



# MASTER UTILITY REPORT

FOR

THE VISTAS AT KINGS POINT  
AURORA, COLORADO

## Prepared for:

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January 2024

APPROVED ON THIS DATE	
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City Engineer	Date
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Aurora Water	Date
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Fire Department	Date

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Sanitary Map  
Water Map

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### **Appendix C – Sanitary Sewer Calculations**

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**terracedesign**

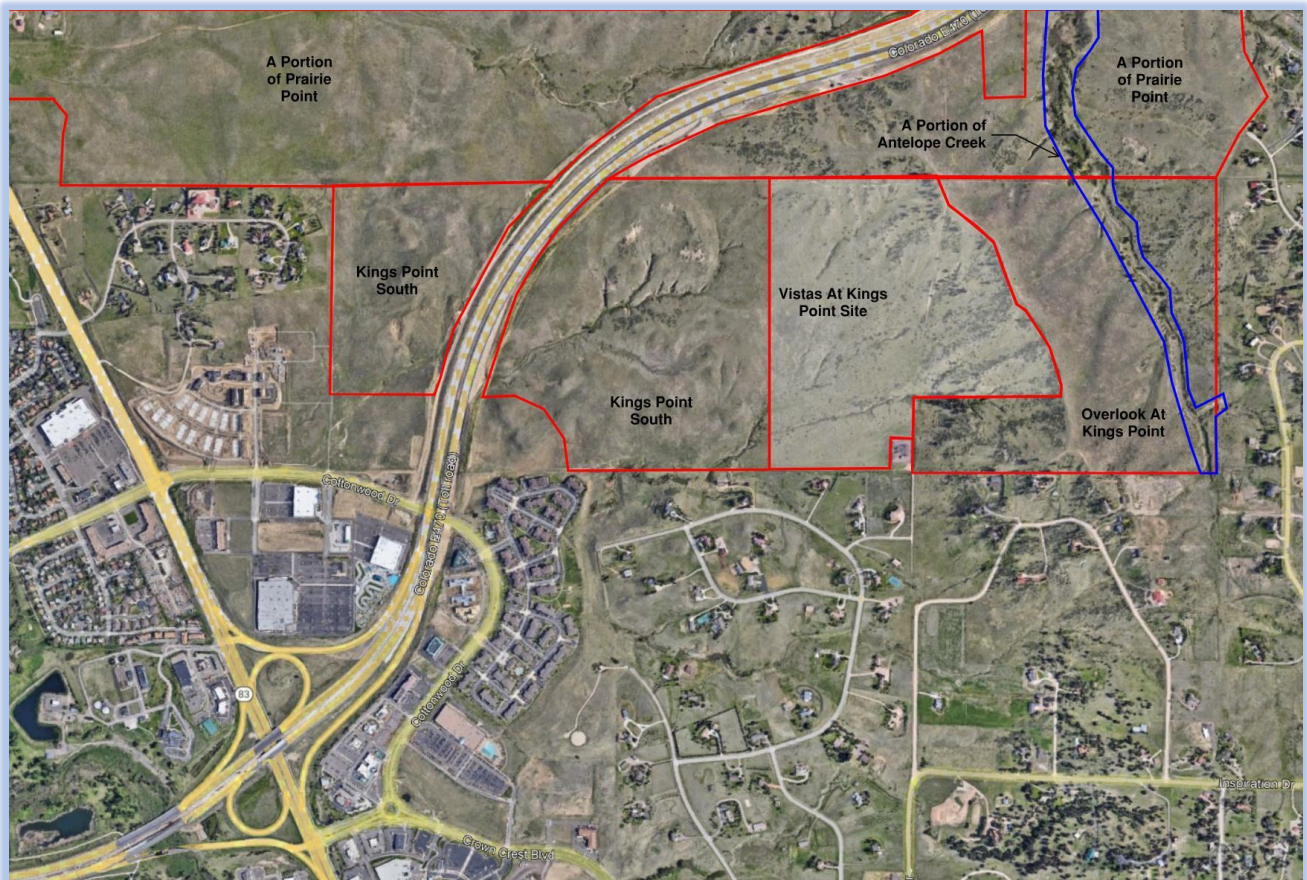
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# I. INTRODUCTION

The Vistas at Kings Point development (Site) is a residential development consisting of single-family, multi-family units, a park, and open space. The purpose of this Master Utility Report is to provide a conceptual utility design for water and sanitary infrastructure to serve the development. This Master Utility Report replaces prior reports for the area and includes updated calculations with additional evaluations for the Site. The proposed improvements outlined in this report and related utility plans are merely conceptual and may be altered in subsequent reports. The surrounding developments and individual filings will not be examined unless there is direct impact to the Site.

## A. Site Location

The Site is located in a portion of the northwest quarter of Section 2 and the northeast quarter of Section 3, Township 6 South, Range 66 West of the 6<sup>th</sup> Principal Meridian, City of Aurora, County of Douglas, State of Colorado. The Site is bound by Highway E-470 to the north, Antelope Creek to the east, Sierra Vista No. 3 subdivision to the south, and vacant land to the west. Currently, there are several future developments adjacent to the site. To the north is Prairie Point South and Aurora Parkway (future), to the east is Overlook at Kings Point, and to the west is Kings Point South.



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## 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 a 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

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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 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.

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Table 2 – Water Demands Based on Capita

Planning Area	Zoning	Dwellings	Equivalent Capita	Avg Day (GPM)	Max Day (GPM)	Peak Hour (GPM)
PA-1	Multi-Family	191.6	530.7	37.22	104.22	167.49
PA-2	Single Family	30	83.1	5.83	16.32	26.23
PA-3	Single Family	136.3	377.6	26.47	74.12	119.12

Table 3 – Water Demands Based on Acreage

Planning Area	Zoning	Acres	GPD/AC	Avg Day (GPM)	Max Day (GPM)	Peak Hour (GPM)
PA-4	Park	3.0	1800	3.75	10.5	16.88

## D. Hydraulic Modeling

Bentley WaterCAD was used to create a model of the internal water distribution system for the Site. By imputing the calculated water demands, various scenarios were simulated in the model to ensure that the water system would function as intended under proposed operating conditions. Below is a list of the different scenarios run in WaterCAD and the WaterCAD output tables can be found in Appendix B

- Average Day Demand
- Max Day Demand
- Peak Hour Demand
- Max Day Demand + Fire Flow of 2500 gpm @ J-7
- Max Day Demand + Fire Flow of 2250 gpm @ J-9
- Max Day Demand + Fire Flow of 2250 gpm @ J-10

The reservoir elevations of the water system are determined by the typical zone pressures (HGLs) as indicated in Table 1 above. In addition, the elevations of the water system junctions were assigned based on their existing elevations. A Hazen-Williams factor of 150 was applied to all pipe in the water model.

## E. Hydraulic Modeling Results

All WaterCAD output tables are located in Appendix B. The pressure and max velocity results at nodes with the maximum demands applied for the Average Day, Max Day Demand, and Peak Hour Demand scenarios are shown below in Table 4. All results from the WaterCAD model fall within the acceptable ranges set forth by the City of Aurora.

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Table 4 – Hydraulic Modeling Results

		Average Day			Max Day Demand			Peak Hour Demand		
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:

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

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Table 5 – Sanitary Demand Per Planning Area

Parcel	Use	Equivalent Capita (2.77 People/Unit)	Average Day (GPM)	Peak Design (GPM)
Planning Area 1	Multi-Family	530.7	37.2	167.5
Planning Area 2	Single Family	83.1	5.83	26.23
Planning Area 3	Single Family	205.5	14.4	64.9
Planning Area 3	Single Family	172.6	12.1	54.5
Overlook at Kings Point South (By Others)	Single Family	30	3.6	16.9

#### **D. Sanitary Sewer Sizing**

A Manning's equation analysis using HydroFlow Express was run for an 8" PVC pipe flowing 75% full, with a Mannings Coefficient of 0.011 at a minimum grade of 0.4% to demonstrate that an 8" pipe could adequately handle flows from this development. This analysis is included in Appendix C. Additional flow analysis will be conducted in subsequent reports.

#### **E. Variances**

No variances are being requested at this time.

## **IV. CONCLUSION**

#### **A. Domestic Water**

This Master Utility Report Vistas at Kings Point is in compliance with the water design standards established by the City of Aurora. The reservoir elevations for the water system connections have been determined based on the typical zone pressures (HGLs) of the surrounding areas.

The proposed domestic water system, which includes 8-inch and 12-inch lines, is designed to connect to future surrounding networks and meets the criteria for Average Day, Maximum Hour, and Maximum Day Demand + Fire Flow scenarios.

#### **B. Sanitary Sewer**

This Master Utility Report Vistas at Kings Point is in compliance with the sanitary sewer design standards established by the City of Aurora. The proposed sanitary sewer system will utilize an 8-inch pipe to convey all wastewater throughout the system. The Site will utilize a future lift station described in the Kings Point South Master Utility Report and other future infrastructure put in place by others.

## **V. REFERENCES**

Water, Sanitary Sewer and Storm Drainage Infrastructure Standards and Specifications, 2023 Edition, City of Aurora, Colorado.

Kings Point South Master Utility Report by HR Green, Dated December 2022

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Kings Point North Master Utility Report and Plan by Core Consultants, Inc., June 2022,  
Amended in January 2023 (EDN 222157 MU1)

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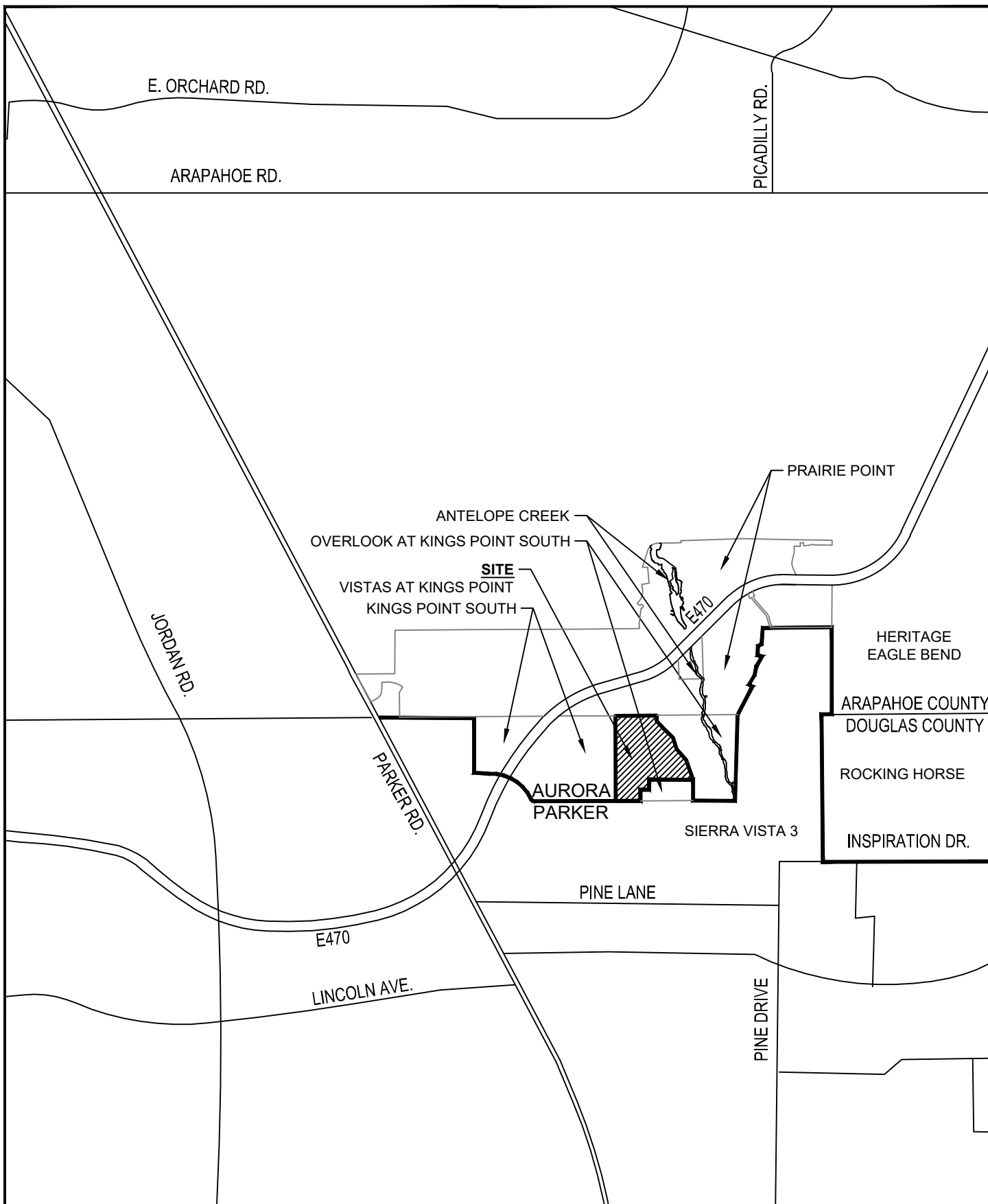
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# **APPENDIX A**

## **GENERAL MAPS**

Vicinity Map  
Vistas at Kings Point Land Use Plan  
Sanitary System Map  
Water System Map

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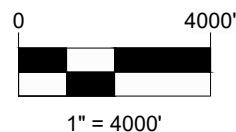


