

January 10, 2020

City of Aurora
Stephen Rodriguez
15151 E. Alameda Pwky, Suite 2300
Aurora, CO 80012

Re: **Fourth Submission Review – Porteos** (Infrastructure CSP)
Application Number: **DA-1903-13**
Case Number: **2019-6032-00**

Dear Mr. Rodriguez:

Thank you for taking the time to review our fourth submission of Porteos Powhaton ISP. We received your comments on December 11, 2019. Responses to comments have been provided below. Please feel free to reach out if you should have any questions and/or concerns at 303-892-1166 or lvielehr@norris-design.com.

Sincerely,
Norris Design



Leanne Vielehr
Senior Associate

Fourth Submission Review

SUMMARY OF KEY COMMENTS FROM ALL DEPARTMENTS

- Address remaining comments from Engineering, Traffic Engineering, Aurora Water, and Real Property for the ISP and any other relevant documents.

Response: Please see response to redlines included at the end of this letter.

REFERRAL COMMENTS FROM OTHER DEPARTMENTS AND AGENCIES

1. Engineering (Public Works)

Reviewed by: Kristin Tanabe 303-739-7306 / ktanabe@auroragov.org

1A. ISP Sheet 1 - The site plan will not be approved by public works until the preliminary drainage letter/report is approved.

Response: Acknowledged.

1B. Add the following note: The streetlight or pedestrian light installation within the public right-of-way shall be designed, funded, and constructed by the developer/owner. Ownership and maintenance of the street/pedestrian lights shall be the responsibility of the City of Aurora once they have been accepted. Street light and/or pedestrian photometrics plans shall be prepared and submitted to the City for review and approval and shall become a part of the approved civil construction plans for the project. An electrical plan showing site location of lights, electrical one line and grounding details shall be submitting to the Permit Center for review by the Building Department. The owner is responsible for obtaining an address for the meter(s) from the Planning Department. A Building Permit for the meter and a Public Inspections Permit for the street lights are required. Certificate of occupancies will not be issued until the street and/or pedestrian lighting plans are approved, constructed, and initially accepted.

Response: The above note has been added to the cover sheet.

1C. Sheet 6 - Maintenance access to the outlet structure cannot be through the bottom of the pond.

Response: Maintenance access to the outlet structure has been revised per the recommended path.

2. Traffic Engineering

Reviewed by: Brianna Medema 303-739-7336 / bmedema@auroragov.org

TIS

2A. Additional analysis and discussion is required to recommend a section east of Powhaton Road that does not match NEATS.

Response: Additional information is provided in the updated memo that shows 64th Avenue is consistent with NEATS. Only one lane east-west in each direction is needed, but 64th Avenue is depicted to be a 4-lane arterial road.

2B. NEATS has 2 through lanes (4 total) for 64th on both sides of this intersection. Based on intersection design, only 1 through lane east (2 total + turns) are proposed. This does not match NEATS and would either require a comp plan amendment or include both the proposed sections & intersection improvements required and include the NEATS compliant section in the ISP with appropriate notes that these would be future improvements if traffic volumes or City Engineer required (see what was done for 64th west of this section). Page 2

Response: The updated report shows 64th Avenue as a 4-lane arterial, consistent with NEATS. The intersection need only provide one through lane in each direction.

2C. Add text identifying that if the reduced laneage and reduced ROW is requested, then a Comprehensive Plan amendment would be required (which would need to be approved by City Council). Building the laneage recommended in this document may be acceptable, but the ISP would need to show the entire ROW for the NEATS

section with the identified auxiliary lanes and indicate that they may be required in the future to construct the additional laneage when required by the City. Page 3

Response: Language has been added in the updated memo.

2D. Add a separate scenario where there are 4 lanes east of Powhatan Rd on 64th Ave. What would be the required right turn lane storage? This will be added to the ISP as this would be required per the 4-lane NEATS section (similar to deferral, but not formally deferral as deferrals are a Civil Plans item). Page 4

Response: 64th Ave. east has been revised to a 4-lane road per conversations with the City. A footnote has been added to the new memo identifying how long this lane should be if not turning into a southbound lane-add situation.

ISP

2E. NEATS has 2 through lanes (4 total) for 64th on both sides of this intersection. Based on intersection design, only 1 through lane east (2 total + turns) are proposed. This does not match NEATS and would either require a comp plan amendment or include both the proposed sections & intersection improvements required and include the NEATS compliant section with appropriate notes that these would be future improvements if traffic volumes or City Engineer required (see what was done for 64th west of this section).

Response: Per conversations with City staff, there will be 4 travel lanes east of Powhatan. A note has been added for the amount of through lanes per the City's comments.

Proposed intersection requires a EB to SB continuous right turn lane based on volumes, which would mean a EB right turn lane would be required (in the already built section). I have shown the general area, but would need to meet City Criteria & length per volumes (& analyzed in the Traffic Memo). Sheet 3

Response: Per conversations with City of Aurora, there will be 4 travel lanes east of the intersection. Note has been added per discussions with COA traffic stating if E/W traffic exceeds 12,000 ADT then the intersection may need to be improved, but improvements are not necessary at this time and are not included with this ISP.

2F. ROW for 4-lane section of minor arterial is required for future development. Sheet 3

Response: Per conversations with City of Aurora, there will be 4 travel lanes east of the intersection. Note has been added per discussions with COA traffic stating if E/W traffic exceeds 12,000 ADT then the intersection may need to be improved, but improvements are not necessary at this time and are not included with this ISP.

2G. Add note that the proposed section east of Powhatan Rd, based on the anticipated ADTs would only require 2 through lanes to meet the NEATS LOS threshold. Identify that NEATS update includes a 4-lane minor arterial, and that reducing the ROW would require a Comprehensive Plan amendment. Identify if the ROW for the full section will be preserved. Sheet 6

Response: A note has been added to the plans per conversations with the City.

2H. Add additional cross section is required. This new cross section would be to comply with NEATS recommendations of 4-lanes for 64th east of Powhatan Rd. It would require the EB continuous drop lane to become a through lane and a new EB right turn lane would be required (yes in the already constructed section, or the roadway would need to shift further north to accommodate the 4 through lanes at the intersection). Sheet 6

Response: 64th Ave. east of Powhatan Road has been revised per conversations with City of Aurora. Notes have been added to the plans per request.

2I. Add sight lines from this stop location. Sheet 10

Response: Site triangles added per comment.

2J. Review comments on the previous sheets regarding potential future changes in this area. Sheet 10

Response: Acknowledged, a note has been added to plans per conversations with the City.

3. Life Safety

Reviewed by: Mark Apodaca 303-739-7656 / mapodaca@auroragov.org

3A. No further comments.

Response: Acknowledged.

4. Aurora Water

Reviewed by: Casey Ballard 303-739-7296 / cballard@auroragov.org

4A. Sheet 6 – Access to the outlet structure should be from a public ROW or other point that allows access when the pond is full.

Response: Maintenance access to the outlet structure has been revised per the recommended path.

5. Real Property

Reviewed by: Maurice Brooks / mbrooks@auroragov.org / 303-739-7294 / PDF comment color is magenta.

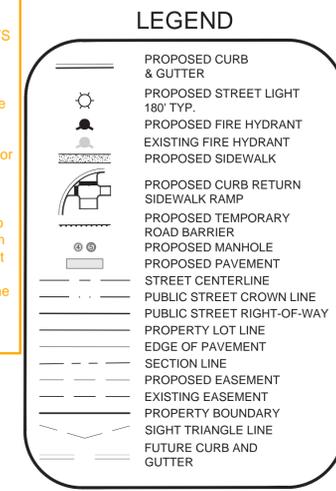
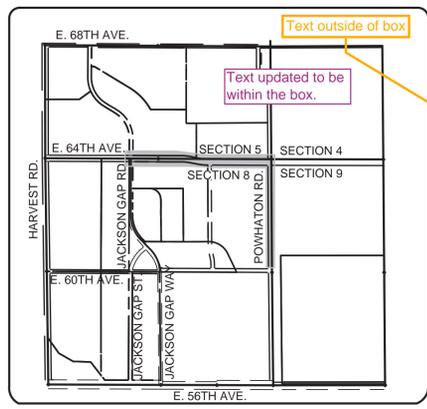
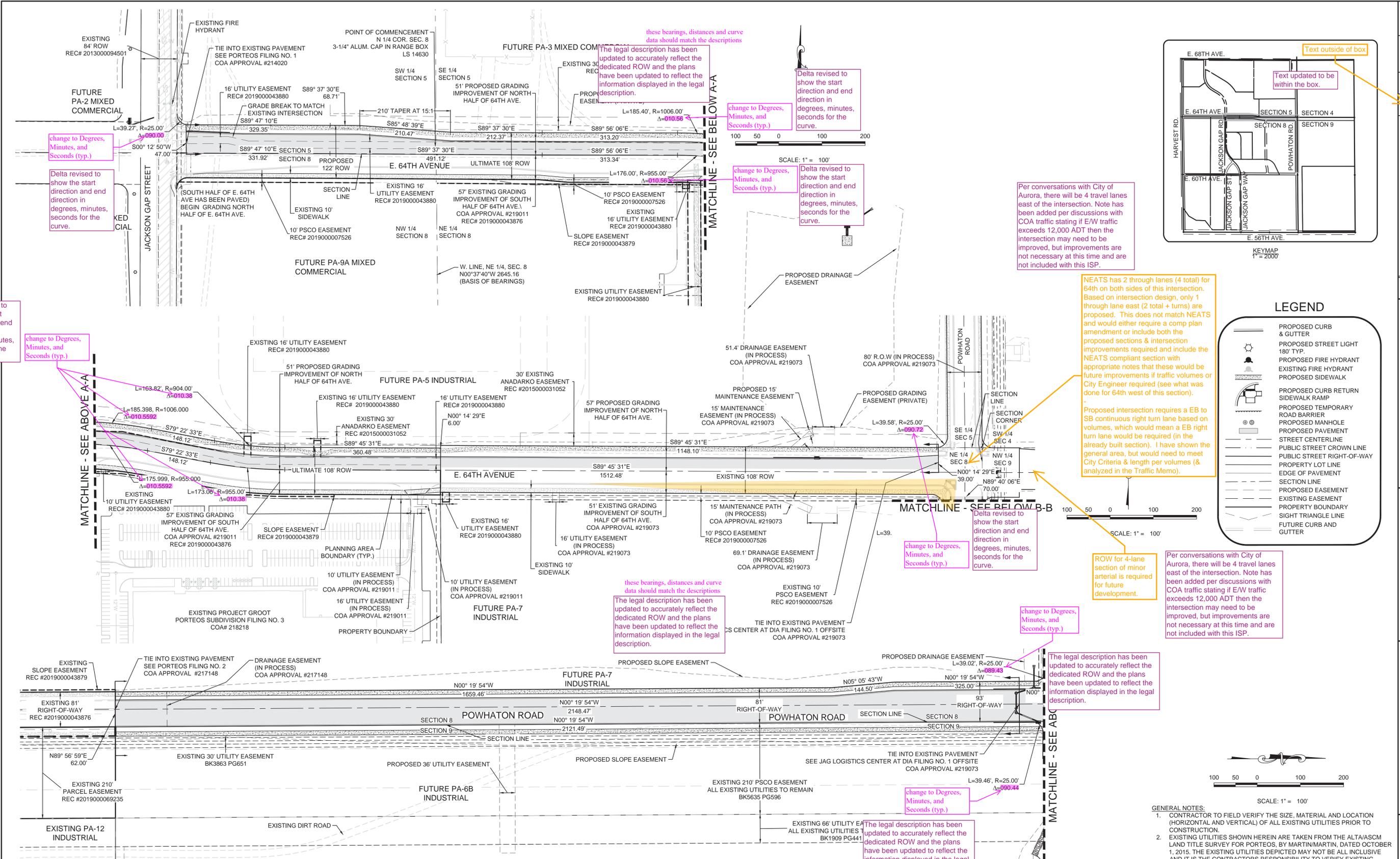
5A. Start the process of the easement and Right of Way dedications. Contact Andy Niquette for the processes for those dedications. See the red line comments in the ISP. Make sure the descriptions on the ISP match the illustrations.

Response: Easement and Right of Way dedication process has begun. Andy Niquette has been contacted. The legal description has been updated to accurately reflect the dedicated ROW and the plans have been updated to reflect the information displayed in the legal description. The deltas on curves have been revised to show the start direction and end direction in degrees, minutes, seconds for the curve.

Xcel Energy

6A. Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has no further concerns than what was stated previously.

Response: Acknowledged.



NEATS has 2 through lanes (4 total) for 64th on both sides of this intersection. Based on intersection design, only 1 through lane east (2 total + turns) are proposed. This does not match NEATS and would either require a comp plan amendment or include both the proposed sections & intersection improvements required and include the NEATS compliant section with appropriate notes that these would be future improvements if traffic volumes or City Engineer required (see what was done for 64th west of this section).

Proposed intersection requires a EB to SB continuous right turn lane based on volumes, which would mean a EB right turn lane would be required (in the already built section). I have shown the general area, but would need to meet City Criteria & length per volumes (& analyzed in the Traffic Memo).

ROW for 4-lane section of minor arterial is required for future development.

Per conversations with City of Aurora, there will be 4 travel lanes east of the intersection. Note has been added per discussions with COA traffic stating if E/W traffic exceeds 12,000 ADT then the intersection may need to be improved, but improvements are not necessary at this time and are not included with this ISP.

- GENERAL NOTES:**
- CONTRACTOR TO FIELD VERIFY THE SIZE, MATERIAL AND LOCATION (HORIZONTAL AND VERTICAL) OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
 - EXISTING UTILITIES SHOWN HEREIN ARE TAKEN FROM THE ALTA/ASCM LAND TITLE SURVEY FOR PORTEOS, BY MARTIN/MARTIN, DATED OCTOBER 1, 2015. THE EXISTING UTILITIES DEPICTED MAY NOT BE ALL INCLUSIVE AND IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY EXISTING UTILITIES PRIOR TO CONSTRUCTION.

