



Aspen Business Park

TAB #5

Response to Pre-Application/ Other
Review Comments

Wednesday, May 04, 2022

Deborah Bickmire, Senior Planner
City of Aurora Planning Department
15151 E. Alameda Parkway, Ste 2300
Aurora, CO 80012
(Phone) 303.739.7250
(e-mail) dbickmir@auroragov.org

Re: Aspen Business Park Master Plan
Application Number: DA-2304-00
Case Number: 2022-7001-00

Dear Ms. Bickmire,

We have reviewed the planning review comments from April 14, 2022 and provide the following responses to the items. Comment responses include in line marked up responses to the PIP and Master Utility Report redlines. Comments have been taken into consideration in the revised Master Plan.

Planning Department Comment Responses:
Completeness and Clarify of the Application:

1A. *Comment: Clarify whether the developer plans to construct all three sites, design/build for specific user(s) or sell developable sites.*

Response: The developer is planning to develop all 3 sites.

1B. *Comment: The response to comments did not provide responses to comments from Civil Engineering, Traffic or Life/Safety. Please maintain the order of the review letter and address comments made by each reviewer in your response.*

Response: As noted in the previous comment response, it was noted that there were on plan comments at the end of the comment response letter. We have included all comment responses in this letter.

1C. *Comment: The Traffic Study was not submitted with this review. Please ensure the revisions address the previous comments and is submitted for the next review.*

Response: We have sent the traffic study directly to the reviewer and are coordinating comment responses with them directly. We have not received comments to this point (5/4).

1D. *Comment: Per the Master Plan Manual, the design standards should concentrate on specific, unique standards, features or upgrades for the proposed development. They should not just list items already required per code. Try to describe a theme or character for the proposed development that will be unique.*

Response: We have added additional detail on these items to the master plan.

Zoning and Land Use Comments

Tab #1 Letter of Introduction:

2A. *Comment: Discuss how the proposed master plan meets the approval criteria in Section 146-5.4.1.E.3.*

Response: We have added additional text describing how the proposed master plan meets these approval criteria.

Tab #3 Context Map:

2B. *Comment: Show recorded right-of-way, label the street and right-of-way width.*

Response: We have added the ROW widths and street labels to the map.

2C. *Comment: See attached plat maps to identify the location of recorded lots and streets.*

Response: Thank you for sending. We have updated our map accordingly.

2D. *Comment: Revise the colors of the zone districts to make lighter; or, outline with colored lines and use colors to differentiate surrounding Master Plans.*

Response: The colors of the zone districts are now lighter.

2E. *Comment: Remove contours. They are not required on this map.*

Response: Contours removed from the map.

2F. *Comment: See redlines for all comments and notations..*

Response: All redlines have been addressed on the revised plan.

Tab #8 Land Use Map:

2G. *Comment: Lighten the colors used for the Planning Areas.*

Response: The colors are now lighter

2H. *Comment: Show the proposed internal circulation with a gray dashed line.*

Response: Internal circulation is added.

2I. *Comment: Clearly delineate the E-470 right-of-way.*

Response: ROW of E-470 noted as 'varies'.

Tab #10 Urban Design Standards:

2J. *Comment: Use these design standards to describe the character of the proposed development.*

Response: We have added categories for theme and character.

2K. *Comment: The code allowance for entry monument signs is one per street frontage. To consider allowing three 12-foot signs we would need additional information. You could just include the monument sign image and omit the quantity from the Master Plan.*

Response: We have revised the Master Plan to only allow 1 entry monument sign at Yale Ave.

2L. *Comment: Outline other permitted sign types, materials and/or illumination type(s) for use by individual tenants. Sign size and quantity can be managed at the site plan level. You can limit individual sign size/area in the Master Plan, however, quantities per tenant could be hard to regulate since the number of tenants per building is unknown.*

Response: Refer to section 7 for additional information on other sign types.

2M. *Comment: These standards should outline a theme, color, material, etc.. for street lights, site furniture and fencing. Specific fixtures do not need to be identified, just examples to illustrate character. The expectation is consistency across the entire Master Plan area once certain fixtures (ie. street or parking lot lights and poles) have been selected.*

Response: Colors and materials labeled for urban design elements. Theming information added to Form F-1.

Tab #11 Landscape Design Standards:

2N. *Comment: For the most part, the standards are repeating UDO standards. There are several areas that the information seems to be misplaced. See redlines for specific locations.*

Response: Descriptions have been added to compliment the UDO standards listed. Landscape Standards have been updated based on redlines.

2O. *Comment: The Landscape Standards Matrix has an extra column. The Brief Description column is intended to include a description for the landscape features identified in the first column.*

Response: The extra column has been removed, only "Brief Description of the Landscape" remains and information has been combined.

2P. *Comment: Delete exceptions to standards that are repetitious of code.*

Response: The repetitious exceptions have been removed from the entire document.

2Q. *Comment: Remove non-applicable standards (ie. residential or commercial).*

Response: The remaining standards pertain only to open space and warehouse/distribution. All other non-applicable standards have been removed.

2R. *Comment: Move site furniture standards to the Urban Design Standards tab.*

Response: Site furniture standards have been moved to the Urban Design Standards tab.

Tab #12 Architecture Standards:

2S. Comment: Please consider reorganizing the information and/or using headings to make it easier to interpret the proposed standards.

Response: Information in Architectural standards reorganized for more legibility.

2T. Comment: See the redlines for questions, comments, and edits.

Response: All redlines have been addressed in revised sheets.

2U. Comment: Revise the font so it will be more readable when printed to mylar.

Response: Font has been adjusted.

Tab #13 Public Improvement Plan:

2V. Comment: The three access points on Gun Club Road are all labeled as full movement. Per CDOT's previous comments, they will only permit one full access entrance. Please address CDOT's comments.

Response: The southern access will remain full, signalized and the 2 north accesses have been changed to $\frac{3}{4}$ or $\frac{1}{2}$.

2W. Comment: Clarify what is proposed for the internal access. The section on Sheet PIP-2 is 68 feet. The maps show a 40' wide private road.

Response: We have made these to match the private roads will be 47' public access, 40' FL-FL with an attached walk.

2X. Comment: Ensure there is a north arrow and bar scale for each map.

Response: Added to plan.

2Y. Comment: Address redline comments.

Response: Red lined comment addressed see attached plans for those.

REFERRAL COMMENTS FROM OTHER DEPARTMENTS AND AGENCIES

3. Civil Engineering

Tab #10 Urban Design Standards

3A. Comment: A railing is required on all retaining walls greater than 30" tall.

Response: Note added to Urban Design Standards.

3B. Comment: A license agreement is required for colored or stamped concrete in the right-of-way if permitted.

Response: Note added to Urban Design Standards.

Tab #13 Public Improvement Plan

3C. Comment: The Master Plan will not be approved by Public Works until the Master Drainage Study is approved.

Response: Understood.

3C. Comment: Are fire lanes required in private streets?

Response: Yes fire lanes are required and have been provided in the typ section.

3C. Comment: Address comments and notations on redlines.

Response: Red lined comment addressed see attached plans for those.

4. Traffic Engineering

Traffic Impact Study

4A. Comment: A Traffic Study was not included with this submittal. Feel free to send it to me directly for review.

Response: We have sent the traffic study to Carl for review. Carl and the traffic engineer are working through comments together.

5. Fire / Life Safety

Tab #8 Land Use Map, Matrix, and Standard Notes

5A. *Comment: See comment to show Whelen Siren System location and system land dedication and to confirm the location with OEM.*

Response: We have reached out to OEM multiple times and did not receive a response. Per code, this location will be determined by them.

6. Aurora Water

Master Utility Report

6A. *Comment: Provide the hydraulic grade line for City of Aurora Pressure Zone 4.*

Response: HGL provided in narrative.

6B. *Comment: Provide a water exhibit for the proposed infrastructure.*

Response: This was included in the last submittal before the sheet the comment was on.

6C. *Comment: As previously stated, include signature block on water and sanitary exhibits. Including those in this report.*

Response: Signature block was not included because previous comment stated sig block was for signature set. Sig set has not been requested to my knowledge.

6D. *Comment: You were asked you to attain a MUS checklist from me since it is not available online. Please email me so I can send it.*

Response: Thank you for sending.

6E. *Comment: Show directional flow arrows and off-site basins on Sheet EX-1.*

Response: Directional flow arrows, contours and offsite basins added.

6F. *Comment: Include the critical depth, max discharge at 75%, 80%.*

Response: These calcs are included at end of report body before references.

6G. *Comment: Address all comments in the redlines.*

Response: See comments on plan at end of letter.

7. PROS

Tab #9 Open Space, Circulation, and Neighborhood Plan

7A. *Comment: Is 2.9 acres the entire detention area? Remember, only portions of the detention pond that meet the 24-hour recovery period after a storm event can receive credit. Make sure to include the match on how you arrived at this number.*

Response:

7B. *Comment: Advisory comment: it is easier to show the specific open space as its own Planning Area.*

Response:

7C. *Comment: Note that the detention area is designed to meet the 24-hour recovery requirements as noted in section 3.8 Land Dedication Criteria of the PROS manual.*

Response:

Tab#13 Public Improvement Plan

7D. *Comment: Ensure the 2% being dedicated toward open space is noted to meet the 24-hour recovery period after any storm event. See the PROS Manual for further information on this type of dedication.*

Response: 2% open space provided outside detention within PA-4&5. No calcs needed.

10. Xcel Comments

Response: 10' Utility easements to be provided within all platted lots and will be shown on plat and site plans. Additional easements requested to be provided as required.

Easement to south is shown on these plans and will be shown on future plan sets.

11. MHFD Comments

1) Per recent conversations with your team, please be sure to coordinate this pond outfall with the downstream property owner.

Response: We have engaged the abutting neighbor and plan to meet with them very soon to discuss the outfall.

2) We will review the pipe outfall and spillway from the detention pond which outfalls into Alexandra Gulch east of S Gun Club Rd in more detail as these items may be maintenance eligible.

Response: Understood.

12. Arapahoe County Planning Division

10A. Comment: Arapahoe County Planning Division has no further comments.

Response: Noted.

Best regards,

Kenneth W. Harshman, AIA
Principal

Grey Wolf Architecture

The master plan will not be approved by public works until the master drainage study is approved.

UNERSTOOD

Aspen Business Park

TAB #13 Public Improvements Plan



PUBLIC IMPROVEMENT PLAN NARRATIVE

ASPEN BUSINESS PARK

Prepared: January 17, 2022
Revised: March 11, 2022
WM: DCS21-4114

Prepared for:
Aspen Capital Partners, LLC
6500 S Quebec St
Greenwood Village, CO 80111

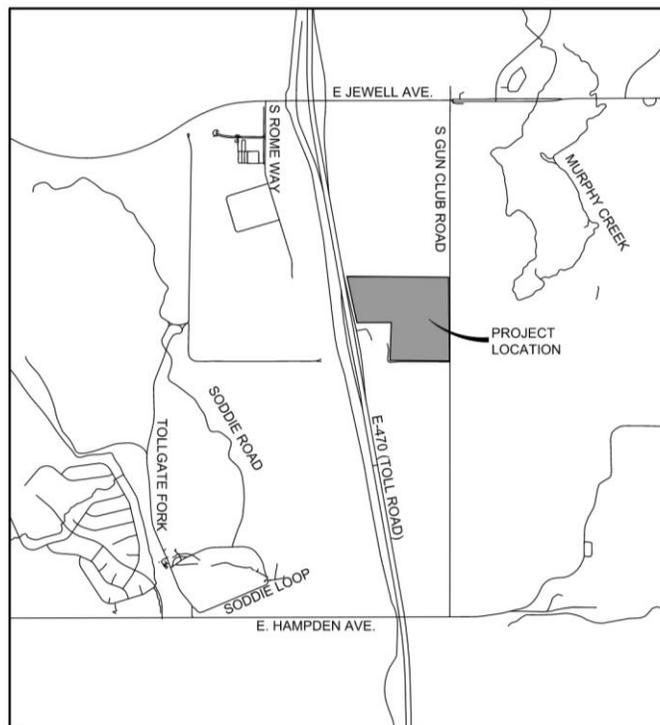
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Introduction

The Aspen Business Park development southwest corner of East Yale Avenue and Gun Club Road in Aurora, Colorado. The site is bounded by undeveloped land to the North, E-470 to the West, Gun Club Road to the West, and by undeveloped land to the South.



Vicinity Map

NTS

The light industrial development consists of 55 acres with proposed uses including warehouse and distribution. The following describes the general parameters of each planning area and the improvements necessary to service the planning areas independently. Each planning area will be required to meet Fire Life Safety requirements. The roadway network adjacent to the development will need to be evaluated when each planning area is developed.

