



Date: March 27th, 2023

To: Dan Osoba, Planner II  
City of Aurora Planning Department

From: Garrett Graham  
PCS Group Inc.  
P.O. Box 18287  
Denver, CO 80218

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This document is a response to the Harmony SP6 Initial Submission Review comments we received on February 3rd, 2023.

Application Number: DA-1925-14

Case Numbers: **2013-7001-07; 2023-6001-00; 2023-4001-00; 2023-3001-00**

Responses are below in **RED**:

## *Initial Submission Review*

### **SUMMARY OF KEY COMMENTS FROM ALL DEPARTMENTS**

- Check the table for all lot type classifications. There are many lots that do not match their classification based on their shown frontage. Less than 50' is small; 50-60' is standard; greater than 60' is large. These designations should be consistent throughout the table and match the lot type tables on sheet 1, the lot designations on sheet 4, and the lot type callouts on the landscaping sheets.

**PCS Response:** The landscape sheet L0.7 has been updated to match the Civil Site Plan Overall Lot Type Sheet (1.3).

- Continue the sidewalk connection to E 2nd Pl. Provide coordination with APS as necessary for any connections to their existing facilities.

**WPS Response:** A sidewalk connection has been added at this location. Coordination will begin with the School district.

- Please add a photometric plan to the plan set. This photometric plan should only include park and open space areas. Note the fixture location within these areas and provide a photometric analysis that shows lighting levels at adjacent property lines. The maximum lighting limit is 0.1 foot candle at 10' interior to adjacent property lines.



PCS Response: There are no light poles located within parks or open space areas in Ph6 however photometric plans for street lights within public right-of-way will be submitted as part of final civil CDs.

- Sod is not allowed except in exempt areas per the UDO Section 138–191.

PCS Response: Sod has been replaced with shrub plantings or a native seed mix, except as allowed in the exempt areas.

- Typical all walks along Powhaton: A sidewalk easement is required to set back 0.5' behind the back of the walk for walks outside of the ROW. Walks that meander significantly away from the ROW will not be owned/maintained by COA. At this time, I am unsure if these walks would be considered too far from the ROW, please follow up upon receipt of these comments for determination: [jbingham@auroragov.org](mailto:jbingham@auroragov.org).

WPS Response: Sidewalk easements have been added to the meandering sidewalks outside of ROW.

- Show the location of all existing and proposed water mains and fire hydrants within or abutting this site. The location and bearing of existing fire hydrants located (within 400' or the next existing fire hydrant) outside the plan area shall utilize a fire hydrant symbol with an arrow identifying the distance from the symbol to the existing fire hydrant.

WPS Response: All existing hydrants and water lines are now shown throughout the plan set. Hydrants along Powhaton and 6<sup>th</sup> Ave have been added.

- Please reference comments on the MUS as this has an effect on the proposed site plan. No comments have been made on the site plan for first round review as the design can change per MUS comments.

WPS Response: Acknowledged, thank you. The proposed site plan will conform to the approved MUS.

## PLANNING DEPARTMENT COMMENTS

**I. Community Questions, Comments and Concerns** IA. Two outside agency referral comments were received from Xcel Energy and APS. Please include a response to those comments with your second submission. The APS comment is listed below; the Xcel comment is listed at the end of this letter.

Response: These comments have been addressed.

IB. Aurora Public Schools, Joshua Hensley ([jd hensley@aurorak12.org](mailto:jd hensley@aurorak12.org) / 303-365-7812)

IC. The total school land dedication requirement for Harmony based on the approved master plan is approximately 49 acres. The master plan includes two P-8 school sites totaling approximately 36 acres.





Aurora Public School and the Harmony developers signed a school land dedication agreement for Harmony. Aurora Public Schools agreed to apply the school dedication required for the purpose of calculating cash-in-lieu of land as site plans are approved. The district will request cash-in-lieu of land when the balance of the obligation from approved site plans exceeds the number of acres dedicated for schools. Cash-in-lieu of land is required to serve high school age students at a district located outside of Harmony.

**PCS Response: Acknowledged.**

Cash-in-lieu will be required for this development application. The amount of cash-in-lieu will depend on the final number of residential units platted and will be valued at the market rate for zoned land with infrastructure in place.

**PCS Response Acknowledged.**

ID. No comments, questions, or concerns were received from adjacent property owners or registered neighborhood groups during this review. The First Review Neighborhood Meeting requirement has therefore been waived.

**Response: Acknowledged, thank you.**

## **2. Completeness and Clarity of the Application**

### *Generally*

2A. Development Review fees in the amount of \$82,519.25 are due prior to the acceptance of the second submission. Please refer to the invoice sent when this application was accepted for further details.

**PCS Response: Acknowledged, these fees are in the process of being paid. However per email from Dan Osoba, the City will move forward with application review even if these fees are outstanding. Thank you,**

2B. All AutoCAD SHX text items must be flattened on all PDF documents. Future submissions that contain AutoCAD SHX text items that are not flattened or removed will be rejected.

**Response: Acknowledged, SHX text has been removed.**

2C. Please note that there are updated forms for avigation easements that will be sent under a separate cover. Please utilize the updated forms and resubmit the avigation easement with your subsequent submittal.

**WPS Response: Acknowledged, thank you. Updated avigation easements are provided with this submittal.**

### *Site Plan Comments*

#### *Sheet 1*



2D. Acreage does not add up to the total. Add percentages to each line item in site area calculations and ensure to make clear if there is overlap (i.e. landscape area, open space area, and tract area).

**WPS Response:** Ensured that the lot, tract, and ROW areas add to 100%.

2E. Continue the sheet index for landscape sheets as this will be uploaded and kept on record as one document.

**PCS Response:** Landscape sheet index has been added to sheet 1 of Site Plan.

#### *Sheet 4*

2F. Label as existing APS school site.

**WPS Response:** Labeled all existing roadways, linework, and adjacent sites.

2G. Show N Robertsdale as an existing roadway.

**WPS Response:** Labeled all existing roadways, linework, and adjacent sites.

2H. Show N Trussville St as an existing roadway and show the roundabout.

**WPS Response:** Labeled all existing roadways, linework, and adjacent sites.

#### *Sheet 6*

2I. Reference Case Numbers for associated ISPs (2023-6001-00).

**WPS Response:** Added case no. information to the callouts.

#### *Landscape Plan Comments*

##### *Sheet 1*

2J. Include this sheet index on the cover sheet of the site plan set.

**PCS Response:** Acknowledged, this landscape sheet index has been added to sheet 1 of Site Plan.

### **3. Zoning and Subdivision Comments**

#### *Site Plan Comments*

##### *Sheet 1*

3A. Add a green court line item per the comments on sheet 3.

**WPS Response:** Green court line item has been provided on the small lot type compliance chart.

3B. Update the lot type compliance table per Harmony 4 Site Plan Amendment proposed changes. With a concurrent review of this application and the Harmony SP 4 Amdt, it will be expected that both documents are updated to match accordingly.

**WPS Response:** The CSP4 counts have been revised to match the amended site plan 4.



3C. Change motor court to green court and update the numbers accordingly for the most recent submissions.

**WPS Response:** Green courts have been added to the cover sheet tables as requested and lot count numbers have been revised to reflect it.

3D. Update the SP 6 lot type compliance table based on changes to lot type callouts on sheet 3.

**WPS Response:** Green courts have been added to the cover sheet tables as requested and lot count numbers have been revised to reflect it.

#### *Sheet 3*

3E. Include the lot corner radius on all frontage calculations. There are several lots that do not match the plat for lot frontage.

**WPS Response:** Corner radii added to frontage lengths.

3F. Check the table for all lot type classifications. There are many lots that do not match their classification based on their shown frontage. Less than 50' is small; 50-60' is standard; greater than 60' is large. These designations should be consistent throughout the table and match the lot type tables on sheet 1, the lot designations on sheet 4, and the lot type callouts on the landscaping sheets.

**WPS Response:** Lot classifications have been revised based on the Overall Lot Type Plan and cover sheet table.

3G. There are several lots that contain corner sides that face a "modified local street". If those streets are functioning as a collector street for the purposes of the local destination requirements, then the side yard setback shall be 20'. See comments on sheet 5 regarding local destinations.

**WPS Response:** N Trussville street is the only proposed collector on site and it does not have any front facing lots. N Robertsdale St will remain a local neat street so it does not apply.

#### *Sheet 4*

3H. Advisory Note: PA-86 contains a remainder of 53 units per the Master Plan Land Use Map and Matrix (134 proposed in MP; 81 shown on this SP).

**Response:** Acknowledged.

3I. Advisory Note: PA-86 contains a remainder of 80 units per the Master Plan Land Use Map and Matrix (177 proposed in MP; 97 shown on this SP).

**Response:** Acknowledged.

3J. These 6 lots are considered green courts as they face an open space (or detention pond in this case). Please update the lot tracking table on sheet 1 and lot matrix on sheet 2.



WPS Response: Green courts have been added to the cover sheet tables as requested and lot count numbers have been revised to reflect it.

3K. These 12 lots are considered green courts. Please update the lot tracking table on sheet 1 and lot matrix on sheet 2.

WPS Response: Green courts have been added to the cover sheet tables as requested and lot count numbers have been revised to reflect it.

3L. Update the lot type legend per the comments on green courts and lot types.

WPS Response: Green courts have been added to the cover sheet tables as requested and lot count numbers have been revised to reflect it.

3M. Add "or Duplex Green Court" if the dimensions and setbacks are the same.

WPS Response: Revised to include Green Court in label.

3N. For these lot typicals, please provide an interior and corner side condition.

WPS Response: Added corner lot conditions to the lot typicals.

#### *Sheet 5*

3O. For the purposes of the local destination section (two turn rule) Robertsdale will count as a collector street. All lots are in compliance with the local destination section.

WPS Response: Acknowledged.

#### *Sheet 13*

3P. Label the maximum distance from the ROW to the furthest edge of the loop lane. This distance may not exceed 250'.

WPS Response: Added label to ensure compliance.

#### *Landscape Plan Comments*

##### *Sheet 8*

3Q. Update this map and lot type designation based on the comments on the site plan sheets.

PCS Response: This map in the landscape site plan is not for lot type compliance, rather it's a legend for on-lot typical landscape sheets and corresponds to the following sheets for on-lot landscape.

#### *Infrastructure Site Plan Comments*

##### *Sheet 1*

3R. Data block area does not add up to the total ISP disturbance area. There is overlap (between sidewalk area + asphalt area = hard surface area) please indicate it on this data block.



**WPS Response:** The area values have been updated to equal the total ISP area.

3S. Provide percentages for each line item to add up to 100%.

**WPS Response:** Added percentages to the line items.

#### *Sheet 2*

3T. Typical for all curbside landscaping and buffer landscaping areas: add a note indicating landscaping requirements may be found on Harmony 6 Site Plan (CN: 2023-4001-00).

**WPS Response:** Added a callout to reference the Harmony SP6 with Case No.

### **4. Streets and Pedestrian Comments**

#### *Site Plan Comments*

#### *Sheet 6*

4A. Label path dimensions, typical for all pedestrian paths shown.

**WPS Response:** Added path dimensions.

#### *Sheet 9*

4B. Show and label pedestrian crosswalks.

**WPS Response:** Added pedestrian striping to the sheets close to Powhatan Rd. However, 64' local streets do not typically have crosswalk striping, therefore it has only been added to two locations.

#### *Sheet 13*

4C. Ensure that the sidewalk within this area is at least 5' minimum.

**WPS Response:** Sidewalk meets the 5' minimum and is now labeled.

4D. Consider adding a "Y" connection to reduce the creation of a habit path. This is the direction towards the walk to get to the school and is likely to be used frequently.

**WPS Response:** Added a Y-connection in this location as suggested.

4E. Sidewalk access is required along the exterior (home side) of the loop lane.

**WPS Response:** WPS Response: Added and attached sidewalk to the units.

#### *Sheet 15*

4F. There should be a mid-block crossing (as permitted by Traffic requirements) in this area to connect a crossing to the sidewalk to the southwest.

**WPS Response:** Added a mid block crossing at this location.

4G. Will this sidewalk width match? If not, please show the taper.



**WPS Response:** Revised the sidewalk to taper to the existing. Widths called out.

4H. There is no receiving ramp on the school site. Will a ramp be installed with this proposal?

**WPS Response:** Added a receiving ramp on the school site.

4I. Continue this sidewalk connection to E 2nd Pl. Provide coordination with APS as necessary for any connections to their existing facilities.

**WPS Response:** Added a sidewalk connection at this location.

#### *Sheet 17*

4J. Continue the sidewalk connection to the existing connection on the south. If the size is different, show the taper in the walk.

**WPS Response:** Existing and proposed sidewalk widths called out and tapers have been added.

#### *Landscape Plan Comments*

##### *Sheet 16*

4K. Fix the hatching over the sidewalk.

**PCS Response:** Hatching has been updated.

##### *Sheet 33*

4L. Consider providing pedestrian connections internal to the park to 2nd Pl. Are there opportunities to program the sod area – i.e. grass sports areas, volleyball, badminton, etc.? The majority of the pocket park seems underutilized.

**PCS Response:** A pedestrian connection has been provided along the wise side of the tract. As well, an additional bean bag toss and volleyball nets have been provided within turf areas of park.

#### *Infrastructure Site Plan Comments*

##### *Sheet 3*

4M. Label sidewalk width, typical.

**WPS Response:** Labeled all sidewalk widths throughout set.

4N. Sidewalks located outside of the ROW need to be covered by a sidewalk easement (verify with Public Works Real Property).

**WPS Response:** WPS Response: Sidewalk easements have been added where the path meanders outside the ROW.

#### *PIP Amendment Comments*

4O. Please provide notes in your letter of introduction on what is changing per this application PIP Amdt.



**WPS Response:** Additional language has been added to the introduction to clarify the changes.

4P. Should this be Trussville? Ellsworth is an east/west roadway.

**WPS Response:** Thank you, this has been revised to N Trussville St.

## 5. Parking Comments

### *Site Plan Comments*

#### *Sheet 1*

5A. Update the parking in the data table. These numbers were from Harmony 4. Only 2 spaces are required per dwelling unit; guest spaces are not required. (See comments regarding loop lanes).

**WPS Response:** The parking counts have been updated.

#### *Sheet 13*

5B. Guest parking is required for loop lane dwellings at 1 per unit. This can be accomplished by utilizing on- street parking outside of the loop lane, head-in parking, or parallel spaces.

**WPS Response:** 7 guest parking spots have been added and is now reflected on the cover sheet tables.

## 6. Urban Design Comments

### *Landscape Plan Comments*

#### *Sheet 23*

6A. Callout these items and/or add the symbols to the legend.

**PCS Response:** The site amenities symbols have been added and labeled.

#### *Sheet 33*

6B. Provide hatching on the enlargement plan.

**PCS Response:** We prefer not to have the landscape hatching on these sheets for clarity since it is already called out on the landscape plans. The Groundcover Legend has been removed from the enlargement sheets.

6C. Add the grill symbol.

**PCS Response:** The grill callout was pointing to the incorrect location. This has been corrected.

6D. Callout symbols or add to the legend.

**PCS Response:** The site amenities symbols have been added and labeled.

#### *Sheet 34*

6E. Add hatching to the enlargement.



PCS Response: We prefer not to have the landscape hatching on these sheets for clarity since it is already called out on the landscape plans. The Groundcover Legend has been removed from the enlargement sheets.

6F. Add symbols to match the legend.

PCS Response: The site amenities symbols have been added and labeled.

## 7. Signage & Lighting Comments

### *Site Plan Comments*

#### *Sheet 1*

7A. Update proposed sign square footage as it is known. A detailed drawing of the sign will be required.

PCS Response: Proposed sign square footage has been added to the cover sheet and detailed drawings have been provided in the landscape site plan detail sheets.

7B. Show all locations of monument signs on the site plan. Provide dimensions from the back of walks (4' min).

PCS Response: The sign monuments have been placed on the site plan and have been dimensioned.

7C. Please add a photometric plan to the plan set. This photometric plan should only include park and open space areas. Note the fixture location within these areas and provide a photometric analysis that shows lighting levels at adjacent property lines. The maximum lighting limit is 0.1 foot candle at 10' interior to adjacent property lines.

PCS Response: There are no light poles located within parks or open space areas in Ph6 however photometric plans for street lights within public right-of-way will be submitted as part of final civil CDs.

### *Landscape Plan Comments*

#### *Sheet 7*

7D. Add a note: Street-facing privacy side yard fencing shall be located 4 feet from the back of walk.

PCS Response: This note has been added.

#### *Sheet 13*

7E. This monument sign needs to be shown on the site plan details sheets in this application. The monument sign height, dimensions and materials need to be shown on the detail.

PCS Response: It is our understanding from previous discussions that this monument sign at 6<sup>th</sup> Ave and Powhatan Rd would be developed as part of a separate sign package that will be submitted separately.

7F. Is this gateway neighborhood sign utilized on this plan? Does this reference "The Meadows" sign detail provided in this plan set?





PCS Response: The neighborhood sign has been provide as part of this site plan package and has been located on the plan, shown on the site plan detail sheets as well as sign square footage shown on the cover of the civil site plan sheets.

*Sheet 38*

7G. Measure to the tallest portion of the sign. This sign is taller than 96".

PCS Response: This was a dimensioning error and dimension has now been fixed to show that sign will not exceed 96" max height.

**8. Landscaping Issues** (Tammy Cook / 954-684-0532 / [tdcook@auroragov.org](mailto:tdcook@auroragov.org) / Comments in bright teal)

*Site Plan Comments*

*Sheet 5*

8A. Provide dimension for the curbside landscape area.

PCS Response: Dimensions for curbside landscape areas have been provided.

*Infrastructure Site Plan Comments*

*Sheet 1*

8B. Provide sheet X of X. It should be cumulative.

WPS Response: Added sheet X of X numbering as requested.

*Sheet 6*

8C. Identify who will be providing the planting and irrigation for this median.

WPS Response: The property owner to the north will be providing planting and irrigation in the median when the north half of the street is constructed in the future.

*Landscape Plan Comments*

*Sheet 1*

8D. Provide sheet X of X so that the full plan submittal numbering is consistent. The numbering should be cumulative. The total sheet count for the entire set should be noted.

PCS Response: Added sheet X of X numbering as requested.

8E. Only include the required landscape notes from the City's Landscape manual. Remove the contractor notes from the Landscape Notes as the city does not review landscape construction drawings.

PCS Response: The notes have been updated to separate the COA Standard Landscape Notes and other Typical Landscape Notes. We do not want to remove these other notes since other departments



have requested some of these notes to be listed. We acknowledge that the COA Landscape Reviewer will not review these notes.

#### *Sheet 3*

8F. Note that the Populus species are prohibited by code per section 4.7.3-B.4a.iii of the UDO. Please specify another tree.

**PCS Response:** These trees have been removed and replaced.

8G. As of October 1, 2022, sod is not allowed except in exempt areas per the UDO Section 138-191.

**PCS Response:** Acknowledged and replaced.

#### *Sheet 4*

8H. Please separate the sides of each street ie. North/South or East/West side under each street name and provide the required/provided information.

**PCS Response:** The landscape charts have been updated to refer to each side of the street separately.

8I. Please separate the sides of each street ie. North/South or East/West side under each street name and provide the required/provided information.

**PCS Response:** The landscape charts have been updated to refer to each side of the street separately.

8J. Make corrections to the landscape tables per the redlined sheet.

**PCS Response:** The counts have been bupdated per the current totals.

#### *Sheet 7*

8K. Note that on Arterial and collector roadways an 18"x18" column is required every 60 feet.

**PCS Response:** This note has been added.

#### *Sheet 9*

8L. Sod is not allowed except in exempt areas per the UDO Section 138-191.

**PCS Response:** Acknowledged and replaced with a different landscape material.

#### *Sheet 10-12*

8M. Sod is not allowed except in exempt areas per the UDO Section 138-191.

**PCS Response:** Acknowledged and replaced with a different landscape material.

8N. Turf is not allowed in front yards.

**PCS Response:** Acknowledged and replaced with a different landscape material.



#### *Sheet 13*

8O. Sod is not allowed except in exempt areas per the UDO Section 138-191.

**PCS Response: Acknowledged and replaced with a different landscape material.**

8P. Turf is not allowed in front yards.

**PCS Response: Acknowledged and replaced with a different landscape material.**

8Q. Note the CN# for the E.6th Avenue ISP plans. (2023-6001-00)

**PCS Response: The CN# has been added along E. 6<sup>th</sup> Ave and Powhaton Rd.**

8R. Note the CN# for the Powhaton Road ISP plans. (2023-6001-00)

**PCS Response: The CN# has been added along E. 6<sup>th</sup> Ave and Powhaton Rd.**

#### *Sheet 15*

8S. Provide the sight light pole locations on the planting plans. There are several locations on this sheet.

**PCS Response: The light pole design and locations will be shown as part of the civil CD submittals.. Any conflicts with tree locations and light poles will be revised at that time. A note has been added to the Legend on all Landscaping Sheets.**

#### *Sheet 17*

8T. Please provide a bolder font for the Tract Labels that are shown with this hatch as it is difficult to read.

**PCS Response: The tract labels have been bolded.**

8U. This tree is in the 50' setback area and should be removed.

**PCS Response: This tree has been removed.**

#### *Sheet 18, 21, & 22*

8V. Sod is not allowed in the curbside landscape area per the UDO Section 138-191.

**PCS Response: Acknowledged and replaced with a different landscape material.**

#### *Sheet 25*

8W. Label Tract O.

**PCS Response: Tract has been labeled.**

#### *Sheet 30*

8X. The label for this sheet is missing. E 2nd Place.

**PCS Response: E. 2<sup>nd</sup> Place has been added.**



8Y. Sod is not allowed in the curbside landscape area per the UDO Section 138-191.

**PCS Response:** Acknowledged and replaced with a different landscape material.

#### *Sheet 32*

8Z. Label and dimension the landscape buffer width.

**PCS Response:** The landscape buffer width has been added.

#### **9. Addressing** (Phil Turner / 303-739-7357 / [pcturner@auroragov.org](mailto:pcturner@auroragov.org))

9A. Please provide a digital .shp or .dwg file for addressing and other GIS mapping purposes. Include the parcel, street line, easement and building footprint layers at a minimum. Please ensure that the digital file provided in a NAD 83 feet, Stateplane, Central Colorado projection so it will display correctly within our GIS system. Please eliminate any line work outside of the target area. Please contact me if you need additional information about this digital file.

**WPS Response:** DWG files with the correct formatting have been included in this submittal.

#### **REFERRAL COMMENTS FROM OTHER DEPARTMENTS AND AGENCIES**

#### **10. Civil Engineering** (Julie Bingham / 303-739-7304 / [jbingham@auroragov.org](mailto:jbingham@auroragov.org) / Comments in green)

##### *PIP Amendment Comments*

10A. This does not match the section shown on the site plan. Revise the typo.

**WPS Response:** The cross section in the site plan has been revised to match the PIP.

10B. How is this master plan amendment different from RSN 1623591?

**WPS Response:** Sentences have been added to the PIP introduction to clarify the changes in this MUS and PIP amendment.

##### *Site Plan Comments*

##### *Sheet 1*

10C. Please remove AutoCad SHX test items in the comment section. Please flatten to reduce selectability of the items.

**WPS Response:** The plan sets have been plotted correctly in this new submittal to remove shx items.

10D. Identify where this occurs.

**WPS Response:** Looped lane is a couplet street and is now correctly labeled.

##### *Sheet 10*

10E. Label the street centerline radii, typical on all site plan sheets.

**WPS Response:** Labeled all street centerline radii on all sheets.



10F. Label the flowline radii where pavement widening is provided.

**WPS Response:** Labeled flowline radii on all knuckle widening locations.

*Sheet 11*

10G. Show how this alley connects to the street, typical.

**WPS Response:** Driveway linework added to display alley connections.

*Sheet 13*

10H. Label the flowline radius.

**WPS Response:** Flowline radii have been labeled.

10I. Label the park sidewalks as private, typical.

**WPS Response:** Park sidewalks labeled as private.

*Sheet 14*

10J. If these are the couplets, identify the ROW width and the FL-FL widths.

**WPS Response:** Added ROW and fl-fl callouts on the couplet streets.

*Sheet 16*

10K. How will this connect to the existing walk? Is the existing walk in this area going to be replaced with this one?

**WPS Response:** The proposed linework has been Revised to match and taper to existing linework.

*Sheet 17*

10L. Show the connection to existing. The connection is required.

**WPS Response:** The proposed linework has been Revised to match and taper to existing linework.

*Sheet 24*

10M. Min 2% in unpaved areas.

**WPS Response:** Revised grading to reflect the 2% minimum.

*Sheet 25*

10N. Show/label the drainage easement/tract for this channel.

**WPS Response:** Added a drainage easement for the channel and labeled.

10O. The pedestrian railing is required for sidewalks adjacent to 3:1 slopes.

**WPS Response:** Added a pedestrian railing and called out.



10P. Show the connection to existing.

**WPS Response:** The proposed linework has been Revised to match and taper to existing linework.

#### *Infrastructure Site Plan Comments*

##### *Sheet 3*

10Q. Dimension the FL-FL.

**WPS Response:** Added fl-fl labels.

10R. Provide a receiving curb ramp.

**WPS Response:** Added a receiving ramp.

##### *Sheet 6*

10S. This does not match the PIP section. Typical all walks along Powhaton:

**WPS Response:** This section should now match in the Master PIP.

10T. A sidewalk easement is required to be set back 0.5' behind the back of the walk for walks outside of the ROW. Walks that meander significantly away from the ROW will not be owned/maintained by COA. At this time, I am unsure if these walks would be considered too far from the ROW, please follow up upon receipt of these comments for determination:

[jbingham@auroragov.org](mailto:jbingham@auroragov.org).

**WPS Response:** Sidewalk easements have been added where the path meanders outside the ROW.

##### *Sheet 7*

10U. Label the longitudinal slope.

**WPS Response:** Added longitudinal slope labels.

10V. Identify this dashed line, typical all sheets.

**WPS Response:** Labeled linework and similar linework on all sheets.

10W. Label these walks as private.

**WPS Response:** Labeled walks as private.

##### *Sheet 8*

10X. Indicate the limits of the ROW that are being dedicated as well as the ROW that already exists.

**WPS Response:** Added existing and proposed ROW extents on the cross section.

##### *Sheet 9*



10Y. Show/label the drainage easement/ or tract for the detention pond.

**WPS Response:** Added easement labels on both sheets.

*Sheet 10*

10Z. Show/label the drainage easement/ or tract for the detention pond.

**WPS Response:** Added easement labels on both sheets.

10AA. This grading doesn't match the site plan.

**WPS Response:** Because the infrastructure plan design is intended to be constructed before the site plan design, grading has been created for this plan set to match the existing surface in the interim condition, hence the slope easement linework.

10BB. Max 3:1 slopes.

**WPS Response:** Slopes have been revised to be 4:1 max. Labeled have been added to indicate.

10CC. Max 4:1 slopes in ROW.

**WPS Response:** Slopes have been revised to be 4:1 max. Labeled have been added to indicate.

10DD. Label the swale.

**WPS Response:** Added swale label.

10EE. It looks like the maintenance access leaves the tract for the detention pond. An access easement is required for the portion of the access not included in the easement. Show/label the easement.

**WPS Response:** Maintenance access paths have been added outside ROW and drainage easements.

10FF. What is the dashed line?

**WPS Response:** Added construction easement labels.

10GG. An access easement is required for maintenance access.

**WPS Response:** Maintenance access paths have been added outside ROW and drainage easements.

**11. Traffic Engineering** (Carl Harline / 303-739-7584 / [charline@auroragov.org](mailto:charline@auroragov.org) / Comments in amber)

*Generally*

11A. There are redline comments on the review documents from Traffic Engineering; however, they have not been reviewed and finalized by the Traffic Engineering Division. Please contact your reviewer above directly for comments.

**Response:** Acknowledged, redlines were finally received and will be addressed.



**12.Fire / Life Safety** (Stephen Kirchner / 303-739-7489 / [stkirchn@auroragov.org](mailto:stkirchn@auroragov.org) / Comments in blue)

*Subdivision Plat Comments*

12A. The minimum inside turning radius of a 23' Fire Lane is 29'. The minimum outside turning radius is 52'. This turn does not appear to be compliant.

**WPS Response:** Alley ROW linework has been revised to ensure that radii are 29' minimum within fire lanes.

12B. The minimum inside turning radius of a 23' Fire Lane is 29'. The minimum outside turning radius is 52'. These turns do not appear to be compliant.

**WPS Response:** Alley ROW linework has been revised to ensure that radii are 29' minimum within fire lanes.

*Site Plan Comments*

*Sheet 1*

12C. Please add the ICC code year for this project, the construction type, and the occupancy type in the Data Table. Additional comments may come after this information has been provided.

**WPS Response:** Added this information to the main cover table.

12D. Provide height of buildings to eaves.

**WPS Response:** Added a row for this requirement. No commercial buildings are being proposed, so "N/A" has been added.

*Sheet 4*

12E. Fire hydrant spacing onsite should be 600' on average.

**WPS Response:** Acknowledged, thank you. Hydrants have been added to 6<sup>th</sup> Ave and Powhaton.

12F. Fire hydrant spacing needs to begin with existing or proposed hydrants abutting the development area.

**WPS Response:** Existing hydrant locations are now shown and proposed hydrants are spaced accordingly.

12G. Additional comments regarding the spacing of fire hydrants onsite will be provided once all proposed and existing hydrants are identified.

**WPS Response:** Acknowledged, thank you. Proposed hydrants should now conform to 600' and 400' spacing criteria.

*Sheet 26*

12H. Fire hydrant spacing onsite should be 600' on average.





**WPS Response:** Acknowledged, thank you. Proposed hydrants should now conform to 600' and 400' spacing criteria.

12I. Show the location of all existing and proposed water mains and fire hydrants within or abutting this site. The location and bearing of existing fire hydrants located (within 400' or the next existing fire hydrant) outside the plan area shall utilize a fire hydrant symbol with an arrow identifying the distance from the symbol to the existing fire hydrant.

**WPS Response:** Existing hydrant locations are now shown and proposed hydrants are spaced accordingly.

#### *Sheet 27*

12J. Add the implementation plan note and completed table to the drawings.

**WPS Response:** Added implementation plan block to the notes sheet.

12K. Remove the duplicate note.

**WPS Response:** Note removed.

12L. ATTENTION BUILDING DIVISION: per ARTICLE xi, C.O.A. Building and Zoning Code, Section 22-425 through 22-434, AN ACOUSTIC ANALYSIS, PREPARED BY AN ACOUSTIC EXPERT THAT WILL IDENTIFY BUILDING DESIGN FEATURES NECESSARY TO ACCOMPLISH EXTERIOR NOISE REDUCTION TO ACHIEVE INTERIOR NOISE LEVELS NOT EXCEEDING INFLUENCE (LDN VALUE TO BE DETERMINED FOR EACH PROJECT) UNDER WORSE-CASE NOISE CONDITIONS.

**WPS Response:** Note added.

12M. Add this note.

**WPS Response:** Note added.

#### *Sheet 28*

12N. Show all street sections that will have fire hydrants. Refer to the redlines on this sheet for details.

**WPS Response:** Added hydrant block to all applicable cross sections.

12O. Add a street section for the loop lane in sheet 2.8.

**WPS Response:** The looped lane on 2.8 is the local couplet street. Labels to the street have been added to clarify.

#### *Sheet 29*

12P. Show the proposed fire hydrant.

**WPS Response:** Hydrants added to the major arterials and are now labeled throughout the set.



#### *Sheet 34*

12Q. The minimum inside turning radius of a 23' Fire Lane is 29'. The minimum outside turning radius is 52'. These turns do not appear to be compliant.

**WPS Response:** Alley ROW linework has been revised to ensure that radii are 29' minimum within fire lanes.

#### *Sheet 36*

12R. Show width of Fire Lane Easement in the description. For example: 23' Fire Lane Easement. TYP

**WPS Response:** Because the street is now classified as a couplet, a fire lane is not being proposed.

12S. Show the location of fire lane signs and include sign details in the sign package.

**WPS Response:** Added fire signs and called out on site plan.

12T. Will there be onsite parking in this looped lane?

**WPS Response:** Yes, 7 guest parking spaces have been added to the couplet street.

#### *Sheet 37*

12U. Ask reference status of roads?

**WPS Response:** The progress of these northern road plans is being coordinated with the adjacent property owner and the City of Aurora staff.

12V. Show connection to existing roadway and provide description in the correct Phase of project.

**WPS Response:** Existing roadway linework and utilities now shown for connections. Adjacent properties and projects now labeled.

12W. Show connection to existing roadway and provide description in the correct Phase of project.

**WPS Response:** Existing roadway linework and utilities now shown for connections. Adjacent properties and projects now labeled.

12X. Phasing narrative must include connections to existing and proposed roadways.

**WPS Response:** Verbiage for this section has been revised for clarification.

12Y. Phasing details need to include two points of access and looped water supply. See note 2.

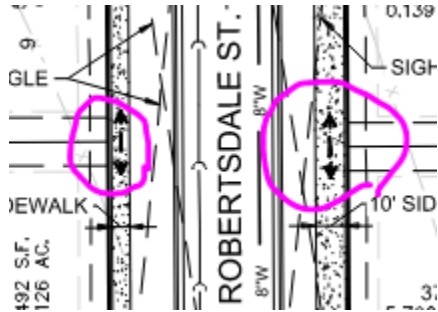
**WPS Response:** Existing waterlines are now shown in the plan. This note 2 should be satisfied.

#### *Sheet 41*

12Z. Using a heavy dashed delineation, show the accessible route on the grading plan.



WPS Response: WPS Response: Because an ADA route would not show up on this overall sheet, ADA linework symbols are shown on the site plan sheets. Additionally, the entire site is required to be ADA compliant since roadways are required to not exceed 5%.



**13. Aurora Water** (Daniel Pershing / 303-739-7646 / [ddpershi@auroragov.org](mailto:ddpershi@auroragov.org) / Comments in red)

*Infrastructure Site Plan Comments*

*Sheet 1*

13A. Please reference comments on the MUS as this has an effect on the proposed site plan. No comments have been made on the site plan for first round review as the design can change per MUS comments

WPS Response: Acknowledged, thank you. All comments on the MUS will be applied to the site plan and infrastructure site plan sets, and vise versa.

13B. The site plan will not be approved by public works until the preliminary drainage report is approved.

WPS Response: Acknowledged, thank you. The PDR is in the process of being approved by CoA.

13C. Coordination required with Aurora Water on the proposed 30" Waterline designed for Powhaton and 6th. This waterline is slated for install this year with proposed stubs for the development.

WPS Response: Acknowledged, thank you. Coordination will continue with CoA on this water line.

*PIP Amendment Comments*

13D. Coordination required with Aurora Water on proposed 30" Waterline designed for Powhaton and 6th. This waterline is slated for install this year with proposed stubs for the development.

WPS Response: Acknowledged, thank you. Coordination will continue with CoA on this water line.

13E. Please revise to 30" per comments on the MUS.

WPS Response: Revised to 30" per MUS revisions.

13F. Coordination required as second point of connection is needed in Powhaton for the looped system to serve this development.



WPS Response: Coordination will continue with Daniel Pershing on the CoA waterline within Powhatan. On Filing 15, two points of access are provided at the two intersections from CSP4 on Exposition Ave.

*MUS Amendment Comments*

13G. Please see redline comments throughout. There are edits to numbers or calculations not included in the text of this review letter.

WPS Response: Acknowledged. The redlines and calculations throughout the report have been addressed.

13H. Please revise the introduction to state Sun Meadow is now being incorporated under Harmony as a part of this amendment.

WPS Response: The introduction language has been revised to include the incorporation of Sun Meadows.

13I. I believe Adonea is built-out. Please confirm.

WPS Response: Revised to address Adonea as fully built-out.

13J. Master documents are at approval and should be referenced in this report.

WPS Response: Master Parklands and Cottonwood Creek documents are now calculated and referenced in the report.

13K. EAA offsite flows appear to be tributary for this development as well.

WPS Response: Master Parklands and Cottonwood Creek documents are now calculated and referenced in the report.

13L. Uses and areas match Exhibits.

WPS Response: Thank you.

13M. Demands match 5.02.

WPS Response: Thank you.

13N. Revise to Max Day/Max Hour factor as this does not only apply to residential.

WPS Response: Removed "residential" from line items.

13O. Commercial FF is 2500gpm. Is worst case scenarios being assumed for all uses? Please clarify.

WPS Response: Revised commercial fire flow to 2500gpm.

13P. Additional connections are also shown at 6th and Trussville and 6th and Monaghan.



WPS Response: Revised description to show all three connections.

13Q. Please revise verbiage as there is a 30" proposed along the frontage in Powhaton and 6th. This waterline is expected to be installed this year with stubs available for connection.

WPS Response: Revised PIP, MUS, and plan sets to show 30" waterline.

13R. Remove the last sentence as it does not apply to the approval of this MUS.

WPS Response: Removed sentences, thank you.

13S. Depending on the degree of change, another MUS amendment may be triggered. I recommend removing this sentence.

WPS Response: Removed sentences, thank you.

13T. PA-15 is referenced in the table on the next sheet.

WPS Response: Revised to PA-15, thank you.

13U. Please include verbiage on EAA as this also appears to be offsite tributary to this site.

WPS Response: Master Parklands and Cottonwood Creek documents are now calculated and referenced in the report.

13V. Parklands is referencing 580 Units for this DP.

WPS Response: This has been revised to 580 units, thank you. The peak daily flows remain the same for this area. Westwood has reached out to CORE for and updated Parklands Master MUS and did not receive a response. Therefore, design numbers from the previously approved Eastern Hills MUS were used.

13W. Additional Coordination is needed on Routing Calcs. Please send electronic copy to [ddpershi@auroragov.org](mailto:ddpershi@auroragov.org).

WPS Response: Additional information of proposed Parklands and Cottonwood creek have been added to the sanitary calculations and are referenced in the narrative.

13X. Parklands is showing 500 gpm for this DP.

WPS Response: Please see the sum for Area F-4 (design point F-7), which is 485,366 gpd – average day flow without infiltration.

13Y. Where is this flow coming from as it is not provided in the Parklands MUS?

WPS Response: Please see the sum of GPD + Infiltration for both the yellow and Orange Areas per the provided Parklands report outlined in magenta.



AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ACRE	UNITS/ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD +10% INFILTRATION	ADF (CFS)
AREA F-1	PART 5J			72	SFD	5	5.0	360	360	92,160	9,216	101,376	0.14
	NAC-12	F-6	F-5	10	NAC	4.5	4.5	45	45	11,520	1,152	12,672	0.01
	PART 5G			14	SFD	6	6.0	84	84	21,504	2,150	23,654	0.03
	PART 5H	F-5	F-4	26	SFD	5.5	5.5	143	143	36,608	3,661	40,269	0.05
	PART 5H	F-4.1	F-4	27	SFD	5.5	5.5	149	149	38,016	3,802	41,818	0.05
	PART 5H			20	SFD	5.5	5.5	109	109	28,019	2,802	30,821	0.04
	NAC-11			10	NAC	4.5	4.5	45	45	11,520	1,152	12,672	0.01
	PART 5G	F-4	F-3	8	SFD	6	6.0	48	48	12,288	1,229	13,517	0.01
				187				483		251,635	25,164		
AREA F-2	PART CP-1			15	CP	1	1.0	15	15	3,738	374	4,111	0.00
	PART 5D			24	SFD	6	6.0	145	145	37,018	3,702	40,719	0.05
	PART 5E	F-3	F-2	20	SFD	5	5.0	99	99	25,216	2,522	27,738	0.03
	NP-12			5	NP	1	1.0	5	5	1,280	128	1,408	0.00
	PART 5A			35	SFD	5.5	5.5	193	193	49,280	4,928	54,208	0.07
	PART 5B			4	SFD	5	5.0	20	20	5,120	512	5,632	0.00
	NAC-10	F-2	F-1	22	NAC	4.5	4.5	99	99	25,344	2,534	27,878	0.03
				124				576		146,996	14,700	161,696	0.22
AREA F-3	NP-14			5	NP	1	1.0	5	5	1,280	128	1,408	0.00
	PART 5E	F-3.1	F-2.1	37	SFD	5	5.0	185	185	47,360	4,736	52,096	0.07
	PART 5B	F-2.1	F-1.1	40	SFD	5	5.0	200	200	51,200	5,120	56,320	0.07
	PART 5B	F-1.1	F-1	21	SFD	5	5.0	105	105	26,752	2,675	29,427	0.04
	PART 5B			14	SFD	5	5.0	70	70	17,920	1,792	19,712	0.02
	PART 5A	F-1	Outfall	38	SFD	5.5	5.5	210	210	53,645	5,364	59,009	0.08
				155				775		198,157	19,815		
AREA F-4 MH F-4	PART 5G	F-11.1	F-11	30	SFD	6	6.0	177	177	45,312	4,531	49,843	0.07
	5F	F-11	F-10	27	SFA	11	11.0	300	300	76,877	7,688	84,564	0.11
	CP-1	F-10	F-9	35	CP	1	1.0	35	35	8,960	896	9,856	0.01
	PART 5D			28	SFD	6	6.0	168	168	43,008	4,301	47,309	0.06
	5C	F-9	F-8	28	SFA	11	11.0	310	310	79,411	7,941	87,352	0.12
	PART 5A			17	SFD	5.5	5.5	94	94	23,936	2,394	26,330	0.03
	CAC-4			30	CAC	10.2	10.2	304	304	77,814	7,781	85,595	0.12
	PART 3A	F-8	F-7	15	SFD	6	6.0	90	90	23,040	2,304	25,344	0.03
	PART 3A			44	SFD	6	6.0	264	264	67,584	6,758	74,342	0.10
	PART 5A	F-7	Outfall	28	SFD	5.5	5.5	154	154	39,424	3,942	43,366	0.06
				282				1,896		485,366	48,536		
AREA F-5	NAC-4			22	NAC	4.5	4.5	99	99	25,344	2,534	27,878	0.03
	PART 3A	F-13	F-12	21	SFD	6	6.0	126	126	32,256	3,226	35,482	0.05
	PART 3A	F-12	Outfall	24	SFD	6	6.0	145	145	37,200	3,720	40,919	0.05
				67				376					

#### 14. PROS (Curtis Bish / 303-739-7131 / [cbish@auroragov.org](mailto:cbish@auroragov.org) / Comments in mauve)

##### PIP Amendment Comments

14A. These proposed culverts are not consistent with previous discussions with PROS staff regarding accommodating the regional trail.

**WPS Response:** Callouts have been revised to include "open span crossing" as an option. Exact crossing design will be determined during preliminary design and city review of the associated filings.

14B. These proposed culverts are not consistent with previous discussions with PROS staff regarding accommodating the regional trail.

**WPS Response:** Callouts have been revised to include "open span crossing" as an option. Exact crossing design will be determined during preliminary design and city review of the associated filings.



14C. Is this a correct cross section with only a 14' median for Powhaton? Other major arterial streets should also be verified relative to median width.

**WPS Response:** This cross section has been revised to show 26' median for CSP1 & CSP6 and a 14' median for CSP4 & CSP5 per conversations with CoA on Powhaton cross section design.

#### *Site Plan Comments*

##### *Sheet 2*

14D. Add standard PROS note. Parks, recreation improvements, trails, and open space areas provided to satisfy land dedication requirements in accordance with approved development plans or provided by a metropolitan district or other appropriate jurisdiction or owners association in accordance with approved metropolitan district service plans shall be open to the general public.

**WPS Response:** Added note to general notes sheet as requested.

##### *Sheet 21*

14E. Reduce the percent of slope to better serve recreation needs for this multi-purpose turf area.

**WPS Response:** Lowered the slope in this area as requested.

#### *Landscape Plan Comments*

##### *Sheet 2*

14F. Should the design of landscaped medians be included in this plan set?

**PCS Response:** Discussions on responsibility and ownership of the landscape medians are in progress with the City and will be designed and added to the plans once this has been resolved.

##### *Sheet 13*

14G. Add callouts pointing to these amenities to clarify where they are proposed .. or use different/larger symbols for the features.

**PCS Response:** Callouts have been added to locate the site amenities.

14H. What facilities, such as benches, trash receptacles and dog waste stations, will be provided in this open space corridor to amenitize it and accommodate public use?

**PCS Response:** The site amenities have been added to the open space corridor.

##### *Sheet 33*

14I. An enlarged plan of the play area would be helpful showing design intent of specific structures, including fall zones for each feature.

**PCS Response:** The specific play equipment has been added to the enlargement plans, as well as the detail sheets.





14J. Does another layer need to be turned on to show the amenity?

**PCS Response:** The site amenities symbols have been added.

14K. Are these intended to be shown on this sheet?

**PCS Response:** The groundcover legend has been removed since we did not intend to show the landscaping material on the sheets.

#### *Sheet 34*

14L. What specific play features will be designed for this space? Ensure sufficient fall zones are accommodated. An enlarged plan of the play area may be helpful.

**PCS Response:** The specific play equipment has been added to the enlargement plans, as well as the detail sheets.

14M. Some features are not visible. Does another layer need to be turned on?

**PCS Response:** The site amenities symbols have been added.

14N. Are these intended to be shown on this sheet?

**PCS Response:** The groundcover legend has been removed since we did not intend to show the landscaping material on the sheets.

### **15. Real Property** (Roger Nelson / 720-587-2657 / [ronelson@auroragov.org](mailto:ronelson@auroragov.org) / Comments in magenta)

#### *Site Plan Comments*

#### *Sheet 1*

15A. Add property description per City of Aurora 2022 Site Plan Checklist.

**WPS Response:** Property legal description can be found on the plat as it is being included in this submittal and would add redundancy on the site plan.

#### *Sheet 5*

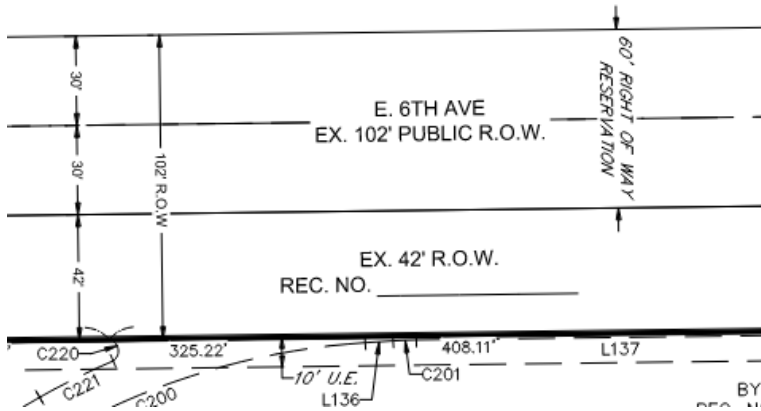
15B. Label Tract Area.

**WPS Response:** Made tract area labels larger. Did not include areas to prevent text overlapping.

15C. Provide Existing ROW Reception No.'s (Typical)

**WPS Response:** Revised the dimensions to match the plat language. See below.





15D. label subdivision exterior B&D's/Curve Data (Typical).

WPS Response: B&D information added.

Sheet 6

15E. Aurora GIS shows existing 30' ROW on W'ly side of section line? Proclamation?

WPS Response: Revised the dimensions to match the plat language.

15F. Label Easements? (Typical).

WPS Response: All easements labeled.

15G. Reception No.?

WPS Response: Revised the dimensions to match the plat language.

Sheet 7-8

15H. Reception No.?

WPS Response: Revised the dimensions to match the plat language.

Sheet 9

15I. Reception No.?

WPS Response: Revised the dimensions to match the plat language.

15J. Aurora GIS shows existing 30' ROW on W'ly side of section line? Proclamation?

WPS Response: Revised the dimensions to match the plat language.

15K. Label Easements (Typical)

WPS Response: Added more utility easements.



*Sheet 12*

15L. Aurora GIS shows existing 30' ROW on W'ly side of section line? Proclamation?

**WPS Response:** Revised the dimensions to match the plat language.

15M. Reception No.?

**WPS Response:** Revised the dimensions to match the plat language.

15N. Label easements (Typical).

**WPS Response:** Revised the dimensions to match the plat language.

15O. Label Tract & Area?

**WPS Response:** Revised the dimensions to match the plat language.

*Sheet 13*

15P. Label easements (Typical).

**WPS Response:** Revised the dimensions to match the plat language.

*Subdivision Plat Comments*

15Q. Please see the corrections, edits, and revisions as noted on the redlines of this plat.

**WPS Response:** Acknowledged, these redlines have been addressed.

15R. Expand Vicinity Map to cover 1/2 mile each direction from the site & Label all publicly dedicated roads per COA 2022 Subdivision Plat Checklist Item #3.

**WPS Response:** Vicinity map updated.

15S. Provide most recent AES Board Monument Records for all aliquot control corners shown hereon. Provide Closure Report to match written property description.

**WPS Response:** Updated Monument records have been provided.

15T. Have laid out, platted, and subdivided the same into Lots, Blocks, and Tracts as shown on this plat under the name and style of HARMONY SUBDIVISION FILING NO. 16 and by these presents do hereby dedicate to the City of Aurora, Colorado, for the perpetual use of the public, the streets, and easements, as shown hereon and not previously dedicated to the public.

**WPS Response:** This has been added.

15U. Remove hard return?

**WPS Response:** This has been removed.



15V. Did not see any S.E.'s?

**WPS Response: Easements to be added.**

15W. Add Reception No. B8109446? (72' E'ly side of section line?)

**WPS Response: Reception numbers to be added once recorded.**

15X. Aurora GIS shows existing 30' ROW on W'ly side of section line? Proclamation?

**WPS Response: This is in PSCO ROW and is offsite. Surveyor cannot confirm this. Adonea fil 7 does not reference this.**

15Y. AES Board Rule 1.6.M. Description of Monuments. Section 38-51-106(1)(f), C.R.S., requires professional land surveyors to provide "a description of all monuments, both found or set, that mark the boundaries of the property and of all control monuments used in conducting a survey." 1. Purpose. The purpose of this statute is to identify the physical attributes of the monuments and caps set or found during the original survey and subsequent retracement surveys. 2. Acceptable description of monuments. Description of monuments found or set should include, but not be limited to the physical attributes and size of the monument, and the physical attributes and size of the cap.

**WPS Response: Monument records have been provided with this resubmittal.**

15Z. Not per written description?

**WPS Response: Language removed.**

15AA. Aurora GIS shows existing 30' ROW on each side of section line? Proclamation?

**WPS Response: This is in PSCO ROW and is offsite. Surveyor cannot confirm this. Adonea fil 7 does not reference this.**

15BB. Reception No.?

**WPS Response: This ROW is in review. Rec. No. To be added after recordation.**

15CC. Show existing abutting easements (Typical) See COA 2022 Subdivision Plat Checklist Item #14.

**WPS Response: No easements shown on overall sheet; added to plat sheets.**

15DD. Show existing abutting easements (Typical) See COA 2022 Subdivision Plat Checklist Item #14.

**WPS Response: No easements shown on overall sheet; added to plat sheets.**

15EE. Show existing abutting easements (Typical) See COA 2022 Subdivision Plat Checklist Item #14.

**WPS Response: No easements shown on overall sheet; added to plat sheets.**



15FF. Show existing abutting easements (Typical) See COA 2022 Subdivision Plat Checklist Item #14.

WPS Response: No easements shown on overall sheet; added to plat sheets.

15GG. Add Key Map?

WPS Response: Key map added.

15HH. AES Board shows monument Record for C-E-W 1/64th?

WPS Response: Monument has been destroyed during construction.

15II. Label Blocks, Tracts, and Street Names (Typical).

WPS Response: Added the above on all plat sheets.

15JJ. Aurora GIS shows existing 30' ROW on W'ly side of section line? Proclamation?

WPS Response: Added dimension and label.

15KK. Show existing 8' U.E. with Reception No. (Typical).

WPS Response: Added existing labels.

15LL. Reception No.?

WPS Response: This ROW is in review. Rec. No. To be added after recordation.

15MM. Does G.E. need to extend across the tract?

WPS Response: Extended easement across tract.

15NN. The site Plan shows the sidewalk. Does there need to be an easement?

WPS Response: Sidewalks easements added. Private sidewalks not covered in easements.

15OO. Aurora GIS shows the existing 30' ROW on W'ly side of the section line? Proclamation?

WPS Response: Added dimension and label.

15PP. The site Plan shows the sidewalk. Does there need to be an easement?

WPS Response: Sidewalks easements added. Private sidewalks not covered in easements.

15QQ. Existing 60' ROW Reception No.?

WPS Response: This ROW is in review. Rec. No. To be added after recordation.

15RR. Aurora GIS shows the existing 30' ROW on W'ly side of the section line? Proclamation?

WPS Response: Added dimension and label.



15SS. The site Plan shows the sidewalk. Does there need to be an easement?

**WPS Response: Sidewalks easements added. Private sidewalks not covered in easements.**

15TT. Existing 60' ROW Reception No.?

**WPS Response: Sidewalks easements added. Private sidewalks not covered in easements.**

15UU. Label Easement?

**WPS Response: Easement labelled.**

15VV. Remove tic mark?

**WPS Response: Centerline added.**

15WW. Site Plan shows a sidewalk. Does there need to be an easement?

**WPS Response: Sidewalks easements added. Private sidewalks not covered in easements.**

15XX. Label Easement?

**WPS Response: Easement labelled.**

15YY. Does G.E. need to extend across tract?

**WPS Response: Extended easement across tract.**

15ZZ. Reception No.? (Typical)

**WPS Response: Added offsite reception numbers.**

15AAA. Label B&D?

**WPS Response: Added B&D label.**

15BBB. Does G.E. need to extend across tract?

**WPS Response: Extended easement across tract.**

15CCC. Not included in list on sheet 1?

**WPS Response: Added to sheet 1 table.**

15DDD. Does Tracts T & W need to also be access, utility, and fire lane easements?

**WPS Response: Corrected on cover sheet.**

15EEE. Label Easement?



WPS Response: Easement labelled.

15FFF. Can these lines be trimmed if these are both U.E.'s?

WPS Response: Easement linework updated.

15GGG. Can these lines be trimmed if these are both U.E.'s? (Typical)

WPS Response: Easement linework updated

15HHH. Label Easement?

WPS Response: Easement labelled.

#### *Infrastructure Site Plan Comments*

##### *Sheet 1*

15III. Add property description per City of Aurora 2022 Site Plan Checklist.

WPS Response: Property legal description can be found on the plat as it is being included in this submittal and would add redundancy on the infrastructure site plan.

15JJJ. Add Note per COA 2022 Site Plan Checklist. Architectural features (i.e. bay windows, fireplaces, roof overhang, gutters, eaves, foundation, footings, cantilevered walls, etc.) are not allowed to encroach into any easement or fire lane.

WPS Response: Note added to cover sheet.

##### *Sheet 2*

15KKK. Reception No.?

WPS Response: Added ROW information from F16 plat.

15LLL. Aurora GIS shows existing 30' ROW on W'ly side of section line? Proclamation?

WPS Response: Added dimensions and label language consistent with F16 plat.

##### *Sheet 3*

15MMM. Reception No.?

WPS Response: Added ROW information from F16 plat.

15NNN. Aurora GIS shows existing 30' ROW on W'ly side of section line? Proclamation?

WPS Response: Added dimensions and label language consistent with F16 plat.

##### *Sheet 4*

15OOO. Reception No.?



WPS Response: Added ROW information from F16 plat.

*Sheet 5*

15PPP. Not reflected on plat? (Typical).

WPS Response: Added "by separate document" to the labels for this easement.



## **XCEL ENERGY – COMMENTS:**

January 30, 2023

City of Aurora Planning and Development Services  
15151 E. Alameda Parkway, 2nd Floor  
Aurora, CO 80012

Attn: Daniel Osoba

**Re: Harmony 6, Case # DA-1925-14**

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the documentation for **Harmony 6** and has several conflicts:

- Lots 9-16 Block 10 are missing 8-foot utility easements for electric distribution facilities  
**WPS Response: Added 8' utility easements along the above mentioned lots.**
- Lots 17-23 Block 10 are missing 6-foot utility easements for natural gas distribution facilities and 8-foot utility easements for electric distribution facilities  
**WPS Response: Added 6' utility easements along the above mentioned lots.**
- The easements are backwards in Lots 1-6 Block 14; please note that natural gas needs to be installed on the side of the lot that is drivable pavement (minimum 8-feet wide, 6-inches thick) with space for service truck access and plowing in snowy conditions with a minimum 5-foot clearance from any structure  
**WPS Response: The utility easements have been revised to reflect the typical criteria above.**
- Lots 7-42 Block 14 are missing 6-foot utility easements for natural gas distribution facilities  
**WPS Response: Added 6' utility easements along the above mentioned lots.**

Additionally, Aurora's standard dedication language does not appear on this plat. Without that, PSCo requests that the following language or plat note is placed on the preliminary and final plats for the subdivision:

*Utility easements are dedicated to the City of Aurora for the benefit of the applicable utility providers for the installation, maintenance, and replacement of electric, gas, television, cable, and telecommunications facilities. Utility easements shall also be granted within any access easements and private streets in the subdivision.*





WPS Response: Note has been added to the Plat cover sheet.

PSCo requests that this language is also placed on the plat:

*Permanent structures, improvements, objects, buildings, wells, water meters and other objects that may interfere with the utility facilities or use thereof (Interfering Objects) shall not be permitted within said utility easements and the utility providers, as grantees, may remove any Interfering Objects at no cost to such grantees, including, without limitation, vegetation. Public Service Company of Colorado (PSCo) and its successors reserve the right to require additional easements and to require the property owner to grant PSCo an easement on its standard form.*

WPS Response: Note has been added to the Plat cover sheet.