- ROADWAY CONSTRUCTION PHASING:**
- THE ENTIRE SECTION OF POWHATON STREET FROM THE INTERSECTION OF POWHATON STREET AND EAST 64TH AVENUE TO THE PROPERTY LINE OF PA-12 INDUSTRIAL SHALL BE CONSTRUCTED AS SHOWN IN THE PROPERTY LINE OF PA-12 INDUSTRIAL AS SHOWN IN THE 104.5' CROSS SECTION. FUTURE ROAD IMPROVEMENTS SHALL BE COMPLETED AS NECESSARY THE ADJACENT PLANNING AREA.
 - ALL ROADWAY AND UTILITY INFRASTRUCTURE SHALL BE IN PLACE TO FACILITATE ADJACENT PARCELS. ADDITIONAL STORM SEWER IMPROVEMENTS MAY BE REQUIRED ONCE SPECIFIC SITE PLAN LAYOUTS ARE DETERMINED.
 - THE DEVELOPER IS RESPONSIBLE FOR STRIPING ALL PUBLIC STREETS. THE DEVELOPER IS REQUIRED TO PLACE TRAFFIC CONTROL SIGNS AND GUIDE SIGNS ON ALL PUBLIC STREETS AND PRIVATE STREETS APPROACHING AN INTERSECTION WITH A PUBLIC STREET.
 - ALL MAJOR INTERSECTIONS ARE CANDIDATES FOR FUTURE SIGNALIZATION IF AND WHEN SIGNAL WARRANTS ARE MET. AS AN ADJACENT LAND OWNER/DEVELOPER, YOU MUST PARTICIPATE IN THE SIGNAL COST.
 - TRANSITION PAVING WILL BE CONSTRUCTED AS REQUIRED.
 - THE DEVELOPER IS RESPONSIBLE FOR STREET LIGHTS ALONG ALL PUBLIC STREETS.

- WATER MAIN SYSTEM:**
- OFFSITE WATER MAIN INFRASTRUCTURE IMPROVEMENTS FOR THE JAG LOGISTICS CENTER AT DIA SUBDIVISION FILING NO. 1 OFFSITE CONSTRUCTION PLANS ARE ASSUMED COMPLETE AND IN PLACE FOR THE CONSTRUCTION OF THIS ISP.
 - A 16" WATER MAIN WILL CONNECT TO THE 24" WATER MAIN (AS CONSTRUCTED BY THE PA-5 INDUSTRIAL DEVELOPMENT).
 - THE PORTEOS PROJECT SITE IS LOCATED WITHIN ZONE 3 OF THE CITY OF AURORA WATER NETWORK AND WILL OPERATE ON TWO WATER PRESSURE ZONES PER THE APPROVED MASTER UTILITY REPORT.
 - EACH PLANNING AREA SHALL BE REQUIRED TO PROVIDE AN INTERNAL LOOPED WATER NETWORK PER CITY CRITERIA DURING THEIR RESPECTIVE CSP SUBMITTALS.
 - REFER TO THE APPROVED PUBLIC IMPROVEMENT PLANS, MASTER UTILITY REPORT, FDP AND SUBSEQUENT ADDENDUMS FOR ADDITIONAL INFORMATION REGARDING PHASING REQUIREMENTS.
 - WATER MAIN STUBS HAVE BEEN PROVIDED TO PLANNING AREA PA-6B FOR REFERENCE PURPOSES. THESE ARE SUBJECT TO CHANGE PER THE POWHATON EXTENSION CSP.

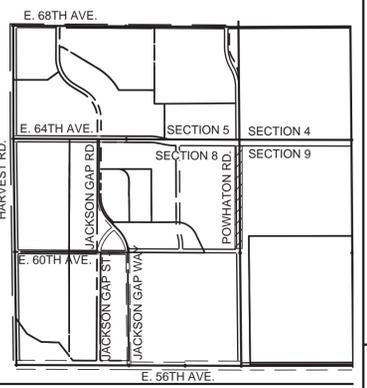
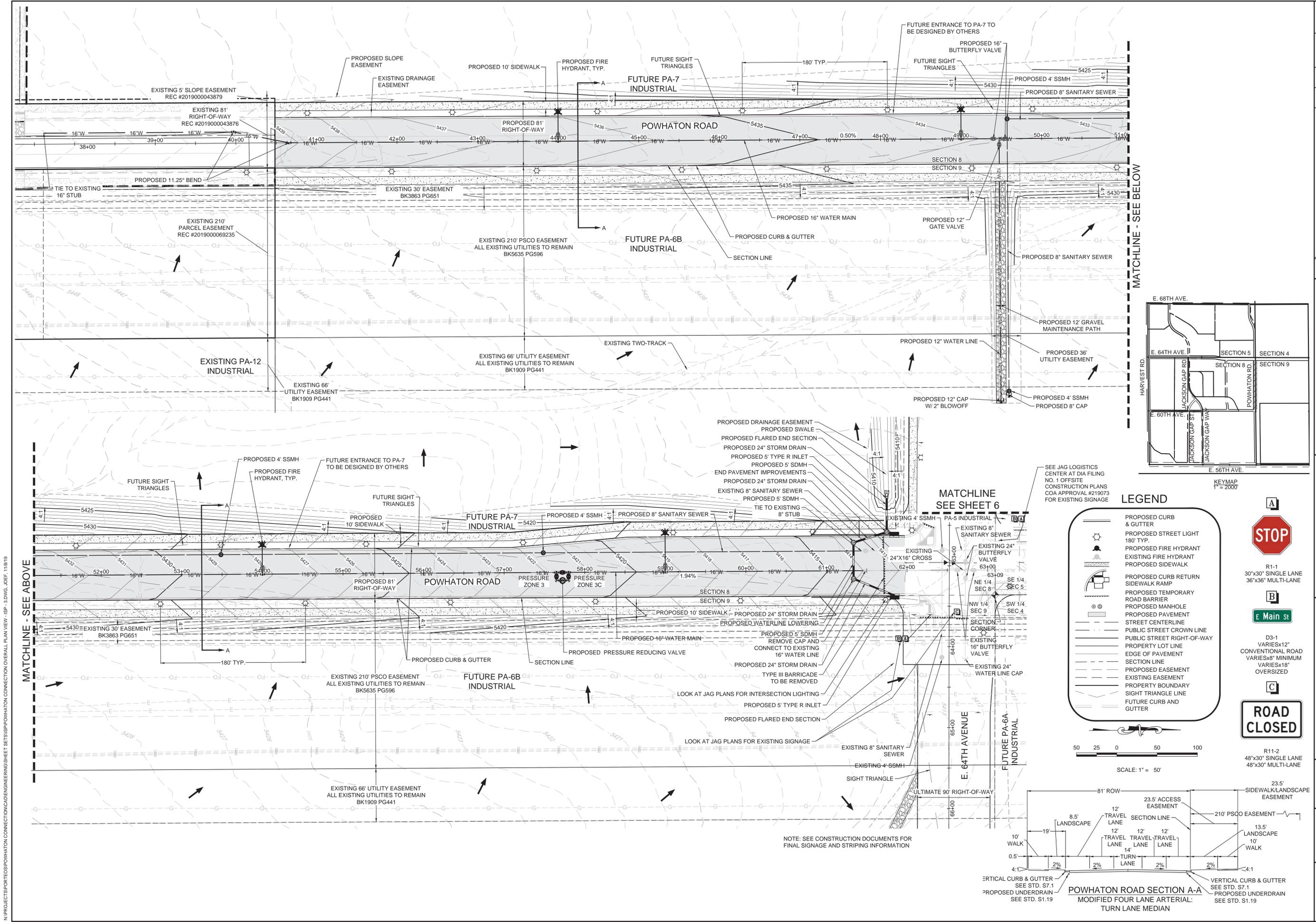
- SANITARY SEWER SYSTEM:**
- PER THE AURORA "MASTER SEWER PLANS" A FUTURE PERMANENT GRAVITY SYSTEM SHALL BE PROVIDED TO CONNECT TO THE DENVER METRO INFRASTRUCTURE AND NORTHERN TREATMENT PLANT. A TIME TABLE FOR THESE IMPROVEMENTS HAS YET TO BE DETERMINED; HOWEVER, AURORA AND PORTEOS OWNERSHIP HAVE IDENTIFIED PARAMETERS AND OTHER DEVELOPMENT TRIGGERS FOR BOTH INTERIM AND FINAL ALTERNATIVE SEWER CONVEYANCE SYSTEMS. REFER TO THE APPROVED MASTER UTILITY STUDY AND AMENDMENTS FOR SPECIFIC INFORMATION REGARDING PHASING REQUIREMENTS.
 - PROPOSED SANITARY SEWER MAINS SHALL BE CONSTRUCTED AS PART OF THESE ISP IMPROVEMENTS TO FACILITATE PA-6B. ADDITIONAL SANITARY SEWER MAINS WILL BE REQUIRED AS OTHER PLANNING AREAS DEVELOP. AS OUTLINED IN THE APPROVED PUBLIC IMPROVEMENT PLANS, MASTER UTILITY REPORT, FDP AND SUBSEQUENT AMENDMENTS TO THESE DOCUMENTS.

- STORM SEWER SYSTEM:**
- STORM INLETS SHALL BE INSTALLED AT THE SOUTHEAST AND SOUTHWEST CORNER OF THE POWHATON ROAD AND EAST 64TH AVENUE INTERSECTION. THESE INLETS WILL CAPTURE STORMWATER FROM THE POWHATON ROAD EXTENSION AND THE EAST 64TH AVENUE CONNECTION. BOX CULVERTS AND CULVERT CROSSINGS ACROSS EAST 64TH AVENUE ARE CURRENTLY UNDER REVIEW WITH THE JAG LOGISTICS CENTER AT D.I.A. FILING NO. 2 AND SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE NORTH HALF OF EAST 64TH AVENUE.
 - BMPs AND EROSION CONTROL MEASURES SHALL BE INSTALLED TO MINIMIZE EROSION AND REDUCE EROSION CHARACTERISTICS AT CULVERT CROSSINGS AND WITHIN EXISTING CHANNEL CONVEYANCE PATHS.
 - ADDITIONAL PUBLIC STORM SEWER SYSTEMS MAY BE REQUIRED AS PLANNING AREAS DEVELOP.

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DATE: OCTOBER 2019	CHECKED BY: JFF	DRAWN BY: WSC	
NO. 3 RESUBMITTAL	NO. 2 RESUBMITTAL	NO. 1 RESUBMITTAL	
DATE: 09/2019	DATE: 07/2019	DATE: 07/2019	
APPR.:	INIT.:	DATE:	DATE:



PORTEOS - PHASE 5
INFRASTRUCTURE SITE PLAN
POWHATON ROAD & E. 64TH AVENUE
RIGHT-OF-WAY & EASEMENT EXHIBIT



LEGEND

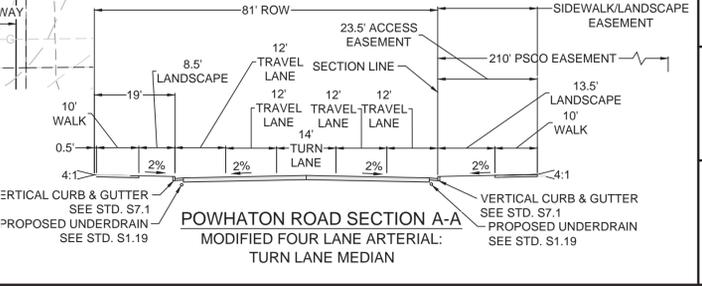
- PROPOSED CURB & GUTTER
- PROPOSED STREET LIGHT 180' TYP.
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED SIDEWALK
- PROPOSED CURB RETURN SIDEWALK RAMP
- PROPOSED TEMPORARY ROAD BARRIER
- PROPOSED MANHOLE
- PROPOSED PAVEMENT
- STREET CENTERLINE
- PUBLIC STREET CROWN LINE
- PUBLIC STREET RIGHT-OF-WAY
- PROPERTY LOT LINE
- EDGE OF PAVEMENT
- SECTION LINE
- PROPOSED EASEMENT
- EXISTING EASEMENT
- PROPERTY BOUNDARY
- SIGHT TRIANGLE LINE
- FUTURE CURB AND GUTTER

R1-1
30"x30" SINGLE LANE
36"x36" MULTI-LANE

E Main St

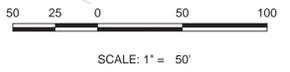
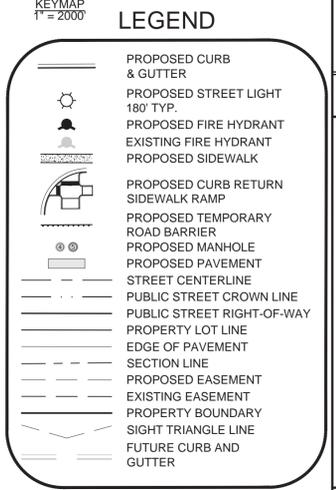
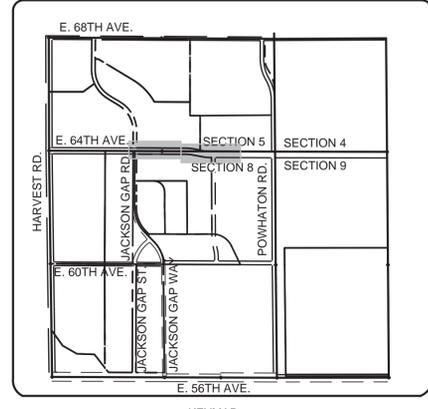
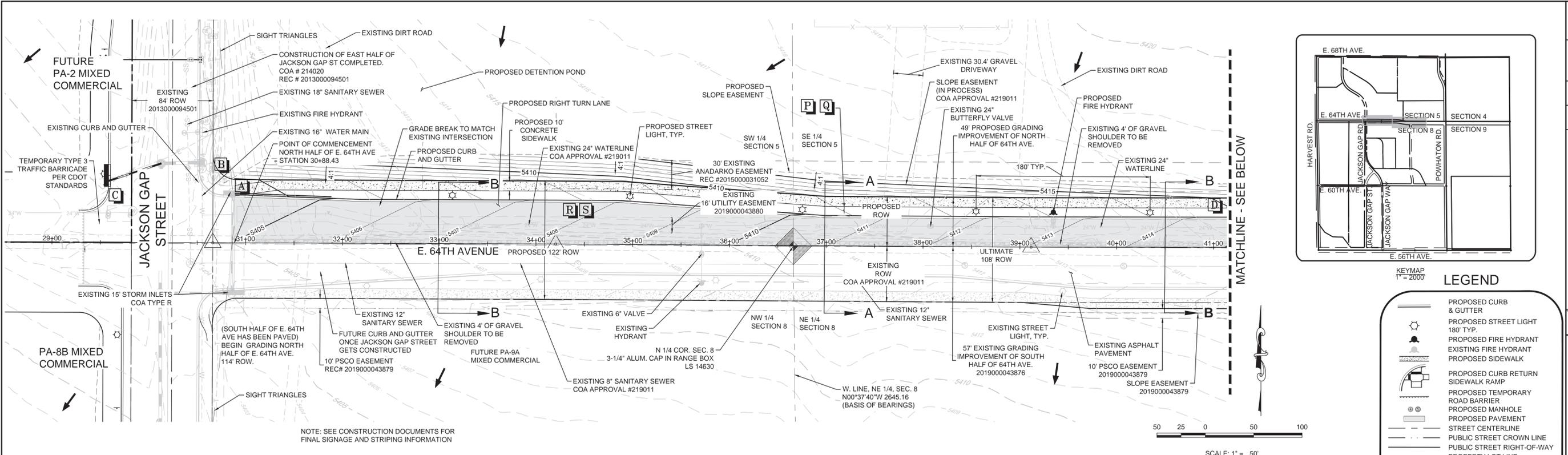
R11-2
48"x30" SINGLE LANE
48"x30" MULTI-LANE