General Development Parameters

Land Development

The Aspen Business Park development will be divided into 3 planning areas (PA1, PA2, PA3, PA4).

The requirements of development for the various planning areas will be detailed later in this narrative.

Roadway Improvements

The perimeter public improvements required for the development of Aspen Business Park include:

- Roadway improvements to Gun Club Road along the extents of the property to include construction of a half section with two additional paved travel lanes with a median and required acceleration and deceleration lanes at access points. Improvements to also include transitions from a 2 lane roadway section to 6 lane arterial section at the north and 6 lane arterial roadway section to 2 lane roadway section at the south.
- Intersection improvements at existing E. Yale Ave. and the Private Roadway site access points will be built when warranted.
- The developer is responsible for construction of all on-site and off-site infrastructure needed to establish two points of emergency access to the overall site and each internal phase of construction. This requirement includes, but is not limited to, the construction of any emergency crossings improvements, looped water supply and fire hydrants as required by the adopted fire code and city ordinances.

Roadways will be constructed to service the planning areas immediately adjacent, however roadways may be required to be constructed to provide both vehicular and fire life safety access to planning areas not immediately adjacent. The construction of half roadway sections will be reviewed during the development of planning areas on a case by case basis.

Table 2.
Recommended Traffic Volume Thresholds

ROADWAY CLASSIFICATION	NUMBER OF LANES EACH DIRECTION	RECOMMENDED DAILY TRAFFIC VOLUME LOS THRESHOLDS (VEHICLES PER DAY)		
		C	D ⁽²⁾	E
Collector	1	> 9,500 to 10,500	> 10,500 to 12,000	> 12,000 to 13,500
Minor Arterial	2	> 22,500 to 25,500	> 25,500 to 28,500	> 28,500 to 32,000
Minor Arterial ⁽¹⁾	3	>30,000 to 34,500	>34,500 to 38,500	>38,500 to 43,000
Major Arterial	2	> 30,000 to 36,000	> 36,000 to 40,000	> 40,000 to 45,000
Major Arterial	3	> 46,000 to 53,000	> 53,000 to 60,000	> 60,000 to 67,000
Major Arterial ⁽¹⁾	4	> 56,000 to 64,000	> 64,000 to 72,000	> 72,000 to 80,000
Expressway	2	> 38,000 to 44,000	> 44,000 to 49,000	> 49,000 to 55,000
Expressway	3	> 56,000 to 64,000	> 64,000 to 72,000	> 72,000 to 80,000

⁽¹⁾ System performance evaluation only.

⁽²⁾ LOS D threshold volumes used for development roadway planning consistent with traffic impact study guidelines.

Table 2 - ADT Thresholds Table per NEATS 2018 Update

The above table is the ADT thresholds table per the 2018 NEATS study update. The city of Aurora uses the NEATS to provide more insight into systems level multimodal transportation facility needs now and into the future. Existing and planned development in this area continues to evolve, and it is important for transportation infrastructure plans to reflect the projected area needs. It is used to determine when lane expansions are required for the phased boulevards within the project.

Gun Club Road, currently a two-lane road (120' ROW), will be transitioned to a six-lane arterial with a 144' right-of-way. At all three access points to the site from Gun Club Road, northbound left turn lanes will be constructed. At the two northern site

access points, southbound right-turn lanes will be constructed. The intersection of southern private drive and existing Yale Ave. will be signalized when warranted.

The internal private improvements for the Aspen Business Park industrial development include:

- The construction of two east-west private roads connecting drive accesses at the north and south, and an access drive at the center of the site.
- The construction of one private road in the north-south direction through the center of the site connecting to and terminating at the two east-west private roadways and also connecting to the central access drive.

Public and private roadways will be constructed to service the planning areas immediately adjacent, however, roadways may be required to be constructed to provide both vehicular and fire life safety access to planning areas not immediately adjacent.

Signal escrows will be required per the City of Aurora Signal Escrow Ordinance. Escrow will be assessed at the time of development of planning areas adjacent to signalized intersections. Aspen Business Park will be responsible for 50% escrow of the proposed traffic signal at the intersection of Future E. Yale Ave and the southern private access drive. The other two access points are not proposed to be signalized. Proposed roadway improvements shall be consistent with the approved Traffic Impact Study prepared by Fox Tuttle Transportation Group for the Aspen Business Park Development and approved with the Framework Development Plan.

Mobility Improvements

The Aspen Business Park Industrial development will provide internal site circulation to support walking or biking to public transit stops.

Drainage Improvements

The Aspen Business Park Development is within the Murphy Creek Watershed. The proposed development will comply with the drainage patterns outlined in the *Murphy Creek Outfall Systems Planning Alternatives Evaluation Report*.

A local water quality and full spectrum detention pond will be constructed to service the entirety of the Aspen Business Park development and any upstream basins within the Murphy Creek drainage basin. The detention basin will be designed COA standards. The water quality and detention basin will be fully constructed with the first planning area to be constructed.

Water Main Improvements

The Aspen Business Park Development will be serviced by the existing 12" water main within Gun Club Road and a 24" water line within the multi-use utility easement that connects to the E-470 Toll Booth property on the West side of the property.

Watermains will be installed within Aspen Business Park to provide the necessary looped water main around each Planning Area to provide fire protection and domestic service for all buildings per the Master Utility Study. Each phase of development will be designed with a looped water supply.

Sanitary Sewer Improvements

The Aspen Business Park development will be serviced by the existing 30" Interceptor located along the west edge of E-470, north of Jewell.

A public sanitary main running north-south along the East side of E-470, within the multi-use utility easement, shall be constructed from the property limits to an existing manhole north of East Jewell Ave. The proposed public Sanitary line will extend beneath E-470 and tie into the existing interceptor to provide service to buildings within the site.

Specific Planning Area Improvement Descriptions

Planning Area 1 – Zone AD (22.94 Acres):

Prior to the development of PA 1 the following public improvements shall be designed and approved for construction:

- Gun Club Road public improvements from the southern property edge to the central proposed access point on the eastern side of the site, including a right turn lane just north of the PA.
- Private road in the east-west direction at the south end of the site connecting to the existing East Yale Ave. intersection. ½ signal escrow applies to this intersection.
- Secondary Emergency Accesses adjacent to the proposed development to provide multiple access points from Gun Club Rd.
- Domestic water connection and fire loop will be provided from the existing 12-inch watermain north of the site within a private road of Murphy Creek Subdivision ROW and the existing 24" water line within the multi-use utility easement that connects to the E-470 Toll Booth proper to service PA 1 and future planning areas adjacent.
- Installation of an 18" sanitary main from the site to the existing Sanitary interceptor on the East side of E-470.
- Storm sewer to provide conveyance from the planning area to the onsite water quality and detention pond and also conveyance of offsite flows from the West to the detention system.
- An onsite water quality and detention pond will be constructed to service the entirety of the Aspen Business Park development and releases from the E470 Toll Plaza detention pond. The detention pond will be designed to COA standards. The water quality and detention pond will be fully constructed with the first planning area to be constructed.

CORRECTED

match land use map acreage

Planning Area 2 – Zone AD (18.17 Acres):

Prior to the development of PA 2 the following public improvements shall be designed and approved for construction:

- Gun Club Road public improvements from the northern property edge to the central proposed access point on the eastern side of the site.
- Secondary Emergency Access roads adjacent to the proposed development to provide multiple access points from Gun Club Rd.
- Domestic water connection and fire loop will be provided from the existing 12-inch watermain north of the site within a private road of Murphy Creek Subdivision ROW and the existing 24" water line within the multi-use utility easement that connects to the E-470 Toll Booth proper to service PA 2 and future planning areas adjacent.
- Installation of an 18" sanitary interceptor from the site to the existing Sanitary interceptor on the East side of E-470.
- Storm sewer to provide conveyance from the planning area to the onsite water quality and detention pond and also conveyance of offsite flows from the West to the detention system.
- An onsite water quality and detention pond will be constructed to service the entirety of the Aspen Business Park development and releases from the E470 Toll Plaza detention pond. The detention pond will be designed to COA standards. The water quality and detention pond will be fully constructed with the first planning area to be constructed.

Planning Area 3 – Zone AD (14.02 Acres):

Prior to the development of PA 3 the following public improvements shall be designed and approved for construction:

- Gun Club Road public improvements from the southern property edge to the central proposed access point on the eastern side of the site.
- Private road in the east-west direction at the southern area of the site connecting to the Gun Club Rd.
- Secondary Emergency Access roads adjacent to the proposed development to provide multiple access points from Gun Club Rd.
- Domestic water connection and fire loop will be provided from the existing 12-inch watermain north of the site within a private road of Murphy Creek Subdivision ROW and the existing 24” water line within the multi-use utility easement that connects to the E-470 Toll Booth proper to service PA 2 and future planning areas adjacent.
- Installation of an 18” sanitary interceptor from the site to the existing Sanitary interceptor on the East side of E-470.
- Storm sewer to provide conveyance from the planning area to the onsite water quality and detention pond and also conveyance of offsite flows from the West to the detention system.
- An onsite water quality and detention pond will be constructed to service the entirety of the Aspen Business Park development and releases from the E470 Toll Plaza detention pond. The detention pond will be designed to COA standards. The water quality and detention pond will be fully constructed with the first planning area to be constructed.

2.9 ac

CORRECTED

Planning Area 4 – Zone AD (14.02 Acres):

With the development of the first PA the following public improvements shall be designed and approved for construction:

- An onsite water quality and detention pond will be constructed to service the entirety of the Aspen Business Park development and releases from the E470 Toll Plaza detention pond. The detention pond will be designed to COA standards. The water quality and detention pond will be fully constructed with the first planning area to be constructed and designed to outfall east of Gun Club Rd to a historic drainage path.
- An open space area accounting for at least 2% of the total property shall be constructed within PA-4. This area can be within the 100yr detention area or outside of it within PA-4’s limits. The open space area can include features such as: tables, seating, trails, or art installations.

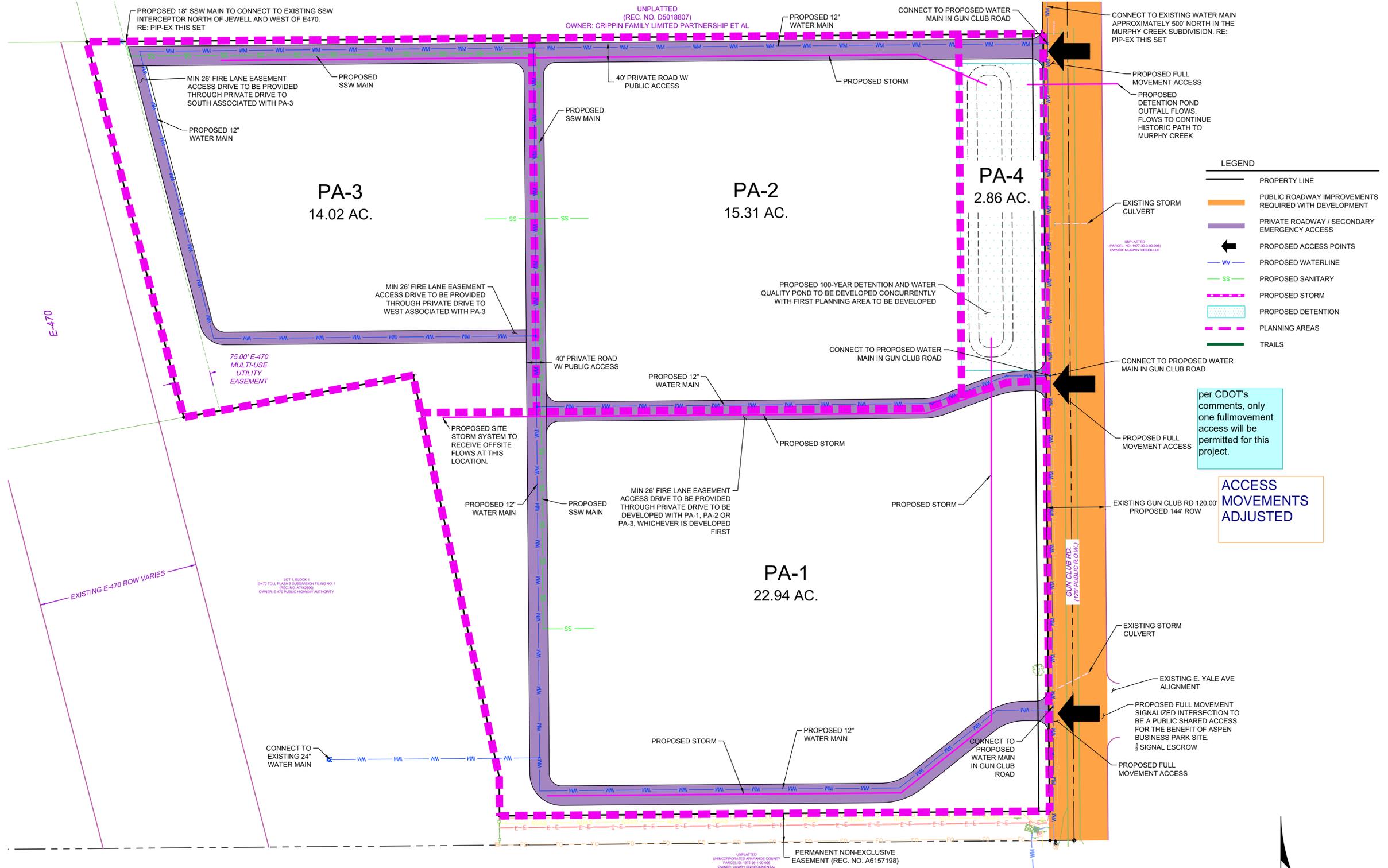
Ensure the 2% you are dedicating toward open space is noted to meet the 24-hour recovery period after any storm event. See the PROS manual for further information on this type of dedication

Trail would need to be provided, cannot just be a few benches or tables, would need to provided access to those amenities.

