



2023-09-06 (DJK)
Minor comments regarding building sizes compared to provided site plan, provide Master Traffic Trip Gen sheet in appendix Crossroads study, denote employee numbers for trip gen (sf isn't being used)

July 26, 2023

Danny Kelly
National Acquisition Company, LLC

Re: QTS Aurora Phase 2
Traffic Compliance and Gated Queue
Aurora, Colorado

Thank you for the review of this traffic study letter. Please see responses individual responses throughout this document.

Dear Mr. Kelly,

This traffic study letter documents a trip generation comparison to identify conformance with the original master traffic impact study for the proposed QTS Aurora Phase 2 to be located to the northeast of the future 10th Avenue & Gun Club Road intersection in Aurora, Colorado. This letter also includes a gated entry vehicle queuing analysis, internal circulation plan, and offsite improvement changes. The project is located within the overall Aurora Crossroads development to the southeast of Interstate 70 (I-70) and E-470. Regional access to QTS Aurora Phase 2 will be provided by I-70 and E-470 while primary access will be provided by Gun Club Road. A conceptual site plan for the project is attached.

SITE INFORMATION AND TRIP GENERATION COMPARISON

Divided by 4 = 232,502 sf footprint of building which is 1,105 sf more than identified on Site Plan (sht 2)

Trip generation for this report was based on employees and site-specific trip generation. Therefore, and based on a follow up comment, square footages were removed from this study to avoid confusion.

... Crossroads Master Traffic Impact Study” that included this overall project area from this study are attached. The ... was compared with the trip ... of the original master traffic study ... of “Aurora Crossroads Master ... a data center of up to 1,160,000 ... The current proposal for the QTS ... buildings with a total of ... addition to the previously studied ... an estimated 288,468 square ... “Gun Club Road ... Data Center” for purposes of this study—and the two buildings currently proposed on the ... western side of the site, the total data center square footage on this parcel would result in ... approximately 1,218,476 square feet, or about 58,476 square feet more than the originally ... proposed development studied in the master study completed in November 2021

per Site Plan

PA-5 Site plan only had 1,101,331 sf per 2022 plan date

See above response.

See above response.

The current proposal for this area proposes one full movement access along the south side ... at the eastern roundabout (Intersection #11 in the original ... and one emergency-vehicle-only access ... western side of the site. Of note, the original ... proposed three accesses along the south side of Gun Club Road, including what was referred to as “Main Street” (Intersection #13 in the master study), in addition to a right-in/right-out access (Intersection #12 in the master study) in between “Main Street” and the Eastern Roundabout.

Site-generated traffic estimates are determined through a process known as trip generation. Trip generation data for this site from the original traffic study was received from a potential data center user. This portion of the Aurora Crossroads development within the original study was anticipated to generate 350 daily weekday trips with 102 trips occurring during the morning and afternoon peak hours based on the information provided in the original study.

The current proposal is anticipated to have the same data center user, and despite the slight increase in overall square footage, the user-specific trip generation data for this overall development area remains the same as the previous proposal Development Option #2. The three total buildings data center is anticipated to incorporate three (3) shifts of eight (8) hours with 51 employees per shift. These operations will occur 24 hours per day. This equates to 306 employee trips per day (51 employees x 3 shifts x 2 trips per employee). In addition to the 306 employee trips, 44 daily visitor and deliveries trips are expected to occur during the off-peak hours per day. It is anticipated that one of the three shifts will occur during the morning peak hour and another of the three shifts will occur during the afternoon peak hour.

Based on this information, the proposed data center is expected to generate 350 daily trips, with 102 of these trips occurring during both the morning and afternoon peak hours. The following table summarizes the anticipated trip generation for the proposed QTS Aurora Phase 2 development compared to the expected trip generation from the previously proposed Aurora Crossroads Master Traffic Impact Study data center development. The change in development size within this development area of the proposed data centers on this parcel is anticipated to account for an equivalent number of daily, morning peak hour, and afternoon peak hour trips.