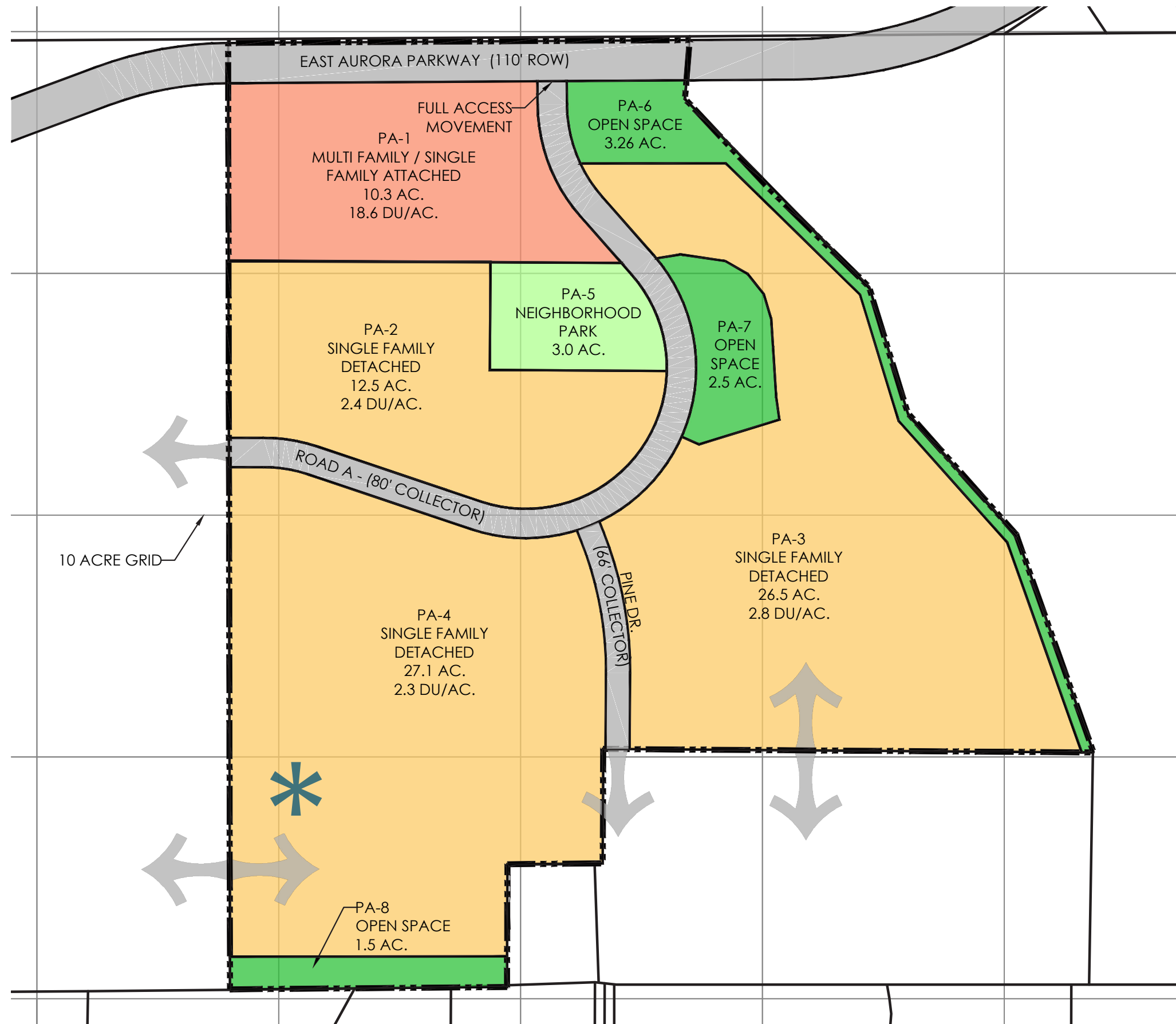
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## KINGS POINT VISTAS VICINITY MAP

AURORA, CO

DATE: 2023-08-01





# LEGEND

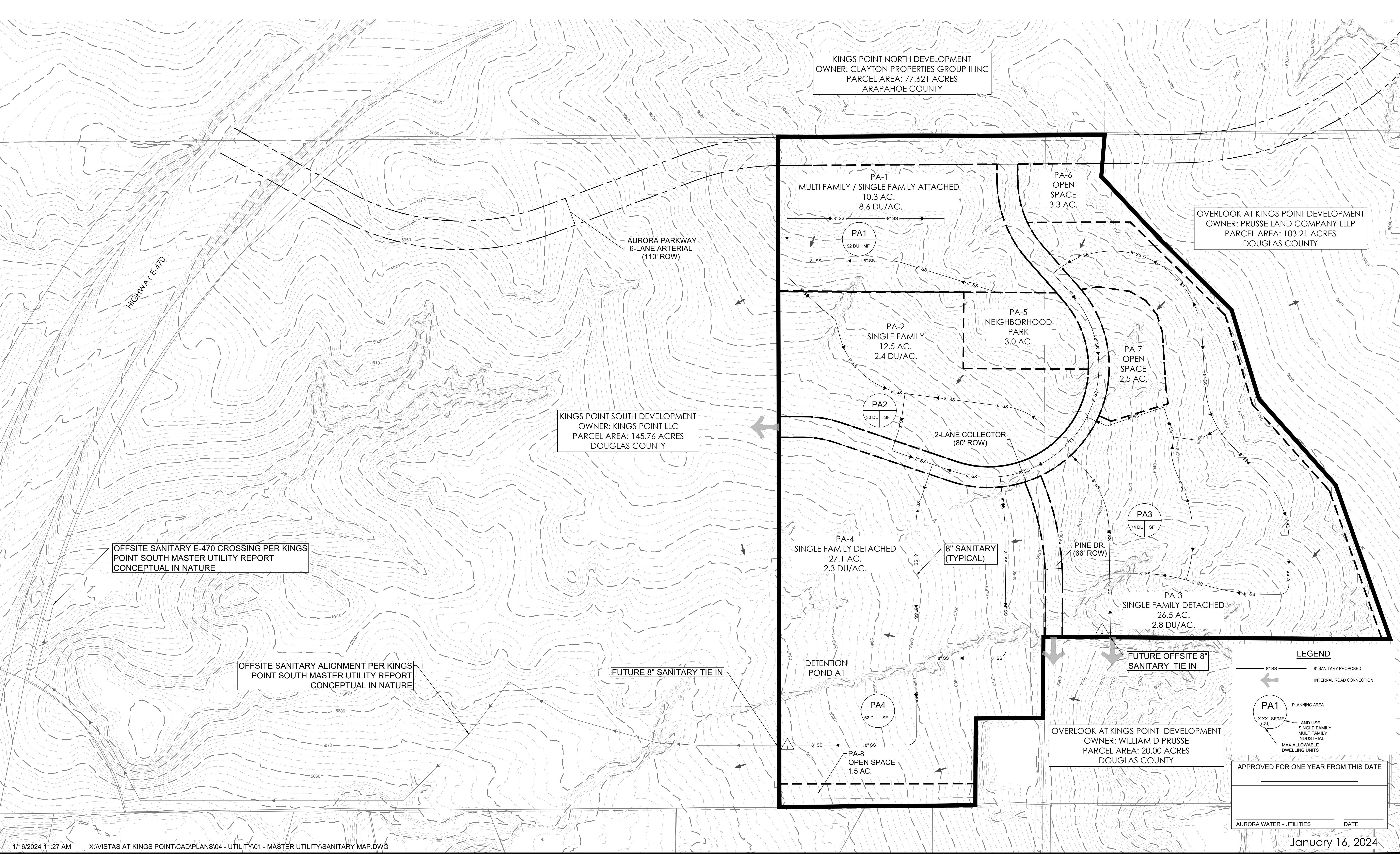
- Single Family Detached
- Multi Family / Single Family Attached
- Neighborhood Park
- Open Space
- Road Right of Way
- Property Boundary
- Detention
- Access Point



SCALE 1"=300'







KINGS POINT NORTH DEVELOPMENT  
OWNER: CLAYTON PROPERTIES GROUP II INC  
PARCEL AREA: 77.621 ACRES  
ARAPAHOE COUNTY

OVERLOOK AT KINGS POINT DEVELOPMENT  
OWNER: PRUSSE LAND COMPANY LLP  
PARCEL AREA: 103.21 ACRES  
DOUGLAS COUNTY

AURORA PARKWAY  
6-LANE ARTERIAL  
(110' ROW)

KINGS POINT SOUTH DEVELOPMENT  
OWNER: KINGS POINT LLC  
PARCEL AREA: 145.76 ACRES  
DOUGLAS COUNTY

OFFSITE SANITARY E-470 CROSSING PER KINGS  
POINT SOUTH MASTER UTILITY REPORT  
CONCEPTUAL IN NATURE

OFFSITE SANITARY ALIGNMENT PER KINGS  
POINT SOUTH MASTER UTILITY REPORT  
CONCEPTUAL IN NATURE

FUTURE 8" SANITARY TIE IN

PA-1  
MULTI FAMILY / SINGLE FAMILY ATTACHED  
10.3 AC.  
18.6 DU/AC.

PA-6  
OPEN  
SPACE  
3.3 AC.

PA1  
192 DU MF

PA-2  
SINGLE FAMILY  
12.5 AC.  
2.4 DU/AC.

PA-5  
NEIGHBORHOOD  
PARK  
3.0 AC.

PA-7  
OPEN  
SPACE  
2.5 AC.

PA2  
30 DU SF

2-LANE COLLECTOR  
(80' ROW)

PA-4  
SINGLE FAMILY DETACHED  
27.1 AC.  
2.3 DU/AC.

8" SANITARY  
(TYPICAL)

PINE DR  
(66' ROW)

PA3  
74 DU SF

PA-3  
SINGLE FAMILY DETACHED  
26.5 AC.  
2.8 DU/AC.

DETENTION  
POND A1

PA4  
62 DU SF

PA-8  
OPEN SPACE  
1.5 AC.

FUTURE OFFSITE 8"  
SANITARY TIE IN

OVERLOOK AT KINGS POINT DEVELOPMENT  
OWNER: WILLIAM D PRUSSE  
PARCEL AREA: 20.00 ACRES  
DOUGLAS COUNTY

LEGEND

- 8" SS 8" SANITARY PROPOSED
- INTERNAL ROAD CONNECTION
- PA1 PLANNING AREA
- XX SF/MF (DU) LAND USE  
SINGLE FAMILY  
MULTIFAMILY  
INDUSTRIAL  
MAX ALLOWABLE  
DWELLING UNITS

APPROVED FOR ONE YEAR FROM THIS DATE

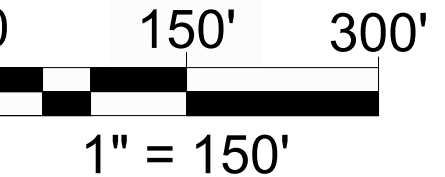
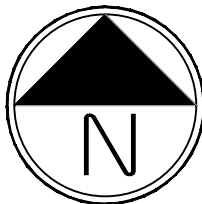
AURORA WATER - UTILITIES DATE

January 16, 2024

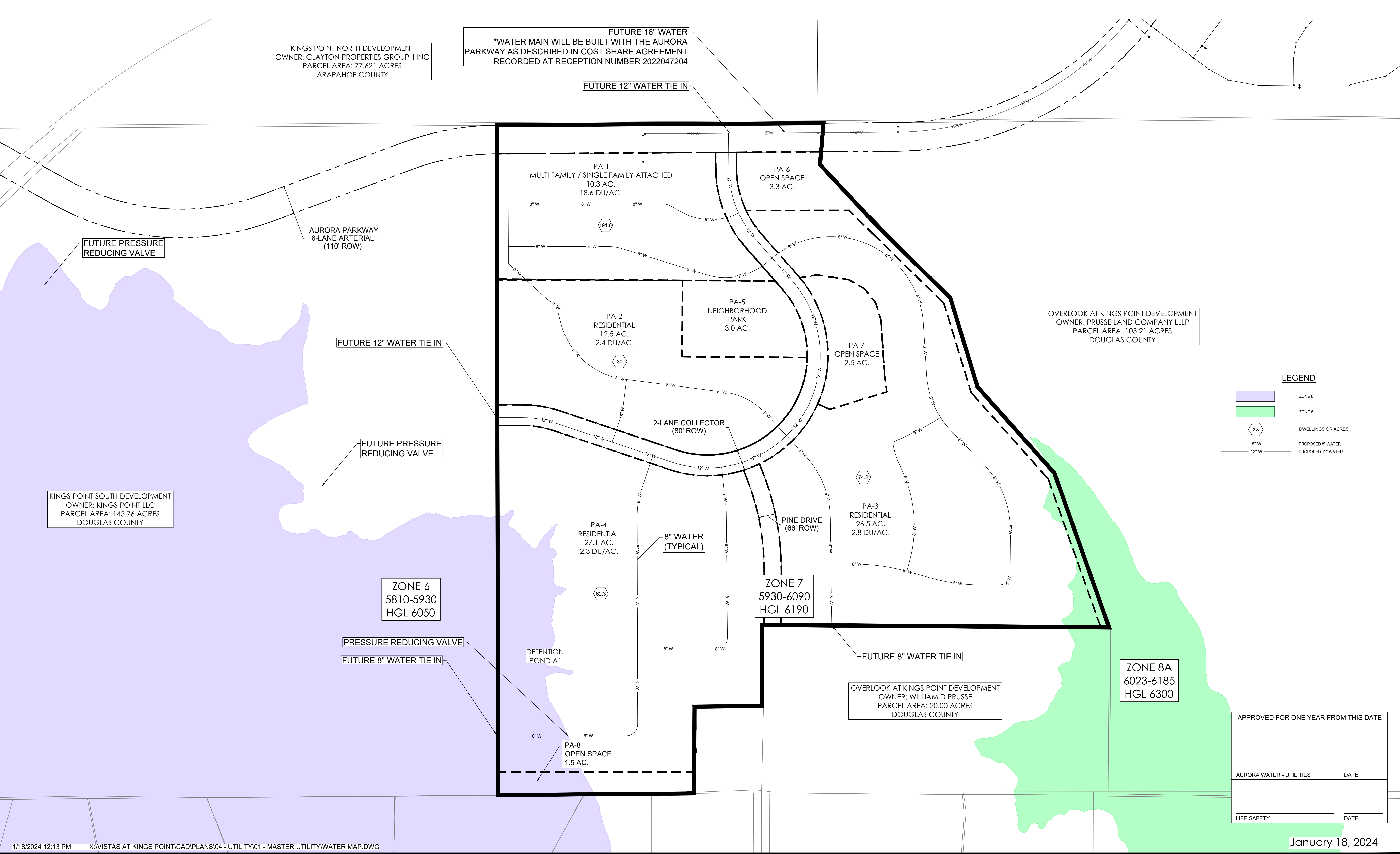
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VISTAS AT KINGS POINT