The property owner/developer/contractor must complete the application process for any new natural gas or electric service via [xcelenergy.com/InstallAndConnect](https://www.xcelenergy.com/InstallAndConnect). It is then the responsibility of the developer to contact the Designer assigned to the project for approval of design details.

WPS Response: Acknowledged by the developer, thank you.

If additional easements need to be acquired by separate PSCo document, a Right-of-Way Agent will need to be contacted.

Donna George  
Right of Way and Permits  
Public Service Company of Colorado dba Xcel Energy  
Office: 303-571-3306 – Email: [donna.l.george@xcelenergy.com](mailto:donna.l.george@xcelenergy.com)

# POWHATON ROAD INFRASTRUCTURE SITE PLAN NO.6

## POWHATON ROAD, E 6TH AVE AND RELATED STORM WATER DETENTION

A PART OF THE NORTH HALF OF SECTION 16, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6th P.M.,  
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO

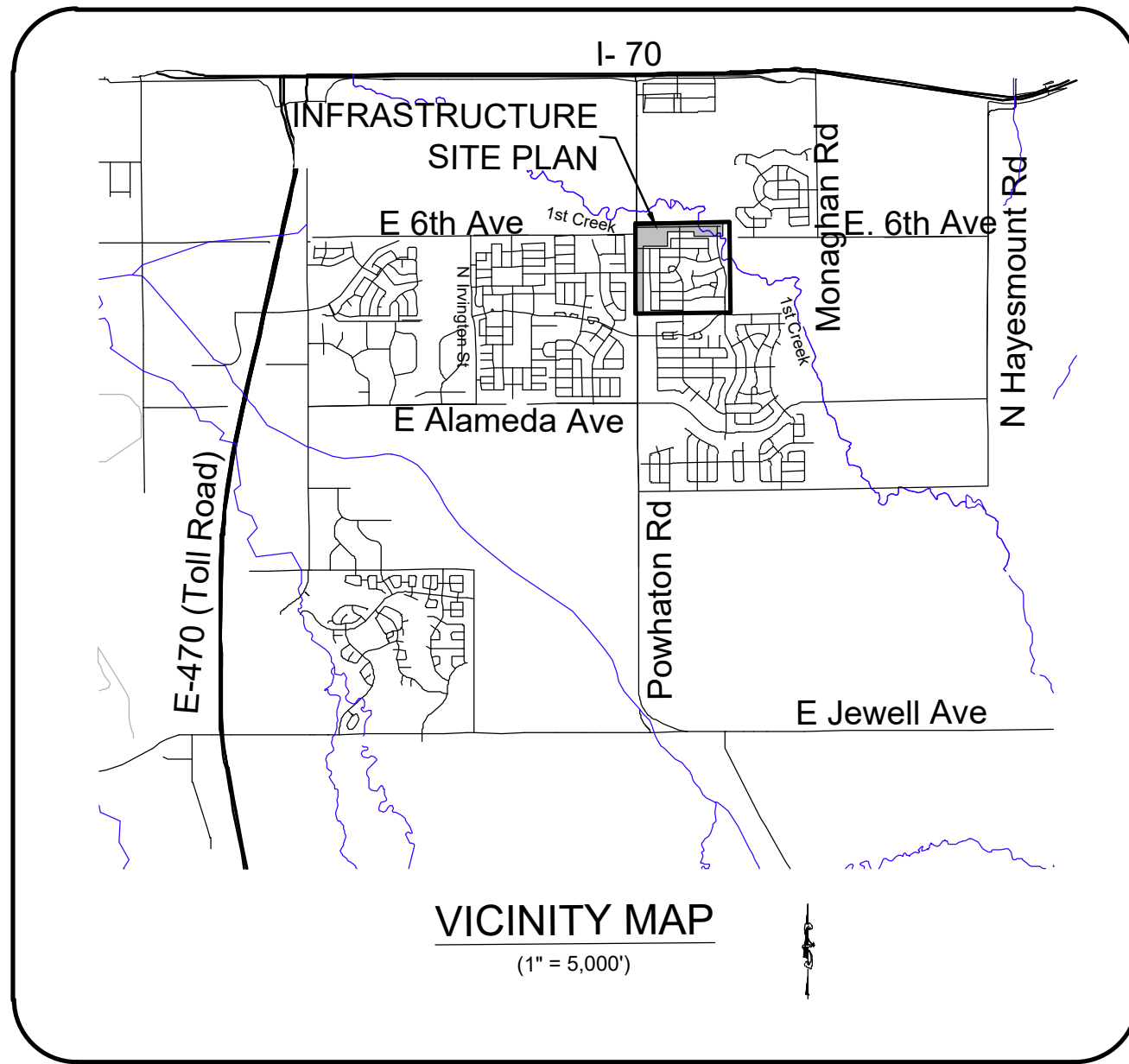
### SHEET LIST TABLE

SHEET #	SHEET TITLE
1	COVER SHEET
2	ROW AND EASEMENT PLAN
3	ROW AND EASEMENT PLAN
4	ROW AND EASEMENT PLAN
5	ROW AND EASEMENT PLAN
6	POWHATON ROAD PLAN VIEW
7	POWHATON ROAD PLAN VIEW
8	6TH AVENUE PLAN VIEW
9	DETENTION POND T PLAN VIEW WITH AREA GRADING
10	DETENTION POND U PLAN VIEW WITH AREA GRADING
11	AREA GRADING

SITE PLAN DATA BLOCK			
OVERALL ISP DISTURBANCE AREA	± 2,023,531 SF	± 46.45 ACRES	
PROPOSED SIDEWALK AREA	± 53,174 SF	± 1.22 ACRES	
PROPOSED ASPHALT AREA	± 177,269 SF	± 4.07 ACRES	
PROPOSED HARD SURFACE AREA	± 257,698 SF	± 5.92 ACRES	
PROPOSED LANDSCAPE AREA	± 1,765,833 SF	± 40.54 ACRES	
PRESENT ZONING CLASSIFICATION	MEDIUM DENSITY RESIDENTIAL	R-2	

Provide percentages for each line item to add up to 100%.

Data block area does not add up to the total ISP disturbance area. There is overlap (between sidewalk area + asphalt area = hard surface area) please indicate it on this data block.



Coordination required with Aurora Water on proposed 30" Waterline designed for Powhatan and 6th. This waterline is slated for install this year with proposed stubs for the development.

Please reference comments on the MUS as this has an effect on the proposed site plan. No comments have been made on the site plan for first round review as the design can change per MUS comments

The site plan will not be approved by public works until the preliminary drainage report is approved.

Add property description per City of Aurora 2022 Site Plan Checklist.

### OWNER'S SIGNATURES POWHATON ROAD INFRASTRUCTURE SITE PLAN NO. 6

This Site Plan and any amendments hereto, upon approval by the City of Aurora and recording, shall be binding upon the applicants therefore, their successors and assigns. This plan shall limit and control the issuance and validity of all building permits, and shall restrict and limit the construction, location, use, occupancy and operation of all land and structures within this plan to all conditions, locations and limitations set forth herein. It, withdrawal or amendment of this plan may be upon approval of the City of Aurora.

I, \_\_\_\_\_ of, \_\_\_\_\_ has caused these presents to be executed this \_\_\_\_\_ day of \_\_\_\_\_ AD.

By: \_\_\_\_\_ Corporate Seal  
(Principals or Owners)

State of Colorado \_\_\_\_\_ )ss

County of \_\_\_\_\_ )

The foregoing instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_ AD, \_\_\_\_\_ by

(Principals or Owners)

Witness my hand and official seal \_\_\_\_\_ Notary Seal

(Notary Public)

Notary Business Address: \_\_\_\_\_

My commission expires \_\_\_\_\_

### CITY OF AURORA APPROVALS

City Attorney: \_\_\_\_\_ Date: \_\_\_\_\_

Planning Director: \_\_\_\_\_ Date: \_\_\_\_\_

### AMENDMENTS

#### NOTES:

- THE METRO DISTRICT, HIS SUCCESSION, AND ASSIGNS, INCLUDING THE HOMEOWNERS OR MERCHANTS ASSOCIATION, SHALL BE RESPONSIBLE FOR INSTALLATION, MAINTENANCE AND REPLACEMENT OF ALL FIRE LINES, AND THE CITY OF AURORA SIGN CODE.
- ALL SIGNS MUST CONFORM TO THE CITY OF AURORA SIGN CODE.
- THE APPLICANT HAS THE OBLIGATION TO MAINTAIN, INSTALL, REPAIR, REMOVE OR RELOCATE ANY CITY FACILITIES LOCATED WITHIN SAID EASEMENTS AND RIGHTS-OF-WAY AT ANY TIME AND IN SUCH A MANNER AS IT DEEMS NECESSARY OR CONVENIENT.
- THE METRO DISTRICT, HIS SUCCESSION, AND ASSIGNS, INCLUDING THE HOMEOWNERS OR MERCHANTS ASSOCIATION, 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 LANDSCAPING WILL BE INSTALLED PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY.
- ALL CROSSINGS OR ENCROACHMENTS INTO EASEMENTS AND RIGHTS-OF-WAY OWNED BY THE CITY OF AURORA ("CITY") IDENTIFIED AS BEING PRIVATELY-OWNED AND MAINTAINED HEREIN ARE ACKNOWLEDGED BY THE UNDERSIGNED AS BEING SUBJECT TO CITY'S USE AND OCCUPANCY OF SAID EASEMENTS OR RIGHTS-OF-WAY. THE UNDERSIGNED, ITS SUCCESSORS AND ASSIGNS, FURTHER AGREES TO REMOVE, REPAIR, REPLACE, RELOCATE, MODIFY, OR OTHERWISE ADJUST SAID CROSSINGS OR ENCROACHMENTS UPON REQUEST FROM THE CITY AND AT NO EXPENSE TO THE CITY. THE CITY RESERVES THE RIGHT TO MAKE FULL USE OF THE EASEMENTS AND RIGHTS-OF-WAY AS MAY BE NECESSARY OR CONVENIENT AND THE CITY RETAINS ALL RIGHTS TO OPERATE, MAINTAIN, INSTALL, REPAIR, REMOVE OR RELOCATE ANY CITY FACILITIES LOCATED WITHIN SAID EASEMENTS AND RIGHTS-OF-WAY AT ANY TIME AND IN SUCH A MANNER AS IT DEEMS NECESSARY OR CONVENIENT.
- THE APPROVAL OF THIS DOCUMENT DOES NOT CONSTITUTE FINAL APPROVAL OF GRADING, DRAINAGE, UTILITY, PUBLIC IMPROVEMENTS AND BUILDING PLANS. CONSTRUCTION PLANS MUST BE REVIEWED AND APPROVED BY THE APPROPRIATE AGENCY PRIOR TO THE ISSUANCE OF BUILDING PERMITS.
- NOTWITHSTANDING ANY SURFACE IMPROVEMENTS, LANDSCAPING, PLANTING OR CHANGES SHOWN IN THESE SITE OR CONSTRUCTION PLANS, OR ACTUALLY CONSTRUCTED OR PUT IN PLACE, ALL UTILITY EASEMENTS MUST REMAIN UNOBTSTRUCTED AND FULLY ACCESSIBLE ALONG THEIR ENTIRE LENGTH TO ALLOW FOR ADEQUATE MAINTENANCE EQUIPMENT. ADDITIONALLY, NO INSTALLATION, PLANTING, CHANGE IN THE SURFACE, ETC., SHALL INTERFERE WITH THE OPERATION OF THE UTILITY LINES PLACED WITHIN THE EASEMENT. BY SUBMITTING THESE SITE OR CONSTRUCTION PLANS FOR APPROVAL, THE LANDOWNER RECOGNIZES AND ACCEPTS THE TERMS, CONDITIONS AND REQUIREMENTS OF THIS NOTE.
- ALL INTERESTED PARTIES ARE HEREBY ALERTED THAT THIS SITE PLAN IS SUBJECT TO ADMINISTRATIVE CHANGES AND AS SHOWN ON THE ORIGINAL SITE PLAN ON FILE IN THE AURORA CITY PLANNING OFFICE AT THE MUNICIPAL BUILDING. A COPY OF THE OFFICIAL CURRENT PLAN MAY BE PURCHASED THERE. LIKEWISE, SITE PLANS ARE REQUIRED TO AGREE WITH THE APPROVED SUBDIVISION PLAT OF RECORD AT THE TIME OF A BUILDING PERMIT; AND IF NOT, MUST BE AMENDED TO AGREE WITH THE PLAT AS NEEDED, OR VICE VERSA.
- ERRORS IN APPROVED SITE PLANS RESULTING FROM COMPUTATIONS OR INCONSISTENCIES IN THE DRAWINGS MADE BY THE APPLICANT ARE THE RESPONSIBILITY OF THE PROPERTY OWNER OF RECORD. WHERE FOUND, THE CURRENT MINIMUM CODE REQUIREMENTS WILL APPLY AT THE TIME OF BUILDING PERMIT. PLEASE BE SURE THAT ALL PLAN COMPUTATIONS ARE CORRECT.
- ALL REPRESENTATIONS AND COMMITMENTS MADE BY APPLICANTS AND PROPERTY OWNERS AT PUBLIC HEARINGS REGARDING THIS PLAN ARE BINDING UPON THE APPLICANT, PROPERTY OWNER, AND ITS HEIRS, SUCCESSORS, AND ASSIGNS.
- ALL STREET TRAFFIC SIGNS PROVIDED BY THE HARMONY DEVELOPMENT SHALL BE FURNISHED AND INSTALLED PER MUTCD STANDARDS.
- IN LOCATIONS WHERE UTILITY EASEMENTS OVERLAP DRAINAGE EASEMENTS, ONLY SUBSURFACE UTILITIES SHALL BE PERMITTED WITHIN THE PORTION OF THE UTILITY EASEMENT THAT OVERLAPS THE DRAINAGE EASEMENT. INSTALLATION OF ABOVE GROUND UTILITIES WITHIN A DRAINAGE EASEMENT REQUIRES PRIOR WRITTEN APPROVAL BY THE CITY ENGINEER.
- 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.
- THE APPLICANT HAS THE OBLIGATION TO COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA).
- ACCESSIBLE EXTERIOR ROUTES SHALL BE PROVIDED FROM PUBLIC TRANSPORTATION STOPS, ACCESSIBLE PARKING AND ACCESSIBLE PASSENGER LOADING ZONES AND PUBLIC SIDEWALKS TO 60% OF THE ACCESSIBLE BUILDING ENTRANCE THEY SERVE. THE ACCESSIBLE ROUTE BETWEEN ACCESSIBLE PARKING AND ACCESSIBLE BUILDING ENTRANCES SHALL BE THE MOST PRACTICAL DIRECT ROUTE. THE ACCESSIBLE ROUTE MUST BE LOCATED WITHIN A SIDEWALK. NO SLOPE ALONG THIS ROUTE MAY EXCEED 1:20 WITHOUT PROVIDING A RAMP WITH A MAXIMUM SLOPE OF 1:12 AND HANDRAILS. CROSSWALKS ALONG THIS ROUTE SHALL BE WIDE ENOUGH TO WHOLLY CONTAIN THE CURB RAMP WITH A MINIMUM WIDTH OF 36" AND SHALL BE PAINTED WITH WHITE STRIPES. THE CITY OF AURORA ENFORCES HANDICAPPED ACCESSIBILITY REQUIREMENTS BASED ON THE 2015 INTERNATIONAL BUILDING CODE, CHAPTER 11, AND THE ICC A117.1-2009.
- THE METRO DISTRICT, OWNER AND ASSIGNS ARE RESPONSIBLE FOR COMPLYING WITH THE FEDERALLY MANDATED REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA).
- THE 2015 INTERNATIONAL FIRE CODE, SECTION 510, REQUIRES ALL BUILDINGS TO BE ASSESSED FOR ADEQUATE EMERGENCY RESPONDER RADIO COVERAGE (ERRC), AT THE TIME THE STRUCTURE IS AT FINAL FRAME AND FINAL ELECTRICAL INSPECTIONS. THE GENERAL CONTRACTOR (GC) WILL BE REQUIRED TO HIRE AN APPROVED AND QUALIFIED INDEPENDENT 3RD PARTY TO ASSESS THE RADIO FREQUENCY LEVELS WITHIN THE STRUCTURE. ONCE COMPLETED, THE 3RD PARTY WILL PROVIDE THE RESULTS OF THE TEST TO BOTH THE GC AND THE AURORA BUILDING DIVISION AS TO WHETHER THE STRUCTURE PASSED OR FAILED THE PRELIMINARY RADIO SURVEILLANCE. A STRUCTURE THAT HAS PASSED THIS SURVEILLANCE REQUIRES NO FURTHER ACTION BY THE GC. A FAILED RADIO SURVEILLANCE WILL REQUIRE A LICENSED CONTRACTOR TO SUBMIT PLANS TO THE AURORA BUILDING DIVISION TO OBTAIN A BUILDING PERMIT FOR THE INSTALLATION OF AN ERRC SYSTEM PRIOR TO INSTALLATION. THIS ASSESSMENT AND INSTALLATION IS AT THE OWNER OR METRO DISTRICT'S EXPENSE. FUTURE INTERIOR OR EXTERIOR MODIFICATIONS TO THE STRUCTURE AFTER THE ORIGINAL CERTIFICATE OF OCCUPANCY IS ISSUED WILL REQUIRE A REASSESSMENT FOR ADEQUATE RADIO FREQUENCY COVERAGE.
- EMERGENCY INGRESS AND EGRESS - RIGHT-OF-WAY FOR INGRESS AND EGRESS FOR SERVICE AND EMERGENCY VEHICLES IS GRANTED OVER, AND ACROSS, ON AND THROUGH ANY AND ALL PRIVATE ROADS AND WAYS NOW OR HEREAFTER ESTABLISHED ON THE DESCRIBED PROPERTY, AND THE SAME ARE HEREBY DESIGNATED AS "SERVICE/EMERGENCY AND UTILITY EASEMENTS" AND SHALL BE POSTED "NO PARKING - FIRE LANE".

Table has been revised to add up to 100% and a column has been added for that information.

Remove duplicate note.

Note removed

Add Note per COA 2022 Site Plan Checklist. Architectural features (i.e. bay windows, fireplaces, roof overhang, gutters, eaves, foundation, footings, cantilevered walls, etc.) are not allowed to encroach into any easement or fire lane.

Added note

Remove note 17.

Note removed

Note has been added.

Add standard conduit note for arterial roadways:  
Applicant shall install two 2" conduits and pull boxes to be owned/maintained by the City of Aurora, for future fiber optic interconnect of traffic signals along arterial roadways (6th Avenue and Powhatan Road).  
Conduit  
\*Conduit material shall be Schedule 80 HDPE (or similar).  
\*A # 14 AWG stranded copper conductor shall be installed for city underground locating purposes.  
\*A nylon pull tape with a minimum 1,250 lb tensile strength shall be installed in all new conduit.  
Pull Box  
\*Pull boxes shall be 30"x48"x24", with two-piece interlocking lids.  
\*City conduit shall be installed into City Pull Boxes.

Page number information has been added

Provide sheet X of X. It should be cumulative.

**APPLICANT:**  
POWHATON ROAD  
METRO DISTRICT  
2154 EAST COMMONS AVENUE, SUITE 2000  
CENTENNIAL, COLORADO 80122  
TEL: (303) 920-9400  
FAX: (303) 920-9440  
CONTACT: JAMES SPEHALSKI

**PLANNER/  
LANDSCAPE  
ARCHITECT:**

**PCS GROUP, INC.**  
200 KALAMATH STREET  
DENVER CO 80223  
TEL: (303) 531-4905  
CONTACT: JOHN PRESTWICH

**SURVEYOR/  
ENGINEER:**  
**Westwood**

Westwoodps.com  
Westwood Professional Services, Inc.  
10333 E DRY CREEK RD.  
SUITE 240  
ENGLEWOOD, CO 80112  
TEL: 720.482.9526

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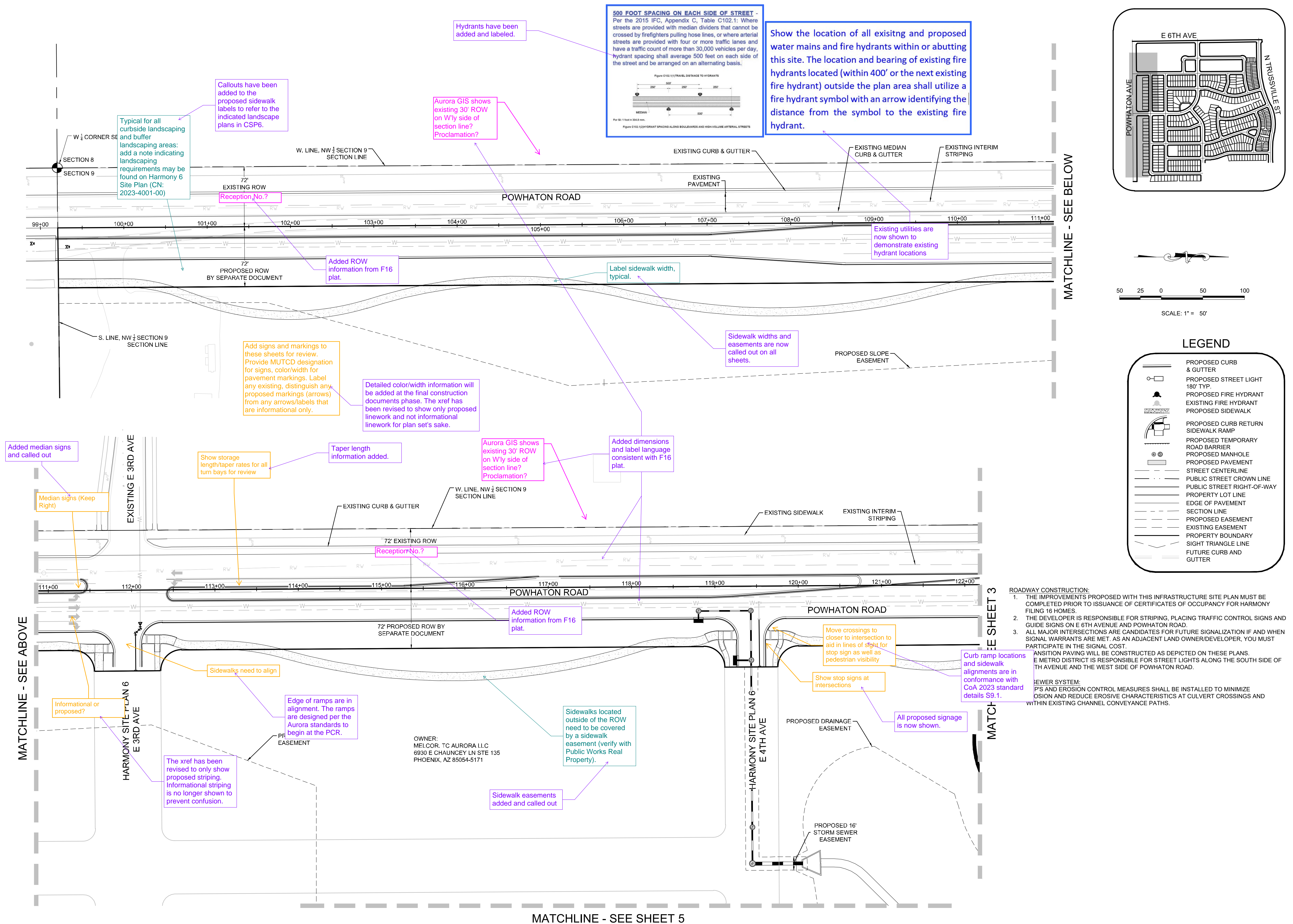
POWHATON ROAD METRO DISTRICT  
C/O Marathon Land Company  
9750 W. Cambridge Place  
Littleton, CO 80127  
Tel: (303) 920-9400 Fax: (303) 920-9440

POWHATON ROAD METRO DISTRICT  
INFRASTRUCTURE SITE PLAN NO. 6  
COVER SHEET

SCALE: AS SHOWN  
DRAWN BY: DJG  
CHECKED BY: BFW  
DATE: DECEMBER 2022  
FILE NO: 8130214922

SHEET NUMBER  
**1**



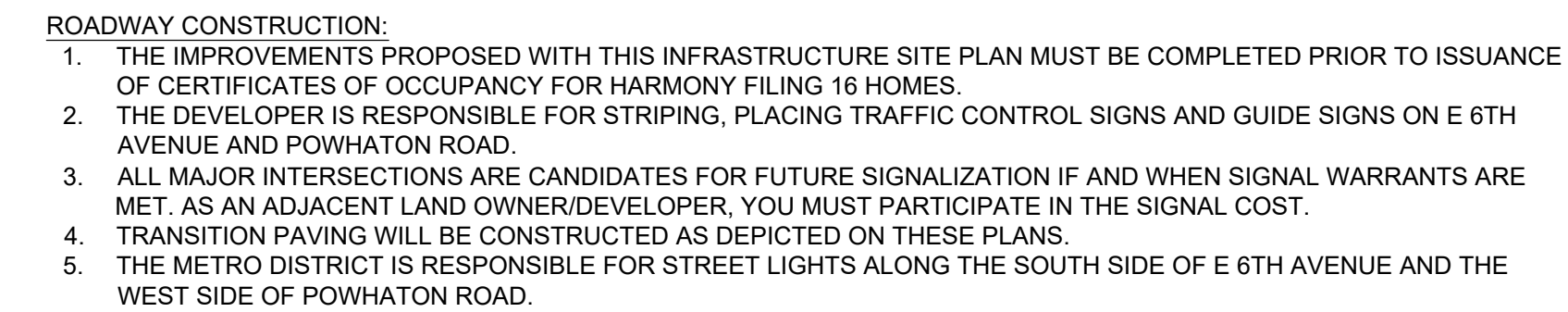






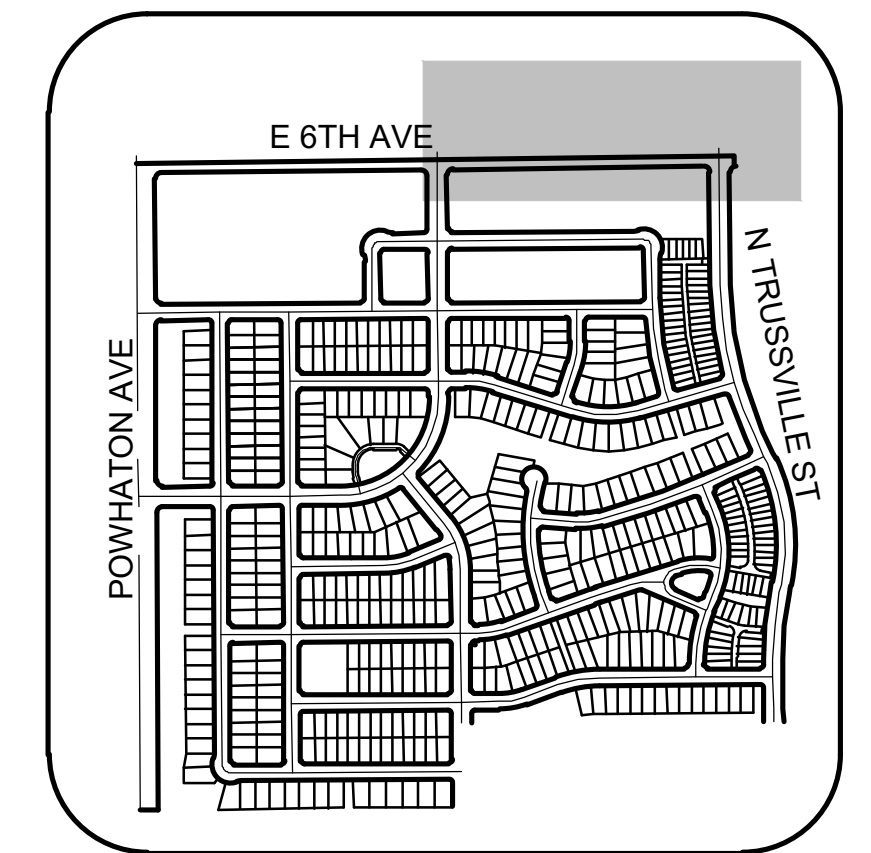


MATCHLINE - SEE SHEET 3



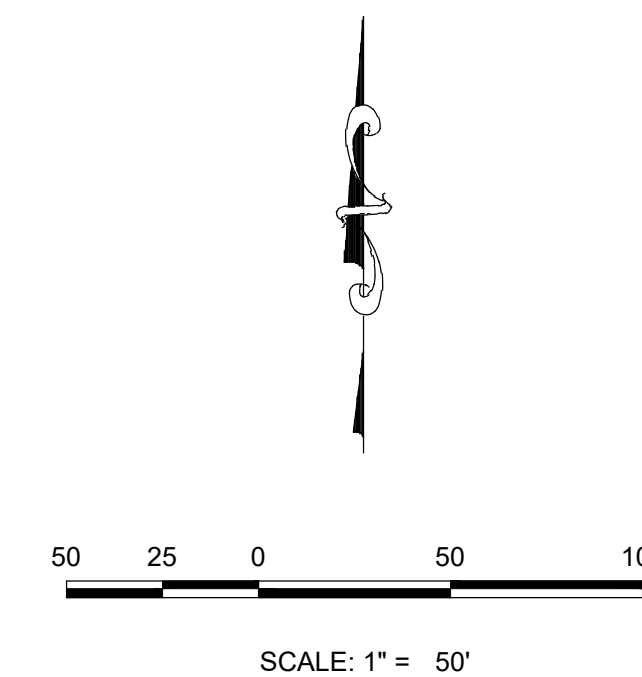
STORM SEWER SYSTEM:

1. BMP'S AND EROSION CONTROL MEASURES SHALL BE INSTALLED TO MINIMIZE EROSION AND REDUCE EROSION CHARACTERISTICS AT CULVERT CROSSINGS AND WITHIN EXISTING CHANNEL CONVEYANCE PATHS.



## LEGEND

- |  |                                    |
|--|------------------------------------|
|  | PROPOSED CURB<br>AND GUTTER        |
|  | PROPOSED STREET LIGHT<br>180' TYP. |
|  | PROPOSED FIRE HYDRANT              |
|  | EXISTING FIRE HYDRANT              |
|  | PROPOSED SIDEWALK                  |
|  | PROPOSED CURB RETURN               |
|  | SIDEWALK RAMP                      |
|  | PROPOSED TEMPORARY<br>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<br>GUTTER          |



OWNER:  
PROPERTY RESERVE, INC  
PO BOX 51119  
SALT LAKE CITY, UT 84151-1196

OWNER:  
MELCOR/TC AURORA LLC  
6930 E CHAUNCEY LN STE 135  
PHOENIX, AZ 85054-5171

HARMONY SITE PLAN 6  
N ROBERTSDALE ST

42' PROPOSED ROW  
BY SEPARATE DOCUMENT


— PROPOSED SLOPE  
EASEMENT

MATCHLINE - SEE SHEET 5

TIS identifies this as  
signalized in future,  
show signal  
easements, south side  
only

Added signal easements to south side

PROPOSED SLOPE  
EASEMENT

SHEET NUMBER  <b>4</b>	DRAWN BY: DJG	SCALE: AS SHOWN	POWHATON ROAD METRO DISTRICT INFRASTRUCTURE SITE PLAN NO. 6 ROW AND EASEMENT PLAN	POWHATON ROAD METRO DISTRICT C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127  Tel: (303) 920-9400 Fax: (303) 920-9440	 <a href="http://Westwoods.com">Westwoods.com</a> 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwood Professional Services, Inc.				
	CHECKED BY: BFW	FILE NO: 8130214922							
	DATE: DECEMBER 2022								
						No.	Revisions	Date	Appr.

# Westwood

Westwoodps.com  
 ENGLEWOOD, CO 80112  
 SUITE 240  
 TEL: 720.482.9526  
 Westwood Professional Services, Inc.

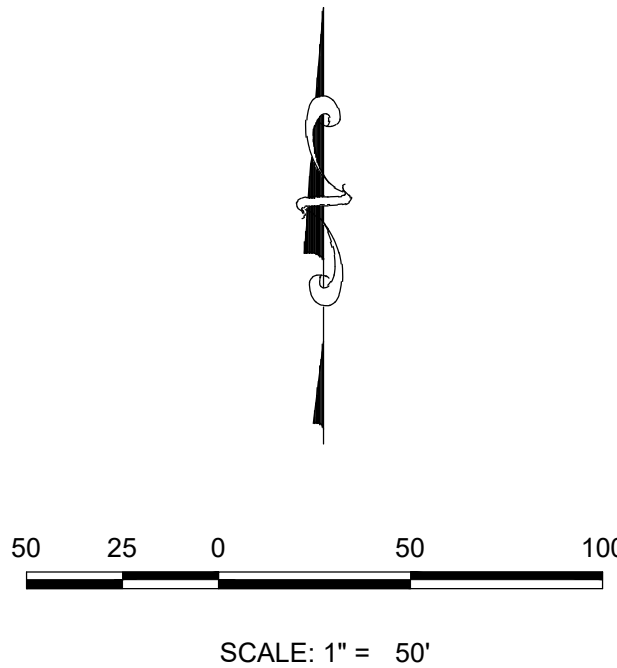
**POWHATON ROAD METRO DISTRICT**  
**C/O Marathon Land Company**  
9750 W. Cambridge Place  
Littleton, CO 80127

Littleton, CO 80127  
Tel: (303) 920-9400 Fax: (303)

**POW-HATON ROAD METRO DISTRICT  
INFRASTRUCTURE SITE PLAN NO. 6  
ROW AND EASEMENT PLAN**

DRAWN BY:	DJG	SCALE:	AS SHOWN
CHECKED BY:	BPW	FILE NO:	8130214922
DATE:	DECEMBER 2022		

4
























- ROADWAY CONSTRUCTION:**
1. THE IMPROVEMENTS PROPOSED WITH THIS INFRASTRUCTURE SITE PLAN MUST BE COMPLETED PRIOR TO ISSUANCE OF CERTIFICATES OF OCCUPANCY FOR HARMONY FILM 16 HOMES.
  2. THE DEVELOPER IS RESPONSIBLE FOR STRIPING, PLACING TRAFFIC CONTROL SIGNS AND GUIDE SIGNS ON E 6TH AVENUE AND POWHATON ROAD.
  3. 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.
  4. ALL PAVING AND CURBING IS IDENTIFIED AS SHOWN ON THESE PLANS.
  5. THE METRO DISTRICT IS RESPONSIBLE FOR STREET LIGHTS ALONG THE SOUTH SIDE OF E 6TH AVENUE AND THE WEST SIDE OF POWHATON ROAD.

- STORM SEWER SYSTEM:**
1. BMP'S AND EROSION CONTROL MEASURES SHALL BE INSTALLED TO MINIMIZE EROSION AND REDUCE EROSION CHARACTERISTICS AT CULVERT CROSSINGS AND WITHIN EXISTING CHANNEL CONVEYANCE PATHS.



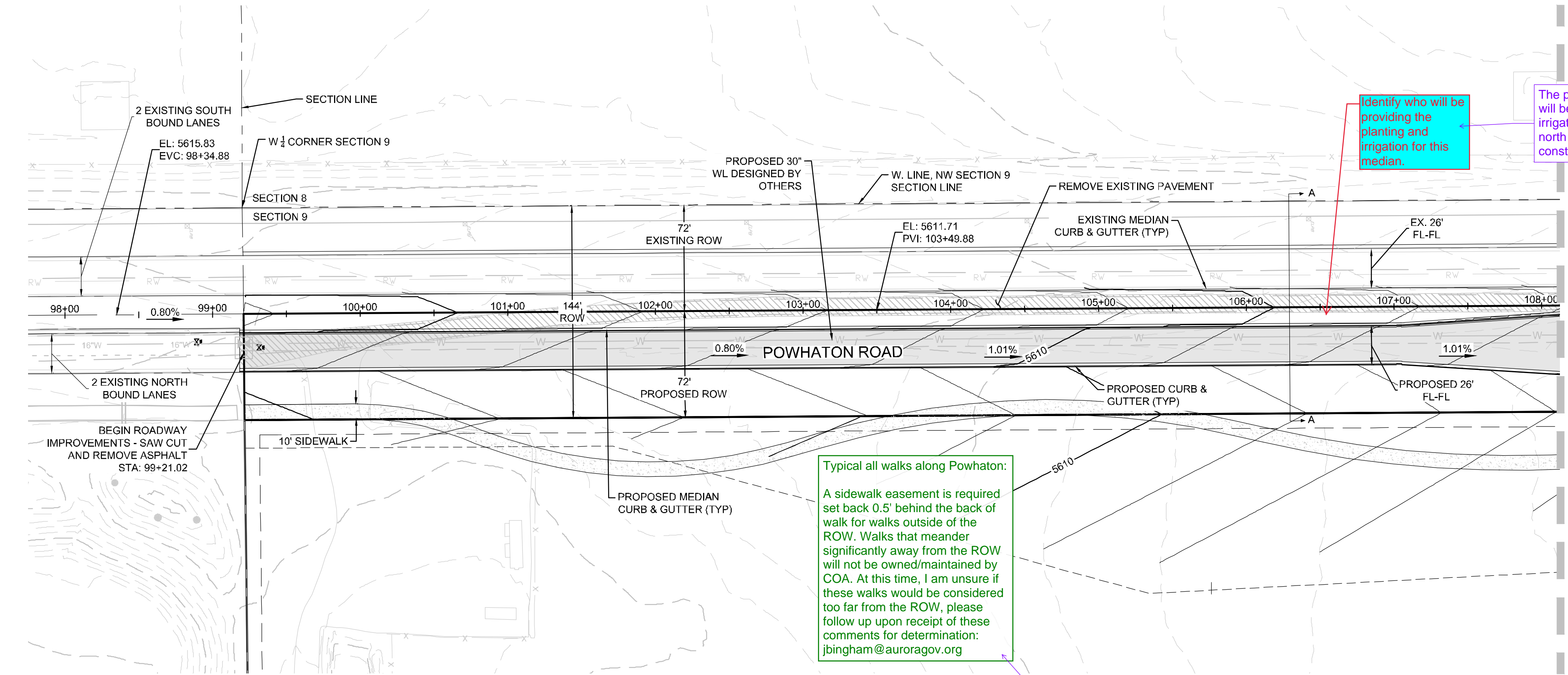
## LEGEND

- |   |                                       |
|---|---------------------------------------|
|    | PROPOSED CURB<br>& GUTTER             |
|    | PROPOSED STREET LIGHT<br>180" TYP.    |
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|    | PROPOSED MANHOLE                      |
|    | PROPOSED PAVEMENT                     |
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|    | PUBLIC STREET CROWN LINE              |
|    | PUBLIC STREET RIGHT-OF-WAY            |
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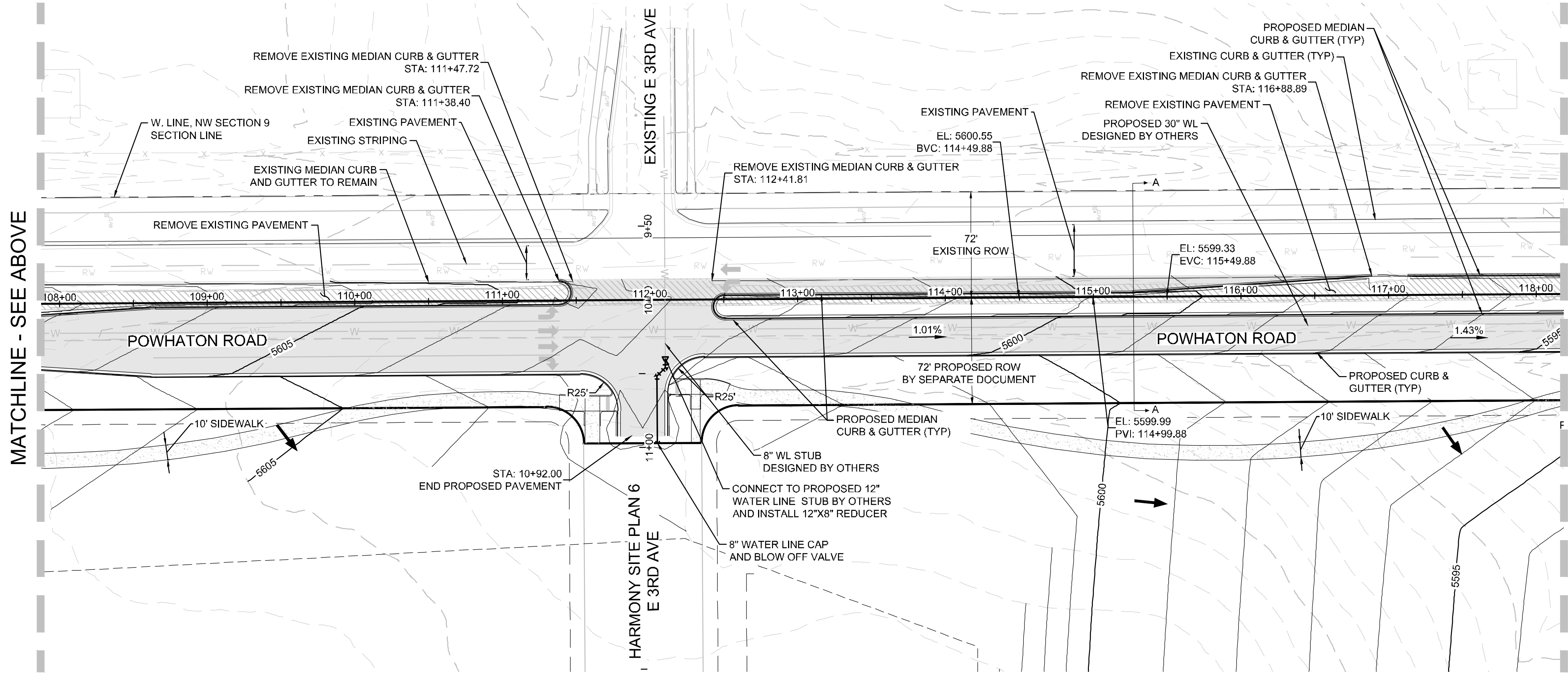
SHEET NUMBER  <b>5</b>	DRAWN BY: DJG		SCALE:	POWHATON ROAD METRO DISTRICT															
	CHECKED BY: BPW		FILE NO:	INFRASTRUCTURE SITE PLAN NO. 6		C/O Marathon Land Company													
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						Littleton, CO 80127													
						Tel: (303) 920-9400 Fax: (303) 920-9440													
				 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 <a href="http://Westwoodps.com">Westwoodps.com</a> Westwood Professional Services, Inc.				No.		Revisions		Date		Init.		Appr.		Date	



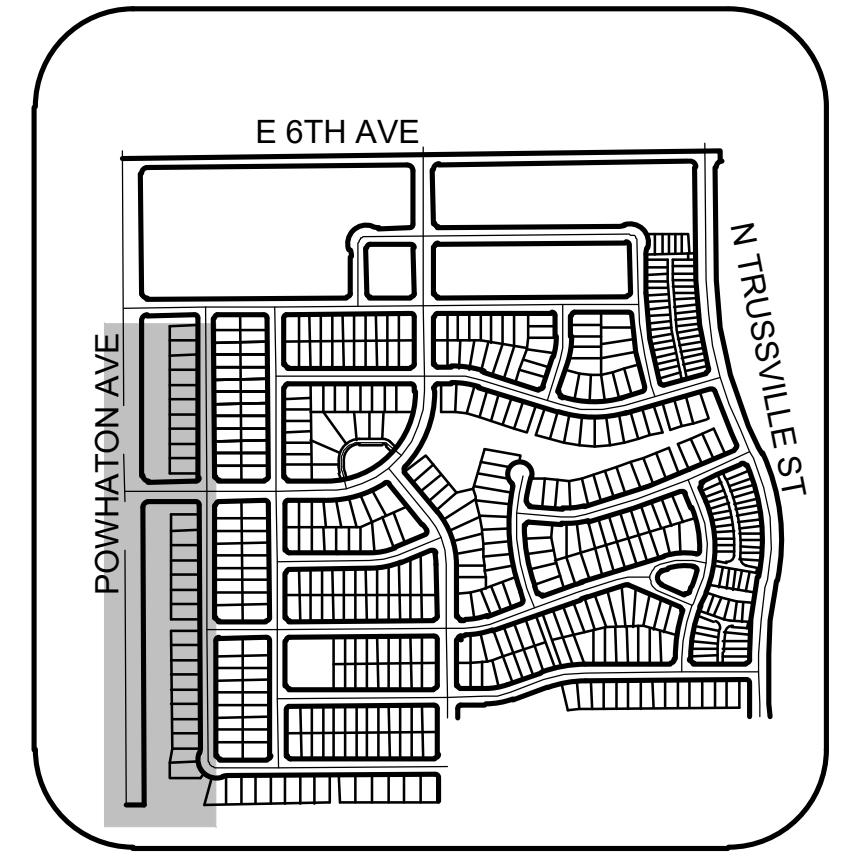
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MATCHLINE - SEE BELOW

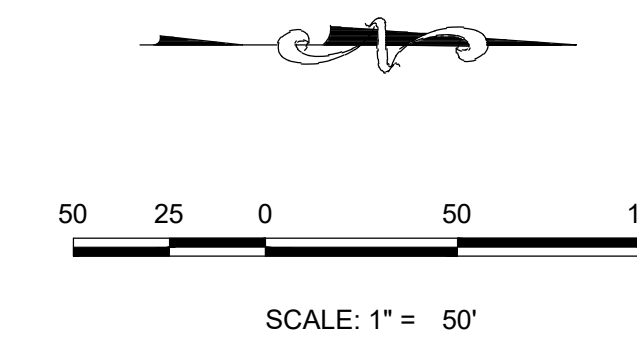
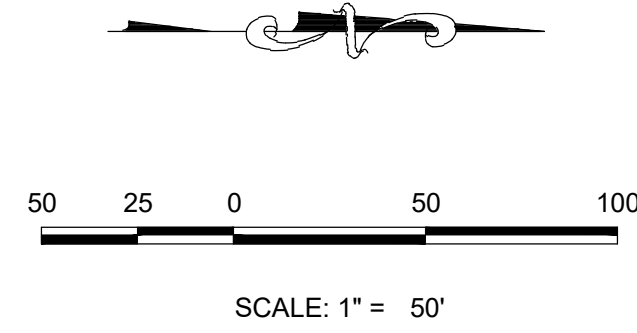


MATCHLINE - SEE SHEET 7



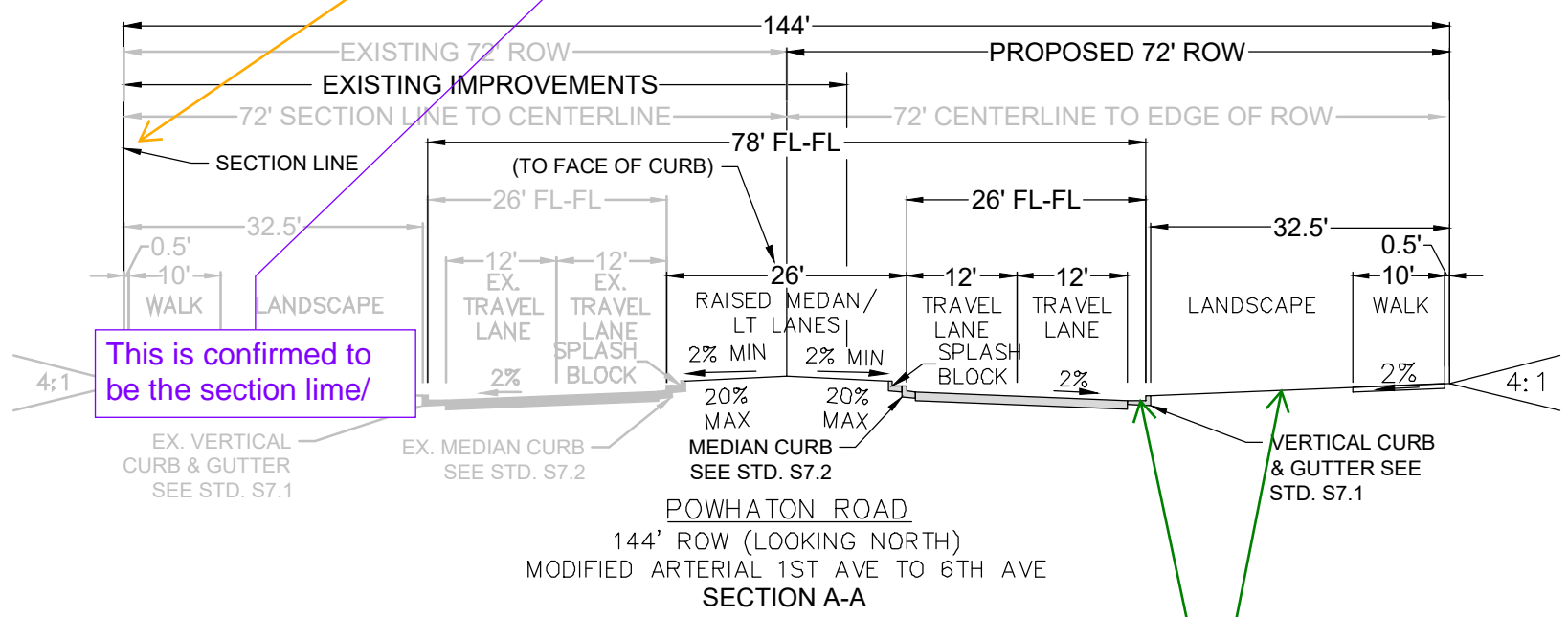
#### LEGEND

- 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



Traffic comments on ROW/Easement plan on need for signing/stripping, and other notes apply here.

Is this the section line? It appears Powhatan south of here has section line running through the SB travel lanes. Confirmation needed.



This does not match the PIP section.

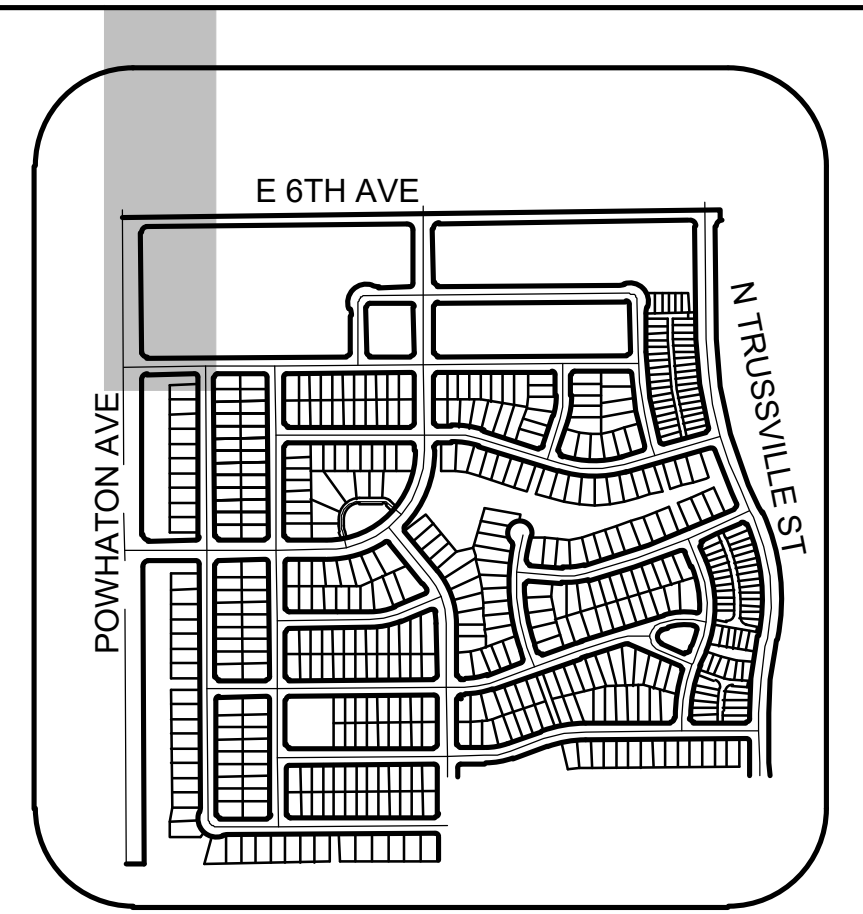
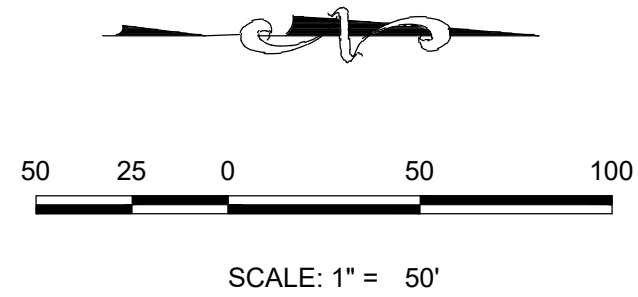
This section should now match in the Master PIP

#### NOTES:

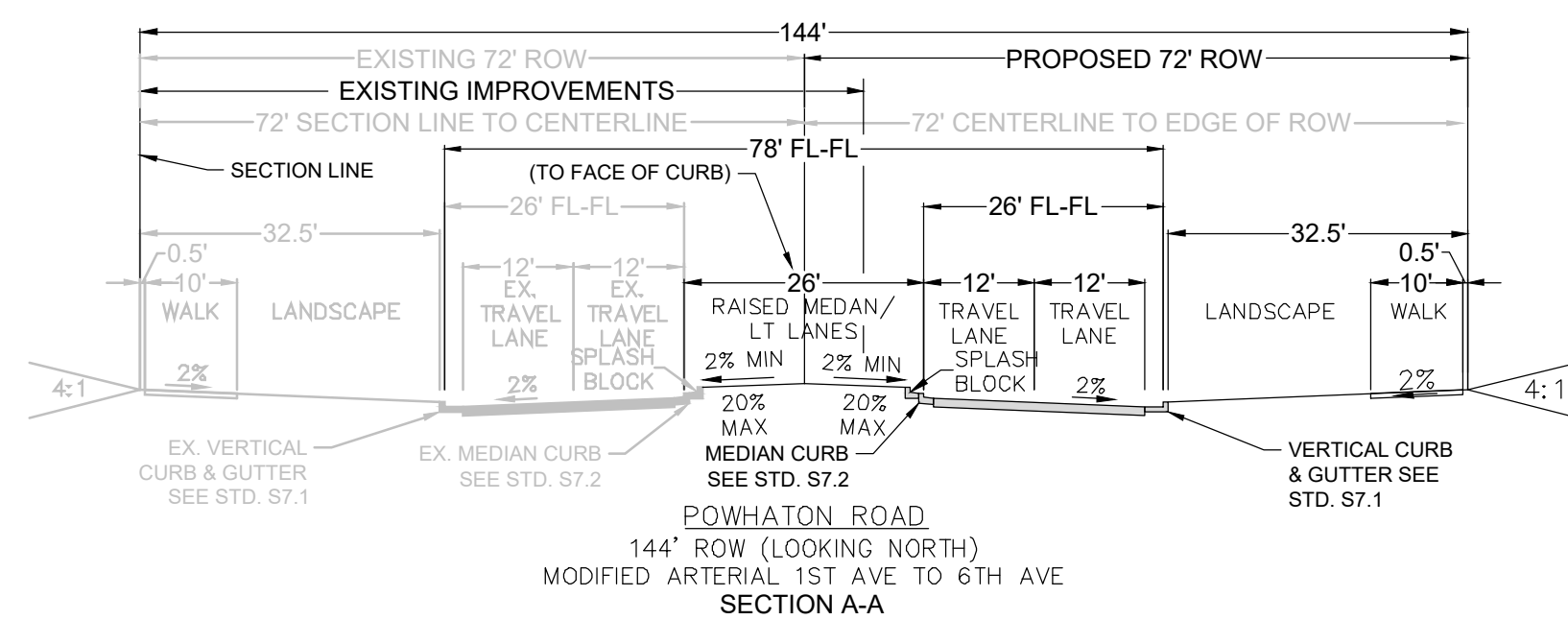
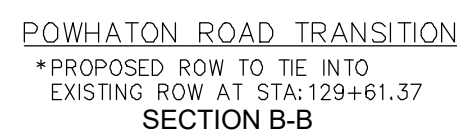
- ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED
- PONDS SHALL BE OWNED AND MAINTAINED BY THE METRO DISTRICT

SHEET NUMBER <b>6</b>	DRAWN BY: STF	SCALE: AS SHOWN	POWATHON ROAD METRO DISTRICT INFRASTRUCTURE SITE PLAN NO. 6	POWATHON ROAD METRO DISTRICT C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	Westwood 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodps.com Westwood Professional Services, Inc.	Revisions No.	Init.	Apr.	Date
	CHECKED BY: BPW	FILE NO: 8130214922	Date						
	DATE: DECEMBER 2022								






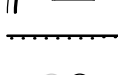

















MATCHLINE - SEE SHEET 8



## 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
	PROPOSED 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

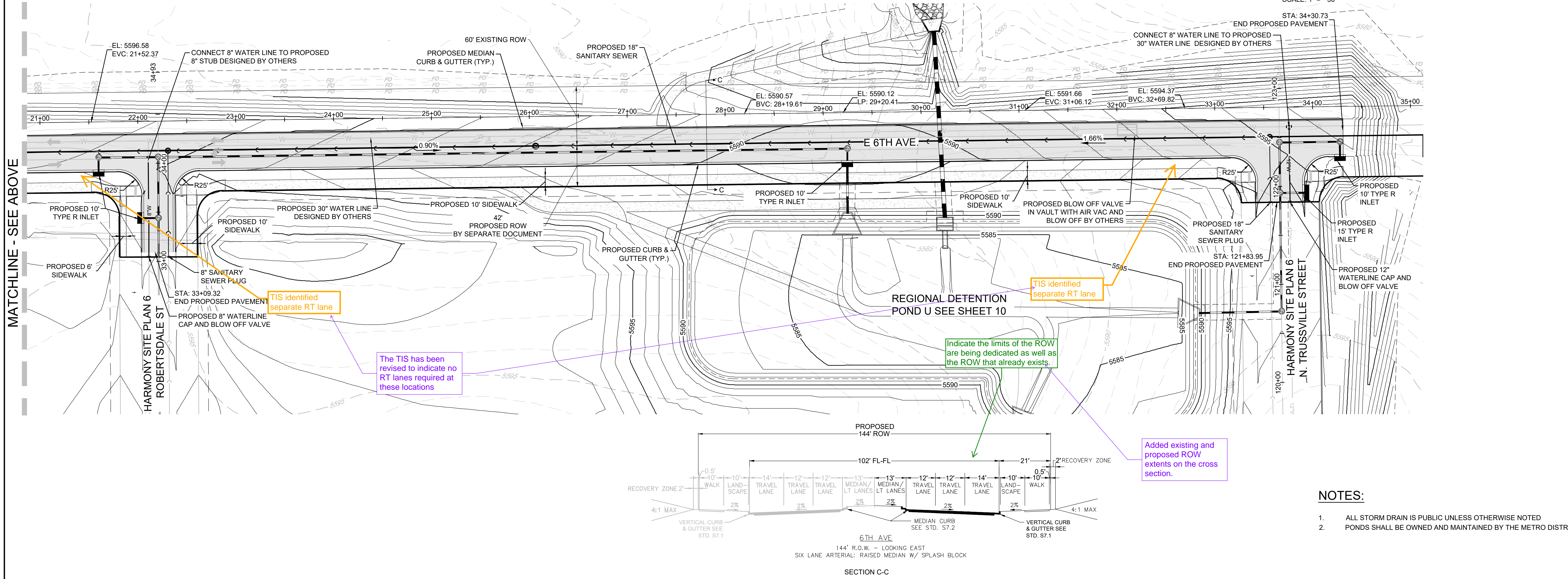
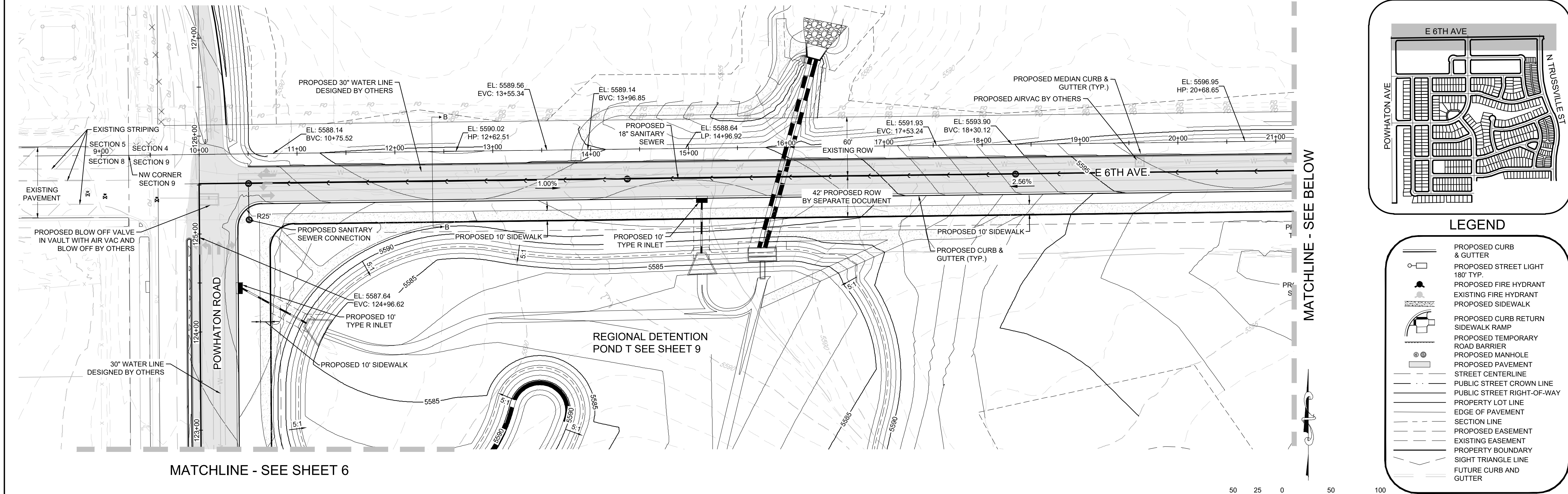
NOTES:

1. ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED
2. PONDS SHALL BE OWNED AND MAINTAINED BY THE METRO DISTRICT

SHEET NUMBER  7	DRAWN BY:	SCALE:	POW HATON ROAD METRO DISTRICT INFRASTRUCTURE SITE PLAN NO. 6 POW HATON ROAD PLAN VIEW	POW HATON ROAD METRO DISTRICT C/O Marathon Land Company 9750 W. Cambridge Place Boulder, CO 80121 Tel: (303) 920-9400 Fax: (303) 920-9440 Tel: (303) 920-9400 Fax: (303) 920-9440 Westwoods.com Westwood Professional Services, Inc.	10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.462.9526								
	CHECKED BY:	AS SHOWN											
	DATE:	FILE NO:											
	DECEMBER 2022	8130214922											
						No.	Revisions	Date	Init.	Appr.			