THE 2% OPEN SPACE AREA IS PROVIDED OUTSIDE THE DETENTION. TRAIL LANGUAGE ADDED TO TEXT FOR CLARITY

MASTER PLAN ASPEN BUSINESS PARK

SE QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M.,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO



LEGEND

- PROPERTY LINE
- PUBLIC ROADWAY IMPROVEMENTS REQUIRED WITH DEVELOPMENT
- PRIVATE ROADWAY / SECONDARY EMERGENCY ACCESS
- PROPOSED ACCESS POINTS
- PROPOSED WATERLINE
- PROPOSED SANITARY
- PROPOSED STORM
- PROPOSED DETENTION
- PLANNING AREAS
- TRAILS

per CDOT's comments, only one full movement access will be permitted for this project.

ACCESS MOVEMENTS ADJUSTED

WARE MALCOMB
LEADING DESIGN FOR COMMERCIAL REAL ESTATE

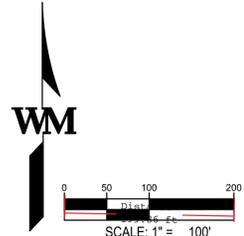
DATE:	01.17.2022
03.11.2022	
SUBMITTAL NO.:	
1ST SUBMITTAL	
2ND SUBMITTAL	

ASPEN BUSINESS PARK
YALE AVE & S GUN CLUB RD.
AURORA

JOB NO.:
DRAWN BY:
CHECKED BY:
SHEET NO. & NAME:

SHEET NAME:
PIP-1

PUBLIC IMPROVEMENT PLAN



MASTER PLAN ASPEN BUSINESS PARK

SE QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M.,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO

NOTES:

1.) WHELEN WARNING SYSTEM REQUIREMENTS: THE FEMA REQUIREMENT FOR OUTDOOR EMERGENCY WARNING SYSTEMS IS A 60-70 FOOT MONOPOLE TOWER USING AN ALERT SIREN. THE CITY OF AURORA USES THE WHELEN SIREN SYSTEM. THE LAND REQUIREMENT FOR THE TOWER IS A 10' X 10' EASEMENT. EACH SIREN COVERS APPROXIMATELY 3,000 RADIAL FEET AT 70 DB AND IS TYPICALLY SPACED ONE SIREN PER SQUARE MILE. IN NEWLY ANNEXED/DEVELOPING AREAS OF THE CITY, SIRENS SHOULD BE SITED ON EVERY 1/2 SECTION OF GROUND (320 ACRES) OR 6000 FEET APART TO PROVIDE EDGE TO EDGE COVERAGE. THE EXACT PLACEMENT OF SIRENS WILL BE DETERMINED BY THE CITY OF AURORA'S OFFICE OF EMERGENCY MANAGEMENT TO INSURE THAT COORDINATED COVERAGE IS PROVIDED ON A SYSTEM-WIDE BASIS. FOR SPECIFIC QUESTIONS, THE OFFICE OF EMERGENCY MANAGEMENT CAN BE REACHED AT 303-739-7636 (PHONE), 303-326-8986 (FAX), OR (EMAIL) AFD_OEM@AURORAGOV.ORG.

2.) PER FIRE LIFE SAFETY, EACH PLANNING AREA IS REQUIRED TO HAVE (2) POINTS OF ACCESS AND A LOOPED WATER SUPPLY. FURTHERMORE, PER THE 2015 IFC, SECTION D104.3 IT STATES THAT WHERE (2) FIRE APPARATUS ACCESS ROADS ARE REQUIRED, THEY SHALL BE PLACED A DISTANCE APART EQUAL TO NOT LESS THAN ONE HALF OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE LOT BEING SERVED, MEASURED IN A STRAIGHT LINE BETWEEN ACCESSES.

3.) AS EACH SUB-SITE OR PLANNING AREA IS DEVELOPED, THE SITES WILL MAINTAIN THE HISTORIC FLOW PATTERN VIA OVERLAND FLOW OR PRIVATE STORM SEWER INFRASTRUCTURE INTO THE PROPOSED DRAINAGE CHANNEL. STORMWATER DETENTION AND WATER QUALITY WILL BE PROVIDED FOR EACH PLANNING AREA WITHIN THE REGIONAL STORMWATER FACILITY TO BE INSTALLED DURING CONSTRUCTION OF FIRST PLANNING AREA AND ONSITE WATER QUALITY POND..

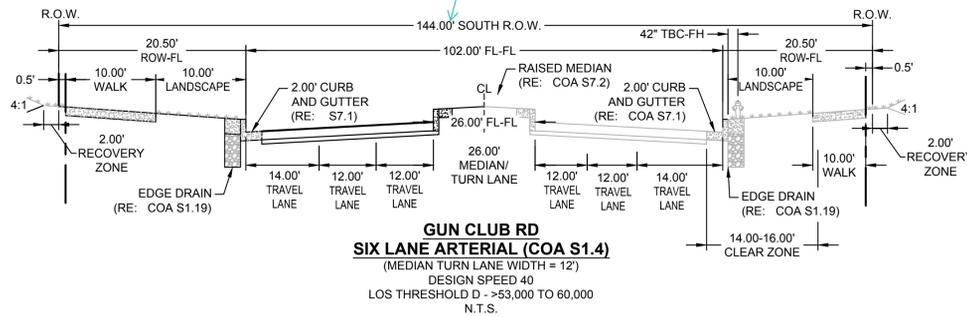
4.) THE PIP HAS BEEN PREPARED IN COORDINATION WITH THE TRAFFIC IMPACT STUDY PREPARED BY FELSBURG HOLT & ULLEVIG PREPARED FOR THE ASPEN BUSINESS PARK.

study was not included with this submittal

TIS WAS TO REVIEWER AND PLANNING SUBMITTED AND COMMENT STILL HAVE NOT BEEN RECIEVED TO THE POINT (5/4/22)

DECIMALS HAVE BEEN REMOVED

remove decimals. TYP



FIRELANE ADDED TO EASEMENT ROADWAY DIMENSION

With the private roads, are fire lanes not included?

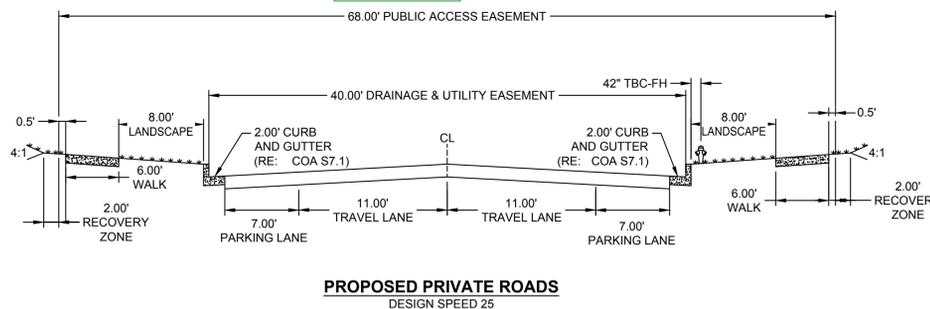
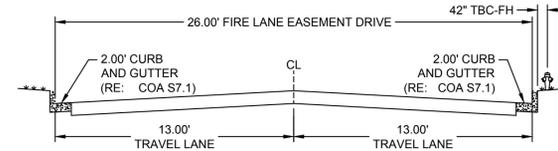


Table 2. Recommended Traffic Volume Thresholds

ROADWAY CLASSIFICATION	NUMBER OF LANES EACH DIRECTION	RECOMMENDED DAILY TRAFFIC VOLUME LOS THRESHOLDS (VEHICLES PER DAY)		
		C	D ⁽¹⁾	E
Collector	1	> 9,500 to 10,500	> 10,500 to 12,000	> 12,000 to 13,500
Minor Arterial	2	> 22,500 to 25,500	> 25,500 to 28,500	> 28,500 to 32,000
Minor Arterial ⁽²⁾	3	> 30,000 to 34,500	> 34,500 to 38,500	> 38,500 to 43,000
Major Arterial	2	> 30,000 to 36,000	> 36,000 to 40,000	> 40,000 to 45,000
Major Arterial	3	> 46,000 to 53,000	> 53,000 to 60,000	> 60,000 to 67,000
Major Arterial ⁽²⁾	4	> 56,000 to 64,000	> 64,000 to 72,000	> 72,000 to 80,000
Expressway	2	> 38,000 to 44,000	> 44,000 to 49,000	> 49,000 to 55,000
Expressway	3	> 56,000 to 64,000	> 64,000 to 72,000	> 72,000 to 80,000

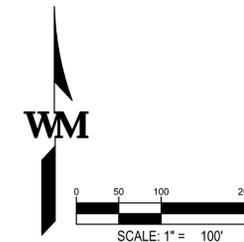
⁽¹⁾ System performance evaluation only.
⁽²⁾ LOS D threshold volumes used for development roadway planning consistent with traffic impact study guidelines.

ADT THRESHOLDS PER OCTOBER 2018 NEATS REFRESH



Is this for shared internal streets or individual sites? easements that will be required for individual sites will be addressed during Site Plan reviews.