SANITARY DEMAND MAP







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# **APPENDIX B**

## **WATER**

Water Demand Calculations  
WaterCAD Map  
WaterCAD Output Tables



**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			
<b>TOTAL</b>				<b>358</b>		

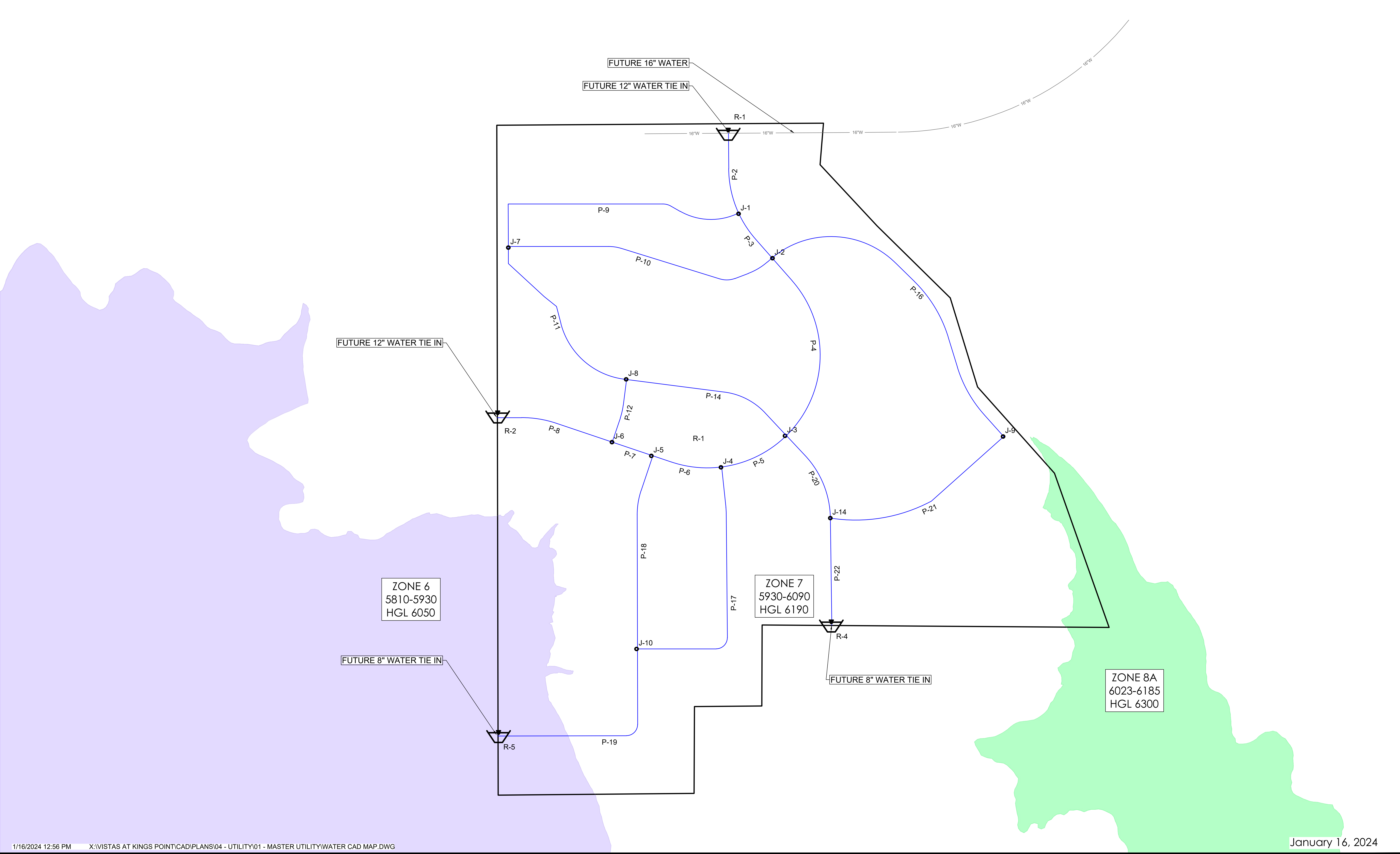
**PEAKING FACTOR**  
**MAX DAY (MDD)**  
**PEAK HOUR (PHD)**

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)
<b>105,588</b>	<b>73.33</b>	<b>205.31</b>	<b>329.96</b>

**2.8**  
**4.5**

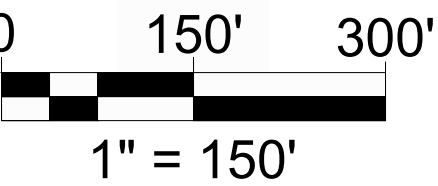
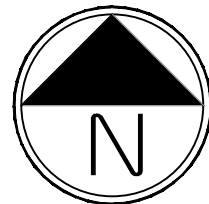


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January 16, 2024

# VISTAS AT KINGS POINT

# WATER CAD MAP





## Vistas at Kings Point

### Average Day

**Reservoir Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	33.74	6,190.00
1269	R-2	6,190.00	22.80	6,190.00
1314	R-4	6,190.00	9.67	6,190.00
1315	R-5	6,190.00	7.07	6,190.00

**Pipe Table - Time: 0.00 hours**

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial )
1272	P-2	312	R-1	J-1	12.0	PVC	150	33.74	0.10	0.000	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	9.07	0.03	0.000	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	-6.03	0.02	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-7.67	0.02	0.000	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-10.15	0.03	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-13.84	0.04	0.000	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-22.80	0.06	0.000	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	6.06	0.04	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-5.90	0.04	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-6.65	0.04	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-8.96	0.06	0.000	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	-3.52	0.02	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-5.45	0.03	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	2.48	0.02	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-3.69	0.02	0.000	Open
1300	P-19	855	J-10	R-5	8.0	PVC	150	-7.07	0.05	0.000	Open
1310	P-20	387	J-3	J-14	8.0	PVC	150	-1.88	0.01	0.000	Open
1311	P-21	778	J-14	J-9	8.0	PVC	150	7.79	0.05	0.000	Open
1312	P-22	401	R-4	J-14	8.0	PVC	150	9.67	0.06	0.000	Open

**Junction Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	18.61	6,190.00	61.44
1273	J-2	6,035.00	3.75	6,190.00	67.06
1275	J-3	6,006.00	0.00	6,190.00	79.61
1277	J-4	5,993.00	0.00	6,190.00	85.23
1279	J-5	5,986.00	0.00	6,190.00	88.26
1281	J-6	5,982.00	0.00	6,190.00	89.99
1284	J-7	6,022.00	18.61	6,190.00	72.68
1287	J-8	5,986.00	5.83	6,190.00	88.26
1293	J-9	6,056.00	13.24	6,190.00	57.97
1296	J-10	5,951.00	13.24	6,190.00	103.40
1309	J-14	6,022.62	0.00	6,190.00	72.42

## Vistas at Kings Point

### Max Daily Demand (MDD)

**Reservoir Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	94.47	6,190.00
1269	R-2	6,190.00	63.82	6,190.00
1314	R-4	6,190.00	27.08	6,190.00
1315	R-5	6,190.00	19.80	6,190.00

**Pipe Table - Time: 0.00 hours**

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial )
1272	P-2	312	R-1	J-1	12.0	PVC	150	94.47	0.27	0.000	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	25.39	0.07	0.000	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	-16.89	0.05	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-21.48	0.06	0.000	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-28.42	0.08	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-38.74	0.11	0.000	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-63.82	0.18	0.000	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	16.96	0.11	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-16.53	0.11	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-18.62	0.12	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-25.08	0.16	0.000	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	-9.86	0.06	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-15.25	0.10	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	6.94	0.04	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-10.32	0.07	0.000	Open
1300	P-19	855	J-10	R-5	8.0	PVC	150	-19.80	0.13	0.000	Open
1310	P-20	387	J-3	J-14	8.0	PVC	150	-5.27	0.03	0.000	Open
1311	P-21	778	J-14	J-9	8.0	PVC	150	21.81	0.14	0.000	Open
1312	P-22	401	R-4	J-14	8.0	PVC	150	27.08	0.17	0.000	Open

**Junction Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	52.11	6,189.99	61.43
1273	J-2	6,035.00	10.50	6,189.99	67.06
1275	J-3	6,006.00	0.00	6,189.99	79.60
1277	J-4	5,993.00	0.00	6,189.99	85.23
1279	J-5	5,986.00	0.00	6,189.99	88.26
1281	J-6	5,982.00	0.00	6,189.99	89.99
1284	J-7	6,022.00	52.11	6,189.98	72.68
1287	J-8	5,986.00	16.32	6,189.99	88.26
1293	J-9	6,056.00	37.06	6,189.98	57.97
1296	J-10	5,951.00	37.06	6,189.99	103.40
1309	J-14	6,022.62	0.00	6,189.99	72.42

## Vistas at Kings Point Peak Hour Demand (PHD)

**Reservoir Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	151.82	6,190.00
1269	R-2	6,190.00	102.57	6,190.00
1314	R-4	6,190.00	43.52	6,190.00
1315	R-5	6,190.00	31.82	6,190.00

**Pipe Table - Time: 0.00 hours**

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial )
1272	P-2	312	R-1	J-1	12.0	PVC	150	151.82	0.43	0.000	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	40.81	0.12	0.000	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	-27.14	0.08	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-34.52	0.10	0.000	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-45.67	0.13	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-62.26	0.18	0.000	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-102.57	0.29	0.000	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	27.26	0.17	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-26.56	0.17	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-29.92	0.19	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-40.31	0.26	0.000	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	-15.84	0.10	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-24.51	0.16	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	11.15	0.07	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-16.59	0.11	0.000	Open
1300	P-19	855	J-10	R-5	8.0	PVC	150	-31.82	0.20	0.000	Open
1310	P-20	387	J-3	J-14	8.0	PVC	150	-8.47	0.05	0.000	Open
1311	P-21	778	J-14	J-9	8.0	PVC	150	35.05	0.22	0.000	Open
1312	P-22	401	R-4	J-14	8.0	PVC	150	43.52	0.28	0.000	Open

**Junction Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	83.75	6,189.98	61.43
1273	J-2	6,035.00	16.88	6,189.98	67.05
1275	J-3	6,006.00	0.00	6,189.98	79.60
1277	J-4	5,993.00	0.00	6,189.98	85.23
1279	J-5	5,986.00	0.00	6,189.99	88.25
1281	J-6	5,982.00	0.00	6,189.99	89.99
1284	J-7	6,022.00	83.75	6,189.96	72.67
1287	J-8	5,986.00	26.23	6,189.98	88.25
1293	J-9	6,056.00	59.56	6,189.96	57.96
1296	J-10	5,951.00	59.56	6,189.98	103.40
1309	J-14	6,022.62	0.00	6,189.98	72.41

## Vistas at Kings Point

### MDD + Fire Demand @ J-7

**Reservoir Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	1,300.67	6,190.00
1269	R-2	6,190.00	884.14	6,190.00
1314	R-4	6,190.00	315.31	6,190.00
1315	R-5	6,190.00	205.03	6,190.00

**Pipe Table - Time: 0.00 hours**

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial )
1272	P-2	312	R-1	J-1	12.0	PVC	150	1,300.67	3.69	0.003	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	439.70	1.25	0.000	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	-295.92	0.84	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-432.05	1.23	0.000	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-342.66	0.97	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-264.08	0.75	0.000	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-884.14	2.51	0.002	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	808.86	5.16	0.009	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-810.40	5.17	0.009	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-932.86	5.95	0.012	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-620.07	3.96	0.006	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	-329.11	2.10	0.002	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	85.27	0.54	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	-89.39	0.57	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	78.58	0.50	0.000	Open
1300	P-19	855	J-10	R-5	8.0	PVC	150	-205.03	1.31	0.001	Open
1310	P-20	387	J-3	J-14	8.0	PVC	150	-192.98	1.23	0.001	Open
1311	P-21	778	J-14	J-9	8.0	PVC	150	122.33	0.78	0.000	Open
1312	P-22	401	R-4	J-14	8.0	PVC	150	315.31	2.01	0.002	Open