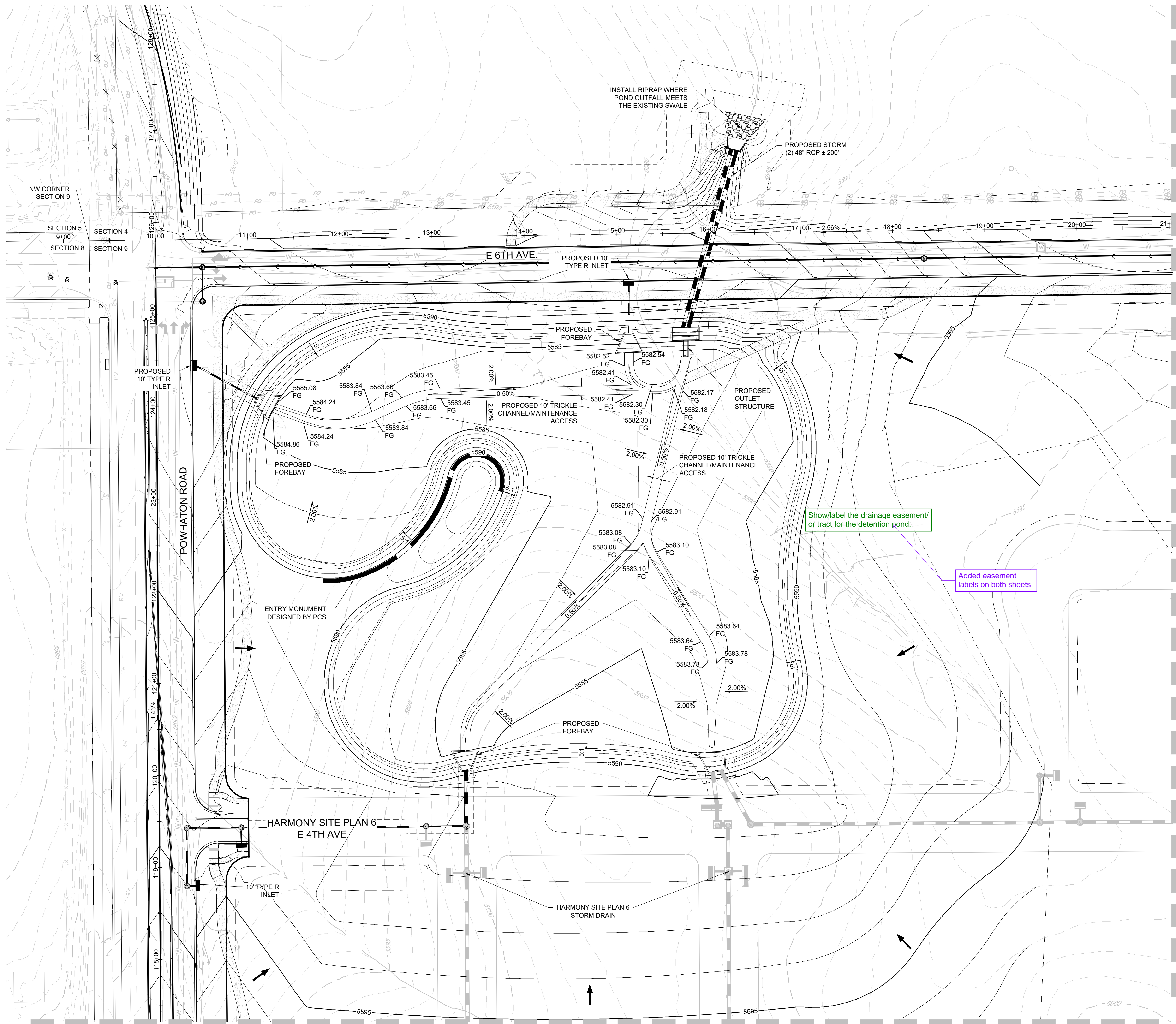
N:\PROJECTS\30175604 SAND CREEK\CAD\ENGINEERING\SHSHEET SETS\CS\SITE PLAN 715P\6TH AVE PLAN VIEW.DWG, BPWILSON, 12/20/22



SHEET NUMBER	DRAWN BY: STF	CHECKED BY: BPW	DATE: DECEMBER 2022	SCALE: AS SHOWN	POW HATON ROAD METRO DISTRICT INFRASTRUCTURE SITE PLAN NO. 6	POW HATON ROAD METRO DISTRICT C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	Revisions	No.	Date	Init.	Apr.	Date
<div>Westwood</div> <div>10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526</div> <div>Westwoodpc.com Westwood Professional Services, Inc.</div>												



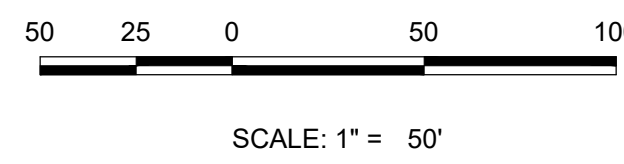
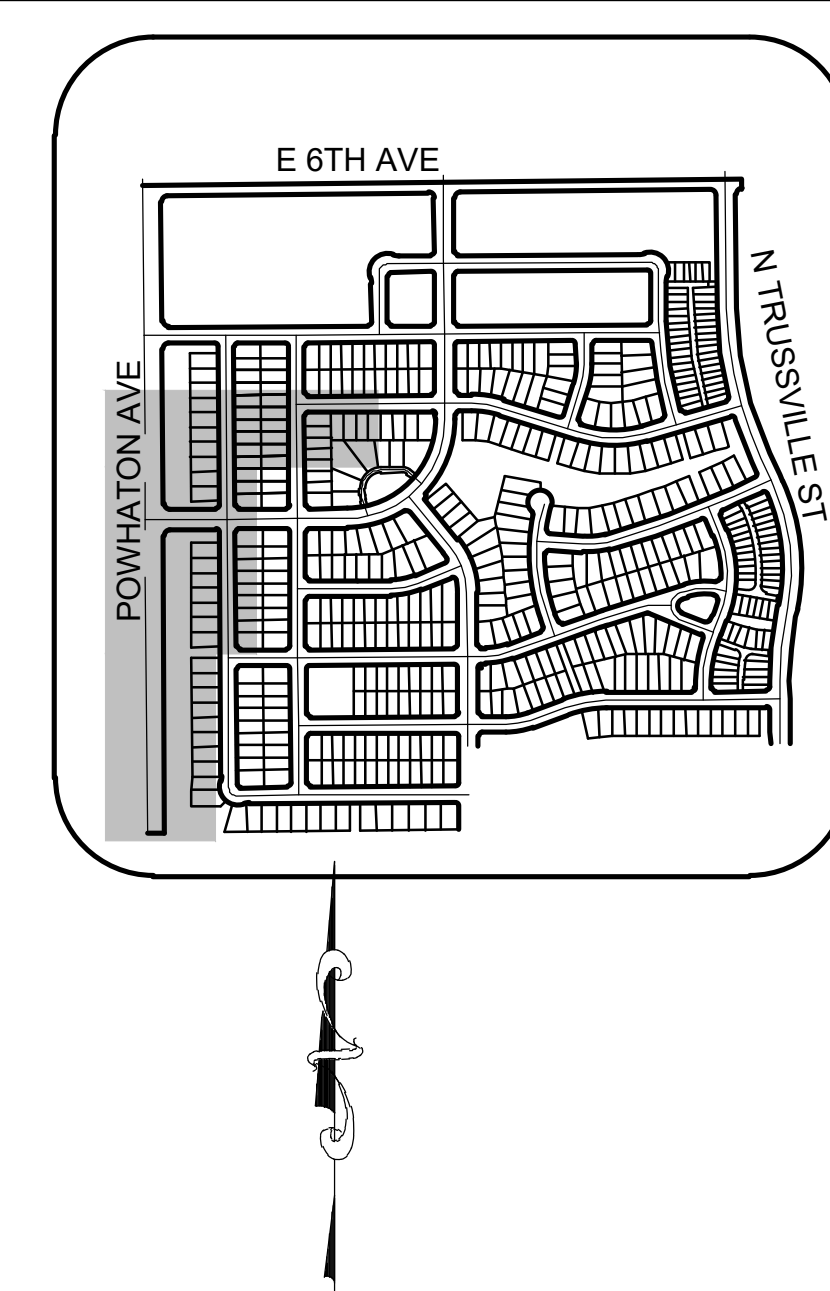
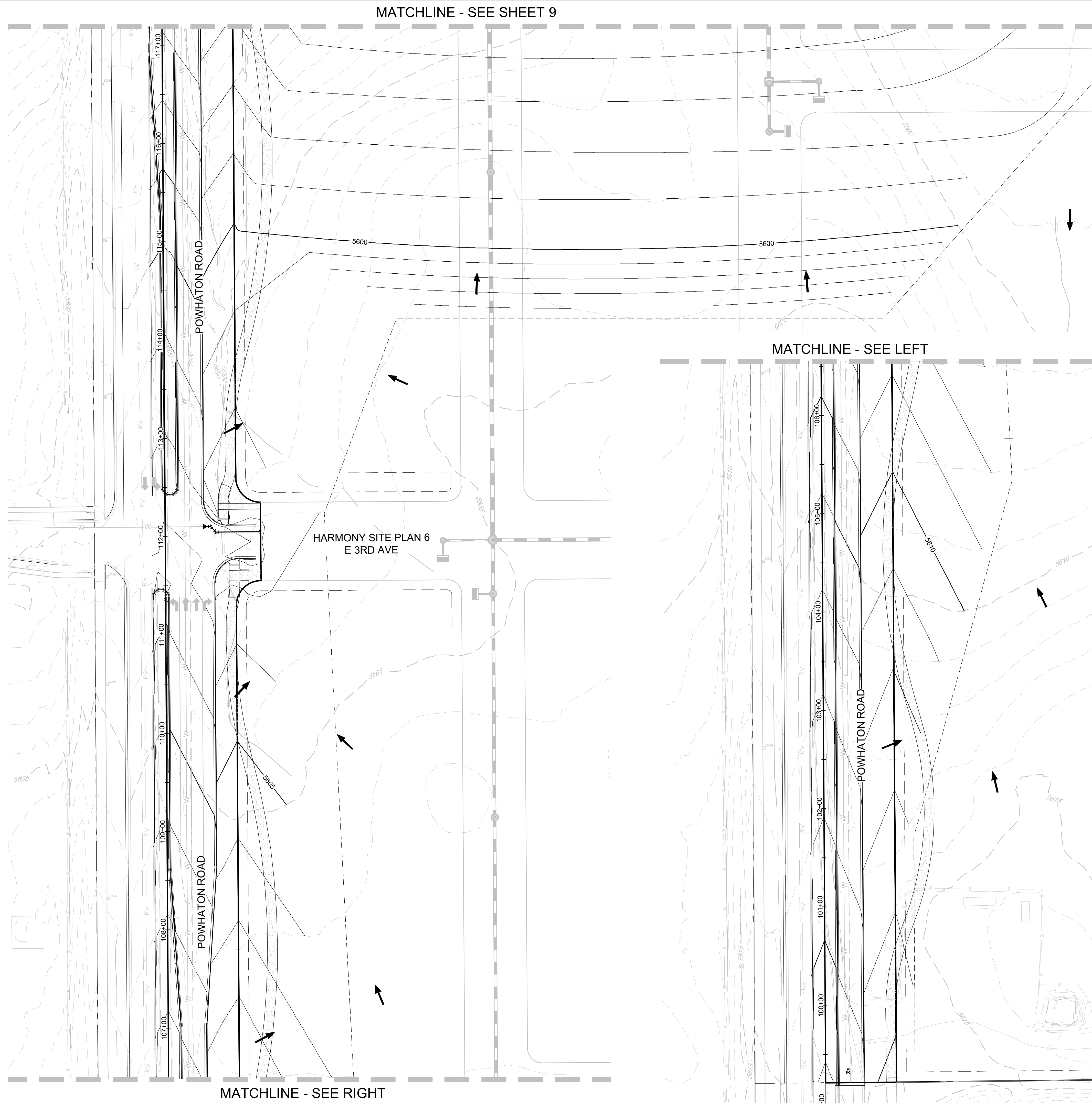
N:\PROJECTS\30175604 SAND CREEK\CAD\ENGINEERING\30175604 SITE\30175604 SITE PLAN 715P\STORM PLAN VIEW.DWG, BPWILSON, 12/20/22
























LEGEND	
 5640 	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
 5640 	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED OVERLAND FLOW
 	FILING BOUNDARY
	PROPOSED STORM INLET
	PROPOSED FLARED END SECTION
	PROPOSED STORM DRAIN

**NOTES:**

1. ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED
2. PONDS SHALL BE OWNED AND MAINTAINED BY THE METRO DISTRICT

SHEET NUMBER	DRAWN BY:	SCALE:	POWHATON ROAD METRO DISTRICT INFRASTRUCTURE SITE PLAN NO. 6  AREA GRADING	POWHATON ROAD METRO DISTRICT C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127  Tel: (303) 920-9400 Fax: (303) 920-9440	  <a href="http://Westwoodsps.com">Westwoodsps.com</a> 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwood Professional Services, Inc.					
	CHECKED BY:	AS SHOWN								
	DATE:	FILE NO:								
	STF	8130214922								
	BPW	DECEMBER 2022								



# HARMONY SUBDIVISION FILING NO. 16

Updated SITUATED IN OF THE NORTH HALF OF SECTION 9, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6th P.M.,  
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO  
SHEET # 1? OF 10

## LEGAL DESCRIPTION:

KNOW ALL PEOPLE BY THESE PRESENTS, THAT THE UNDERSIGNED WARRANT THEY ARE THE OWNERS OF A PARCEL OF LAND, LOCATED IN THE NORTH HALF OF SECTION 9, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE WEST QUARTER CORNER OF SAID SECTION 9, BEING MONUMENTED BY A 3-1/4"DIAMETER ALUMINUM CAP ON A NO. 6 REBAR SET FLUSH WITH THE EXISTING GROUND, STAMPED "T4S R65W 1/4 S8/S9 2022 PLS 25369", FROM WHENCE THE NORTHWEST CORNER OF SAID SECTION 9, BEING MONUMENTED BY A 3-1/4" DIAMETER ALUMINUM CAP ON A NO. 6 REBAR IN A RANGE BOX STAMPED "T4S R65W S5/S4/S8/S9 2022 PLS 25369", BEARS NORTH 00°22'06" WEST, A DISTANCE OF 2660.27 FEET, WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO;

THENCE NORTH 89°21'50"EAST ALONG THE SOUTH LINE OF THE NORTHWEST QUARTER OF SAID SECTION 9, A DISTANCE OF 144.00 FEET TO A POINT ON THE EASTERLY RIGHT OF WAY LINE OF POWHATON ROAD AS DESCRIBED IN THE SPECIAL WARRANTY DEED RECORDED AT RECEPTION NUMBER [REDACTED] IN THE RECORDS OF THE ARAPAHOE COUNTY CLERK AND RECORDER, SAID POINT BEING THE POINT OF BEGINNING;

THENCE ALONG SAID EASTERLY RIGHT OF WAY LINE THE FOLLOWING TEN (10) COURSES:

1. NORTH 00°22'06" WEST, A DISTANCE OF 1208.10 FEET TO A POINT OF CURVATURE;
2. ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°00'00", AN ARC LENGTH OF 39.27 FEET, THE CHORD OF WHICH BEARS NORTH 44°37'54" EAST, 35.36 FEET TO A POINT OF NON TANGENCY;
3. NORTH 00°22'06" WEST, A DISTANCE OF 80.00 FEET TO A POINT OF NON TANGENT CURVATURE;
4. ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°00'00", AN ARC LENGTH OF 39.27 FEET, THE CHORD OF WHICH BEARS NORTH 45°22'06" WEST, 35.36 FEET TO A POINT OF TANGENCY;
5. NORTH 00°22'06" WEST, A DISTANCE OF 626.50 FEET TO A POINT OF CURVATURE;
6. ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°00'00", AN ARC LENGTH OF 39.27 FEET, THE CHORD OF WHICH BEARS NORTH 44°37'54" EAST, 35.36 FEET TO A POINT OF NON TANGENCY;
7. NORTH 00°22'06" WEST, A DISTANCE OF 64.00 FEET TO A POINT OF NON TANGENT CURVATURE;
8. ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°00'00", AN ARC LENGTH OF 39.27 FEET, THE CHORD OF WHICH BEARS NORTH 45°22'06" WEST, 35.36 FEET TO A POINT OF TANGENCY;
9. NORTH 00°22'06" WEST, A DISTANCE OF 485.01 FEET TO A POINT OF CURVATURE;
10. ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 89°39'22", AN ARC LENGTH OF 39.12 FEET, THE CHORD OF WHICH BEARS NORTH 44°27'35" EAST, 35.25 FEET TO A POINT OF TANGENCY, SAID POINT BEING A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF E. 6<sup>TH</sup> AVENUE AS DESCRIBED IN THE SPECIAL WARRANTY DEED RECORDED AT RECEPTION NUMBER [REDACTED] IN THE RECORDS OF THE ARAPAHOE COUNTY CLERK AND RECORDER;

THENCE ALONG SAID SOUTHERLY RIGHT OF WAY LINE THE FOLLOWING NINE (9) COURSES:

1. NORTH 89°17'16" EAST, A DISTANCE OF 1058.52 FEET TO A POINT OF CURVATURE;
2. ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°20'38", AN ARC LENGTH OF 39.42 FEET, THE CHORD OF WHICH BEARS SOUTH 45°32'25" EAST, 35.46 FEET;
3. SOUTH 00°22'06" EAST, A DISTANCE OF 41.36 FEET;
4. NORTH 89°37'54" EAST, A DISTANCE OF 80.00 FEET;
5. NORTH 00°22'06" WEST, A DISTANCE OF 42.14 FEET TO A POINT OF CURVATURE;
6. ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 89°39'22", AN ARC LENGTH OF 39.12 FEET, THE CHORD OF WHICH BEARS NORTH 44°27'35" EAST, 35.25 FEET;
7. NORTH 89°17'16" EAST, A DISTANCE OF 1015.79 FEET TO A POINT OF CURVATURE;
8. ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°00'08", AN ARC LENGTH OF 39.27 FEET, THE CHORD OF WHICH BEARS SOUTH 45°42'40" EAST, 35.36 FEET TO A POINT OF NON TANGENCY;
9. NORTH 89°17'11" EAST, A DISTANCE OF 80.00 FEET;

THENCE SOUTH 00°42'35" EAST, A DISTANCE OF 458.08 FEET TO A POINT OF CURVATURE;

THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 1460.00 FEET, A CENTRAL ANGLE OF 24°00'47", AN ARC LENGTH OF 611.90 FEET, THE CHORD OF WHICH BEARS SOUTH 12°42'59" EAST, 607.43 FEET;

THENCE SOUTH 24°43'23" EAST, A DISTANCE OF 125.82 FEET TO A POINT OF CURVATURE;

THENCE ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 840.00 FEET, A CENTRAL ANGLE OF 36°13'18", AN ARC LENGTH OF 531.04 FEET, THE CHORD OF WHICH BEARS SOUTH 06°36'44" EAST, 522.24 FEET;

THENCE SOUTH 11°29'56" WEST, A DISTANCE OF 32.92 FEET TO A POINT CURVATURE;

THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 1260.00 FEET, A CENTRAL ANGLE OF 11°53'58", AN ARC LENGTH OF 261.68 FEET, THE CHORD OF WHICH BEARS SOUTH 05°32'57" WEST, 261.21 FEET;

THENCE SOUTH 00°24'02" EAST, A DISTANCE OF 205.32 FEET TO A POINT OF CURVATURE;

THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 1960.00 FEET, A CENTRAL ANGLE OF 01°26'58", AN ARC LENGTH OF 49.58 FEET, THE CHORD OF WHICH BEARS SOUTH 01°07'31" EAST, 49.58 FEET TO A POINT OF NON TANGENCY;

THENCE SOUTH 89°35'58" WEST, A DISTANCE OF 3.00 FEET TO A POINT BEING THE NORTHEASTERLY CORNER OF APS P-8 AT HARMONY SUBDIVISION FILING NO. 1, AS RECORDED AT RECEPTION NO. D9077963 IN THE RECORDS OF THE ARAPAHOE COUNTY CLERK AND RECORDER;

THENCE ALONG THE BOUNDARY OF SAID APS P-8 AT HARMONY SUBDIVISION FILING NO. 1 THE FOLLOWING TWO (2) COURSES:

1. CONTINUING SOUTH 89°35'58" WEST, A DISTANCE OF 1345.37 FEET;
2. SOUTH 00°23'59" EAST, A DISTANCE OF 338.99 FEET TO A POINT ON THE SOUTH LINE OF THE NORTHWEST QUARTER OF SAID SECTION 9, SAID POINT ALSO BEING A POINT ON THE NORTHERLY BOUNDARY OF HARMONY SUBDIVISION FILING NO. 1, AS RECORDED AT RECEPTION NO. D7146217 IN THE RECORDS OF THE ARAPAHOE COUNTY CLERK AND RECORDER;

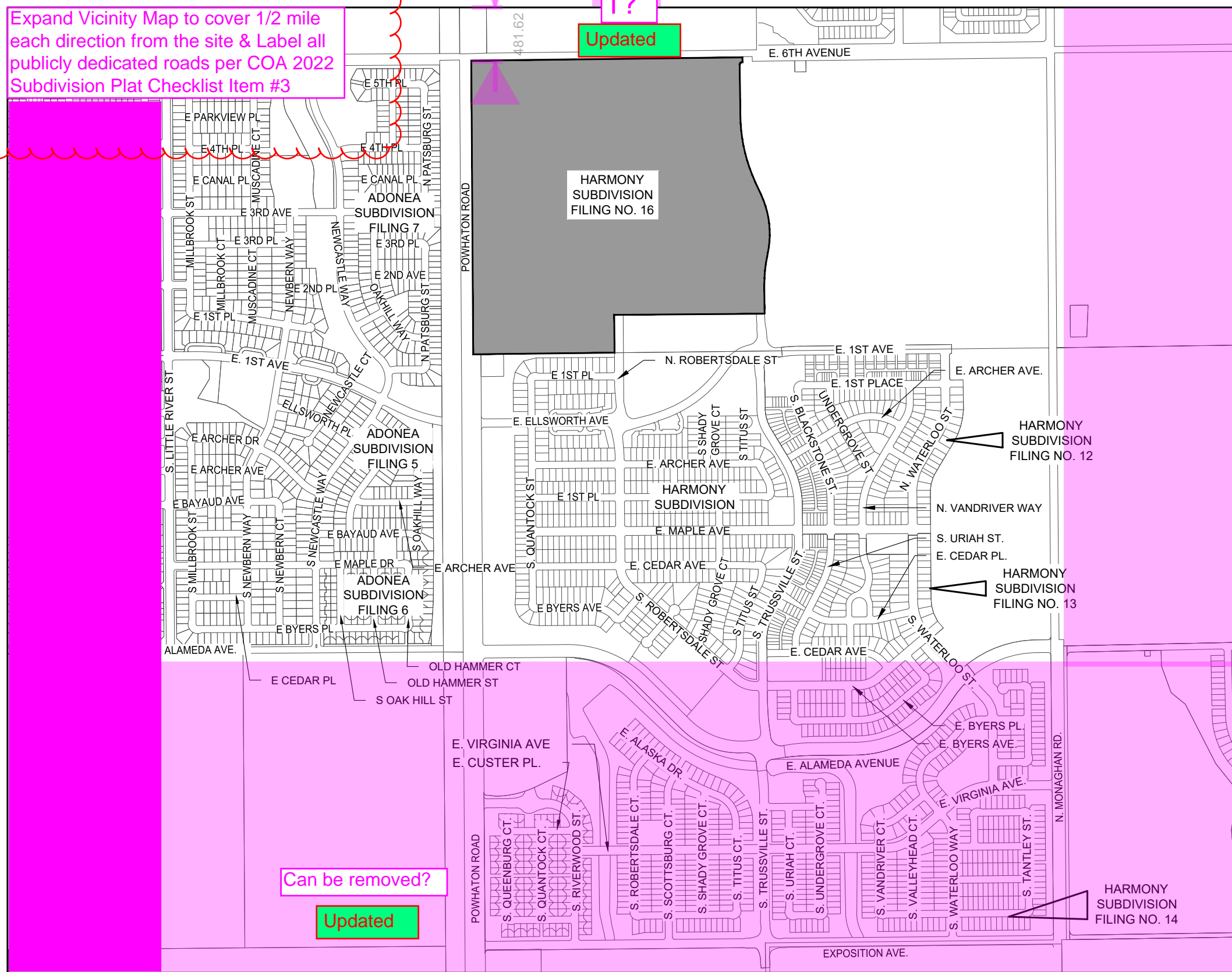
THENCE SOUTH 89°21'50" WEST ALONG THE SOUTH LINE OF SAID NORTHWEST QUARTER AND ALONG THE NORTHERLY LINE OF SAID HARMONY SUBDIVISION FILING NO. 1, A DISTANCE OF 1194.49 FEET TO THE POINT OF BEGINNING,

SAID PARCEL CONTAINING A CALCULATED AREA OF 5,938,025 SQUARE FEET OR 136.318 ACRES, MORE OR LESS, AND BEING SUBJECT TO ANY EXISTING EASEMENTS AND/OR RIGHTS OF WAY OF WHATSOEVER NATURE.

Have laid out, platted, and subdivided the same into Lots, Blocks, and Tracts as shown on this plat under the name and style of HARMONY SUBDIVISION FILING NO. 16 and by these presents do hereby dedicate to the City of Aurora, Colorado, for the perpetual use of the public, the streets, and easements, as shown hereon and not previously dedicated to the public.

OWNER: \_\_\_\_\_

MELCOR/TC AURORA LLC, A COLORADO LIMITED LIABILITY COMPANY	ROBYN SALIK	VICE--PRESIDENT
SIGNATURE _____	PRINT NAME _____	PRINT TITLE _____
	NAOMI STEFURA	SECRETARY--TREASURER
SIGNATURE _____	PRINT NAME _____	PRINT TITLE _____



VICINITY MAP  
SCALE: 1" = 1000'

## NOTARIAL:

PROVINCE OF ALBERTA )  
CITY OF EDMONTON )SS

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_ A.D.

BY ROBYN SALIK AS VICE--PRESIDENT AND BY NAOMI STEFURA AS SECRETARY--TREASURER OF MELCOR/TC AURORA LLC, A COLORADO LIMITED LIABILITY COMPANY.

WITNESS MY HAND AND OFFICIAL SEAL

\_\_\_\_\_  
NOTARY PUBLIC

MY COMMISSION EXPIRES: \_\_\_\_\_

## MORTGAGE HOLDER:

THE UNDERSIGNED, CANADIAN IMPERIAL BANK OF COMMERCE, A CHARTERED BANK OF CANADA, AS MORTGAGE HOLDER ON PART OR ALL OF THE HEREIN SHOWN REAL PROPERTY, DOES HEREBY AGREE AND CONSENT TO THE PLATTING OF SAID PROPERTY AS SHOWN HEREON.

MORTGAGE HOLDER \_\_\_\_\_ AS \_\_\_\_\_

MORTGAGE HOLDER \_\_\_\_\_ AS \_\_\_\_\_

## NOTARIAL:

PROVINCE OF ALBERTA )  
CITY OF EDMONTON )SS

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_ A.D.

BY \_\_\_\_\_, AND BY \_\_\_\_\_ AS DIRECTORS OF REAL ESTATE OF CANADIAN IMPERIAL BANK OF COMMERCE, A CHARTERED BANK OF CANADA.

WITNESS MY HAND AND OFFICIAL SEAL

\_\_\_\_\_  
NOTARY PUBLIC

MY COMMISSION EXPIRES: \_\_\_\_\_

## NOTES:

1. RIGHT-OF-WAY FOR INGRESS AND EGRESS FOR SERVICE AND EMERGENCY VEHICLES IS GRANTED OVER, ACROSS, ON, AND THROUGH ANY AND ALL PRIVATE ROADS, WAYS, AND FIRE LANES NOW OR HEREAFTER ESTABLISHED ON THE DESCRIBED PROPERTY. THE SAME ARE HEREBY DESIGNATED AS FIRE LANES AND EMERGENCY AND SERVICE VEHICLE ROADS, AND SHALL BE POSTED "NO PARKING -- FIRE LANE".
2. BASIS OF BEARINGS: BEARINGS ARE BASED IN ACCORDANCE WITH THE CITY OF AURORA HORIZONTAL CONTROL, UPON THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, BEING MONUMENTED BY A 3-1/4" DIAMETER ALUMINUM CAP ON A NO. 6 REBAR SET FLUSH WITH THE EXISTING GROUND, STAMPED "T4S R65W 1/4 S8/S9 2022 PLS 25369", FROM WHENCE THE NORTHWEST CORNER OF SAID SECTION 9, BEING MONUMENTED BY A 3-1/4" DIAMETER ALUMINUM CAP ON A NO. 6 REBAR IN A RANGE BOX, STAMPED "T4S R65W S5/S4/S8/S9 2022 PLS 25369", BEARS NORTH 00°22'06" WEST, A DISTANCE OF 2660.27 FEET, WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO.
3. THE EASEMENT AREA WITHIN EACH LOT OR TRACT IS TO BE CONTINUOUSLY MAINTAINED BY THE OWNER OF THE LOT OR TRACT EXCEPTING THE CITY OF AURORA FROM SUCH RESPONSIBILITY. ANY STRUCTURES INCONSISTENT WITH THE USE GRANTED IN THE EASEMENT ARE PROHIBITED.
4. TRACTS A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, AND W ARE TO BE PRIVATELY OWNED AND MAINTAINED.
5. TRACTS L, M, N, S, AND V ARE DEDICATED AS ACCESS, UTILITY, AND FIRE LANE EASEMENTS.
6. ALL OWNERS OF LOTS ADJACENT TO NORTH GREENSBURG STREET, NORTH QUANTOCK STREET, EAST FIRST DRIVE, EAST 2ND PLACE, EAST 2ND AVENUE, EAST 3RD PLACE, EAST 3RD AVENUE, EAST 4TH AVENUE, NORTH RIVERWOOD STREET, EAST 5TH PLACE, NORTH ROBERTSDALE STREET, NORTH TITUS COURT, NORTH TRUSSVILLE STREET, NORTH SHADY GROVE STREET, NORTH SCOTTSBURG COURT, AND NORTH TITUS STREET SHALL BE REQUIRED TO COMPLY WITH REQUIREMENTS OF THE AURORA CITY CODE RESTRICTING THE ABILITY TO BUILD A FENCE ALONG THOSE STREETS OR THE TYPES AND SIZES OF FENCES THAT CAN BE BUILT ALONG THOSE STREETS.
7. THE OWNERS OR OCCUPANTS OF THE LANDS HEREIN DESCRIBED SHALL HAVE NO RIGHT OR CAUSE OF ACTION, EITHER IN LAW OR IN EQUITY, FOR DAMAGES OR INJURY TO ANY PERSON OR PROPERTY ARISING OUT OF OR RESULTING DIRECTLY OR INDIRECTLY, FROM THE OVERFLIGHT OF AIRCRAFT, OR FOR DAMAGES OR INJURY TO ANY PERSON OR PROPERTY RESULTING FROM ANY NOISE, NUISANCE, VIBRATIONS OF ANY KIND OR DESCRIPTION RESULTING, DIRECTLY OR INDIRECTLY, FROM AIRCRAFT OVERFLIGHTS PROVIDED, THAT NOTHING CONTAINED IN THE FOREGOING EASEMENT SHALL DIVEST THE OWNERS OR OCCUPANTS, THEIR HEIRS, SUCCESSORS ADMINISTRATORS OR ASSIGNS, OF ANY RIGHT OR CAUSE OF ACTION FOR DAMAGES TO ANY PERSON OR PROPERTY RESULTING FROM THE NEGLIGENT OPERATION OF AIRCRAFT OVERFLIGHTS OVER THE DESCRIBED PREMISES AT ANY ALTITUDE ABOVE GROUND LEVEL.
8. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACTS ANY PUBLIC LAND SURVEY MONUMENT OR LAND BOUNDARY MONUMENT OR ACCESSORY, COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, C.R.S.
9. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY WESTWOOD PROFESSIONAL SERVICES, INC. TO DETERMINE OWNERSHIP OR EASEMENTS OF RECORD. FOR ALL INFORMATION REGARDING EASEMENTS, RIGHTS-OF-WAY, AND TITLE OF RECORD, WESTWOOD PROFESSIONAL SERVICES, INC. RELIED UPON LAND TITLE GUARANTEE COMPANY TITLE COMMITMENT NUMBER AB070779628, DATED SEPTEMBER 06, 2022 AT 5:00 P.M.
10. THE LINEAL UNIT USED IN THE PREPARATION OF THIS PLAT IS THE U.S. SURVEY FOOT AS DEFINED BY THE UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.
11. ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
12. THE EASEMENTS HEREON SHOWN AND LABELED 6' GAS EASEMENT (6' G.E.) ARE FOR THE EXCLUSIVE USE AS GAS EASEMENTS; EXCEPT OTHER UTILITIES, SERVICE WALKS, AND DRIVEWAYS MAY CROSS SAID EASEMENTS AT SUBSTANTIALLY THE SAME POINTS.
13. NON-EXCLUSIVE SIDEWALK EASEMENTS ARE HEREBY GRANTED TO THE CITY OF AURORA FOR PURPOSES OF MAINTAINING, RECONSTRUCTING, CONTROLLING AND USING SUCH SIDEWALKS TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS; PROVIDED THE CITY SHALL NOT INTERFERE WITH ANY OTHER STRUCTURES OR IMPROVEMENTS.

## COVENANTS:

THE UNDERSIGNED OWNERS, FOR THEMSELVES, THEIR HEIRS, SUCCESSORS AND ASSIGNS, COVENANT AND AGREE WITH THE CITY OF AURORA;

NO STRUCTURE CONSTRUCTED ON ANY PORTION OF THE PLATTED LAND SHOWN HEREIN SHALL BE OCCUPIED OR USED UNLESS AND UNTIL ALL PUBLIC IMPROVEMENTS, AS DEFINED BY CHAPTER 146 OF THE CITY CODE OF AURORA, COLORADO, ARE IN PLACE AND ACCEPTED BY THE CITY OR CASH FUNDS OR OTHER SECURITY FOR THE SAME ARE ESCROWED WITH THE CITY OF AURORA AND A CERTIFICATE OF OCCUPANCY HAS BEEN ISSUED BY THE CITY;

ALL ELECTRICAL, COMMUNITY UTILITY LINES AND SERVICES, AND STREET LIGHTING CIRCUITS, EXCEPT AS PROVIDED IN SECTION 126-505 OF THE CITY CODE AS THE SAME MAY BE AMENDED FROM TIME TO TIME, SHALL BE INSTALLED UNDERGROUND;

ALL CROSSINGS OR ENCROACHMENTS, INCLUDING BUT NOT LIMITED, TO PRIVATE LANDSCAPE IRRIGATION SYSTEMS, UNDERDRAINS, OR PRIVATE UTILITIES INTO EASEMENTS OWNED BY THE CITY OF AURORA ARE ACKNOWLEDGED BY THE UNDERSIGNED AS BEING SUBJECT TO THE CITY OF AURORA'S USE AND OCCUPANCY OF SAID EASEMENTS AND RIGHTS-OF-WAY. THE UNDERSIGNED, THEIR SUCCESSORS AND ASSIGNS, HEREBY AGREE TO INDEMNIFY AND HOLD HARMLESS THE CITY OF AURORA FOR ANY LOSS, DAMAGE, OR REPAIR TO PRIVATE LANDSCAPE IRRIGATION SYSTEMS, UNDERDRAINS, OR PRIVATE UTILITIES THAT MAY RESULT FROM THE CITY OF AURORA'S USE AND OCCUPANCY OR EXERCISE OF ITS RIGHTS IN SAID EASEMENTS AND RIGHTS OF WAY. THE UNDERSIGNED, ITS SUCCESSORS AND ASSIGNS, FURTHER AGREES TO REMOVE, REPAIR, REPLACE, RELOCATE, MODIFY, OR OTHERWISE ADJUST SAID PRIVATE LANDSCAPE IRRIGATION SYSTEMS, UNDERDRAINS, PRIVATE DETENTION POND AND DRAINAGE FEATURES, OR PRIVATE UTILITIES UPON REQUEST FROM THE CITY OF AURORA AND AT NO EXPENSE TO THE CITY OF AURORA.

## CITY OF AURORA APPROVALS:

THE FOREGOING INSTRUMENT IS APPROVED FOR FILING AND CONVEYANCE OF STREETS AND EASEMENTS, AS SHOWN HEREON AND IS ACCEPTED BY THE \_\_\_\_\_

CITY OF AURORA, COLORADO, THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_ A.D. SUBJECT TO THE CONDITION THAT THE CITY SHALL UNDERTAKE MAINTENANCE OF ANY SUCH STREETS ONLY AFTER CONSTRUCTION HAS BEEN COMPLETED BY THE SUBDIVIDER TO THE CITY OF AURORA SPECIFICATIONS.

CITY ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

PLANNING DIRECTOR \_\_\_\_\_ DATE \_\_\_\_\_

## SURVEYOR'S CERTIFICATE:

I HEREBY CERTIFY \_\_\_\_\_ RESPONSIBLE CHARGE OF THE SURVEY WORK USED IN THE PREPARATION OF THIS PLAT; THE POSITIONS OF THE PLATTED CORNERS SHOWN HEREON HAVE AN ACCURACY OF NOT LESS THAN ONE (1) FOOT IN TEN THOUSAND (10,000) FEET PRIOR TO ADJUSTMENTS; AND ALL BOUNDARY MONUMENTS AND CONTROL CORNERS SHOWN HEREON WERE IN PLACE AS DESCRIBED ON AUGUST 29, 2022.

I FURTHER CERTIFY THAT THE INFORMATION CONTAINED HEREIN IS ACCURATE AND IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE TO MY KNOWLEDGE, INFORMATION AND BELIEF. THIS CERTIFICATION IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

WILLIAM F. HESSELBACH, JR., PLS NO. 25369  
FOR AND ON BEHALF OF WESTWOOD

ENGINEER/SURVEYOR

**Westwood**

10333 E. Dry Creek Rd., Suite 240  
Englewood, CO 80112  
Tel: (720) 482-9526 / Fax: (720) 482-9546



# HARMONY SUBDIVISION FILING NO. 16

A PART OF THE NORTH HALF OF SECTION 9, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6th P.M.,  
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO  
SHEET # 2? OF 10

THIS CORNER IS TO BE SET. NEEDS  
A RANGE BOX DRILLED.  
COORDINATED WITH CONTRACTOR  
AND WILL BE SET ONCE RANGE BOX  
IS DRILLED

FOUND or SET?

NW COR SEC. 9  
NO. 6 REBAR WITH A  
3-1/4" ALUMINUM CAP  
IN A RANGE BOX STAMPED  
"WESTWOOD T4S R65W  
S5/S4/S8/S9 2022 PLS 25369"

ADDED

Aurora GIS shows existing  
30' ROW on each side of  
section line? Proclamation?

SW 1/4  
SEC. 4  
UNPLATTED

#  
2?

ADDED

THIS ROW IS IN REVIEW. REC. NO. TO  
BE ADDED AFTER RECORDATION

FOUND

FOUND?

N 1/4 COR SEC. 9  
2-1/2" ALUMINUM CAP  
IN CONCRETE STAMPED "T4S R65W  
1/4 S4/S9 2002 LS 11666"

Add Key Map?

ADDED

ADONEA SUBDIVISION  
FILING NO. 7  
REC. NO. D7122266

THIS IS IN PSCO ROW AND IS  
OFFSITE. SURVEYOR CANNOT  
CONFIRM THIS. ADONEA FIL 7 DOES  
NOT REFERENCE THIS.

Aurora GIS shows  
existing 30' ROW  
on W'y side of  
section line?  
Proclamation?

NE 1/4  
SEC. 8

Add Reception No.  
B8109446? (72' E'ly side of  
section line?)

42' TAG ADDED FOR  
B8109446 ALONG WITH  
30' TAG

THIS ROW IS IN REVIEW. REC. NO. TO  
BE ADDED AFTER RECORDATION

Label Blocks,  
Tracts, and Street  
Names (Typical)

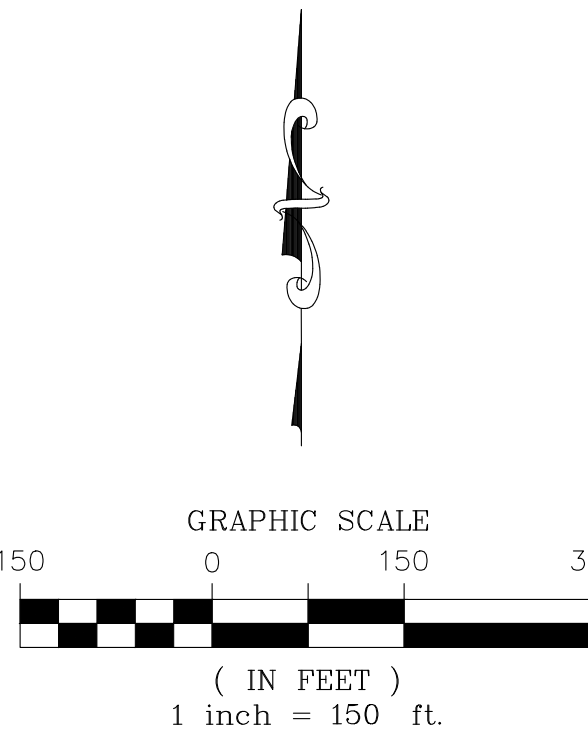
ADDED

HARMONY  
FILING NO. 16  
5,938,025 S.F.  
136.318 AC.  
NW 1/4  
SEC. 9

CURVE TABLE						
CURVE NO.	RADIUS	DELTA	LENGTH	CHORD DIRECTION	CHORD LENGTH	
C1	25.00'	90°00'00"	39.27'	N44°37'54"E	35.36'	
C2	25.00'	90°00'00"	39.27'	N45°22'06"W	35.36'	
C3	25.00'	90°00'00"	39.27'	N44°37'54"E	35.36'	
C4	25.00'	90°00'00"	39.27'	N45°22'06"W	35.36'	
C5	25.00'	89°39'22"	39.12'	N44°27'35"E	35.25'	
C6	25.00'	90°20'38"	39.42'	S45°32'25"E	35.46'	
C7	25.00'	89°39'22"	39.12'	N44°27'35"E	35.25'	
C8	25.00'	90°00'08"	39.27'	S45°42'40"E	35.36'	

LINE TABLE		
LINE NO.	DIRECTION	LENGTH
L1	N00°22'06"W	80.00'
L2	N00°22'06"W	64.00'
L3	S00°22'06"E	41.36'
L4	N89°37'54"E	80.00'
L5	N00°22'06"W	42.14'
L6	N89°17'11"E	80.00'

LEGEND	
	FOUND OR SET SECTION CORNER AS DESCRIBED
	SET NO. 5 REBAR, 30" LONG, w/1-1/4" ORANGE PLASTIC CAP STAMPED WESTWOOD PLS 25369



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HARMONY SUBDIVISION FILING NO. 16 FINAL PLAT J.N. R0031258.00 PREPARED: 10/10/2022 REVISED: SHEET # OF 10

AES Board Rule 1.6.M. Description of Monuments.  
Section 38-51-106(1)(f), C.R.S., requires professional land surveyors to  
provide "a description of all monuments, both found or set, that mark the  
boundaries of the property and of all control monuments used in conducting  
a survey."  
1. Purpose. The purpose of this statute is to identify the physical attributes of  
the monuments and caps **set or found** during the original survey and  
subsequent retracement surveys.  
2. Acceptable description of monuments. Description of monuments found  
or set should include, but not be limited to the physical attributes and size of  
the monument, and the physical attributes and size of the cap.

ADONEA SUBDIVISION  
FILING NO. 7  
REC. NO. D7122266

WESTWOOD  
T4S R65W  
1/4 8+9  
2022  
PLS 25369

POINT OF COMMENCEMENT  
W 1/4 CORNER SEC. 9  
NO. 6 REBAR WITH A  
3-1/4" ALUMINUM CAP  
FLUSH WITH GROUND STAMPED  
"WESTWOOD T4S R65W 1/4  
8/9 2022 PLS 25369"

POINT OF BEGINNING  
TRACT A  
HARMONY SUBDIVISION  
FILING NO. 1  
REC. NO. D7146217

HARMONY SUBDIVISION  
FILING NO. 3  
REC. NO. D8027840

SW 1/4  
SEC. 9

S. LINE, NW 1/4, SECTION 9  
N89°21'50"E 2646.25'  
(BASIS OF BEARINGS)

Not per written description?

REMOVED

AES Board shows  
monument Record  
for C-E-W 1/64th?

SET

FOUND or SET?

WESTWOOD  
T4S R65W  
C 1/4 S 9  
2022  
PLS 25369

N. TRUSSVILLE STREET  
(R.O.W. VARIES)  
REC. NO. D9077963

NOT EASEMENTS SHOWN ON OVERALL  
SHEET. ADDED TO PLAT SHEETS

LOT 1, BLOCK 1  
APS P-8 AT HARMONY  
SUBDIVISION  
FILING NO. 1  
REC. NO. D9077963

Show existing abutting  
easements (Typical) See  
COA 2022 Subdivision  
Plat Checklist Item #14.

MONUMENT DESTROYED BY  
CONSTRUCTION

Show existing abutting easements (Typical)  
See COA 2022 Subdivision Plat Checklist Item #14.