Table 1 – QTS Aurora Phase 2 Traffic Generation Comparison

Land Use and Size	Weekday Vehicles Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Original Study – Aurora Crossroads Master Traffic Impact Study: Development Option #2							
Data Centers (user-specific) – 1,160,000 Square Feet	350	51	51	102	51	51	102
Current Proposal – QTS Aurora Phase 2 and Gun Club Road Data Center							
Data Centers (user-specific) – 1,218,476 Square Feet	350	51	51	102	51	51	102
Net Difference in Trips	0	0	0	0	0	0	0

GATED ENTRY VEHICLE QUEUING

1,214,056 sf per site plan

This project proposes one gate station for vehicles entering the project site located to southeast of the eastern roundabout to access the two buildings on the western side of site. Therefore, a gated entry vehicle queue will be implemented to ensure vehicles do not spillback into the public streets. There will be a dedicated entry lane for employee vehicles and a separate lane for visitor vehicles. The gate station will be designated for visitors while the outside lane will be for employees. Visitors will stop at the gate station while employees will drive through the gate station.

This now only references number of employees

SF difference meaningless since generation per employees

Agreed, we have removed all references of building areas.



This trip generation table from the original traffic study was added to the revised traffic study letter.

Add this sheet from Master Study, either here or in appendix with other Master Study sheets

Appendix Table

with DATA CENTER

Land Use	Size	Unit	Internal Capture	Non Auto Factor	Daily				AM Peak Hour Trips			PM Peak Hour Trips				
					In	Out	Rate	Total	In	Out	Rate	Total	In	Out		
PA-1																
ITE 610: Hospital	355	ksf	1.00	0.95	10.72	3,615	1,808	1,807	0.89	300	204	96	0.97	327	105	222
ITE 720: Medical-Dental Office Building	150	ksf	0.90	0.95	34.80	4,463	2,232	2,231	2.78	357	278	79	3.46	444	124	320
Subtotal of New Trips					8,078	4,040	4,038		657	482	175		771	229	542	
PA-4																
ITE 310 - Hotel	120	rooms	0.95	0.90	8.36	858	429	429	0.47	48	28	20	0.60	62	32	30
ITE 820: Shopping Center	56.50	ksf	0.95	0.95	37.75	1,925	963	962	0.94	48	30	18	3.81	194	93	101
ITE 934 - Fast-Food Restaurant w/ Drive-Through Window	9	ksf	0.95	0.95	470.95	3,825	1,913	1,912	40.19	326	166	160	32.67	265	138	127
ITE 945 - Gas/Service Station w/ Convenience Market	16	fueling stations	0.90	0.95	205.36	2,809	1,405	1,404	12.47	171	87	84	13.99	191	97	94
Subtotal of Trips					9,417	4,710	4,707		593	311	282		712	360	352	
Pass-by Trips: Shopping Center 34%						-655	-327	-328		0	0	0		-66	-32	-34
Pass-by Trips: Fast-Food (AM) 49%						0	0	0		-160	-81	-79		0	0	0
Pass-by Trips: Fast-Food (PM) 50%						-1913	-957	-956		0	0	0		-133	-69	-64
Pass-by Trips: Gas Station (AM) 62%						-1742	-871	-871		-106	-54	-52		0	0	0
Pass-by Trips: Gas Station (PM) 56%						0	0	0		0	0	0		-107	-54	-53
Subtotal of Pass-By Trips						-4310	-2155	-2155		-266	-135	-131		-306	-155	-151
Subtotal of New Trips						5,107	2,555	2,552		327	176	151		406	205	201
	1160	ksf	n/a	n/a		350	175	175		102	51	51		102	51	51
Subtotal of New Trips						350	175	175		102	51	51		102	51	51
Total New Trips:						13,535	6,770	6,765	AM >	1,086	709	377	PM >	1,279	485	794
Total Pass-By Trips:						4,310	2,155	2,155	AM >	266	135	131	PM >	306	155	151
Total Trips:						17,845	8,925	8,920	AM >	1,352	844	508	PM >	1,585	640	945

This is an inconsistency from the original traffic study.