**Junction Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	52.11	6,189.01	61.01
1273	J-2	6,035.00	10.50	6,188.92	66.59
1275	J-3	6,006.00	0.00	6,189.08	79.21
1277	J-4	5,993.00	0.00	6,189.19	84.88
1279	J-5	5,986.00	0.00	6,189.27	87.94
1281	J-6	5,982.00	0.00	6,189.29	89.69
1284	J-7	6,022.00	2,552.11	6,178.83	67.85
1287	J-8	5,986.00	16.32	6,187.86	87.33
1293	J-9	6,056.00	37.06	6,189.11	57.59
1296	J-10	5,951.00	37.06	6,189.36	103.13
1309	J-14	6,022.62	0.00	6,189.34	72.13

## Vistas at Kings Point

### MDD + Fire Demand @ J-9

**Reservoir Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	944.22	6,190.00
1269	R-2	6,190.00	653.83	6,190.00
1314	R-4	6,190.00	688.56	6,190.00
1315	R-5	6,190.00	168.55	6,190.00

**Pipe Table - Time: 0.00 hours**

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial )
1272	P-2	312	R-1	J-1	12.0	PVC	150	944.22	2.68	0.002	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	818.10	2.32	0.001	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	-117.02	0.33	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-574.49	1.63	0.001	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-484.85	1.38	0.001	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-443.01	1.26	0.000	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-653.83	1.85	0.001	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	74.01	0.47	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	89.15	0.57	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-67.25	0.43	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-210.82	1.35	0.001	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	127.25	0.81	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-1,013.77	6.47	0.014	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	-89.64	0.57	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	41.85	0.27	0.000	Open
1300	P-19	855	J-10	R-5	8.0	PVC	150	-168.55	1.08	0.001	Open
1310	P-20	387	J-3	J-14	8.0	PVC	150	584.72	3.73	0.005	Open
1311	P-21	778	J-14	J-9	8.0	PVC	150	1,273.29	8.13	0.022	Open
1312	P-22	401	R-4	J-14	8.0	PVC	150	688.56	4.39	0.007	Open

**Junction Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	52.11	6,189.45	61.20
1273	J-2	6,035.00	10.50	6,189.16	66.70
1275	J-3	6,006.00	0.00	6,189.19	79.26
1277	J-4	5,993.00	0.00	6,189.39	84.97
1279	J-5	5,986.00	0.00	6,189.53	88.06
1281	J-6	5,982.00	0.00	6,189.60	89.82
1284	J-7	6,022.00	52.11	6,189.33	72.40
1287	J-8	5,986.00	16.32	6,189.40	88.00
1293	J-9	6,056.00	2,287.06	6,170.14	49.38
1296	J-10	5,951.00	37.06	6,189.56	103.21
1309	J-14	6,022.62	0.00	6,187.18	71.20



## Vistas at Kings Point

### MDD + Fire Demand @ J-10

**Reservoir Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	617.56	6,190.00
1269	R-2	6,190.00	813.08	6,190.00
1314	R-4	6,190.00	222.24	6,190.00
1315	R-5	6,190.00	802.28	6,190.00

**Pipe Table - Time: 0.00 hours**

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial )
1272	P-2	312	R-1	J-1	12.0	PVC	150	617.56	1.75	0.001	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	471.36	1.34	0.000	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	387.42	1.10	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	624.03	1.77	0.001	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-51.42	0.15	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-860.75	2.44	0.001	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-813.08	2.31	0.001	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	94.09	0.60	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-61.35	0.39	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	103.33	0.66	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	47.67	0.30	0.000	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	39.34	0.25	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-12.10	0.08	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	675.45	4.31	0.007	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-809.32	5.17	0.009	Open
1300	P-19	855	J-10	R-5	8.0	PVC	150	-802.28	5.12	0.009	Open
1310	P-20	387	J-3	J-14	8.0	PVC	150	-197.28	1.26	0.001	Open
1311	P-21	778	J-14	J-9	8.0	PVC	150	24.96	0.16	0.000	Open
1312	P-22	401	R-4	J-14	8.0	PVC	150	222.24	1.42	0.001	Open

**Junction Table - Time: 0.00 hours**

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	52.11	6,189.75	61.33
1273	J-2	6,035.00	10.50	6,189.65	66.91
1275	J-3	6,006.00	0.00	6,189.38	79.34
1277	J-4	5,993.00	0.00	6,189.16	84.87
1279	J-5	5,986.00	0.00	6,189.16	87.90
1281	J-6	5,982.00	0.00	6,189.40	89.73
1284	J-7	6,022.00	52.11	6,189.56	72.50
1287	J-8	5,986.00	16.32	6,189.41	88.01
1293	J-9	6,056.00	37.06	6,189.64	57.82
1296	J-10	5,951.00	2,287.06	6,182.03	99.96
1309	J-14	6,022.62	0.00	6,189.65	72.27

# **APPENDIX C**

## **Wastewater**

Sanitary Sewer Calculations  
8" PVC Max Flow @ 75% Full  
8" PVC @ Peak Design Flow



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

TD # 14-003  
1/16/2024  
MJG

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

# Channel Report

## Design Point 1 - 8in PVC @ Peak Design Flow

### Circular

Diameter (ft) = 0.67

Invert Elev (ft) = 5000.00

Slope (%) = 0.40

N-Value = 0.011

### Calculations

Compute by: Known Q

Known Q (cfs) = 0.46

### Highlighted

Depth (ft) = 0.34

Q (cfs) = 0.460

Area (sqft) = 0.18

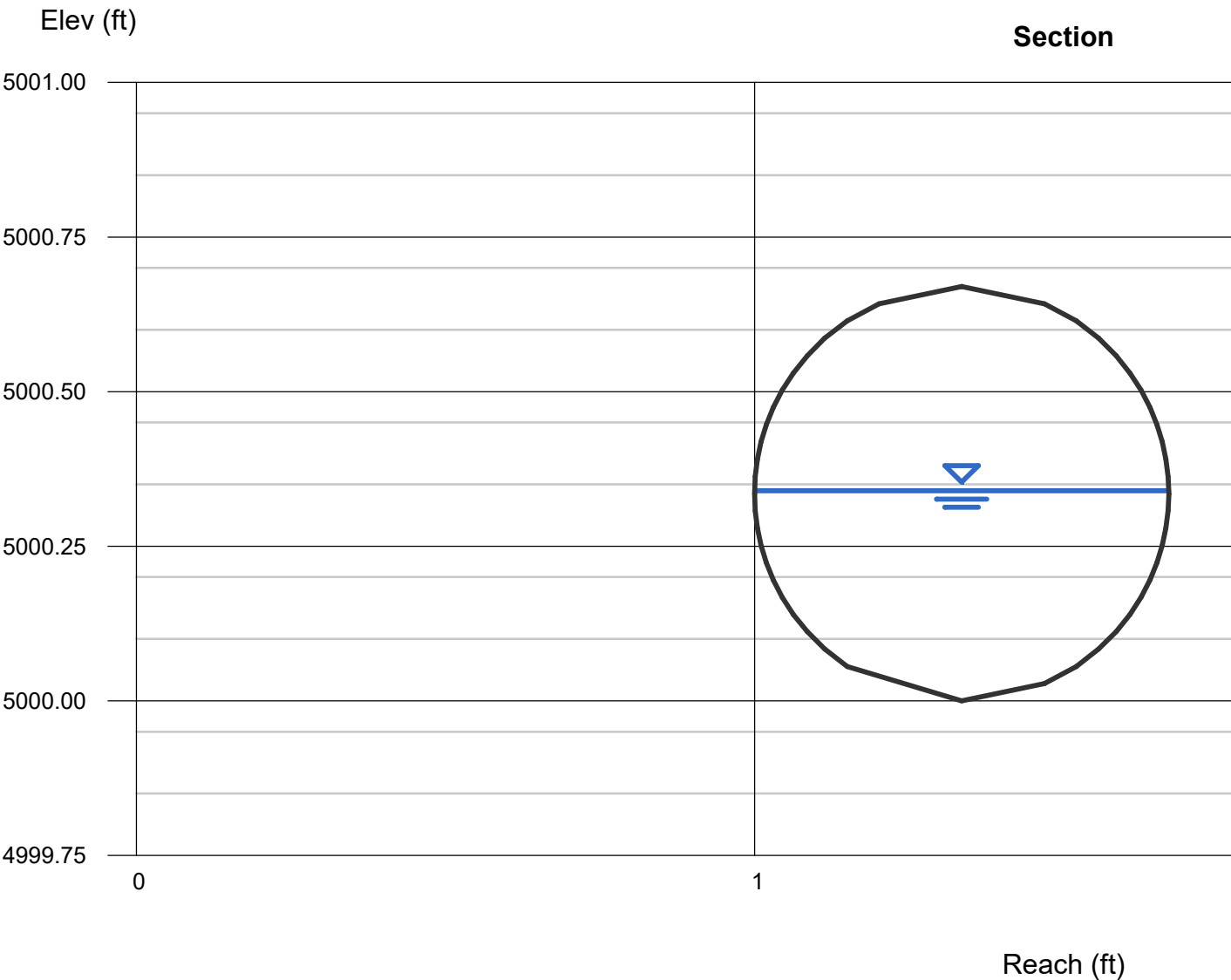
Velocity (ft/s) = 2.55

Wetted Perim (ft) = 1.07

Crit Depth, Yc (ft) = 0.32

Top Width (ft) = 0.67

EGL (ft) = 0.44



# Channel Report

## Design Point 2 - 8in PVC @ Peak Design Flow

### Circular

Diameter (ft) = 0.67

Invert Elev (ft) = 5000.00

Slope (%) = 0.40

N-Value = 0.011

### Calculations

Compute by: Known Q

Known Q (cfs) = 0.04

### Highlighted

Depth (ft) = 0.10

Q (cfs) = 0.042

Area (sqft) = 0.03

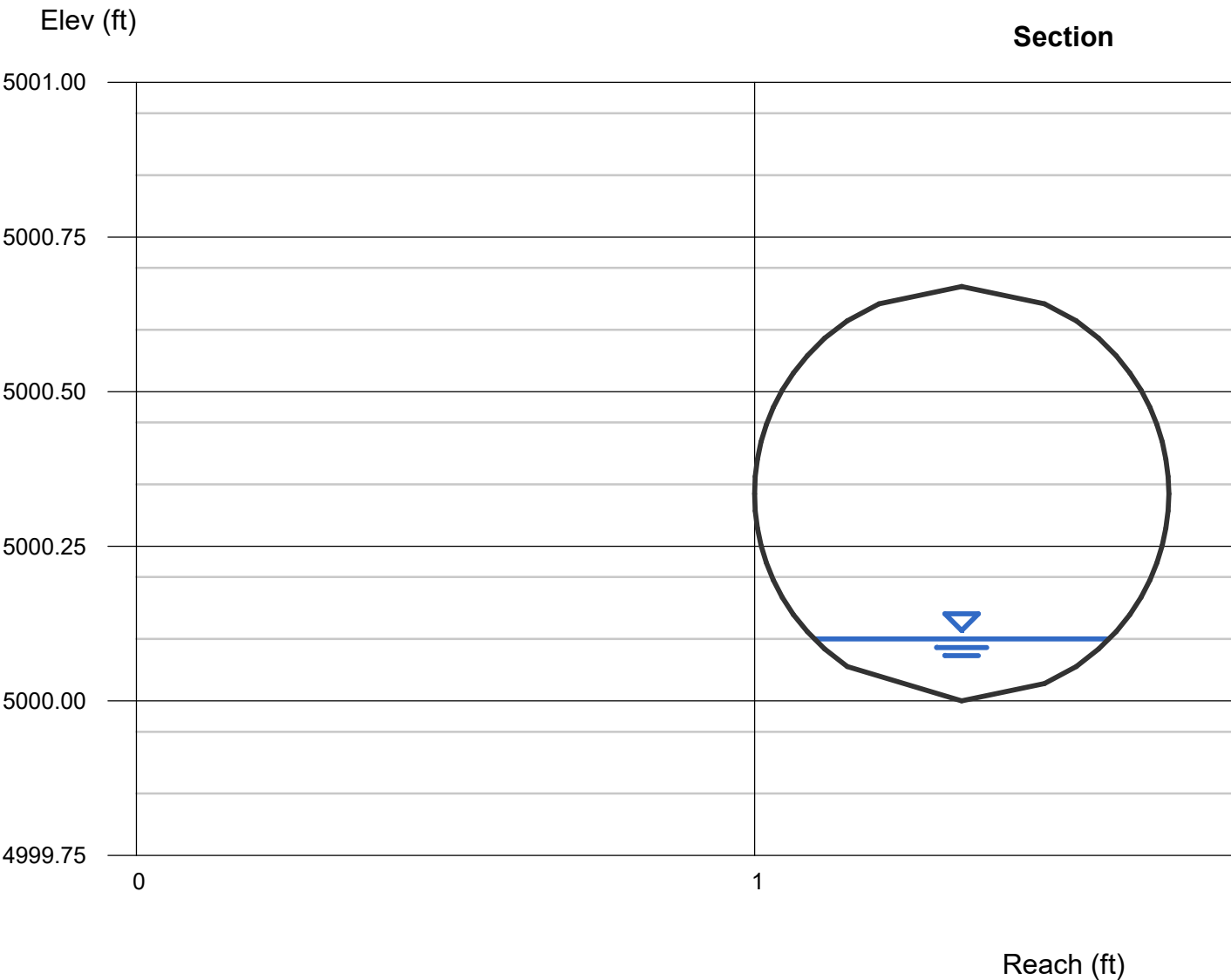
Velocity (ft/s) = 1.27

Wetted Perim (ft) = 0.53

Crit Depth, Yc (ft) = 0.10

Top Width (ft) = 0.48

EGL (ft) = 0.13



# **APPENDIX D**

## **References**

Kings Point South Master Utility Report (West of Site)  
Kings Point North Master Utility Report(North of Site)



▷ HRGREEN.COM

## Kings Point South Master Utility Report

December 2022  
HR Green Project No: 212000.01

Prepared For:  
Lennar Corporation  
c/o Joseph Huey, PE  
9193 S Jamaica Street  
Englewood, CO 80112

### FACSIMILE

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

Kristine L. House  
12-21-22  
Kristine L. House Date

Prepared By:  
HR Green Development, LLC  
Contact: Kristine House, PE  
khouse@hrgreen.com  
720-602-4938

### Approved For One Year From This Date

01/05/2023

Haley B. Plummer  
City Engineer

01/04/2023  
Date

Vernon A. Adam  
Water Department

12/30/2022  
Date

Mark Apodaca  
Fire Department

12-27-2022  
Date

- Minimum velocity of 2 fps at least once per day. Minimum slope of 0.4% will be analyzed for pipes to meet the 2 fps requirement.