UNDERSTOOD



PUBLIC IMPROVEMENT PLAN

WARE MALCOMB
LEADING DESIGN FOR COMMERCIAL REAL ESTATE

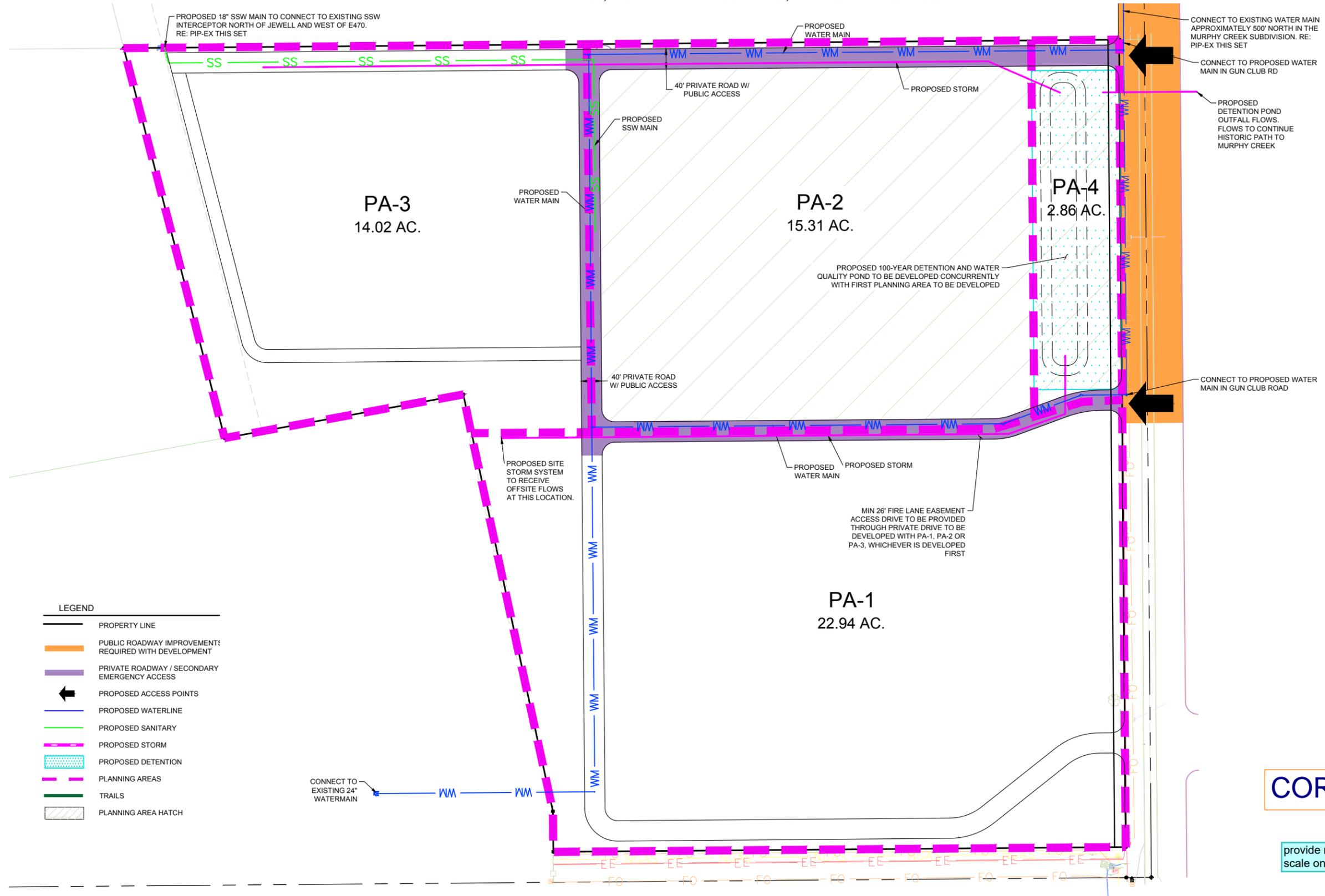
DATE:	01.17.2022	03.11.2022			
SUBMITTAL NO.:	1ST SUBMITTAL	2ND SUBMITTAL			

**ASPEN BUSINESS PARK
YALE AVE & S GUN CLUB RD.
AURORA**

JOB NO.:	
DRAWN BY:	
CHECKED BY:	
SHEET NO. & NAME:	
SHEET NAME:	PIP-2

MASTER PLAN - PUBLIC IMPROVEMENT PLAN ASPEN BUSINESS PARK

SE QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M.,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO



WARE MALCOMB
LEADING DESIGN FOR COMMERCIAL REAL ESTATE

DATE:	01.17.2022	03.11.2022					
SUBMITTAL NO.:	1ST SUBMITTAL	2ND SUBMITTAL					

ASPEN BUSINESS PARK
YALE AVE & S GUN CLUB RD.
AURORA

JOB NO.:	DCS21-4114
DRAWN BY:	JZ
CHECKED BY:	JKC
SHEET NO. & NAME:	

CORRECTED

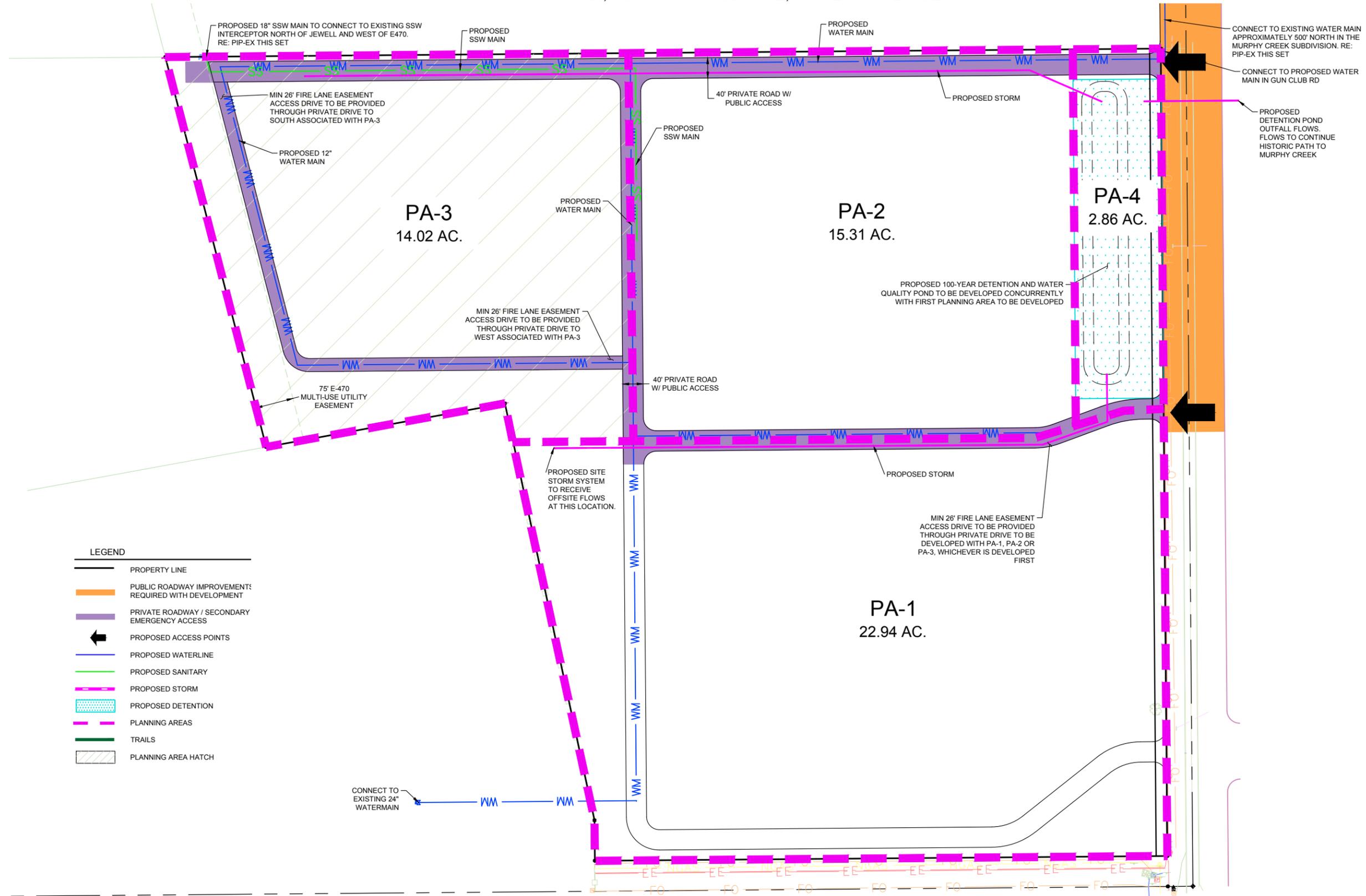
provide north arrow and bar scale on all maps

SHEET NAME:

PA-2

MASTER PLAN - PUBLIC IMPROVEMENT PLAN ASPEN BUSINESS PARK

SE QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M.,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO



WARE MALCOMB
LEADING DESIGN FOR COMMERCIAL REAL ESTATE

DATE:	01.17.2022	03.11.2022			
SUBMITTAL NO.:	1ST SUBMITTAL	2ND SUBMITTAL			

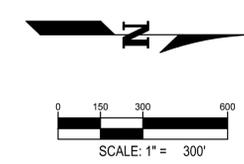
ASPEN BUSINESS PARK
YALE AVE & S GUN CLUB RD.
AURORA

JOB NO.: DCS21-4114
 DRAWN BY: JZ
 CHECKED BY: JKC
 SHEET NO. & NAME:

SHEET NAME:
PA-3

MASTER PLAN ASPEN BUSINESS PARK

SE QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M.,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO



PUBLIC IMPROVEMENT PLAN - OFFSITE UTILITY EXHIBIT

WARE MALCOMB
LEADING DESIGN FOR COMMERCIAL REAL ESTATE

DATE:	01.12.2022
	03.11.2022
SUBMITTAL NO.:	
1ST SUBMITTAL	
2ND SUBMITTAL	

ASPEN BUSINESS PARK
YALE AVE & S GUN CLUB RD.
AURORA

JOB NO.:
DRAWN BY:
CHECKED BY:

SHEET NO. & NAME:

SHEET NAME:
PIP-EX

MASTER UTILITY REPORT

**SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66
WEST OF THE SIXTH PRINCIPAL MERIDIAN
CITY OF AURORA, COUNTY OF ARAPAHOE,
STATE OF COLORADO**

ASPEN BUSINESS PARK

AURORA, CO

JN: DCS21-4114

Submitted: 01/17/2022

Revised: 03/11/2022

Prepared by:

Ware Malcomb

990 South Broadway Suite 230

Denver, CO 80209

P: 303.561.3333

F: 303.561.3339

Approved for One Year From this Date

City Engineer

Date

Fire Department

Date

Water Department

Date

Christopher S. Strawn, PE No. 36328

WARE MALCOMB

ARCHITECTURE | PLANNING | INTERIORS
BRANDING | CIVIL ENGINEERING

CERTIFICATION

I hereby certify that this Master Utility Report for Aspen Business Park Industrial was prepared by me (or under my direct supervision) in accordance with the provisions of the City of Aurora Standard Specifications regarding Water, Sanitary, and Storm Drainage Infrastructure.

Christopher S. Strawn, PE
State of Colorado Registration No. 36328
Ware Malcomb

Date

TABLE OF CONTENTS

I. GENERAL LOCATION AND DESCRIPTION.....	4
II. WATER	5
III. SANITARY SEWER	6
IV. CONCLUSION	7
V. REFERENCES.....	8

APPENDICES

APPENDIX A

Vicinity Map

APPENDIX B

Aurora Pre-Submittal Checklist
Overall and Detailed Utility Plans
Preliminary Water Demand Calculations
Preliminary Sanitary Demand Calculations

APPENDIX C

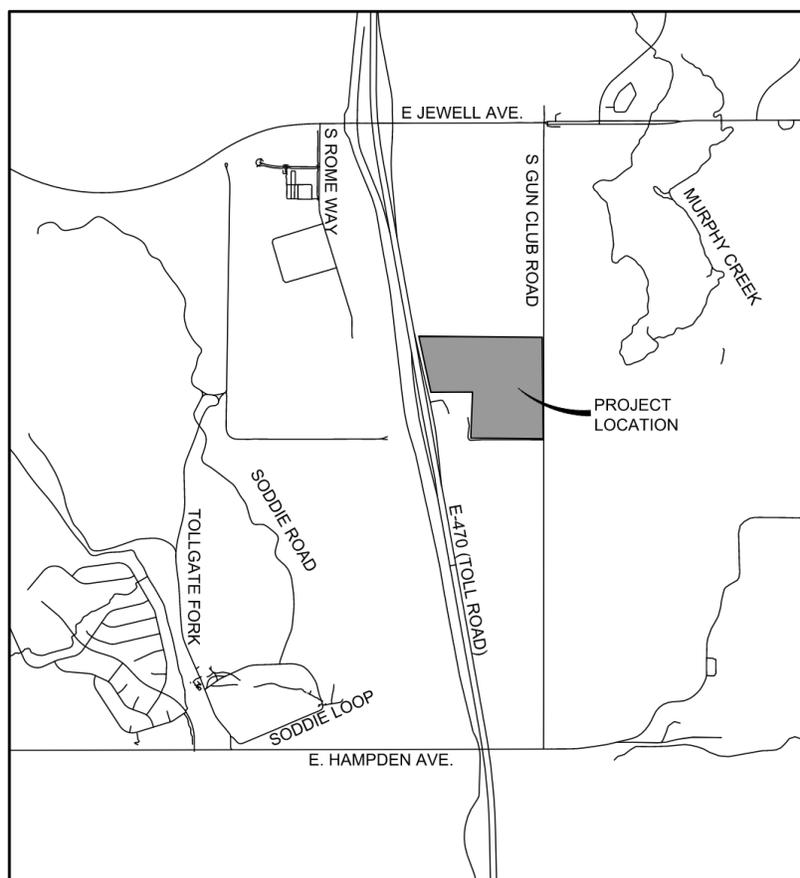
Referenced Material

I. GENERAL LOCATION AND DESCRIPTION

A. Site Location

The project site is located at the southwest corner of East Yale Avenue and Gun Club Road in Aurora, Colorado. The site is bounded by undeveloped land to the North, E-470 to the West, Gun Club Road to the West, and by undeveloped land to the South. The approximate location of the site can be seen in the vicinity map provided below.

A parcel of land located in the Southeast Quarter of Section 25, Township 4 South, Range 66 West of the Sixth Principal Meridian, City of Aurora, County of Arapahoe, State of Colorado.