1,103,331 sf per approved PA-5 Site Plan

10th Edition, 2017.

Current Site Plan in application

See above response.

PROJECT DATA

LOT 2 (BUILDING 2)	BUILDING 2 (DC2)
LAND AREA WITHIN PROPERTY LINES (SF)	891,474
LAND AREA WITHIN PROPERTY LINES (AC)	20.47
NUMBER OF BUILDINGS	1
NUMBER OF STORIES	2
MAXIMUM HEIGHT OF BUILDING (FT)	74
PROPOSED HEIGHT OF BUILDING (FT)	74
TOTAL GROSS SQUARE FOOTAGE (ENCLOSED)	231,397 SF
OPEN YARD SQUARE FOOTAGE	150,179 SF
BUILDING + YARD COVERAGE	390,576 SF
HARD SURFACE AREA	149,195 SF
LANDSCAPE AREA	351,703 SF
2015 IBC CONSTRUCTION TYPE	IIIB
IBC OCCUPANCY	BUSINESS
FIRE SPRINKLERED	YES
PRESENT ZONING CLASSIFICATION	MU-R
PROPOSED USE	DATA CENTER
NUMBER OF SIGNS PERMITTED	1
PROPOSED NUMBER OF SIGNS	0
PARKING	
DATA CENTER PARKING SPACES (1 SPACE PER PEAK-TIME EMPLOYEES)	12
TOTAL STANDARD SPACES	79
ACCESSIBLE SPACES (1 PER 6 TO BE VAN-ACCESSIBLE)	6 (3 VAN)
EV PARKING SPACES	8 (1 ADA)

LOT 3 (BUILDING 3)	BUILDING 3 (DC3)
LAND AREA WITHIN PROPERTY LINES (SF)	844,477
LAND AREA WITHIN PROPERTY LINES (AC)	19.39
NUMBER OF BUILDINGS	1
NUMBER OF STORIES	2
MAXIMUM HEIGHT OF BUILDING (FT)	74
PROPOSED HEIGHT OF BUILDING (FT)	74
TOTAL GROSS SQUARE FOOTAGE (ENCLOSED)	231,397 SF
OPEN YARD SQUARE FOOTAGE	150,092 SF
BUILDING + YARD COVERAGE	370,089 SF
HARD SURFACE AREA	186,868 SF
LANDSCAPE AREA	287,520 SF
2015 IBC CONSTRUCTION TYPE	IIIB
IBC OCCUPANCY	BUSINESS
FIRE SPRINKLERED	YES
PRESENT ZONING CLASSIFICATION	MU-R
PROPOSED USE	DATA CENTER
NUMBER OF SIGNS PERMITTED	1
PROPOSED NUMBER OF SIGNS	0
PARKING	
DATA CENTER PARKING SPACES (1 SPACE PER PEAK-TIME EMPLOYEES)	12
TOTAL STANDARD SPACES	104
ACCESSIBLE SPACES (1 PER 6 TO BE VAN-ACCESSIBLE)	5 (2 VAN)
EV PARKING SPACES	8 (1 ADA)

guard shack and be processed by a security guard. Employees will have a badge scanned at an automated device which will open an arm gate for entrance.

During the morning and afternoon peak hours, a maximum of 51 employee vehicles are anticipated to enter the overall facility. Further, it is assumed that eight (8) visitor trips would enter the facility during the highest hour of the off-peak hour. Based on the ratio of square footage of the two buildings being considered in this letters with 930,008 square feet compared to the previously studied 288,468 square-foot building on the eastern side of the site, these two western buildings account for approximately 76.3 percent of the total square footage area. As such, these two buildings could be expected to have approximately 39 entering employee vehicles (51 employee vehicles * 76.3 percent = 38.9) and 6 visitor trips (8 visitor trips * 76.3 percent = 6.1) entering the facility during the highest hour of the off-peak hour.