The *Master Utility Report for Kings Point North* (EDN 222157 MU1) assumed two off-site demand locations for Kings Point South, noted with Design Point 32 and Basin FUT-2. Design Point 32 references a cumulative Total Peak Flow of 645 gallons-per-minute (gpm), whereas this report calculates a lesser demand of 502 gpm or 0.723 million gallons-per-day (mgd) at the same location. The Kings Point North Report calculated a cumulative Total Peak Flow of 15.3 gpm for Basin FUT-2, whereas this report calculates a greater demand of 20.4 gpm or 0.029 million mgd at the same location. It appears the Kings Point North Report was utilizing out of date calculations, the design teams will continue to coordinate these demands to ensure adequate infrastructure sizing as both projects move forward with design.

### 3. Sanitary Sewer Flow Generations

- Sanitary sewer loading calculations have been completed and applied to the proposed sanitary system in accordance with COA Standards and Specifications. Unit counts used in this analysis are based on current development projections and are within parameters set forth with the FDP. Additional criteria used to determine sanitary sewer generations include:
  - Average flow generation of 68 gallons per capita per day (gpc/day).
  - Residential population density of (2.77 people/unit).
- Sanitary basin boundaries were estimated based on the existing grades and natural flow direction of the site. One off-site basin and thirteen major on-site sanitary basins were identified. The off-site basin includes approximately 115 acres and is inclusive of the Prusse property (including unannexed portions). Sanitary sewer generation calculations are included in Appendix C and summarized below (including off-site).

**TABLE 4: SANITARY SEWER DEMAND SUMMARY**

Location (see sheet SS1)	Average Day Flow (mgd)	Peak Flow + Infiltration (mgd)
Filing No. 1 (west)	0.034	0.141
Filing No. 2 (east)	0.094	0.387
Off-site	0.055	0.226
Kings Point South Total	0.184	0.753

### 4. Sanitary Sewer Sizing

- Preliminary sanitary sewer system sizing was determined in accordance with the COA Standards and Specifications for maximum depth of flow of 75% capacity for all pipe sizes 12-inches and smaller and 80% for pipe sizes larger than 12-inches.
- Pipe capacities and velocity requirements were verified in Bentley FlowMaster. Calculations indicate that all planned development can be serviced by 8-inch and 10-inch mains. The City of Aurora has requested that where this report calculates a 10-inch line is adequate, those lines be upsized to 12-inch mains. This provides for a measure of flexibility in the future land use densities.



## 5. Sanitary Sewer Lift Station

- a) A lift station will be required for the City of Aurora to provide wastewater service to the proposed development. Most of the flow will gravity flow to the southwest corner of the site, where the lift station is located, and be lifted via 8-inch force main along Kings Point Way. The proposed lift station will be designed to accommodate the peak flow (0.724 mgd) from the Kings Point South development.

The lift station, force main, and connection point to Filing No. 2 will be constructed during Filing No. 1. There will be a 12-inch line under E-470 that will connect service from Filing No. 2 to the lift station. The City of Aurora has an intergovernmental agreement (IGA) with Metro Wastewater, where flows will eventually be conveyed via a series of lift stations. Neighboring sanitation districts include Cottonwood Sanitation and Water District and Parker Sanitation District. See separate *Conceptual Design Report, Kings Point South Lift Station* for additional details.

## D. Conclusions

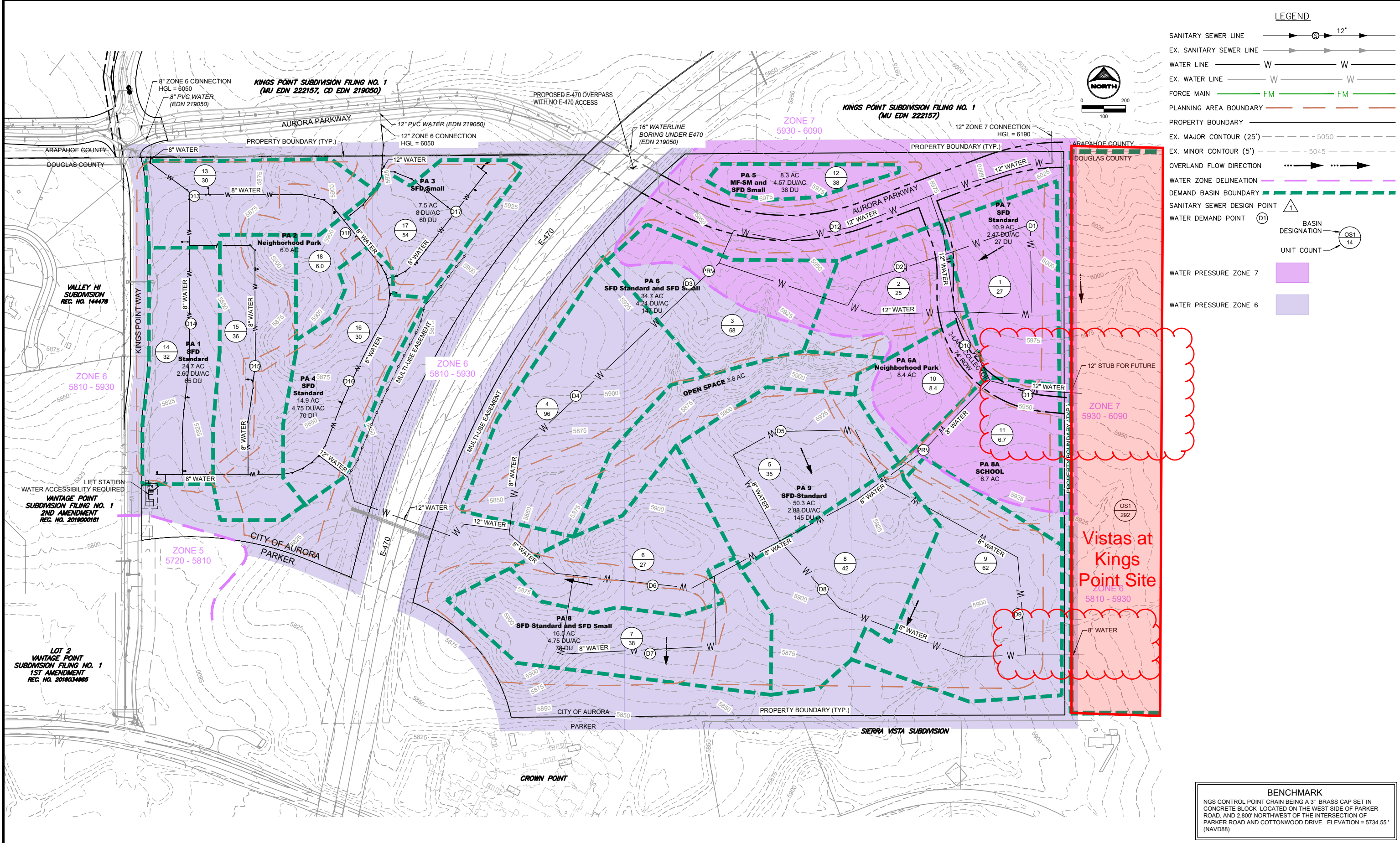
### 1. Domestic Water

- a) This Master Utility Report for Kings Point South is in compliance with the City of Aurora domestic water design criteria. Reservoir elevations of the connections to the water system are consistent with surrounding developments and are based on typical Zone pressures (HGLs) noted above.
- b) The domestic water system is comprised of 8-inch and 12-inch lines, is proposed to tie into the existing network and satisfies the requirements for the Average Day, Maximum Hour, and Maximum Day Demand + Fire Flow scenarios.
- c) No water system variances are requested at this time.

### 2. Sanitary Sewer


- a) This Master Utility Report for Kings Point South is in compliance with the City of Aurora sanitary sewer design criteria.
- b) The following conclusions are drawn based on this study:
  - Proposed 8-inch local sanitary sewer lines will tie into larger 12-inch sanitary mains conveying effluent to a lift station near the southwest corner of the site.
  - A lift station will be required for the City of Aurora to provide wastewater service to the proposed development.
  - The sanitary alignment can maintain minimum slopes and acceptable design depths for the proposed development within the project area.
  - Total average flow rates calculated with this Report (0.18 mgd) are less than those estimated with *The Master Utility Report for Kings Point North* (0.50 mgd). The existing sanitary sewer infrastructure is adequately sized to convey lifted effluent from Kings Point South.

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



DRAWN BY:	KLH	JOB DATE:	9/21/2022
APPROVED:	RWL	JOB NUMBER:	212000.01
CAD DATE:	11/30/2022		
CAD FILE:	J:\2021\212000.01\CAD\DWGS\CIMURKPS_MasterUtilityPlan		

NO.	DATE	BY	REVISION DESCRIPTION



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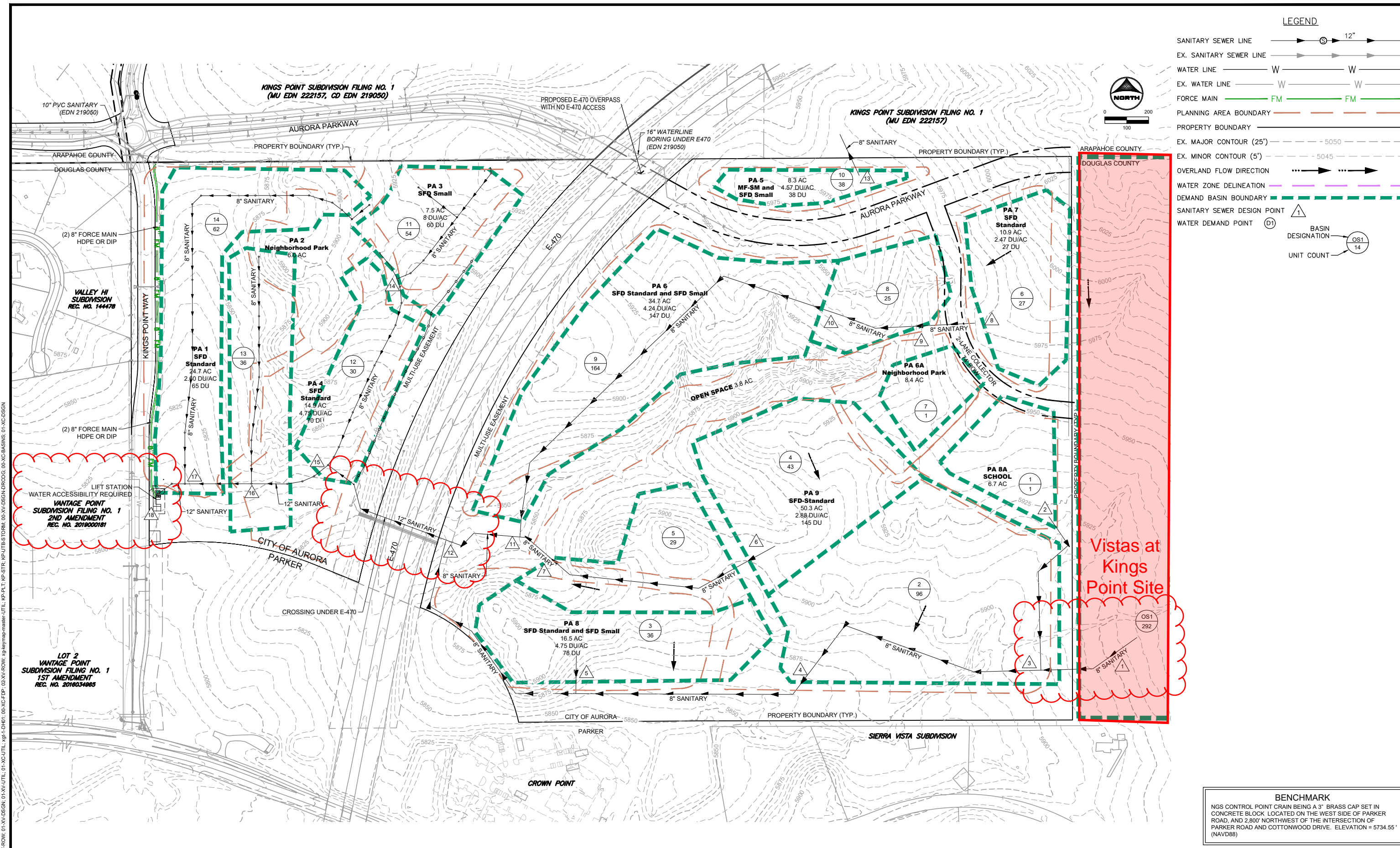
KINGS POINT SOUTH SUBDIVISION - FILING NO. 1  
LENNAR CORPORATION  
CITY OF AURORA, COLORADO