Vicinity Map
NTS

B. Site Description.

The proposed Aspen Business Park site is approximately 55-acre undeveloped vacant land covered with native grasses.

The proposed development calls for the construction of (3) light industrial buildings that vary in size depending on the lot delineation and sizing. These Planning Areas (PA's) have been broken out in this FDP and are the relative phases of development Proposed with this preliminary Master analysis.

Aspen Business Park - Planning Areas



Water exhibit was provided with sheet 13 of this report. If this exhibit is not what is expected please comment further.

II. WATER

A. Existing Infrastructure

Domestic water is currently available along the southwest and northeast corners of the proposed Aspen Business Park development. A 12" water main is located just east of the Right of Way of Gun Club Road and a 24" water line is available within a multi-use utility easement that connects to the E-470 Toll booth property. The property lies within the City of Aurora Pressure Zone 4, indicating an approximate static pressure of 56-84 psi (0.3889-0.5833 psf) at the Aspen Business Park site. Note that with future flow tests of the site the static pressure used in water modeling will be updated.

Why is there no water exhibit?

B. Proposed Infrastructure

12" water mains are proposed within the public accesses and private roadways in the Aspen Business Park development. These water mains will provide both domestic and fire flow for all planning areas within the development. Two connections are proposed for the entire site as well as the domestic use of all planning areas. The connections to existing water mains are proposed to the west at the E470 toll plaza and to the north within the Murphy Creek subdivision.

Provide the HGL

HGL provided per comment

C. Proposed Improvement Timing

The site has been divided into four Planning Areas as shown in the Overall Utility Plan within Appendix B. The site will be developed sequentially starting in no particular order. As the Planning Areas are developed, the water main will be constructed as shown on the Utility Plans within Appendix B and per the PIP phasing.

As the proposed planning areas are developed, a looped water main will be provided to provide fire protection for the Aspen Business Center site. These loops will be designed and installed per City of Aurora criteria.

D. Anticipated Demand & Design Criteria

The water demand for the 55 acre Aspen Business Center is based on type of construction (Industrial). Water demand loads for the industrial construction type are taken from the *Water, Sanitary Sewer and Storm Drainage Infrastructure Manual*, City of Aurora, CO, effective January 2012, updated in 2020. Section 5.02 was referenced for all design criteria. The proposed water demands are broken down in Appendix B and taken from Section 5.02.3 Domestic Water Demand per Zoning Classification, City of Aurora Standards and Specifications. The scenarios modeled include maximum day plus fire flow, maximum day, maximum hour, and average day demands. Residual pressures and velocities conform the requirements within Section 5.02 of the City of Aurora Standards and Specifications.

Fire Flow Demand by Land Use

Use Classification	Fire Flow Demand
Residential	1,500 gpm for 2 hrs
Commercial	2,500 gpm for 2 hrs
Industrial	3,500 gpm for 3 hrs

Sanitary Sewer Loading rates table added per comment

add

III. SANITARY SEWER

A. Existing Infrastructure

A 30" Sanitary Main that runs from this development. This was analyzed as an option but was not selected. The 30" main along E-470

Residential

Zoning	People per Unit	Loading Rate (gpcd)
Residential	2.77	68

was also not.

B. Proposed Infrastructure

An 8" sanitary sewer will be provided within a multi-use utility easement. A sanitary sewer is proposed to run along E-470. The sanitary sewer will then be bored under the E-470 highway to provide service to all developments within the proposed Aspen Business development. The proposed Aspen Business development will be a multi-use development with 12 main services and 12 mains. Necessary easements for mains outside of the Right of Way will be obtained as the Planning Areas are developed if the lines fall outside of the existing multi-use utility easement. The proposed connection to the existing 30" sanitary sewer interceptor will be made at an existing manhole northwest of the site near the intersection of East Jewell Avenue and E-470. Sanitary lines that serve more than one building will be designed and dedicated as public. The proposed sewer alignment can serve all the proposed buildings as shown in the Utility Plans within Appendix B.

Non-Residential

Zoning	Average Day (gpd/acre)	Equivalent Population per Acre
Commercial	1,500	22
Industrial (including schools)	1,200	18

h

The connections at Murphy Creek and the E470 Toll Plaza have been determined to be adequate for water services to the site. There are no other known off-site improvements that will impact the proposed tie-in location.

C. Proposed Improvement Timing

The site has been divided into multiple Planning Areas as shown in the Overall Utility Plan within Appendix B. The site will be developed in no predetermined order but will be phased a determined by the Public Improvement Plan. As the Planning Areas are developed the sewer main will be constructed as shown on the Utility Plans within Appendix B. The 18" main proposed to connect to the existing 30" North and East of Jewell and E470, respectively, will be installed with the first planning area as described by the PIP.

D. Design Standards

The Water, Sanitary Sewer and Storm Drainage Infrastructure Manual, City of Aurora, CO, effective January 2012, updated in 2022, Section 5.03 was referenced for all design criteria including main size, domestic and fire flow demand/use, minimum & maximum diameter and hydrant criteria. Sanitary average and peak demands, design slopes, pipe sizes, and pipe capacities have been provided within Appendix B.

IV. CONCLUSION

A. Conclusions

As described above, there is adequate existing infrastructure from The Murphy Creek Subdivision and E470 Toll Plaza to provide water services for the Aspen Business Park development per the City of Aurora. The existing 12" and 24" connections to the proposed 12" have the capacity and ability to allow each potential new development to connect and build water loops for adequate water service. The existing sanitary sewer to the Northwest of the overall property has the depth and capacity to service the proposed development with the Sanitary infrastructure proposed.

V. REFERENCES

1. *Aurora Storm Drainage and Technical Criteria*, City of Aurora, CO, effective January 2012
2. *Water, Sanitary Sewer and Storm Drainage Infrastructure Manual*, City of Aurora, CO, effective January 2012, Updated 2022.
3. *Water Maps – Aurora Water*, City of Aurora, CO, Plotted Date June 11, 2017.
4. *Amendment to the Master Utility Report for Murphy Creek East Development*, prepared by CVL dated May 29,2020.

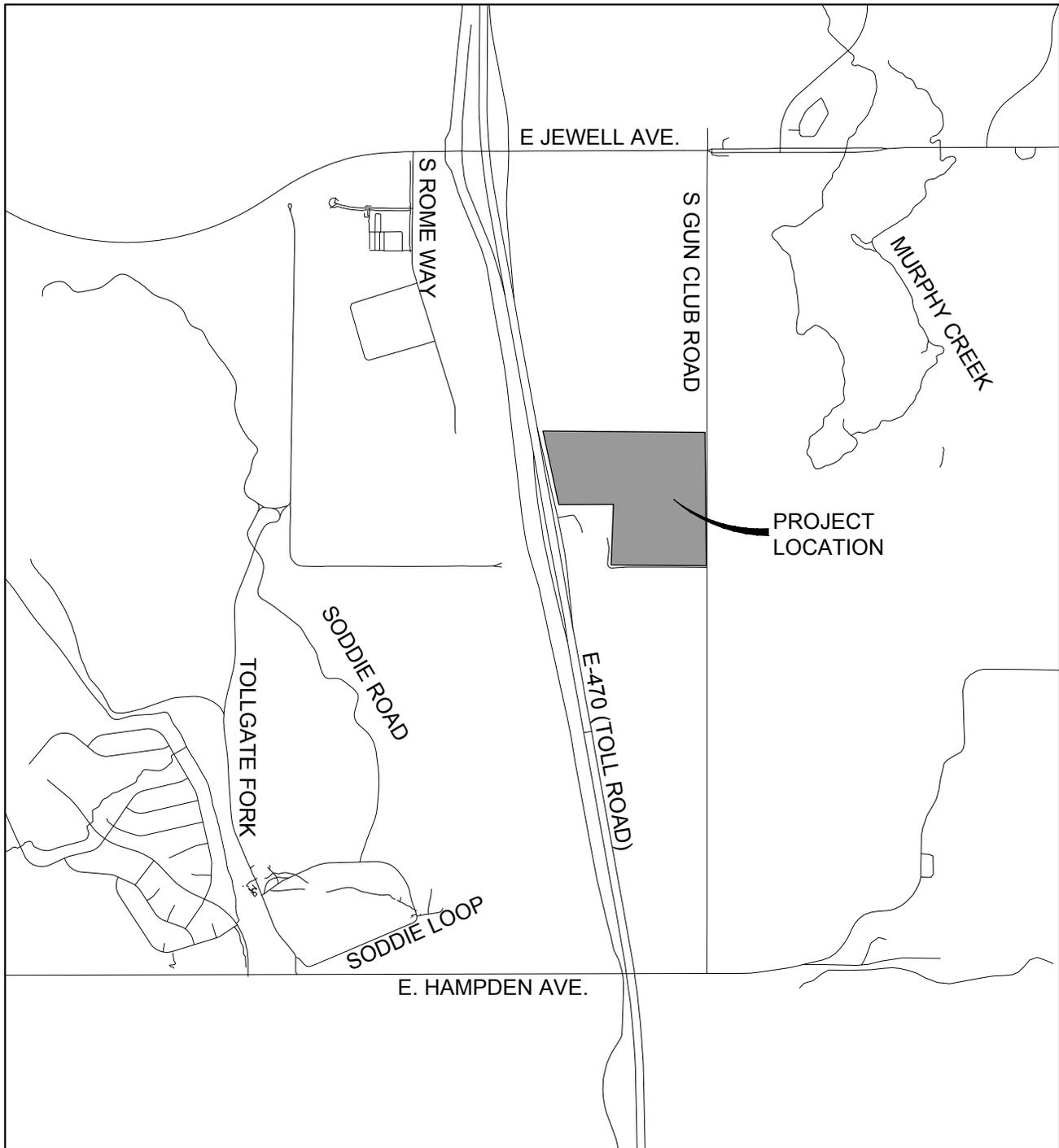
WARE MALCOMB

ARCHITECTURE | PLANNING | INTERIORS

BRANDING | CIVIL ENGINEERING

APPENDIX A Vicinity Map

VICINITY MAP



VICINITY MAP
1"=2000'

900 south broadway suite 320 denver, co 80209 p 303.561.3333 waremalcomb.com CIVIL ENGINEERING & SURVEYING		PROJECT NAME: ASPEN BUSINESS PARK		
		JOB NO.: DCS21-4114	DATE : 12/16/2021	
		DRAWN: SL	PA/PM: JC	SCALE: 1"=2000'

WARE MALCOMB

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BRANDING | CIVIL ENGINEERING

APPENDIX B

Overall and Detailed Utility Plans
Preliminary Water Demand Calculations
Preliminary Sanitary Demand Calculations

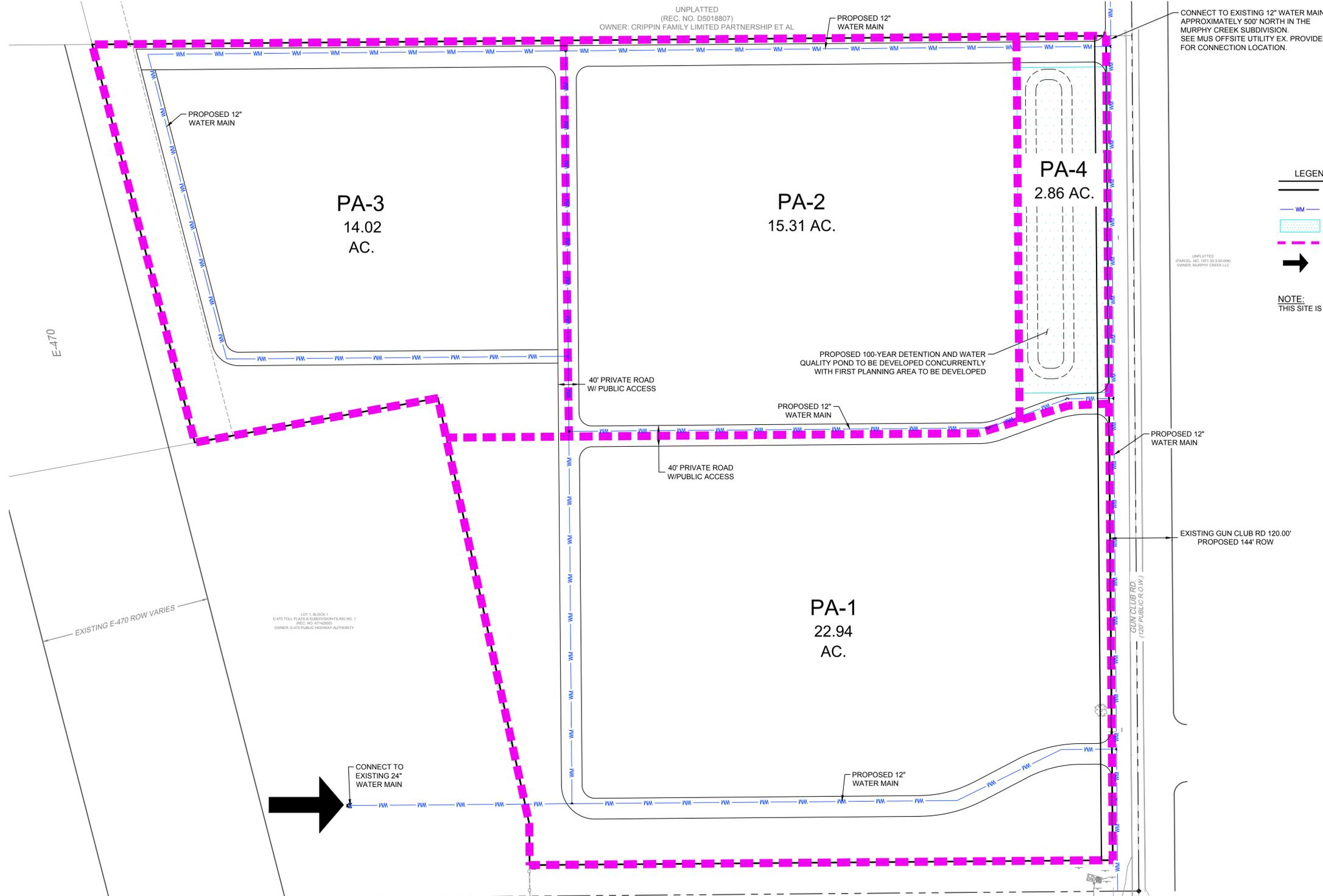
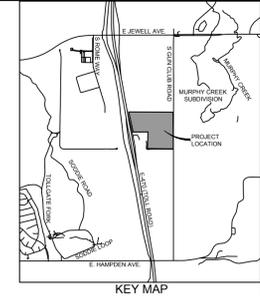
As previously stated, include signature block on water and sanitary exhibits. Including those in this report.