The traffic volumes expected to enter the gate station were used to analyze the queuing storage requirements. Since it is unreasonable to assume that vehicles will arrive at a constant rate throughout the peak hours, a Poisson distribution storage equation was used to account for the variations in arrival rates. Service rates of 45 seconds per employee vehicles and 180 seconds per visitor vehicles were utilized within the queuing analysis as the time identified at the window.

Based on these volumes and service rate, it was calculated that a storage length of up to two (2) vehicles (50 feet) is needed on site prior to the gate station during the morning and afternoon peak hours and the highest hour of visitor traffic, while approximately 65 feet are anticipated to be provided at this gated access before entering into the roadway of the southeast leg of the roundabout and over 250 feet available before queued vehicles would spill into the roundabout. Therefore, it is anticipated that the vehicle queuing will be sufficiently accommodated onsite. The gated entry vehicle queuing worksheets are attached.

SITE PLAN CHANGES AND ROADWAY IMPROVEMENT IMPACTS WITH DATA CENTER USE

The Aurora Crossroads Master Traffic Study provided a Development Option #2 evaluation with a data center with the same expected trip generation as the current proposal. In this alternative evaluation within the original traffic study, only three accesses were utilized along Gun Club Road (Main Street #13, RIRO Access #12, and East Roundabout #11 as referenced in the original traffic study).

As the proposed site is a lower trip generator with larger building footprints than the possible commercial development that was studied, all the previously assumed access locations for the uses prior to the data center are not necessary. As such, Intersection Accesses #9 (along Colfax Avenue), #10, and #15 were not included for evaluation for the data center option in the original traffic study. In addition, the access at Main Street (Intersection #13) as well as the originally proposed right-in/right-out access (Intersection #12) are no longer proposed in the current development plan; these are the only major access changes with the current proposal compared to Development Option #2 in the original traffic study.

LEGEND

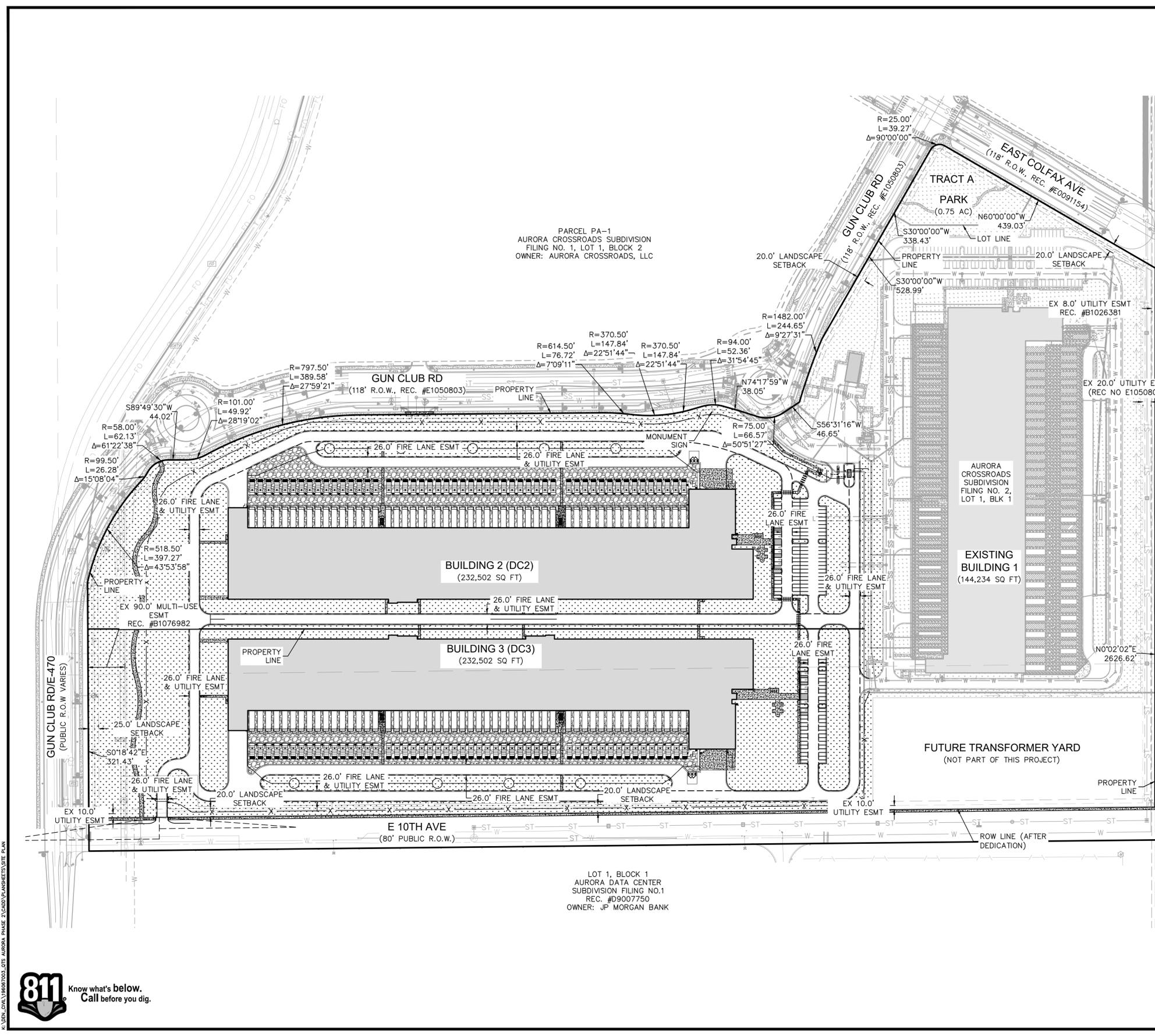
- PROPERTY LINE
- EXISTING EASEMENT LINES
- PROPOSED EASEMENT LINES
- CURB AND GUTTER
- LANDSCAPED AREA
- CONCRETE
- PROPOSED BUILDING
- GRAVEL
- PROPOSED/EXISTING FIRE HYDRANT
- PROPOSED STORM SEWER INFRASTRUCTURE
- EXISTING STORM SEWER INFRASTRUCTURE
- EXISTING SANITARY SEWER MANHOLE
- FENCE
- PRECAST SCREEN WALL