MASTER UTILITY REPORT  
MASTER WATER PLAN

SHEET  
WT1  
1

**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)





**LEGEND**

SANITARY SEWER LINE 12"

EX. SANITARY SEWER LINE

WATER LINE W W

EX. WATER LINE W W

FORCE MAIN FM 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 1

WATER DEMAND POINT 01

BASIN DESIGNATION OS1

UNIT COUNT 14

**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)

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APPROVED: RWL JOB NUMBER: 212000.01  
CAD DATE: 11/30/2022  
CAD FILE: J:\2021\212000.01\CAD\DWG\CIMURKPS\_MasterUtilityPlan

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

NO.	DATE	BY	REVISION DESCRIPTION

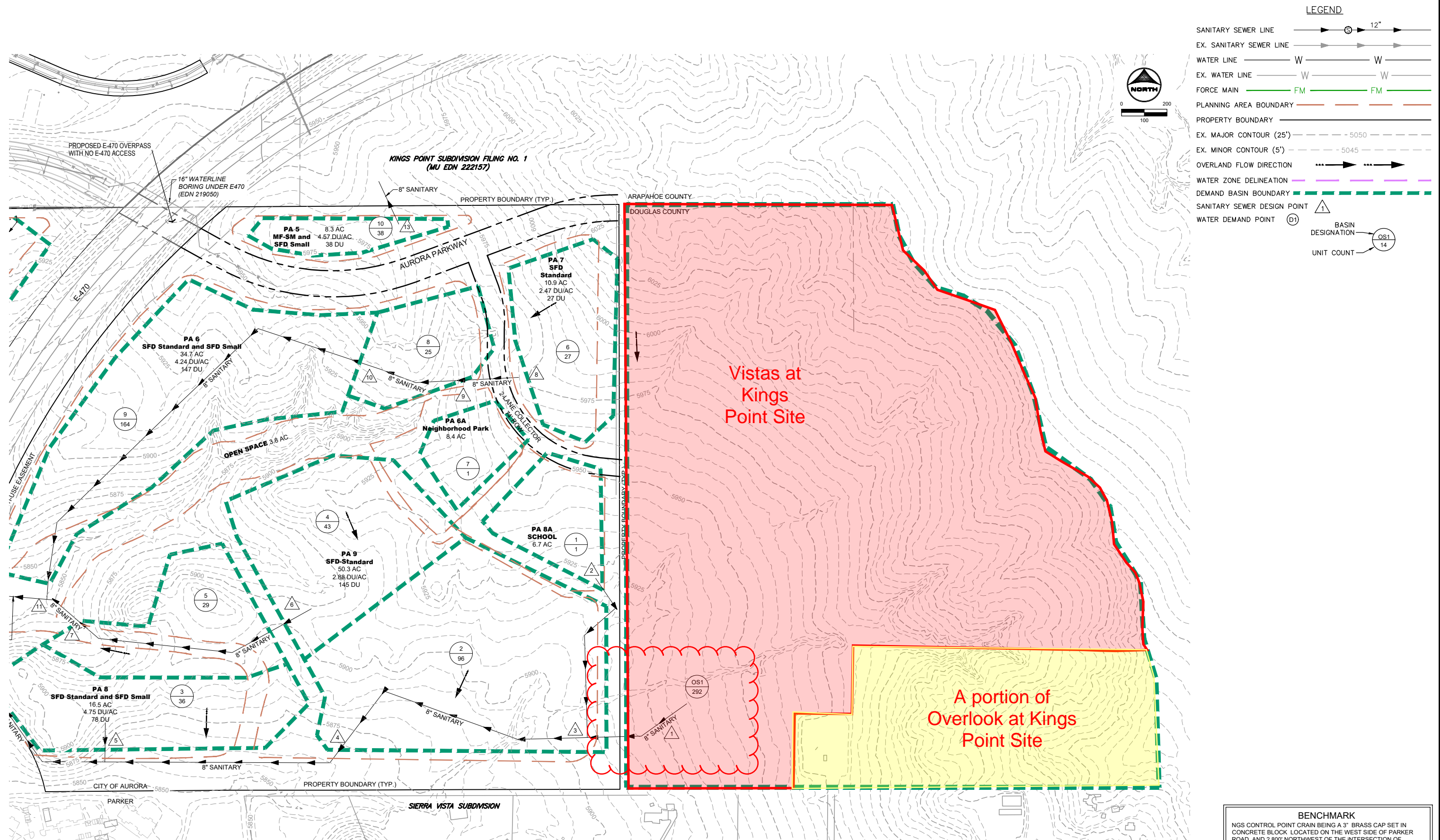
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DENVER CO 80111  
PHONE: 720.602.4999 | TOLL FREE: 800.728.7805  
FAX: 844.273.1057 | HRGreen.com

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

MASTER UTILITY REPORT  
MASTER SANITARY SEWER PLAN

SHEET  
SS1  
2





NO.	DATE	BY	REVISION DESCRIPTION

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

SHEET  
SS2

3



# 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 <sup>0.167</sup> )		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	<b>0.226</b>	0.349	0.4%	8		
2	1	School		1	6.7	18.00	121	67	0.008	0.001	121	4.0	0.032	<b>0.033</b>	0.051	0.4%	8		
3	Total at Design Point								0.063	0.006	929	4.0	0.252	<b>0.258</b>	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	<b>0.074</b>	0.115	0.4%	8		
	Total at Design Point								0.081	0.008	1,195	4.0	0.324	<b>0.333</b>	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	<b>0.028</b>	0.043	0.4%	8		
	Total at Design Point								0.088	0.009	1,295	4.0	0.352	<b>0.360</b>	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	<b>0.033</b>	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	<b>0.022</b>	0.035	0.4%	8		
	Total at Design Point								0.014	0.001	199	4.0	0.054	<b>0.056</b>	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	<b>0.021</b>	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	<b>0.021</b>	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	<b>0.019</b>	0.030	0.4%	8		
	Total at Design Point								0.010	0.001	144	4.0	0.039	<b>0.040</b>	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	<b>0.127</b>	0.196	0.4%	8		
	Total at Design Point								0.054	0.005	798	4.0	0.217	<b>0.222</b>	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	<b>0.583</b>	0.902	0.4%	10	3.1	53.0%

Excerpts from

# MASTER UTILITY REPORT FOR

KINGS POINT NORTH  
AURORA, CO  
PROJECT NO. 1571466

## Prepared for:

Clayton Properties Group II, Inc.  
4908 Tower Road  
Denver, CO 80249  
Contact: Randy Bauer  
Phone: 303-486-8500

## Prepared by:

**CORE**

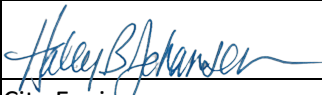
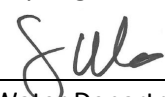
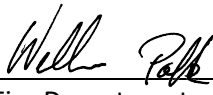
CORE Consultants, Inc.  
3473 South Broadway  
Englewood, CO 80113  
Contact: Rob Hansen, PE, CFM  
Phone: 303-703-4444  
CORE Project Number: 19-032

## FACSIMILE

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OF THE SIGNED AND SEALED PDF SET.

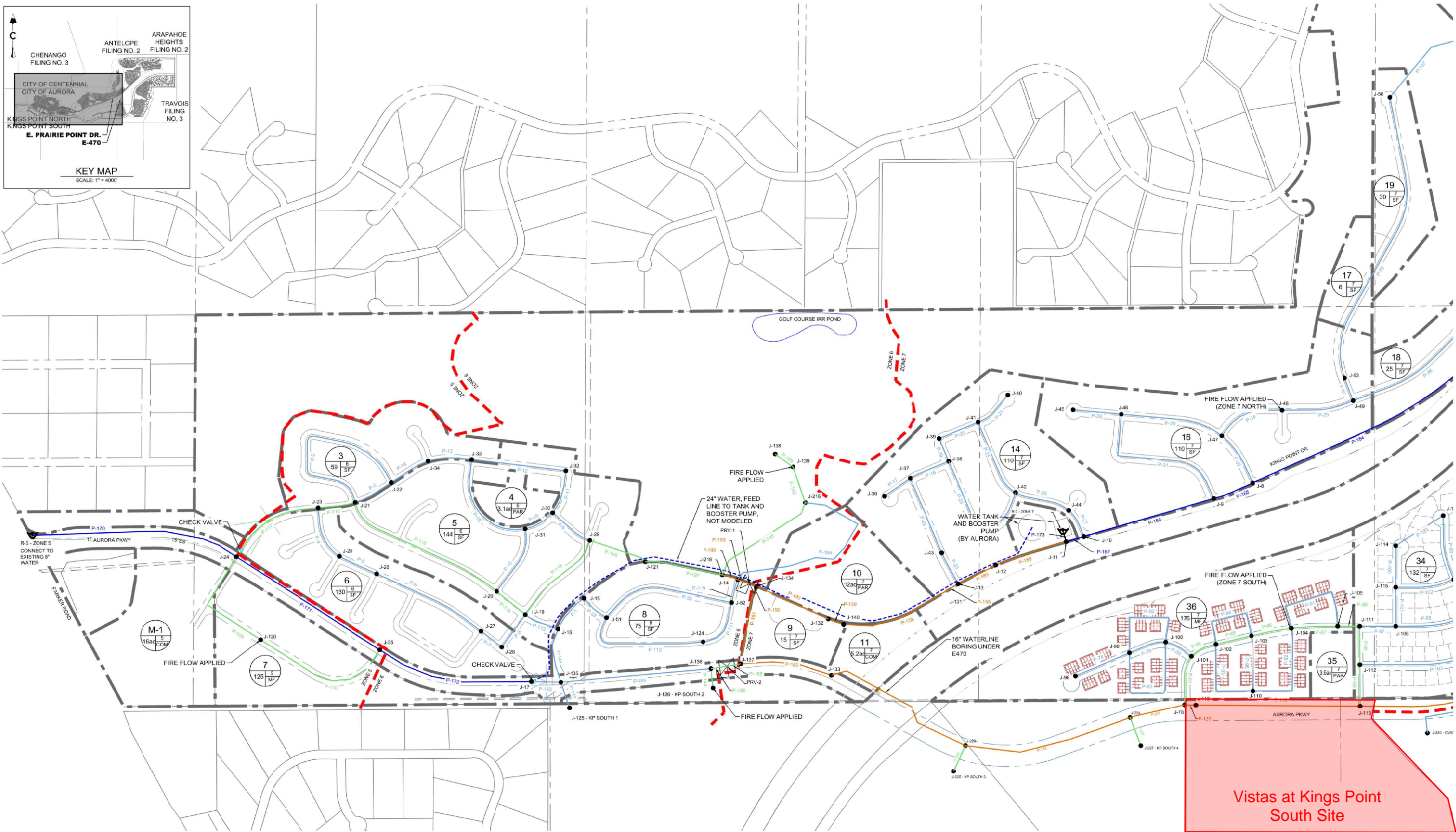
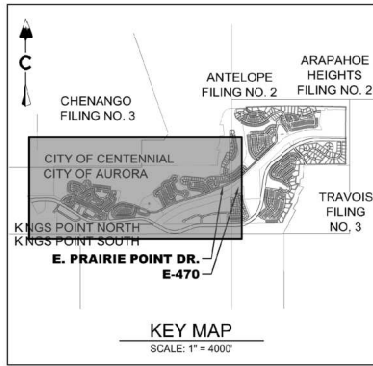
  
ROBERT D. HANSEN, PE, CFM 12/29/22  
DATE

Amendment Dated: December 29, 2022  
Originally Approved on June 15, 2022 (222157)

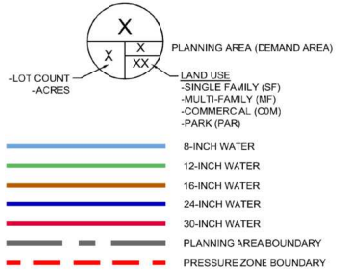
APPROVED ON THIS DATE	
01/11/2023	
	01/10/2023
City Engineer	Date
	01/05/2023
Water Department	Date
	01/05/2023
Fire Department	Date