NOT EASEMENTS SHOWN ON OVERALL  
SHEET. ADDED TO PLAT SHEETS

N:\PROJECTS\30175604 SAND CREEK\CAD\SURVEY\PLAT\HARMONY F16 - OVERALL.DWG, MUPARK, 12/2/22



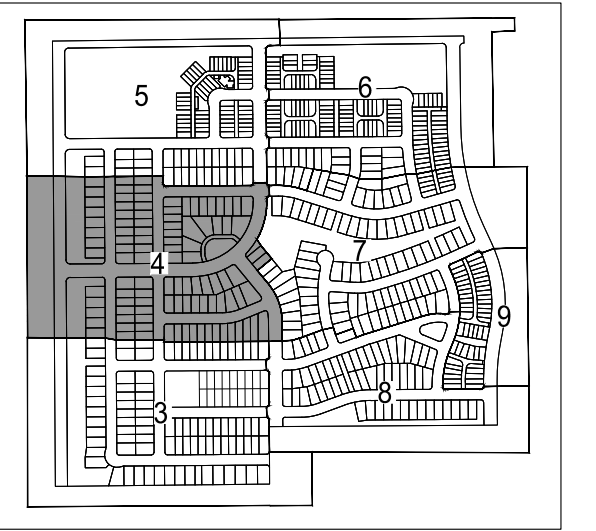




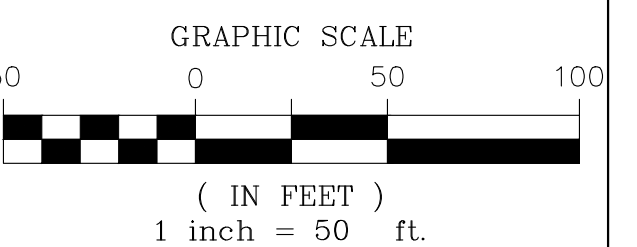
# HARMONY SUBDIVISION FILING NO. 16

A PART OF THE NORTH HALF OF SECTION 9, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6th P.M.,  
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO  
SHEET 4 OF 10

## KEYMAP



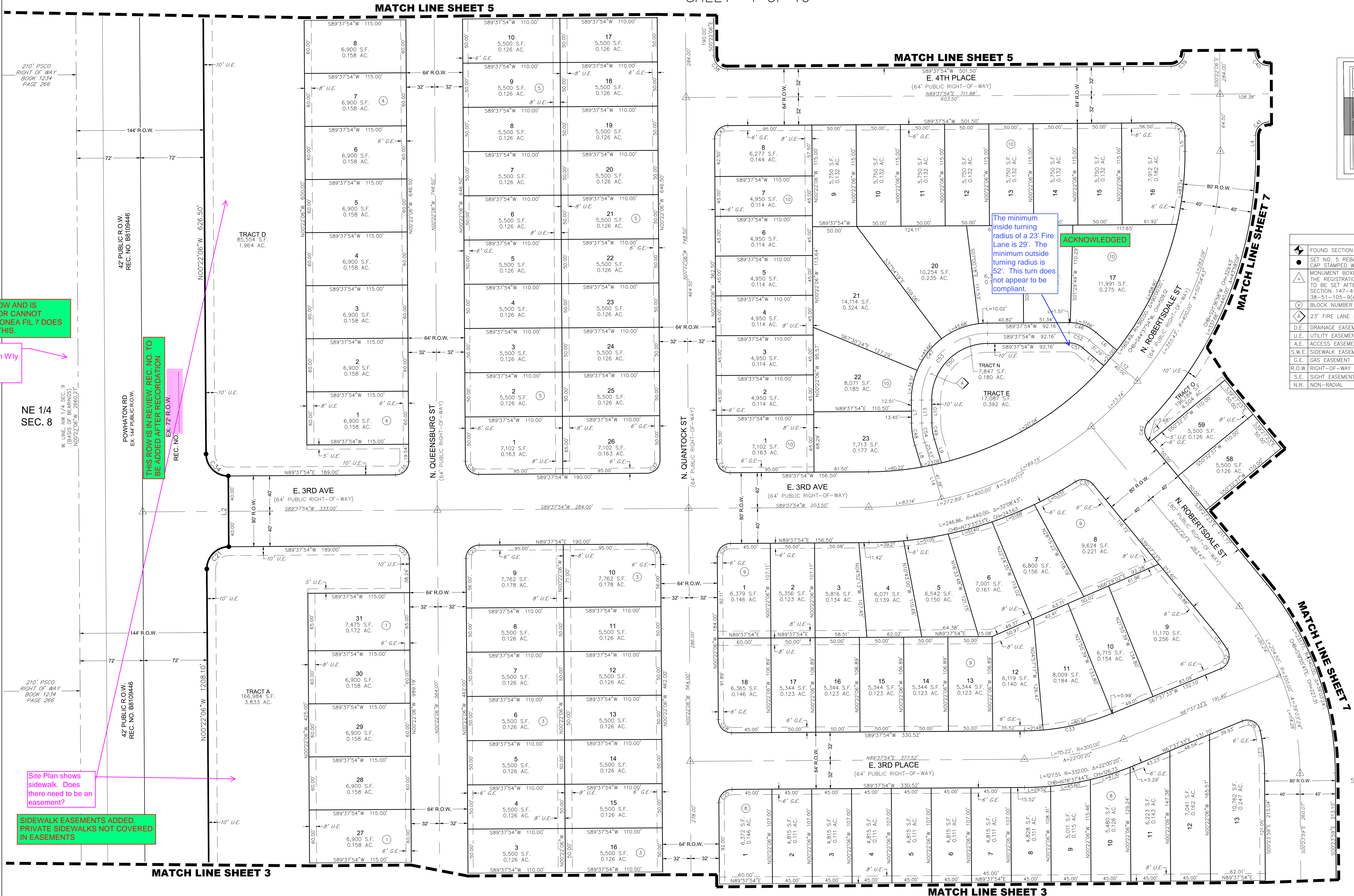
LEGEND	
	FOUND SECTION CORNER AS DESCRIBED
	SET NO. 5 REBAR, 30" LONG, w/1-1/4" ORANGE PLASTIC CAP, STAMPED WESTWOOD PLS 25369
	MONUMENT BOXES WITH 30", 3/4" REBAR WITH CAP BEARING THE REGISTRATION NUMBER OF THE RESPONSIBLE SURVEYOR, TO BE SET AFTER CONSTRUCTION IS COMPLETED PER SECTION 147-47 AURORA CITY CODE AND PER SEC. 38-51-105-9(A & B) COLORADO REVISED STATUTES.
	BLOCK NUMBER
	23' FIRE LANE EASEMENT
	D.E. DRAINAGE EASEMENT
	U.E. UTILITY EASEMENT
	A.E. ACCESS EASEMENT
	S.W.E. SIDEWALK EASEMENT
	G.E. GAS EASEMENT
	R.O.W. RIGHT-OF-WAY
	S.E. SIGHT EASEMENT
	N.R. NON-RADIAL



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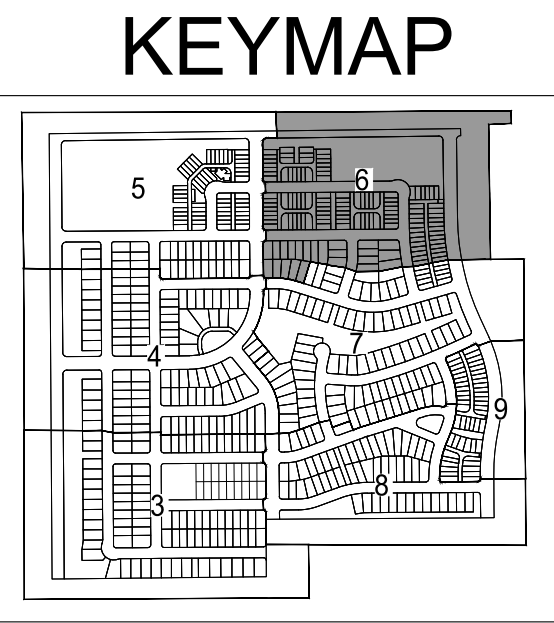
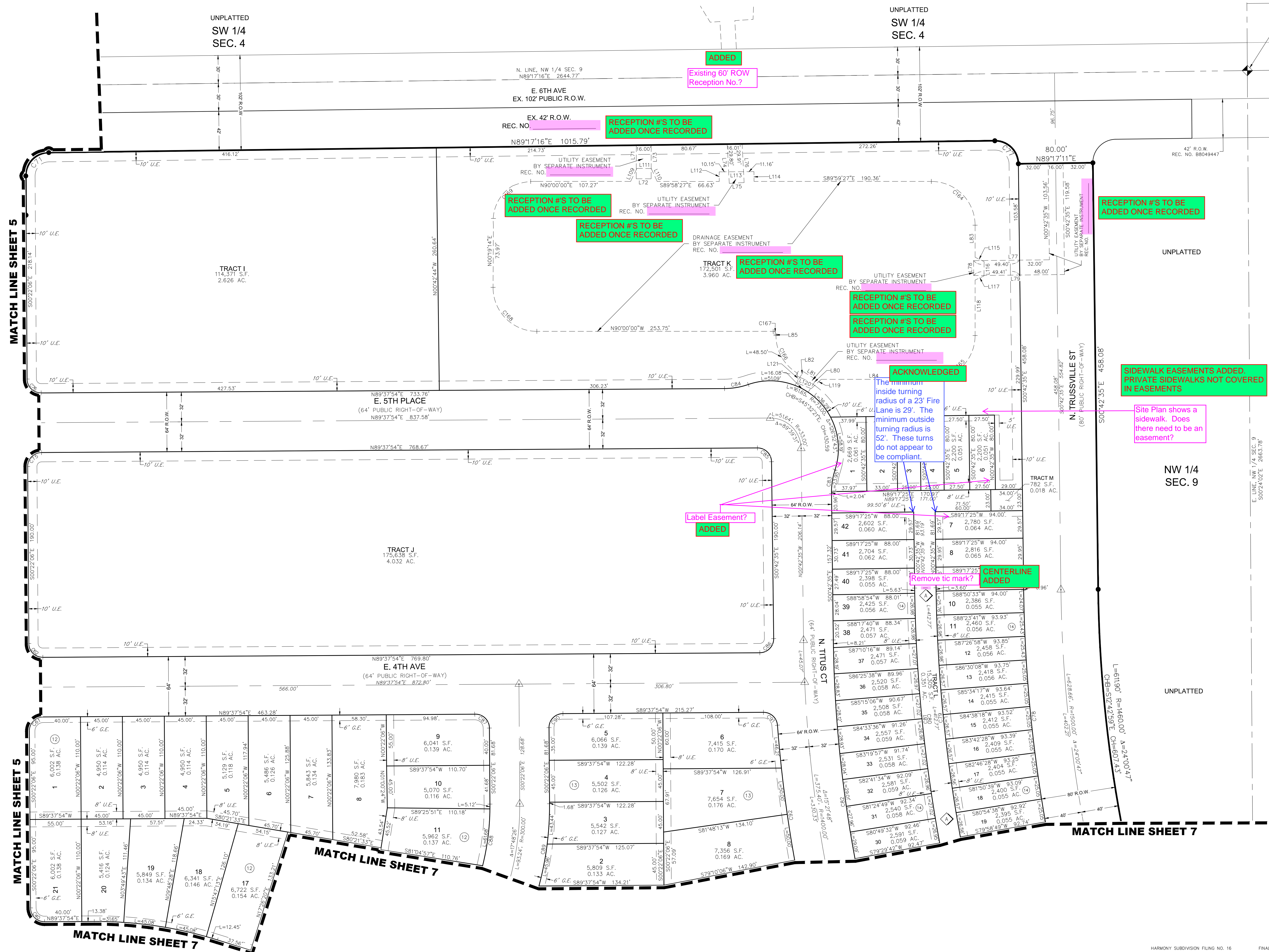
A PART OF THE NORTH HALF OF SECTION 9, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6th P.M.,  
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO  
SHEET 5 OF 10



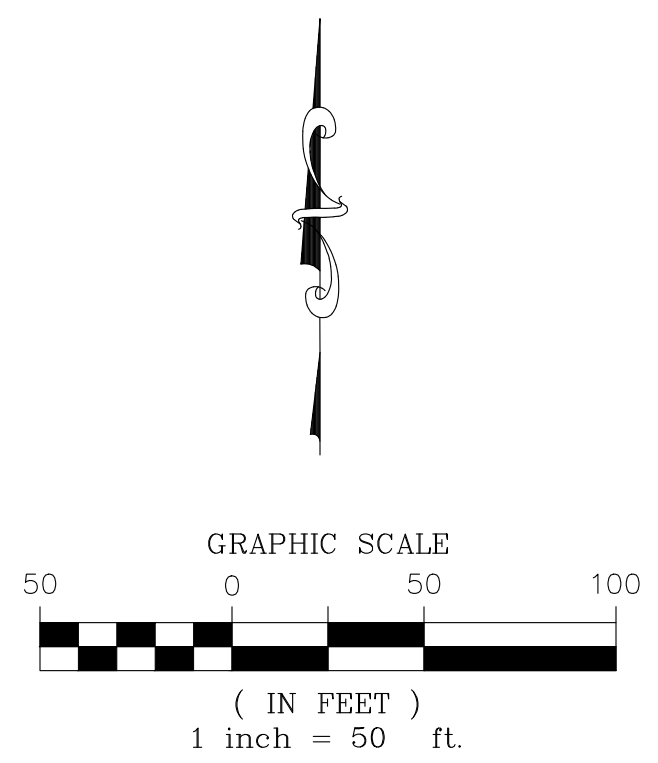


# HARMONY SUBDIVISION FILING NO. 16

A PART OF THE NORTH HALF OF SECTION 9, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6th P.M.,  
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO  
SHEET 6 OF 10



LEGEND	
	FOUND SECTION CORNER AS DESCRIBED
	SET NO. 5 REBAR, 30" LONG, w/1-1/4" ORANGE PLASTIC CAP STAMPED WESTWOOD PLS 25369
	MONUMENT BOXES WITH 30", 3/4" REBAR WITH CAP BEARING THE REGISTRATION NUMBER OF THE RESPONSIBLE SURVEYOR, TO BE SET AFTER CONSTRUCTION IS COMPLETED PER SECTION 147-47 AURORA CITY CODE AND PER SEC. 38-51-105-9(A & B) COLORADO REVISED STATUTES.
	BLOCK NUMBER
	23' FIRE LANE EASEMENT
	D.E. DRAINAGE EASEMENT
	U.E. UTILITY EASEMENT
	A.E. ACCESS EASEMENT
	S.W.E. SIDEWALK EASEMENT
	G.E. GAS EASEMENT
	R.O.W. RIGHT-OF-WAY
	S.E. SIGHT EASEMENT
	N.R. NON-RADIAL



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CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO  
SHEET 7 OF 10

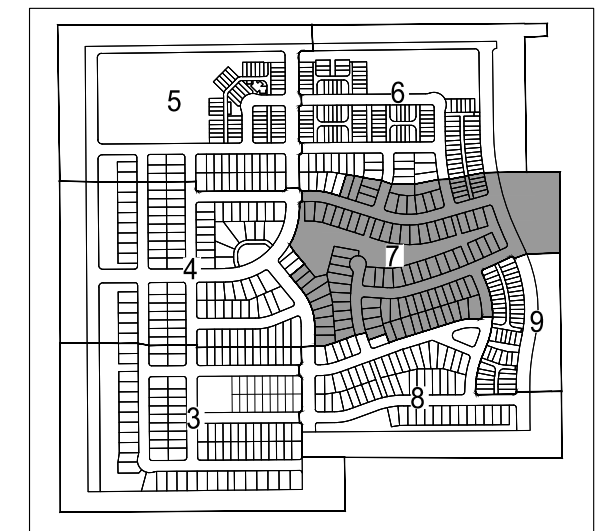
MATCH LINE SHEET 6

NW 1/4  
SEC. 9

UNPLATTED

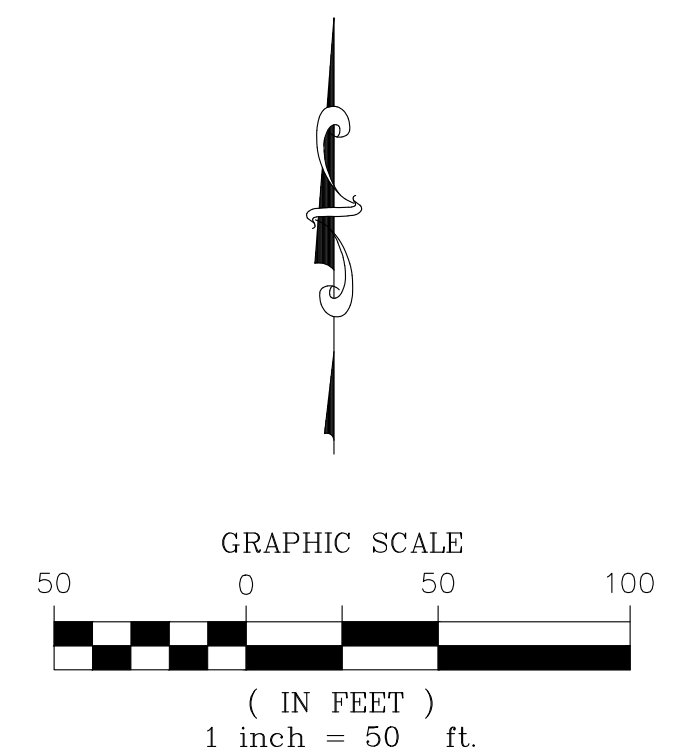
NE 1/4  
SEC. 9

KEYMAP



MATCH LINE SHEET 9

LEGEND	
	FOUND SECTION CORNER AS DESCRIBED
	SET NO. 5 REBAR, 30" LONG, w/1-1/4" ORANGE PLASTIC CAP STAMPED WESTWOOD PLS 25369
	MONUMENT BOXES WITH 30", 3/4" REBAR WITH CAP BEARING THE REGISTRATION NUMBER OF THE RESPONSIBLE SURVEYOR, TO BE SET AFTER CONSTRUCTION IS COMPLETED PER SECTION 147-47 AURORA CITY CODE AND PER SEC. 38-51-105-9(A & B) COLORADO REVISED STATUTES.
	BLOCK NUMBER
	23" FIRE LANE EASEMENT
	D.E. DRAINAGE EASEMENT
	U.E. UTILITY EASEMENT
	A.E. ACCESS EASEMENT
	S.W.E. SIDEWALK EASEMENT
	G.E. GAS EASEMENT
	R.O.W. RIGHT-OF-WAY
	S.E. SIGHT EASEMENT
	N.R. NON-RADIAL

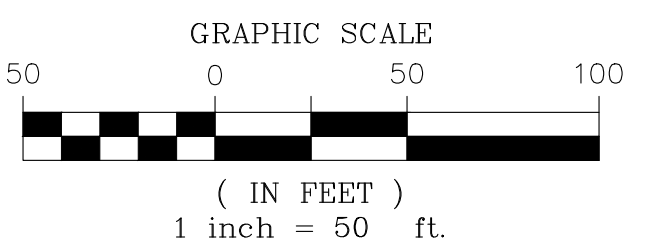
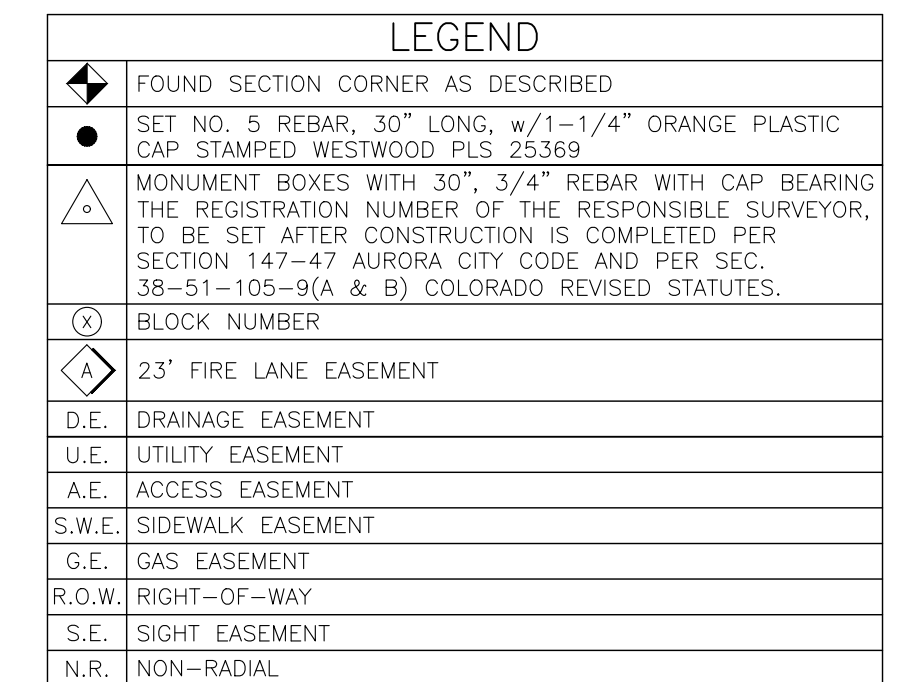


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CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO  
SHEET 8 OF 10

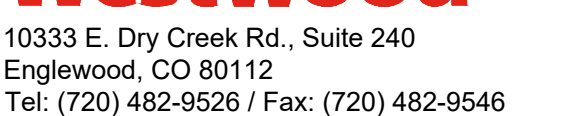
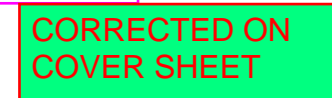


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SHEET 9 OF 10





# HARMONY SUBDIVISION FILING NO. 16

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CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO  
SHEET 10 OF 10

CURVE TABLE					
CURVE NO.	RADIUS	DELTA	LENGTH	CHORD DIRECTION	CHORD LENGTH
C1	15.00'	89°58'07"	23.55'	N45°23'03"W	21.21'
C2	65.00'	19°36'18"	22.24'	S79°49'45"W	22.13'
C3	65.03'	19°36'18"	22.25'	N09°25'48"E	22.14'
C4	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C5	15.00'	90°00'00"	23.56'	N44°37'54"E	21.21'
C6	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C7	15.00'	90°00'00"	23.56'	N45°22'06"W	21.21'
C8	15.00'	90°00'00"	23.56'	N44°37'54"E	21.21'
C9	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C10	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C11	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C12	15.00'	89°58'07"	23.55'	N45°23'03"W	21.21'
C13	15.00'	90°01'53"	23.57'	N44°36'57"E	21.22'
C14	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C15	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C16	15.00'	89°58'07"	23.55'	N45°23'03"W	21.21'
C17	15.00'	90°01'53"	23.57'	N44°36'57"E	21.22'
C18	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C19	15.00'	90°01'53"	23.57'	N44°36'57"E	21.22'
C20	33.00'	90°00'00"	51.84'	S45°22'06"E	46.67'
C21	25.00'	90°00'00"	39.27'	S44°37'54"W	35.36'
C22	15.00'	90°00'00"	23.56'	N45°22'06"W	21.21'
C23	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C24	15.00'	90°00'00"	23.56'	N45°22'06"W	21.21'
C25	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C26	15.00'	101°15'01"	26.51'	N61°44'56"W	23.19'
C27	260.00'	10°43'26"	48.66'	N05°45'42"W	48.59'
C28	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C29	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'

CURVE TABLE					
CURVE NO.	RADIUS	DELTA	LENGTH	CHORD DIRECTION	CHORD LENGTH
C30	15.00'	83°03'26"	21.74'	N80°59'06"W	19.89'
C31	260.00'	6°01'21"	27.33'	N36°26'43"W	27.32'
C32	15.00'	101°03'36"	26.46'	N17°05'45"E	23.16'
C33	268.00'	22°00'20"	102.93'	N78°37'44"E	102.30'
C34	25.00'	90°00'00"	39.27'	S45°22'06"E	35.36'
C35	15.00'	90°00'00"	23.56'	N44°37'54"E	21.21'
C36	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C37	15.00'	90°00'00"	23.56'	N44°37'54"E	21.21'
C38	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C39	15.00'	90°00'00"	23.56'	N44°37'54"E	21.21'
C40	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C41	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C42	15.00'	83°03'26"	21.74'	S02°04'20"W	19.89'
C43	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C44	15.00'	90°00'00"	23.56'	N45°22'06"W	21.21'
C45	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C46	46.50'	40°52'14"	33.17'	N69°55'59"W	32.47'
C47	86.50'	90°00'00"	135.87'	S44°37'54"W	122.33'
C48	86.50'	16°59'52"	25.66'	S08°52'02"E	25.57'
C49	63.50'	17°07'13"	18.97'	S08°55'42"E	18.90'
C50	63.50'	90°00'00"	99.75'	S44°37'54"W	89.80'
C51	23.50'	40°55'14"	16.78'	N69°54'29"W	16.43'
C52	35.00'	40°53'22"	24.98'	N69°55'25"W	24.45'
C53	75.00'	90°00'00"	117.81'	S44°37'54"W	106.07'
C54	75.00'	17°03'07"	22.32'	S08°53'40"E	22.24'
C55	25.00'	90°00'00"	39.27'	S44°37'54"W	35.36'
C56	15.00'	90°00'00"	23.56'	N45°22'06"W	21.21'
C57	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C58	15.00'	90°00'00"	23.56'	N45°22'06"W	21.21'

CURVE TABLE					
CURVE NO.	RADIUS	DELTA	LENGTH	CHORD DIRECTION	CHORD LENGTH
C59	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C60	15.00'	90°00'00"	23.56'	N45°22'06"W	21.21'
C61	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C62	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C63	15.00'	90°00'00"	23.56'	N44°37'54"E	21.21'
C64	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C65	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C66	15.00'	90°00'00"	23.56'	N45°22'06"W	21.21'
C67	15.00'	90°00'00"	23.56'	N44°37'54"E	21.21'
C68	25.00'	90°00'00"	39.27'	S45°22'06"E	35.36'
C69	25.00'	89°39'22"	39.12'	S44°27'35"W	35.25'
C70	25.00'	90°20'38"	39.42'	N45°32'25"W	35.46'
C71	25.00'	89°39'22"	39.12'	S44°27'35"W	35.25'
C72	15.00'	90°00'00"	23.56'	S44°37'54"E	21.21'
C73	80.00'	18°36'36"	25.98'	S81°03'48"E	25.87'
C74	80.00'	18°36'36"	25.98'	N09°40'24"W	25.87'
C75	15.00'	90°00'00"	23.56'	S44°37'54"W	21.21'
C76	15.00'	90°00'00"	23.56'	S45°22'06"E	21.21'
C77	25.00'	90°00'08"	39.27'	N45°42'40"W	35.36'
C78	1540.00'	13°37'53"	366.39'	S07°31'32"E	365.52'
C79	1588.50'	14°46'37"	409.68'	S08°05'54"E	408.55'
C80	1600.00'	15°21'48"	429.03'	S08°23'30"E	427.74'
C81	1611.50'	14°47'07"	415.85'	S08°06'09"E	414.70'
C82	1368.00'	15°21'48"	366.82'	S08°23'30"E	365.72'
C83	80.00'	18°36'36"	25.98'	S08°35'43"W	25.87'
C84	80.00'	18°36'36"	25.98'	N80°19'36"E	25.87'
C85	15.00'	89°39'31"	23.47'	N45°32'21"W	21.15'
C86	15.00'	90°20'29"	23.65'	N44°27'39"E	21.28'
C87	15.00'	92°49'11"	24.30'	N46°42'43"W	21.73'

LINE TABLE		
LINE NO.	DIRECTION	LENGTH
L1	N40°59'42"E	25.26'
L2	N00°22'06"W	80.00'
L3	N00°22'06"W	64.00'
L4	N00°22'06"W	17.50'
L5	S00°22'06"E	17.50'
L6	N49°37'15"W	31.02'
L7	S00°22'06"E	25.96'
L8	S16°38'02"E	25.55'
L9	S16°38'02"E	27.66'
L10	S00°22'06"E	25.96'
L11	N49°37'15"W	31.20'
L12	N49°37'15"W	71.29'
L13	S00°22'06"E	25.96'
L14	S16°38'02"E	66.92'
L15	S00°22'06"E	41.36'
L16	N89°37'54"E	80.00'
L17	N00°22'06"W	42.14'
L18	N16°04'24"W	3.85'
L19	S16°04'24"E	3.85'
L20	N16°04'24"W	15.74'
L21	N89°37'54"E	53.38'

LINE TABLE		
LINE NO.	DIRECTION	LENGTH
L22	N89°37'54"E	53.38'
L23	N24°43'36"W	59.74'
L24	N74°08'43"W	18.00'
L25	N03°20'20"E	30.00'
L26	S89°37'54"W	17.66'
L27	S19°56'29"E	34.08'
L28	N19°56'29"W	34.08'
L29	N87°28'05"W	48.89'
L30	S72°45'23"W	24.57'
L31	N81°22'35"W	50.43'
L32	S72°45'23"W	24.57'
L33	N81°22'35"W	1.91'
L34	N22°35'41"E	22.92'
L35	S67°52'11"E	101.61'
L36	N89°37'54"E	17.61'
L37	N00°23'59"W	39.49'
L38	N00°29'43"W	4.49'
L39	S72°33'40"E	8.34'
L40	N00°29'43"W	4.70'
L41	N24°43'52"W	27.74'
L42	N24°43'52"W	27.74'

LINE TABLE		
LINE NO.	DIRECTION	LENGTH
L43	S80°21'54"E	48.43'
L44	N80°21'54"W	45.77'
L45	S09°38'06"W	23.00'
L46	S11°29'56"W	32.92'
L47	N82°26'48"E	23.20'
L48	S11°29'56"W	32.92'
L49	S04°41'20"W	23.00'
L50	N00°24'02"W	46.53'
L51	S00°24'02"E	78.53'
L52	S00°24'02"E	46.54'
L53	S00°24'02"E	26.06'
L54	N00°20'07"W	57.74'
L55	N89°39'53"E	16.00'
L56	S00°20'07"E	73.73'
L57	S78°52'57"E	52.05'
L58	S00°22'06"E	25.41'
L59	N81°15'42"W	10.35'
L60	S87°29'31"W	86.50'
L61	N34°44'19"W	11.77'
L62	N61°39'34"W	42.48'
L63	S28°20'26"W	16.00'

LINE TABLE		
LINE NO.	DIRECTION	LENGTH
L64	S61°39'34"E	51.24'
L65	S00°28'45"W	40.53'
L66	S89°31'15"E	16.00'
L67	N00°28'45"E	40.86'
L68	N15°11'00"E	37.10'
L69	S89°39'14"W	26.99'
L70	S15°11'00"W	37.28'
L71	S00°05'00"W	36.05'
L72	S89°55'00"E	16.00'
L73	N00°05'00"E	36.27'
L74	S03°00'23"E	42.23'
L75	N86°59'37"E	16.00'
L76	N03°00'23"W	41.59'
L77	N89°21'09"E	81.40'
L78	N00°38'51"W	16.00'
L79	S89°21'09"W	97.41'
L80	N32°02'06"E	16.02'
L81	N57°57'54"W	16.00'
L82	S32°02'06"W	17.31'
L83	N00°00'00"E	34.45'
L84	N90°00'00"E	118.19'

LINE TABLE		
LINE NO.	DIRECTION	LENGTH
L85	S00°00'00"E	1.51'
L86	N07°35'35"W	29.24'
L87	N78°29'46"E	23.36'
L88	S28°56'14"E	38.16'
L89	N00°33'18"E	17.87'
L90	N53°41'23"W	15.58'
L91	N85°47'15"W	25.91'
L92	N00°20'46"W	7.92'
L93	S89°39'14"W	49.33'
L94	S00°20'46"E	9.76'
L95	S87°29'31"W	27.25'
L96	N27°55'52"W	6.29'
L97	S87°21'41"W	15.40'
L98	S22°39'14"W	6.24'
L99	N87°32'21"W	17.85'
L100	S27°45'12"W	15.40'
L101	S36°57'15"E	17.52'
L102	N75°49'28"E	1.28'
L103	S27°11'26"E	15.19'
L104	N88°06'07"E	17.93'
L105	N23°23'40"E	22.11'

LINE TABLE		
LINE NO.	DIRECTION	LENGTH
L106	S27°49'39"E	24.57'
L107	N78°29'46"E	35.51'
L108	N03°03'16"W	19.69'
L109	N25°53'46"E	15.54'
L110	S24°41'20"E	15.21'
L111	S89°23'47"E	15.40'
L112	N00°20'46"W	10.31'
L113	N89°39'14"E	37.33'
L114	S00°20'46"E	10.47'
L115	S641°2'02"E	10.73'
L116	S00°30'24"W	15.40'
L117	S65°12'51"W	10.49'
L118	S00°00'00"E	59.61'
L119	N46°50'17"E	14.64'
L120	S68°27'16"E	15.40'
L121	S03°44'49"E	11.04'

CURVE TABLE				
CURVE NO.	RADIUS	DELTA	CHORD LENGTH	CHORD DIRECTION
C88	263.00'	18°08'55"	83.31'	N08°32'07"E
C89	328.00'	18°09'36"	103.96'	N08°36'03"E
C90	15.00'	90°00'00"	23.56'	S44°37'54"W
C91	15.00'	86°01'17"	22.52'	N47°21'28"W
C92	1432.00'	11°43'35"	293.08'	S10°12'37"E
C93	432.00'	17°48'26"	134.26'	N81°27'53"W
C94	15.00'	90°00'00"	23.56'	N62°26'20"E
C95	15.00'	90°00'00"	23.56'	S27°33'40"E
C96	15.00'	90°00'00"	23.56'	N28°55'36"E
C97	15.00'	90°01'15"	23.57'	S61°05'02"E
C98	15.00'	88°16'05"	23.11'	N29°47'34"E
C99	15.00'	88°16'05"	23.11'	N61°56'22"W
C100	15.00'	90°00'00"	23.56'	N20°16'37"E
C101	268.00'	18°58'20"	88.74'	N84°28'51"E
C102	15.00'	93°50'00"	24.57'	S39°06'59"E
C103	718.00'	8°03'16"	100.93'	S11°49'39"W
C104	15.00'	61°23'31"	16.07'	N19°06'09"W
C105	718.00'	20°04'29"	251.57'	S09°54'14"E
C106	15.00'	93°50'00"	24.57'	S47°03'00"W
C107	332.00'	18°58'20"	109.93'	N84°28'51"E
C108	15.00'	89°11'00"	23.35'	N6°71'57"W
C109	418.00'	24°38'02"	179.72'	N10°23'26"W
C110	15.00'	96°49'46"	25.35'	N50°20'35"E
C111	482.00'	45°18'08"	381.11'	N00°03'23"W
C112	15.00'	89°11'00"	23.35'	S21°53'03"W
C113	3282.00'	11°1'56"	68.66'	N6°52'35"E
C114	15.00'	91°22'44"	23.92'	N69°02'01"W
C115	368.00'	11°19'24"	72.73'	N80°54'41"W
C116	15.00'	89°58'07"	23.53'	S25°23'03"E

WESTWOOD Job No. R0029616.00

AURORA, COLORADO

**HARMONY**

**A MASTER PLANNED  
COMMUNITY**

**MASTER UTILITY REPORT  
AMENDMENT**

Prepared for:  
Melcor/TC, LLC  
c/o Marathon Land Company  
9750 W. Cambridge Place  
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303.920.9400

Prepared by:  
Westwood Professional Services  
10333 East Dry Creek Road, Suite 240  
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Contact: Brian Wilson  
720.482.9526

Report Date:  
November 7, 2014  
July 1, 2015  
November 17, 2015


**June 1, 2016 (Revised)**

**November 23, 2021 (Amendment)**

**September 30, 2022 (Amendment)**

FACSIMILE

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

  
\_\_\_\_\_  
CO PROFESSIONAL ENGINEER  
BRIAN P. WILSON, CO P.E. NO. 0050067

10/3/2022  
DATE

**MASTER UTILITY REPORT AMENDMENT  
FOR  
HARMONY**

---

**APPROVED FOR ONE YEAR FROM THIS DATE** \_\_\_\_\_

\_\_\_\_\_  
**City Engineer Date**

\_\_\_\_\_  
**Water Department**

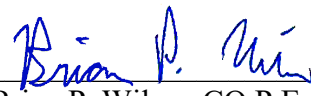
\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Fire Department**

\_\_\_\_\_  
**Date**

**ENGINEER'S STATEMENT:**

This utility study "Harmony – Master Utility Report Amendment" was prepared under my direct supervision in accordance with the provisions of the City of Aurora Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure. I understand that the City of Aurora does not and will not assume liability for facilities designed by others.

  
\_\_\_\_\_  
Brian P. Wilson CO P.E. 0050067  
Westwood Professional Services

\_\_\_\_\_  
10-3-2022  
Date



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## Appendix

<b>Appendix A</b> – Water Distribution Demands and WaterGEMS Results
<b>Appendix B</b> – Wastewater Collection and Routing Calculations
<b>Appendix C</b> – Sun Meadow Master Utilities Report(Partial) – Sanitary Sewer Calcs/Map
<b>Appendix D</b> – Parklands Sanitary Sewer Calcs/Map
<b>Appendix E</b> – Adonea Master Utility Report – Water & Sewer Calcs/Maps

## Introduction

### General Description

The Harmony Development, formerly Sandy Creek and Sun Meadow, contains a total of approximately 1,381 acres. This report is a modification to the previously submitted “*Harmony Creek Master Utility Report*” (Ref.1) prepared by CVL Consultants of Colorado, Inc (CVL) and approved in 2016. The project will be primarily residential with development to include a maximum of 1,381 family units, and 651 attached single-family townhome units. There will also be a fire station, an oil and gas site, two commercial properties, and two industrial properties located within the site. The two commercial properties are not included as a part of this report. They are still accounted for as part of this report. The same is true regarding the multi-family parcel in the extreme southwest corner of the site. The remaining improved areas will be for roadways, detention ponds, drainage channels, parks, streets, and open space located throughout the development.

Please revise the introduction to state Sun Meadow is now being incorporated under Harmony as a part of this amendment

The introduction language has been revised to include the incorporation of Sun Meadows.

### Scope of Work

The purpose of this Master Utility Report Amendment is to amend the “Master Utility Report” (Ref. 1) prepared by CVL Consultants of Colorado, Inc (CVL). The proposed water and sewer system must meet the criteria set forth by the guidelines of the ***Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure*** (Ref. 2) manual prepared by the City of Aurora (COA). Westwood Professional Services (Westwood) will work in conjunction with the client and the COA to ensure that the water distribution and sanitary sewer systems are compatible with existing facilities and planned development.

### Project Location

The 1,381-acre Harmony development is located in Section 9, the southwest, northwest, and northeast 1/4 of Section 16, and the northern 1/2 of Section 15, Township 4 South, Range 65 West of the 6<sup>th</sup> Principal Meridian, in the City of Aurora. The project is bound on the north by future 6<sup>th</sup> Avenue, while future Mississippi Avenue bound the site to the south. Powhatan Road defines the site to the east. Monaghan Road, future Trussville Street, and future Hayesmount Road provide the site boundaries.

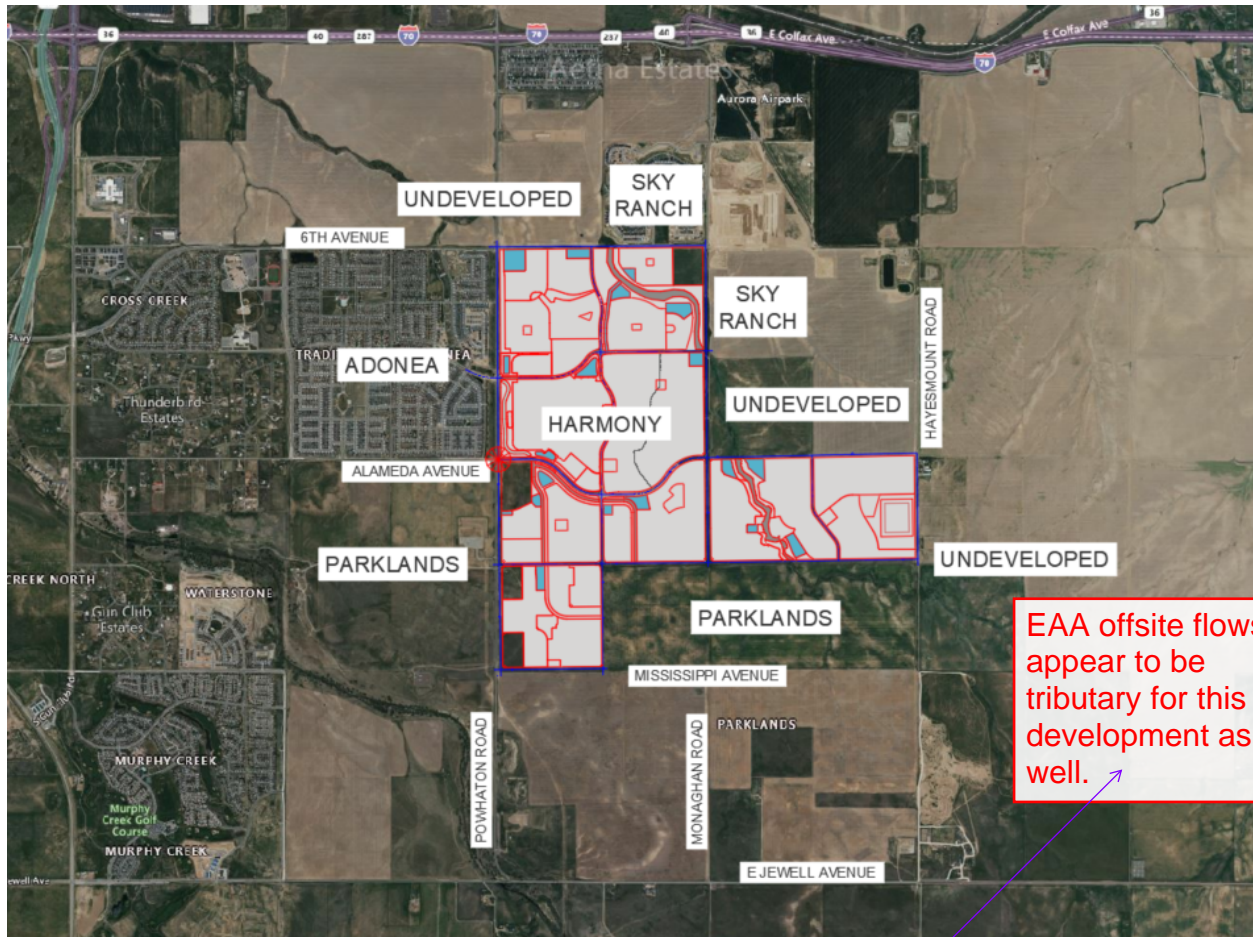
Revised language to say Adonea is built out.

I believe Adonea is built-out. Please confirm

Currently there are multiple developments bounding the proposed site including the *Adonea Development* which is located west of the northern portion of the site, and is partially constructed. *Sky Ranch* is located to the northeast of Harmony and is partially developed. *Parklands (formerly Eastern Hills)* is located east, south, and west of the proposed development, and is currently in the conceptual/preliminary planning stage. There are no current plans for the land improvement project. The site plan clearly depicts the project in context to the surrounding roadways and developments.

Acknowledged, thank you. Parklands and Cottonwood Creek MUS information has been added to this report.

Master documents are at approval and should be referenced in this report



**Figure-1**  
**Location Map**

## Topographic Conditions

The proposed site encompasses approximately 1,381 acres of undeveloped land. The western portion of the site slopes from the south to the northwest, while the eastern portions drain both east and west to the First Creek drainage which drains from the south to the north. The total elevation change in the western portion is approximately 90 feet, dropping from 5675 feet above mean sea level (MSL) at the southern boundary of the development to 5585 feet above MSL at the northwest portion of the development. The total elevation change in the eastern portion is approximately 115 feet, dropping from 5720 feet (56.3 psi) above mean sea level (MSL) at the eastern boundary to 5605 feet (106 psi) above MSL at the north-central point of the development.

From the *City of Aurora's Water Capital Improvement Plan (CIP)*, (Ref. 3) dated February, 2009, it is shown that the proposed development is entirely within pressure Zone 4. Table 1 below presents the pressures provided for Zone 4.

Zone	Static Hydraulic Grade Line, (ft)	Service Elevation Range, (ft)	Static Pressure Range, (psig)
Zone 4	5850	5589-5711	60-113

**Table 1 – City of Aurora Pressure Zones**

From the *City of Aurora Wastewater Utility Plan – Volume I: Report* (Ref. 4) the proposed development falls within the service area Subarea 2 – Environs/Eastern Prairie Developing Area and part of the First Creek drainage basin.

## Infrastructure Areas

The entire project site has been divided up into 23 separate residential planning areas. These planning areas are divided into 10 infrastructure areas. Infrastructure Area 1 is located on the west side of the project site north of Alameda Avenue. This infrastructure area contains PA-1, the western portion of PA-2, the North School parcel, and the community center on the southern side of the area. Infrastructure Area 2 is located east of Infrastructure Area 1 and it contains PA-4, the municipal fire station, and the western portion of PA-3. Infrastructure Area 3 is east of Infrastructure Area 2 and contains the remaining portion of PA-2. Infrastructure Area 4 is located south of Infrastructure Areas 1, 2, and 3 and is bordered by Alameda Avenue, Monaghan Road, 1<sup>st</sup> Avenue, and Powhaton Road. Infrastructure Area 4 includes PA-5, PA-6, PA-7, PA-11, PA-12, and a 20 acre commercial site. Infrastructure Area 5 is in the southwest corner of the project site, south of Infrastructure Area 4, and is bordered by Mississippi Avenue, Trussville Road, Exposition Avenue, and Powhaton Road. This Area 5 encompasses PA-8, PA-9, PA-10, the South School parcel, an 11.4 acre church site, along with a 10.4 acre multifamily residential property. Infrastructure Area 6 is in the northwest corner of the project site and it contains PA-86, PA-87, PA-88, and PA-89. Infrastructure Area 7 is split into two portions 7A and 7B. Area 7A is east of I.S. Area 8 and south of Infrastructure Area 7B. Infrastructure Area 7A includes PA-90 and PA-91. Infrastructure Area 7B contains PA-92 along with a 16.3 acre commercial site. Infrastructure Area 8 incorporates PA-4 along with a portion of PA-3. This Infrastructure Area 8 is located between Infrastructure Area 7B and Infrastructure Area 4. Infrastructure Area 9 is on the far east side of the project site and is bordered by First Creek, Alameda Avenue, Hayesmount Road, and Exposition Avenue. Area 9 contains PA-14, PA-15, PA-16, along with an 31.7 acre oil and gas site. Infrastructure Area 10 is east of Infrastructure Area 9 on the west side of First Creek, and includes PA-13. CSP boundaries within each infrastructure area will be delineated at a later date.

# Water Distribution System

## Land Use and Population

The Harmony development has a total of 23 residential planning areas (see the appendix for a planning area map). The proposed areas include single and multi-family residential units, parks, a community center, a church, a fire station, an oil and gas site, two school sites, and two commercial parcels. A parcel-by-parcel tabulation of land use is shown in Table 2. Population estimates are based on 2.77 capita per residential dwelling unit.

Uses and areas match Exhibits

**Table 2 – Land Use and Population Estimates**

Land Use and Population

Parcel No.	Land Use	Area (acres)	Max DU/Acre	Max Total DU's	Max Res. Pop
PA-1	SINGLE FAMILY	12.6	8.0	101	323
PA-17	NORTH SCHOOL SITE	19.0			
PA-2	SINGLE FAMILY	107.8	8.0	862	2768
PA-19	COMMUNITY CENTER	7.4			
PA-3	SINGLE FAMILY	115.2	8.0	922	2950
PA-64	MUNICIPAL	2.8			
PA-4	SINGLE FAMILY	62.0	8.0	496	1587
PA-5	SINGLE FAMILY	15.5	8.0	124	397
PA-6	SINGLE FAMILY	18.4	8.0	147	470
PA-7	SINGLE FAMILY	51.5	8.0	412	1318
PA-8	SINGLE FAMILY	21.8	8.0	174	557
PA-9	SINGLE FAMILY	24.4	8.0	195	624
PA-10	SINGLE FAMILY	55.4	8.0	443	1418
PA-18	WEST SCHOOL SITE	18.1			
PA-11	SINGLE FAMILY	23.1	8.0	185	592
PA-12	SINGLE FAMILY	83.4	8.0	667	2134
PA-13	SINGLE FAMILY	64.5	8.0	516	1651
PA-14	SINGLE FAMILY	59.3	8.0	474	1517
PA-15	SINGLE FAMILY	60.4	8.0	483	1546
PA-16	SINGLE FAMILY - ATTACHED	35.9	8.0	287	603
PA-39	NEIGHBORHOOD ACTIVITY CENTER	1.3			
PA-40	NEIGHBORHOOD ACTIVITY CENTER	2.3			
PA-41	NEIGHBORHOOD PARK	5.7			
PA-44	NEIGHBORHOOD ACTIVITY CENTER	1.9			
PA-47	NEIGHBORHOOD ACTIVITY CENTER	1.2			
PA-48	NEIGHBORHOOD ACTIVITY CENTER	5.1			
PA-50	NEIGHBORHOOD PARK	5.5			
PA-52	NEIGHBORHOOD ACTIVITY CENTER	1.2			
PA-56	NEIGHBORHOOD PARK	1.2			
PA-58	NEIGHBORHOOD ACTIVITY CENTER	5.0			
PA-59	NEIGHBORHOOD ACTIVITY CENTER	2.2			
PA-84	NEIGHBORHOOD PARK	11.5			
PA-86	SINGLE FAMILY	23.2	8.0	186	595
PA-87	SINGLE FAMILY	24.0	8.0	192	614
PA-88	SINGLE FAMILY	32.4	8.0	259	829
PA-89	SINGLE FAMILY	30.0	8.0	240	768
PA-90	SINGLE FAMILY	40.0	8.0	320	1024
PA-91	SINGLE FAMILY	12.1	8.0	97	310
PA-92	SINGLE FAMILY - ATTACHED	24.1	11.0	265	557
PA-93	COMMERCIAL SITE	16.3			
<b>HARMONY TOTAL =</b>		<b>1108.6</b>		<b>8047</b>	<b>25152</b>

\*Note: per land use and planning estimates

11.0?

Revised, thank you.



## Water Design Criteria

This section describes the design criteria incorporated in developing the water distribution system for the proposed development. These Design criteria were adopted from the *Standards and Specifications for Water Distribution, Sanitary Sewer and Storm Drainage Infrastructure* (Ref. 2) and the *Water Utilities Report* (Ref. 1).

### Demand

Revise to Max Day/Max Hour factor as this does not only apply to residential

Demands match 5.02

The following is a list of criteria used to develop the water demands for the proposed site:

- Residential Average Day demand = 101 gpd/capita
- Commercial Average Day demand = 1,500 gpd/acre
- Industrial (schools, worship, municipal) demand = 1,200 gpd/acre
- Parks Average Day demand = 1,800 gpd/acre
- Residential Max Day Factor = 2.8
- Residential Max Hour Factor = 4.5 x average day demand
- Commercial Max Day demand = 4,200 gpd/acre
- Commercial Max Hour demand = 6,750 gpd/acre
- Industrial (schools, worship, municipal) Max Day demand = 3,360 gpd/acre
- Industrial (schools, worship, municipal) Max Hour demand = 5,400 gpd/acre
- Parks Max Day demand = 5,040 gpd/acre

Removed "residential" from line items.

The following is a list of fire flow demands by use (as determined by ISO criteria):

- Residential fire flow demand = 1,500 gpm
- Commercial fire flow demand = 2,500 gpm
- Industrial fire flow demand = 3,500 gpm

## Pressures

The system shall be analyzed to meet the maximum day plus fire flow demand with a residual pressure of no less than 20 psig at any point in the water distribution system. The system will maintain at a minimum 50 psig at any point in the distribution system during the Average Day Demand. Also, the Maximum Day residual water pressure shall not be less than 50 psig.

## Distribution System

The following constraints will be used to model the water distribution system:

- Max Velocity for 8 inch = 5 fps
- Max Velocity for 12 inch = 5 fps
- Max Velocity for 16 inch and up = 5 fps
- Residential Fire Flow = 1500 gpm
- Commercial Fire Flow = 3500 gpm
- Church Fire Flow = 3500 gpm

Revised commercial fire flow to 2500gpm

Commercial FF is 2500gpm. Is worst case scenarios being assumed for all uses? Please clarify

- Fire Station Fire Flow=3500 gpm
- Community Center=3500 gpm
- Hazen Williams Coefficient, C = 130
- Sufficient looping will be incorporated to minimize the effects of main breaks

## Existing Infrastructure and Supply

Harmony is located in the service area. All potable water will be supplied by the City of Aurora. The water distribution system connects to the COA's system. The first connection is at Alameda Avenue and Powhatan Road. This connection is part of the Adonea Development. The second connection is at Powhatan Road and 1st Avenue with a 12" waterline. At the time of construction, connections have been made and PAs 1, 2, 3, 17, 19, 85, and the associated open space, parks, drainage, and detention are constructed, while PAs 5, 6, 7, 11, 12, and associated open space, parks, drainage, and detention are under construction.

Revised description to show all three connections.

Additional connections are also shown at 6th and Trussville and 6th and Monaghan

A third connection is proposed at the intersection of 6th Avenue and Powhatan Road. The existing Adonea Development provided a 30" stub to the east and a 16" stub to the south. In addition, the City of Aurora has installed a 60" water main in recent years at the intersection of Jewell Avenue and Powhatan Road. Development increases in the surrounding areas in the near future, this connection is needed north to ultimately provide a fourth connection to the Harmony water network. When the Harmony project begins, a temporary 16" water main will be connected to the Harmony frontage. This line will primarily serve the demands of the Harmony frontage. This 60" main extension from the south is completed. A corridor for this future extension is provided as part of the design of Powhatan Road.

Revised PIP, MUS, and plan sets to show 30" waterline

Please revise verbiage as there is a 30" proposed along the frontage in Powhatan and 6th. This waterline is expected to be installed this year with stubs available for connection.

## Water Demands

The summary of water demands calculated for the proposed water distribution system is presented in Table 3. As stated previously within this report, the demands were determined using assumptions and requirements outlined in the *Sand Creek Ranch Master Utilities Report* (Ref. 1) and the *Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure* (Ref. 2). The residential populations were based on 2.77 persons per dwelling unit. Maximum Day and Maximum Hour demands were calculated using Peaking Factors shown above. Average day demands for commercial properties, industrial properties, and parks were calculated from developable acreage, population density, dwelling units per acre, and the average water demand rate. For more detailed demand calculations please refer to Appendix A.



Land Use	Area (acres)	Max Units	Average Day (gpm)	Max Day (gpm)	Max Hour (gpm)
SFD	937.0	7495	1,456.1	4,077.0	6,552.4
SFA	60.0	552	107.2	300.3	482.6
MF-Medium(Offsite)	10.4	208	40.4	113.1	181.8
Commercial(20 Acres Offsite)	36.3		37.8	105.9	170.2
Community Center	7.4		6.2	17.3	27.8
School	37.1		30.9	86.6	139.1
Municipal-Fire Station	2.8		2.3	6.5	10.5
Church (offsite)	11.4		9.5	26.6	42.8
Parks	48.0		60.0	168.0	
Adjacent Development			246.7	690.9	1110.3
<b>Total</b>	<b>1150.4</b>	<b>8,255</b>	<b>1,997.2</b>	<b>5,592.2</b>	<b>8,717.4</b>

**Table 3 – Water Demand Summary**

## Proposed Water Facilities

This section describes the proposed onsite water facilities that will be required to meet the demands of the proposed planning areas. Offsite water facilities are also discussed in this section.

### Offsite Water Facilities Revised to 30"

The proposed offsite water facilities, being the 12" transmission main, in the future *Adonea Development* are shown in schematic within this 30" The offsite area lies within the City of Aurora's eastern service area.

Eventually, the Harmony development will be served by a 60" waterline in Powhaton Road coming from the south starting at the intersection of Powhaton Road and Jewell Avenue. It will be extended north along the entire Harmony frontage. This main extension will be completed by others or as part of a regional cost sharing with the surrounding developments in coordination with the City of Aurora.

### Onsite Water Facilities

The study area includes areas that are developed and undeveloped. The distribution mains are sized to accommodate peak flow requirements for each planning area at full build-out based on the land use and population estimates described in this report. A preliminary water distribution system layout is shown in the appendix of this report. The minimum line sizes are based on this layout. If the distribution system is developed differently from that shown, line sizes may change. This Master Utility Plan and accompanying WaterGEMS model should be updated if alignment/layouts/planning estimates change.

Removed sentences, thank you.

Remove last sentence as it does not apply to approval of this MUS

Depending on the degree of change, another MUS amendment may be triggered. I recommend removing this sentence

## Water Network Analysis

The network analysis for the proposed development was analyzed using Bentley WaterGEMS V8i Edition by Bentley. The layout of the distribution system for the proposed development is shown in the appendix. The base network skeleton and the set points for WaterGEMS pressures were adapted from the *City of Aurora's Water CIP map*, dated February, 2009.

## Modeling Criteria

The modeling criteria incorporated in the water distribution system network analysis was adopted from *Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure* (Ref. 2) and is shown in detail earlier in this report.

## Network Analysis

Flows were allocated to each node (pipe junction of external demand) based on tributary areas mapped to each node within the site. Demands were then determined by land use and unit flows. The water supply connections were modeled as reservoirs (see map in appendix). The hydraulic grades for these reservoirs for different scenarios were taken from the *City of Aurora's Water CIP map*, dated February, 2009.

The model was analyzed, and several scenarios were computed to match the design criteria. Final pipe sizing was based on the results of this analysis. Changes were made to the layout based on the results of successive simulations as needed to meet the above criteria. Wherever possible, waterlines were internalized to maximize system efficiency and reduce construction costs. A roughness coefficient of 130 (Hazen-Williams C value) was used for all simulations. The residual fire flow (1,500 gpm) was assigned to every node servicing residential areas or known fire hydrants servicing residential areas and the system was evaluated for fire flow requirements as required by the COA. The commercial, church, fire station, and community center fire flows (3,500 gpm) were assigned to selected nodes based on the land use, and the system was evaluated for fire flow requirements.

Within the model, several cases were included to fully analyze how peak flows and fire demands will affect the system.

The general cases are as follows:

1. Average Day Demand
2. Maximum Day Demand
3. Maximum Hour Demand
4. Maximum Day Demand with coincident fire flow at all parcels
5. Maximum Day Demand with coincident fire flow at Planning Area 17

Revised to PA-15,  
thank you.

PA-15 referenced in the  
table on the next sheet.

Input Parameters of the water distribution system modeled above include the following:

1. Pipe Diameters (inches)
2. Pipe Lengths (feet)
3. Node Elevations (feet)

4. System Demands (as outlined above)
5. Fire Flows (1,500 gpm and 3,500 gpm)
6. Pipe Friction Coefficient, C = 130

Output Parameters Include:

1. Velocities (fps)
2. Pressure (psig)
3. Head Loss (feet)
4. Flow Rates (gpm)

## Modeling Results

The results of the WaterGEMS analysis for the proposed planning areas are presented in Appendix A. This analysis represents the proposed water distribution system, including node locations, pipe locations and pipe sizes that serve the project site. See Table 4 for a summary of the WaterGEMS analysis.

**Table 4 – Results of WaterGEMS Analysis<sup>1</sup>**

<sup>1</sup>See Appendix A for detailed output

Scenario		Minimum Pressure		Maximum Pressure		Maximum Velocity (fps)	Pipe ID
		(psig)	Node	(psig)	Node		
1.	AD	59.2	PA-15	118.0	J21	0.85	P7
2.	MD	58.6	PA-15	118.0	J21	2.17	P7
3.	MH	56.3	PA-15	118.0	J21	4.80	P7
4.	MD+FF (All Demand Nodes)	58.6	PA-15	118.0	J21	2.17	P7
5.	MD+FF (Node PA-15)	58.2	PA-15	118.0	J21	2.89	P4

## Sanitary Sewer System

### Land Use and Population

The Harmony development has a total of 23 residential planning areas (see Appendix B for a planning area map). The proposed planning areas include single family detached (SFD), single family attached townhomes (SFA), parks, two schools, a community center, an oil and gas site, and a fire station. In addition, two commercial areas, a church area and a multi-family residential area not included within this FDP have been accommodated in the overall design and utility models. A tabulation of planning area land uses is shown in Table 2. Population estimates are based on 2.77 capita per residential dwelling unit.

### Wastewater Design Criteria

This section describes the design criteria incorporated in developing the wastewater collection system for Harmony. These design criteria were adopted from the *Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure* (Ref. 2):

- Population – 2.77 people per residential dwelling unit. Equivalent population for commercial areas is 22 people per acre. Equivalent population for industrial areas is 18 people per acre.
- Average Daily Flow – 68 gpcd for residential areas, 1,200 gpd per acre for industrial areas (schools, community centers, municipal facilities, churches, ect.), 1,500 gpd per acre for commercial areas.
- Peaking Factor (PF) =  $5 + p^{0.167}$ , where p = population in thousands and PF is no greater than 4.0 and no less than 1.7.
- The flow velocity shall not exceed ten (10) fps flowing full of ½ full using Manning's Formula and (n=0.011 for PVC) or (n=0.013 for RCP). Minimum slope shall be 0.4% with a minimum velocity of two (2) fps at least once per day.
- Depth of flow in pipes should not exceed 75% of capacity for pipes 12 inches or smaller and 90% for pipes larger than 12 inches
- Minimum drop through a manhole from inlet to outlet or same diameter pipe shall be:
  1. 0.2 ft. on straight through run
  2. 0.3 ft. on deflected bends greater than 45 degrees
- Minimum of 4 inch diameter pipe for service lines

### Onsite Wastewater Demands

Average day wastewater generation rates per the *Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure* (Ref. 2) manual are based on 80 gallons per capita per day (gpcd) for residential areas, 35 gpcd for schools, 4000 gallons per day/acre for commercial areas, community centers, fire stations, and churches. Peak Flow factors are based on population. Please refer to Appendix B for detailed wastewater generation calculations.

## Offsite Wastewater Demands

The Harmony collection system will also convey the flows generated by a portion of the future *Parklands Development* to the south. This development is planned to be in place after the construction of the Harmony development, therefore, it is necessary to take into account the contributions from these offsite areas in the modeling of this collection system. It is anticipated that these offsite developments will contribute a total of approximately 1,176,772 gpd of wastewater during the average day at a four input locations along the southern boundary of the site. See Appendix D.

In the full build-out condition, the eastern portion of the site will gravity flow through the property to the north, formerly *Sun Meadow*, connect to the existing 18" sewer main in 6<sup>th</sup> Avenue at Powhaton. This property has been added to the project site and is referred to as Infrastructure Areas 6, 7A, and 7B now considered onsite flows for this analysis. The original Master Utilities Report prepared by CVL, Consultants of Colorado, Inc. is show in Appendix C. The undeveloped property immediately east of Monaghan Road does not directly impact onsite sanitary sewer facilities, this area has been incorporated into the offsite gravity sewer design for future coordination between all applicable properties.

## Existing Infrastructure

### Wastewater Collection

Infrastructure to support PA 6, 7A, and 7B has been installed. No other wastewater collection infrastructure within the proposed Harmony development has been built.

Offsite development flow description has been added to the report.