SCALE: 1" = 50'

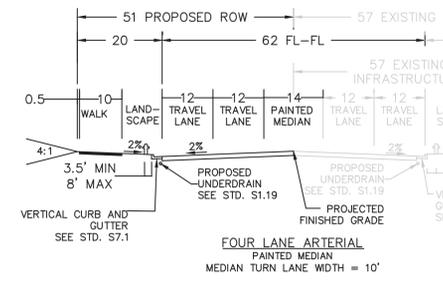
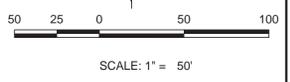
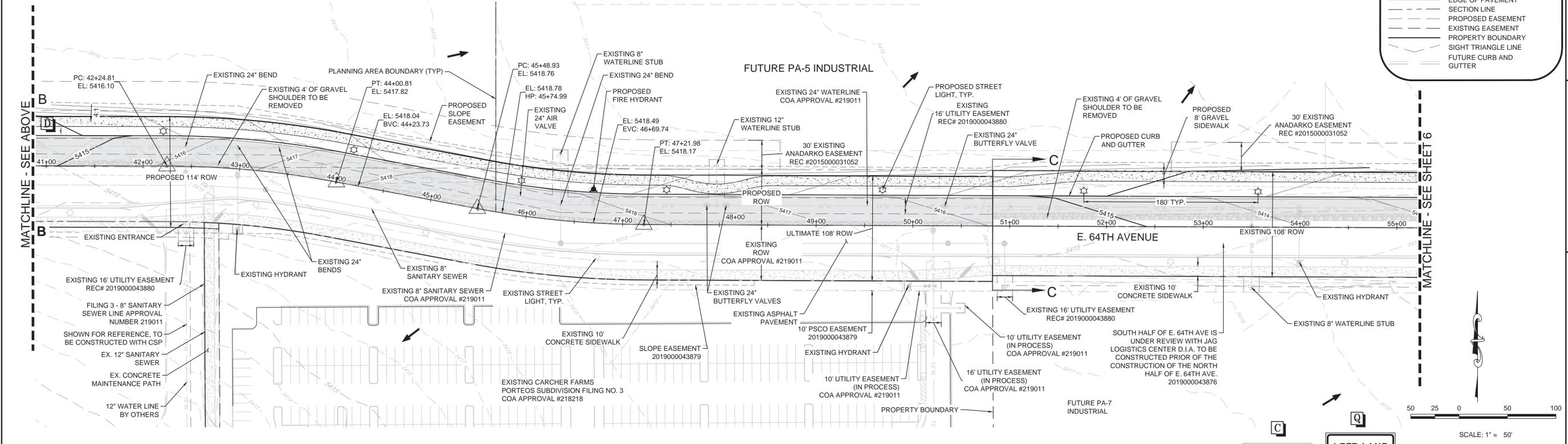


NOTE: SEE CONSTRUCTION DOCUMENTS FOR FINAL SIGNAGE AND STRIPING INFORMATION

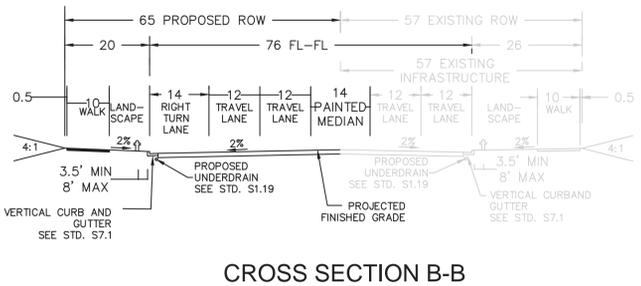
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	NO. 2	RESUBMITTAL	10/9/2019	JF		
	NO. 1	RESUBMITTAL	8/27/2019	JF		
	NO.	Revisions	Date	Init	Appr.	Date
10333 E. Dry Creek Rd., Suite 240, Englewood, CO 80112 Tel: (720) 482-9526 Fax: (720) 482-9546	CML CONSULTANTS		PORTES - PHASE 5 INFRASTRUCTURE SITE PLAN POWATHON ROAD PLAN VIEW			
SCALE: AS SHOWN	FILE NO: 8130249709					
DRAWN BY: WSC	CHECKED BY: JFF	DATE: OCTOBER 2019				
SHEET NUMBER	4					



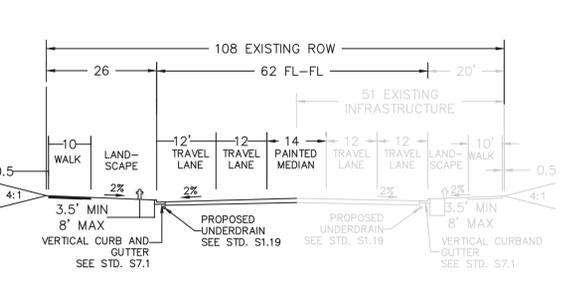
NOTE: SEE CONSTRUCTION DOCUMENTS FOR FINAL SIGNAGE AND STRIPING INFORMATION



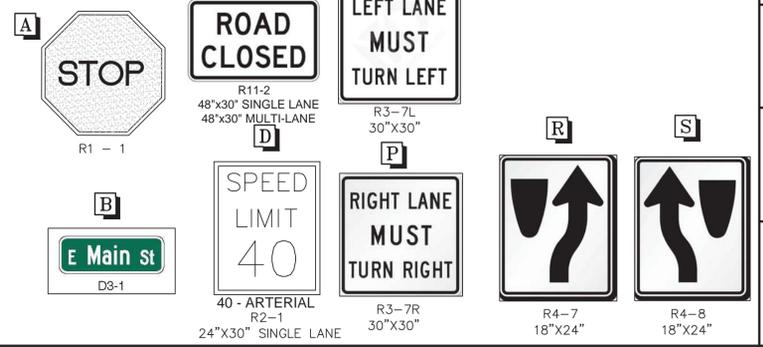
CROSS SECTION A-A
TRAVELING EASTERLY ON 64TH AVE



CROSS SECTION B-B
TRAVELING WEST ON 64TH AVE AT
INTERSECTION WITH JACKSON GAP STREET



CROSS SECTION C-C
TRAVELING EASTERLY ON 64TH AVE

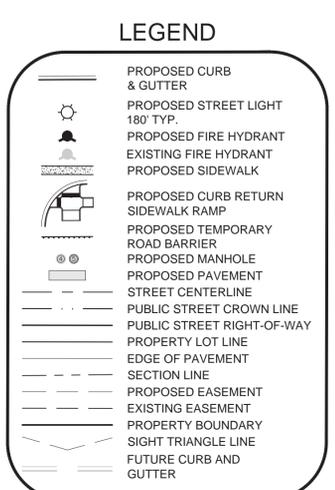
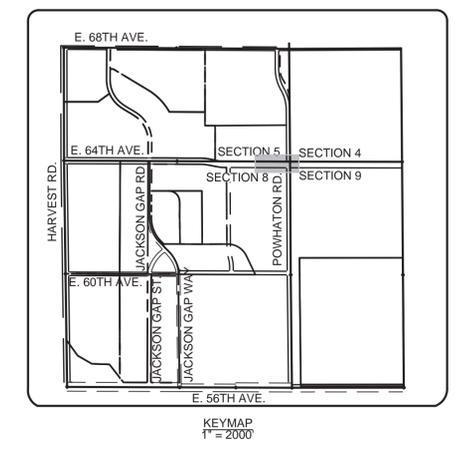
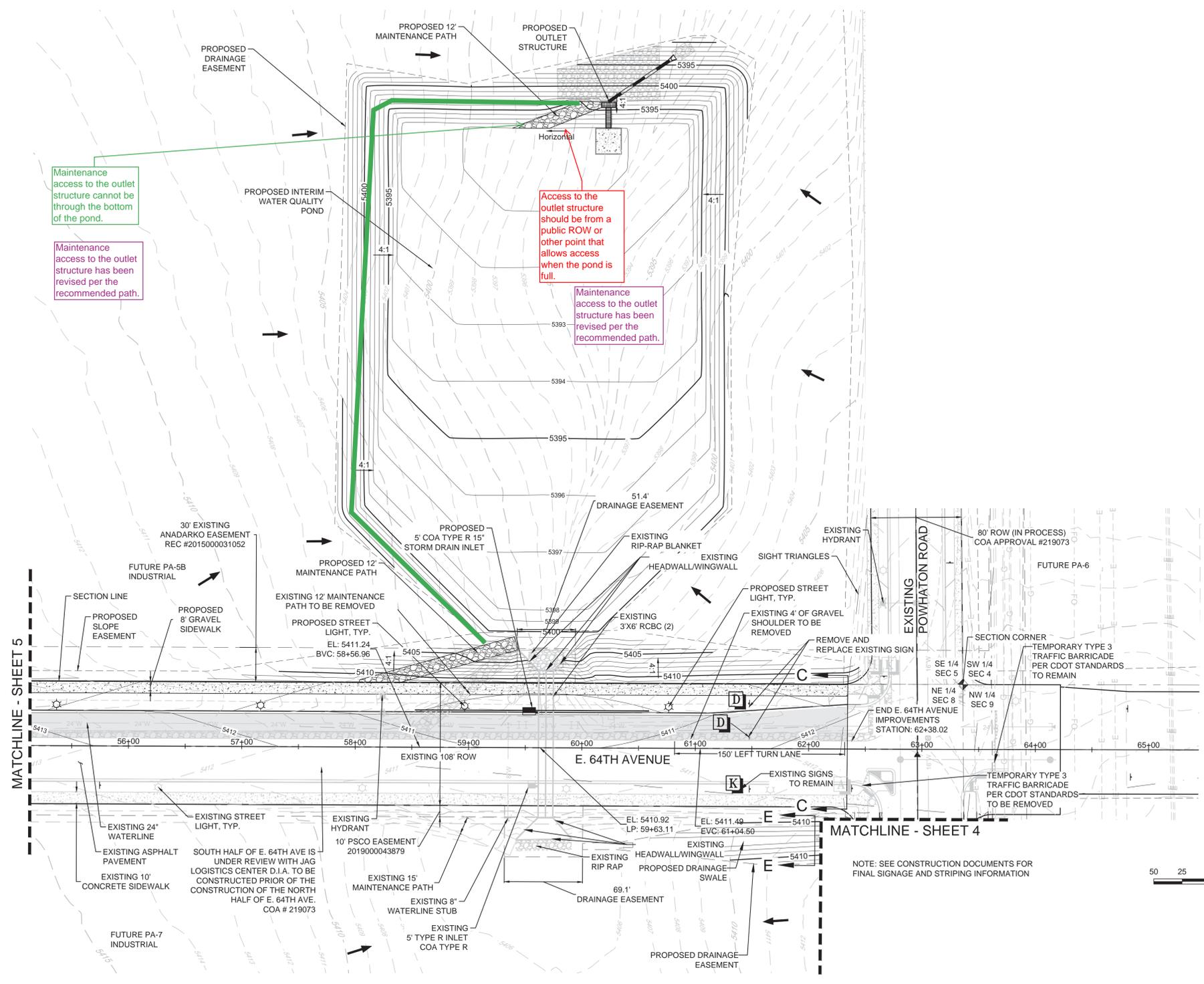


NOTE: FUTURE RIGHT TURN LANE (IF WARRANTED) WOULD BE ADDED BY ADJACENT DEVELOPMENT.

N:\PROJECTS\PORTEOS\PORTEOS\CONNECTION\ENGINEERING\DRG_SHEETS\SUSP\NORTH HALF 64TH AVE.DWG_DEF.11.08.19

10335 E. Dry Creek Rd. Suite 240 Englewood, CO 80112 Tel: (720) 482-9526 Fax: (720) 482-9546	No. 3 RESUBMITTAL No. 2 RESUBMITTAL No. 1 RESUBMITTAL	11/1/2019 JF 10/9/2019 JF 8/27/2019 JF	Date Date Date	Revisions No. No. No.	Date Date Date	Date Date Date
CML CONSULTANTS	PORTEOS - PHASE 5 INFRASTRUCTURE SITE PLAN E. 64TH AVENUE PLAN VIEW					
	SCALE: AS SHOWN DRAWN BY: JRG CHECKED BY: JFF DATE: OCTOBER 2019	FILE NO: 8130249709	SHEET NUMBER <h1 style="text-align: center;">5</h1>			

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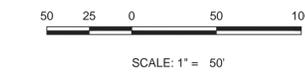
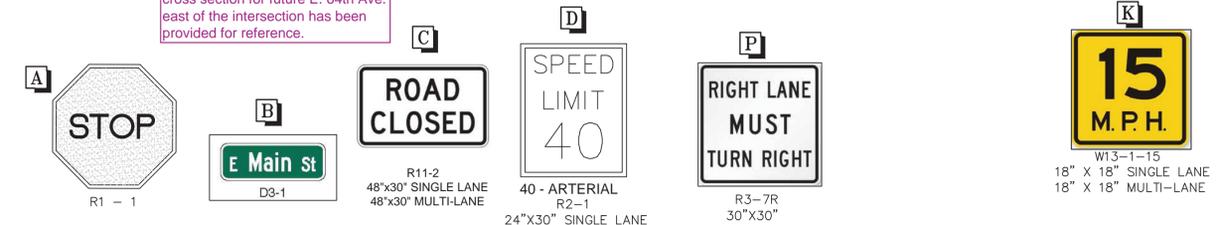
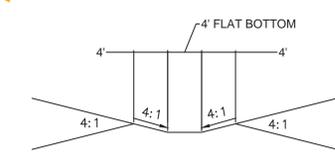
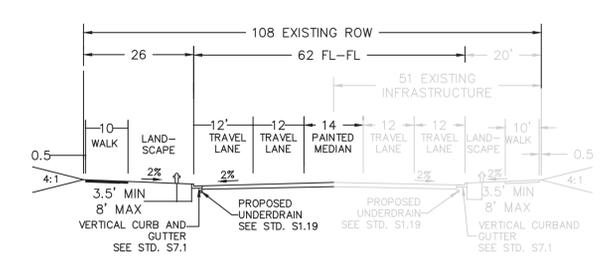


Add note that the proposed section east of Powhatan Rd, based on the anticipated ADTs would only require 2 through lanes to meet the NEATS LOS threshold. Identify that NEATS update includes a 4-lane minor arterial, and that reducing the ROW would require a Comprehensive Plan amendment. Identify if the ROW for the full section will be preserved.