PROJECT: KINGS POINT NORTH MASTER UTILITY REPORT SANITARY DESIGN																									Design Criteria									
																									Slope		Capacity (gpm)							
																									Pipe (in)	Min	Max	Min	Max					
																									12/28/22 Date AR	8	0.40%	7.50%	374		1,619			
	10	0.40%	5.50%	678	2,514																													
	12	0.40%	4.50%	1,103	3,698																													
	15	0.40%	3.50%	1,999	5,913																													
	18	0.40%	2.50%	3,251	8,126																													
	21	0.40%	2.00%	4,903	10,964																													
	24	0.40%	1.80%	7,000	14,850																													
	27	0.40%	1.50%	9,584	18,559																													
PROJECTED FLOW DETERMINATION																						SEWER DESIGN												
DESIGN POINT								RESIDENTIAL			MMERCIAL		PEAK FLOW					INFILTRATION & INFLOW		CUMULATIVE TOTAL FLOW					Pipe Size (in)	Number of Pipes	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 (gpm) @ 75% depth @ Design Slope	Capacity Remaining (gpm)	Allowable Percent Capacity Used
Design Point	Basin	Portions of Planning Area(s)	Contributing Flow 1	Contributing Flow 2	Contributing Flow 3	Zoning	No. of Units	Single Family Equivalents / Unit	SFE's	Average Daily Flow (GPD)	Area (Acres)	SFE's	Average Daily Flow (GPD)	Total Average Flow (GPD)	Total Average Daily 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)											
							a	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	z	y	y - r	r/y	
									a*c	188.36*d	Map	f*3	1500*g	e + h	i/24/60	j * 4	10%*j	l/(24*60)	m+k	r	r	r	n+o+p+q											
1	A	PA-16				SF	31	1	31	5,839				5,839	4.05	16.22	583.92	0.405	16.7				16.7	8	1	0.40	0.40	7.50	374	1619	374	357	4%	
2	B	PA-14 & 15	1			SF	85	1	85	16,011				16,011	11.12	44.47	1,601.06	1.112	45.6	16.7			62.3	8	1	0.40	0.40	7.50	374	1619	374	312	17%	
3	C	PA-36 & 35		33	21	SF	176	1	176	33,151				33,151	23.02	92.09	3,315.14	2.302	94.4		20.4	17.7	132.5	8	1	0.40	0.40	7.50	374	1619	374	241	35%	
4	D	PA-14	2	3		SF	17	1	17	3,202				3,202	2.22	8.89	320.21	0.222	9.2	62.3	132.5		204.0	8	1	0.40	0.40	7.50	374	1619	374	170	55%	
5	E	PA-10	4	37		Comm					12.3	36.9	55,350	55,350	38.44	153.75	5,535.00	3.844	157.6	204.0	3.9		365.5	10	1	0.40	0.40	5.50	678	2514	678	313	54%	
6	1/2-F	PA-8	31			SF	34	1	34	6,404				6,404	4.45	17.79	640.42	0.445	18.3	86.2			104.5	8	1	0.40	0.40	7.50	374	1619	374	269	28%	
7	G	PA-5 & 4	5	6		SF	208	1	208	39,179				39,179	27.21	108.83	3,917.89	2.721	111.6	365.5	104.5		581.6	10	1	0.40	0.40	5.50	678	2514	678	96	86%	
8			11																	967.0			967.0	12	1	0.40	0.40	4.50	1103	3698	1,103	136	88%	
9	I	PA-7A				SF	116.0	1	116	21,850				21,850	15.17	60.69	2,184.98	1.517	62.3				62.3	8	1	0.40	0.40	7.50	374	1619	374	312	17%	
10			9	8	10A	NA														62.3	967.0	566.5	1595.8	15	1	0.40	0.40	3.50	1999	5913	1,999	403	80%	
10A	1/2-H	PA-6	18			SF	40.0	1	40	7,534				7,534	5.23	20.93	753.44	0.523	21.5	545.0			566.5	10	1	1.00	0.40	5.50	678	2514	1,072	506	53%	
11	J	PA-3	34			SF	37.0	1	37	6,969				6,969	4.84	19.36	696.93	0.484	19.9	947.1			967.0	12	1	0.40	0.40	4.50	1103	3698	1,103	136	88%	
12	Q-1	PA-18				SF	38.0	1	38	7,158				7,158	4.97	19.88	715.77	0.497	20.4				20.4	8	1	0.40	0.40	7.50	374	1619	374	354	5%	
13	K	FDP M-1				Comm					16.0	48	72,000	72,000	50.00	200.00	7,200.00	5.000	205.0				205.0	8	1	0.40	0.40	7.50	374	1619	374	169	55%	
14			11	13																967.0	205.0		1172.0	15	1	0.40	0.40	3.50	1999	5913	1,999	827	50%	
15			14																	1172.0			1172.0	15	1	0.40	0.40	3.50	1999	5913	1,999	827	59%	
16	L	PA-34	17			SF	62.0	1	62	11,678				11,678	8.11	32.44	1,167.83	0.811	33.3	134.1			167.4	8	1	0.40	0.40	7.50	374	1619	374	207	45%	
17	FUT (Overlook)					SF	250.0	1	250	47,090				47,090	32.70	130.81	4,709.00	3.270	134.1				134.1	8	1	0.40	0.40	7.50	374	1619	374	240	36%	
18	1/2-H	PA-6	32			SF	41.0	1	41	7,723				7,723	5.36	21.45	772.28	0.536	22.0	523.0			545.0	10	1	1.00	0.40	5.50	678	2514	1,072	527	51%	
19	M	PA-32, 31A & 31B	38			SF	291.0	1	291	54,813				54,813	38.06	152.26	5,481.28	3.806	156.1	29.5			185.6	8	1	0.40	0.40	7.50	374	1619	374	188	50%	
20			16	19																167.4	185.6		353.0	10	1	0.40	0.40	5.50	678	2514	678	325	52%	
21	N	PA-16				SF	33.0	1	33	6,216				6,216	4.32	17.27	621.59	0.432	17.7				17.7	8	1	0.40	0.40	7.50	374	1619	374	356	5%	
23	O	PA-25	35			SF	111	1	111	20,908				20,908	14.52	58.08	2,090.80	1.452	59.6	373.4			433.0	10	1	0.40	0.40	5.50	678	2514	678	245	64%	
24	P	PA-20, 21 & 22A	23			SF	84	1	84	15,822				15,822	10.99	43.95	1,582.22	1.099	45.1	433.0			478.1	10	1	0.40	0.40	5.50	678	2514	678	200	71%	
25	Q	PA-17 & 19				SF	34	1	34	6,404				6,404	4.45	17.79	640.42	0.445	18.3				18.3	8	1	0.40	0.40	7.50	374	1619	374	356	5%	
26			25																	18.3			18.3	8	1	0.40	0.40	7.50	374	1619	374	356	5%	
27			24																	478.1			478.1	10	1	0.40	0.40	5.50	678	2514	678	200	71%	
28	R	PA-22A & 23				SF	112	1	112	21,096				21,096	14.65	58.60	2,109.63	1.465	60.1				60.1	8	1	0.40	0.40	7.50	374	1619	374	314	16%	
29	S	PA-30				SF	49	1	49	9,230				9,230	6.41	25.64	922.96	0.641	26.3				26.3	8	1	0.40	0.40	7.50	374	1619	374	348	7%	
30	T	PA-11				Comm					4.8	14.4	21,600	21,600	15.00	60.00	2,160.00	1.500	61.5				61.5	8	1	0.40	0.40	7.50	374	1619	374	312	16%	
31	U & 1/2-F	PA-9	30			SF	40.0	1	40	8,063				8,063	6.02	24.07	806.46	0.602	24.7	61.5			86.2	10	1	0.40	0.40	3.50	678	2514	678	392	13%	
32	KP SOUTH	N/A				SF											Demand from HR Green MU Report for Kings Point South					523.0	10	1	1.00	0.40	5.50	678	2514	1,072	549	49%		
33	FUT-2	N/A				MF	38.0	0.75	38	7,158				7,158	4.97	19.88	715.77	0.497	20.4				20.4	8	1	0.40	0.40	7.						





LEGEND

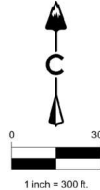


NOTES:

1. WATER NODE MAP DOES NOT DEPICT ALL REQUIRED WATERLINES. MAP ONLY SHOWS THE MODELING OF THE PRIMARY WATER LINES.
2. THE ONLY OBLIGATIONS AURORA HAS CONCERNING THE PROVISION OF WATER FOR IRRIGATION OF THE GOLF COURSE ARE THOSE SET FORTH IN THE AMENDED AND RESTATED WATER LEASE AND DEVELOPMENT AGREEMENT BETWEEN CAYTON PROPERTY GROUP II, INC. (CAYTON) AND THE CITY OF AURORA, COLORADO, DATED SEPTEMBER 27, 2022 AND RECORDED IN THE ARAPAHOE COUNTY, COLORADO CLERK AND RECORDERS OFFICE AT RECEPTION NUMBER 099256.

APPROVED FOR ONE YEAR FROM THIS DATE

CITY ENGINEER	DATE
WATER DEPARTMENT	DATE
FIRE DEPARTMENT	DATE



LAND DEVELOPMENT  
ENERGY  
PUBLIC INFRASTRUCTURE

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

CORE

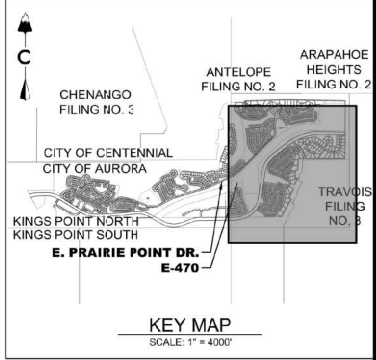
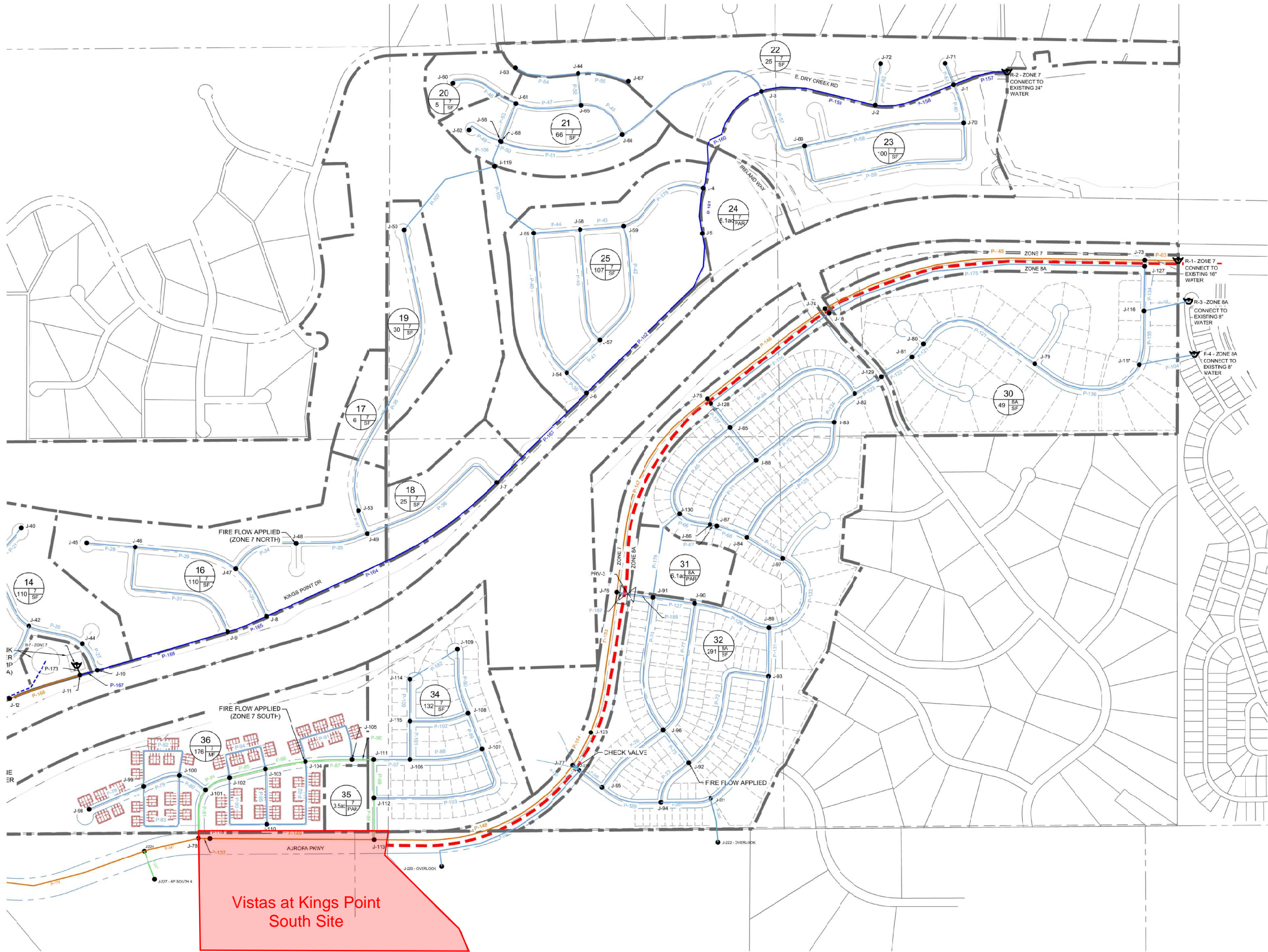
MASTER UTILITY WATER  
NODE MAP

KINGS POINT NORTH

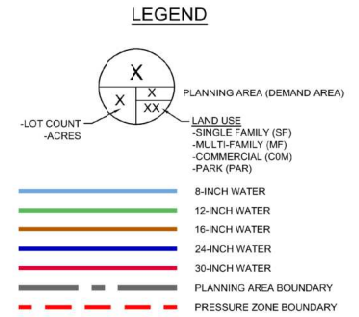
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CREATED BY: AR  
JOB NO. 19-032  
SHEET 1



12/29/2022 4:38 PM : CORE-2012-FILED PROJECTS\10-032 KINGS POINT\CAD\LAND\UTILITY REPORT\MASTER UTILITY REPORT\WATER CAD\MP MASTER WATERCAD MODEL.DWG.