I asked you to attain a MUS checklist from me- as it is not available online. Please email me so I can send it

**SIG BLOCK ADDED.
THIS WAS NOT ADDED BECAUSE
IT WAS REQUESTED FOR
SIGNATURE SET. TO MY
KNOWLEDGE SIGNATURE SET
WAS NOT REQUESTED.**

MASTER PLAN ASPEN BUSINESS PARK

SE QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M.,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO



LEGEND

- PROPERTY LINE
- PROPOSED WATERLINE
- PROPOSED DETENTION
- PLANNING AREAS
- PROPOSED WATER CONNECTION

NOTE:
THIS SITE IS PROPOSED FOR INDUSTRIAL USE.

WARE MALCOMB
LEADING DESIGN FOR COMMERCIAL REAL ESTATE

900 south broadway
suite 320
denver, co 80209
p 303.561.3333
waremalcomb.com

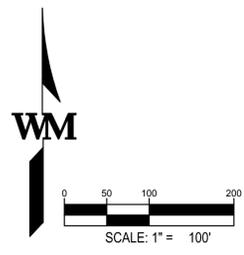
FOR AND ON BEHALF
OF WARE MALCOMB

ASPEN BUSINESS PARK
YALE AVE & S GUN CLUB RD.
AURORA, CO
OVERALL UTILITY PLAN (WATER)

NO.	DATE	REMARKS

JOB NO.:	DCS21-4114
PA / PM:	JKC
DESIGNED:	JRR
DATE:	01/17/2021
PLOT DATE:	

SHEET
C1
Sheet



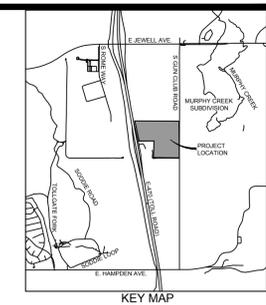
W:\DCS\21\4114\00\CAD\Sheets\Planning\Overall_Utility\DCS21-4114_Overall_Water_Utility_Plan.dwg 1/17/2022 2:51 PM SLESSARD 11

THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY AND COPYRIGHT OF WARE MALCOMB AND SHALL NOT BE USED ON ANY OTHER WORK EXCEPT BY AGREEMENT WITH WARE MALCOMB. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED ON THE JOB SITE. ANY DISCREPANCY SHALL BE BROUGHT TO THE NOTICE OF WARE MALCOMB PRIOR TO THE COMMENCEMENT OF ANY WORK.

NOT FOR CONSTRUCTION

MASTER PLAN ASPEN BUSINESS PARK

SE QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M.,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO



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suite 320
denver, co 80209
p 303.561.3333
waremalcomb.com

FOR AND ON BEHALF
OF WARE MALCOMB

ASPEN BUSINESS PARK
YALE AVE & S GUN CLUB RD.
AURORA, CO
OVERALL UTILITY PLAN (SANITARY)



LEGEND

- PROPERTY LINE
- SS — PROPOSED SANITARY
- ▭ PROPOSED DETENTION
- - - PLANNING AREAS

NOTE:
THIS SITE IS PROPOSED FOR INDUSTRIAL USE.

Where's
the water
exhibit?

Water exhibit was provided
on the previous sheet. If
something else is expected
please comment further.

NO.	DATE	REMARKS

JOB NO.:	DCS21-4114
PA / PM:	JKC
DESIGNED:	JRR
DATE:	01/17/2021
PLOT DATE:	

SHEET
C2
Sheet

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NOT FOR CONSTRUCTION

Preliminary Water Demand Calculations

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BRANDING | CIVIL ENGINEERING

PROJECT : Sun Empire
PROJECT NO. : DCS21-4114

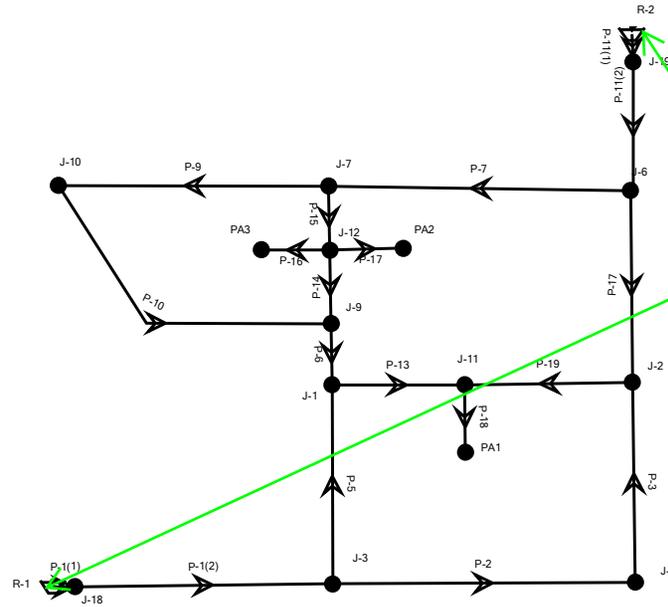
DATE: 1/17/2022
BY: JRR

Values from City of Aurora Standards - Master Utility Design Criteria for Water (July 2021)

Zoning Classifications M-O and B-1 used in analysis.

Planning Area	Zoning Classification	Developable Area (ac)	Average Day (gpd/acre)	Max Day (gpd/acre)	Max Hour (gpd/acre)	Average Day (gpm)	Max Day (gpm)	Max Hour (gpm)	Fire Flow Demands (gpm)	MaxDay + Fire Flow (gpm)
PA-1	INDUSTRIAL	22.94	1,200	3,360	5,400	19	54	86	3,500	3,554
PA-2	INDUSTRIAL	18.17	1,200	3,360	5,400	15	42	68	3,500	3,542
PA-3	INDUSTRIAL	14.02	1,200	3,360	5,400	12	33	53	3,500	3,533
	Total:	55.13				46	129	207		

WaterCAD Map



Per conversation with Casey Ballard at the City of Aurora, all reservoirs representing connection to existing water system has been set to the same elevation based on which water zone they are within.

FlexTable: Pipe Table
Active Scenario: Average Day

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)
76	P-1(1)	10	R-1	J-18	12.0	PVC	150.0	0.011	1,345	3.82	0.006	1
77	P-1(2)	113	J-18	J-3	12.0	PVC	150.0	0.011	1,345	3.82	0.003	429
79	P-11(1)	12	R-2	J-19	12.0	PVC	150.0	0.011	-1,299	3.69	0.005	1
80	P-11(2)	56	J-19	J-6	12.0	PVC	150.0	0.011	-1,299	3.69	0.003	186
50	P-5	87	J-1	J-3	12.0	PVC	150.0	0.011	-805	2.28	0.001	718
81	P-17	84	J-6	J-2	12.0	PVC	150.0	0.000	-729	2.07	0.001	679
51	P-6	27	J-1	J-9	12.0	PVC	150.0	0.011	597	1.69	0.001	145
53	P-7	132	J-7	J-6	12.0	PVC	150.0	0.011	570	1.62	0.001	803
46	P-2	132	J-3	J-4	12.0	PVC	150.0	0.011	540	1.53	0.001	948
47	P-3	87	J-4	J-2	12.0	PVC	150.0	0.011	540	1.53	0.001	717
68	P-14	32	J-9	J-12	12.0	PVC	150.0	0.011	376	1.07	0.000	295
69	P-15	28	J-12	J-7	12.0	PVC	150.0	0.011	349	0.99	0.000	295
56	P-9	118	J-7	J-10	12.0	PVC	150.0	0.011	-221	0.63	0.000	797
57	P-10	152	J-10	J-9	12.0	PVC	150.0	0.011	-221	0.63	0.000	685
66	P-13	58	J-11	J-1	12.0	PVC	150.0	0.011	-208	0.59	0.000	429
82	P-19	73	J-2	J-11	12.0	PVC	150.0	0.011	-189	0.54	0.000	628
72	P-18	29	J-11	PA1	12.0	PVC	150.0	0.011	19	0.05	0.000	100
71	P-17	32	J-12	PA2	12.0	PVC	150.0	0.011	15	0.04	0.000	100
70	P-16	30	J-12	PA3	12.0	PVC	150.0	0.011	12	0.03	0.000	100

FlexTable: Junction Table
Active Scenario: Average Day

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
36	J-1	5,697.51	0	5,841.43	62
37	J-2	5,682.45	0	5,841.33	69
38	J-3	5,716.77	0	5,842.37	54
39	J-4	5,697.50	0	5,841.78	62
41	J-6	5,670.25	0	5,840.59	74
42	J-7	5,686.28	0	5,841.15	67
44	J-9	5,691.90	0	5,841.32	65
55	J-10	5,706.43	0	5,841.24	58
61	PA3	5,694.83	12	5,841.23	63
62	PA2	5,694.83	15	5,841.23	63
63	PA1	5,695.00	19	5,841.39	63
64	J-11	5,691.12	0	5,841.39	65
67	J-12	5,690.83	0	5,841.23	65
75	J-18	5,716.77	0	5,843.81	55
78	J-19	5,667.24	0	5,840.01	75

FlexTable: Pipe Table
Active Scenario: Max Day

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)
76	P-1(1)	10	R-1	J-18	12.0	PVC	150.0	0.011	1,374	3.90	0.006	1
77	P-1(2)	113	J-18	J-3	12.0	PVC	150.0	0.011	1,374	3.90	0.004	429
79	P-11(1)	12	R-2	J-19	12.0	PVC	150.0	0.011	-1,245	3.53	0.005	1
80	P-11(2)	56	J-19	J-6	12.0	PVC	150.0	0.011	-1,245	3.53	0.003	186
50	P-5	87	J-1	J-3	12.0	PVC	150.0	0.011	-825	2.34	0.001	718
81	P-17	84	J-6	J-2	12.0	PVC	150.0	0.000	-707	2.01	0.001	679
51	P-6	27	J-1	J-9	12.0	PVC	150.0	0.011	613	1.74	0.001	145
46	P-2	132	J-3	J-4	12.0	PVC	150.0	0.011	549	1.56	0.001	948
47	P-3	87	J-4	J-2	12.0	PVC	150.0	0.011	549	1.56	0.001	717
53	P-7	132	J-7	J-6	12.0	PVC	150.0	0.011	538	1.53	0.001	803
68	P-14	32	J-9	J-12	12.0	PVC	150.0	0.011	395	1.12	0.000	295
69	P-15	28	J-12	J-7	12.0	PVC	150.0	0.011	320	0.91	0.000	295
56	P-9	118	J-7	J-10	12.0	PVC	150.0	0.011	-218	0.62	0.000	797
57	P-10	152	J-10	J-9	12.0	PVC	150.0	0.011	-218	0.62	0.000	685
66	P-13	58	J-11	J-1	12.0	PVC	150.0	0.011	-212	0.60	0.000	429
82	P-19	73	J-2	J-11	12.0	PVC	150.0	0.011	-158	0.45	0.000	628
72	P-18	29	J-11	PA1	12.0	PVC	150.0	0.011	54	0.15	0.000	100
71	P-17	32	J-12	PA2	12.0	PVC	150.0	0.011	42	0.12	0.000	100
70	P-16	30	J-12	PA3	12.0	PVC	150.0	0.011	33	0.09	0.000	100