Per conversations with City of Aurora, there will be 4 travel lanes east of the intersection. Note has been added per discussions with COA traffic stating if E/W traffic exceeds 12,000 ADT then the intersection may need to be improved, but improvements are not necessary at this time and are not included with this ISP. The cross section for future E. 64th Ave. east of the intersection has been provided for reference.

Add additional cross section is required. This new cross section would be to comply with NEATS recommendations of 4-lanes for 64th east of Powhatan Rd. It would require the EB continuous drop lane to become a through lane and a new EB right turn lane would be required (yes in the already constructed section, or the roadway would need to shift further north to accommodate the 4 through lanes at the intersection).

Per conversations with City of Aurora, there will be 4 travel lanes east of the intersection. Note has been added per discussions with COA traffic stating if E/W traffic exceeds 12,000 ADT then the intersection may need to be improved, but improvements are not necessary at this time and are not included with this ISP. The cross section for future E. 64th Ave. east of the intersection has been provided for reference.



10333 E. Dry Creek Rd. Suite 240 Englewood, CO 80112 Tel: (720) 482-9526 Fax: (720) 482-9546	No. 3	RESUBMITTAL	11/1/2019	TB		
	No. 2	RESUBMITTAL	10/9/2019	JF		
	No. 1	RESUBMITTAL	8/27/2019	JF		
	No.	Revisions	Date	Init	Appr.	Date
CML CONSULTANTS						
PORTES - PHASE 5 INFRASTRUCTURE SITE PLAN E. 64TH AVENUE PLAN VIEW						
DRAWN BY:	JRG	SCALE:	AS SHOWN	FILE NO.:	8130249709	
CHECKED BY:	JFF	DATE:	OCTOBER 2019			
SHEET NUMBER	6					

SLOPE EASEMENT A DESCRIPTION:

A SLOPE EASEMENT SITUATED WITHIN THE NORTHEAST QUARTER OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF AURORA, COUNTY OF ADAMS, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
 COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 8, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN AND CONSIDERING THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 8, BEING MONUMENTED ON THE NORTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607 AND ON THE SOUTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607, TO BEAR SOUTH 00°19'54" EAST, 2658.06 FEET WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO;
 THENCE SOUTH 28°35'37" WEST, A DISTANCE OF 192.28 FEET TO THE POINT OF BEGINNING;
 THENCE SOUTH 00°19'54" EAST, A DISTANCE OF 288.53 FEET;
 THENCE SOUTH 05°05'43" EAST, A DISTANCE OF 144.50 FEET;
 THENCE SOUTH 00°19'54" EAST, A DISTANCE OF 1659.46 FEET;
 THENCE SOUTH 89°56'59" WEST, A DISTANCE OF 0.88 FEET;
 THENCE NORTH 02°51'00" WEST, A DISTANCE OF 1077.20 FEET;
 THENCE NORTH 01°22'28" EAST, A DISTANCE OF 125.03 FEET;
 THENCE NORTH 03°53'22" EAST, A DISTANCE OF 350.95 FEET;
 THENCE NORTH 05°53'41" WEST, A DISTANCE OF 253.54 FEET;
 THENCE NORTH 00°55'32" WEST, A DISTANCE OF 67.86 FEET;
 THENCE NORTH 05°34'57" EAST, A DISTANCE OF 221.84 FEET;
 THENCE NORTH 89°40'06" EAST, A DISTANCE OF 9.09 FEET TO THE POINT OF BEGINNING.
 SAID PARCEL OF LAND CONTAINING A CALCULATED AREA OF 56.888 SQUARE FEET OR 1.306 ACRES, MORE OR LESS.
 THE LINEAL UNIT USED IN THE PREPARATION OF THIS LEGAL DESCRIPTION IS THE U.S. SURVEY FOOT AS DEFINED BY THE UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

SLOPE EASEMENT B DESCRIPTION:

A SLOPE EASEMENT SITUATED WITHIN THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF AURORA, COUNTY OF ADAMS, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
 COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN AND CONSIDERING THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 9, BEING MONUMENTED ON THE NORTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607 AND ON THE SOUTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607, TO BEAR SOUTH 00°19'54" EAST, 2658.06 FEET WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO;
 THENCE SOUTH 00°19'54" EAST, A DISTANCE OF 168.30 FEET TO THE POINT OF BEGINNING;
 THENCE NORTH 89°40'06" EAST, A DISTANCE OF 27.05 FEET;
 THENCE SOUTH 02°35'10" EAST, A DISTANCE OF 441.29 FEET;
 THENCE SOUTH 00°41'18" EAST, A DISTANCE OF 783.13 FEET;
 THENCE SOUTH 00°57'30" WEST, A DISTANCE OF 868.69 FEET;
 THENCE SOUTH 89°56'59" WEST, A DISTANCE OF 29.74 FEET;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 2092.39 FEET TO THE POINT OF BEGINNING.
 SAID PARCEL OF LAND CONTAINING A CALCULATED AREA OF 86.762 SQUARE FEET OR 1.992 ACRES, MORE OR LESS.
 THE LINEAL UNIT USED IN THE PREPARATION OF THIS LEGAL DESCRIPTION IS THE U.S. SURVEY FOOT AS DEFINED BY THE UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

UTILITY EASEMENT A DESCRIPTION:

A UTILITY EASEMENT SITUATED WITHIN THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF AURORA, COUNTY OF ADAMS, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
 COMMENCING AT THE WEST QUARTER CORNER OF SAID SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN AND CONSIDERING THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 9, BEING MONUMENTED ON THE SOUTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607 AND ON THE NORTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607, TO BEAR NORTH 00°19'54" WEST, 2658.06 FEET WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 398.35 FEET TO THE POINT OF BEGINNING;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 16.00 FEET;
 THENCE NORTH 89°36'25" EAST, A DISTANCE OF 210.00 FEET;
 THENCE SOUTH 00°19'54" EAST, A DISTANCE OF 16.00 FEET;
 THENCE SOUTH 89°36'25" WEST, A DISTANCE OF 210.00 FEET TO THE POINT OF BEGINNING.
 SAID PARCEL OF LAND CONTAINING A CALCULATED AREA OF 3.360 SQUARE FEET OR 0.077 ACRES, MORE OR LESS.
 THE LINEAL UNIT USED IN THE PREPARATION OF THIS LEGAL DESCRIPTION IS THE U.S. SURVEY FOOT AS DEFINED BY THE UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

UTILITY EASEMENT B DESCRIPTION:

A UTILITY EASEMENT SITUATED WITHIN THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF AURORA, COUNTY OF ADAMS, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
 COMMENCING AT THE WEST QUARTER CORNER OF SAID SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN AND CONSIDERING THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 9, BEING MONUMENTED ON THE SOUTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607 AND ON THE NORTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607, TO BEAR NORTH 00°19'54" WEST, 2658.06 FEET WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 398.35 FEET;
 THENCE NORTH 89°40'06" EAST, A DISTANCE OF 210.00 FEET TO THE POINT OF BEGINNING;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 16.00 FEET;
 THENCE NORTH 89°36'25" EAST, A DISTANCE OF 91.27 FEET;
 THENCE SOUTH 00°19'54" EAST, A DISTANCE OF 16.00 FEET;
 THENCE SOUTH 89°36'25" WEST, A DISTANCE OF 91.27 FEET TO THE POINT OF BEGINNING.
 SAID PARCEL OF LAND CONTAINING A CALCULATED AREA OF 1.460 SQUARE FEET OR 0.034 ACRES, MORE OR LESS.
 THE LINEAL UNIT USED IN THE PREPARATION OF THIS LEGAL DESCRIPTION IS THE U.S. SURVEY FOOT AS DEFINED BY THE UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

UTILITY EASEMENT C DESCRIPTION:

A UTILITY EASEMENT SITUATED WITHIN THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF AURORA, COUNTY OF ADAMS, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
 COMMENCING AT THE WEST QUARTER CORNER OF SAID SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN AND CONSIDERING THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 9, BEING MONUMENTED ON THE SOUTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607 AND ON THE NORTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607, TO BEAR NORTH 00°19'54" WEST, 2658.06 FEET WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 15.19 FEET TO THE POINT OF BEGINNING;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 16.00 FEET;
 THENCE NORTH 89°59'34" EAST, A DISTANCE OF 210.00 FEET;
 THENCE SOUTH 00°19'54" EAST, A DISTANCE OF 16.00 FEET;
 THENCE SOUTH 89°59'34" WEST, A DISTANCE OF 210.00 FEET TO THE POINT OF BEGINNING.
 SAID PARCEL OF LAND CONTAINING A CALCULATED AREA OF 3,360 SQUARE FEET OR 0.077 ACRES, MORE OR LESS.
 THE LINEAL UNIT USED IN THE PREPARATION OF THIS LEGAL DESCRIPTION IS THE U.S. SURVEY FOOT AS DEFINED BY THE UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

UTILITY EASEMENT D DESCRIPTION:

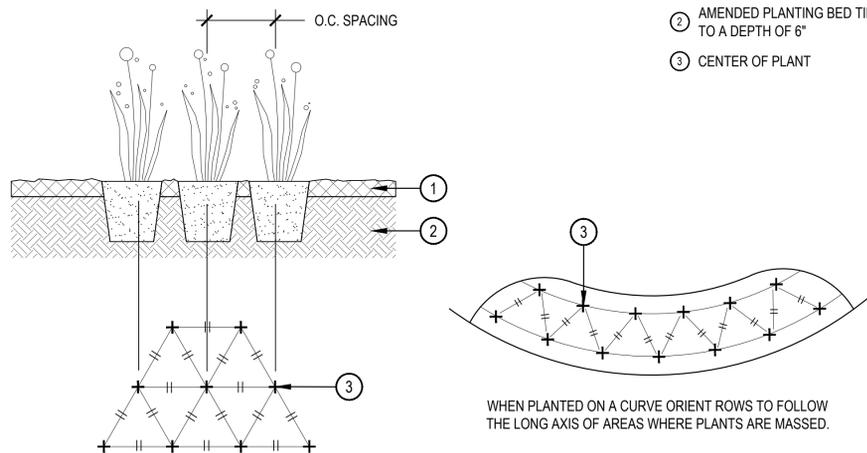
A UTILITY EASEMENT SITUATED WITHIN THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF AURORA, COUNTY OF ADAMS, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
 COMMENCING AT THE WEST QUARTER CORNER OF SAID SECTION 9, TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN AND CONSIDERING THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 9, BEING MONUMENTED ON THE SOUTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607 AND ON THE NORTH END BY A FOUND 3-1/4 INCH ALUMINUM CAP SET BY PLS 19607, TO BEAR NORTH 00°19'54" WEST, 2658.06 FEET WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 14.00 FEET;
 THENCE NORTH 89°40'06" EAST, A DISTANCE OF 210.00 FEET TO THE POINT OF BEGINNING;
 THENCE NORTH 00°19'54" WEST, A DISTANCE OF 16.00 FEET;
 THENCE NORTH 89°59'31" EAST, A DISTANCE OF 71.09 FEET;
 THENCE SOUTH 00°00'14" EAST, A DISTANCE OF 16.00 FEET;
 THENCE SOUTH 89°59'34" WEST, A DISTANCE OF 71.00 FEET;
 SAID PARCEL OF LAND CONTAINING A CALCULATED AREA OF 1,137 SQUARE FEET OR 0.026 ACRES, MORE OR LESS.
 THE LINEAL UNIT USED IN THE PREPARATION OF THIS LEGAL DESCRIPTION IS THE U.S. SURVEY FOOT AS DEFINED BY THE UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

SHEET NUMBER	DRAWN BY: KKJS	CHECKED BY: JB	DATE: JULY 3, 2019	SCALE: AS SHOWN	FILE NO: 8130249709	NOTES	ACPDIA 1287 INVESTORS, LLC 4530 E. SHEA BLVD., SUITE 100 PHOENIX, AZ 85028 ATTN: BILL WICHTERMAN P: 602.494.7800	 Norris Design 1101 Bennock Street Denver, CO 80204 P: 303.692.1166 www.norrisdesign.com	No.	No.	No.	Date	Appr.	Date
				2					RESUBMITTAL	RESUBMITTAL	RESUBMITTAL	1/08/2019 CB	10/09/2019 CB	8/27/2019 KK