Please include verbiage on EAA as this also appears to be offsite tributary to this site

There is an existing 24" sanitary sewer within Alameda Avenue that was built as part of the *Adonea Development*. See Appendix E. This existing line directs wastewater to the west and then north, eventually connecting to the 30-inch diameter First Creek Transfer Sewer Main within E. 6th Avenue r-o-w. This offsite sewer main is described in the *Sand Creek Ranch Master Utilities Report* (Ref. 4).

The Adonea Development also built a 10" sanitary sewer within 1st Avenue east of New Castle Way that extends to the east to Powhaton Road and later connects to an existing 24" main in New Castle Way, see Appendix E. This 10" line supports the existing harmony infrastructure in the PAs mentioned above.

12"

Revised to 12", thank you.

### Wastewater Treatment

Harmony is part of the First Creek drainage basin area. This area is to be served by the existing Metro Wastewater facilities. This information was provided by City of Aurora staff at a meeting on May 31, 2016.

## Proposed Wastewater Facilities

### Onsite Facilities

The proposed onsite wastewater collection infrastructure is designed to serve Harmony and a portion of the future *Parklands Development*. The collection system will consist of 8-inch to 24-inch gravity sewer lines (See Exhibit SS). Preliminary sewer design calculations are shown in Appendix B of this report. The onsite sewers will ultimately discharge to the proposed 6<sup>th</sup> Avenue Transfer line as discussed earlier within this report. The major amendment in this report is the addition of former *Sun Meadow* parcels now shown as Infrastructure Areas 6, 7A, and 7B.

### Offsite Facilities

The proposed offsite wastewater transmission/collection infrastructure is designed to convey the sewage flows of the Harmony development, a portion of the future *Parklands Development*, the undeveloped parcel located northeast of Monaghan Road and Alameda Avenue, and the majority of the undeveloped parcel to the north (formerly *Sun Meadow*). This system consists of an 18 gravity sewer line that starts at the corner of Monaghan Road and 1st Avenue and ends at the upstream end of the existing 18" sanitary sewer located in 6th Avenue at Powhaton Road. This 18" sewer main extends to the west to New Castle Way where it increases to a 30" pipe. Preliminary sewer design calculations are shown in Appendix B of this report.

Before the implementation of Infrastructure Areas 8, 9, or 10, the proposed routing of the gravity system down Monaghan Road north of Alameda Avenue we be required to convey sewer flows. This basin conveys sewage flows from Infrastructure Areas 8, 9, and 10 along with offsite flows from undeveloped adjacent parcels depicted as SM Offsite 1 and 2 on the Preliminary Sanitary Sewer Layout exhibit shown in Appendix B. These flows follow First Creek north to 6th Avenue and connect to the *Adonea Development's* 18" sewer main.

## Conclusion

The water distribution system will connect to the existing Zone 4 water system at two points in Alameda Avenue and 1<sup>st</sup> Avenue. The remaining site system will expand off of these initial water mains as required for each Filing's construction. The results of the system analysis indicate that the proposed water system conforms to the ***Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure*** (Ref. 2) and the ***Sand Creek Ranch Master Utilities Report*** (Ref. 1). Any subsequent changes to the proposed water distribution system as described within this report will require a reanalysis of the system. The Appendix contains the WaterGEMS results and layout exhibit.

The sanitary sewer system for Harmony serves the entire Harmony development, and receives contributing sewer flows from offsite basins in the Parklands development. The results of the system analysis indicate that the proposed sanitary sewer system conforms to the ***Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure*** (Ref. 2) and the ***Sand Creek Ranch Master Utilities Report*** (Ref. 1). The Appendix contains the anticipated sewer flow results and layout exhibit.

## References

1. **Sand Creek Ranch Master Utilities Report for Sand Creek Ranch, LLC**, Nolte Associates, Inc., November 2002.
2. **Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure**, City of Aurora, January 2012.
3. **Treated Water Distribution System 2025 Capital Improvement Plan**, City of Aurora, February, 2009.
4. **City of Aurora Wastewater Utility Plan – Volume I: Report**, Camp Dresser & McKee, Inc., January 15, 2003.
5. **Sewer Calculations/Exhibits for Eastern Hills**, Meurer & Associates, July, 2005.
6. **Starfall Master Utilities Report for Starfall Ranch, LLC**, Nolte Associates, Inc., December 2004.
7. **Trails at First Creek Master Utilities Report for Trails at First Creek, LLC**, Nolte Associates, Inc., October 2003.
8. **Master Utilities Report for Sun Meadow**, CVL Consultants of Colorado, Inc., October 5, 2005.
9. **Adonea Master Utilities Report Amendment No. 1**, CVL Consultants of Colorado, Inc., September 2016.



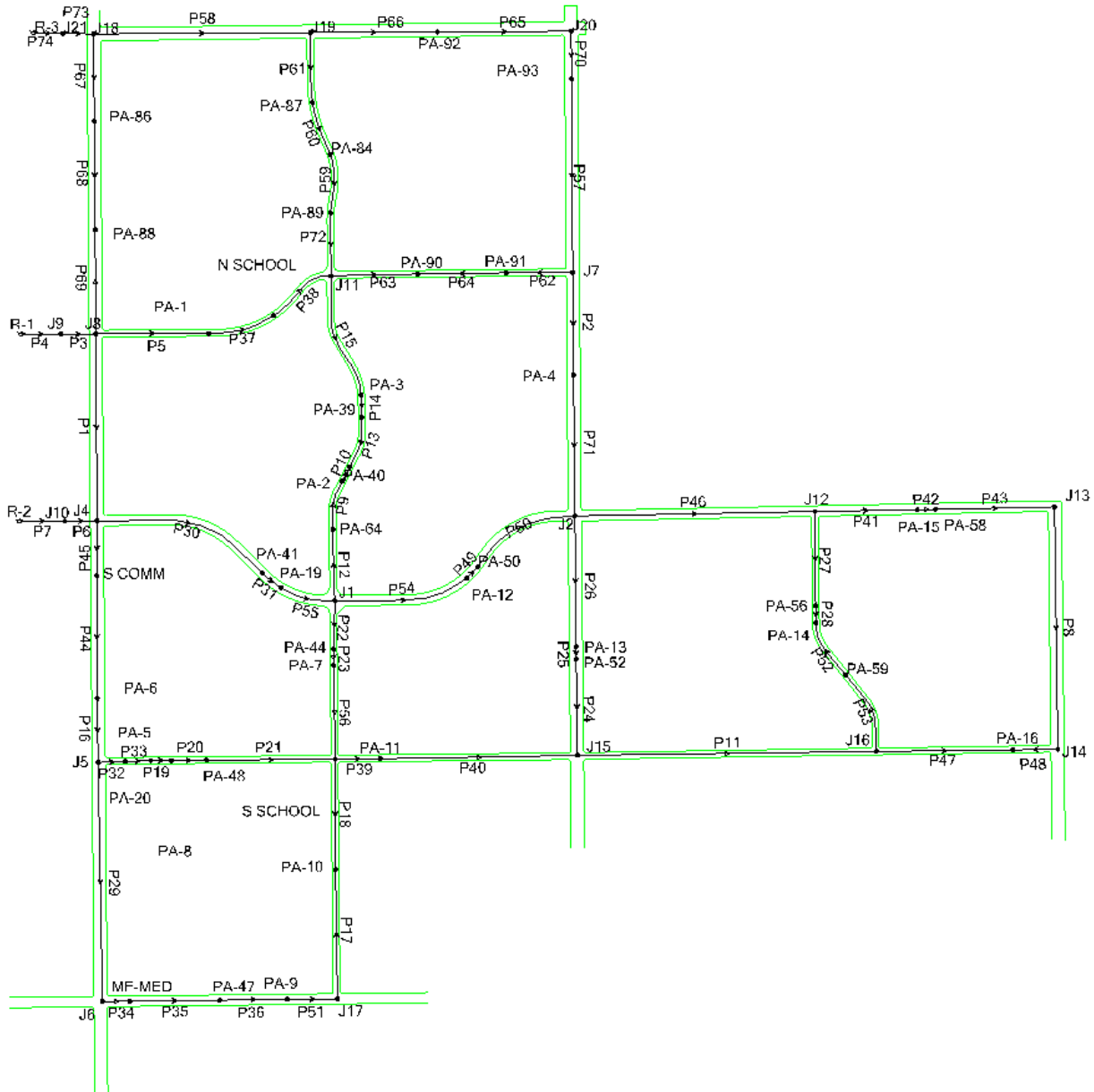
# Appendix A

Water Distribution Demands and WaterGEMS Results

# WATER SYSTEM SCHEMATIC

# HARMONY

## Active Scenario: AVERAGE DAY



# WATER DEMAND

**HARMONY**  
Master Utility Report  
Water Demand Calculations

Land Use	Max Day (gpm/cap)	Max Hour (gpm/cap)	Occupancy	Density (units/ac)
SINGLE FAMILY	2.8:1 of Avg	4.5:1 of Avg	2.77	8.0
SINGLE FAMILY-ATTACHED	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0
MULTI FAMILY - MEDIUM	2.8:1 of Avg	4.5:1 of Avg	2.77	15.0
MULTI FAMILY - LARGE	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0

**RESIDENTIAL**

Zoning	People Per Unit	Average Day Per Capita Flow
Residential	2.77	101

**NON-RESIDENTIAL**

Zone	Average Day (gpd/acre)	Max Day (gpd/acre)	Max Hour (gpd/acre)
Commercial	1500	4200	6750
Industrial (Including Schools)	1200	3360	5400
Parks	1800	5040	N/A

Label	Description	Area (ac)	Max Units**	Density (units/ac)	Occupancy (persons/unit)	Max Population	Avg. Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)	Comments
PA-1	SINGLE FAMILY	12.6	101	8.0	2.77	280	19.64	54.99	88.38	
	<b>Total</b>						<b>19.64</b>	<b>54.99</b>	<b>88.38</b>	Residential
PA-17	NORTH SCHOOL SITE	19.0					15.83	44.33	71.25	K-8
	<b>Total</b>						<b>15.83</b>	<b>44.33</b>	<b>71.25</b>	Industrial
PA-2	SINGLE FAMILY	107.8	862	8.0	2.77	2388	167.49	468.98	753.71	
	<b>Total</b>						<b>167.49</b>	<b>468.98</b>	<b>753.71</b>	Residential
PA-19	COMMUNITY CENTER	7.4					6.17	17.27	27.75	COMMUNITY CENTER
	<b>Total</b>						<b>6.17</b>	<b>17.27</b>	<b>27.75</b>	Industrial
PA-3	SINGLE FAMILY	115.2	922	8.0	2.77	2554	179.13	501.58	806.11	
	<b>Total</b>						<b>179.13</b>	<b>501.58</b>	<b>806.11</b>	Residential
PA-64	MUNICIPAL	2.8					2.33	6.53	10.50	FIRE STATION
	<b>Total</b>						<b>2.33</b>	<b>6.53</b>	<b>10.50</b>	Industrial
PA-4	SINGLE FAMILY	62.0	496	8.0	2.77	1374	96.37	269.84	433.67	
	<b>Total</b>						<b>96.37</b>	<b>269.84</b>	<b>433.67</b>	Residential
*CS	SOUTH COMMERCIAL	20.0					20.83	58.33	93.75	GROCERY RELATED
	<b>Total</b>						<b>20.83</b>	<b>58.33</b>	<b>93.75</b>	Commercial
PA-5	SINGLE FAMILY	15.5	124	8.0	2.77	343	24.06	67.36	108.26	
	<b>Total</b>						<b>24.06</b>	<b>67.36</b>	<b>108.26</b>	Residential
PA-6	SINGLE FAMILY	18.4	147	8.0	2.77	407	28.55	79.93	128.46	
	<b>Total</b>						<b>28.55</b>	<b>79.93</b>	<b>128.46</b>	Residential
PA-7	SINGLE FAMILY	51.5	412	8.0	2.77	1141	80.03	224.08	360.13	
	<b>Total</b>						<b>80.03</b>	<b>224.08</b>	<b>360.13</b>	Residential
*PA-20	CHURCH	11.4					9.50	26.60	42.75	CHURCH SITE
	<b>Total</b>						<b>9.50</b>	<b>26.60</b>	<b>42.75</b>	Industrial
*MF-MED	MF-OFFSITE	10.4	208	20.0	2.77	576	40.40	113.12	181.80	
	<b>Total</b>						<b>40.40</b>	<b>113.12</b>	<b>181.80</b>	Residential
PA-8	SINGLE FAMILY	21.8	174	8.0	2.77	482	33.81	94.66	152.13	
	<b>Total</b>						<b>33.81</b>	<b>94.66</b>	<b>152.13</b>	Residential
PA-9	SINGLE FAMILY	24.4	195	8.0	2.77	540	37.88	106.05	170.44	
	<b>Total</b>						<b>37.88</b>	<b>106.05</b>	<b>170.44</b>	Residential

\* NOT A PART OF THE HARMONY FDP, BUT IS INCLUDED IN THIS WATERCAD ANALYSIS

\*\*MAX UNITS AND MAX POPULATION WILL BE UP TO BUT NOT EXCEEDING THE NUMBER SHOWN.

**HARMONY**  
**Master Utility Report**  
**Water Demand Calculations**

Land Use	Max Day (gpm/cap)	Max Hour (gpm/cap)	Occupancy	Density (units/ac)
SINGLE FAMILY	2.8:1 of Avg	4.5:1 of Avg	2.77	8.0
SINGLE FAMILY-ATTACHED	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0
MULTI FAMILY - MEDIUM	2.8:1 of Avg	4.5:1 of Avg	2.77	15.0
MULTI FAMILY - LARGE	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0

**RESIDENTIAL**

Zoning	People Per Unit	Average Day Per Capita Flow
Residential	2.77	101

**NON-RESIDENTIAL**

Zone	Average Day (gpd/acre)	Max Day (gpd/acre)	Max Hour (gpd/acre)
Commercial	1500	4200	6750
Industrial (Including Schools)	1200	3360	5400
Parks	1800	5040	N/A

Label	Description	Area (ac)	Max Units**	Density (units/ac)	Occupancy (persons/unit)	Max Population	Avg. Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)	Comments
PA-10	SINGLE FAMILY	55.4	443	8.0	2.77	1227	86.06	240.97	387.27	
	<b>Total</b>						<b>86.06</b>	<b>240.97</b>	<b>387.27</b>	Residential
PA-18	SOUTH SCHOOL SITE	18.1					15.08	42.23	67.88	K-8
	<b>Total</b>						<b>15.08</b>	<b>42.23</b>	<b>67.88</b>	Industrial
PA-11	SINGLE FAMILY	23.1	185	8.0	2.77	512	35.91	100.55	161.60	
	<b>Total</b>						<b>35.91</b>	<b>100.55</b>	<b>161.60</b>	Residential
PA-12	SINGLE FAMILY	83.4	667	8.0	2.77	1848	129.62	362.93	583.28	
	<b>Total</b>						<b>129.62</b>	<b>362.93</b>	<b>583.28</b>	Residential
PA-13	SINGLE FAMILY	64.5	516	8.0	2.77	1429	100.23	280.64	451.03	
	<b>Total</b>						<b>100.23</b>	<b>280.64</b>	<b>451.03</b>	Residential
PA-14	SINGLE FAMILY	59.3	474	8.0	2.77	1313	92.09	257.86	414.42	
	<b>Total</b>						<b>92.09</b>	<b>257.86</b>	<b>414.42</b>	Residential
PA-15	SINGLE FAMILY	60.4	483	8.0	2.77	1338	93.85	262.77	422.31	
	<b>Total</b>						<b>93.85</b>	<b>262.77</b>	<b>422.31</b>	Residential
PA-16	SINGLE FAMILY - ATTACHED	35.9	287	8.0	2.77	795	55.76	156.13	250.92	
	<b>Total</b>						<b>55.76</b>	<b>156.13</b>	<b>250.92</b>	Residential

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**HARMONY**  
**Master Utility Report**  
**Water Demand Calculations**

Land Use	Max Day (gpm/cap)	Max Hour (gpm/cap)	Occupancy	Density (units/ac)
SINGLE FAMILY	2.8:1 of Avg	4.5:1 of Avg	2.77	8.0
SINGLE FAMILY-ATTACHED	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0
MULTI FAMILY - MEDIUM	2.8:1 of Avg	4.5:1 of Avg	2.77	15.0
MULTI FAMILY - LARGE	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0

**RESIDENTIAL**

Zoning	People Per Unit	Average Day Per Capita Flow
Residential	2.77	101

**NON-RESIDENTIAL**

Zone	Average Day (gpd/acre)	Max Day (gpd/acre)	Max Hour (gpd/acre)
Commercial	1500	4200	6750
Industrial (Including Schools)	1200	3360	5400
Parks	1800	5040	N/A

Label	Description	Area (ac)	Max Units**	Density (units/ac)	Occupancy (persons/unit)	Max Population	Avg. Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)	Comments
PA-39	NEIGHBORHOOD ACTIVITY CENTER	1.3					1.63	4.55	NA	
	<b>Total</b>						<b>1.63</b>	<b>4.55</b>	<b>0.00</b>	Parks
PA-40	NEIGHBORHOOD ACTIVITY CENTER	2.3					2.88	8.05	NA	
	<b>Total</b>						<b>2.88</b>	<b>8.05</b>	<b>0.00</b>	Parks
PA-41	NEIGHBORHOOD PARK	5.7					7.13	19.95	NA	
	<b>Total</b>						<b>7.13</b>	<b>19.95</b>	<b>0.00</b>	Parks
PA-44	NEIGHBORHOOD ACTIVITY CENTER	1.9					2.38	6.65	NA	
	<b>Total</b>						<b>2.38</b>	<b>6.65</b>	<b>0.00</b>	Parks
PA-47	NEIGHBORHOOD ACTIVITY CENTER	1.2					1.50	4.20	NA	
	<b>Total</b>						<b>1.50</b>	<b>4.20</b>	<b>0.00</b>	Parks
PA-48	NEIGHBORHOOD ACTIVITY CENTER	5.1					6.38	17.85	NA	
	<b>Total</b>						<b>6.38</b>	<b>17.85</b>	<b>0.00</b>	Parks
PA-50	NEIGHBORHOOD PARK	5.5					6.88	19.25	NA	
	<b>Total</b>						<b>6.88</b>	<b>19.25</b>	<b>0.00</b>	Parks
PA-52	NEIGHBORHOOD ACTIVITY CENTER	1.0					1.25	3.50	NA	
	<b>Total</b>						<b>1.25</b>	<b>3.50</b>	<b>0.00</b>	Parks
PA-56	NEIGHBORHOOD PARK	5.3					6.63	18.55	NA	
	<b>Total</b>						<b>6.63</b>	<b>18.55</b>	<b>0.00</b>	Parks
PA-58	NEIGHBORHOOD ACTIVITY CENTER	5.0					6.25	17.50	NA	
	<b>Total</b>						<b>6.25</b>	<b>17.50</b>	<b>0.00</b>	Parks
PA-59	NEIGHBORHOOD ACTIVITY CENTER	2.2					2.75	7.70	NA	
	<b>Total</b>						<b>2.75</b>	<b>7.70</b>	<b>0.00</b>	Parks
PA-84	NEIGHBORHOOD PARK	11.5					14.38	40.25	NA	
	<b>Total</b>						<b>14.38</b>	<b>40.25</b>	<b>0.00</b>	Parks

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**HARMONY**  
Master Utility Report  
Water Demand Calculations

Land Use	Max Day (gpm/cap)	Max Hour (gpm/cap)	Occupancy	Density (units/ac)
SINGLE FAMILY	2.8:1 of Avg	4.5:1 of Avg	2.77	8.0
SINGLE FAMILY-ATTACHED	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0
MULTI FAMILY - MEDIUM	2.8:1 of Avg	4.5:1 of Avg	2.77	15.0
MULTI FAMILY - LARGE	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0

**RESIDENTIAL**

Zoning	People Per Unit	Average Day Per Capita Flow
Residential	2.77	101

**NON-RESIDENTIAL**

Zone	Average Day (gpd/acre)	Max Day (gpd/acre)	Max Hour (gpd/acre)
Commercial	1500	4200	6750
Industrial (Including Schools)	1200	3360	5400
Parks	1800	5040	N/A

Label	Description	Area (ac)	Max Units**	Density (units/ac)	Occupancy (persons/unit)	Max Population	Avg. Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)	Comments
PA-86	SINGLE FAMILY	23.2	186	8.0	2.77	515	36.12	101.14	162.55	
	<b>Total</b>						<b>36.12</b>	<b>101.14</b>	<b>162.55</b>	Residential
PA-87	SINGLE FAMILY	24.0	192	8.0	2.77	532	37.31	104.48	167.91	
	<b>Total</b>						<b>37.31</b>	<b>104.48</b>	<b>167.91</b>	Residential
PA-88	SINGLE FAMILY	32.4	259	8.0	2.77	717	50.29	140.81	226.30	
	<b>Total</b>						<b>50.29</b>	<b>140.81</b>	<b>226.30</b>	Residential
PA-89	SINGLE FAMILY	30.0	240	8.0	2.77	665	46.64	130.60	209.89	
	<b>Total</b>						<b>46.64</b>	<b>130.60</b>	<b>209.89</b>	Residential
PA-90	SINGLE FAMILY	40.0	320	8.0	2.77	886	62.14	174.00	279.64	
	<b>Total</b>						<b>62.14</b>	<b>174.00</b>	<b>279.64</b>	Residential
PA-91	SINGLE FAMILY	12.1	97	8.0	2.77	269	18.87	52.83	84.90	
	<b>Total</b>						<b>18.87</b>	<b>52.83</b>	<b>84.90</b>	Residential
PA-92	SINGLE FAMILY - ATTACHED	24.1	265	11.0	2.77	734	51.48	144.15	231.67	
	<b>Total</b>						<b>51.48</b>	<b>144.15</b>	<b>231.67</b>	Residential
PA-93	NORTH COMMERCIAL - CAC	16.3					16.98	47.54	76.41	SHOPPING CENTER
	<b>Total</b>						<b>16.98</b>	<b>47.54</b>	<b>76.41</b>	Commercial
<b>MODEL TOTAL</b>		<b>1,150.40</b>	<b>8,255</b>			<b>22,865</b>	<b>1,997.20</b>	<b>5,592.15</b>	<b>8,717.38</b>	
<b>HARMONY TOTAL</b>		<b>1,108.6</b>	<b>8,047</b>			<b>22,289</b>	<b>1,679.72</b>	<b>4,703.22</b>	<b>7,288.75</b>	<b>On-Site</b>

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**HARMONY**  
**Master Utility Report**  
**Water Demand Calculations**

Land Use	Max Day (gpm/cap)	Max Hour (gpm/cap)	Occupancy	Density (units/ac)
SINGLE FAMILY	2.8:1 of Avg	4.5:1 of Avg	2.77	8.0
SINGLE FAMILY-ATTACHED	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0
MULTI FAMILY - MEDIUM	2.8:1 of Avg	4.5:1 of Avg	2.77	15.0
MULTI FAMILY - LARGE	2.8:1 of Avg	4.5:1 of Avg	2.77	11.0

**RESIDENTIAL**

Zoning	People Per Unit	Average Day Per Capita Flow
Residential	2.77	101

**NON-RESIDENTIAL**

Zone	Average Day (gpd/acre)	Max Day (gpd/acre)	Max Hour (gpd/acre)
Commercial	1500	4200	6750
Industrial (Including Schools)	1200	3360	5400
Parks	1800	5040	N/A

**OFF-SITE WATER CALCULATIONS\***

Label	Description	Area (ac)	Max Units**	Density (units/ac)	Occupancy (persons/unit)	Max Population	Avg. Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)	Comments
J6 Parklands	PARKLANDS CONNECTION	58.0	290	5.0	2.77	803	56.34	157.76	253.54	
J14 Parklands	PARKLANDS CONNECTION	58.0	290	5.0	2.77	803	56.34	157.76	253.54	
J15 Parklands	PARKLANDS CONNECTION	58.0	290	5.0	2.77	803	56.34	157.76	253.54	
J2 Undeveloped	UNDEVELOPED CONNECTION	40.0	200	5.0	2.77	554	38.86	108.80	174.86	
J12 Undeveloped	UNDEVELOPED CONNECTION	40.0	200	5.0	2.77	554	38.86	108.80	174.86	

AVERAGE DAY

## HARMONY

### Active Scenario: AVERAGE DAY

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P1	J4	J8	2,046	16	PVC	130.0	0.01	-5.05	0.000
P2	J7	PA-4	1,120	16	PVC	130.0	0.38	239.38	0.044
P3	J9	J8	10	12	PVC	130.0	0.54	189.31	0.146
P4	J9	R-1	1	12	PVC	130.0	0.54	-189.31	0.000
P5	J8	PA-1	1,232	12	PVC	130.0	0.43	150.27	0.076
P6	J4	J10	10	24	PVC	130.0	0.85	-1,198.69	0.146
P7	J10	R-2	1	24	PVC	130.0	0.85	-1,198.69	0.000
P8	J13	J14	2,650	16	PVC	130.0	0.15	94.82	0.008
P9	PA-64	PA-40	549	12	PVC	130.0	0.47	166.71	0.092
P10	PA-40	PA-2	181	12	PVC	130.0	0.46	163.83	0.089
P11	J16	J15	3,264	12	PVC	130.0	0.10	-35.15	0.005
P12	J1	PA-64	780	12	PVC	130.0	0.48	169.04	0.095
P13	PA-2	PA-39	568	12	PVC	130.0	0.01	-3.66	0.000
P14	PA-39	PA-3	247	12	PVC	130.0	0.02	-5.29	0.000
P15	PA-3	J11	1,377	12	PVC	130.0	0.52	-184.42	0.111
P16	J5	PA-6	700	16	PVC	130.0	0.47	-296.30	0.066
P17	J17	PA-10	1,415	12	PVC	130.0	0.09	30.46	0.004
P18	PA-10	S SCHOOL	1,208	12	PVC	130.0	0.16	-55.60	0.012
P19	PA-5	PA-8	225	12	PVC	130.0	0.27	96.16	0.033
P20	PA-8	PA-48	384	12	PVC	130.0	0.18	62.35	0.014
P21	PA-48	S SCHOOL	1,407	12	PVC	130.0	0.16	55.97	0.012
P22	J1	PA-44	530	12	PVC	130.0	0.44	156.01	0.081
P23	PA-44	PA-7	178	12	PVC	130.0	0.44	153.63	0.080
P24	J15	PA-52	1,052	16	PVC	130.0	0.11	-68.52	0.004
P25	PA-52	PA-13	136	16	PVC	130.0	0.11	-69.77	0.004
P26	PA-13	J2	1,430	16	PVC	130.0	0.27	-170.00	0.024
P27	J12	PA-56	1,032	12	PVC	130.0	0.24	83.59	0.026
P28	PA-56	PA-14	187	12	PVC	130.0	0.22	76.96	0.021
P29	J5	J6	2,616	16	PVC	130.0	0.27	166.58	0.023
P30	J4	PA-41	2,005	24	PVC	130.0	0.61	858.06	0.065
P31	PA-41	PA-19	251	24	PVC	130.0	0.60	850.93	0.064
P32	J5	PA-20	297	12	PVC	130.0	0.37	129.72	0.058
P33	PA-20	PA-5	280	12	PVC	130.0	0.34	120.22	0.051
P34	J6	MF-MED	298	16	PVC	130.0	0.18	110.24	0.010
P35	MF-MED	PA-47	985	16	PVC	130.0	0.11	69.84	0.004
P36	PA-47	PA-9	736	16	PVC	130.0	0.11	68.34	0.005
P37	PA-1	N SCHOOL	751	12	PVC	130.0	0.37	130.63	0.059
P38	N SCHOOL	J11	794	12	PVC	130.0	0.33	114.80	0.046
P39	S SCHOOL	PA-11	491	12	PVC	130.0	0.17	58.89	0.013
P40	PA-11	J15	2,158	12	PVC	130.0	0.07	22.98	0.002
P41	J12	PA-15	1,120	24	PVC	130.0	0.14	194.92	0.004
P42	PA-15	PA-58	197	24	PVC	130.0	0.07	101.07	0.002
P43	PA-58	J13	1,304	24	PVC	130.0	0.07	94.82	0.001
P44	PA-6	S COMM	1,342	16	PVC	130.0	0.52	-324.85	0.078
P45	S COMM	J4	599	16	PVC	130.0	0.55	-345.68	0.087
P46	J2	J12	2,623	24	PVC	130.0	0.23	317.38	0.010
P47	J16	PA-16	1,494	12	PVC	130.0	0.05	17.28	0.001

## HARMONY

### Active Scenario: AVERAGE DAY

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P48	PA-16	J14	492	12	PVC	130.0	0.11	-38.48	0.006
P49	PA-12	PA-50	171	24	PVC	130.0	0.28	390.10	0.014
P50	PA-50	J2	1,265	24	PVC	130.0	0.27	383.22	0.015
P51	PA-9	J17	549	16	PVC	130.0	0.05	30.46	0.001
P52	PA-14	PA-59	671	12	PVC	130.0	0.04	-15.13	0.001
P53	PA-59	J16	942	12	PVC	130.0	0.05	-17.88	0.002
P54	J1	PA-12	1,494	24	PVC	150.0	0.37	519.72	0.020
P55	PA-19	J1	621	24	PVC	130.0	0.60	844.76	0.063
P56	PA-7	S SCHOOL	1,025	12	PVC	130.0	0.21	73.60	0.020
P57	J7	PA-93	2,119	16	PVC	150.0	0.47	-296.37	0.050
P58	J19	J18	2,368	30	PVC	150.0	0.25	-556.81	0.008
P59	PA-89	PA-84	650	12	PVC	150.0	0.40	-140.29	0.051
P60	PA-84	PA-87	598	12	PVC	150.0	0.44	-154.67	0.061
P61	PA-87	J19	769	12	PVC	150.0	0.54	-191.98	0.091
P62	PA-91	J7	729	12	PVC	130.0	0.16	-56.99	0.013
P63	J11	PA-90	946	12	PVC	130.0	0.07	24.02	0.002
P64	PA-90	PA-91	966	12	PVC	130.0	0.11	-38.12	0.006
P65	J20	PA-92	1,461	30	PVC	150.0	0.14	-313.35	0.003
P66	PA-92	J19	1,390	30	PVC	150.0	0.17	-364.83	0.004
P67	J18	PA-86	954	16	PVC	150.0	0.08	52.42	0.002
P68	PA-86	PA-88	1,187	16	PVC	150.0	0.03	16.30	0.000
P69	PA-88	J8	1,140	16	PVC	150.0	0.05	-33.99	0.001
P70	PA-93	J20	522	16	PVC	150.0	0.50	-313.35	0.055
P71	PA-4	J2	1,542	16	PVC	130.0	0.23	143.01	0.017
P72	PA-89	J11	691	12	PVC	150.0	0.27	93.65	0.025
P73	J21	J18	10	30	PVC	150.0	0.28	609.23	0.000
P74	R-3	J21	1	30	PVC	150.0	0.28	609.23	0.000

## HARMONY

### Active Scenario: AVERAGE DAY

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
J1	5,641.98	0.00	89.9	5,849.81
J2	5,643.16	38.86	89.4	5,849.76
J4	5,629.30	0.00	95.5	5,850.00
J5	5,647.47	0.00	87.5	5,849.80
J6	5,672.32	56.34	76.8	5,849.74
J7	5,604.97	0.00	105.9	5,849.84
J8	5,612.42	0.00	102.8	5,850.00
J9	5,609.31	0.00	104.1	5,850.00
J10	5,624.26	0.00	97.7	5,850.00
J11	5,620.07	0.00	99.4	5,849.82
J12	5,681.12	38.86	73.0	5,849.73
J13	5,711.38	0.00	59.9	5,849.73
J14	5,685.26	56.34	71.1	5,849.71
J15	5,677.09	56.34	74.7	5,849.72
J16	5,660.25	0.00	82.0	5,849.71
J17	5,672.78	0.00	76.6	5,849.73
J18	5,582.05	0.00	115.9	5,850.00
J19	5,580.09	0.00	116.8	5,849.98
J20	5,642.39	0.00	89.8	5,849.97
J21	5,577.15	0.00	118.0	5,850.00
MF-MED	5,670.87	40.40	77.4	5,849.73
N SCHOOL	5,617.48	15.83	100.5	5,849.86
PA-1	5,620.06	19.64	99.4	5,849.91
PA-2	5,629.95	167.49	95.1	5,849.67
PA-3	5,630.21	179.13	95.0	5,849.67
PA-4	5,625.96	96.37	96.8	5,849.79
PA-5	5,645.18	24.06	88.5	5,849.76
PA-6	5,636.98	28.55	92.1	5,849.84
PA-7	5,641.60	80.03	90.1	5,849.76
PA-8	5,646.41	33.81	88.0	5,849.76
PA-9	5,671.39	37.88	77.2	5,849.73
PA-10	5,656.97	86.06	83.4	5,849.72
PA-11	5,657.56	35.91	83.1	5,849.73
PA-12	5,666.02	129.62	79.5	5,849.78
PA-13	5,669.05	100.23	78.2	5,849.73
PA-14	5,675.51	92.09	75.4	5,849.70
PA-15	5,713.00	93.85	59.2	5,849.73
PA-16	5,680.75	55.76	73.1	5,849.70
PA-19	5,630.53	6.17	94.9	5,849.85
PA-20	5,646.55	9.50	87.9	5,849.78
PA-39	5,631.44	1.63	94.4	5,849.67
PA-40	5,637.99	2.88	91.6	5,849.69
PA-41	5,637.27	7.13	92.0	5,849.87
PA-44	5,642.87	2.38	89.5	5,849.77
PA-47	5,664.55	1.50	80.1	5,849.73
PA-48	5,644.42	6.38	88.8	5,849.75
PA-50	5,666.74	6.88	79.2	5,849.78
PA-52	5,671.99	1.25	76.9	5,849.73

## HARMONY

### Active Scenario: AVERAGE DAY

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
PA-56	5,681.20	6.63	72.9	5,849.71
PA-58	5,712.42	6.25	59.4	5,849.73
PA-59	5,681.35	2.75	72.8	5,849.70
PA-64	5,635.82	2.33	92.6	5,849.74
PA-84	5,604.08	14.38	106.3	5,849.88
PA-86	5,595.01	36.12	110.3	5,850.00
PA-87	5,594.90	37.31	110.3	5,849.91
PA-88	5,609.19	50.29	104.2	5,850.00
PA-89	5,608.29	46.64	104.5	5,849.84
PA-90	5,625.03	62.14	97.3	5,849.82
PA-91	5,626.49	18.87	96.6	5,849.83
PA-92	5,609.90	51.48	103.9	5,849.98
PA-93	5,633.92	16.98	93.5	5,849.94
S COMM	5,628.18	20.83	95.9	5,849.95
S SCHOOL	5,652.03	15.08	85.5	5,849.73

## HARMONY

### Active Scenario: AVERAGE DAY

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
473	R-1	5,850.00	189.31	5,850.00
591	R-2	5,850.00	1,198.69	5,850.00
916	R-3	5,850.00	609.23	5,850.00

MAX DAY



## HARMONY

### Active Scenario: MAX DAY

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P1	J4	J8	2,046	16	PVC	130.0	0.06	-35.84	0.001
P2	J7	PA-4	1,120	16	PVC	130.0	0.97	609.35	0.249
P3	J9	J8	10	12	PVC	130.0	1.12	393.77	0.439
P4	J9	R-1	1	12	PVC	130.0	1.12	-393.77	0.488
P5	J8	PA-1	1,232	12	PVC	130.0	0.98	344.21	0.352
P6	J4	J10	10	24	PVC	130.0	2.17	-3,062.62	0.732
P7	J10	R-2	1	24	PVC	130.0	2.17	-3,062.62	0.488
P8	J13	J14	2,650	16	PVC	130.0	0.43	270.94	0.055
P9	PA-64	PA-40	549	12	PVC	130.0	1.24	438.19	0.550
P10	PA-40	PA-2	181	12	PVC	130.0	1.23	435.31	0.545
P11	J16	J15	3,264	12	PVC	130.0	0.22	-76.26	0.022
P12	J1	PA-64	780	12	PVC	130.0	1.26	444.06	0.563
P13	PA-2	PA-39	568	12	PVC	130.0	0.10	-33.66	0.005
P14	PA-39	PA-3	247	12	PVC	130.0	0.10	-35.29	0.004
P15	PA-3	J11	1,377	12	PVC	130.0	1.52	-536.86	0.801
P16	J5	PA-6	700	16	PVC	130.0	1.25	-780.44	0.394
P17	J17	PA-10	1,415	12	PVC	130.0	0.18	64.58	0.016
P18	PA-10	S SCHOOL	1,208	12	PVC	130.0	0.50	-176.39	0.102
P19	PA-5	PA-8	225	12	PVC	130.0	0.66	232.06	0.169
P20	PA-8	PA-48	384	12	PVC	130.0	0.39	137.39	0.064
P21	PA-48	S SCHOOL	1,407	12	PVC	130.0	0.37	131.01	0.059
P22	J1	PA-44	530	12	PVC	130.0	1.22	431.19	0.533
P23	PA-44	PA-7	178	12	PVC	130.0	1.22	428.81	0.529
P24	J15	PA-52	1,052	16	PVC	130.0	0.34	-213.21	0.036
P25	PA-52	PA-13	136	16	PVC	130.0	0.34	-214.46	0.036
P26	PA-13	J2	1,430	16	PVC	130.0	0.79	-495.10	0.170
P27	J12	PA-56	1,032	12	PVC	130.0	0.66	233.91	0.172
P28	PA-56	PA-14	187	12	PVC	130.0	0.64	227.28	0.162
P29	J5	J6	2,616	16	PVC	130.0	0.71	443.01	0.138
P30	J4	PA-41	2,005	24	PVC	130.0	1.54	2,171.43	0.364
P31	PA-41	PA-19	251	24	PVC	130.0	1.53	2,164.30	0.362
P32	J5	PA-20	297	12	PVC	130.0	0.96	337.43	0.339
P33	PA-20	PA-5	280	12	PVC	130.0	0.85	299.43	0.272
P34	J6	MF-MED	298	16	PVC	130.0	0.46	285.26	0.062
P35	MF-MED	PA-47	985	16	PVC	130.0	0.27	172.14	0.024
P36	PA-47	PA-9	736	16	PVC	130.0	0.27	170.64	0.024
P37	PA-1	N SCHOOL	751	12	PVC	130.0	0.82	289.22	0.255
P38	N SCHOOL	J11	794	12	PVC	130.0	0.71	249.33	0.194
P39	S SCHOOL	PA-11	491	12	PVC	130.0	0.34	121.35	0.051
P40	PA-11	J15	2,158	12	PVC	130.0	0.06	20.80	0.002
P41	J12	PA-15	1,120	24	PVC	130.0	0.38	539.97	0.028
P42	PA-15	PA-58	197	24	PVC	130.0	0.20	277.19	0.007
P43	PA-58	J13	1,304	24	PVC	130.0	0.19	270.94	0.008
P44	PA-6	S COMM	1,342	16	PVC	130.0	1.37	-860.38	0.473
P45	S COMM	J4	599	16	PVC	130.0	1.48	-927.03	0.542
P46	J2	J12	2,623	24	PVC	130.0	0.58	812.75	0.059
P47	J16	PA-16	1,494	12	PVC	130.0	0.12	42.94	0.008

## HARMONY

### Active Scenario: MAX DAY

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P48	PA-16	J14	492	12	PVC	130.0	0.32	-113.19	0.046
P49	PA-12	PA-50	171	24	PVC	130.0	0.65	910.56	0.074
P50	PA-50	J2	1,265	24	PVC	130.0	0.64	903.68	0.072
P51	PA-9	J17	549	16	PVC	130.0	0.10	64.58	0.004
P52	PA-14	PA-59	671	12	PVC	130.0	0.09	-30.57	0.004
P53	PA-59	J16	942	12	PVC	130.0	0.09	-33.32	0.005
P54	J1	PA-12	1,494	24	PVC	150.0	0.90	1,273.49	0.104
P55	PA-19	J1	621	24	PVC	130.0	1.52	2,148.75	0.357
P56	PA-7	S SCHOOL	1,025	12	PVC	130.0	0.58	204.73	0.134
P57	J7	PA-93	2,119	16	PVC	150.0	1.10	-692.00	0.242
P58	J19	J18	2,368	30	PVC	150.0	0.52	-1,144.67	0.029
P59	PA-89	PA-84	650	12	PVC	150.0	0.94	-332.53	0.253
P60	PA-84	PA-87	598	12	PVC	150.0	0.98	-346.91	0.274
P61	PA-87	J19	769	12	PVC	150.0	1.09	-384.22	0.331
P62	PA-91	J7	729	12	PVC	130.0	0.23	-82.65	0.025
P63	J11	PA-90	946	12	PVC	130.0	0.00	-1.64	0.000
P64	PA-90	PA-91	966	12	PVC	130.0	0.18	-63.78	0.016
P65	J20	PA-92	1,461	30	PVC	150.0	0.32	-708.98	0.012
P66	PA-92	J19	1,390	30	PVC	150.0	0.35	-760.46	0.014
P67	J18	PA-86	954	16	PVC	150.0	0.12	72.70	0.004
P68	PA-86	PA-88	1,187	16	PVC	150.0	0.06	36.58	0.001
P69	PA-88	J8	1,140	16	PVC	150.0	0.02	-13.71	0.000
P70	PA-93	J20	522	16	PVC	150.0	1.13	-708.98	0.253
P71	PA-4	J2	1,542	16	PVC	130.0	0.82	512.98	0.181
P72	PA-89	J11	691	12	PVC	150.0	0.81	285.89	0.191
P73	J21	J18	10	30	PVC	150.0	0.55	1,217.37	0.049
P74	R-3	J21	1	30	PVC	150.0	0.55	1,217.37	0.000

## HARMONY

### Active Scenario: MAX DAY

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
J1	5,641.98	0.00	89.5	5,848.95
J2	5,643.16	108.81	88.9	5,848.69
J4	5,629.30	0.00	95.5	5,849.99
J5	5,647.47	0.00	87.1	5,848.76
J6	5,672.32	157.75	76.2	5,848.40
J7	5,604.97	0.00	105.7	5,849.25
J8	5,612.42	0.00	102.8	5,850.00
J9	5,609.31	0.00	104.1	5,850.00
J10	5,624.26	0.00	97.7	5,850.00
J11	5,620.07	0.00	99.1	5,849.22
J12	5,681.12	38.86	72.4	5,848.54
J13	5,711.38	0.00	59.3	5,848.49
J14	5,685.26	157.75	70.6	5,848.35
J15	5,677.09	157.75	74.1	5,848.41
J16	5,660.25	0.00	81.4	5,848.34
J17	5,672.78	0.00	76.0	5,848.33
J18	5,582.05	0.00	115.9	5,850.00
J19	5,580.09	0.00	116.7	5,849.93
J20	5,642.39	0.00	89.8	5,849.90
J21	5,577.15	0.00	118.0	5,850.00
MF-MED	5,670.87	113.12	76.8	5,848.38
N SCHOOL	5,617.48	39.89	100.3	5,849.37
PA-1	5,620.06	54.99	99.3	5,849.56
PA-2	5,629.95	468.97	94.4	5,848.11
PA-3	5,630.21	501.56	94.3	5,848.11
PA-4	5,625.96	96.37	96.5	5,848.97
PA-5	5,645.18	67.37	88.0	5,848.58
PA-6	5,636.98	79.94	91.7	5,849.03
PA-7	5,641.60	224.08	89.5	5,848.57
PA-8	5,646.41	94.67	87.5	5,848.54
PA-9	5,671.39	106.06	76.6	5,848.34
PA-10	5,656.97	240.97	82.8	5,848.31
PA-11	5,657.56	100.55	82.6	5,848.41
PA-12	5,666.02	362.94	79.1	5,848.79
PA-13	5,669.05	280.64	77.6	5,848.45
PA-14	5,675.51	257.85	74.8	5,848.33
PA-15	5,713.00	262.78	58.6	5,848.51
PA-16	5,680.75	156.13	72.5	5,848.32
PA-19	5,630.53	15.55	94.6	5,849.17
PA-20	5,646.55	38.00	87.4	5,848.66
PA-39	5,631.44	1.63	93.7	5,848.11
PA-40	5,637.99	2.88	91.0	5,848.21
PA-41	5,637.27	7.13	91.7	5,849.26
PA-44	5,642.87	2.38	89.0	5,848.67
PA-47	5,664.55	1.50	79.5	5,848.35
PA-48	5,644.42	6.38	88.3	5,848.52
PA-50	5,666.74	6.88	78.8	5,848.78
PA-52	5,671.99	1.25	76.3	5,848.44

## HARMONY

### Active Scenario: MAX DAY

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
PA-56	5,681.20	6.63	72.3	5,848.36
PA-58	5,712.42	6.25	58.9	5,848.50
PA-59	5,681.35	2.75	72.2	5,848.33
PA-64	5,635.82	5.87	92.0	5,848.51
PA-84	5,604.08	14.38	106.2	5,849.51
PA-86	5,595.01	36.12	110.3	5,850.00
PA-87	5,594.90	37.31	110.2	5,849.68
PA-88	5,609.19	50.29	104.2	5,849.99
PA-89	5,608.29	46.64	104.3	5,849.35
PA-90	5,625.03	62.14	97.0	5,849.22
PA-91	5,626.49	18.87	96.4	5,849.23
PA-92	5,609.90	51.48	103.8	5,849.91
PA-93	5,633.92	16.98	93.4	5,849.76
S COMM	5,628.18	66.66	95.8	5,849.67
S SCHOOL	5,652.03	38.00	85.0	5,848.44

## HARMONY

### Active Scenario: MAX DAY

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
473	R-1	5,850.00	393.77	5,850.00
591	R-2	5,850.00	3,062.62	5,850.00
916	R-3	5,850.00	1,217.37	5,850.00

# MAX DAY WITH FIRE FLOW ANALYSIS

## HARMONY

### Active Scenario: MAX DAY + FIRE FLOW

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P1	J4	J8	2,046	16	PVC	130.0	0.06	-35.84	0.001
P2	J7	PA-4	1,120	16	PVC	130.0	0.97	609.35	0.249
P3	J9	J8	10	12	PVC	130.0	1.12	393.77	0.439
P4	J9	R-1	1	12	PVC	130.0	1.12	-393.77	0.488
P5	J8	PA-1	1,232	12	PVC	130.0	0.98	344.21	0.352
P6	J4	J10	10	24	PVC	130.0	2.17	-3,062.62	0.732
P7	J10	R-2	1	24	PVC	130.0	2.17	-3,062.62	0.488
P8	J13	J14	2,650	16	PVC	130.0	0.43	270.94	0.055
P9	PA-64	PA-40	549	12	PVC	130.0	1.24	438.19	0.550
P10	PA-40	PA-2	181	12	PVC	130.0	1.23	435.31	0.545
P11	J16	J15	3,264	12	PVC	130.0	0.22	-76.26	0.022
P12	J1	PA-64	780	12	PVC	130.0	1.26	444.06	0.563
P13	PA-2	PA-39	568	12	PVC	130.0	0.10	-33.66	0.005
P14	PA-39	PA-3	247	12	PVC	130.0	0.10	-35.29	0.004
P15	PA-3	J11	1,377	12	PVC	130.0	1.52	-536.86	0.801
P16	J5	PA-6	700	16	PVC	130.0	1.25	-780.44	0.394
P17	J17	PA-10	1,415	12	PVC	130.0	0.18	64.58	0.016
P18	PA-10	S SCHOOL	1,208	12	PVC	130.0	0.50	-176.39	0.102
P19	PA-5	PA-8	225	12	PVC	130.0	0.66	232.06	0.169
P20	PA-8	PA-48	384	12	PVC	130.0	0.39	137.39	0.064
P21	PA-48	S SCHOOL	1,407	12	PVC	130.0	0.37	131.01	0.059
P22	J1	PA-44	530	12	PVC	130.0	1.22	431.19	0.533
P23	PA-44	PA-7	178	12	PVC	130.0	1.22	428.81	0.529
P24	J15	PA-52	1,052	16	PVC	130.0	0.34	-213.21	0.036
P25	PA-52	PA-13	136	16	PVC	130.0	0.34	-214.46	0.036
P26	PA-13	J2	1,430	16	PVC	130.0	0.79	-495.10	0.170
P27	J12	PA-56	1,032	12	PVC	130.0	0.66	233.91	0.172
P28	PA-56	PA-14	187	12	PVC	130.0	0.64	227.28	0.162
P29	J5	J6	2,616	16	PVC	130.0	0.71	443.01	0.138
P30	J4	PA-41	2,005	24	PVC	130.0	1.54	2,171.43	0.364
P31	PA-41	PA-19	251	24	PVC	130.0	1.53	2,164.30	0.362
P32	J5	PA-20	297	12	PVC	130.0	0.96	337.43	0.339
P33	PA-20	PA-5	280	12	PVC	130.0	0.85	299.43	0.272
P34	J6	MF-MED	298	16	PVC	130.0	0.46	285.26	0.062
P35	MF-MED	PA-47	985	16	PVC	130.0	0.27	172.14	0.024
P36	PA-47	PA-9	736	16	PVC	130.0	0.27	170.64	0.024
P37	PA-1	N SCHOOL	751	12	PVC	130.0	0.82	289.22	0.255
P38	N SCHOOL	J11	794	12	PVC	130.0	0.71	249.33	0.194
P39	S SCHOOL	PA-11	491	12	PVC	130.0	0.34	121.35	0.051
P40	PA-11	J15	2,158	12	PVC	130.0	0.06	20.80	0.002
P41	J12	PA-15	1,120	24	PVC	130.0	0.38	539.97	0.028
P42	PA-15	PA-58	197	24	PVC	130.0	0.20	277.19	0.007
P43	PA-58	J13	1,304	24	PVC	130.0	0.19	270.94	0.008
P44	PA-6	S COMM	1,342	16	PVC	130.0	1.37	-860.38	0.473
P45	S COMM	J4	599	16	PVC	130.0	1.48	-927.03	0.542
P46	J2	J12	2,623	24	PVC	130.0	0.58	812.75	0.059
P47	J16	PA-16	1,494	12	PVC	130.0	0.12	42.94	0.008

## HARMONY

### Active Scenario: MAX DAY + FIRE FLOW

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P48	PA-16	J14	492	12	PVC	130.0	0.32	-113.19	0.046
P49	PA-12	PA-50	171	24	PVC	130.0	0.65	910.56	0.074
P50	PA-50	J2	1,265	24	PVC	130.0	0.64	903.68	0.072
P51	PA-9	J17	549	16	PVC	130.0	0.10	64.58	0.004
P52	PA-14	PA-59	671	12	PVC	130.0	0.09	-30.57	0.004
P53	PA-59	J16	942	12	PVC	130.0	0.09	-33.32	0.005
P54	J1	PA-12	1,494	24	PVC	150.0	0.90	1,273.49	0.104
P55	PA-19	J1	621	24	PVC	130.0	1.52	2,148.75	0.357
P56	PA-7	S SCHOOL	1,025	12	PVC	130.0	0.58	204.73	0.134
P57	J7	PA-93	2,119	16	PVC	150.0	1.10	-692.00	0.242
P58	J19	J18	2,368	30	PVC	150.0	0.52	-1,144.67	0.029
P59	PA-89	PA-84	650	12	PVC	150.0	0.94	-332.53	0.253
P60	PA-84	PA-87	598	12	PVC	150.0	0.98	-346.91	0.274
P61	PA-87	J19	769	12	PVC	150.0	1.09	-384.22	0.331
P62	PA-91	J7	729	12	PVC	130.0	0.23	-82.65	0.025
P63	J11	PA-90	946	12	PVC	130.0	0.00	-1.64	0.000
P64	PA-90	PA-91	966	12	PVC	130.0	0.18	-63.78	0.016
P65	J20	PA-92	1,461	30	PVC	150.0	0.32	-708.98	0.012
P66	PA-92	J19	1,390	30	PVC	150.0	0.35	-760.46	0.014
P67	J18	PA-86	954	16	PVC	150.0	0.12	72.70	0.004
P68	PA-86	PA-88	1,187	16	PVC	150.0	0.06	36.58	0.001
P69	PA-88	J8	1,140	16	PVC	150.0	0.02	-13.71	0.000
P70	PA-93	J20	522	16	PVC	150.0	1.13	-708.98	0.253
P71	PA-4	J2	1,542	16	PVC	130.0	0.82	512.98	0.181
P72	PA-89	J11	691	12	PVC	150.0	0.81	285.89	0.191
P73	J21	J18	10	30	PVC	150.0	0.55	1,217.37	0.049
P74	R-3	J21	1	30	PVC	150.0	0.55	1,217.37	0.000



## HARMONY

### Active Scenario: MAX DAY + FIRE FLOW

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
J1	5,641.98	0.00	89.5	5,848.95
J2	5,643.16	108.81	88.9	5,848.69
J4	5,629.30	0.00	95.5	5,849.99
J5	5,647.47	0.00	87.1	5,848.76
J6	5,672.32	157.75	76.2	5,848.40
J7	5,604.97	0.00	105.7	5,849.25
J8	5,612.42	0.00	102.8	5,850.00
J9	5,609.31	0.00	104.1	5,850.00
J10	5,624.26	0.00	97.7	5,850.00
J11	5,620.07	0.00	99.1	5,849.22
J12	5,681.12	38.86	72.4	5,848.54
J13	5,711.38	0.00	59.3	5,848.49
J14	5,685.26	157.75	70.6	5,848.35
J15	5,677.09	157.75	74.1	5,848.41
J16	5,660.25	0.00	81.4	5,848.34
J17	5,672.78	0.00	76.0	5,848.33
J18	5,582.05	0.00	115.9	5,850.00
J19	5,580.09	0.00	116.7	5,849.93
J20	5,642.39	0.00	89.8	5,849.90
J21	5,577.15	0.00	118.0	5,850.00
MF-MED	5,670.87	113.12	76.8	5,848.38
N SCHOOL	5,617.48	39.89	100.3	5,849.37
PA-1	5,620.06	54.99	99.3	5,849.56
PA-2	5,629.95	468.97	94.4	5,848.11
PA-3	5,630.21	501.56	94.3	5,848.11
PA-4	5,625.96	96.37	96.5	5,848.97
PA-5	5,645.18	67.37	88.0	5,848.58
PA-6	5,636.98	79.94	91.7	5,849.03
PA-7	5,641.60	224.08	89.5	5,848.57
PA-8	5,646.41	94.67	87.5	5,848.54
PA-9	5,671.39	106.06	76.6	5,848.34
PA-10	5,656.97	240.97	82.8	5,848.31
PA-11	5,657.56	100.55	82.6	5,848.41
PA-12	5,666.02	362.94	79.1	5,848.79
PA-13	5,669.05	280.64	77.6	5,848.45
PA-14	5,675.51	257.85	74.8	5,848.33
PA-15	5,713.00	262.78	58.6	5,848.51
PA-16	5,680.75	156.13	72.5	5,848.32
PA-19	5,630.53	15.55	94.6	5,849.17
PA-20	5,646.55	38.00	87.4	5,848.66
PA-39	5,631.44	1.63	93.7	5,848.11
PA-40	5,637.99	2.88	91.0	5,848.21
PA-41	5,637.27	7.13	91.7	5,849.26
PA-44	5,642.87	2.38	89.0	5,848.67
PA-47	5,664.55	1.50	79.5	5,848.35
PA-48	5,644.42	6.38	88.3	5,848.52
PA-50	5,666.74	6.88	78.8	5,848.78
PA-52	5,671.99	1.25	76.3	5,848.44

## HARMONY

### Active Scenario: MAX DAY + FIRE FLOW

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
PA-56	5,681.20	6.63	72.3	5,848.36
PA-58	5,712.42	6.25	58.9	5,848.50
PA-59	5,681.35	2.75	72.2	5,848.33
PA-64	5,635.82	5.87	92.0	5,848.51
PA-84	5,604.08	14.38	106.2	5,849.51
PA-86	5,595.01	36.12	110.3	5,850.00
PA-87	5,594.90	37.31	110.2	5,849.68
PA-88	5,609.19	50.29	104.2	5,849.99
PA-89	5,608.29	46.64	104.3	5,849.35
PA-90	5,625.03	62.14	97.0	5,849.22
PA-91	5,626.49	18.87	96.4	5,849.23
PA-92	5,609.90	51.48	103.8	5,849.91
PA-93	5,633.92	16.98	93.4	5,849.76
S COMM	5,628.18	66.66	95.8	5,849.67
S SCHOOL	5,652.03	38.00	85.0	5,848.44

## HARMONY

### Active Scenario: MAX DAY + FIRE FLOW

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
473	R-1	5,850.00	393.77	5,850.00
591	R-2	5,850.00	3,062.62	5,850.00
916	R-3	5,850.00	1,217.37	5,850.00