FlexTable: Junction Table
Active Scenario: Max Day

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
36	J-1	5,697.51	0	5,841.33	62
37	J-2	5,682.45	0	5,841.24	69
38	J-3	5,716.77	0	5,842.31	54
39	J-4	5,697.50	0	5,841.70	62
41	J-6	5,670.25	0	5,840.55	74
42	J-7	5,686.28	0	5,841.04	67
44	J-9	5,691.90	0	5,841.22	65
55	J-10	5,706.43	0	5,841.14	58
61	PA3	5,694.83	33	5,841.11	63
62	PA2	5,694.83	42	5,841.11	63
63	PA1	5,695.00	54	5,841.28	63
64	J-11	5,691.12	0	5,841.28	65
67	J-12	5,690.83	0	5,841.11	65
75	J-18	5,716.77	0	5,843.81	55
78	J-19	5,667.24	0	5,840.00	75

FlexTable: Pipe Table
Active Scenario: Max Hour

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)
76	P-1(1)	10	R-1	J-18	12.0	PVC	150.0	0.011	1,399	3.97	0.006	1
77	P-1(2)	113	J-18	J-3	12.0	PVC	150.0	0.011	1,399	3.97	0.004	429
79	P-11(1)	12	R-2	J-19	12.0	PVC	150.0	0.011	-1,192	3.38	0.005	1
80	P-11(2)	56	J-19	J-6	12.0	PVC	150.0	0.011	-1,192	3.38	0.003	186
50	P-5	87	J-1	J-3	12.0	PVC	150.0	0.011	-843	2.39	0.001	718
81	P-17	84	J-6	J-2	12.0	PVC	150.0	0.000	-686	1.94	0.001	679
51	P-6	27	J-1	J-9	12.0	PVC	150.0	0.011	628	1.78	0.001	145
46	P-2	132	J-3	J-4	12.0	PVC	150.0	0.011	556	1.58	0.001	948
47	P-3	87	J-4	J-2	12.0	PVC	150.0	0.011	556	1.58	0.001	717
53	P-7	132	J-7	J-6	12.0	PVC	150.0	0.011	507	1.44	0.001	803
68	P-14	32	J-9	J-12	12.0	PVC	150.0	0.011	412	1.17	0.000	295
69	P-15	28	J-12	J-7	12.0	PVC	150.0	0.011	291	0.82	0.000	295
56	P-9	118	J-7	J-10	12.0	PVC	150.0	0.011	-216	0.61	0.000	797
57	P-10	152	J-10	J-9	12.0	PVC	150.0	0.011	-216	0.61	0.000	685
66	P-13	58	J-11	J-1	12.0	PVC	150.0	0.011	-215	0.61	0.000	429
82	P-19	73	J-2	J-11	12.0	PVC	150.0	0.011	-129	0.37	0.000	628
72	P-18	29	J-11	PA1	12.0	PVC	150.0	0.011	86	0.24	0.000	100
71	P-17	32	J-12	PA2	12.0	PVC	150.0	0.011	68	0.19	0.000	100
70	P-16	30	J-12	PA3	12.0	PVC	150.0	0.011	53	0.15	0.000	100

FlexTable: Junction Table
Active Scenario: Max Hour

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
36	J-1	5,697.51	0	5,841.24	62
37	J-2	5,682.45	0	5,841.16	69
38	J-3	5,716.77	0	5,842.26	54
39	J-4	5,697.50	0	5,841.63	62
41	J-6	5,670.25	0	5,840.51	74
42	J-7	5,686.28	0	5,840.95	67
44	J-9	5,691.90	0	5,841.12	65
55	J-10	5,706.43	0	5,841.04	58
61	PA3	5,694.83	53	5,841.01	63
62	PA2	5,694.83	68	5,841.01	63
63	PA1	5,695.00	86	5,841.19	63
64	J-11	5,691.12	0	5,841.19	65
67	J-12	5,690.83	0	5,841.01	65
75	J-18	5,716.77	0	5,843.81	55
78	J-19	5,667.24	0	5,840.00	75

FlexTable: Pipe Table
Active Scenario: Max Day + Fire Flow

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Length (User Defined) (ft)
72	P-18	29	J-11	PA1	12.0	PVC	150.0	0.011	3,554	10.08	0.021	100
76	P-1(1)	10	R-1	J-18	12.0	PVC	150.0	0.011	2,120	6.01	0.014	1
77	P-1(2)	113	J-18	J-3	12.0	PVC	150.0	0.011	2,120	6.01	0.008	429
66	P-13	58	J-11	J-1	12.0	PVC	150.0	0.011	-1,929	5.47	0.007	429
82	P-19	73	J-2	J-11	12.0	PVC	150.0	0.011	1,625	4.61	0.005	628
79	P-11(1)	12	R-2	J-19	12.0	PVC	150.0	0.011	1,509	4.28	0.007	1
80	P-11(2)	56	J-19	J-6	12.0	PVC	150.0	0.011	1,509	4.28	0.004	186
50	P-5	87	J-1	J-3	12.0	PVC	150.0	0.011	-1,319	3.74	0.003	718
81	P-17	84	J-6	J-2	12.0	PVC	150.0	0.000	824	2.34	0.001	679
46	P-2	132	J-3	J-4	12.0	PVC	150.0	0.011	801	2.27	0.001	948
47	P-3	87	J-4	J-2	12.0	PVC	150.0	0.011	801	2.27	0.001	717
53	P-7	132	J-7	J-6	12.0	PVC	150.0	0.011	-686	1.94	0.001	803
51	P-6	27	J-1	J-9	12.0	PVC	150.0	0.011	-611	1.73	0.001	145
69	P-15	28	J-12	J-7	12.0	PVC	150.0	0.011	-440	1.25	0.000	295
68	P-14	32	J-9	J-12	12.0	PVC	150.0	0.011	-365	1.04	0.000	295
56	P-9	118	J-7	J-10	12.0	PVC	150.0	0.011	246	0.70	0.000	797
57	P-10	152	J-10	J-9	12.0	PVC	150.0	0.011	246	0.70	0.000	685
71	P-17	32	J-12	PA2	12.0	PVC	150.0	0.011	42	0.12	0.000	100
70	P-16	30	J-12	PA3	12.0	PVC	150.0	0.011	33	0.09	0.000	100

FlexTable: Junction Table
Active Scenario: Max Day + Fire Flow

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
36	J-1	5,697.51	0	5,838.11	61
37	J-2	5,682.45	0	5,838.29	67
38	J-3	5,716.77	0	5,840.45	54
39	J-4	5,697.50	0	5,839.22	61
41	J-6	5,670.25	0	5,839.22	73
42	J-7	5,686.28	0	5,838.44	66
44	J-9	5,691.90	0	5,838.23	63
55	J-10	5,706.43	0	5,838.32	57
61	PA3	5,694.83	33	5,838.31	62
62	PA2	5,694.83	42	5,838.31	62
63	PA1	5,695.00	3,554	5,833.24	60
64	J-11	5,691.12	0	5,835.29	62
67	J-12	5,690.83	0	5,838.31	64
75	J-18	5,716.77	0	5,843.81	55
78	J-19	5,667.24	0	5,839.99	75

Preliminary Sanitary Demand Calculations

WARE MALCOMB

ARCHITECTURE | PLANNING | INTERIORS

BRANDING | CIVIL ENGINEERING

Aspen Business Park

DCS21-4114

DATE: 1/17/2022

BY: JRR

SANITARY FLOW SUMMARY (LOCAL)

PLANNING AREA	ZONING	AVG. DAY FLOW	TOTAL AREA	LOCAL AVG. FLOW	EQUIVALENT POPULATION PER ACRE	TOTAL POPULATION (P)	I/I	TOTAL LOCAL AVERAGE FLOW	
		GPD/ACRE	ACRES	GPD			0.1* LOCAL AVG FLOW	GPD	CFS
PA-1	M-O	1,200	22.9	27,528	18	413	2,753	30,281	0.05
PA-2	M-O	1,200	18.2	21,804	18	327	2,180	23,984	0.04
PA-3	M-O	1,200	14.0	16,824	18	252	1,682	18,506	0.03

$$Avg\ Flow = AREA\ (AC) \times AVG.\ DAY\ FLOW\ \left(\frac{GDP}{AC}\right) =$$

$$Peak\ Factor\ (PF) = \frac{5}{P^{0.167}} =$$

where P=Population in thousands

$$Peak\ Flow = Peak\ Factor \times Avg\ Flow =$$

$$I/I = Avg\ Flow \times 0.1 =$$

$$TOTAL\ AVERAGE\ FLOW = Avg\ Flow + (Avg\ Flow \times 0.1) =$$

$$TOTAL\ PEAK\ FLOW = Peak\ Flow + (Avg\ Flow \times 0.1) =$$

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Aspen Business Park
DCS21-4114

DATE: 1/17/2022
BY: JRR

SANITARY FLOW SUMMARY (CUMULATIVE)

DESIGN POINT	PLANNING AREAS	TOTAL CUMULATIVE POPULATION (P)	CUMULATIVE PEAKING FACTOR MAX PF = 4.0 MIN PF = 1.7	CUMULATIVE AVG. FLOW		CUMULATIVE PEAK FLOW		I/I 0.1* CUMULATIVE AVG FLOW	TOTAL CUMULATIVE PEAK FLOW		INNER PIPE DIAMETER (IN)	PERCENT FULL
				GPD	CFS	GPD	CFS		GPD	CFS		
1	PA1	413	4.0	27,528	0.04	110,112	0.2	2,753	112,865	0.2	8"	31%
2	PA1+PA2+PA3	992	4.0	66,156	0.1	264,624	0.4	6,616	271,240	0.4	8"	49%
3	PA1+PA2+PA3 @ OUTFALL	992	4.0	66,156	0.1	264,624	0.4	6,616	271,240	0.4	18"	16%

$$Avg\ Flow = AREA\ (AC) \times AVG.\ DAY\ FLOW\ \left(\frac{GDP}{AC}\right) =$$

$$Peak\ Factor\ (PF) = \frac{5}{P^{0.167}} =$$

where P=Population in thousands

$$Peak\ Flow = Peak\ Factor \times Avg\ Flow =$$

$$I/I = Avg\ Flow \times 0.1 =$$

$$TOTAL\ AVERAGE\ FLOW = Avg\ Flow + (Avg\ Flow \times 0.1) =$$

$$TOTAL\ PEAK\ FLOW = Peak\ Flow + (Avg\ Flow \times 0.1) =$$

Critical depth has been added to this table per comment. Max discharge analysis has been included for 12" and 8" pipes for 75%, 80%, and 100%.

critical depth,
max discharge
at 75%, 80%?