LANDSCAPE NOTES

- THE DEVELOPER, HIS SUCCESSORS AND ASSIGNS, SHALL BE RESPONSIBLE FOR INSTALLATION, MAINTENANCE AND REPLACEMENT OF ALL LANDSCAPING MATERIALS SHOWN OR INDICATED ON THE APPROVED SITE PLAN ON FILE IN THE PLANNING DEPARTMENT.
- ALL CROSSINGS OR ENCROACHMENTS BY PRIVATE LANDSCAPE IRRIGATION LINES OR SYSTEMS INTO EASEMENTS AND STREET RIGHTS-OF-WAY OWNED BY THE CITY OF AURORA ARE ACKNOWLEDGED BY THE OWNER AS BEING SUBJECT TO CITY OF AURORA'S USE AND OCCUPANCY OF THE SAID EASEMENTS OR RIGHTS-OF-WAY. THE OWNER, THEIR SUCCESSORS AND ASSIGNS, HEREBY AGREE TO INDEMNIFY THE CITY OF AURORA FOR ANY LOSS, DAMAGE OR REPAIR TO CITY FACILITIES THAT MAY RESULT FROM THE INSTALLATION, OPERATION, OR MAINTENANCE OF SAID PRIVATE IRRIGATION LINES OR SYSTEMS.
- ANY MAJOR CHANGES FROM THE APPROVED PLANS, REQUIRED BECAUSE OF VARIATIONS IN THE FIELD CONDITIONS SHALL REQUIRE AN APPROVED AMENDMENT TO THE CSP, PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES THAT WOULD SUPPORT THIS CHANGE.
- IRRIGATION CONTROLLERS SHALL BE EQUIPPED WITH AUTOMATIC RAIN SHUT OFF SENSORS.
- SHRUB BEDS ARE TO BE CONTAINED BY GREEN 1/8" X 4" INTERLOCKING TYPE STEEL EDGER. IT IS NOT REQUIRED WHEN BED IS ADJACENT TO CURBS, WALLS, FENCES, OR WALKS.
- ALL SHRUB BEDS ARE TO BE MULCHED WITH 3" DEPTH, 1 1/2" LOCAL RIVER ROCK MULCH. WEED CONTROL FABRIC IS REQUIRED IN ALL SHRUB BEDS.
- ALL GROUND COVER AND PERENNIAL BEDS ARE TO BE MULCHED WITH 3" DEPTH SHREDDED WOOD BARK MULCH. NO WEED CONTROL FABRIC IS REQUIRED IN GROUND COVER BEDS. ALL SOD AND TURF TYPE SEEDING AREAS ARE TO HAVE SOIL PREPARATION PER CITY OF AURORA, UTILITIES DEPARTMENT, OFFICE OF WATER CONSERVATION, REGULATIONS FOR OBTAINING NEW SOD/SEED PERMITS. (MINIMUM RATE OF 4.0 CU. YDS. OF COMPOST PER 1000 S.F.).
- ALL AREAS TO BE SEEDED WITH DRYLAND GRASSES, NATIVE TYPE GRASSES, NATURALIZED GRASSES, OR RESTORATIVE GRASSES SHALL COMPLY WITH ARTICLE 14 OF THE CITY OF AURORA ZONING CODE, "LANDSCAPE ORDINANCE", SEC. 146-1429. THESE AREAS WILL COMPLY WITH REGULATIONS OUTLINED IN THIS CODE FOR SOIL AMENDMENTS AND IRRIGATION.
- THE COVER CROP SHOWN IN THE SEED MIXTURE MAY BE CHANGED OR RATES ADJUSTED BASED ON THE TIME OF YEAR IN WHICH THE SEEDING IS TO OCCUR.
- CONTRACTOR TO RE-ESTABLISH VEGETATION IN AREAS OF DISTURBANCE.
- A SOILS ANALYSIS SHALL BE PERFORMED, BY AN INDEPENDENT TESTING LABORATORY, FOR ALL AREAS TO BE LANDSCAPED PRIOR TO ISSUING CONSTRUCTION DRAWINGS. THE SOILS ANALYSIS WILL BE USED TO JUSTIFY THE SEEDING RATE, QUANTITY OF COMPOST, NEED FOR IRRIGATION, AND RECOMMENDED AMOUNT OF WATER TO BE APPLIED TO SEEDED AREAS. THE SEED MIXTURE, IRRIGATION SYSTEM, AND COMPOST RATES SHOWN ON PLANS MAY BE MODIFIED TO OPTIMIZE THE PERFORMANCE AND EXPEDITE THE RESTORATION OF THESE AREAS.
- THE DEVELOPER, HIS SUCCESSORS AND ASSIGNS SHALL BE RESPONSIBLE FOR THE ESTABLISHMENT OF DRYLAND GRASSES, NATIVE TYPE GRASSES, NATURALIZED GRASSES, OR RESTORATIVE GRASSES, FOR A PERIOD NOT TO EXCEED THREE FULL GROWING SEASONS. TEMPORARY IRRIGATION SYSTEMS MAY BE NECESSARY TO FACILITATE GERMINATION AND ESTABLISHMENT. THE AREA SHALL BE MAINTAINED AS WEED FREE AS POSSIBLE, DURING THE ENTIRE ESTABLISHMENT PERIOD. MOWING, PULLING, AND CHEMICAL METHODS MAY BE USED TO CONTROL WEEDS AND PREVENT REDEVELOPMENT OF SEED HEADS ON THE WEED PLANT.
- PERFORMANCE OF SEEDED AREAS SHALL BE EVALUATED FOR INITIAL ACCEPTANCE, AT THE END OF THE FIRST FULL GROWING SEASON, BY BOTH THE CITY OF AURORA AND THE DEVELOPER'S REPRESENTATIVE. THE INSPECTION WILL BE DETERMINE COMPLIANCE WITH SUBSECTION C (1 AND 2), OF ARTICLE 14, SECTION 146-1429
- AFTER EACH FULL GROWING SEASON, FOR A PERIOD NOT TO EXCEED THREE YEARS, THE GRASS STAND SHALL BE EVALUATED FOR UNIFORMITY IN APPEARANCE, COVERAGE, AND PRESENCE OF WEEDS. UPON AGREEMENT FROM THE DEVELOPER'S REPRESENTATIVE AND THE CITY AURORA, THE TEMPORARY IRRIGATION SYSTEM WILL BE PERMANENTLY DEACTIVATED OR REMOVED.
- SIX INCHES OF THE ORIGINAL TOP SOIL, SHALL BE SALVAGED FROM THE SITE, PRIOR TO OVERLOT GRADING AND REDISTRIBUTED OVER AREAS TO RECEIVED DRYLAND GRASSES, NATIVE TYPE GRASSES, NATURALIZED GRASSES, OR RESTORATIVE GRASSES, IN ACCORDANCE WITH PART 3 OF SUBSECTION I, OF ARTICLE 14, SECTION 146-1429.
- TREES SHALL NOT BE LOCATED IN DRAINAGE SWALES, OR DRAINAGE AREAS.
- THE DEVELOPER, HIS SUCCESSORS AND ASSIGNS ARE RESPONSIBLE FOR IMPLEMENTING EROSION CONTROL MEASURES ON SEEDED SLOPES EXCEEDING 3:1.
- SIGHT TRIANGLES SHALL REMAIN UNOBSTRUCTED BY PLANT MATERIAL, OR ANY OTHER VISUAL OBSTACLE, OVER 26" IN HEIGHT. VISIBILITY MUST REMAIN 75% OPEN FOR THE VERTICAL AREA FROM 2 TO 3 FEET HEIGHT AS IDENTIFIED IN THE ROADWAY DESIGN & SPECIFICATIONS MANUAL SECTION 4.04.2.10.
- ANY TREE LOCATED WITH IN A SIGHT TRIANGLE MUST BE PRUNED TO PROVIDE NO OBSTRUCTION BELOW 7' IN ACCORDANCE WITH THE SIGHT TRIANGLE DETAIL IN COA ROADWAY DESIGN MANUAL.
- ALL AREAS SHALL BE GRADED TO ACHIEVE POSITIVE DRAINAGE, UNLESS IDENTIFIED AS A DETENTION OR RETENTION POND.
- DO NOT DISTURB THE EXISTING PAVING, LIGHTING, LANDSCAPING, OR IRRIGATION THAT EXISTS ADJACENT TO THE SITE UNLESS OTHERWISE NOTED ON PLAN.
- LANDSCAPE MATERIAL PLACEMENT SHALL NOT BE PLACED OR KEPT NEAR FIRE HYDRANTS, FIRE DEPARTMENT INLET CONNECTIONS OR FIRE PROTECTION CONTROL VALVES IN A MANNER THAT WOULD PREVENT SUCH EQUIPMENT OR FIRE HYDRANTS FROM BEING IMMEDIATELY DISCERNIBLE. THE FIRE DEPARTMENT SHALL NOT BE DETERRED OR HINDERED FROM GAINING IMMEDIATE ACCESS TO FIRE PROTECTION EQUIPMENT OR HYDRANTS.
- A 5-FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF FIRE HYDRANTS.
- LANDSCAPING MATERIAL SHOWN WITHIN THE SITE PLAN CANNOT ENCROACH INTO ROADWAYS THAT ARE DEDICATED (OR DESIGNATED) AS FIRE LANE EASEMENTS (OR CORRIDORS).
- ALL LANDSCAPED AREAS AND PLANT MATERIAL, EXCEPT FOR NON-IRRIGATED NATIVE, RESTORATIVE, AND DRYLAND GRASS AREAS THAT COMPLY WITH REQUIREMENTS FOUND IN SEC. 146-1429, MUST BE WATERED BY AN AUTOMATIC UNDERGROUND IRRIGATION SYSTEM. IRRIGATION SYSTEM DESIGN, INSTALLATION, OPERATION, AND MAINTENANCE SHALL CONFORM TO REQUIREMENTS FOUND IN THE CITY OF AURORA IRRIGATION ORDINANCE.
- ALL FIRE HYDRANTS SHALL BE LOCATED NOT LESS THAN 3'6" AND NOT MORE THAN 8' MAXIMUM FROM THE BACK OF THE CURB TO THE CENTER OF THE HYDRANT AND SHALL BE UNOBSTRUCTED ON THE STREET SIDE.
- PRIOR TO ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY (CO) FOR PLANNING AREA 12, DEVELOPER WILL COMPLETE INSTALLATION OF THE LANDSCAPING. IF ROADWAY AND HARDSCAPE CONSTRUCTION IS COMPLETED AFTER OCTOBER 15TH, A TEMPORARY CERTIFICATE OF OCCUPANCY (TCO) MAY BE ISSUED, AND THE LANDSCAPING WILL BE REQUIRED TO BE COMPLETED WITHIN 90 DAYS FROM THE FOLLOWING APRIL 15TH.
- ADJUSTMENTS IN THE PLANT MATERIAL LOCATIONS WILL BE NECESSARY TO ACCOMMODATE FUTURE DRIVEWAY/CURB CUTS ASSOCIATED WITH PLANNING AREA 12.
- FIRE HYDRANTS MUST BE PLACED AT LEAST ONE (1) FOOT IN FRONT OR BEHIND A SIDEWALK WHILE STILL MEETING THE MINIMUM BACK OF CURB CLEARANCE REQUIREMENTS.

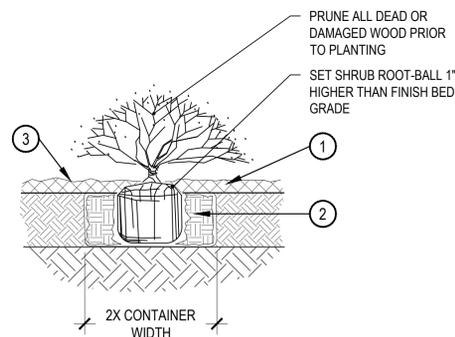
- ① SPECIFIED MULCH
- ② AMENDED PLANTING BED TILLED TO A DEPTH OF 6"
- ③ CENTER OF PLANT



1 PERENNIAL PLANT LAYOUT

SCALE: 1" = 1'-0"

- ① SPECIFIED MULCH
- ② AMENDED SOIL IN PLANTING BED PER SPECIFICATIONS. TILL SOIL TO A DEPTH OF EIGHT INCHES.
- ③ FINISH GRADE (TOP OF MULCH)



- NOTE:
- BROKEN OR CRUMBLING ROOT-BALLS WILL BE REJECTED
 - CARE SHOULD BE TAKEN NOT TO DAMAGE THE SHRUB OR ROOT-BALL WHEN REMOVING IT FROM ITS CONTAINER
 - ALL JUNIPERS SHOULD BE PLANTED SO THE TOP OF THE ROOT-BALL OCCURS ABOVE THE FINISH GRADE OF THE MULCH LAYER
 - DIG PLANT PIT TWICE AS WIDE AND HIGH AS THE CONTAINER

2 SHRUB PLANTING

SCALE: 1-1/2" = 1'-0"

STANDARD RIGHT OF WAY LANDSCAPE REQUIREMENTS

ROW DESCRIPTION	BUFFER WIDTH	BUFFER LENGTH	BUFFER REDUCTION FEATURES	# OF TREES REQUIRED	# OF TREES PROVIDED	# OF SHRUBS REQUIRED	# OF SHRUBS PROVIDED
64TH AVENUE							
STREET FRONTAGE (1 TREE / 40 FT.)	N/A	4,242 L.F.	N/A	107	107	N/A	275 SHRUBS 252 GRASSES TOTAL:527 SHRUBS
POWHATON ROAD							
STREET FRONTAGE (1 TREE / 40 FT.)	N/A	4,597 L.F.	N/A	115	112'	N/A	322 SHRUBS 277 GRASSES TOTAL:599 SHRUBS

*DUE TO THE UTILITY EASEMENTS, UTILITY ROUTING CONFLICTS, AND FUTURE DRIVES, STREET TREES CANNOT BE PLANTED IN SOME AREAS. WHERE POSSIBLE THESE REQUIRED TREES HAVE BEEN RELOCATED TO OTHER AREAS.

NOTE:

- STREET BUFFER REQUIREMENTS: 1 TREE AND 10 SHRUBS PER 40 LINEAR FEET, WITH 50% OF TREES BEING EVERGREEN, ARE NOT PROVIDED WITH THESE PLANS. STREET BUFFER PLANTINGS WILL BE PROVIDED WITH ON-SITE IMPROVEMENTS OF DEVELOPMENT ADJACENT TO ROADWAY INFRASTRUCTURE IMPROVEMENTS.
- FUTURE DRIVES HAVE BEEN REMOVED FROM THE OVERALL LANDSCAPE CALCULATIONS

NOTES:

- 10 (#5 CONTAINER) SHRUBS EQUALS ONE TREE EQUIVALENT (TE)
- 30 (#1 CONTAINER) GRASSES EQUALS ONE TREE EQUIVALENT (TE)
- 30 (#1 CONTAINER) PERENNIALS EQUALS ONE TREE EQUIVALENT (TE)

WATER USE TABLE

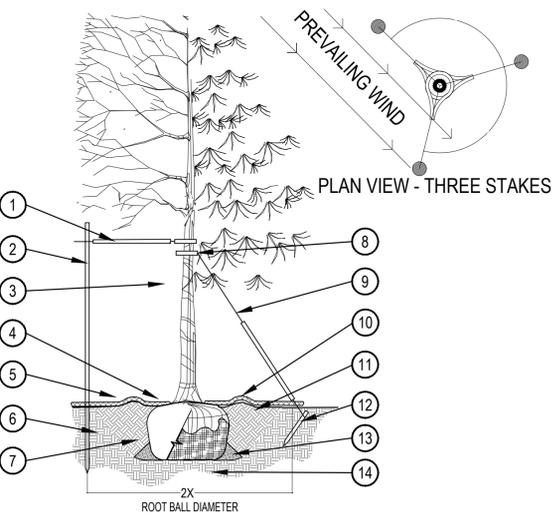
AREA DESCRIPTION	WATER CONSERVING IRRIGATION (NON-SOD)	NON-WATER CONSERVING IRRIGATION (SOD)
STREET FRONTAGE	66,364 S.F.	N/A

PRUNING NOTES:

- ALL PRUNING SHALL COMPLY WITH ANSI A300 STANDARDS.
- DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS AND BROKEN BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED. HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.

STAKING NOTES:

- STAKE TREES PER FOLLOWING SCHEDULE, THEN REMOVE AT END OF FIRST GROWING SEASON.
 - 1-1/2" CALIPER SIZE - MIN. 1 STAKE ON SIDE OF PREVAILING WIND (GENERALLY N.W. SIDE)
 - 1-3/4" - 3" CALIPER SIZE - MIN. 2 STAKES - ONE ON N.W. SIDE, ONE ON S.W. SIDE (OR PREVAILING WIND SIDE AND 180° FROM THAT SIDE)
 - 3" CALIPER SIZE AND LARGER - 3 STAKES PER DIAGRAM
- WIRE OR CABLE SHALL BE MIN. 12 GAUGE, TIGHTEN WIRE OR CABLE ONLY ENOUGH TO KEEP FROM SLIPPING. ALLOW FOR SOME TRUNK MOVEMENT. NYLON STRAPS SHALL BE LONG ENOUGH TO ACCOMMODATE 1-3/4" OF GROWTH AND BUFFER ALL BRANCHES FROM WIRE.