MAX DAY WITH FF  
AT PA-15

## HARMONY

### Active Scenario: MAX DAY FF AT PA-15

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P1	J4	J8	2,046	16	PVC	130.0	0.07	-44.77	0.002
P2	J7	PA-4	1,120	16	PVC	130.0	1.31	821.67	0.434
P3	J9	J8	10	12	PVC	130.0	1.53	537.63	0.781
P4	J9	R-1	1	12	PVC	130.0	1.53	-537.63	0.977
P5	J8	PA-1	1,232	12	PVC	130.0	1.27	448.59	0.574
P6	J4	J10	10	24	PVC	130.0	2.89	-4,074.42	1.172
P7	J10	R-2	1	24	PVC	130.0	2.89	-4,074.42	0.977
P8	J13	J14	2,650	16	PVC	130.0	0.67	421.34	0.126
P9	PA-64	PA-40	549	12	PVC	130.0	1.14	403.18	0.470
P10	PA-40	PA-2	181	12	PVC	130.0	1.14	400.30	0.467
P11	J16	J15	3,264	12	PVC	130.0	0.30	-104.17	0.038
P12	J1	PA-64	780	12	PVC	130.0	1.16	409.06	0.485
P13	PA-2	PA-39	568	12	PVC	130.0	0.19	-68.67	0.018
P14	PA-39	PA-3	247	12	PVC	130.0	0.20	-70.30	0.018
P15	PA-3	J11	1,377	12	PVC	130.0	1.62	-571.86	0.900
P16	J5	PA-6	700	16	PVC	130.0	1.67	-1,049.36	0.682
P17	J17	PA-10	1,415	12	PVC	130.0	0.38	133.01	0.060
P18	PA-10	S SCHOOL	1,208	12	PVC	130.0	0.86	-303.62	0.278
P19	PA-5	PA-8	225	12	PVC	130.0	0.98	346.42	0.356
P20	PA-8	PA-48	384	12	PVC	130.0	0.50	174.92	0.100
P21	PA-48	S SCHOOL	1,407	12	PVC	130.0	0.48	168.54	0.094
P22	J1	PA-44	530	12	PVC	130.0	1.65	582.08	0.930
P23	PA-44	PA-7	178	12	PVC	130.0	1.64	579.70	0.924
P24	J15	PA-52	1,052	16	PVC	130.0	0.42	-261.73	0.052
P25	PA-52	PA-13	136	16	PVC	130.0	0.42	-262.98	0.054
P26	PA-13	J2	1,430	16	PVC	130.0	1.23	-771.55	0.386
P27	J12	PA-56	1,032	12	PVC	130.0	1.11	391.66	0.447
P28	PA-56	PA-14	187	12	PVC	130.0	1.09	385.03	0.433
P29	J5	J6	2,616	16	PVC	130.0	0.95	597.58	0.241
P30	J4	PA-41	2,005	24	PVC	130.0	2.03	2,858.30	0.606
P31	PA-41	PA-19	251	24	PVC	130.0	2.02	2,851.17	0.603
P32	J5	PA-20	297	12	PVC	130.0	1.28	451.79	0.582
P33	PA-20	PA-5	280	12	PVC	130.0	1.17	413.79	0.495
P34	J6	MF-MED	298	16	PVC	130.0	0.70	439.82	0.136
P35	MF-MED	PA-47	985	16	PVC	130.0	0.52	326.70	0.079
P36	PA-47	PA-9	736	16	PVC	130.0	0.52	325.20	0.078
P37	PA-1	N SCHOOL	751	12	PVC	130.0	0.99	349.05	0.361
P38	N SCHOOL	J11	794	12	PVC	130.0	0.88	309.16	0.288
P39	S SCHOOL	PA-11	491	12	PVC	130.0	0.52	182.53	0.108
P40	PA-11	J15	2,158	12	PVC	130.0	0.00	0.19	0.000
P41	J12	PA-15	1,120	24	PVC	130.0	0.42	597.61	0.034
P42	PA-15	PA-58	197	24	PVC	130.0	0.30	427.59	0.017
P43	PA-58	J13	1,304	24	PVC	130.0	0.30	421.34	0.017
P44	PA-6	S COMM	1,342	16	PVC	130.0	1.91	-1,194.23	0.867
P45	S COMM	J4	599	16	PVC	130.0	2.01	-1,260.89	0.959
P46	J2	J12	2,623	24	PVC	130.0	0.73	1,028.13	0.091
P47	J16	PA-16	1,494	12	PVC	130.0	0.05	19.27	0.002

## HARMONY

### Active Scenario: MAX DAY FF AT PA-15

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P48	PA-16	J14	492	12	PVC	130.0	0.75	-263.59	0.214
P49	PA-12	PA-50	171	24	PVC	130.0	0.84	1,190.06	0.120
P50	PA-50	J2	1,265	24	PVC	130.0	0.84	1,183.18	0.118
P51	PA-9	J17	549	16	PVC	130.0	0.21	133.01	0.015
P52	PA-14	PA-59	671	12	PVC	130.0	0.23	-82.15	0.025
P53	PA-59	J16	942	12	PVC	130.0	0.24	-84.90	0.026
P54	J1	PA-12	1,494	24	PVC	150.0	1.31	1,847.44	0.207
P55	PA-19	J1	621	24	PVC	130.0	2.01	2,838.57	0.598
P56	PA-7	S SCHOOL	1,025	12	PVC	130.0	1.01	355.61	0.373
P57	J7	PA-93	2,119	16	PVC	150.0	1.43	-896.64	0.391
P58	J19	J18	2,368	30	PVC	150.0	0.68	-1,489.58	0.047
P59	PA-89	PA-84	650	12	PVC	150.0	1.19	-419.00	0.388
P60	PA-84	PA-87	598	12	PVC	150.0	1.23	-433.38	0.413
P61	PA-87	J19	769	12	PVC	150.0	1.44	-509.06	0.557
P62	PA-91	J7	729	12	PVC	130.0	0.21	-74.97	0.021
P63	J11	PA-90	946	12	PVC	130.0	0.20	71.81	0.019
P64	PA-90	PA-91	966	12	PVC	130.0	0.12	-40.83	0.007
P65	J20	PA-92	1,461	30	PVC	150.0	0.42	-919.30	0.019
P66	PA-92	J19	1,390	30	PVC	150.0	0.45	-980.52	0.021
P67	J18	PA-86	954	16	PVC	150.0	0.18	112.38	0.009
P68	PA-86	PA-88	1,187	16	PVC	150.0	0.07	46.91	0.002
P69	PA-88	J8	1,140	16	PVC	150.0	0.07	-44.26	0.002
P70	PA-93	J20	522	16	PVC	150.0	1.47	-919.30	0.411
P71	PA-4	J2	1,542	16	PVC	130.0	1.16	725.30	0.344
P72	PA-89	J11	691	12	PVC	150.0	0.95	334.52	0.256
P73	J21	J18	10	30	PVC	150.0	0.73	1,601.96	0.049
P74	R-3	J21	1	30	PVC	150.0	0.73	1,601.96	0.000

## HARMONY

### Active Scenario: MAX DAY FF AT PA-15

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
J1	5,641.98	0.00	89.2	5,848.25
J2	5,643.16	108.81	88.5	5,847.77
J4	5,629.30	0.00	95.5	5,849.99
J5	5,647.47	0.00	86.7	5,847.77
J6	5,672.32	157.75	75.6	5,847.14
J7	5,604.97	0.00	105.5	5,848.79
J8	5,612.42	0.00	102.8	5,849.99
J9	5,609.31	0.00	104.1	5,850.00
J10	5,624.26	0.00	97.7	5,850.00
J11	5,620.07	0.00	99.0	5,848.78
J12	5,681.12	38.86	72.0	5,847.53
J13	5,711.38	0.00	58.9	5,847.47
J14	5,685.26	157.75	70.0	5,847.13
J15	5,677.09	157.75	73.6	5,847.16
J16	5,660.25	0.00	80.8	5,847.03
J17	5,672.78	0.00	75.4	5,846.96
J18	5,582.05	0.00	115.9	5,850.00
J19	5,580.09	0.00	116.7	5,849.89
J20	5,642.39	0.00	89.7	5,849.83
J21	5,577.15	0.00	118.0	5,850.00
MF-MED	5,670.87	113.12	76.2	5,847.10
N SCHOOL	5,617.48	39.89	100.2	5,849.01
PA-1	5,620.06	99.54	99.2	5,849.28
PA-2	5,629.95	468.97	94.1	5,847.53
PA-3	5,630.21	501.56	94.0	5,847.54
PA-4	5,625.96	96.37	96.2	5,848.30
PA-5	5,645.18	67.37	87.5	5,847.46
PA-6	5,636.98	144.87	91.4	5,848.25
PA-7	5,641.60	224.08	89.1	5,847.59
PA-8	5,646.41	171.50	86.9	5,847.38
PA-9	5,671.39	192.19	76.0	5,846.97
PA-10	5,656.97	436.63	82.2	5,846.87
PA-11	5,657.56	182.34	82.0	5,847.16
PA-12	5,666.02	657.38	78.7	5,847.94
PA-13	5,669.05	508.56	77.1	5,847.22
PA-14	5,675.51	467.18	74.2	5,846.99
PA-15	5,713.00	170.02	58.2	5,847.49
PA-16	5,680.75	282.86	71.9	5,847.03
PA-19	5,630.53	12.60	94.4	5,848.62
PA-20	5,646.55	38.00	87.0	5,847.60
PA-39	5,631.44	1.63	93.5	5,847.54
PA-40	5,637.99	2.88	90.7	5,847.61
PA-41	5,637.27	7.13	91.5	5,848.77
PA-44	5,642.87	2.38	88.6	5,847.76
PA-47	5,664.55	1.50	78.9	5,847.02
PA-48	5,644.42	6.38	87.8	5,847.34
PA-50	5,666.74	6.88	78.4	5,847.92
PA-52	5,671.99	1.25	75.8	5,847.21

## HARMONY

### Active Scenario: MAX DAY FF AT PA-15

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
PA-56	5,681.20	6.63	71.8	5,847.07
PA-58	5,712.42	6.25	58.4	5,847.49
PA-59	5,681.35	2.75	71.7	5,847.01
PA-64	5,635.82	5.87	91.7	5,847.87
PA-84	5,604.08	14.38	106.1	5,849.21
PA-86	5,595.01	65.47	110.3	5,849.99
PA-87	5,594.90	75.68	110.1	5,849.46
PA-88	5,609.19	91.17	104.2	5,849.99
PA-89	5,608.29	84.48	104.1	5,848.96
PA-90	5,625.03	112.64	96.8	5,848.77
PA-91	5,626.49	34.14	96.2	5,848.77
PA-92	5,609.90	61.22	103.8	5,849.86
PA-93	5,633.92	22.66	93.3	5,849.62
S COMM	5,628.18	66.66	95.7	5,849.41
S SCHOOL	5,652.03	38.00	84.4	5,847.21



## HARMONY

### Active Scenario: MAX DAY FF AT PA-15

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
473	R-1	5,850.00	537.63	5,850.00
591	R-2	5,850.00	4,074.42	5,850.00
916	R-3	5,850.00	1,601.96	5,850.00

MAX HOUR

## HARMONY

### Active Scenario: MAX HOUR

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P1	J4	J8	2,046	16	PVC	130.0	0.14	-88.45	0.007
P2	J7	PA-4	1,120	16	PVC	130.0	2.28	1,431.21	1.212
P3	J9	J8	10	12	PVC	130.0	2.30	809.32	1.709
P4	J9	R-1	1	12	PVC	130.0	2.30	-809.32	1.953
P5	J8	PA-1	1,232	12	PVC	130.0	2.01	708.20	1.338
P6	J4	J10	10	24	PVC	130.0	4.80	-6,764.21	2.979
P7	J10	R-2	1	24	PVC	130.0	4.80	-6,764.21	2.930
P8	J13	J14	2,650	16	PVC	130.0	1.01	632.52	0.267
P9	PA-64	PA-40	549	12	PVC	130.0	1.73	610.73	1.017
P10	PA-40	PA-2	181	12	PVC	130.0	1.72	607.85	1.009
P11	J16	J15	3,264	12	PVC	130.0	0.64	-224.25	0.159
P12	J1	PA-64	780	12	PVC	130.0	1.75	618.23	1.040
P13	PA-2	PA-39	568	12	PVC	130.0	0.41	-145.85	0.072
P14	PA-39	PA-3	247	12	PVC	130.0	0.42	-147.48	0.073
P15	PA-3	J11	1,377	12	PVC	130.0	2.71	-953.57	2.321
P16	J5	PA-6	700	16	PVC	130.0	2.79	-1,748.35	1.756
P17	J17	PA-10	1,415	12	PVC	130.0	0.65	227.75	0.164
P18	PA-10	S SCHOOL	1,208	12	PVC	130.0	1.34	-473.98	0.636
P19	PA-5	PA-8	225	12	PVC	130.0	1.62	571.61	0.898
P20	PA-8	PA-48	384	12	PVC	130.0	0.84	295.99	0.266
P21	PA-48	S SCHOOL	1,407	12	PVC	130.0	0.82	289.61	0.255
P22	J1	PA-44	530	12	PVC	130.0	2.70	950.73	2.308
P23	PA-44	PA-7	178	12	PVC	130.0	2.69	948.35	2.299
P24	J15	PA-52	1,052	16	PVC	130.0	0.66	-415.52	0.123
P25	PA-52	PA-13	136	16	PVC	130.0	0.67	-416.77	0.122
P26	PA-13	J2	1,430	16	PVC	130.0	1.97	-1,234.11	0.922
P27	J12	PA-56	1,032	12	PVC	130.0	1.73	611.56	1.020
P28	PA-56	PA-14	187	12	PVC	130.0	1.72	604.93	0.997
P29	J5	J6	2,616	16	PVC	130.0	1.55	973.46	0.594
P30	J4	PA-41	2,005	24	PVC	130.0	3.39	4,784.00	1.572
P31	PA-41	PA-19	251	24	PVC	130.0	3.39	4,776.88	1.568
P32	J5	PA-20	297	12	PVC	130.0	2.20	774.88	1.580
P33	PA-20	PA-5	280	12	PVC	130.0	1.93	679.88	1.242
P34	J6	MF-MED	298	16	PVC	130.0	1.15	719.93	0.339
P35	MF-MED	PA-47	985	16	PVC	130.0	0.86	538.13	0.198
P36	PA-47	PA-9	736	16	PVC	130.0	0.86	536.63	0.197
P37	PA-1	N SCHOOL	751	12	PVC	130.0	1.56	548.23	0.833
P38	N SCHOOL	J11	794	12	PVC	130.0	1.41	497.26	0.695
P39	S SCHOOL	PA-11	491	12	PVC	130.0	1.01	355.29	0.373
P40	PA-11	J15	2,158	12	PVC	130.0	0.18	62.25	0.015
P41	J12	PA-15	1,120	24	PVC	130.0	1.00	1,403.86	0.162
P42	PA-15	PA-58	197	24	PVC	130.0	0.45	638.77	0.040
P43	PA-58	J13	1,304	24	PVC	130.0	0.45	632.52	0.037
P44	PA-6	S COMM	1,342	16	PVC	130.0	3.16	-1,981.18	2.214
P45	S COMM	J4	599	16	PVC	130.0	3.30	-2,068.66	2.399
P46	J2	J12	2,623	24	PVC	130.0	1.46	2,054.28	0.329
P47	J16	PA-16	1,494	12	PVC	130.0	0.21	75.60	0.021

## HARMONY

### Active Scenario: MAX HOUR

Label	Start Node	Stop Node	Length (ft)	Diameter (in)	Material	Hazen- Williams C	Velocity (ft/s)	Flow (gpm)	Headloss Gradient (ft/1000ft)
P48	PA-16	J14	492	12	PVC	130.0	1.08	-378.99	0.420
P49	PA-12	PA-50	171	24	PVC	130.0	1.51	2,135.30	0.354
P50	PA-50	J2	1,265	24	PVC	130.0	1.51	2,128.42	0.351
P51	PA-9	J17	549	16	PVC	130.0	0.36	227.75	0.040
P52	PA-14	PA-59	671	12	PVC	130.0	0.41	-145.90	0.071
P53	PA-59	J16	942	12	PVC	130.0	0.42	-148.65	0.075
P54	J1	PA-12	1,494	24	PVC	150.0	2.26	3,191.81	0.570
P55	PA-19	J1	621	24	PVC	130.0	3.38	4,760.77	1.558
P56	PA-7	S SCHOOL	1,025	12	PVC	130.0	1.67	588.22	0.948
P57	J7	PA-93	2,119	16	PVC	150.0	2.31	-1,445.96	0.948
P58	J19	J18	2,368	30	PVC	150.0	1.04	-2,292.72	0.104
P59	PA-89	PA-84	650	12	PVC	150.0	1.91	-672.83	0.933
P60	PA-84	PA-87	598	12	PVC	150.0	1.95	-687.21	0.971
P61	PA-87	J19	769	12	PVC	150.0	2.16	-762.89	1.178
P62	PA-91	J7	729	12	PVC	130.0	0.04	-14.75	0.001
P63	J11	PA-90	946	12	PVC	130.0	0.37	132.03	0.059
P64	PA-90	PA-91	966	12	PVC	130.0	0.06	19.39	0.002
P65	J20	PA-92	1,461	30	PVC	150.0	0.67	-1,468.62	0.046
P66	PA-92	J19	1,390	30	PVC	150.0	0.69	-1,529.84	0.049
P67	J18	PA-86	954	16	PVC	150.0	0.23	143.98	0.013
P68	PA-86	PA-88	1,187	16	PVC	150.0	0.13	78.51	0.005
P69	PA-88	J8	1,140	16	PVC	150.0	0.02	-12.66	0.000
P70	PA-93	J20	522	16	PVC	150.0	2.34	-1,468.62	0.976
P71	PA-4	J2	1,542	16	PVC	130.0	2.13	1,334.84	1.066
P72	PA-89	J11	691	12	PVC	150.0	1.67	588.35	0.729
P73	J21	J18	10	30	PVC	150.0	1.11	2,436.71	0.146
P74	R-3	J21	1	30	PVC	150.0	1.11	2,436.71	0.000

## HARMONY

### Active Scenario: MAX HOUR

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
J1	5,641.98	0.00	88.0	5,845.45
J2	5,643.16	174.87	86.9	5,844.10
J4	5,629.30	0.00	95.5	5,849.97
J5	5,647.47	0.00	85.2	5,844.33
J6	5,672.32	253.53	73.7	5,842.78
J7	5,604.97	0.00	104.8	5,847.10
J8	5,612.42	0.00	102.8	5,849.98
J9	5,609.31	0.00	104.1	5,850.00
J10	5,624.26	0.00	97.7	5,850.00
J11	5,620.07	0.00	98.2	5,847.16
J12	5,681.12	38.86	70.1	5,843.24
J13	5,711.38	0.00	56.9	5,843.00
J14	5,685.26	253.53	67.9	5,842.29
J15	5,677.09	253.53	71.6	5,842.63
J16	5,660.25	0.00	78.7	5,842.11
J17	5,672.78	0.00	73.3	5,842.31
J18	5,582.05	0.00	115.9	5,850.00
J19	5,580.09	0.00	116.7	5,849.75
J20	5,642.39	0.00	89.7	5,849.62
J21	5,577.15	0.00	118.0	5,850.00
MF-MED	5,670.87	181.80	74.3	5,842.67
N SCHOOL	5,617.48	50.97	99.6	5,847.71
PA-1	5,620.06	159.98	98.8	5,848.33
PA-2	5,629.95	753.71	92.6	5,843.90
PA-3	5,630.21	806.08	92.5	5,843.96
PA-4	5,625.96	96.37	95.1	5,845.74
PA-5	5,645.18	108.27	85.8	5,843.51
PA-6	5,636.98	232.83	90.2	5,845.56
PA-7	5,641.60	360.14	87.5	5,843.82
PA-8	5,646.41	275.63	85.2	5,843.31
PA-9	5,671.39	308.88	74.0	5,842.33
PA-10	5,656.97	701.73	80.1	5,842.08
PA-11	5,657.56	293.04	80.1	5,842.67
PA-12	5,666.02	1,056.51	77.3	5,844.60
PA-13	5,669.05	817.34	75.2	5,842.78
PA-14	5,675.51	750.83	72.0	5,842.00
PA-15	5,713.00	765.09	56.3	5,843.05
PA-16	5,680.75	454.59	69.8	5,842.08
PA-19	5,630.53	16.10	93.4	5,846.42
PA-20	5,646.55	95.00	85.4	5,843.86
PA-39	5,631.44	1.63	91.9	5,843.94
PA-40	5,637.99	2.88	89.2	5,844.08
PA-41	5,637.27	7.13	90.7	5,846.81
PA-44	5,642.87	2.38	87.1	5,844.23
PA-47	5,664.55	1.50	77.0	5,842.48
PA-48	5,644.42	6.38	86.0	5,843.21
PA-50	5,666.74	6.88	76.9	5,844.54
PA-52	5,671.99	1.25	73.9	5,842.76

## HARMONY

### Active Scenario: MAX HOUR

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)	Hydraulic Grade (ft)
PA-56	5,681.20	6.63	69.6	5,842.18
PA-58	5,712.42	6.25	56.5	5,843.05
PA-59	5,681.35	2.75	69.5	5,842.04
PA-64	5,635.82	7.50	90.3	5,844.64
PA-84	5,604.08	14.38	105.6	5,848.27
PA-86	5,595.01	65.47	110.3	5,849.99
PA-87	5,594.90	75.68	109.9	5,848.85
PA-88	5,609.19	91.17	104.2	5,849.98
PA-89	5,608.29	84.48	103.6	5,847.66
PA-90	5,625.03	112.64	96.1	5,847.10
PA-91	5,626.49	34.14	95.4	5,847.10
PA-92	5,609.90	61.22	103.7	5,849.68
PA-93	5,633.92	22.66	93.1	5,849.11
S COMM	5,628.18	87.49	95.3	5,848.53
S SCHOOL	5,652.03	48.56	82.6	5,842.85

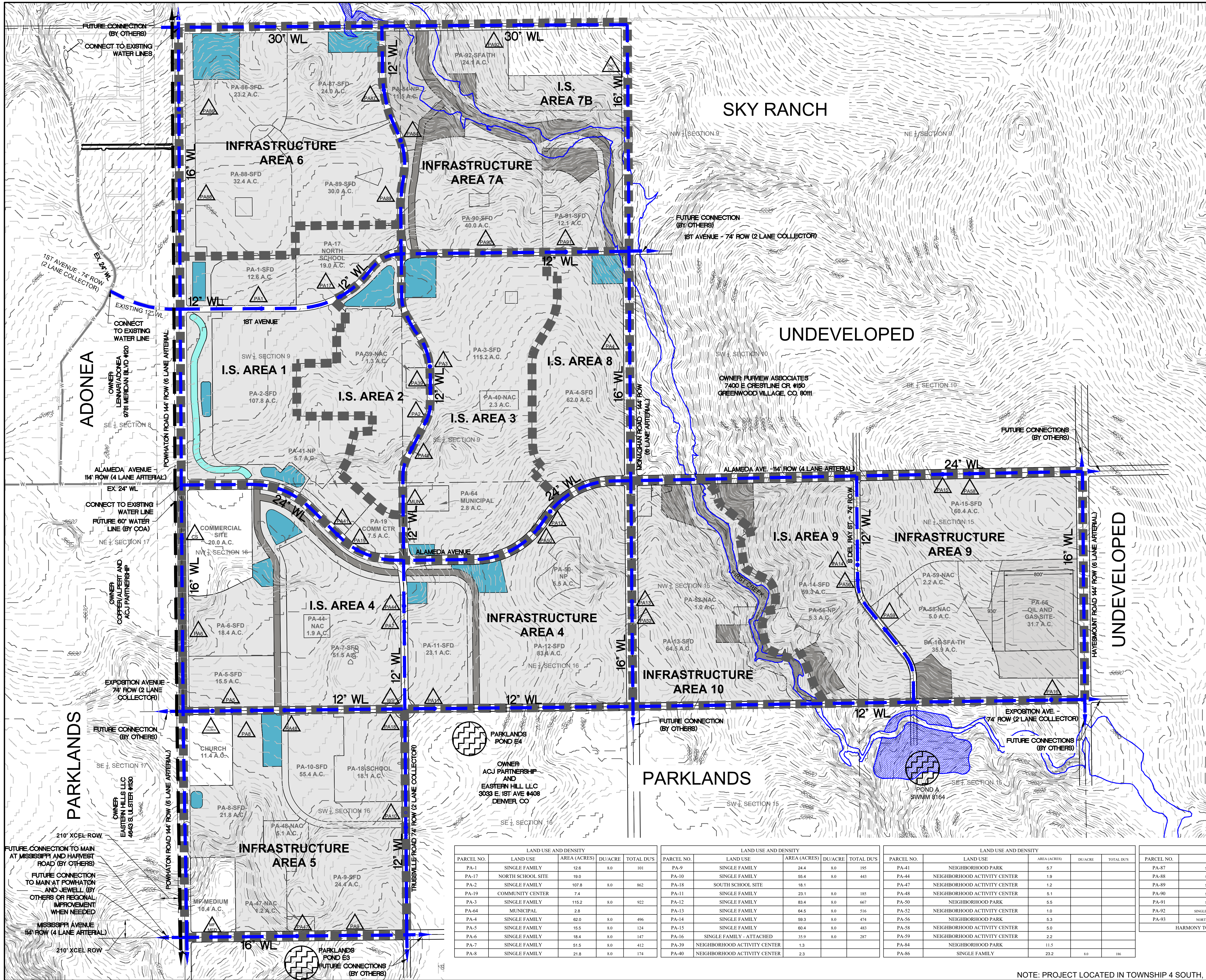
## HARMONY

### Active Scenario: MAX HOUR

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
473	R-1	5,850.00	809.32	5,850.00
591	R-2	5,850.00	6,764.21	5,850.00
916	R-3	5,850.00	2,436.71	5,850.00



N:\PROJECTS\30175603 SAND CREEK\ENGINEERING\EXHIBITS\SDS SANDY CREEK\DP-WT EXHIBIT DWG ACASSIDY 92102



**LEGEND**

- RIGHT-OF-WAY
- EXISTING 5' CONTOUR
- EXISTING 1' CONTOUR
- PROPOSED WATER LINE/DESIGN NODE
- EXISTING WATER LINE
- PROPOSED DRAINAGE CHANNEL
- PROPOSED DETENTION POND
- PROPOSED DETENTION POND (BY OTHERS)
- PHASE LINE
- FLOOD PLAIN
- DRAINAGE CL
- I.S. AREA
- INFRASTRUCTURE AREA

SCALE: 1" = 500'

LAND USE AND DENSITY				
PARCEL NO.	LAND USE	AREA (ACRES)	DU/ACRE	TOTAL DUS
PA-1	SINGLE FAMILY	12.6	8.0	101
PA-17	NORTH SCHOOL SITE	19.0		
PA-2	SINGLE FAMILY	107.8	8.0	862
PA-19	COMMUNITY CENTER	7.4		
PA-3	SINGLE FAMILY	115.2	8.0	922
PA-64	MUNICIPAL	2.8		
PA-4	SINGLE FAMILY	62.0	8.0	496
PA-5	SINGLE FAMILY	15.5	8.0	124
PA-6	SINGLE FAMILY	18.4	8.0	147
PA-7	SINGLE FAMILY	51.5	8.0	412
PA-8	SINGLE FAMILY	21.8	8.0	174

LAND USE AND DENSITY				
PARCEL NO.	LAND USE	AREA (ACRES)	DU/ACRE	TOTAL DUS
PA-9	SINGLE FAMILY	24.4	8.0	195
PA-10	SINGLE FAMILY	55.4	8.0	443
PA-18	SOUTH SCHOOL SITE	18.1		
PA-11	SINGLE FAMILY	23.1	8.0	185
PA-12	SINGLE FAMILY	82.4	8.0	667
PA-13	SINGLE FAMILY	64.5	8.0	516
PA-14	SINGLE FAMILY	59.3	8.0	474
PA-15	SINGLE FAMILY	60.4	8.0	483
PA-16	SINGLE FAMILY - ATTACHED	35.9	8.0	287
PA-39	NEIGHBORHOOD ACTIVITY CENTER	1.3		
PA-40	NEIGHBORHOOD ACTIVITY CENTER	2.3		

LAND USE AND DENSITY				
PARCEL NO.	LAND USE	AREA (ACRES)	DU/ACRE	TOTAL DUS
PA-41	NEIGHBORHOOD PARK	5.7		
PA-44	NEIGHBORHOOD ACTIVITY CENTER	1.9		
PA-47	NEIGHBORHOOD ACTIVITY CENTER	1.2		
PA-48	NEIGHBORHOOD ACTIVITY CENTER	5.1		
PA-50	NEIGHBORHOOD PARK	5.5		
PA-52	NEIGHBORHOOD ACTIVITY CENTER	1.0		
PA-56	NEIGHBORHOOD PARK	5.3		
PA-58	NEIGHBORHOOD ACTIVITY CENTER	5.0		
PA-59	NEIGHBORHOOD ACTIVITY CENTER	2.2		
PA-84	NEIGHBORHOOD PARK	11.5		
PA-86	SINGLE FAMILY	23.2	8.0	186

LAND USE AND DENSITY				
PARCEL NO.	LAND USE	AREA (ACRES)	DU/ACRE	TOTAL DUS
PA-87	SINGLE FAMILY	24.0	8.0	192
PA-88	SINGLE FAMILY	32.4	8.0	259
PA-89	SINGLE FAMILY	30.0	8.0	240
PA-90	SINGLE FAMILY	40.0	8.0	320
PA-91	SINGLE FAMILY	12.1	8.0	97
PA-92	SINGLE FAMILY - ATTACHED	24.1	11.0	265
PA-93	NORTH COMMERCIAL SITE	18.3		
HARMONY TOTAL =		1108.6		8047

NOTE: PROJECT LOCATED IN TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN

SCALE: AS SHOWN

DRAWN BY: AEC

SHEET NUMBER: WL

HARMONY SUBDIVISION

PRELIMINARY WATERLINE LAYOUT

AS SHOWN

CHECKED BY: BPW

DATE: JUNE 9, 2022

FILE NO: 30214901

DATE: JUNE 9, 2022

Westwood

10333 E DRY CREEK RD. SUITE 240  
ENGLEWOOD, CO 80112  
TEL: 720.452.9226

Westwoods.com  
Westwood Professional Services, Inc.

Revisions

No.	Date	Init.	Appr.	Date



## Appendix B

### Wastewater Demands and Routing Calculations

**HARMONY DEVELOPMENT**  
**CITY OF AURORA**  
**ON-SITE SANITARY SEWER PEAK ROUTING CALCULATIONS**

PLANNING AREA	TYPE OF DEVELOPMENT	AREA (AC)	MAX. UNITS***	MAXIMUM DENSITY (DU/AC)	OCCUPANCY (PERSONS/DU)	AVG DAY FLOW (GPD/CAP)	AVG DAY FLOW (GPD)	MAX POPULATION*** (THOUSANDS)	PEAKING FACTOR (PF)	PEAK DAILY FLOW (GPD)	PEAK DAILY FLOW (CFS)	INFILTRATION 10% OF AVG DAY FLOW (GPD)	PEAK DAY FLOW WITH INFILTRATION (GPD)
PA-1	SFD	12.6	101	8.0	2.77	68	19,024	0.280	4.0	76,097	0.12	1,902	78,000
PA-17-NORTH SCHOOL	SCHOOL	19.0			(Equivalent Pop./Acre) 18	(GPD/Acre) 1200	22,800	0.342	4.0	91,200	0.14	2,280	93,480
PA-2	SFD	107.8	862	8.0	2.77	68	162,366	2.388	4.0	649,465	1.01	16,237	665,702
PA-19-COMMUNITY CENTER	COMM	7.4	1		(Equivalent Pop./Acre) 18	(GPD/Acre) 1200	8,880	0.133	4.0	35,520	0.05	888	36,408
PA-3	SFD	115.2	922	8.0	2.77	68	173,668	2.554	4.0	694,672	1.07	17,367	712,038
PA-4	SFD	62.0	248	4.0	2.77	68	46,713	0.687	4.0	186,853	0.29	4,671	191,524
CS	COMMERCIAL SITE	20.0	1		(Equivalent Pop./Acre) 22	(GPD/Acre) 1,500	30,000	0.440	4.0	120,000	0.19	3,000	123,000
PA-5	SFD	15.5	124	8.0	2.77	68	23,357	0.343	4.0	93,427	0.14	2,336	95,762
PA-6	SFD	18.4	147	8.0	2.77	68	27,689	0.407	4.0	110,756	0.17	2,769	113,525
PA-7	SFD	51.5	412	8.0	2.77	68	77,604	1.141	4.0	310,417	0.48	7,760	318,178
CHURCH	CHURCH	11.4	1		(Equivalent Pop./Acre) 18	(GPD/Acre) 1,200	13,680	0.205	4.0	54,720	0.08	1,368	56,088
MF-MED	MF-MEDIUM	10.4	208	20.0	2.77	68	39,179	0.576	4.0	156,716	0.24	3,918	160,633
PA-8	SFD	21.8	174	8.0	2.77	68	32,775	0.482	4.0	131,099	0.20	3,277	134,376
PA-9	SFD	24.4	195	8.0	2.77	68	36,730	0.540	4.0	146,921	0.23	3,673	150,594
PA-10	SFD	55.4	443	8.0	2.77	68	83,443	1.227	4.0	333,774	0.52	8,344	342,118

\*\*\*MAX UNITS AND MAX POPULATION WILL BE UP TO BUT NOT EXCEEDING THE NUMBER SHOWN.

## HARMONY DEVELOPMENT CITY OF AURORA

PLANNING AREA	TYPE OF DEVELOPMENT	AREA (AC)	MAX. UNITS	MAXIMUM DENSITY (DU/AC)	OCCUPANCY (PERSONS/DU)	AVG DAY FLOW (GPD/CAP)	AVG DAY FLOW (GPD)	POPULATION (THOUSANDS)	PEAKING FACTOR (PF)	PEAK DAILY FLOW (GPD)	PEAK DAILY FLOW (CFS)	INFILTRATION 10% OF AVG DAY FLOW (GPD)	PEAK DAY FLOW WITH INFILTRATION (GPD)
PA-18- WEST SCHOOL	SCHOOL	18.1	1		(Equivalent Popul.) 18	(GPD/Acre) 1,200	21,720	0.326	4.0	86,880	0.13	2,172	89,052
PA-11	SFD	23.1	185	8.0	2.77	68	34,847	0.512	4.0	139,386	0.22	3,485	142,871
PA-12 PA-64- MUNICIPAL	SFD FIRE STATION	83.4 2.8	667 1	8.0	2.77 (Equivalent Pop./Acre) 18	68 (GPD/Acre) 1,200	125,636 3,360	1.848 0.050	4.0	502,544 13,440	0.78 0.02	12,564 336	515,108 13,776
PA-13	SFD	64.5	206	3.2	2.77	68	38,802	0.571	4.0	155,209	0.24	3,880	159,089
PA-14	SFD	59.3	219	3.7	2.77	68	41,251	0.607	4.0	165,003	0.26	4,125	169,128
PA-15	SFD	60.4	260	4.3	2.77	68	48,974	0.720	4.0	195,894	0.30	4,897	200,792
PA-16	SFA-TH	35.9	233	6.5	2.77	68	43,888	0.645	4.0	175,552	0.27	4,389	179,940
PA-86	SFD	23.2	123	5.3	2.77	68	23,168	0.341	4.0	92,673	0.14	2,317	94,990
PA-87	SFD	24.0	156	6.5	2.77	68	29,384	0.432	4.0	117,537	0.18	2,938	120,475
PA-88	SFD	32.4	162	5.0	2.77	68	30,514	0.449	4.0	122,057	0.19	3,051	125,109
PA-89	SFD	30.0	168	5.6	2.77	68	31,644	0.465	4.0	126,578	0.20	3,164	129,742
PA-90	SFD	40.0	204	5.1	2.77	68	38,425	0.565	4.0	153,702	0.24	3,843	157,544
PA-91	SFD	12.1	39	3.2	2.77	68	7,346	0.108	4.0	29,384	0.05	735	30,119
PA-92	SFA-TH	24.1	419	17.4	2.77	68	78,923	1.161	4.0	315,691	0.49	7,892	323,584
PA-93	CAC-Shopping Ctr	16.3			(Equivalent Pop./Acre) 22	(GPD/Acre) 1,500	24,450	0.359	4.0	97,800	0.15	2,445	100,245

### OFF-SITE SANITARY SEWER PEAK FLOW CALCULATIONS\*

PLANNING AREA	TYPE OF DEVELOPMENT	AREA (AC)	MAX. UNITS	MAXIMUM DENSITY (DU/AC)	OCCUPANCY (PERSONS/DU)	AVG DAY FLOW (GPD/CAP)	AVG DAY FLOW (GPD)	POPULATION (THOUSANDS)	PEAKING FACTOR (PF)	PEAK DAILY FLOW (GPD)	PEAK DAILY FLOW (CFS)	INFILTRATION 10% OF AVG DAY FLOW (GPD)	PEAK DAY FLOW WITH INFILTRATION (GPD)
Parklands F-13*	NAC & SFD	43.0	225				57,600	0.720	4.0	230,400	0.36	5,760	236,160
Parklands F-12*	SFD	24.0	145				37,018	0.464	4.0	148,072	0.23	3,702	151,774
Parklands F-7*	CP, CAC, SFA, SFD	282.0	1896				485,366	6.067	2.78	1,349,317	2.09	48,537	1,397,854
Parklands F-1*	CP, NP, NAC SFD	466.0	2334				596,788	7.469	2.57	1,533,745	2.37	59,679	1,593,424
Sun Meadows** SM Offsite 2	SFD/MF COMM/RETAIL	60.0	320			80	60,638	0.758	4.0	242,552	0.38	6,064	248,616
Undeveloped SM Offsite 1	SFD/MF COMM/RETAIL	160.5	857			80	162,208	2.028	4.0	648,832	1.00	16,221	665,053

\* Source: Sanitary Sewer Analysis calculations/exhibits by Meurer & Associates dated 7/5/2005 for Parklands (formerly Eastern Hills)

\*\* Source: Master Utilities Report for Sun Meadow, CVL Consultants of Colorado, Inc., Oct. 5, 2005

\*\*\*MAX UNITS AND MAX POPULATION WILL BE UP TO BUT NOT EXCEEDING THE NUMBER SHOWN.

**HARMONY DEVELOPMENT**  
**CITY OF AURORA**  
**ON-SITE SANITARY SEWER PEAK ROUTING CALCULATIONS - (PERMANENT GRAVITY SYSTEM)**

DESIGN POINT	PLANNING AREA	DESCRIPTION	AREA (AC)	UNITS	MAXIMUM DENSITY (DU/AC)	OCCUPANCY (PERSONS/DU)	AVG DAY FLOW (GPD/CAP)	PERCENTAGE OF PLANNING AREA	AVG DAY FLOW (GPD)	POPULATION (THOUSANDS)	PEAKING FACTOR (PF)	PEAK DAILY FLOW (GPD)	INFILTRATION 10% OF AVG DAY FLOW (GPD)	PEAK DAY FLOW WITH INFILTRATION (GPD)	PEAK DAY FLOW WITH INFILTRATION (CFS)	COMMENTS
<b>SS2</b>	<b>PA-1, 2, 3</b>		<b>297.7</b>	<b>2,231</b>					<b>442,805</b>	<b>6,519</b>	<b>3.7</b>	<b>1,618,898</b>	<b>44,281</b>	<b>1,663,178</b>	<b>2.57</b>	<b>to DP SS1, 12"</b>
SS2	PA-1	SFD	12.6	101	8.0	2.77	68	100%	19,024	0.280	4.0	76,097	1,902	78,000	0.12	
SS2	PA-2 (40%)	SFD	107.8	862	8.0	2.77	68	40%	64,947	0.955	4.0	259,786	6,495	266,281	0.41	
<b>SS3</b>	<b>PA-2, 3</b>		<b>242.0</b>	<b>1,785</b>					<b>358,834</b>	<b>5,284</b>	<b>3.8</b>	<b>1,358,731</b>	<b>35,883</b>	<b>1,394,614</b>	<b>2.16</b>	<b>to DP SS2 - 12"</b>
SS3	PA-2 (35%)	SFD	107.8	862	8.0	2.77	68	100%	162,366	2.388	4.0	649,465	16,237	665,702	1.03	
SS3	PA-17	SCHOOL	19.0	1		(Equivalent Pop./Acre) 18.0	(GPD/Acre) 1,200	100%	22,800	0.342	4.0	91,200	2,280	93,480	0.14	
<b>SS4</b>	<b>PA-3</b>		<b>115.2</b>	<b>922</b>					<b>173,668</b>	<b>2,554</b>	<b>4.0</b>	<b>694,672</b>	<b>17,367</b>	<b>712,038</b>	<b>1.10</b>	<b>to DP SS3 - 12"</b>
SS4	PA-3 (80%)	SFD	115.2	922	8.0	2.77	68	80%	138,934	2.043	4.0	555,737	13,893	569,631	0.88	
<b>SS5</b>	<b>PA-3</b>		<b>23.0</b>	<b>184</b>					<b>34,734</b>	<b>0.511</b>	<b>4.0</b>	<b>138,934</b>	<b>3,473</b>	<b>142,408</b>	<b>0.22</b>	<b>to DP SS4 - 8"</b>
SS5	PA-3 (20%)	SFD	115.2	922	8.0	2.77	68	20%	34,734	0.511	4.0	138,934	3,473	142,408	0.22	

DESIGN POINT	PLANNING AREA	DESCRIPTION	AREA (AC)	UNITS	MAXIMUM DENSITY (DU/AC)	OCCUPANCY (PERSONS/DU)	AVG DAY FLOW (GPD/CAP)	PERCENTAGE OF PLANNING AREA	AVG DAY FLOW (GPD)	POPULATION (THOUSANDS)	PEAKING FACTOR (PF)	PEAK DAILY FLOW (GPD)	INFILTRATION 10% OF AVG DAY FLOW (GPD)	PEAK DAY FLOW WITH INFILTRATION (GPD)	PEAK DAY FLOW WITH INFILTRATION (CFS)	COMMENTS
<b>SS8</b>	<b>PA-2, 5, 6, 7, 8, 9, 10, 11, 12, SOUTH SCHOOL, CS, CHURCH, MF-MED, F-12,13, COMM, MUNICIPAL</b>		<b>457.6</b>	<b>3,144</b>					<b>694,109</b>	<b>10.013</b>	<b>3.4</b>	<b>2,362,134</b>	<b>69,411</b>	<b>2,431,545</b>	<b>3.76</b>	<b>to DP SS7, 15"</b>
SS8	COMMERCIAL SITE	CS	20.0			(Equivalent Pop./Acre) 22.0	(GPD/Acre) 1,500	100%	30,000	0.440	4.0	120,000	3,000	123,000	0.19	
<b>SS9</b>	<b>PA- 5, 6, 7, 8, 9, 10, 11, 12, SOUTH SCHOOL, CHURCH, MF-MED, F-12,13, COMM, MUNICIPAL</b>		<b>437.6</b>	<b>3,144</b>					<b>664,109</b>	<b>9.573</b>	<b>3.4</b>	<b>2,277,065</b>	<b>66,411</b>	<b>2,343,476</b>	<b>3.63</b>	<b>to DP SS8 - 15"</b>
SS9	PA-2 (25%)	SFD	107.8	862	8.0	2.77	68	25%	40,592	0.597	4.0	162,366	4,059	166,425	0.26	
<b>SS10</b>	<b>PA-11,12, COMM, MUNICIPAL</b>		<b>116.7</b>	<b>853.0</b>					<b>172,723</b>	<b>2.544</b>	<b>4.0</b>	<b>690,891</b>	<b>17,272</b>	<b>708,163</b>	<b>1.10</b>	<b>to DP SS9 - 8"</b>
SS10	COMMUNITY CENTER		7.4			(Equivalent Pop./Acre) 18.0	(GPD/Acre) 1,200	100%	8,880	0.133	4.0	35,520	888	36,408	0.06	
<b>SS19</b>	<b>PA-64 - MUNICIPAL</b>		<b>2.8</b>	<b>1</b>					<b>3,360</b>	<b>0.050</b>	<b>4.0</b>	<b>13,440</b>	<b>336</b>	<b>13,776</b>	<b>0.02</b>	<b>to DP SS10 - 8"</b>
SS19	PA-64 - MUNICIPAL	SFD	2.8	1		(Equivalent Pop./Acre) 18.0	(GPD/Acre) 1200	100%	3,360	0.050	4.0	13,440	336	13,776	0.02	
<b>SS11</b>	<b>PA-12</b>		<b>83.4</b>	<b>667</b>					<b>125,636</b>	<b>1.848</b>	<b>4.0</b>	<b>502,544</b>	<b>12,564</b>	<b>515,108</b>	<b>0.80</b>	<b>to DP SS10 - 8"</b>
SS11	PA-12	SFD	83.4	667	8.0	2.77	68	100%	125,636	1.848	4.0	502,544	12,564	515,108	0.80	
<b>SS12</b>	<b>PA-11</b>		<b>23.1</b>	<b>185</b>					<b>34,847</b>	<b>0.512</b>	<b>4.0</b>	<b>139,386</b>	<b>3,485</b>	<b>142,871</b>	<b>0.22</b>	<b>to DP SS10 - 8"</b>
SS12	PA-11	SFD	23.1	185	8.0	2.77	68	100%	34,847	0.512	4.0	139,386	3,485	142,871	0.22	
<b>SS13</b>	<b>PA-5, 6, 7, 8, 9, 10, CHURCH MF-MED, WEST SCHOOL, F-12,13</b>		<b>293.9</b>	<b>2,075</b>					<b>450,795</b>	<b>6.432</b>	<b>3.7</b>	<b>1,651,779</b>	<b>45,080</b>	<b>1,696,858</b>	<b>2.63</b>	<b>to DP SS9 - 12"</b>
SS13	PA-7	SFD	51.5	412	8.0	2.77	68	100%	77,604	1.141	4.0	310,417	7,760	318,178	0.49	

**HARMONY DEVELOPMENT**  
**CITY OF AURORA**  
**ON-SITE SANITARY SEWER PEAK ROUTING CALCULATIONS - (PERMANENT GRAVITY SYSTEM)**

DESIGN POINT	PLANNING AREA	DESCRIPTION	AREA (AC)	UNITS	MAXIMUM DENSITY (DU/AC)	OCCUPANCY (PERSONS/DU)	AVG DAY FLOW (GPD/CAP)	PERCENTAGE OF PLANNING AREA	AVG DAY FLOW (GPD)	POPULATION (THOUSANDS)	PEAKING FACTOR (PF)	PEAK DAILY FLOW (GPD)	INFILTRATION 10% OF AVG DAY FLOW (GPD)	PEAK DAY FLOW WITH INFILTRATION (GPD)	PEAK DAY FLOW WITH INFILTRATION (CFS)	COMMENTS
SS14	PA-5, 6		33.9	271					51,046	0.751	4.0	204,182	5,105	209,287	0.32	to DP SS13 - 8"
SS14	PA-6	SFD	18.4	147	8.0	2.77	68	100%	27,689	0.407	4.0	110,756	2,769	113,525	0.18	
SS15	PA-5		15.5	124					23,357	0.343	4.0	93,427	2,336	95,762	0.15	to DP SS14 - 8"
SS15	PA-5	SFD	15.5	124	8.0	2.77	68	100%	23,357	0.343	4.0	93,427	2,336	95,762	0.15	
SS16	PA-8, 9, 10, SOUTH SCHOOL CHURCH, MF-MED, F-12,13		208.5	1,392					322,145	4.540	3.9	1,251,085	32,215	1,283,300	1.99	to DP SS13 - 12"
SS16	PA-10	SFD	55.4	443	8.0	2.77	68	100%	83,443	1.227	4.0	333,774	8,344	342,118	0.53	
SS17	PA-8, CHURCH		43.6	175					46,455	0.687	4.0	185,819	4,645	190,464	0.29	to DP SS16 - 8"
SS17	PA-8	SFD	21.8	174	8.0	2.77	68	100%	32,775	0.482	4.0	131,099	3,277	134,376	0.21	
SS18	CHURCH		11.4	1					13,680	0.205	4.0	54,720	1,368	56,088	0.09	to DP SS17 - 8"
SS18	CHURCH	SFD	11.4	1		(Equivalent Pop./Acre) 18.0	(GPD/Acre) 1200	100%	13,680	0.205	4.0	54,720	1,368	56,088	0.09	
SS20	PA-9		24.4	403					75,909	1.116	4.0	303,636	7,591	311,227	0.48	to DP SS16 - 8"
SS20	PA-9	SFD	24.4	195	8.0	2.77	68	100%	36,730	0.540	4.0	146,921	3,673	150,594	0.23	
SS21	MF-MED		10.4	208					39,179	0.576	4.0	156,716	3,918	160,633	0.25	to DP SS17 - 8"
SS21	MF-MEDIUM	MF-MEDIUM	10.4	208	20.0	2.77	68	100%	39,179	0.576	4.0	156,716	3,918	160,633	0.25	
SS22	SOUTH SCHOOL, PARK F-12 PARK F-13		85.1	371					116,338	1.510	4.0	465,352	11,634	476,986	0.74	to DP SS16 - 8"
SS22	PA-18- SOUTH SCHOOL	SCHOOL	18.1	1		(Equivalent Pop./Acre) 18.0	(GPD/Acre) 1200	100%	21,720	0.326	4.0	86,880	2,172	89,052	0.14	
SS22	PARKLAND F-12	OFFSITE	24.0	145				100%	37,018	0.464	4.0	148,072	3,702	151,774	0.23	
SS23	PARK F-13		43.0	225					57,600	0.720	4.0	230,400	5,760	236,160	0.37	to DP SS22 - 8"
SS23	PARKLAND F-13	OFFSITE	43.0	225					57,600	0.720	4.0	230,400	5,760	236,160	0.37	
SS40	PA-4,13,14,15,16,91,90,89,92,93,87,86 PARK F-1,7, SM OFF-1, SM OFF-2		1389.5	7,504							3.0	5,120,301	172,389	5,292,690	8.19	Tie to 18" SS Line at 6th Ave/Pow
SS40	SM OFF-2	SFD	30.0	168.0						465	4.0	126,578	3,164	129,742	0.20	
SS40	PA-86	SFD	23.2	123.0	5.3	2.77	68	100%	23,168	0.341	4.0	92,673	2,317	94,990	0.15	
SS39	PA-4,13,14,15,16,91,90,89,92,93,87 PARK F-1,7, SM OFF-1		1336.3	7,213					1,669,077	21.809	3.0	4,987,635	166,908	5,154,543	7.98	to SS40 - 18"
SS39	PA-87	SFD	24.0	156.0	6.5	2.77	68	100%	29,384	0.432	4.0	117,537	2,938	120,475	0.19	
SS38	PA-4,13,14,15,16,91,90,89,92,93 PARK F-1,7, SM OFF-1		1312.3	7,057					1,639,693	21.377	3.0	4,916,231	163,969	5,080,201	7.86	to SS39 - 18"
SS37	PA-93, PA-92		64.1	420					103,373	1.519	4.0	413,491	10,337	423,829	0.66	to SS38 - 8"
SS37	PA-92	SFA-TH	24.1	419.0	17.4	2.77	68	100%	78,923	1.161	4.0	315,691	7,892	323,584	0.50	
SS36	PA-93		40.0	1					24,450	0.359	4.0	97,800	2,445	100,245	0.16	to SS37 - 8"
SS36	PA-93-CAC	SFD	40.0	1.0		(Equivalent Pop./Acre) 22.0	(GPD/Acre) 1500	100%	24,450	0.359	4.0	97,800	2,445	100,245	0.16	

Parklands is referencing  
580 Units for this DP

Revised to 580

**HARMONY DEVELOPMENT**  
CITY OF AURORA  
ON-SITE SANITARY SEWER PEAK ROUTING CALCULATIONS - (PERMANENT GRAVITY)

DESIGN POINT	PLANNING AREA	DESCRIPTION	AREA (AC)	UNITS	MAXIMUM DENSITY (DU/AC)	OCCUPANCY (PERSONS/DU)	AVG DAY FLOW (GPD/CAP)	PERCENTAGE OF PLANNING AREA	AVG DAY FLOW (GPD)	POPULATION (THOUSANDS)	PE/FAI
SS35	PA-4,13,14,15,16,91,90,89 PARK F-1,7, SM OFF-1		1248.2	6,637					1,536,320	19.858	3.0
SS35	PA-89	SFD	30.0	168.0	5.6	2.77	68	100%	31,644	0.465	
SS34	PA-13,14,15,16,91,90 SM OFF-1		1218.2	6,469					1,504,676	19.392	3.0
SS34	PA-90	SFD	40.0	204.0	5.1	2.77	68	100%	38,425	0.565	
SS33	PA-91	SFD	2	6,265					1,466,250	18.827	3.1
SM DP 2/SS33	PA-91	SFD	12.1	39	3.2	2.77	68	100%	7,346	0.108	
SS25	PA-4,13,14,15,16, PARK F-1,7, SM OFF-1		1166.1	6,226					1,458,904	18.719	3.1
SM DP 1/SS 25	SM OFF-1	SFD/MF COMM/RETAIL	160.5	857.0				100%	162,208	2.028	
SS25	PA-4	SFD	62.0	248	4.0	2.77	68	100%	46,713	0.687	
SS26	PA-13,14,15,16 PARK F-1,7		943.6	5,121					1,249,983	16.004	3.1
SS 26	PA-13	SFD	64.5	206	3.2	2.77	68	100%	38,802	0.571	
SS27	PARK F-7		282.0	1,896					485,366	6.067	2.8
SS27	PARKLAND F-7	OFFSITE	282.0	1,896				100%	485,366	6.067	
SS28	PA-14,15,16, PARK F-1		597.1	3,019					725,815	9.366	3.4
SS29	PA-14 (60%)	SFD	59.3	219	3.7	2.77	68	60%	24,751	0.364	4.0
SS29	PA-15 (60%)								43,888	0.645	4.0
SS30	PA-15					2.77	68	100%	43,888	0.645	4.0
SS30	PA-14, 15, 16, PARKLAND F-1								657,176	8.357	3.5
SS30	PA-14 (40%)					2.77	68	40%	16,500	0.243	4.0
SS31	PA-16, Park-F1								640,676	8.114	3.5
SS31	PA-16					2.77	68	100%	43,888	0.645	4.0
SS31	Parklands-F1							100%	596,788	7.469	2.6
SS41	PA-88		32.4	162					30,514	0.449	4.0
SS41	PA-88	SFD	32.4	162.0	5.0	2.77	68	100%	30,514	0.449	4.0

NOTES:  
Peaking Factor =  $5/p^{0.167}$ , p = population in thousands, where  $1.7 < PF < 4$   
Sanitary Sewer loading rates, factors, and calculations based on City of Aurora Public Utility Improvements Standards and Specifications  
(p) - in Planning Area and Description columns represent portion of the total Planning Area described

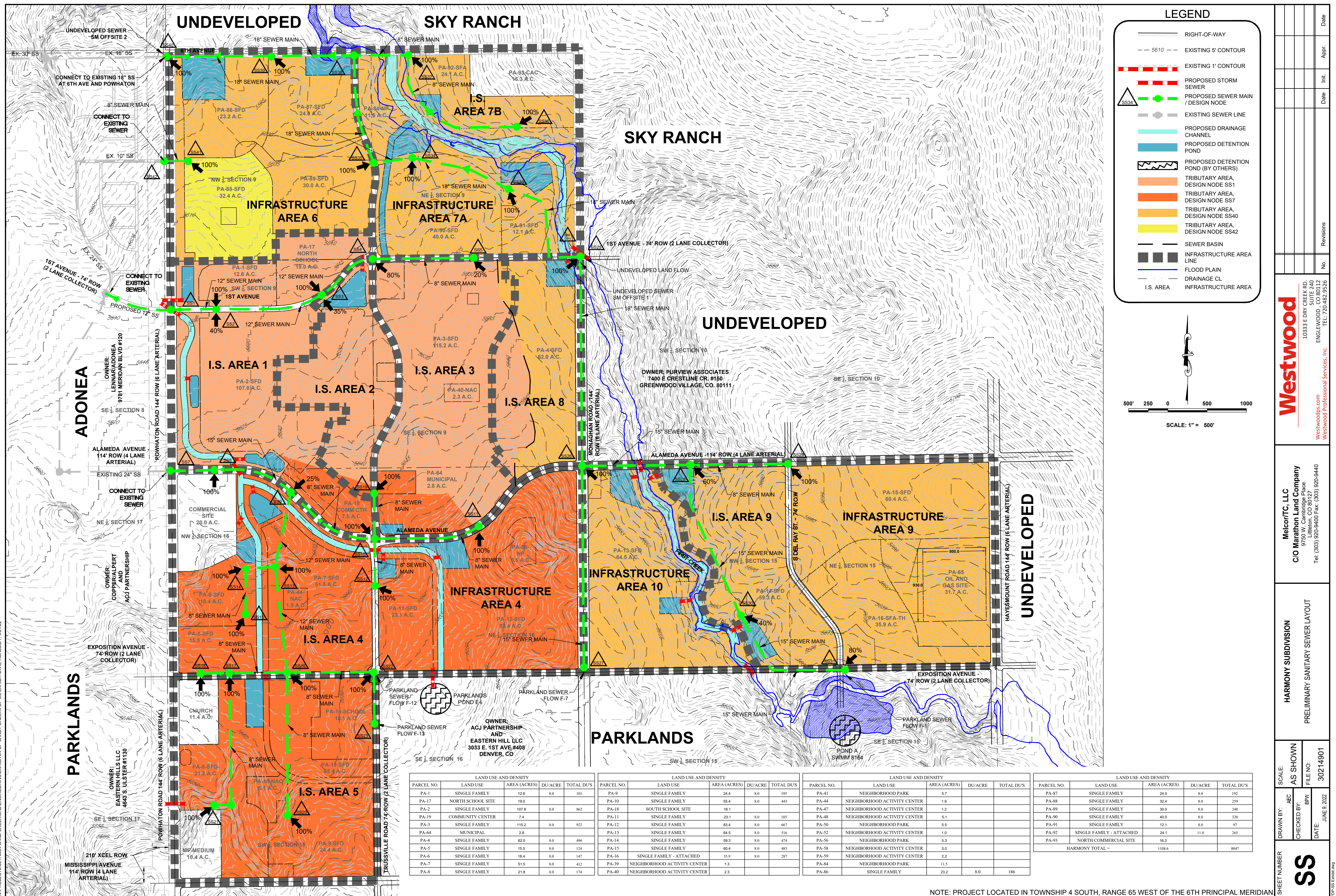
Where is this flow coming from as it is not provided in the Parklands MUS?

