.22	104.22	167.49
8,393	5.83	16.32	26.23
20,759	14.42	40.36	64.87
17,438	12.11	33.91	54.49

a x b	f/24/60	g x 2.8	g x 4.5
5,400	3.75	10.50	16.88

AVG DAY (GPD)	AVG DAY (GPM)	MAX DAY (MDD)	PEAK HOUR (PHD)
(GPD)	(GPM)	(GPM)	(GPM)
105,588	73.33	205.31	329.96

2.8
4.5

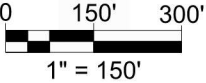


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January 16, 2024

VISTAS AT KINGS POINT

WATER CAD MAP



PARCEL	USE	ACRES	DENSITY (DU/AC)	Max Units (DU)	EQUIVALENT (PEOPLE/DU)	EQUIVALENT CAPITA (C)
		a	b	c	d	e
				a x b		a x b x d
Planning Area 1	Multi-Family	10.3	18.6	191.6	2.77	530.7
Planning Area 2	Single Family	12.5	2.4	30.0	2.77	83.1
Planning Area 3	Single Family	26.5	2.8	74.2	2.77	205.5
Planning Area 4	Single Family	27.1	2.3	62.3	2.77	172.7
TOTAL UNITS				358	TOTAL CAPITA	992

PARCEL	USE	ACRES			EQUIVALENT (PEOPLE/DU)	AVERAGE DAY (GPD/ACRE)
		a	b	c	d	e
Overlook at Kings Point South (By Others)	Single Family			30.0	2.77	83.1

DEMAND			
AVG DAY (GPC/DAY)	AVG DAY (GPD)	AVG DAY (GPM)	PEAK DESIGN (GPM)
f	g	h	i
	e x f	g/24*60	h x 4
68	36086	25.06	100.24
68	5651	3.92	15.70
68	13976	9.71	38.82
68	11740	8.15	32.61
SUB-TOTAL	67453.60	46.84	187.37

	e x f	g/24*59	h x 3
68	5651	3.92	15.70
SUB-TOTAL	5650.80	3.92	15.70
TOTAL	73104.40	50.77	203.07

	AVG DAY	PEAK DESIGN
INFILTRATION (10% OF THE AVERAGE DAILY FLOW)(GPM) =	5.08	
TOTALS WITH INFILTRATION (GPM) =	55.84	208.14
TOTALS WITH INFILTRATION (GPD) =	80,415	299,728
TOTALS WITH INFILTRATION (CFS) =	0.124	0.464

PEAKING FACTOR* 4.0