3 TREE PLANTING DETAIL

SCALE: 3/16" = 1'-0"

NOT FOR CONSTRUCTION

SHEET NUMBER

7

DRAWN BY: KKJS

CHECKED BY: JB

DATE: JULY 3, 2019

SCALE: AS SHOWN

FILE NO: 8130249709

ACPDIA 1287 INVESTORS, LLC
4530 E. SHEA BLVD., SUITE 100
PHOENIX, AZ 85028
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NORRIS DESIGN
Planning | Landscape Architecture | Project Forensics

Norris Design
1101 Bannock Street
Denver, CO 80204
P: 303.692.1166
www.norrisdesign.com

No. Revisions

Date

Appr.

Date

PLANTING SCHEDULE

XERIC RATING	SYM. COMMON NAME	BOTANICAL NAME	SIZE & COND.
DECIDUOUS CANOPY TREES			
29 X	ABM AUTUMN BLAZE MAPLE	ACER X FREEMANII 'AUTUMN BLAZE'	2.5" CAL. MIN. B&B
5 XXX	BUR BUR OAK	QUERCUS MACROCARPA	2.5" CAL. MIN. B&B
55 X	CAL WESTERN CATALPA	CATALPA SPECIOSA	2.5" CAL. MIN. B&B
37 XX	KCT KENTUCKY COFFEETREE	GYMNOCLADUS DIOICA	2.5" CAL. MIN. B&B
41 X	SKY SKYLINE LOCUST	GLEDITSIA TRIACANTHOS 'INERMIS' 'SKYLINE'	2.5" CAL. MIN. B&B
9 XX	SWO SWAMP WHITE OAK	QUERCUS BICOLOR	2.5" CAL. MIN. B&B
EVERGREEN TREES			
43 XXX	AUS AUSTRIAN PINE	PINUS NIGRA	6'-8" HGT. MIN. B&B
DECIDUOUS SHRUBS			
23 XX	BMS BLUE MIST SPIREA	CARYOPTERIS X CLANDONENSIS	#5 CONT.
24 XX	DBB DWARF BURNING BUSH	EUONYMUS ALATUS 'COMPACTUS'	#5 CONT.
113 XXX	FER FERNBUSH	CHAMAEBATIARIA MILLEFOLIUM	#5 CONT.
40 XX	MKL MISS KIM DWARF LILAC	SYRINGA PATULA 'MISS KIM'	#5 CONT.
14 XX	PBB COMPACT PURPLE BUTTERFLY BUSH	BUDDLEA DAVIDII NANHOENSIS 'PETITE PLUM'	#5 CONT.
24 XX	RSA RUSSIAN SAGE	PEROVSKIA ARTIPLICIFOLIA	#5 CONT.
16 XX	RSD LITTLE SPIRE RUSSIAN SAGE	PEROVSKIA ARTIPLICIFOLIA 'LITTLE SPIRE'	#5 CONT.
12 XX	SWN SUMMER WINE NINEBARK	PHYSOCARPUS OPULIFOLIUS 'SEWARD'	#5 CONT.
19 XXX	YCU GOLDEN CURRANT	RIBES AUREUM	#5 CONT.
EVERGREEN SHRUBS			
18 XX	ARC ARCADIA JUNIPER	JUNIPERUS SABINA 'ARCADIA'	#5 CONT.
41 XX	BCJ BLUE CHIP JUNIPER	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	#5 CONT.
49 XX	BRO BROADMOOR JUNIPER	JUNIPERUS SABINA 'BROADMOOR'	#5 CONT.
101 XXX	MPA PANCHITO MANZANITA	ARCTOSTAPHYLOS 'PANCHITO'	#5 CONT.
17 XX	SGB SPANISH GOLD BROOM	CYTISUS PURGAN 'SPANISH GOLD'	#5 CONT.
125 XXX	ITY IVORY TOWER YUCCA	YUCCA FILAMENTOSA 'IVORY TOWER'	#5 CONT.

XERIC RATING	SYM. COMMON NAME	BOTANICAL NAME	SIZE & COND.
GRASSES			
166 X	AVG BLUE AVENA GRASS	HELICTOTRICHON SEMPERVIRENS	#5 CONT.
110 X	FRG FEATHER REED GRASS	CALAMAGROSTIS ARUNDINACEA 'KARL FOERSTER'	#5 CONT.
31 XXX	HMG HEAVY METAL SWITCHGRASS	PANICUM VIRGATUM 'HEAVY METAL'	#5 CONT.
76 XXX	LBG LITTLE BLUESTEM GRASS	SCHIZACHYRIUM SCOPARIUM	#5 CONT.
204 X	MAG MAIDEN GRASS	MISCANTHUS SINENSIS 'GRACILLIMUS'	#5 CONT.
22 XXX	SHG SHENANDOAH SWITCH GRASS	PANICUM 'SHENANDOAH'	#5 CONT.

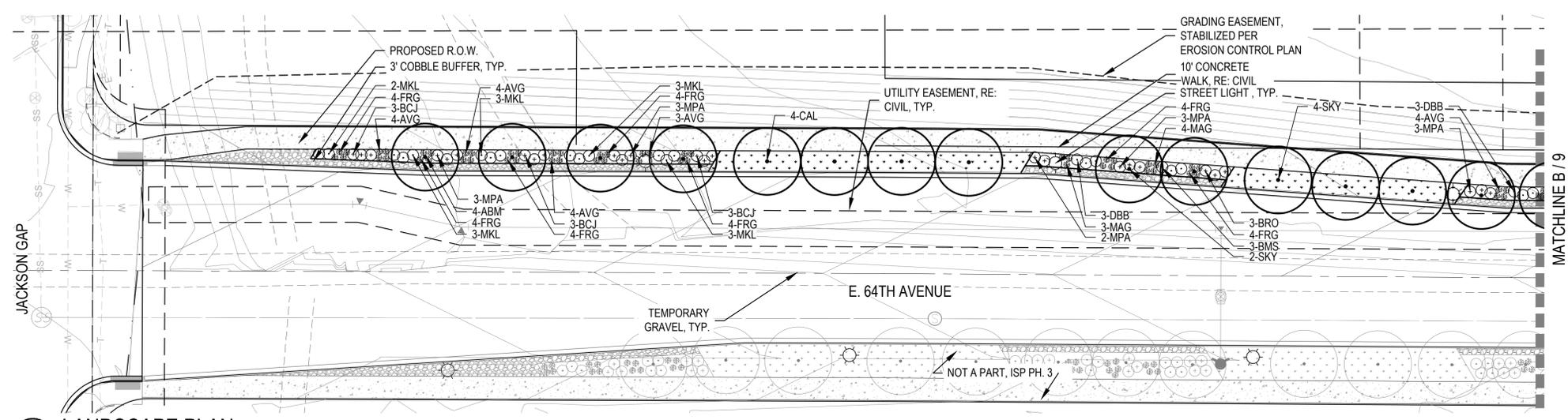
ENHANCED NATIVE SEED MIX (IRRIGATED)

COMMON NAME	SCIENTIFIC NAME	% OF TOTAL	PLS PER ACRE
WESTERN WHEATGRASS	AGROPYRON SMITHII	35%	10.5 LBS.
SIDE OATS GRAMA	BOUTELOUA CURTIPENDULA	35%	10.5 LBS.
BLUE GRAMA	BOUTELOUA GRACILIS	10%	3.0 LBS.
SWITCHGRASS	PANICUM VIRGATUM	10%	3.0 LBS.
LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUS	10%	3.0 LBS.
TOTAL		100%	30.0 LBS. DRILLED

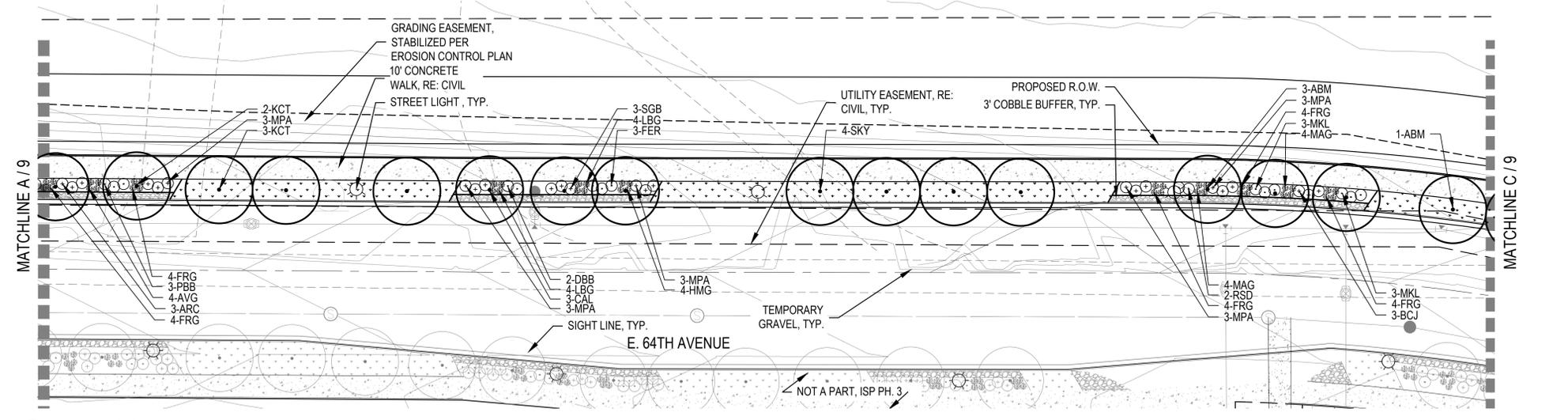


P:\PORTEOS - 0068-01-0000\PORTEOS POWHATON ISP - 0808-01-2057\DRAWINGS\SUBMITTAL\PLAN\PORTEOS-LANDSCAPE_LAND.DWG, CBRESNAHAN, 11/7/19

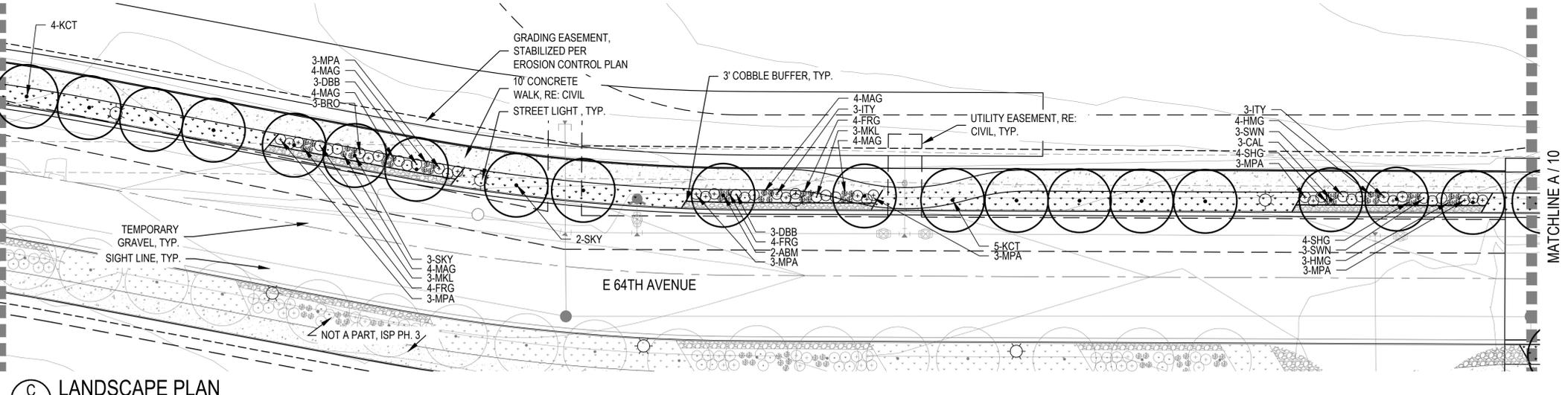
SHEET NUMBER	8	SCALE:	AS SHOWN	FILE NO:	8130249709
DRAWN BY:	KKJS	CHECKED BY:	JB	DATE:	JULY, 3 2019
ACPDIA 1287 INVESTORS, LLC 4530 E. SHEA BLVD., SUITE 100 PHOENIX, AZ 85028 ATTN: BILL WICHTERMAN P: 602.494.7800					
PORTEOS - PHASE 5 INFRASTRUCTURE SITE PLAN PLANT LIST					
<p style="text-align: center; font-size: 0.8em;">NORRIS DESIGN Planning Landscape Architecture Project Management www.norrisdesign.com</p>					
No.	108/2019 CB	No.	1009/2019 CB	No.	8/27/2019 KK
Revisions	Date	Date	Date	Date	Date



A LANDSCAPE PLAN SCALE: 1" = 30'



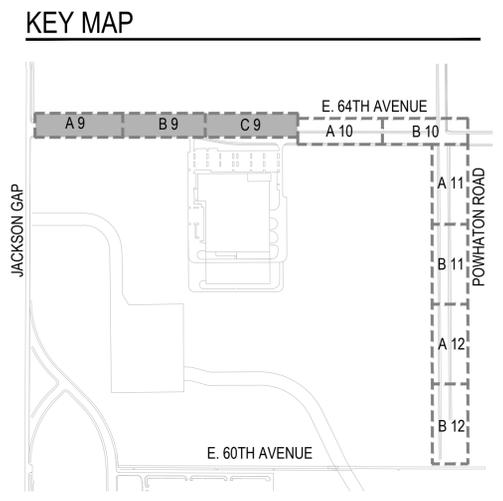
B LANDSCAPE PLAN SCALE: 1" = 30'



C LANDSCAPE PLAN SCALE: 1" = 30'