Please see the sum of GPD + Infiltration for both the yellow and Orange Areas per the provided Parklands report.

Additional Coordination needed on Routing Calcs. Please send electronic copy to [ddpershi@auroragov.org](mailto:ddpershi@auroragov.org)

AREA F-1	NAC-12 PART 5G PART 5H	F-6 F-5	F-5 F-4	10 14	NAC SFD	4.5 6.0	4.5 6.0	45 84	45 84	11,520 21,504
	PART 5H NAC-11 PART 5G	F-4.1 F-4	F-4 F-3	27 20 10 8	SFD SFD NAC SFD	5.5 5.5 4.5 6.0	5.5 5.5 4.5 6.0	149 109 45 48	149 109 45 48	38,016 28,019 11,520 12,288
				187				483		231,633
AREA F-2	PART CP-1 PART 5D PART 5E NP-12 PART 5A PART 5B NAC-10	F-3 F-2 F-1	F-2 F-1 F-1	15 24 20 5 35 4 22	CP SFD SFD NP SFD SFD NAC	1 6 5 1 5.5 5 4.5	1.0 6.0 5.0 1.0 5.5 5.0 4.5	15 145 99 5 193 20 99	15 145 99 5 193 20 99	3,738 37,018 25,216 1,280 49,280 5,120 25,344
				124				976		146,496
AREA F-3	NP-14 PART 5E PART 5B PART 5B PART 5A	F-3.1 F-2.1 F-1.1 F-1	F-2.1 F-1.1 F-1 Outfall	5 37 40 21 14 38	NP SFD SFD SFD SFD SFD	1 5 5 5 5 5.5	1.0 5.0 5.0 5.0 5.0 5.5	5 185 200 105 70 210	5 185 200 105 70 210	1,280 47,360 51,200 26,752 17,920 53,645
				155				175		146,157
AREA F-4 MH F-4	PART 5G 5F CP-1 PART 5D 5C PART 5A CAC-4 PART 3A PART 3A PART 5A	F-11.1 F-11 F-10 F-10 F-9 F-8 F-8 F-7 F-7	F-11 F-10 F-9 F-8 F-7 F-7 Outfall	30 27 35 28 28 17 30 15 44 28	SFD SFA CP SFD SFA SFD CAC SFD SFD SFD	6 11 1 6 11 5.5 10.2 6 6 5.5	6.0 11.0 1.0 6.0 11.0 5.5 10.2 6.0 6.0 5.5	177 300 35 168 310 94 304 90 264 154	177 300 35 168 310 94 304 90 264 154	45,312 76,877 8,960 43,008 79,411 23,936 77,814 23,040 67,584 39,744
				282				1896		465,366
AREA F-5	NAC-4 PART 3A PART 3A	F-13 F-12 F-12	F-12 F-12 Outfall	22 21 24	NAC SFD SFD	4.5 6 6	4.5 6.0 6.0	99 126 145	99 126 145	25,344 32,256 37,018
				67				376		57,622







## Appendix C

Sun Meadow – Master Utilities Report (Partial Report) – Sanitary Sewer Calcs/Map

# **MASTER UTILITIES REPORT**

*For*

**Sun Meadow  
Aurora, Colorado**

**Prepared for:**

**6<sup>th</sup> and Powhaton Investors, LLC  
9162 S. Kenwood Court  
Highlands Ranch, Colorado 80126**

**Prepared by:**

**CVL Consultants of Colorado, Inc.  
7901 E. Belleview Avenue  
Suite 150  
Englewood, Colorado 80111  
(720) 482-9526**

March 1, 2005  
May 26, 2005  
September 14, 2005  
**Revised: October 5, 2005**

*Partial Report  
Cen 2/2015*

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#### Appendix A – Water System

- Exhibit 2 – Aurora Water CIP
- Exhibit 3 – Proposed Water System
- Exhibit 4 - Single Family Equivalent Calculation Worksheet
- Exhibit 4A - Water System Demand Calculation Table
- Exhibit 4B - Offsite Water System Demand Calculation Table
- Average Day Demand Analysis
- Maximum Hour Demand Analysis
- Maximum Day Demand Analysis
- Fire Flow Analysis

#### Appendix B – Sanitary Sewer System

- Exhibit 5 – Aurora Sanitary Sewer CIP
- Exhibit 6 – Offsite Sanitary Sewer Basin Map
- Exhibit 7 – Offsite Sanitary Sewer Calculation Table
- Exhibit 8 – Proposed Sanitary Sewer Basin Map
- Exhibit 9 – Onsite Sanitary Sewer Calculation Table
- Exhibit 10 – Preliminary Sanitary Sewer Profiles
- Sanitary Sewer System Analysis

#### Appendix C – Public Improvements Phasing Plan

- Phase Maps
- Phasing Water System Analysis

#### Appendix D – Full Size Utility Maps



**MASTER UTILITY REPORT  
FOR  
SUN MEADOW**

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**APPROVED FOR ONE YEAR FROM THIS DATE** \_\_\_\_\_

\_\_\_\_\_  
**City Engineer** **Date**

\_\_\_\_\_  
**Utilities Department** **Date**

\_\_\_\_\_  
**Life Safety** **Date**

\_\_\_\_\_  
**Kurt A. Lang, P.E.** **Date**  
**State of Colorado No. 32249**

**CVL Consultants of Colorado, Inc.**  
**7901 E. Belleview Ave, Suite 150**  
**Englewood, Colorado 80111**



This Master Utilities Report for the Sun Meadow Development is prepared to address the parameters and design characteristics to be utilized during the preliminary and final utility design for this subdivision.

**A. LOCATION**

The Sun Meadow project is located within the boundaries of the City of Aurora, County of Arapahoe, Colorado. The project is situated in the North ½ of Section 9, Township 4 South, Range 65 West of the 6<sup>th</sup> Principal Meridian. It is bordered on the north by East 6<sup>th</sup> Avenue, on the west by Powhatan Road, on the east by Monaghan Road, and on the south by East 1st Avenue.

Three planned developments border the Sun Meadow development. The Adonea Subdivision is located to the west, The Hills at Sky Ranch in Arapahoe County is located to the east, and Starfall Ranch is located to the south. To the north, the east half of Section 4 is part of the Sky Ranch development while the west half is currently undeveloped.

**B. DESIGN CRITERIA**

The water and sanitary system has been designed in accordance with the City of Aurora Public Utility Improvements Rules and Regulations Regarding Standards and Specifications, (PUI Standards and Specifications).

**C. WATER SYSTEM****Existing Facilities and Proposed Improvements**

The Sun Meadow development is located within water pressure Zone 4, as defined by the City of Aurora Water CIP Map. The proposed water system will connect to the existing 30" water main at the northwest corner of the site, constructed by the Adonea development, and the water system loop connection will be accomplished by tying into the proposed 24" water main stub in the southwest corner of the site provided by the Starfall Ranch development.

If the Sun Meadow development is constructed prior to the Starfall Ranch development, the waterline loop connection will extend southerly along Powhatan Road to a 24" water main in East Alameda Avenue. An exhibit of the CIP map has been included in the appendix as Exhibit 2.



The water mains within the proposed Sun Meadow arterial and collector roads have been sized to provide service for the development's internal water loop system. A 12" water line is proposed in Powhaton Road and a 12" water line is proposed in East 6<sup>th</sup> Avenue extending easterly to Monaghan Road. The 12" water line in Monaghan Road is extended southerly from East 6<sup>th</sup> Avenue to connect to the Starfall Ranch Development.

A 24" water line diameter is identified in the City of Aurora masterplan for the entire length of East 6<sup>th</sup> Avenue and Monaghan Road. However, since the neighboring Sky Ranch development to the north and The Hills at Sky Ranch development to the east are within the Rangeview Metropolitan District water system, the proposed water mains have been sized based on Sun Meadow fire flow demands. The 6<sup>th</sup> Avenue and Powhaton Investors, LLC respectfully requests your consideration on this issue.

A 12" waterline is proposed in the north-south minor collector at the center of the Sun Meadow development to connect the East 6<sup>th</sup> Avenue water main to the Starfall Ranch Development. An 8" water line is proposed approximately halfway between East 6<sup>th</sup> Avenue and East 1<sup>st</sup> Avenue to connect the 12" water line in Powhaton to the 12" water line at the north-south Sun Meadow minor collector road. Additionally, each local street will be served by 8" water lines. A water system map has been included in the appendix.

In the pre-application meeting, the City of Aurora utility staff requested a 60" steel water line pipe in Powhaton Road from East 6<sup>th</sup> Avenue to the southern property boundary. We have indicated a 12" water line, the water line size appropriate for the Sun Meadow water system demand, as a request by our client, understanding after our initial submittal of the FDP package that the City will not cost participate for the over-sizing of this main.

A corridor for the future 60" waterline, the location of which has not been determined, will be provided by either the Sun Meadow or Adonea rights-of-way, or within the XCEL Energy right-of-way as determined by a pending transmission main alignment alternatives study. The City will be responsible for all costs related to the future 60" water main.

**Demand Quantities**

The water system was sized using the demand tables, equations, and design criteria presented in Chapter 4 of the PUI Standards and Specifications.

The following criteria were used to size the water system:

Average Day Demand (ADD)= 0.10 gallons per minute per capita

Maximum Day Demand (MDD) to ADD ratio = 2.8:1

Maximum Hour Demand (MHD) to ADD ratio = 4.5:1

Maximum Static Pressure = 113 psi

Minimum Maximum Day Pressure = 50 psi

Minimum Residual Pressure During Fire Flow = 20 psi

Maximum Pipe Velocity during Maximum Day + Fire Flow and/or Peak Hour

- 16" water main or greater = 5 fps
- 12" water main = 10 fps
- 8" water main = 15 fps

The City of Aurora bases the minimum fire flow demands on the ISO criteria. This results in a fire flow demand of:

- 1,500 gpm for single family planning areas
- 2,500 gpm for the NAC planning area
- 4,000 gpm for commercial planning areas
- 4,800 gpm for the elementary school planning area

The residential areas for the proposed development plan to mix single-family detached units (SFD), single family attached units (SFA), and multi-family units (MF) within each individual planning area. This applies to planning areas PA-4, PA6, PA-12, PA-15, PA-21, PA-22, and PA-26.

At this time, this project is unable to identify the density of the SFD, SFA, and MF units for each planning area. This report has assumed that maximum density for each planning area of 8 units per acre as set forth in the Framework Development Plan. Planning areas 21 and 22 are an exception to this density as this report will conservatively assume that these could be developed as multi-family with a maximum density of 16 units per acre. Using these assumptions, Exhibit 4 calculates a total of 1499.7 single-family equivalent units for the proposed development. Exhibit 4 has been provided in the appendix.

### **Water System Analysis**

The water system was analyzed using Heastad Method's WaterCAD to determine the effects that the development demands, pressures, and fire flows would have on the proposed water mains. A water model has been set up with four reservoirs: three set at the Zone 4 HGL elevation of 5850 and one set at the Zone 3 HGL elevation of 5720 per the City of Aurora Water CIP Map. These reservoirs have been located at the connection points to the Adonea and Starfall Ranch developments.





## **Sun Meadow**

## **Aurora, Colorado**

The Sun Meadow water system model has included portions of the Adonea development to ensure continuity between the proposed system and the existing water infrastructure. This infrastructure includes the Adonea onsite demand, the Adonea PRV in East 6<sup>th</sup> Avenue, and reservoir 4 at the western limits of the Adonea development.

The onsite demands for the north half of the Adonea development, planning areas 6 through 9, have been applied evenly at junctions Adonea J-1 and Adonea J-2. The calculation for this demand has been taken from the approved Adonea Master Utilities Report, revised August 2003, by Nolte Associates, Inc, (reference 3).

The Sun Meadow development's onsite demands have been divided over twenty-one junctions in the water system model. These junctions include demands from the single-family equivalent portions of the site (SFD-Stand, SFA-TH, and MF-Med), the future commercial areas (CAC), the elementary school site (School-ELE), and the neighborhood activity center (NAC).

The results from the Sun Meadow water system model indicate the proposed water mains meet the pressure and velocity requirements set forth in the PUI Standards and Specifications. The minimum pressure during the MHD scenario is approximately 92 psi at Junction J-10. The maximum onsite pressure, which occurred during the ADD scenario, is approximately 118 psi at Junction J-5.

Fire flow scenarios were run at each junction to determine the junction with the lowest system pressure. The results indicated that a fire flow demand applied at Junction J-10 yielded the lowest system pressure of approximately 82 psi. A scenario has been created for this junction to model the fire flow applied during the maximum day demand. All junctions that have a fire flow greater than 1,500 gpm were modeled to verify pipe velocities. All results from the water system model have been included in the appendix.

### **D. SANITARY SEWER SYSTEM**

#### **Existing Facilities and Proposed Improvements**

The Sun Meadow development is located within Basin 3, as defined by the City of Aurora Sewer CIP Map. The Sun Meadow development is included in the basin boundary of the regional interceptor designated as "First Creek Transfer to Cross Creek." This regional interceptor has been designed per the Cross Creek Subdivision Regional Utility Report, by High Country Engineering, Inc, revised October 2002. (Reference 2)



## **Sun Meadow**

## **Aurora, Colorado**

The proposed developments in the Cross Creek basin have defined how upstream basins will connect to the regional interceptor. The potential contributing upstream basins for the Sun Meadow sewer system have been significantly reduced due to the removal of the Sky Ranch and The Hills at Sky Ranch Developments from the City of Aurora sanitary sewer system. An Overall Sanitary Basin Map has been provided in the appendix.

The proposed Sun Meadow sanitary sewer system will connect to the 18" regional interceptor at the intersection of East 6<sup>th</sup> Avenue and Powhatan road, provided by the Adonea Development. The proposed development will extend the 18" sanitary sewer main easterly along East 6<sup>th</sup> Avenue just past the First Creek drainageway crossing, then routed southeasterly as a 12" and 10" main through the site to the intersection of Monaghan Road and East 1<sup>st</sup> Avenue. All local interior streets will serve developed areas with 8" sewer pipes.

The proposed planning Area 6 sanitary sewer directs flows to the 12" sanitary sewer stub in Powhatan Road provided by the Adonea development. If this stub has not been extended by the Adonea development, the proposed sanitary system will route proposed flows north in Powhatan Road to the 18" sanitary sewer stub provided by the Adonea development.. All sanitary sewer mains greater than 8" have been profiled and included in the appendix. The Proposed Sanitary Sewer Basin Map has been included in the appendix.

### **Demand Quantities**

The sanitary sewer system was sized using the loading tables, equations, and design criteria presented in Chapter 4 of the PUI Standards and Specifications.

The following criteria were used to size the sanitary sewer system:

#### **Single-Family Detached: SFD-Stand**

- Equivalent Population = 3.2 persons per dwelling unit
- Loading Rate = 80 gallons per capita day

#### **Single-Family Attached: SFA-Th**

- Equivalent Population = 2.1 persons per dwelling unit
- Loading Rate = 80 gallons per capita day

#### **Multi-Family: MF-Med**

- Equivalent Population = 1.7 persons per dwelling unit
- Loading Rate = 80 gallons per capita day

**Commercial-Neighborhood Shopping Center: CAC**

- Equivalent Population = 25 persons per unit
- Loading Rate = 2000 gallons per capita day

**Offsite Areas:**

Area broken down by Cross Creek Regional Utility Report as:

- 60% Planned single-family detached area
- 30% Planned multi-family area
- 10% Planned commercial area

**Pipe Design:**

- Infiltration = 10% of average day demand
- Peaking factor equation:  $PF = 5/p^{0.167}$ 
  - Where  $p$  = population in thousands
  - For  $1.7 < PF < 4$
- Sewer mains 12" or smaller to be sized up to 75% full
- Sewer mains 15" and up to be sized at 90% full
- Pipe velocity not to exceed 10 fps flowing full or half full.

The residential areas for the proposed development plan to mix single-family detached units (SFD), single family attached units (SFA), and multi-family units (MF) within each individual planning area. This applies to planning areas PA-4, PA6, PA-12, PA-15, PA-21, PA-22, and PA-26.

At this time, this project is unable to identify the density of the SFD, SFA, and MF units for each planning area. This report has assumed that maximum density for each planning area of 8 units per acre as set forth in the Framework Development Plan. Planning areas 21 and 22 are an exception to this density as this report will conservatively assume that these could be developed as multi-family with a maximum density of 16 units per acre. Using these assumptions, Exhibit 4 calculates a total of 1499.7 single-family equivalent units for the proposed development. Exhibit 4 has been provided in the appendix.

**Sanitary Sewer System Analysis**

The sanitary sewer system was analyzed using Heastad Method's SewerCAD to determine the effects that the onsite and offsite sewer demands have on the proposed pipe system. The cumulative sanitary sewer system Average Day Flow accumulating at Design Point 11, the connection to the 18" sanitary sewer main provided by the Adonea development, is 0.65 million gallons per day (mgd). The total equivalent population at this design point is 8,953 people resulting in a system peaking factor of 3.47.

The Adonea Master Utility Report, by Nolte Associates, Inc revised August 2003, anticipated a cumulative 4.874 mgd from the Sun Meadow development, including the offsite basins. The significant reduction of sanitary sewer flows to the Adonea system can be accounted for because of:

- Obtainment of more accurate data for the Sun Meadow portion of the upstream sewer basins.
- The Sand Creek Development capturing the sanitary sewer flows from the First Creek Development and routing the flow to the Adonea sewer system.
- The majority of the Adonea offsite basin accounted for the Sky Ranch and the Hills at Sky Ranch developments, which will be serviced by another sanitation district.

The results from the proposed sanitary sewer system indicate that the sewer mains conform to the slope, velocity, and design flow depth requirements set forth in the PUI Standards and Specifications. The highest velocity encountered in the pipe system was 4.5 ft/s at pipe P-29. All results from the sanitary sewer system model have been included in the appendix.

#### **E. PROJECT PHASING**

The Sun Meadow development will be accomplished in 9 phases. The Public Improvements Phasing Plan narrative describes the necessary improvements for each phase and has been included in the appendix.

#### **F. CONCLUSION**

This Master Utility Report is in conformance with the City of Aurora PUI Standards and Specifications.





**G. REFERENCES**

1. Public Utility Improvements and Regulations Regarding Standards and Specifications, City of Aurora, revised July 2001.
2. Cross Creek Subdivision Regional Utility Report, High Country Engineering, revised July 2002.
3. Adonea Master Utilities Report, COA#203180, Nolte Associates Inc., revised August 2003.
4. Starfall Ranch Master Utilities Report, Nolte Associates Inc., December 2004.

**EXHIBIT 7**  
**OFFSITE SANITARY SEWER CALCULATION TABLE**  
**SUN MEADOW DEVELOPMENT**  
CITY OF AURORA

DESIGN POINT	SERVICE DESCRIPTION	PERCENT OF BUILDABLE AREA	SERVICE AREA (ACRES)	DWELLING UNITS**	OCCUPANCY (PERSONS/DU)	POPULATION	DEMAND (gpd/cap)	AVERAGE DAILY FLOW (gal/day)	PEAK FACTOR	PEAK DAILY FLOW (gal/day)	INFILTRATION 10% OF AVG DAY FLOW (gal/day)	TOTAL PEAK FLOW WITH INFILTRATION (gal/day)
1	TOTAL AREA=		160.5									
	SINGLE FAMILY DETACHED	60%	96.30	337.05	3.20	1,078.6	80.00	86,284.80	4.00	345,139.20	8,628.48	353,767.68
	MULTI FAMILY	30%	28.89	520.02	1.70	884.0	80.00	70,722.72	4.00	282,890.88	7,072.27	289,963.15
	RESIDENTIAL SUBTOTALS	90%	26.00	857.07		1,962.6		157,007.52		628,030.08	15,700.75	643,730.83
	COMMERCIAL/RETAIL*	10%	2.60	2.60	25.00	65.00	2,000.00	5,200.20	4.00	20,800.80	520.02	21,320.82
	SITE TOTALS	100%	2.60			2,027.60	80.00	162,207.72	4.00	648,830.88	16,220.77	665,051.65
2	TOTAL AREA=		60.0									
	SINGLE FAMILY DETACHED	60%	36.00	126.00	3.20	403.2	80.00	32,256.00	4.00	129,024.00	3,225.60	132,249.60
	MULTI FAMILY	30%	10.80	194.40	1.70	330.5	80.00	26,438.40	4.00	105,753.60	2,643.84	108,397.44
	RESIDENTIAL SUBTOTALS	90%	9.72	320.40		733.7		58,694.40		234,777.60	5,869.44	240,647.04
	COMMERCIAL/RETAIL*	10%	0.97	0.97	25.00	24.30	2,000.00	1,944.00	4.00	7,776.00	194.40	7,970.40
	SITE TOTALS	100%	0.97			757.98	80.00	60,638.40	4.00	242,553.60	6,063.84	248,617.44

\* BUSINESS EQUIVALENT POPULATION BASED ON (2000 gpd/ac) / (80 gpd/cap) = 25.0 cap/ac

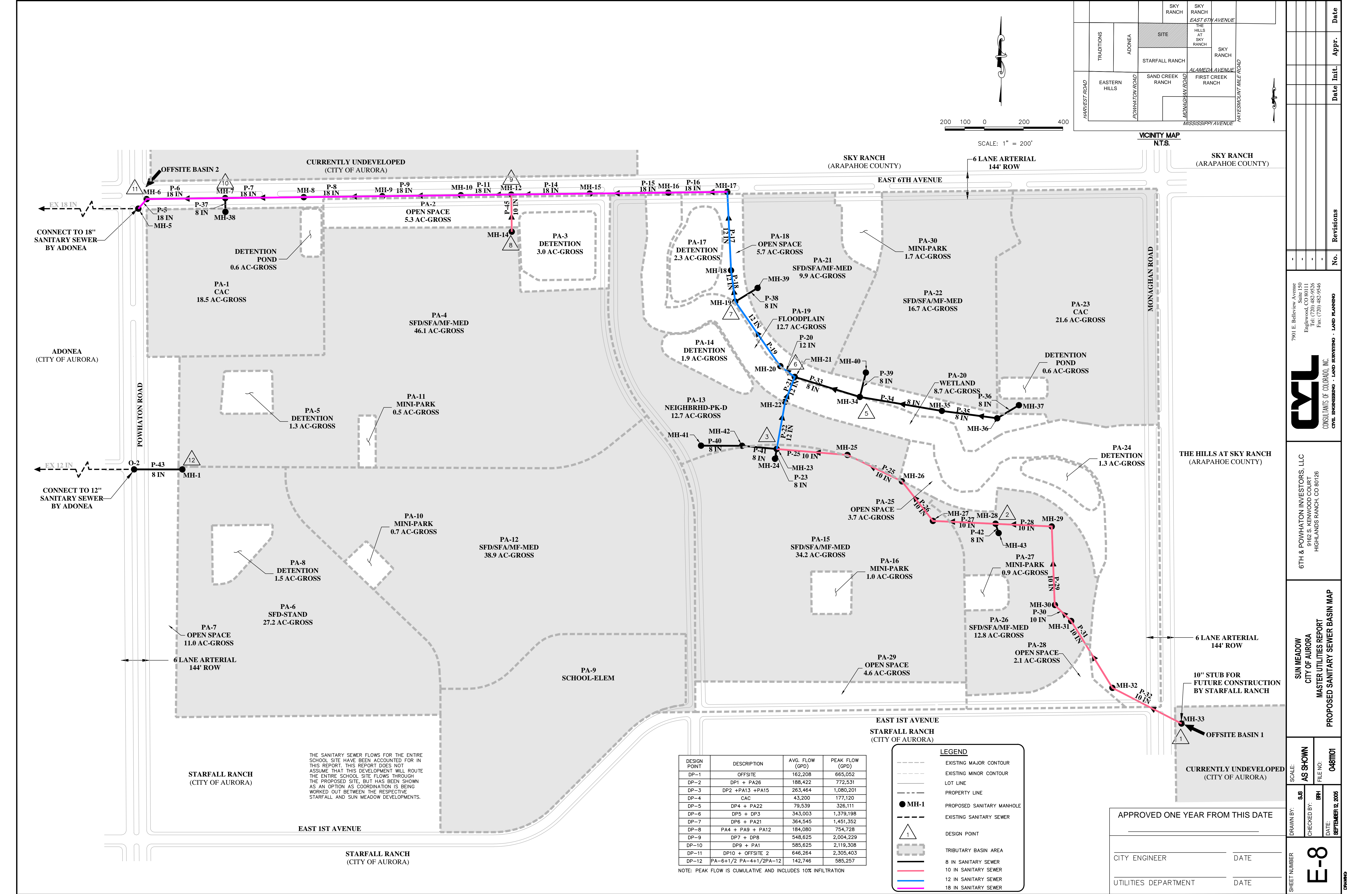
\*\*DENSITY BASED ON:  
3.5 DU/Ac FOR SINGLE FAMILY DWELLING  
18 DU/Ac FOR MULTIFAMILY DWELLING

**EXHIBIT 9**  
**ONSITE SANITARY SEWER CALCULATION TABLE**  
**SUN MEADOW DEVELOPMENT**  
CITY OF AURORA

DESIGN POINT	PLANNING AREA	DESCRIPTION	AREA (AC)	MAXIMUM DENSITY (DU/AC)*	UNITS	OCCUPANCY (PERSONS/DU)	POPULATION (THOUSANDS)**	AVG DAY FLOW (gal/day/cap)	AVG DAY FLOW (gal/day)	PEAKING FACTOR (PF)	PEAK DAILY FLOW (gal/day)	INFILTRATION 10% OF AVG DAY FLOW (gal/day)	PEAK DAY FLOW WITH INFILTRATION (gal/day)	COMMENTS
1	OFFSITE 1***		160.5				2.028	80	162,208	4.00	648,830.88	16,221	665,052	Flow from upstream basin to Design Point 2
	PA-26	SFD/SFA/MF-MED	12.8	8.0	102	3.2	0.328	80	26,214	4.00	104,857.60	2,621	107,479	Flow from PA-26 to Design Point 2
2	JUNCTION	DP1 + PA26					2.355		188,422	4.00	753,688.48	18,842	772,531	Flow at Junction To Design Point 3
	PA-15	SFD/SFA/MF-MED	34.2	8.0	274	3.2	0.876	80	70,042	4.00	280,166.40	7,004	287,171	Flow from PA-15 to Design Point 3
	PA-13	NEIGHBORHOOD PARK	12.7		1		0.063		5,000	4.00	20,000.00	500	20,500	Flow from PA-13 to Design Point 3
3	JUNCTION	DP2 + PA-13 + PA-15					3.293		263,464	4.00	1,053,854.88	26,346	1,080,201	Flow at Junction To Design Point 6
4	PA-23	CAC - SHOPPING CENTER	21.6		22	25	0.540	2000	43,200	4.00	172,800.00	4,320	177,120	Flow from PA-23 to Design Point 5
	PA-22	MF-MED	16.7	16.0	267	1.7	0.454	80	36,339	4.00	145,356.80	3,634	148,991	Flow from PA-22 to Design Point 5
5	JUNCTION	DP4 + PA22					0.994		79,539	4.00	318,156.80	7,954	326,111	Flow at Junction To Design Point 6
6	JUNCTION	DP5 + DP3					4.288		343,003	3.92	1,344,897.28	34,300	1,379,198	Flow at Junction To Design Point 7
	PA-21	MF-MED	9.9	16.0	158	1.7	0.269	80	21,542	4.00	86,169.60	2,154	88,324	Flow from PA-21 to Design Point 7
7	JUNCTION	DP6 + PA21					4.557		364,545	3.88	1,414,897.74	36,455	1,451,352	Flow at Junction To Design Point 9
	PA-9	SCHOOL - ELE				1000	1.000	10	10,000	4.00	40,000.00	1,000	41,000	Flow from PA-9 & Starfall portion of school site. to Design Point 8
	PA-4 AND PA-12	SFD/SFA/MF-MED	85.0	8.0	680	3.2	2.176	80	174,080	4.00	696,320.00	17,408	713,728	Flow from PA-4 and PA-12 to Design Point 8
8	JUNCTION	PA-4 + PA-9+ PA-12					3.176		184,080	4.00	736,320.00	18,408	754,728	Flow at Junction To Design Point 9
9	JUNCTION	DP7 + DP8					7.733		548,625	3.55	1,949,366.30	54,863	2,004,229	Flow at Junction To Design Point 10
	PA-1	CAC - SHOPPING CENTER	18.5		19	25	0.463	2000	37,000	4.00	148,000.00	3,700	151,700	Flow from PA-1 to Design Point 10
10	JUNCTION	DP9 + PA-1					8.195		585,625	3.52	2,060,745.56	58,563	2,119,308	Flow at Junction To Design Point 11
	Offsite 2 ***		60.0				0.758	80	60,638	4.00	242,553.60	6,064	248,617	Flow from offsite basin to Design Point 11
11	JUNCTION	DP10 + Offsite 2					8.953		646,264	3.47	2,240,776.93	64,626	2,305,403	Flow at Junction To Adonea 18" STUB
12	JUNCTION	PA-6 + (0.5)*PA-4 + (0.5)*PA-12	69.7	8.0	558	3.2	1.784	80	142,746	4.00	570,982.40	14,275	585,257	Flow from PA-6, 1/2 of PA-4, & 1/2 of PA-12 to Adonea 12" STUB

NOTES:  
Peaking Factor =  $5/p^{0.167}$ , p = population in thousands, where  $1.7 < PF < 4$   
Sanitary Sewer loading rates, factors, and calculations based on City of Aurora Public Utility Improvements Standards and Specifications, Chapter 4.  
\* Maximum density based on Form D: FDP Land Use Map Matrix of section 8 of the Sun Meadow FDP Package  
\*\* Population converted to equivalent population for Commercial, NAC, and Offsite areas  
\*\*\* See Offsite Sanitary Sewer Calculations worksheet for density/unit/population details







## Appendix D

Parklands Sanitary Sewer Calcs/Map

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING

AT BUILD OUT

MISSISSIPPI INTERCEPTOR

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ ACRE	UNITS/ ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD '+10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)
M-1	PART NP-6			10	NP	1	1.0	10	10	2,509	251	2,760	0.004	0.004	0.000	0.004	8.78	4.00	0.016	0.016	0.010
	PART 3D	M-10	M-9	23	SFD	6	6.0	136	136	34,867	3,487	38,354	0.054	0.058	0.005	0.067	5.54	4.00	0.221	0.237	0.153
	PART 3A			17	SFD	6	6.0	102	102	26,112	2,611	28,723	0.040	0.098	0.004	0.170	4.75	4.00	0.166	0.403	0.260
	PART 3D	M-9	M-8	24	SFD	6	6.0	144	144	36,864	3,686	40,550	0.057	0.155	0.006	0.331	4.25	4.00	0.234	0.637	0.411
	3I	M-8.2	M-8.1	59	SFD	6	6.0	355	355	90,931	9,093	100,024	0.141	0.141	0.014	0.155	4.82	4.00	0.577	0.577	0.373
	PART NP-6			13	NP	1	1.0	13	13	3,328	333	3,661	0.005	0.146	0.001	0.301	4.31	4.00	0.021	0.598	0.386
	NAC-5	M-8.1	M-8	7	NAC	4.5	4.5	32	32	8,064	806	8,870	0.012	0.158	0.001	0.461	4.02	4.00	0.051	0.649	0.420
	PART 3A			13	SFD	6	6.0	78	78	19,968	1,997	21,965	0.031	0.189	0.003	0.653	3.79	3.79	0.120	0.769	0.497
	PART 3D	M-8	M-7	31	SFD	6	6.0	186	186	47,616	4,762	52,378	0.074	0.418	0.007	1.409	3.33	3.33	0.253	1.659	1.072
				197																	
M-2	PART NP-5			17	NP	1	1.0	17	17	4,352	435	4,787	0.007	0.007	0.001	0.007	8.01	4.00	0.028	0.028	0.018
	PART 3C	M-7	M-6	46	SFD	6	6.0	276	276	70,656	7,066	77,722	0.109	0.534	0.011	1.962	3.15	3.15	0.356	2.042	1.320
				63																	
M-3	PART NP-5	M-6.1	M-6	9	NP	1	1.0	9	9	2,253	225	2,478	0.003	0.003	0.000	0.004	8.94	4.00	0.014	0.014	0.009
	PART 3C	M-6	M-5	33	SFD	6	6.0	195	195	49,920	4,992	54,912	0.077	0.615	0.008	2.588	3.01	3.01	0.240	2.297	1.485
	3B	M-5	M-4	35	SFD	6	6.0	209	209	53,606	5,361	58,967	0.083	0.698	0.008	3.295	2.89	2.89	0.248	2.545	1.645
				76																	
M-4	1/2 OS-11			4	OS	0	0.0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.00	1.70	0.000	0.000	0.000
	4H			22	SFD	6	6.0	131	131	33,638	3,364	37,002	0.052	0.052	0.005	0.057	5.69	4.00	0.213	0.213	0.138
	PART 4G			54	SFD	6	6.0	324	324	82,944	8,294	91,238	0.128	0.180	0.013	0.250	4.45	4.00	0.526	0.740	0.478
	4F	M-4	M-3	10	SFD-S	8	8.0	78	78	20,070	2,007	22,077	0.031	0.909	0.003	4.458	2.75	2.75	0.089	3.373	2.180
	NAC-8	M-3	M-2	10	NAC	4.5	4.5	45	45	11,520	1,152	12,672	0.018	0.927	0.002	5.387	2.66	2.66	0.049	3.423	2.212
				100																	
M-5	PART 4A	H-3.1	H-3	14	SFD	6	6.0	84	84	21,504	2,150	23,654	0.033	0.033	0.003	0.037	6.13	4.00	0.136	0.136	0.088
		H-3	H-2	0				0	0	0	0	0	0.000	0.033	0.000	0.037	6.13	4.00	0.000	0.136	0.088
	NAC-7	H-2.1	H-2	22	NAC	4.5	4.5	99	99	25,344	2,534	27,878	0.039	0.039	0.004	0.043	5.97	4.00	0.161	0.161	0.104
	PART 4A	H-2	H-1	44	SFD	6	6.0	262	262	67,123	6,712	73,836	0.104	0.176	0.010	0.266	4.40	4.00	0.426	0.723	0.467
				80																	
M-6	NP-10			5	NP	1	1.0	5	5	1,280	128	1,408	0.002	0.002	0.000	0.002	9.82	4.00	0.008	0.008	0.005
	PART 4D	H-1.1	H-1	10	SFD	6	6.0	60	60	15,360	1,536	16,896	0.024	0.026	0.002	0.030	6.33	4.00	0.097	0.106	0.068
	PART 4D	H-1	M-2	87	SFD	6	6.0	523	523	133,786	13,379	147,164	0.207	0.409	0.021	0.727	3.72	3.72	0.791	1.620	1.047
	4E	M-2	M-1	22	MF	16	16.0	347	347	88,883	8,888	97,772	0.138	1.474	0.014	7.601	2.52	2.52	0.360	5.402	3.492
				124																	
TOTAL MISS. INTERCEPTOR:				639																	
									3721	952,499	95,250	1,047,749	1.474	1.474	0.147	7.601	2.52	2.52	3.855	5.402	3.492

Note: The Areas on this page may not match the Areas on the drawings This is due to open space and flood plain areas not included on these sheets.

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING

AT BUILD OUT

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ ACRE	UNITS/ ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD +10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)
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Table 1: Selected City of Aurora's Wastewater Criteria			
Loading	City of Aurora		
Per Capita Flow Rate	80 gal/cap/day	SFE	SFE/AC
Commercial	2,600 gal/acre/day (FAR = 0.55)		10.2
Res-sf: units/ac	3.5		
R-1: Capita/unit	3.2	1	3.5
Res-mf: units/ac	20		
R-2m: Capita/unit	1.7	0.53	10.6
Res-th: units/ac	10		
R-1A: Capita/unit	2.1	0.66	6.6
Infiltration/inflow (I/I) Rate	10% average daily flow		
Peaking Factor	Pf=3.53/Qavg0.167 Max = 4		

**EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING**

AT BUILD OUT

**FIRST CREEK INTERCEPTOR**

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ACRE	UNITS/ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD +10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)
AREA F-1	PART 5J	F-6	F-5	72	SFD	5	5.0	360	360	92,160	9,216	101,376	0.143	0.143	0.014	0.157	4.81	4.00	0.585	0.585	0.378
	NAC-12			10	NAC	4.5	4.5	45	45	11,520	1,152	12,672	0.018	0.160	0.002	0.319	4.27	4.00	0.073	0.658	0.425
	PART 5G	F-5	F-4	14	SFD	6	6.0	84	84	21,504	2,150	23,654	0.033	0.194	0.003	0.516	3.94	3.94	0.135	0.792	0.512
	PART 5H			26	SFD	5.5	5.5	143	143	36,608	3,661	40,269	0.057	0.250	0.006	0.772	3.69	3.69	0.214	1.007	0.651
	PART 5H	F-4.1	F-4	27	SFD	5.5	5.5	149	149	38,016	3,802	41,818	0.059	0.059	0.006	0.065	5.58	4.00	0.241	0.241	0.156
	PART 5H			20	SFD	5.5	5.5	109	109	28,019	2,802	30,821	0.043	0.102	0.004	0.171	4.74	4.00	0.178	0.419	0.271
	NAC-11	F-4	F-3	10	NAC	4.5	4.5	45	45	11,520	1,152	12,672	0.018	0.120	0.002	0.293	4.33	4.00	0.073	0.492	0.318
	PART 5G			8	SFD	6	6.0	48	48	12,288	1,229	13,517	0.019	0.389	0.002	1.456	3.32	3.32	0.065	1.564	1.011
				187				483		251,635	25,164										
AREA F-2	PART CP-1	F-3	F-2	15	CP	1	1.0	15	15	3,738	374	4,111	0.006	0.395	0.001	1.852	3.18	3.18	0.019	1.583	1.023
	PART 5D			24	SFD	6	6.0	145	145	37,018	3,702	40,719	0.057	0.452	0.006	2.310	3.07	3.07	0.182	1.764	1.140
	PART 5E			20	SFD	5	5.0	99	99	25,216	2,522	27,738	0.039	0.491	0.004	2.806	2.97	2.97	0.120	1.884	1.218
	NP-12			5	NP	1	1.0	5	5	1,280	128	1,408	0.002	0.493	0.000	3.299	2.89	2.89	0.006	1.890	1.222
	PART 5A	F-2	F-1	35	SFD	5.5	5.5	193	193	49,280	4,928	54,208	0.076	0.570	0.008	3.877	2.82	2.82	0.222	2.112	1.365
	PART 5B			4	SFD	5	5.0	20	20	5,120	512	5,632	0.008	0.578	0.001	4.455	2.75	2.75	0.023	2.135	1.380
	NAC-10			22	NAC	4.5	4.5	99	99	25,344	2,534	27,878	0.039	0.617	0.004	5.076	2.69	2.69	0.109	2.244	1.451
				124				576		146,996	14,700	161,696	0.727								
AREA F-3	NP-14	F-3.1	F-2.1	5	NP	1	1.0	5	5	1,280	128	1,408	0.002	0.002	0.000	0.002	9.82	4.00	0.008	0.008	0.005
	PART 5E			37	SFD	5	5.0	185	185	47,360	4,736	52,096	0.073	0.075	0.007	0.085	5.33	4.00	0.300	0.309	0.199
	PART 5B	F-2.1	F-1.1	40	SFD	5	5.0	200	200	51,200	5,120	56,320	0.079	0.154	0.008	0.247	4.46	4.00	0.325	0.633	0.409
	PART 5B	F-1.1	F-1	21	SFD	5	5.0	105	105	26,752	2,675	29,427	0.041	0.196	0.004	0.447	4.04	4.00	0.170	0.803	0.519
	PART 5B			14	SFD	5	5.0	70	70	17,920	1,792	19,712	0.028	0.224	0.003	0.674	3.77	3.77	0.107	0.910	0.588
	PART 5A	F-1	Outfall	38	SFD	5.5	5.5	210	210	53,645	5,364	59,009	0.083	0.923	0.008	6.681	2.57	2.57	0.222	3.376	2.182
				155				775		198,157	19,815										
AREA F-4 MH F-4	PART 5G	F-11.1	F-11	30	SFD	6	6.0	177	177	45,312	4,531	49,843	0.070	0.070	0.007	0.077	5.42	4.00	0.287	0.287	0.186
	5F	F-11	F-10	27	SFA	11	11.0	300	300	76,877	7,688	84,564	0.119	0.189	0.012	0.278	4.37	4.00	0.488	0.775	0.501
	CP-1	F-10	F-9	35	CP	1	1.0	35	35	8,960	896	9,856	0.014	0.203	0.001	0.482	3.99	3.99	0.057	0.832	0.538
	PART 5D			28	SFD	6	6.0	168	168	43,008	4,301	47,309	0.067	0.269	0.007	0.759	3.70	3.70	0.253	1.085	0.701
	5C	F-9	F-8	28	SFA	11	11.0	310	310	79,411	7,941	87,352	0.123	0.392	0.012	1.163	3.44	3.44	0.435	1.520	0.982
	PART 5A			17	SFD	5.5	5.5	94	94	23,936	2,394	26,330	0.037	0.429	0.004	1.596	3.26	3.26	0.125	1.644	1.063
	CAC-4	F-8	F-7	30	CAC	10.2	10.2	304	304	77,814	7,781	85,595	0.120	0.550	0.012	2.158	3.10	3.10	0.386	2.030	1.312
	PART 3A			15	SFD	6	6.0	90	90	23,040	2,304	25,344	0.036	0.585	0.004	2.747	2.98	2.98	0.110	2.140	1.383
	PART 3A			44	SFD	6	6.0	264	264	67,584	6,758	74,342	0.105	0.690	0.010	3.448	2.87	2.87	0.311	2.451	1.584
	PART 5A	F-7	Outfall	28	SFD	5.5	5.5	154	154	39,424	3,942	43,366	0.061	0.751	0.006	4.205	2.78	2.78	0.176	2.626	1.697
				282				1896		485,366	48,536										
AREA F-5	NAC-4	F-13	F-12	22	NAC	4.5	4.5	99	99	25,344	2,534	27,878	0.039	0.039	0.004	0.043	5.97	4.00	0.161	0.161	0.104
	PART 3A			21	SFD	6	6.0	126	126	32,256	3,226	35,482	0.050	0.089	0.005	0.137	4.92	4.00	0.205	0.365	0.236
	PART 3A	F-12	Outfall	24	SFD	6	6.0	145	145	37,018	3,702	40,719	0.057	0.146	0.006	0.289	4.34	4.00	0.235	0.600	0.388

67

376

pop

3146

1843

2480

6067

720  
464  
1184

Master Sewer Rev\_4.XLS

7/5/05



EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING

AT BUILD OUT

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ ACRE	UNITS/ ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD '+10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)
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Note: The Areas on this page may not match the Areas on the drawings. This is due to open space and flood plain areas not included on these sheets.

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING

AT BUILD OUT

FIRST CREEK  
INTERCEPTOR

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ ACRE	UNITS/ ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD '+10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)
AREA F-6	PART 4G			29	SFD	6	6.0	172	172	43,930	4,393	48,323	0.068	0.068	0.007	0.075	5.44	4.00	0.279	0.279	0.180
	NAC-9	A-3.2	A-3.1	10	NAC	4.5	4.5	45	45	11,520	1,152	12,672	0.018	0.086	0.002	0.162	4.78	4.00	0.073	0.352	0.227
	PART 4B	A-3.1	A-3	16	SFD	6	6.0	98	98	25,037	2,504	27,540	0.039	0.125	0.004	0.291	4.34	4.00	0.159	0.511	0.330
	PART CAC-3	A-3	A-2	20	CAC	10.2	10.2	204	204	52,224	5,222	57,446	0.081	0.205	0.008	0.504	3.96	3.96	0.328	0.839	0.542
	PART CAC-3			8	CAC	10.2	10.2	84	84	21,412	2,141	23,553	0.033	0.238	0.003	0.746	3.71	3.71	0.126	0.965	0.623
	NP-9			5	NP	1	1.0	5	5	1,280	128	1,408	0.002	0.240	0.000	0.987	3.54	3.54	0.007	0.972	0.628
	4C	A-2	A-1	15	SFA	12	12.0	176	176	45,158	4,516	49,674	0.070	0.310	0.007	1.304	3.38	3.38	0.243	1.215	0.785
	PART 4G			37	SFD	6	6.0	224	224	57,446	5,745	63,191	0.089	0.089	0.009	0.098	5.20	4.00	0.364	0.364	0.236
	PART 4B	A-1.1	A-1	21	SFD	6	6.0	126	126	32,256	3,226	35,482	0.050	0.139	0.005	0.242	4.48	4.00	0.205	0.569	0.368
	PART 4B	A-1	Outfall	22	SFD	6	6.0	132	132	33,792	3,379	37,171	0.052	0.432	0.005	1.982	3.15	3.15	0.170	1.711	1.106
TOTAL FIRST CREEK INTERCEPTOR:				183	998				5863	1,500,826	150,083	1,650,908	2.322	2.322	0.232	2.555	3.02	3.02	7.241	7.241	4.680

Note: The Areas on this page may not match the Areas on the drawings. This is due to open space and flood plain areas not included on these sheets.

MURPHY  
CREEK

AREA MC-1																					
MH MC-1	MC.1	MC-1	MC-2	46	SF	3.5	3.5	161	161	41,216	4,122	8,243	0.064	0.064	0.006	0.070	5.50	4.00	0.261	0.261	0.169
				46					161	41,216	4,122	45,338	0.064	0.064	0.006	0.070	5.59	4.00	0.261	0.261	0.169

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4281

Table 1: Selected City of Aurora's Wastewater Criteria			
Loading	City of Aurora		
Per Capita Flow Rate	80 gal/cap/day	SFE	SFE/AC
Commercial	2,600 gal/acre/day (FAR = 0.55)		10.2
Res-sf: units/ac	3.5		
R-1: Capita/unit	3.2	1	3.5
Res-mf: units/ac	20		
R-2m:Capita/unit	1.7	0.53	10.6
Res-th: units/ac	10		
R-1A:Capita/unit	2.1	0.66	6.6
Infiltration/inflow (I/I) Rate	10% average daily flow		
Peaking Factor	$Pf = 3.53/Q_{avg}^{0.167}$ Max = 4		

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING

AT BUILD OUT

COAL CREEK INTERCEPTOR

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ ACRE	UNITS/ ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD *+10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)			
AREA C-1 MH CC-11		CC-11	CC-10	264	SF	3.5	16.0	4216	922	236,096	23,610	259,706	0.365	0.365	0.037	0.402	4.11	4.00	1.498	1.498	0.968			
				264																				
AREA C-2 MH CC-10		CC-10	CC-9	221	SF	3.5	16.0	3533	773	197,837	19,784	217,620	0.306	0.671	0.031	1.104	3.47	3.47	1.094	2.591	1.675			
				221																				
AREA C-3 MH CC-9		C-3.1	CC-9.1	0	SF	3.5	16.0																	
				0	SF	3.5	16.0																	
				0	SF	3.5	16.0																	
				839	SF	3.5	16.0	13424	2937	751,744	75,174	826,918	1.163	1.835	0.116	3.055	2.93	2.93	3.524	6.115	3.952			
				839																				
AREA C-4	OS-17	J-4	J-3	7	OS	0	0.0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.00	1.70	0.000	0.000	0.000			
	PART 5J			55	SFD	5	5.0	277	277	70,784	7,078	77,862	0.110	0.110	0.011	0.120	5.03	4.00	0.449	0.449	0.290			
	5I			40	SFD	5.5	5.5	217	217	55,616	5,562	61,178	0.086	0.196	0.009	0.325	4.26	4.00	0.353	0.802	0.518			
	NP-15			5	NP	1	1.0	5	5	1,280	128	1,408	0.002	0.198	0.000	0.522	3.93	3.93	0.008	0.810	0.523			
	S-7	11	S	4.5	4.5	50	50	12,672	1,267	13,939	0.020	0.217	0.002	0.742	3.71	3.71	0.075	0.885	0.572					
	HS	J-3	J-2	60	HS	8	8.0	480	480	122,880	12,288	135,168	0.190	0.407	0.019	1.168	3.44	3.44	0.673	1.558	1.007			
	3L			26	MF-L	16	16.0	421	421	107,725	10,772	118,497	0.167	0.574	0.017	1.759	3.21	3.21	0.552	2.110	1.364			
				1/2 SAC-1	J-2	J-1	31	SAC	30	30.0	930	930	238,080	23,808	261,888	0.368	1.064	0.037	3.153	2.91	2.91	1.110	3.720	2.404
				235																				
AREA C-5	3K	J-1.3	J-1.2	19	SFD	6	6.0	116	116	29,645	2,964	32,609	0.046	0.046	0.005	0.050	5.81	4.00	0.188	0.188	0.122			
	3J			21	SFD-S	8	8.0	170	170	43,418	4,342	47,759	0.067	0.113	0.007	0.170	4.74	4.00	0.275	0.464	0.300			
	NAC-6	J-1.2	J-2	5	NAC	4.5	4.5	23	23	5,760	576	6,336	0.009	0.122	0.001	0.293	4.33	4.00	0.037	0.500	0.323			
	1/2 SAC-1	J-1.1	J-1	54	SAC	30	30.0	1614	1614	413,184	41,318	454,502	0.639	0.639	0.064	0.703	3.74	3.74	2.457	2.457	1.588			
				99																				
AREA C-6	3F	P-4	P-3	33	SFD	6	6.0	195	195	49,920	4,992	54,912	0.077	0.077	0.008	0.085	5.33	4.00	0.317	0.317	0.205			
	OS-7	P-3.1	P-3	5	OS	0	0.0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.00	1.70	0.000	0.000	0.000			
				S-4	17	S	4.5	4.5	77	77	19,584	1,958	21,542	0.030	0.030	0.003	0.033	6.23	4.00	0.124	0.124	0.080		
				3H	10	SFA	12	12.0	116	116	29,798	2,980	32,778	0.046	0.076	0.005	0.114	5.07	4.00	0.189	0.313	0.202		
	3G	P-3	P-2	16	SFD-S	8	8.0	130	130	33,178	3,318	36,495	0.051	0.205	0.005	0.409	4.10	4.00	0.210	0.840	0.543			
	PART 3E	P-2	P-1		SFD	0	0.0	0	0	0	0	0	0.000	0.205	0.000	0.409	4.10	4.00	0.000	0.840	0.543			
		P-1	J-1	56	SFD	6	6.0	335	335	85,709	8,571	94,280	0.133	0.338	0.013	0.760	3.70	3.70	0.503	1.344	0.869			
		PART 3E	J-1	CC-8	16	SFD	6	6.0	96	96	24,576	2,458	27,034	0.038	2.079	0.004	6.700	2.57	2.57	0.102	7.623	4.927		
					0			0	0	0	0	0	0.000	4.523	0.000	18.707	2.16	2.16	0.000	15.920	10.290			
				0			0	0	0	0	0	0.000	4.523	0.000	18.707	2.16	2.16	0.000	15.920	10.290				
				152																				

**EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING**

AT BUILD OUT

**COAL CREEK INTERCEPTOR**

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ACRE	UNITS/ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD *+10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)
AREA C-7	PART 2J			13	SFA	11	11.0	143	143	36,608	3,661	40,269	0.057	0.057	0.006	0.062	5.61	4.00	0.232	0.232	0.150
	1/2 2I	CC-8.6A	CC-8.6	8	SFA	11	11.0	87	87	22,246	2,225	24,471	0.034	0.091	0.003	0.157	4.81	4.00	0.141	0.373	0.241
	1/2 2I	CC-8.6	CC-8.5	22	SFA	11	11.0	242	242	61,952	6,195	68,147	0.096	0.187	0.010	0.353	4.20	4.00	0.393	0.766	0.495
	2G			14	SFA	11	11.0	11	156	39,987	3,999	43,986	0.062	0.249	0.006	0.608	3.84	3.84	0.244	1.010	0.653
	2H			14	MF-M	15	15.0	213	213	54,528	5,453	59,981	0.084	0.333	0.008	0.950	3.56	3.56	0.309	1.319	0.852
	2F			27	SFD	6	6.0	164	164	41,933	4,193	46,126	0.065	0.398	0.006	1.354	3.36	3.36	0.224	1.543	0.997
	PART 2E			9	SFD	6	6.0	55	55	13,978	1,398	15,375	0.022	0.420	0.002	1.776	3.21	3.21	0.072	1.614	1.043
	PART 2C	CC-8.5	CC-8.4	9	SFD	6	6.0	54	54	13,824	1,382	15,206	0.021	0.441	0.002	2.220	3.09	3.09	0.068	1.683	1.088
	PART 2C	CC-8.4	CC-8.3	16	SFD	6	6.0	95	95	24,269	2,427	26,696	0.038	0.479	0.004	2.702	2.99	2.99	0.116	1.799	1.163
	PART 2C	CC-8.3	CC-8.2	26	SFD	6	6.0	156	156	39,936	3,994	43,930	0.062	0.540	0.006	3.249	2.90	2.90	0.185	1.984	1.282
	PART 2B	CC-8.2	CC-8.1	10	SFD	6	6.0	60	60	15,360	1,536	16,896	0.024	0.564	0.002	3.815	2.82	2.82	0.069	2.054	1.327
	PART 2B	CC-8.1	CC-8	19	SFD	6	6.0	114	114	29,184	2,918	32,102	0.045	0.609	0.005	4.429	2.75	2.75	0.129	2.182	1.411
				175					1538	393,805	39,380	433,185	0.609								
AREA C-8	2K	CC-5.9A	CC-5.9	16	MF-M	15	15.0	234	234	59,904	5,990	65,894	0.093	0.093	0.009	0.102	5.17	4.00	0.380	0.380	0.246
	PART 2J	CC-5.9	CC-5.8	22	SFA	11	11.0	246	246	63,078	6,308	69,386	0.098	0.190	0.010	0.302	4.31	4.00	0.400	0.780	0.504
	2D			26	SFD	6	6.0	155	155	39,782	3,978	43,761	0.062	0.252	0.006	0.560	3.89	3.89	0.246	1.026	0.663
	PART 2E			22	SFD	6	6.0	132	132	33,792	3,379	37,171	0.052	0.304	0.005	0.869	3.61	3.61	0.194	1.220	0.788
	NAC-3			14	NAC	4.5	4.5	63	63	16,128	1,613	17,741	0.025	0.329	0.002	1.201	3.42	3.42	0.088	1.308	0.845
	S-2			17	S	4.5	4.5	77	77	19,584	1,958	21,542	0.030	0.359	0.003	1.563	3.28	3.28	0.102	1.410	0.911
	PART 2A	CC-5.8	CC-5.7	28	SFD	6	6.0	165	165	42,240	4,224	46,464	0.065	0.425	0.007	1.995	3.15	3.15	0.212	1.622	1.049
	PART 2A	CC-5.7	CC-5.6	33	SFD	6	6.0	198	198	50,688	5,069	55,757	0.078	0.503	0.008	2.506	3.03	3.03	0.245	1.868	1.207
	1I			10	SFD-S	8	8.0	79	79	20,275	2,028	22,303	0.031	0.535	0.003	3.043	2.93	2.93	0.095	1.963	1.269
	1J			26	SFD	6	6.0	157	157	40,090	4,009	44,099	0.062	0.597	0.006	3.646	2.84	2.84	0.183	2.145	1.387
	NP-2			5	NP	1	1.0	5	5	1,280	128	1,408	0.002	0.599	0.000	4.245	2.77	2.77	0.006	2.151	1.390
	1H	CC-5.6	CC-5.5	21	SFD	6	6.0	125	125	32,102	3,210	35,313	0.050	0.648	0.005	4.898	2.71	2.71	0.139	2.290	1.480
		CC-5.5	CC-5.4			0	0.0	0	0	0	0	0	0.000	0.648	0.000	4.898	2.71	2.71	0.000	2.290	1.480
		CC-5.4	CC-5.3	17	S	4.5	4.5	77	77	19,584	1,958	21,542	0.030	0.679	0.003	5.580	2.65	2.65	0.083	2.374	1.534
	PART 1E	CC-5.3	CC-5.2	9	SFD	6	6.0	54	54	13,824	1,382	15,206	0.021	0.700	0.002	6.282	2.60	2.60	0.058	2.431	1.572
		CC-5.2	CC-5.1		SFD	0	0.0	0	0	0	0	0	0.000	0.700	0.000	6.282	2.60	2.60	0.000	2.431	1.572
		CC-5.1	CC-5		SFD	0	0.0	0	0	0	0	0	0.000	0.700	0.000	6.282	2.60	2.60	0.000	2.431	1.572
	PART 1E	CC-6	CC-5	20	SFD	6	6.0	120	120	30,720	3,072	33,792	0.048	4.571	0.005	29.564	2.01	2.01	0.100	16.021	10.354
		CC-5	CC-4			0	0.0	0	0	0	0	0	0.000	4.571	0.000	35.846	1.94	1.94	0.000	18.452	11.926
	PART 1E	CC-4.2	CC-4.1	22	SFD	6	6.0	130	130	33,331	3,333	36,664	0.052	0.052	0.005	0.057	5.70	4.00	0.211	0.211	0.137
	PART 1E	CC-4.1	CC-4	8	SFD	6	6.0	48	48	12,288	1,229	13,517	0.019	0.071	0.002	0.129	4.97	4.00	0.078	0.289	0.187
	PART 1E	CC-4	CC-3	4	SFD	6	6.0	24	24	6,144	614	6,758	0.010	4.651	0.001	40.627	1.90	1.90	0.019	18.760	12.125
				319					2089	534,835	53,484	588,319	0.828								

Area's C-7 & C-8 were updated in May of 2005 to reflect the Village 2 use changes (removal of commercial property).