NOTES

1. THE DEVELOPER IS REQUIRED TO PLACE TRAFFIC CONTROL, STREET NAME, AND GUIDE SIGNS ON ALL PUBLIC STREETS AND PRIVATE STREETS APPROACHING AN INTERSECTION WITH A PUBLIC STREET.
2. ALL PROPOSED LANDSCAPING WITHIN THE SIGHT TRIANGLES SHALL BE IN COMPLIANCE WITH COA ROADWAY SPECIFICATIONS, SECTION 4.04.2.10.

A current version of the site plan has been attached. Further, references of building areas have been removed from the study.

Current Application Site Plan Sizes: Blk #2 231,397 sf; Blk #3 231,397 sf; Blg #1 144,234 sf (per Site Plan) Totals 607,028 sf



PARCEL PA-1
AURORA CROSSROADS SUBDIVISION
FILING NO. 1, LOT 1, BLOCK 2
OWNER: AURORA CROSSROADS, LLC

LOT 1, BLOCK 1
AURORA DATA CENTER
SUBDIVISION FILING NO.1
REC. #D9007750
OWNER: JP MORGAN BANK

NO.	REVISION	BY	DATE	APPR

Kimley»Horn
2023 KIMLEY-HORN AND ASSOCIATES, INC.
6200 South Syracuse Way, Suite 300
Greenwood Village, Colorado 80111 (303) 228-2300

DESIGNED BY: CPW
DRAWN BY: CPW
CHECKED BY: SAL
DATE: 7/25/2023

AURORA CROSSROADS SUBDIVISION FILING NO. 2
AURORA, COLORADO
SITE PLAN
OVERALL SITE PLAN

PRELIMINARY
FOR REVIEW ONLY
NOT FOR
CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
196067003
DRAWING NAME
196067003_OVERALL_SP.DWG

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