LEGEND

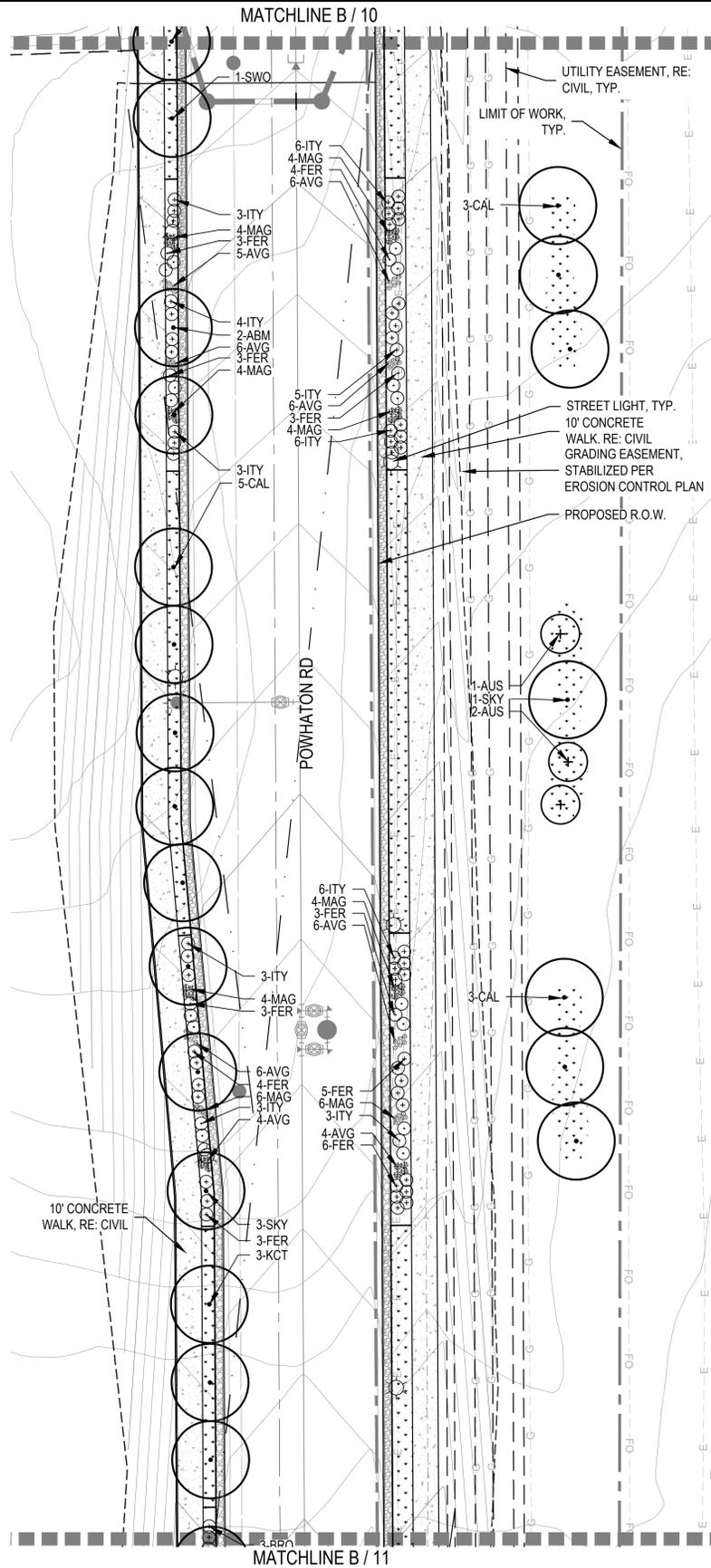
	CANOPY TREE
	DECIDUOUS SHRUBS
	EVERGREEN SHRUBS
	ORNAMENTAL GRASSES
	ENHANCED NATIVE SEED MIX
	4"-6" ROCK COBBLE
	STEEL EDGER
	STREET LIGHT
	FIRE HYDRANT
	PROPOSED CONTOURS - MAJOR
	PROPOSED CONTOURS - MINOR
	EXISTING CONTOURS



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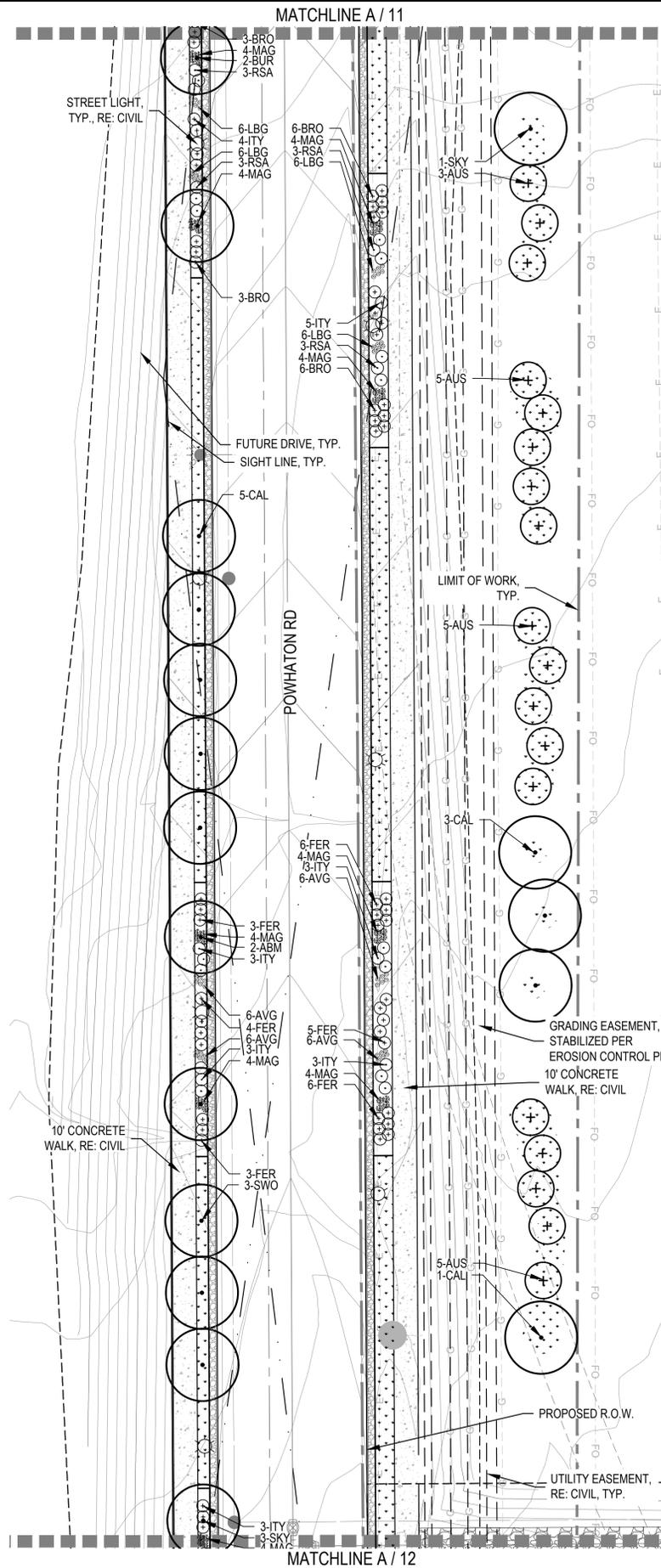
SHEET NUMBER	9				
	DRAWN BY: KKJS				
	CHECKED BY: JB				
	DATE: JULY 3, 2019				
SCALE:	AS SHOWN				
	FILE NO: 8130249709				
	PORTEOS - PHASE 5				
	INFRASTRUCTURE SITE PLAN				
PROJECT:	ACP DIA 1287 INVESTORS, LLC				
	4530 E. SHEA BLVD., SUITE 100				
	PHOENIX, AZ 85028				
	ATTN: BILL WICHTERMAN				
CONTACT:	P: 602.494.7800				
	NORRIS DESIGN				
	Planning Landscape Architecture Project Forester				
	1101 Bannock Street Denver, CO 80204 P: 303.692.1166 www.norrisdesign.com				
Revisions	No.	Date	Init.	Appr.	Date
	1	10/09/2019	CB		
	2	8/27/2019	KK		
	3	10/02/2019	CB		

P:\PORTEOS - 0068-01-0000\PORTEOS POWHATON ISP - 0808-01-2057\DRAWINGS\SUBMITTAL\PLAN\PORTEOS-LANDSCAPE_LAND.DWG, CBRESNAHAN, 11/7/19



A LANDSCAPE PLAN

SCALE: 1" = 30'



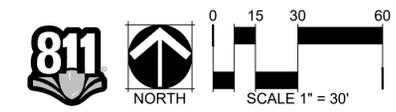
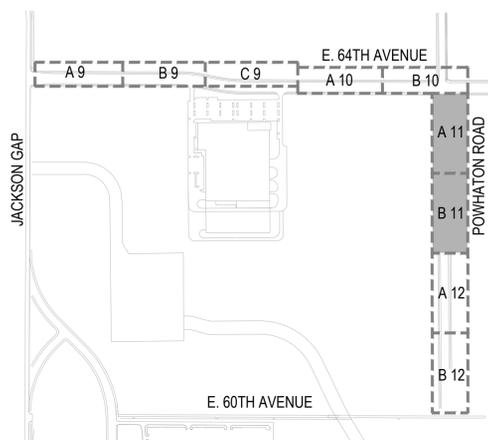
B LANDSCAPE PLAN

SCALE: 1" = 30'

LEGEND

- CANOPY TREE
- DECIDUOUS SHRUBS
- EVERGREEN SHRUBS
- ORNAMENTAL GRASSES
- ENHANCED NATIVE SEED MIX
- 4"-6" ROCK COBBLE
- STEEL EDGER
- STREET LIGHT
- FIRE HYDRANT
- PROPOSED CONTOURS - MAJOR
- PROPOSED CONTOURS - MINOR
- EXISTING CONTOURS

KEY MAP



SHEET NUMBER	11	
	DRAWN BY: KKJS	CHECKED BY: JB
SCALE:	AS SHOWN	
	FILE NO:	8130249709
DATE:	JULY, 2019	
PROJECT:	PORTEOS - PHASE 5	
	INFRASTRUCTURE SITE PLAN	
CLIENT:	ACP DIA 1287 INVESTORS, LLC	
	4530 E. SHEA BLVD., SUITE 100 PHOENIX, AZ 85028 ATTN: BILL WICHTERMAN P: 602.494.7800	
DESIGNER:	NORRIS DESIGN	
	Planning Landscape Architecture Project Forester 1101 Bannock Street Denver, CO 80204 P: 303.692.1166 www.norrisdesign.com	
REVISIONS:	No.	Date
	No.	Date
APPROVALS:	No.	Date
	No.	Date
SUBMITTALS:	No.	Date
	No.	Date
REVISIONS:	No.	Date
	No.	Date



Comment 11.27.19:
1) Additional analysis & discussion is required to recommend a section east of Powhaton Rd that does not match NEATS.

Response: Additional information is provided in the updated memo that shows 64th Avenue is consistent with NEATS. Only one lane east-west in each direction is needed, but 64th Avenue is depicted to be a 4-lane arterial road.

2) See comments below.
Response: Response provided for each comment.

MEMORANDUM

TO: Chris Fellows, Velocity Metropolitan District No. 1
FROM: Philip J. Dunham, PE
DATE: November 7, 2019
SUBJECT: **Porteos ISP Traffic Analysis (64th Avenue & Powhaton Road)**
(FHU No. 119296-01)

The purpose of this memorandum is to summarize future traffic projections for the intersection of 64th Avenue & Powhaton Road in the Porteos development of Aurora, Colorado, and to update lane geometry recommendations compared to the previous Porteos traffic studies. Information from new development plans and recent transportation studies were utilized to develop a “blended” forecast of traffic volumes and operations at this intersection. Intersection operations analyses were conducted using methodology outlined in the 6th Edition of the *Highway Capacity Manual* (HCM, 2017). Levels of Service (LOS) and 95th percentile queue lengths were referenced to provide lane geometry recommendations.

2040 Traffic Projections

Several studies were referenced in developing the forecasts shown in this memorandum. One of the foundation studies used in this analysis is the Aurora Northeast Area Transportation Study (NEATS) Refresh. This study presented results of travel demand modeling for the area. Traffic impact studies prepared to consider specific impacts of a maximum build out scenario were also used to develop “blended” traffic forecasts. These “blended” forecasts begin with the master Porteos Traffic Study information and then refines the numbers by adjusting to trip generation for known land uses as they compare to those presented in the master studies. These traffic studies include:

- Porteos Master Traffic Impact Study Update
- Porteos PA-7 Groot Distribution Center
- Porteos PA-5 JAG Logistics Center
- 64th Avenue ISP

NEATS results were not available at the time the master study was completed, so this approach produces very different projections than shown in the master Porteos Traffic Study. All subsequent Porteos traffic studies utilized the NEATS Refresh study to aid in determining background traffic volumes. The Groot and JAG studies refined traffic forecasts for specific planning areas within the larger Porteos development area. These two studies were used primarily as the basis for determining traffic volumes on Powhaton Road. The more recent 64th Avenue ISP has informed a reduction in through traffic expected along 64th Avenue which reflects reduced development plans from properties to the west of Porteos. These volumes also consider that that 60th Avenue is no longer planned to continue east beyond Jackson Gap Street.

Figure I presents the final set of 2040 traffic volume projections for the intersection 64th Avenue & Powhaton Road intersection. Daily and peak hour traffic volumes on each approach leg are lower than the

NEATS has 2 through lanes (4 total) for 64th on both sides of this intersection. Based on intersection design, only 1 through lane east (2 total + turns) are proposed. This does not match NEATS and would either require a comp plan amendment or include both the proposed sections & intersection improvements required and include the NEATS compliant section in the ISP with appropriate notes that these would be future improvements if traffic volumes or City Engineer required (see what was done for 64th west of this section).

Response: The updated report shows 64th Avenue as a 4-lane arterial, consistent with NEATS. The intersection need only provide one through lane in each direction.

previous Porteos study.

2040 Traffic

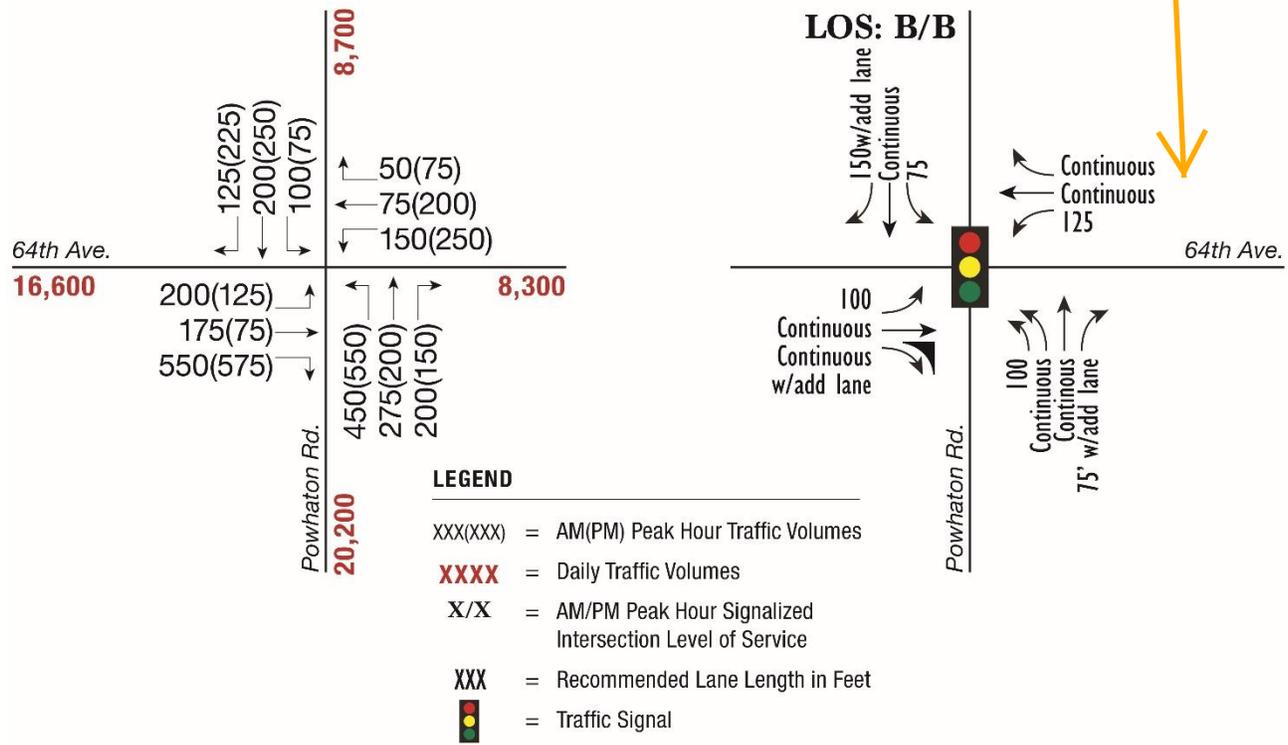
Using peak hour p...
 lane geometry and...
 (CDOT SHAC) w...
 percentile queue l...
 recommendations.