Channel Report

8 INCH SANITARY MAIN @ 0.5% AT DP 1

Circular

Diameter (ft) = 0.67

Invert Elev (ft) = 1.00

Slope (%) = 0.50

N-Value = 0.012

Calculations

Compute by: Known Q

Known Q (cfs) = 0.20

Highlighted

Depth (ft) = 0.21

Q (cfs) = 0.200

Area (sqft) = 0.09

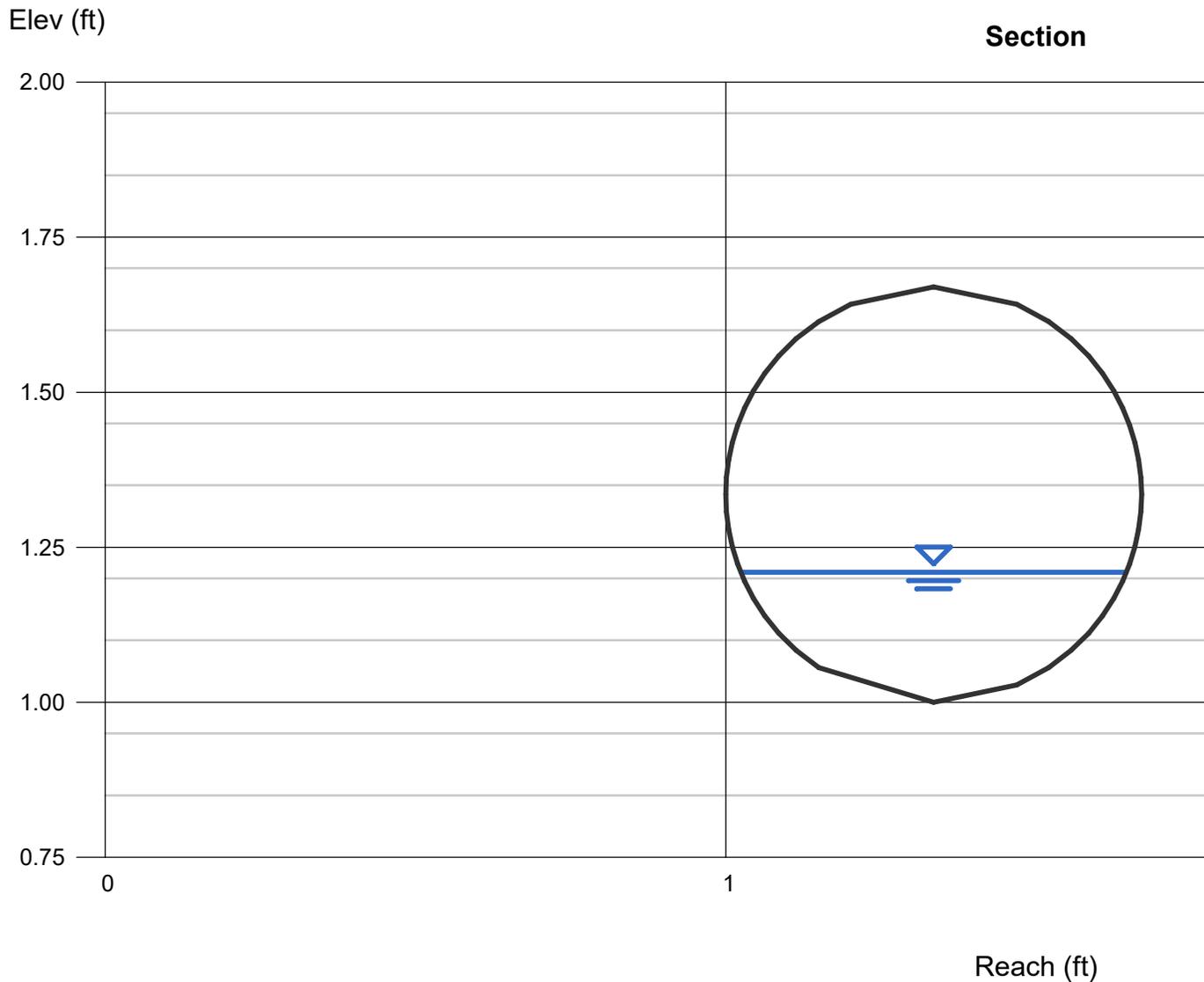
Velocity (ft/s) = 2.11

Wetted Perim (ft) = 0.80

Crit Depth, Yc (ft) = 0.21

Top Width (ft) = 0.62

EGL (ft) = 0.28



Channel Report

8 INCH SANITARY MAIN @ 0.4% AT DP 2

Circular

Diameter (ft) = 0.67

Invert Elev (ft) = 1.00

Slope (%) = 0.40

N-Value = 0.012

Calculations

Compute by: Known Q

Known Q (cfs) = 0.40

Highlighted

Depth (ft) = 0.33

Q (cfs) = 0.400

Area (sqft) = 0.17

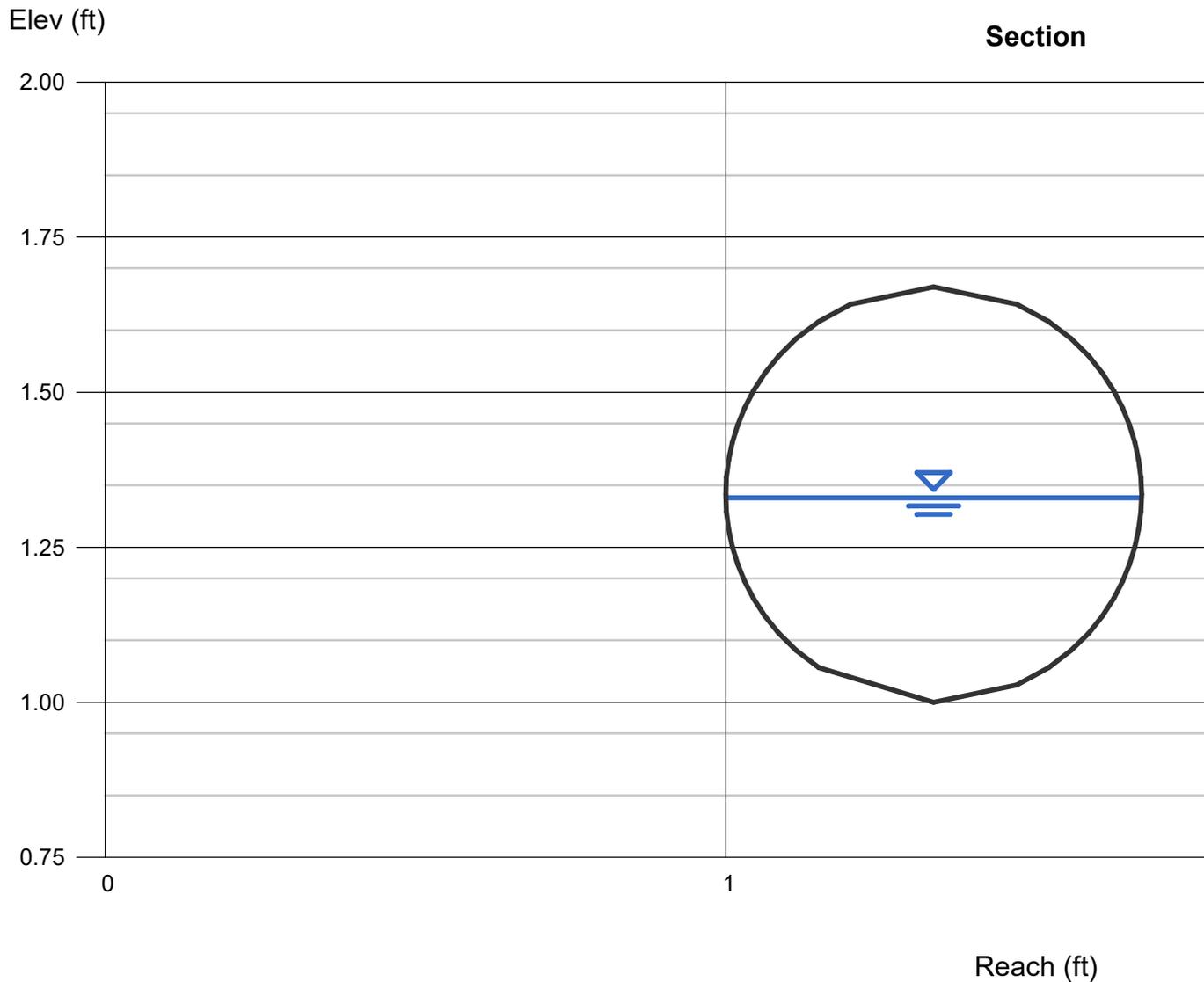
Velocity (ft/s) = 2.30

Wetted Perim (ft) = 1.05

Crit Depth, Y_c (ft) = 0.30

Top Width (ft) = 0.67

EGL (ft) = 0.41



Channel Report

18 INCH SANITARY MAIN @ 0.4% AT DP 3

Circular

Diameter (ft) = 1.50

Invert Elev (ft) = 1.00

Slope (%) = 0.40

N-Value = 0.012

Calculations

Compute by: Known Q

Known Q (cfs) = 0.40

Highlighted

Depth (ft) = 0.24

Q (cfs) = 0.400

Area (sqft) = 0.18

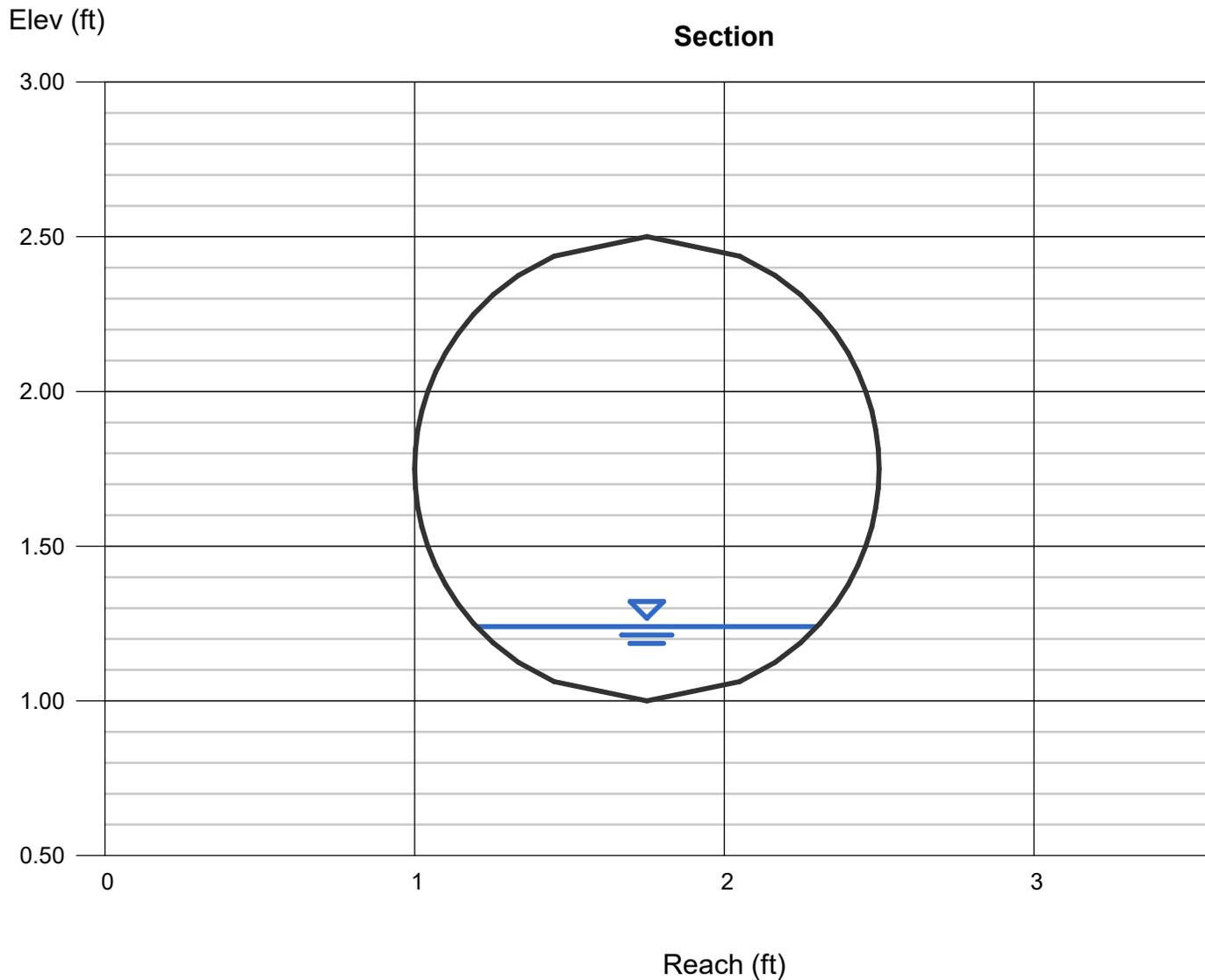
Velocity (ft/s) = 2.18

Wetted Perim (ft) = 1.24

Crit Depth, Yc (ft) = 0.24

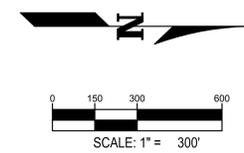
Top Width (ft) = 1.10

EGL (ft) = 0.31



MASTER PLAN ASPEN BUSINESS PARK

SE QUARTER OF SECTION 25, TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH P.M.,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO



MASTER UTILITY STUDY - OFFSITE UTILITY EXHIBIT

WARE MALCOMB
LEADING DESIGN FOR COMMERCIAL REAL ESTATE

SUBMITTAL NO.:	DATE:	
1ST SUBMITTAL	01.12.2022	
2ND SUBMITTAL	03.11.2022	

ASPEN BUSINESS PARK
YALE AVE & S GUN CLUB RD.
AURORA

JOB NO.:
DRAWN BY:
CHECKED BY:

SHEET NO. & NAME:

SHEET NAME:
MUS-EX