- NOTES:**
1. WATER NODE MAP DOES NOT DEPICT ALL REQUIRED WATERLINES. MAP ONLY SHOWS THE MODELING OF THE PRIMARY WATER LINES.
  2. THE ONLY OBLIGATIONS AURORA HAS CONCERNING THE PROVISION OF WATER FOR IRRIGATION OF THE GOLF COURSE ARE THOSE SET FORTH IN THE AMENDED AND RESTATED WATER LEASE AND DEVELOPMENT AGREEMENT BETWEEN CLAYTON PROPERTY GROUP I, INC (DBA OAKWOOD HOMES) AND THE CITY OF AURORA, COLORADO, ACTING BY AND THROUGH ITS UTILITY ENTERPRISE, (LATE SEPTEMBER 27, 2022 AND RECORDED IN THE ARAPAHOE COUNTY, COLORADO CLERK AND RECORDERS OFFICE AT RECEPTION NUMBER E099256).



APPROVED FOR ONE YEAR FROM THIS DATE

CITY ENGINEER	DATE
WATER DEPARTMENT	DATE
FIRE DEPARTMENT	DATE
10/05/2023	

LAND DEVELOPMENT

ENERGY

PUBLIC INFRASTRUCTURE

CORE CONSULTANTS, INC.

3473 S. BROADWAY

ENGLEWOOD, CO 80113

303.703.4444

LIVEYOURCORE.COM

**CORE**

MASTER UTILITY WATER

NODE MAP

KINGS POINT NORTH

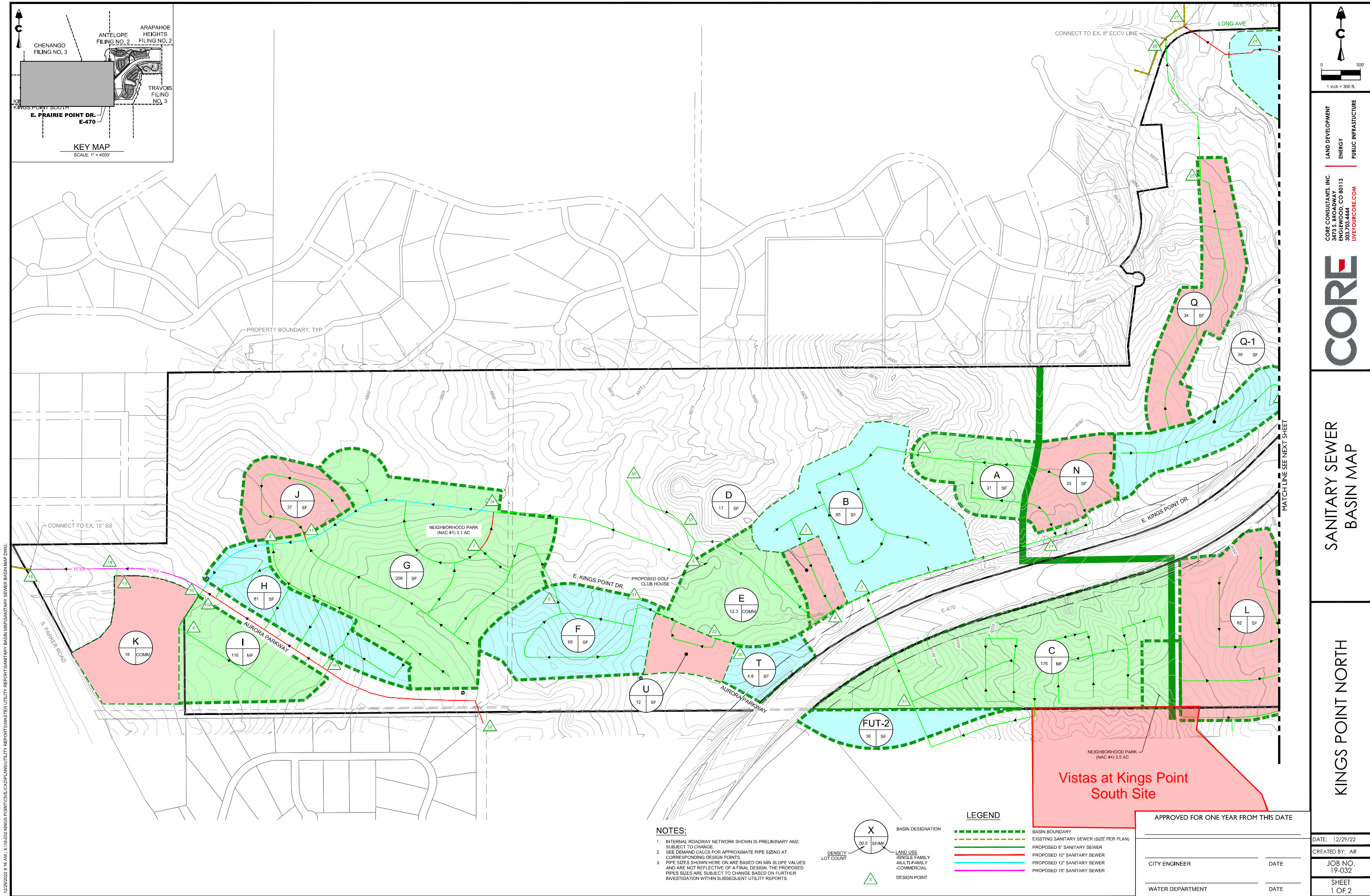
DATE: 12/29/22

CREATED BY: AR

JOB NO. 19-032

SHEET 2





1/29/2022 9:16 AM: X:\18032 KINGS POINT\CAD\PLANS\UTILITY REPORTS\MASTER UTILITY REPORT\SANITARY BASIN MAP\SANITARY SEWER BASIN MAP.DWG.

NOTES:  
1. INTERNAL ROADWAY NETWORK SHOWN IS PRELIMINARY AND SUBJECT TO CHANGE.  
2. SEE DEMAND CALCS FOR APPROXIMATE PIPE SIZING AT CORRESPONDING DESIGN POINTS.  
3. PIPE SIZES SHOWN HERE ON ARE BASED ON MIN SLOPE VALUES AND ARE NOT REFLECTIVE OF A FINAL DESIGN. THE PROPOSED PIPES SIZES ARE SUBJECT TO CHANGE BASED ON FURTHER INVESTIGATION WITHIN SUBSEQUENT UTILITY REPORTS.

X

00.0

SF/MF

DENSITY  
LOT COUNT

LAND USE

-SINGLE FAMILY  
-MULTI-FAMILY  
-COMMERCIAL

DESIGN POINT

DESIGN POINT

2

LEGEND

---

BASIN BOUNDARY

---

EXISTING SANITARY SEWER (SIZE PER PLAN)

---

PROPOSED 8" SANITARY SEWER

---

PROPOSED 10" SANITARY SEWER

---

PROPOSED 12" SANITARY SEWER

---

PROPOSED 15" SANITARY SEWER

APPROVED FOR ONE YEAR FROM THIS DATE

CITY ENGINEER

DATE

WATER DEPARTMENT

DATE

0

1 inch = 300 ft.

300'

LAND DEVELOPMENT  
ENERGY  
PUBLIC INFRASTRUCTURE

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

CORE

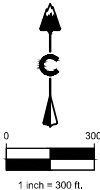
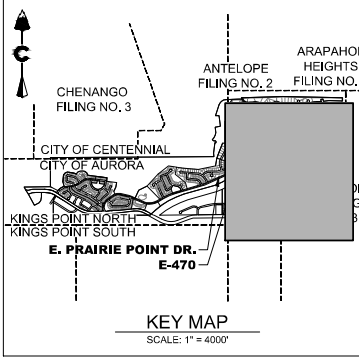
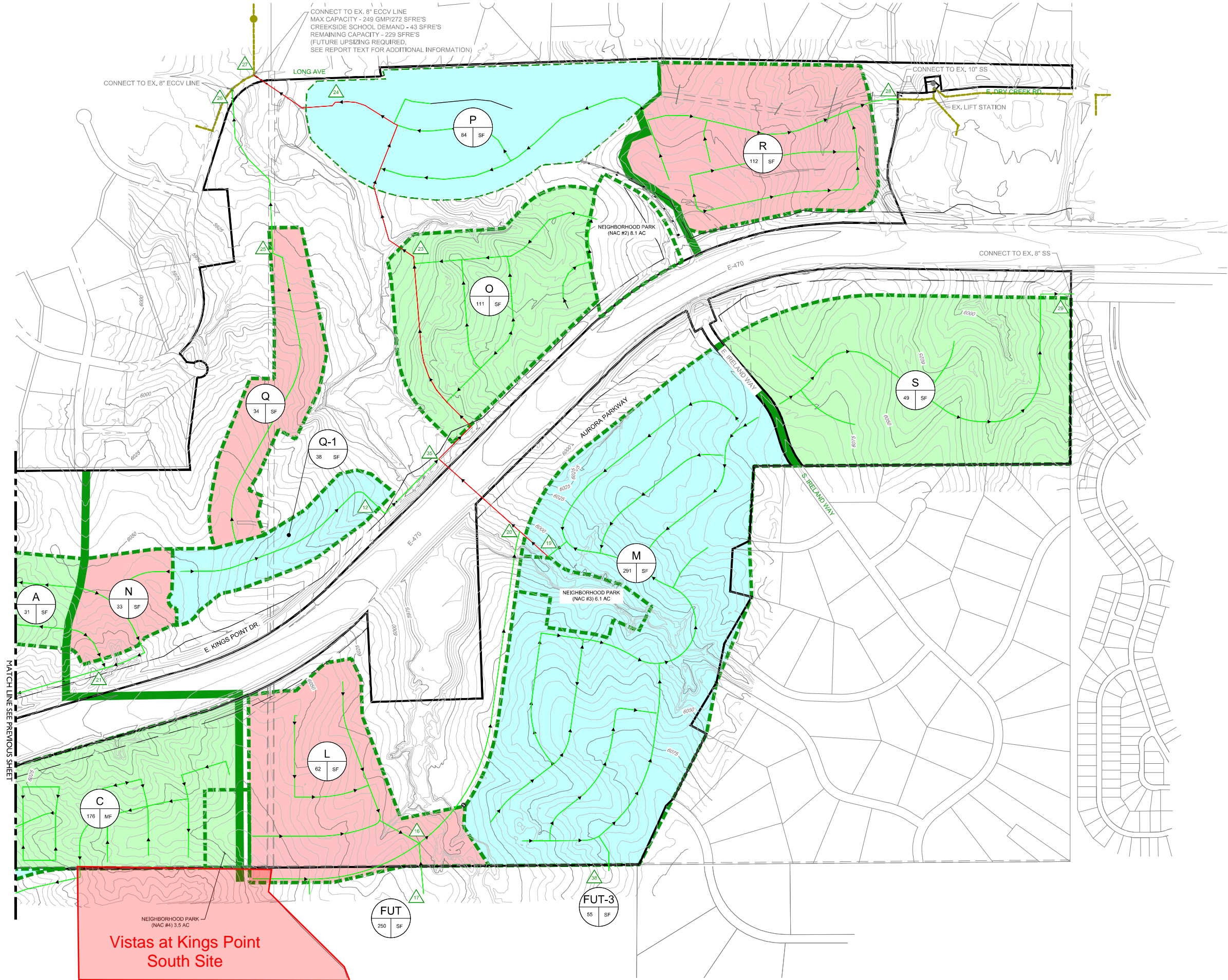
SANITARY SEWER  
BASIN MAP

KINGS POINT NORTH

DATE: 12/29/22  
CREATED BY: AR  
JOB NO. 19-032  
SHEET 1 OF 2



1/22/2022 8:17 AM: X:\18\032 KINGS POINT\CAD\PLANS\UTILITY REPORTS\MASTER UTILITY REPORT\SANITARY BASIN MAP\SANITARY SEWER BASIN MAP.DWG



**LEGEND**

**DENSITY LOT COUNT**

**BASIN DESIGNATION**

**LAND USE**

**DESIGN POINT**

**BASIN BOUNDARY**

**EXISTING SANITARY SEWER (SIZE PER PLAN)**

**PROPOSED 8" SANITARY SEWER**

**PROPOSED 10" SANITARY SEWER**

**PROPOSED 12" SANITARY SEWER**

**PROPOSED 15" SANITARY SEWER**

**NOTES:**

- INTERNAL ROADWAY NETWORK SHOWN IS PRELIMINARY AND SUBJECT TO CHANGE.
- SEE DEMAND CALCS FOR APPROXIMATE PIPE SIZING AT CORRESPONDING DESIGN POINTS.
- PIPE SIZES SHOWN HERE ON ARE BASED ON MIN SLOPE VALUES AND ARE NOT REFLECTIVE OF A FINAL DESIGN. THE PROPOSED PIPES SIZES ARE SUBJECT TO CHANGE BASED ON FURTHER INVESTIGATION WITHIN SUBSEQUENT UTILITY REPORTS.

APPROVED FOR ONE YEAR FROM THIS DATE	
CITY ENGINEER	DATE
WATER DEPARTMENT	DATE

DATE: 12/29/22
CREATED BY: AR
JOB NO. 19-032
SHEET 2 OF 2

SANITARY SEWER  
BASIN MAP

KINGS POINT NORTH

CORE CONSULTANTS, INC.  
3473 S. BROADWAY  
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LAND DEVELOPMENT  
ENERGY  
PUBLIC INFRASTRUCTURE