NEATS refresh

appropriate s Code
 s. The 95th
 ne length

Figure I also displays peak hour traffic operations and geometry recommendations for the 64th Avenue & Powhatan Road. Traffic analysis worksheets are attached to this memorandum.

Figure I. Year 2040 Traffic Conditions



As shown, the intersection will operate at LOS B during both peak hours. Dedicated turn lanes should be provided for all turning movements on each approach. Dual left-turn lanes should be installed on the northbound approach. Each turn lane should have its own storage length with two exceptions; the eastbound right-turn and outside northbound left-turn lanes should be continuous to allow transition between the 4-lane roads (64th Avenue west of Powhatan Road and Powhatan Road south of 64th Avenue) and the 2-lane roads (north and east legs). The eastbound right-turn lane should be channelized and given an acceleration lane onto southbound Powhatan Road to create a free operating condition.

Based on the daily traffic volumes shown on Figure I and the anticipated peak hour operations in Year 2040, 64th Avenue is planned to be constructed as a four-lane roadway both east and west of Powhatan Road. Powhatan Road is planned to be constructed as a two-lane road north of 64th Avenue (with a center turn lane where appropriate) and a four-lane road south of 64th Avenue. Volumes along both 64th Avenue and Powhatan Road presented in Figure I are greater than values presented for a 2040 condition in the NEATS Refresh study, however language recommendations remain consistent and within LOS thresholds

identified in the NEATS Refresh study. The eastbound and westbound through volumes do not support the need for two through lanes at the intersection and have been exchanged for continuous right turn lanes in both directions.

Table 1 displays 2040 peak hour 95th percentile queue lengths and recommended storage lengths based on both the estimated queues and guidance contained in the CDOT SHAC using an NR-B classification. Heavy vehicle percentage is assumed at twenty-five percent for the purposes of determining queue length. These recommended storage lengths are chosen to contain the maximum anticipated peak hour queue length.

Add text identifying that if the reduced laneage and reduced ROW is requested, then a Comprehensive Plan amendment would be required (which would need to be approved by City Council). Building the laneage recommended in this document may be acceptable, but the ISP would need to show the entire ROW for the NEATS section with the identified auxiliary lanes and indicate that they may be required in the future to construct the additional laneage when required by the City.

Response: Language has been added in the updated memo

Add a separate scenario where there are 4 lanes east of Powhatan Rd on 64th Ave. What would be the required right turn lane storage? This will be added to the ISP as this would be required per the 4-lane NEATS section (similar to deferral, but not formally deferral as deferrals are a Civil Plans item)
 Response: A footnote has been added to the new memo identifying how long this lane should be if not turning into a southbound lane-add situation.

Table I. Year 2040

Approach	Movement	Queue Length (ft) ¹		Storage Length based on 95 th Percentile	SHAC Recommended Storage Length ²
		AM	PM		
Eastbound	Left-Turn	85	68	100	300
	Through	100	50	Continuous	Continuous
	Right-Turn	0	0	Continuous	Continuous
Westbound	Left-Turn	68	123	125	375
	Through	40	128	Continuous	Continuous
	Right-Turn	25	43	75	Continuous
Northbound	Left-Turn	75	80	100 (L) / Continuous (R)	350 (L) / Continuous (R)
	Through	130	88	Continuous	Continuous
	Right-Turn	73	50	75	300
Southbound	Left-Turn	43	33	75	150
	Through	113	153	Continuous	Continuous
	Right-Turn	58	133	150	350

¹ Calculations based on HCM methodology using a heavy vehicle percentage of 15 percent.

² Number shown is based on volume adjustments of 3 PCE per heavy vehicle

Recommendation

City of Aurora *Traffic Impact Study Guidelines* indicate that the CDOT SHAC be used to determine storage and taper lengths. These values yield overly conservative results and provide storage well in excess 95th percentile queues (which already incorporates a heavy vehicle percentage), often by a factor of two to three. The SHAC procedures do not account for other conditions in the intersection such as a low opposing through movements if a left turn movement is in question. Rather, our recommendation is that the values in **Table I** corresponding to the 95th percentile lengths plus 144-foot tapers (to provide the required 12:1 taper for 12-foot lanes at 40 MPH for NR-B classification as identified in the CDOT SHAC) be incorporated in the design of the 64th Avenue & Powhatan Road intersection.

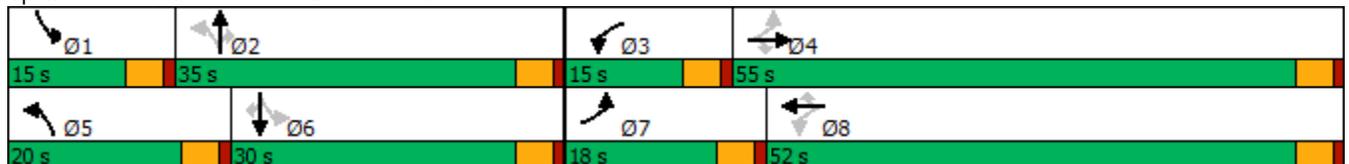
Timings
1: Powhatan Rd & 64th Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	175	550	150	75	50	450	275	200	100	200	125
Future Volume (vph)	200	175	550	150	75	50	450	275	200	100	200	125
Turn Type	pm+pt	NA	Perm									
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	18.0	55.0	55.0	15.0	52.0	52.0	20.0	35.0	35.0	15.0	30.0	30.0
Total Split (%)	15.0%	45.8%	45.8%	12.5%	43.3%	43.3%	16.7%	29.2%	29.2%	12.5%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes											
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
Act Effct Green (s)	32.0	19.3	19.3	26.5	16.6	16.6	36.7	26.2	26.2	25.6	16.8	16.8
Actuated g/C Ratio	0.40	0.24	0.24	0.33	0.21	0.21	0.46	0.33	0.33	0.32	0.21	0.21
v/c Ratio	0.48	0.52	0.82	0.43	0.26	0.14	0.58	0.60	0.38	0.32	0.68	0.36
Control Delay	19.9	31.8	14.5	19.7	29.1	0.8	19.3	33.1	6.3	18.8	43.1	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	31.8	14.5	19.7	29.1	0.8	19.3	33.1	6.3	18.8	43.1	8.9
LOS	B	C	B	B	C	A	B	C	A	B	D	A
Approach Delay		19.0			18.8			20.6			27.3	
Approach LOS		B			B			C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 80.1
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 20.9
 Intersection LOS: C
 Intersection Capacity Utilization 64.1%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Powhatan Rd & 64th Ave



HCM 6th Signalized Intersection Summary

1: Powhatan Rd & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	175	550	150	75	50	450	275	200	100	200	125
Future Volume (veh/h)	200	175	550	150	75	50	450	275	200	100	200	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	217	190	0	163	82	54	489	299	181	109	217	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	453	262		364	205	174	869	446	378	338	294	249
Arrive On Green	0.16	0.17	0.00	0.12	0.13	0.13	0.18	0.29	0.29	0.08	0.19	0.19
Sat Flow, veh/h	1457	1530	1296	1457	1530	1296	2826	1530	1296	1457	1530	1296
Grp Volume(v), veh/h	217	190	0	163	82	54	489	299	181	109	217	123
Grp Sat Flow(s),veh/h/ln	1457	1530	1296	1457	1530	1296	1413	1530	1296	1457	1530	1296
Q Serve(g_s), s	6.6	6.3	0.0	5.0	2.6	2.0	6.6	9.2	6.1	3.1	7.1	4.5
Cycle Q Clear(g_c), s	6.6	6.3	0.0	5.0	2.6	2.0	6.6	9.2	6.1	3.1	7.1	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	453	262		364	205	174	869	446	378	338	294	249
V/C Ratio(X)	0.48	0.73		0.45	0.40	0.31	0.56	0.67	0.48	0.32	0.74	0.49
Avail Cap(c_a), veh/h	591	1449		474	1363	1155	1188	875	741	511	731	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	20.9	0.0	16.8	21.1	20.9	12.4	16.6	15.6	15.5	20.3	19.2
Incr Delay (d2), s/veh	0.8	3.8	0.0	0.9	1.3	1.0	0.6	1.8	0.9	0.5	3.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	4.0	0.0	2.7	1.6	1.0	3.0	5.2	2.9	1.7	4.5	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.5	24.7	0.0	17.7	22.4	21.9	13.0	18.4	16.5	16.0	23.9	20.7
LnGrp LOS	B	C		B	C	C	B	B	B	B	C	C
Approach Vol, veh/h		407	A		299			969			449	
Approach Delay, s/veh		20.4			19.7			15.3			21.1	
Approach LOS		C			B			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	20.0	11.0	13.6	14.0	14.7	12.9	11.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	10.5	30.5	10.5	50.5	15.5	25.5	13.5	47.5				
Max Q Clear Time (g_c+I1), s	5.1	11.2	7.0	8.3	8.6	9.1	8.6	4.6				
Green Ext Time (p_c), s	0.1	1.7	0.1	0.9	0.9	1.1	0.2	0.5				

Intersection Summary

HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

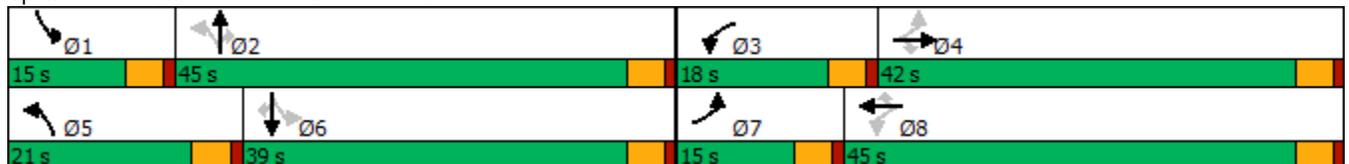
Timings
1: Powhatan Rd & 64th Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	75	575	250	200	75	450	200	150	75	250	225
Future Volume (vph)	125	75	575	250	200	75	450	200	150	75	250	225
Turn Type	pm+pt	NA	Perm									
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	42.0	42.0	18.0	45.0	45.0	21.0	45.0	45.0	15.0	39.0	39.0
Total Split (%)	12.5%	35.0%	35.0%	15.0%	37.5%	37.5%	17.5%	37.5%	37.5%	12.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes											
Recall Mode	None	Min	Min	None	Min	Min						
Act Effct Green (s)	32.3	22.4	22.4	39.1	25.8	25.8	43.4	33.2	33.2	30.8	22.2	22.2
Actuated g/C Ratio	0.35	0.24	0.24	0.42	0.28	0.28	0.46	0.36	0.36	0.33	0.24	0.24
v/c Ratio	0.37	0.23	0.92	0.59	0.52	0.18	0.63	0.40	0.29	0.23	0.75	0.50
Control Delay	21.0	30.6	27.7	25.5	33.7	1.6	22.1	29.9	6.0	19.5	49.0	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	30.6	27.7	25.5	33.7	1.6	22.1	29.9	6.0	19.5	49.0	8.0
LOS	C	C	C	C	C	A	C	C	A	B	D	A
Approach Delay		26.9			25.2			21.0			28.2	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 93.5
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 25.1
 Intersection LOS: C
 Intersection Capacity Utilization 73.9%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Powhatan Rd & 64th Ave



HCM 6th Signalized Intersection Summary

1: Powhatan Rd & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	75	575	250	200	75	450	200	150	75	250	225
Future Volume (veh/h)	125	75	575	250	200	75	450	200	150	75	250	225
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	136	82	0	272	217	82	489	217	127	82	272	232
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	323	158		455	288	244	815	516	437	408	355	301
Arrive On Green	0.10	0.10	0.00	0.19	0.19	0.19	0.17	0.34	0.34	0.06	0.23	0.23
Sat Flow, veh/h	1457	1530	1296	1457	1530	1296	2826	1530	1296	1457	1530	1296
Grp Volume(v), veh/h	136	82	0	272	217	82	489	217	127	82	272	232
Grp Sat Flow(s),veh/h/ln	1457	1530	1296	1457	1530	1296	1413	1530	1296	1457	1530	1296
Q Serve(g_s), s	4.8	3.0	0.0	9.1	7.9	3.2	6.9	6.4	4.2	2.5	9.7	9.8
Cycle Q Clear(g_c), s	4.8	3.0	0.0	9.1	7.9	3.2	6.9	6.4	4.2	2.5	9.7	9.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	158		455	288	244	815	516	437	408	355	301
V/C Ratio(X)	0.42	0.52		0.60	0.75	0.34	0.60	0.42	0.29	0.20	0.77	0.77
Avail Cap(c_a), veh/h	432	978		515	1057	896	1135	1057	896	577	900	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	24.9	0.0	16.6	22.5	20.6	13.0	15.0	14.3	15.4	21.0	21.0
Incr Delay (d2), s/veh	0.9	2.6	0.0	1.5	4.0	0.8	0.7	0.5	0.4	0.2	3.5	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.7	2.0	0.0	4.9	5.1	1.7	3.2	3.5	2.0	1.3	6.1	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	27.5	0.0	18.1	26.5	21.4	13.8	15.5	14.6	15.7	24.5	25.2
LnGrp LOS	C	C		B	C	C	B	B	B	B	C	C
Approach Vol, veh/h		218	A		571			833			586	
Approach Delay, s/veh		23.6			21.8			14.4			23.5	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	24.3	15.6	10.6	14.4	18.1	10.6	15.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	10.5	40.5	13.5	37.5	16.5	34.5	10.5	40.5				
Max Q Clear Time (g_c+I1), s	4.5	8.4	11.1	5.0	8.9	11.8	6.8	9.9				
Green Ext Time (p_c), s	0.1	1.3	0.2	0.3	0.9	1.8	0.1	1.2				

Intersection Summary

HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.