Master Sewer Rev\_4.XLS

7/5/05

Job No.: 3289

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EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING

AT BUILD OUT

COAL CREEK INTERCEPTOR

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ ACRE	UNITS/ ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD '+10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)
AREA C-9	PART 2X	CC-3.10	CC-3.9	4	SFD	3.5	3.5	15	15	3,942	394	4,337	0.006	0.006	0.001	0.007	8.14	4.00	0.025	0.025	0.016
	PART 2X	CC-3.9	CC-3.8	10	SFD	3.5	3.5	34	34	8,602	860	9,462	0.013	0.019	0.001	0.027	6.43	4.00	0.055	0.080	0.051
	PART 2X	CC-3.8	CC-3.7	54	SFD	3.5	3.5	189	189	48,384	4,838	53,222	0.075	0.094	0.007	0.129	4.97	4.00	0.307	0.387	0.250
	CAC-1			28	CAC	10.2	10.2	286	286	73,114	7,311	80,425	0.113	0.207	0.011	0.348	4.21	4.00	0.464	0.850	0.550
	1/2 1G	CC-3.7	CC-3.6	13	SFA	12	12.0	156	156	39,936	3,994	43,930	0.062	0.269	0.006	0.623	3.82	3.82	0.242	1.093	0.706
	1/2 1G	CC-3.6A	CC-3.6	20	SFA	12	12.0	238	238	60,826	6,083	66,908	0.094	0.094	0.009	0.104	5.16	4.00	0.386	0.386	0.249
		CC-3.6	CC-3.5			0	0.0	0	0	0	0	0	0.000	0.363	0.000	0.727	3.72	3.72	0.000	1.478	0.956
	PART 1E	CC-3.5	CC-3.4	24	SFD	6	6.0	144	144	36,864	3,686	40,550	0.057	0.420	0.006	1.153	3.45	3.45	0.202	1.681	1.086
	1D			12	SFD	6	6.0	71	71	18,125	1,812	19,937	0.028	0.448	0.003	1.604	3.26	3.26	0.094	1.775	1.147
	NAC-1	CC-3.4	CC-3.3	10	NAC	4.5	4.5	45	45	11,520	1,152	12,672	0.018	0.466	0.002	2.072	3.13	3.13	0.057	1.833	1.184
	PART 1B	CC-3.3	CC-3.2			0	0.0	0	0	0	0	0	0.000	0.466	0.000	2.072	3.13	3.13	0.000	1.833	1.184
		CC-3.2	CC-3.1	19	SFD	6	6.0	114	114	29,184	2,918	32,102	0.045	0.511	0.005	2.588	3.01	3.01	0.141	1.973	1.275
	PART 1A	CC-3.1	CC-3			0		0	0	0	0	0	0.000	0.511	0.000	2.588	3.01	3.01	0.000	1.973	1.275
		CC-3	CC-2	15	SFD	6	6.0	90	90	23,040	2,304	25,344	0.036	5.198	0.004	48.417	1.85	1.85	0.069	20.803	13.445
209																					
AREA C-10	PART 1F	CC-2.5	CC-2.4	25	MF-L	16	16.0	400	400	102,400	10,240	112,640	0.158	0.158	0.016	0.174	4.73	4.00	0.650	0.650	0.420
	PART 1F	CC-2.4	CC-2.3	14	MF-L	16	16.0	230	230	58,982	5,898	64,881	0.091	0.250	0.009	0.433	4.06	4.00	0.374	1.024	0.662
	1C	CC-2.3	CC-2.2			0	0.0	0	0	0	0	0	0.000	0.250	0.000	0.433	4.06	4.00	0.000	1.024	0.662
		CC-2.2	CC-2.1	20	SFD-S	8	8.0	157	157	40,141	4,014	44,155	0.062	0.312	0.006	0.751	3.70	3.70	0.236	1.260	0.814
		CC-2.1	CC-2	18	SFD	6	6.0	107	107	27,494	2,749	30,244	0.043	0.354	0.004	1.110	3.47	3.47	0.152	1.412	0.913
	PART 1B	CC-2	CC-1	9	SFD	6	6.0	55	55	13,978	1,398	15,375	0.022	5.574	0.002	55.103	1.81	1.81	0.041	22.256	14.384
	PART 1A	CC-1	M-1			0	0.0	0	0	0	0	0	0.000	5.574	0.000	55.103	1.81	1.81	0.000	22.256	14.384
		M-1	Outfall			0	0.0	0	0	0	0	0	0.000	7.048	0.000	62.703	1.77	1.77	0.000	27.659	17.876
				86																	
TOTAL COAL CREEK INTERCEPTOR:				2598																	
									19466	4,983,296	498,330	5,481,626	7.711	7.711	0.771	55.103	1.81	1.81	14.706	22.256	14.384

Note: The Areas on this page may not match the Areas on the drawings. This is due to open space and flood plain areas not included on these sheets.

Table 1: Selected City of Aurora's Wastewater Criteria			
Loading	City of Aurora		
Per Capita Flow Rate	80 gal/cap/day	SFE	SFE/AC
Commercial	2,600 gal/acre/day (FAR = 0.55)		10.2
Res-sf: units/ac	3.5		
R-1: Capita/unit	3.2	1	3.5
Res-mf: units/ac	20		
R-2m: Capita/unit	1.7	0.53	10.6
Res-th: units/ac	10		
R-1A: Capita/unit	2.1	0.66	6.6
Infiltration/inflow (I/I) Rate	10% average daily flow		

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY  
BASIN LOADING

AT BUILD OUT

AREA	SUB-BASINS	U.S. MH	D.S. MH	AREA (ACRES)	USE	USE SFE'S/ ACRE	UNITS/ ACRE	TOTAL UNITS	SFE'S	GPD	10% INFIL	GPD '+10% INFILTRATION	ADF (CFS)	CUMM. ADF (CFS)	INFIL (CFS)	CUMM. ADF+ INFIL (CFS)	CALC PEAK FACTOR	PEAK FACTOR	PDF (CFS)	CUMM. PDF (CFS)	CUMM. PDF (MGD)
																Peaking Factor	Pf = 3.53/Q <sub>avg</sub> <sup>0.167</sup> Max = 4				

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

			PIPE DATA										PIPE SIZING				ACTUAL FLOWS										
	SUB-BASIN	REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)	VELOCITY (FT/S)	
MISSISSIPPI INTERCEPTOR	M-1	PART NP-6											10	10	0.003	0.000	0.003	0.004	0.004	4.00	0.016						
		PART 3D	M-10	M-9	4	PVC	800	8	0.400%	50.2	0.35	2	0.17	136	136	0.035	0.003	0.041	0.054	0.058	4.00	0.221	M-9	0.237	0.153	0.23	2.18
		PART 3A												102	102	0.026	0.003	0.070	0.040	0.098	4.00	0.166					
		PART 3D	M-9	M-8	4	PVC	1100	8	0.400%	50.2	0.35	2	0.17	144	144	0.037	0.004	0.110	0.057	0.155	4.00	0.234	M-8(fr.M-9)	0.637	0.411	0.41	2.80
		3I	M-8.2	M-8.1	4	PVC	1450	8	0.400%	50.2	0.35	2	0.17	355	355	0.091	0.009	0.210	0.141	0.141	4.00	0.577	M-8.1	0.577	0.373	0.39	2.74
		PART NP-6												13	13	0.003	0.000	0.214	0.005	0.146	4.00	0.021					
		NAC-5	M-8.1	M-8	4	PVC	700	8	0.400%	50.2	0.35	2	0.17	32	32	0.008	0.001	0.223	0.012	0.158	4.00	0.051	M-8(fr.M-8.1)	0.649	0.420	0.42	2.81
		PART 3A												78	78	0.020	0.002	0.245	0.031	0.189	3.79	0.120					
	PART 3D	M-8	M-7	4	PVC	1400	12	0.400%	113.0	0.79	3	0.25	186	186	0.048	0.005	0.297	0.074	0.418	3.33	0.253	M-7	1.659	1.072	0.57	3.57	
	M-2	PART NP-5											17	17	0.004	0.000	0.005	0.007	0.007	4.00	0.028						
		PART 3C	M-7	M-6	3	PVC	1250	12	0.400%	113.0	0.79	3	0.25	276	276	0.071	0.007	0.380	0.109	0.534	3.15	0.356	M-6(fr.M-7)	2.042	1.320	0.66	3.74
	M-3	PART NP-5	M-6.1	M-6	2	PVC	900	8	0.400%	50.2	0.35	2	0.17	9	9	0.002	0.000	0.002	0.003	0.003	4.00	0.014	M-6(fr.M-6.1)	0.014	0.009	0.06	0.95
		PART 3C	M-6	M-5	2	PVC	900	12	0.400%	113.0	0.79	3	0.25	195	195	0.050	0.005	0.437	0.077	0.615	3.01	0.240	M-5	2.297	1.485	0.72	3.82
		3B	M-5	M-4	2	PVC	2250	15	0.400%	176.6	1.23	3.75	0.31	209	209	0.054	0.005	0.496	0.083	0.698	2.89	0.248	M-4	2.545	1.645	0.64	3.99
	M-4	1/2 OS-11											0	0	0.000	0.000	0.496	0.000	0.000	1.70	0.000						
		4H											131	131	0.034	0.003	0.533	0.052	0.052	4.00	0.213						
		PART 4G											324	324	0.083	0.008	0.624	0.128	0.180	4.00	0.526						
		4F	M-4	M-3	2	PVC	700	15	0.400%	176.6	1.23	3.75	0.31	78	78	0.020	0.002	0.646	0.031	0.909	2.75	0.089	M-3	3.373	2.180	0.77	4.25
		NAC-8	M-3	M-2	2	PVC	1100	15	0.400%	176.6	1.23	3.75	0.31	45	45	0.012	0.001	0.659	0.018	0.927	2.66	0.049	M-2(fr.M-3)	3.423	2.212	0.77	4.26
	M-5	PART 4A	H-3.1	H-3	3	PVC	1400	8	0.400%	50.2	0.35	2	0.17	84	84	0.022	0.002	0.024	0.033	0.033	4.00	0.136	H-3	0.136	0.088	0.17	1.86
			H-3	H-2	3	PVC	1450	8	0.400%	50.2	0.35	2	0.17	0	0	0.000	0.000	0.024	0.000	0.033	4.00	0.000	H-2(fr.H-3)	0.136	0.088	0.17	1.86
		NAC-7	H-2.1	H-2	3	PVC	1400	8	0.400%	50.2	0.35	2	0.17	99	99	0.025	0.003	0.028	0.039	0.039	4.00	0.161	H-2(fr.H-2.1)	0.161	0.104	0.20	2.00
		PART 4A	H-2	H-1	3	PVC	2200	8	0.400%	50.2	0.35	2	0.17	262	262	0.067	0.007	0.125	0.104	0.176	4.00	0.426	H-1(fr.H-2)	0.723	0.467	0.46	2.89
	M-6	NP-10											5	5	0.001	0.000	0.001	0.002	0.002	4.00	0.008						
		4D	H-1.1	H-1	3	PVC	800	8	0.400%	50.2	0.35	2	0.17	60	60	0.015	0.002	0.018	0.024	0.026	4.00	0.097	H-1(fr.H-1.1)	0.106	0.068	0.26	2.31
		4C	H-1	M-2	3	PVC	650	12	0.400%	113.0	0.79	3	0.25	523	523	0.134	0.013	0.291	0.207	0.409	3.72	0.791	M-2(fr.H-1)	1.620	1.047	0.60	3.63
		4E	M-2	M-1	2	PVC	1500	18	0.400%	254.3	1.77	4.5	0.38	347	347	0.089	0.009	0.389	0.138	1.474	2.52	0.360	M-1(fr.M-2)	5.402	3.492	0.92	4.80

Table 1: Minimum Sewer Main Slopes		
Pipe Size	Min. Slope Feet/1001	Max. CFS
8"	0.40	0.82
12"	0.40	2.43
15"	0.40	5.15
18"	0.40	8.37
21"	0.40	12.61
24"	0.40	18.02
27"	0.40	24.64
30"	0.40	32.67

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

	PIPE DATA												PIPE SIZING		ACTUAL FLOWS										
	SUB-BASIN	REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)
	36"	0.40		53.13																					



EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

		PIPE DATA										PIPE SIZING					ACTUAL FLOWS										
	SUB-BASIN	REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)	VELOCITY (FT/S)	
F-1	PART 5J												360	360	0.092	0.009	0.101	0.143	0.143	4.00	0.585						
	NAC-12	F-6	F-5	7	PVC	1000	8	0.400%	50.2	0.35	2	0.17	45	45	0.012	0.001	0.114	0.018	0.160	4.00	0.073	F-5	0.658	0.425	0.42	2.82	
	PART 5G												84	84	0.022	0.002	0.138	0.033	0.194	3.94	0.135						
	PART 5H	F-5	F-4	7	PVC	1150	12	0.400%	113.0	0.79	3	0.25	143	143	0.037	0.004	0.178	0.057	0.250	3.69	0.214	F-4(fr.F-5)	1.007	0.651	0.43	3.15	
	PART 5H	F-4.1	F-4	7	PVC	700	8	0.400%	50.2	0.35	2	0.17	149	149	0.038	0.004	0.042	0.059	0.059	4.00	0.241	F-4(fr.F-4.1)	0.241	0.156	0.24	2.19	
	PART 5H												109	109	0.028	0.003	0.251	0.043	0.102	4.00	0.178						
	NAC-11												45	45	0.012	0.001	0.263	0.018	0.120	4.00	0.073						
	PART 5G	F-4	F-3	7	PVC	1600	12	0.400%	113.0	0.79	3	0.25	48	48	0.012	0.001	0.277	0.019	0.389	3.32	0.065	F-3	1.564	1.011	0.55	3.53	
F-2	PART CP-1												15	15	0.004	0.000	0.281	0.006	0.395	3.18	0.019						
	PART 5D												145	145	0.037	0.004	0.322	0.057	0.452	3.07	0.182						
	PART 5E	F-3	F-2	5	PVC	1300	12	0.400%	113.0	0.79	3	0.25	99	99	0.025	0.003	0.349	0.039	0.491	2.97	0.120	F-2	1.884	1.218	0.59	3.62	
	NP-12												5	5	0.001	0.000	0.351	0.002	0.493	2.89	0.006						
	PART 5A												193	193	0.049	0.005	0.405	0.076	0.570	2.82	0.222						
	PART 5B												20	20	0.005	0.001	0.411	0.008	0.578	2.75	0.023						
	NAC-10	F-2	F-1	5	PVC	1350	12	0.400%	113.0	0.79	3	0.25	99	99	0.025	0.003	0.438	0.039	0.617	2.69	0.109	F-1(fr.F-2)	2.244	1.451	0.70	3.80	
F-3	NP-14												5	5	0.001	0.000	0.001	0.002	0.002	4.00	0.008						
	PART 5E	F-3.1	F-2.1	5	PVC	1300	8	0.400%	50.2	0.35	2	0.17	185	185	0.047	0.005	0.054	0.073	0.075	4.00	0.300	F-2.1	0.309	0.199	0.27	2.34	
	PART 5B	F-2.1	F-1.1	5	PVC	850	8	0.400%	50.2	0.35	2	0.17	200	200	0.051	0.005	0.110	0.079	0.154	4.00	0.325	F-1.1	0.633	0.409	0.41	2.80	
	PART 5B	F-1.1	F-1	5	PVC	700	8	0.400%	50.2	0.35	2	0.17	105	105	0.027	0.003	0.139	0.041	0.196	4.00	0.170	F-1(fr.F-1.1)	0.803	0.519	0.49	2.92	
	PART 5B												70	70	0.018	0.002	0.597	0.028	0.224	3.77	0.107						
	PART 5A	F-1	Outfall	-	PVC	-	15	0.400%	176.6	1.23	4	0.31	210	210	0.054	0.005	0.656	0.083	0.923	2.57	0.222	Outfall	3.376	2.182	0.77	4.26	
F-4	PART 5G	F-11.1	F-11	7	PVC	950	8	0.400%	50.2	0.35	2	0.17	177	177	0.045	0.005	0.050	0.070	0.070	4.00	0.287	F-11	0.287	0.186	0.26	2.30	
	5F	F-11	F-10	7	PVC	1000	8	0.400%	50.2	0.35	2	0.17	300	300	0.077	0.008	0.134	0.119	0.189	4.00	0.488	F-10	0.775	0.501	0.48	2.91	
	CP-1	F-10	F-9	7	PVC	1100	12	0.400%	113.0	0.79	3	0.25	35	35	0.009	0.001	0.144	0.014	0.203	3.99	0.057	F-9	0.832	0.538	0.38	3.00	
	PART 5D												168	168	0.043	0.004	0.192	0.067	0.269	3.70	0.253		1.085	0.701			
	5C	F-9	F-8	5	PVC	1000	12	0.400%	113.0	0.79	3	0.25	310	310	0.079	0.008	0.279	0.123	0.392	3.44	0.435	F-8	1.520	0.982	0.54	3.50	
	PART 5A												94	94	0.024	0.002	0.305	0.037	0.429	3.26	0.125		1.644	1.063			
	CAC-4												304	304	0.078	0.008	0.391	0.120	0.550	3.10	0.386		2.030	1.312			
	PART 3A	F-8	F-7	5	PVC	1600	12	0.400%	113.0	0.79	3	0.25	90	90	0.023	0.002	0.416	0.036	0.585	2.98	0.110	F-7	2.140	1.383	0.68	3.77	
	PART 3A												264	264	0.068	0.007	0.491	0.105	0.690	2.87	0.311		2.451	1.584			
	PART 5A	F-7	Outfall	-	PVC	-	15	0.400%	176.6	1.23	4	0.31	154	154	0.039	0.004	0.534	0.061	0.751	2.78	0.176	Outfall	2.626	1.697	0.66	4.02	
F-5	NAC-4												99	99	0.025	0.003	0.028	0.039	0.039	4.00	0.161						
	PART 3A	F-13	F-12	5	PVC	750	8	0.400%	50.2	0.35	2	0.17	126	126	0.032	0.003	0.063	0.050	0.089	4.00	0.205	F-12	0.365	0.236	0.29	2.45	
	PART 3A	F-12	Outfall	-	PVC	-	8	0.400%	50.2	0.35	2	0.17	145	145	0.037	0.004	0.104	0.057	0.146	4.00	0.235	Outfall	0.600	0.388	0.40	2.77	
Master Sewer Rev_4.XLS																											
FIRST CREEK INTERCEPTOR	PART 4G												172	172	0.044	0.004	0.048	0.068	0.068	4.00	0.279						
	NAC-9	A-3.2	A-3.1	3	PVC	1350	8	0.400%	50.2	0.35	2	0.17	45	45	0.012	0.001	0.061	0.018	0.086	4.00	0.073	A-3.1	0.352	0.227	0.33	2.56	

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

	SUB-BASIN	PIPE DATA										PIPE SIZING										ACTUAL FLOWS									
		REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)	VELOCITY (FT/S)					
F-6	PART 4B	A-3.1	A-3	3	PVC	1375	8	0.400%	50.2	0.35	2	0.17	98	98	0.025	0.003	0.089	0.039	0.125	4.00	0.159	A-3	0.511	0.330	0.46	2.88					
	PART CAC-3	A-3	A-2	3	PVC	1400	12	0.400%	113.0	0.79	3	0.25	204	204	0.052	0.005	0.146	0.081	0.205	3.96	0.328	A-2	0.839	0.542	0.44	3.19					
	PART CAC-3												84	84	0.021	0.002	0.170	0.033	0.238	3.71	0.126										
	NP-9												5	5	0.001	0.000	0.171	0.002	0.240	3.54	0.007										
	4C	A-2	A-1	3	PVC	1325	12	0.400%	113.0	0.79	3	0.25	176	176	0.045	0.005	0.221	0.070	0.310	3.38	0.243	A-1(fr.A-2)	1.215	0.785	0.47	3.29					
	PART 4G												224	224	0.057	0.006	0.063	0.089	0.089	4.00	0.364										
	PART 4B	A-1.1	A-1	3	PVC	900	8	0.400%	50.2	0.35	2	0.17	126	126	0.032	0.003	0.099	0.050	0.139	4.00	0.205	A-1(fr.A-1.1)	0.569	0.368	0.36	2.66					
	PART 4B	A-1	Outfall	-	PVC	-	12	0.400%	113.0	0.79	3	0.25	132	132	0.034	0.003	0.356	0.052	0.432	3.15	0.170	Outfall	1.711	1.106	0.61	3.66					

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

		PIPE DATA										PIPE SIZING					ACTUAL FLOWS												
		SUB-BASIN	REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)	VELOCITY (FT/S)		
MURPHY CREEK INTERCEPTOR	AREA MC-1 MH MC-1																												
		MC.1	MC-1	MC-2	-	PVC	1350	8	0.400%	50.2	0.35	2	0.17	161	161	0.041	0.004	0.045	0.064	0.064	4.00	0.261	MC-2	0.261	0.169	0.26	2.31		

Table 1: Minimum Sewer Main Slopes		
Pipe Size	Min. Slope Feet/1001	Max. CFS
8"	0.40	0.82
12"	0.40	2.43
15"	0.40	5.15
18"	0.40	8.37
21"	0.40	12.61
24"	0.40	18.02
27"	0.40	24.64
30"	0.40	32.67
36"	0.40	53.13

COAL CREEK INTERCEPTOR

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

COAL CREEK INTERCEPTOR

		PIPE DATA										PIPE SIZING										ACTUAL FLOWS									
	SUB-BASIN	REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)	VELOCITY (FT/S)					
C-1		CC-11	CC-10	-	PVC	3650	12	0.400%	113.0	0.79	3	0.25	4216	922	0.236	0.024	0.260	0.365	0.365	4.00	1.498	CC-10	1.498	0.968	0.54	3.49					
		CC-10	CC-9	-	PVC	3350	15	0.400%	176.6	1.23	4	0.31	3533	773	0.198	0.020	0.477	0.306	0.671	3.47	1.094	CC-9 (fr.CC-10)	2.591	1.675	0.65	4.00					
C-3		CC-9.1	CC-9	-	PVC	2750	12	0.400%	113.0	0.79	3	0.25																			
		CC-9	CC-8	-	PVC	4775	18	0.400%	254.3	1.77	5	0.38	13424	2937	0.752	0.075	1.304	1.163	1.835	2.93	3.524	CC-8(fr.CC-9)	6.115	3.952	1.00	4.91					
C-4	OS-17												0	0	0.000	0.000	0.000	0.000	0.000	1.70	0.000										
	PART 5J	J-4	J-3	6	PVC	2700	8	0.400%	50.2	0.35	2	0.17	277	277	0.071	0.007	0.078	0.110	0.110	4.00	0.449	J-3	0.449	0.290	0.33	2.59					
	5I												217	217	0.056	0.006	0.139	0.086	0.196	4.00	0.353										
	NP-15												5	5	0.001	0.000	0.140	0.002	0.198	3.93	0.008										
	S-7												50	50	0.013	0.001	0.154	0.020	0.217	3.71	0.075										
	HS	J-3	J-2	3	PVC	3525	12	0.400%	113.0	0.79	3	0.25	480	480	0.123	0.012	0.290	0.190	0.407	3.44	0.673	J-2(fr.J-3)	1.558	1.007	0.55	3.52					
	3L											421	421	0.108	0.011	0.408	0.167	0.574	3.21	0.552											
	1/2 SAC-1	J-2	J-1	2	PVC	1350	15	0.400%	176.6	1.23	4	0.31	930	930	0.238	0.024	0.670	0.368	1.064	2.91	1.110	J-1(fr.J-2)	3.720	2.404	0.82	4.34					
C-5	3K	J-1.3	J-1.2	3	PVC	1900	8	0.400%	50.2	0.35	2	0.17	116	116	0.030	0.003	0.033	0.046	0.046	4.00	0.188	J-1.2	0.188	0.122	0.21	2.04					
	3J												170	170	0.043	0.004	0.080	0.067	0.113	4.00	0.275										
	NAC-6	J-1.2	J-2	3	PVC	1200	8	0.400%	50.2	0.35	2	0.17	23	23	0.006	0.001	0.087	0.009	0.122	4.00	0.037	J-2(fr.J-1.2)	0.500	0.323	0.35	2.65					
	1/2 SAC-1	J-1.1	J-1	2	PVC	1500	12	0.700%	113.0	0.79	3	0.25	1614	1614	0.413	0.041	0.455	0.639	0.639	3.74	2.457	J-1(fr.J-1.1)	2.457	1.588	0.62	4.85					
C-6	3F	P-4	P-3	2	PVC	700	8	0.400%	50.2	0.35	2	0.17	195	195	0.050	0.005	0.055	0.077	0.077	4.00	0.317	P-3(fr.P-4)	0.317	0.205	0.27	2.36					
	OS-7												0	0	0.000	0.000	0.000	0.000	0.000	1.70	0.000										
	S-4												77	77	0.020	0.002	0.022	0.030	0.030	4.00	0.124										
	3H	P-3.1	P-3	2	PVC	1000	8	0.400%	50.2	0.35	2	0.17	116	116	0.030	0.003	0.054	0.046	0.076	4.00	0.189	P-3(fr.P-3.1)	0.313	0.202	0.27	2.35					
	3G	P-3	P-2	2	PVC	550	12	0.400%	113.0	0.79	3	0.25	130	130	0.033	0.003	0.146	0.051	0.205	4.00	0.210	P-2	0.840	0.543	0.39	3.00					
		P-2	P-1	2	PVC	1350	12	0.400%	113.0	0.79	3	0.25	0	0	0.000	0.000	0.146	0.000	0.205	4.00	0.000	P-1	0.840	0.543	0.39	3.00					
	PART 3E	P-1	J-1	2	PVC	1000	12	0.400%	113.0	0.79	3	0.25	335	335	0.086	0.009	0.240	0.133	0.338	3.70	0.503	J-1(fr.P-1)	1.344	0.869	0.50	3.40					
	PART 3E	J-1	CC-8	1	PVC	1125	18	0.400%	254.3	1.77	5	0.38	96	96	0.025	0.002	1.391	0.038	2.079	2.57	0.102	CC-8(fr.J-1)	7.623	4.927	1.19	5.06					
		CC-8	CC-7	1	PVC	3500	24	0.400%	452.2	3.14	6	0.50	0	0	0.000	0.000	3.129	0.000	4.523	2.16	0.000	CC-7	15.920	10.290	1.54	6.12					
	CC-7	CC-6	1	PVC	400	24	0.400%	452.2	3.14	6	0.50	0	0	0.000	0.000	3.129	0.000	4.523	2.16	0.000	CC-6	15.920	10.290	1.54	6.12						
C-7	PART 2J												143	143	0.037	0.004	0.040	0.057	0.057	4.00	0.232										
	1/2 2I	CC-8.6A	CC-8.6	7	PVC	400	8	0.400%	50.2	0.35	2	0.17	87	87	0.022	0.002	0.065	0.034	0.091	4.00	0.141	CC-8.6	0.373	0.241	0.34	2.60					
	1/2 2I												242	242	0.062	0.006	0.133	0.096	0.187	4.00	0.393										
	2G												11	156	0.040	0.004	0.177	0.062	0.249	3.84	0.244										
	2H	CC-8.6	CC-8.5	2 & 7	PVC	2500	12	0.400%	113.0	0.79	3	0.25	213	213	0.055	0.005	0.237	0.084	0.333	3.56	0.309	CC-8.5	1.319	0.852	0.49	3.37					
	2F												164	164	0.042	0.004	0.283	0.065	0.398	3.36	0.224										
	PART 2E												55	55	0.014	0.001	0.298	0.022	0.420	3.21	0.072										
	PART 2C	CC-8.5	CC-8.4	2	PVC	300	12	0.400%	113.0	0.79	3	0.25	54	54	0.014	0.001	0.314	0.021	0.441	3.09	0.068	CC-8.4	1.683	1.088	0.67	3.59					
PART 2C	CC-8.4	CC-8.3	2	PVC	1050	12	0.400%	113.0	0.79	3	0.25	95	95	0.024	0.002	0.340	0.038	0.479	2.99	0.116	CC-8.3	1.799	1.163	0.6075	3.64						

Master Sewer Rev. 4.XLS



EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

	SUB-BASIN	PIPE DATA										PIPE SIZING										ACTUAL FLOWS									
		REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)	VELOCITY (FT/S)					
	PART 2C	CC-8.3	CC-8.2	2	PVC	500	12	0.400%	113.0	0.79	3	0.25	156	156	0.040	0.004	0.384	0.062	0.540	2.90	0.185	CC-8.2	1.984	1.282	0.64	3.72					
	PART 2B	CC-8.2	CC-8.1	2	PVC	850	12	0.400%	113.0	0.79	3	0.25	60	60	0.015	0.002	0.401	0.024	0.564	2.82	0.069	CC-8.1	2.054	1.327	0.66	3.74					
	PART 2B	CC-8.1	CC-8	2	PVC	550	12	0.400%	113.0	0.79	3	0.25	114	114	0.029	0.003	0.433	0.045	0.609	2.75	0.129	CC-8	2.182	1.411	0.69	3.78					

\*Note: The pipe from MH J-1.1 to MH J-1 must be installed with a minimum slope of 0.7%  
Area's C-7 & C-8 were updated in May of 2005 to reflect the Village 2 use changes (removal of commercial property).

EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

		PIPE DATA										PIPE SIZING					ACTUAL FLOWS										
		SUB-BASIN	REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)	VELOCITY (FT/S)
COAL CREEK INTERCEPTOR	C-8	2K	CC-5.9A	CC-5.9	7	PVC	500	8	0.400%	50.2	0.35	2	0.17	234	234	0.060	0.006	0.066	0.093	0.093	4.00	0.380	CC-5.9	0.380	0.246	0.21	2.05
		PART 2J												246	246	0.063	0.006	0.135	0.098	0.190	4.00	0.400					
		2D	CC-5.9	CC-5.8	2 & 7	PVC	2550	12	0.400%	113.0	0.79	3	0.25	155	155	0.040	0.004	0.179	0.062	0.252	3.89	0.246	CC-5.8	1.026	0.663	0.46	3.27
		PART 2E												132	132	0.034	0.003	0.216	0.052	0.304	3.61	0.194					
		NAC-3												63	63	0.016	0.002	0.234	0.025	0.329	3.42	0.088					
		S-2												77	77	0.020	0.002	0.255	0.030	0.359	3.28	0.102					
		PART 2A	CC-5.8	CC-5.7	2	PVC	1500	12	0.400%	113.0	0.79	3	0.25	165	165	0.042	0.004	0.302	0.065	0.425	3.15	0.212	CC-5.7	1.622	1.049	0.55	3.53
		PART 2A	CC-5.7	CC-5.6	1	PVC	1400	12	0.400%	113.0	0.79	3	0.25	198	198	0.051	0.005	0.358	0.078	0.503	3.03	0.245	CC-5.6	1.868	1.207	0.61	3.65
		1I												79	79	0.020	0.002	0.380	0.031	0.535	2.93	0.095					
		1J												157	157	0.040	0.004	0.424	0.062	0.597	2.84	0.183					
		NP-2												5	5	0.001	0.000	0.426	0.002	0.599	2.77	0.006					
		1H	CC-5.6	CC-5.5	1	PVC	950	12	0.400%	113.0	0.79	3	0.25	125	125	0.032	0.003	0.461	0.050	0.648	2.71	0.139	CC-5.5	2.290	1.480	0.71	3.81
			CC-5.5	CC-5.4	1	PVC	300	12	0.400%	113.0	0.79	3	0.25	0	0	0.000	0.000	0.461	0.000	0.648	2.71	0.000	CC-5.4	2.290	1.480	0.71	3.81
		S-1	CC-5.4	CC-5.3	1	PVC	950	12	0.400%	113.0	0.79	3	0.25	77	77	0.020	0.002	0.482	0.030	0.679	2.65	0.083	CC-5.3	2.374	1.534	0.73	3.83
		PART 1E	CC-5.3	CC-5.2	1	PVC	275	12	0.400%	113.0	0.79	3	0.25	54	54	0.014	0.001	0.498	0.021	0.700	2.60	0.058	CC-5.2	2.431	1.572	0.74	3.84
			CC-5.2	CC-5.1	1	PVC	675	12	0.400%	113.0	0.79	3	0.25	0	0	0.000	0.000	0.498	0.000	0.700	2.60	0.000	CC-5.1	2.431	1.572	0.74	3.84
			CC-5.1	CC-5	1	PVC	250	12	0.400%	113.0	0.79	3	0.25	0	0	0.000	0.000	0.498	0.000	0.700	2.60	0.000	CC-5(fr.CC-5.1)	2.431	1.572	0.74	3.84
		PART 1E	CC-6	CC-5	1	PVC	400	24	0.400%	452.2	3.14	6	0.50	120	120	0.031	0.003	3.660	0.048	4.571	2.01	0.100	CC-5(fr.CC-6)	16.021	10.354	1.55	6.12
			CC-5	CC-4	1	PVC	600	27	0.400%	572.3	3.97	7	0.56	0	0	0.000	0.000	4.158	0.000	4.571	1.94	0.000	CC-4(fr.CC-5)	18.452	11.926	1.52	6.46
		PART 1E	CC-4.2	CC-4.1	1	PVC	500	8	0.400%	50.2	0.35	2	0.17	130	130	0.033	0.003	0.037	0.052	0.052	4.00	0.211	CC-4.1	0.211	0.137	0.22	2.11
		PART 1E	CC-4.1	CC-4	1	PVC	275	8	0.400%	50.2	0.35	2	0.17	48	48	0.012	0.001	0.050	0.019	0.071	4.00	0.078	CC-4(fr.CC-4.1)	0.289	0.187	0.26	2.30
		PART 1E	CC-4	CC-3	1	PVC	1500	27	0.400%	572.3	3.97	7	0.56	24	24	0.006	0.001	4.215	0.010	4.651	1.90	0.019	CC-3(fr.CC-4)	18.760	12.125	1.54	6.48
C-9	PART 2X	CC-3.10	CC-3.9	7	PVC	750	8	0.400%	50.2	0.35	2	0.17	15	15	0.004	0.000	0.004	0.006	0.006	4.00	0.025	CC-3.9	0.025	0.016	0.08	1.13	
	PART 2X	CC-3.9	CC-3.8	2	PVC	2000	8	0.400%	50.2	0.35	2	0.17	34	34	0.009	0.001	0.014	0.013	0.019	4.00	0.055	CC-3.8	0.080	0.051	0.13	1.60	
	PART 2X	CC-3.8	CC-3.7	1	PVC	1050	8	0.400%	50.2	0.35	2	0.17	189	189	0.048	0.005	0.067	0.075	0.094	4.00	0.307	CC-3.7	0.387	0.250	0.30	2.49	
	CAC-1												286	286	0.073	0.007	0.147	0.113	0.207	4.00	0.464						
	1/2 1G	CC-3.7	CC-3.6	1	PVC	1000	12	0.400%	113.0	0.79	3	0.25	156	156	0.040	0.004	0.191	0.062	0.269	3.82	0.242	CC-3.6(fr.CC-3.7)	1.093	0.706	0.45	3.22	
	1/2 1G	CC-3.6A	CC-3.6	1	PVC	700	8	0.400%	50.2	0.35	2	0.17	238	238	0.061	0.006	0.258	0.094	0.094	4.00	0.386	CC-3.6(fr.CC-3.6A)	0.386	0.249	0.30	2.49	
		CC-3.6	CC-3.5	1	PVC	950	12	0.400%	113.0	0.79	3	0.25	0	0	0.000	0.000	0.258	0.000	0.363	3.72	0.000	CC-3.5	1.478	0.956	0.53	3.48	
	PART 1E	CC-3.5	CC-3.4	1	PVC	750	12	0.400%	113.0	0.79	3	0.25	144	144	0.037	0.004	0.299	0.057	0.420	3.45	0.202	CC-3.4	1.681	1.086	0.58	3.59	
	1D												71	71	0.018	0.002	0.319	0.028	0.448	3.26	0.094		1.775	1.147			
	NAC-1	CC-3.4	CC-3.3	1	PVC	800	12	0.400%	113.0	0.79	3	0.25	45	45	0.012	0.001	0.331	0.018	0.466	3.13	0.057	CC-3.3	1.833	1.184	0.61	3.66	
		CC-3.3	CC-3.2	1	PVC	300	12	0.400%	113.0	0.79	3	0.25	0	0	0.000	0.000	0.331	0.000	0.466	3.13	0.000	CC-3.2	1.833	1.184	0.61	3.66	
	PART 1B	CC-3.2	CC-3.1	1	PVC	500	12	0.400%	113.0	0.79	3	0.25	114	114	0.029	0.003	0.364	0.045	0.511	3.01	0.141	CC-3.1	1.973	1.275	0.64	3.71	
		CC-3.1	CC-3	1	PVC	200	12	0.400%	113.0	0.79	3	0.25	0	0	0.000	0.000	0.364	0.000	0.511	3.01	0.000	CC-3(fr.CC-3.1)	1.973	1.275	0.64	3.71	
PART 1A	CC-3	CC-2	1	PVC	950	27	0.400%	572.3	3.97	7	0.56	90	90	0.023	0.002	4.604	0.036	5.198	1.85	0.069	CC-2(fr.CC-3)	20.803	13.445	1.67	6.59		
C-10	PART 1F	CC-2.5	CC-2.4	1	PVC	500	8	0.400%	50.2	0.35	2	0.17	400	400	0.102	0.010	0.113	0.158	0.158	4.00	0.650	CC-2.4	0.650	0.420	0.42	2.82	
	PART 1F	CC-2.4	CC-2.3	1	PVC	500	12	0.400%	113.0	0.79	3	0.25	230	230	0.059	0.006	0.178	0.091	0.250	4.00	0.374	CC-2.3	1.024	0.662	0.43	3.17	
		CC-2.3	CC-2.2	1	PVC	1650	12	0.400%	113.0	0.79	3	0.25	0	0	0.000	0.000	0.178	0.000	0.250	4.00	0.000	CC-2.2	1.024	0.662	0.43	3.17	
	1C	CC-2.2	CC-2.1	1	PVC	300	12	0.400%	113.0	0.79	3	0.25	157	157	0.040	0.004	0.222	0.062	0.312	3.70	0.236	CC-2.1	1.260	0.814	0.48	3.34	
	PART 1B	CC-2.1	CC-2	1	PVC	700	12	0.400%	113.0	0.79	3	0.25	107	107	0.027	0.003	0.252	0.043	0.354	3.47	0.152	CC-2(fr.CC-2.1)	1.412	0.913	0.52	3.44	
	PART 1A	CC-2	CC-1	1	PVC	1150	27	0.400%	572.3	3.97	7	0.56	55	55	0.014	0.001	4.871	0.022	5.574	1.81	0.041	CC-1	22.256	14.384	1.77	6.63	
		CC-1	M-1	1	PVC	700	27	0.400%	572.3	3.97	7	0.56	0	0	0.000	0.000	4.871	0.000	5.574	1.81	0.000	M-1(fr.CC-1)	22.256	14.384	1.77	6.63	
	M-1	Outfall	-	PVC	-	30	0.400%	706.5	4.91	8	0.63	0	0	0.000	0.000	5.260	0.000	7.048	1.77	0.000	Outfall	27.659	17.876	1.86	7.07		

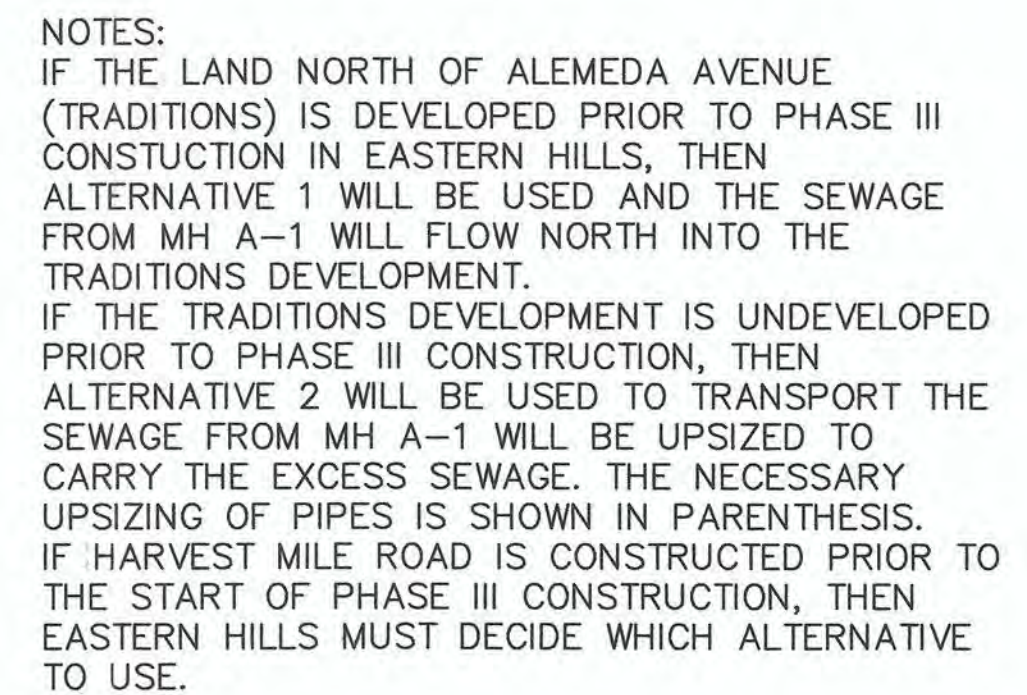
EASTERN HILLS  
SANITARY SEWER  
MASTER UTILITY STUDY

	PIPE DATA											PIPE SIZING		ACTUAL FLOWS												
SUB-BASIN	REACH U.S. MH	D.S. MH	PHASE	PIPE TYPE	PIPE LENGTH (ft)	DIA. (in)	SLOPE (%)	AREA (sq. in.)	AREA (sq. ft.)	R (in)	R (ft)	TOTAL UNITS	SFE'S	ADF (MGD)	INFIL. (MGD)	CUMM. ADF (MGD)	ADF CFS	CUMM. CFS	PEAK FACTOR	PDF CFS	RECEIVING MH	FLOW TO MH (CFS)	FLOW TO MH (MGD)	DEPTH (FT)	VELOCITY (FT/S)	

Area's C-7 & C-8 were updated in May of 2005 to reflect the Village 2 use changes (removal of commercial property).

Table 1: Minimum Sewer Main Slopes		
Pipe Size	Min. Slope Feet/1001	Max. CFS
8"	0.40	0.82
12"	0.40	2.43
15"	0.40	5.15
18"	0.40	8.37
21"	0.40	12.61
24"	0.40	18.02
27"	0.40	24.64
30"	0.40	32.67
36"	0.40	53.13

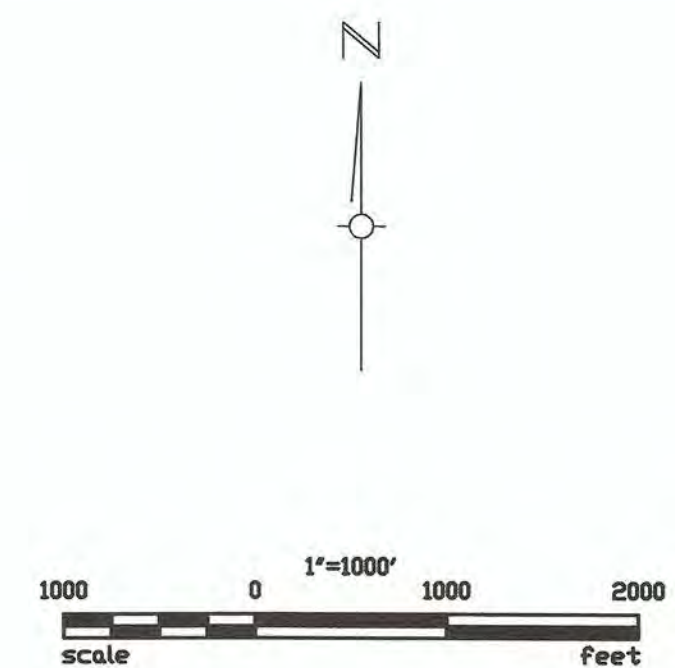
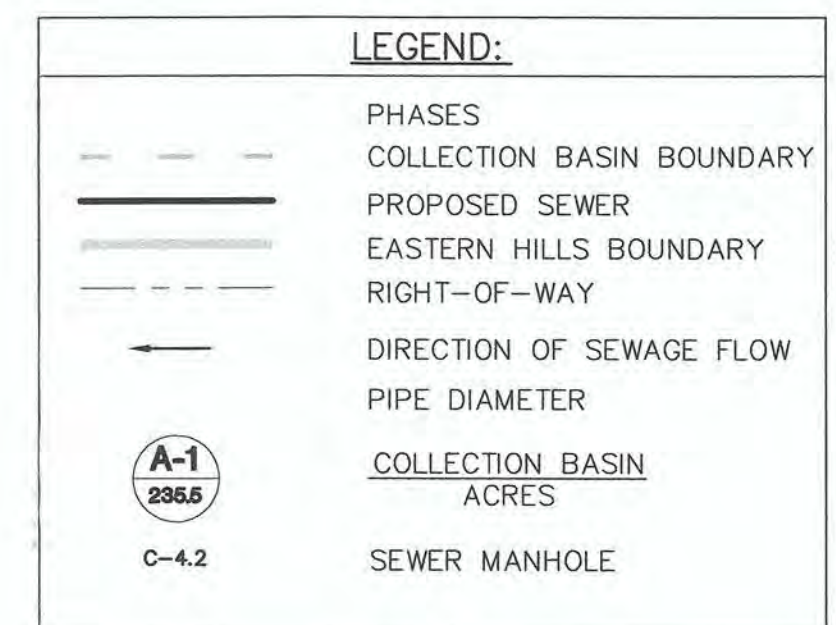




APPROVAL OF THIS DOCUMENT DOES NOT  
CONSTITUTE APPROVAL OF THE ALIGNMENT OF THE  
OUTFALL SANITARY SEWER. ACTUAL LOCATION OF  
THE OUTFALL WILL DEPEND UPON ACQUISITION OF  
EASEMENTS FROM OFF-SITE PROPERTY OWNERS.  
REVISION TO THE ALIGNMENT OF THE SANITARY  
SEWERS AS SHOWN MAY BE REQUIRED.

BENCHMARK:  
CITY OF AURORA BENCHMARK #23 062 3" DIA.  
BRASS CAP IN AURORA RANGE BOX, SAID CAP  
BEING A GPS POINT LABELED "SMITH" BEING ON  
THE EAST SIDE OF POWHATON ROAD ON TOP OF  
HILL 35 FT. M/L E. OF CENTERLINE OF POWHATON  
RD. ELEVATION = 5679.196 US FT.

APPROVAL BLOCK	
<div style="border-bottom: 1px solid black; margin-bottom: 10px;">CITY ENGINEER</div> <div style="border-bottom: 1px solid black; margin-bottom: 10px;">UTILITIES DEPARTMENT</div>	<div style="border-bottom: 1px solid black; margin-bottom: 10px;">DATE</div> <div style="border-bottom: 1px solid black; margin-bottom: 10px;">DATE</div>

[illegible]

**MEURER &  
ASSOCIATES**  
CONSULTING ENGINEERS



143 Union Boulevard  
Suite 600  
Lakewood, Colorado 80228  
(303) 985-3636 FAX (303) 985-3800

EASTERN HILLS

# SANITARY SEWER MASTER PLAN

EASTERN HILLS OWNERSHIP GROUP

Design	SMH
Drawn	SMH
Checked	BS
Date	11/01
Job No.	3289
D-1122	
328901A.SWR1000.DWG	

SHEET

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OF 1 SHEETS

XREFs: 3289BASE.DWG, murphog-R14.DWG, xtopo090801.DWG, 051705BASE.DWG  
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## Appendix E

Adonea Master Utility Report – Water & Sewer Calcs/Maps

CVL Job No. 8.13.0254103

## AURORA, COLORADO

### **Adonea Master Utilities Report Amendment No. 1**

Prepared for:

Contact:

Prepared by:

CVL Consultants of Colorado, Inc.  
10333 East Dry Creek Road, Suite 240  
Englewood, Colorado 80112  
Contact: Melinda Lundquist  
720.249.3539

Report Date:

**September 2016**

## Adonea Master Utilities Report Amendment No. 1

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APPROVED FOR ONE YEAR FROM THIS DATE \_\_\_\_\_

\_\_\_\_\_  
City Engineer

\_\_\_\_\_  
Date

\_\_\_\_\_  
Water Department

\_\_\_\_\_  
Date

\_\_\_\_\_  
Fire Department

\_\_\_\_\_  
Date

### ENGINEER'S STATEMENT:

This amendment to the "Adonea Master Utilities Report" was prepared under my direct supervision in accordance with the provisions of the City of Aurora Standards and Specifications Regarding Water, Sanitary Sewer and Storm Drainage Infrastructure. I understand that the City of Aurora does not and will not assume liability for facilities designed by others.

\_\_\_\_\_  
Melinda Erin Lundquist  
CVL Consultants of Colorado, Inc.

\_\_\_\_\_  
CO P.E. 38413

\_\_\_\_\_  
Date



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Design Criteria.....	3
Domestic & Irrigation Demands.....	4
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APPENDICES

## APPENDIX A - WATER SYSTEM

WATER SYSTEM DEMANDS  
AVERAGE DAY ANALYSIS  
MAXIMUM HOUR ANALYSIS  
MAXIMUM DAY ANALYSIS  
FIRE FLOW ANALYSIS

## APPENDIX B - RELATED FIGURES, GRAPHS &amp; TABLES

EXHIBIT I- AURORA WATER ATLAS  
EXHIBIT II - ADONEA WATER CAD MODEL

## Introduction

The Adonea Filing 3, 5, and 6 site occupies the east one-quarter of Section 8, Township 4 south, Range 65 west of the 6th principal meridian, County of Arapahoe, State of Colorado.

The project consists of approximately 136 acres and will be developed with 543 single-family units. The site slopes gently from south to north and existing elevations range from approximately 5614 to 5566.

Adonea is bordered on the north by 6<sup>th</sup> Avenue, Powhaton Road to the east, Newcastle Way to the west and Alameda Avenue on the south. Adjacent land use includes undeveloped land to the north, proposed Harmony Subdivision to the east, Traditions to the west, and the proposed Parklands development to the south, see Vicinity Map.

## Scope

The purpose of this Water Report is to analyze the water demands of the proposed project area and the known adjacent areas. In addition, this study will be used to size the on-site systems without the need for a 16" waterline in Powhaton.

Existing infrastructure includes:

- 6th Avenue - 30" WL
- 3rd Avenue - 12" WL
- 1st Avenue – 8" WL(east of New Castle)
- Alameda Avenue – 12" WL
- Newcastle – 12" WL

## Design Criteria

The water system demand loading rates were calculated in accordance with the City of Aurora's *Public Utility Improvements Rules & Regulations Regarding Standards & Specifications*, Reference 1.

**The following water criteria was used:**

Average Day Demand = 0.10 gallons per minute per capita, gpm/cap

Maximum Day to Average Day Demand ratio = 2.8:1

- Max Hour Demand to Average Day Demand ratio = 4.5:1  
Maximum Static Pressure = 113 pounds per square inch, psi  
Minimum Residual Pressure During Maximum Day plus Fire Flow = 20 psi  
Minimum Max Day Pressure = 50 psi.  
Minimum Average Day Pressure = 60 psi  
Maximum Pipe Velocity during Maximum Day plus Fire or Peak Hour  
(whichever is greater):
- 16" main or larger = 5 fps
  - 12" main = 10 fps
  - 8" or smaller = 15 fps

## Domestic and Irrigation Demands

Water demand criteria is based upon domestic and irrigation use for a residential single-family development. The average day demands for the residential portions of the site were calculated by multiplying the lot count by the Unit Occupancy standard per COA standards (3.2 ppl/unit). Offsite and/or unknown future developments were calculated per COA estimated acreage demand. Multiplying the land use density by acreage.

Adonea F3, F5, and F6 totaled an Average Day flow of 183 gpm. Maximum day and maximum hour ratios of 2.8:1 and 4.5:1 were applied to the residential portions of the site for a Maximum Day demand totaled 513 gpm, and the Maximum Hour demand totaled 824 gpm for the Adonea project. See Appendix A, Water System Demands for details.

Demands from off-site areas were also accounted for in the determination of the overall demands of the area as mentioned above. The Harmony Subdivision project includes an elementary school, recreation center and commercial development in addition to the residential portions of the site. Maximum Day and Maximum Hour demands were calculated with a ratio of 2.5:1 and 3.2:1 respectively, for the elementary school and recreation center. For the commercial site, a ratio of 2.1:1 was used in calculating the Maximum Day demand and 4.2:1 for the Maximum Hour demand. This resulted in an average day flow of 495.6 gpm, a Maximum Day demand of 1347 gpm and a Maximum Hour demand total of 2192 gpm.

The demands for the adjacent: Traditions and Eastern Hills developments were calculated according to the land use area given in both the "Traditions Master Utility Report" (Reference 4) and the "Master Utility Report For Eastern Hills" (Reference 5). A portion of these calculated demands were also applied to the Adonea site.



For the off-site areas other than Harmony Subdivision, Traditions and Eastern Hills, demands were calculated with the assumed acreage ratios used in the Regional Utility Report prepared by High Country Engineering, Inc., of 60% single-family detached, 30% multi-family, and 10% combined commercial and retail space. See, Appendix A, Water System Demands for details.

## **Fire Flow Demand**

Fire Demand Criteria is based upon a residential single-family development. The City of Aurora's criteria for minimum fire flow are based upon ISO criteria, see Appendix B. Per ISO criteria single-family dwellings with a spacing of 11-30' requires a Needed Fire Flow (NFF) of 1,000 gpm. To allow for 10' separation, 1,500 gpm Fire Flow demand was modeled. The fire flow demand for the recreation center (2,500 gpm) was included in this analysis. Fire flow demands of 4,800 gpm were also placed at each corner of the Adonea development to simulate the maximum fire flow that would be required by off-site development (i.e. elementary school).

## **Network Analysis**

The majority of the Adonea development lies within hydraulic Zone 4, according to the City of Aurora's Water Atlas Sheets 07X and 08X dated March 16, 2014, see Exhibit I. Adonea site will be connecting to the Zone 4 system.

The majority of the spine infrastructure is existing with the exception of a short segment in 1<sup>st</sup> Avenue between Newcastle Way and Powhaton. This segment has been modelled as an 8" line, while the Harmony Subdivision has this section of line modelled as a 12" line. If the 12" line is deemed necessary for Harmony, the system will benefit from the additional capacity. All interior roadways shall be looped to maintain system integrity and eliminate stagnant water.

The water system analysis was performed using the Bentley WaterGEMS v8i computer program. Water lines are sized to transport water during Average Day, Maximum Day, and Maximum Hour demand conditions in accordance with City specifications.

Simulations of different flow models were completed and compared to the corresponding City of Aurora criteria. A hydraulic gradient of 5850 for Zone 4, taken from the City of Aurora's Water CIP, was used to simulate the pressure source at the proposed tie in location. The simulations consisted of: maximum hour demand with a residual pressure of 60 psi and a maximum pipe velocity of 10 fps; maximum day plus fire with a minimum pressure requirement of 20 psi and a maximum pipe velocity of 5 fps for pipes 16" in diameter or larger, 10 fps for 12" in diameter pipes and 15 fps for pipes 8" in diameter or smaller.

Output for the simulations can be found in Appendix A. Each simulation contains five outputs:

- 1) Scenario Summary Report which outlines the settings used for the scenario.
- 2) Demand Alternative Summary Report which illustrates the demand at each junction of the model.
- 3) Reservoir Report which indicates the hydraulic grade used at each of the reservoirs for the scenario.
- 4) Junction Report which is used to check the water pressure in the model against City of Aurora criteria.
- 5) Pipe Report which is used to check velocities and headloss in the model against City of Aurora criteria.

Within the output, the preface DJ- denotes a demand junction, whereas the preface J- is a junction with no associative demand.

The Fire Flow Demands were analyzed as follows:

- 2,500 gpm at DJ-5 (existing rec center)
- 1,500 gpm at DJ-6 (multi-family residential)
- 4,800 gpm at DJ-2 (off-site commercial, residential, school)
- 4,800 gpm at DJ-12 (off-site commercial, residential, school)
- 4,800 gpm at DJ-14 (off-site commercial, residential, school)
- 4,800 gpm at J-27 (off-site commercial, residential, school)

Velocity and pressure criteria were verified against the fire flow demands throughout the entire model. The results from this analysis can be found in Appendix A.

See Exhibit II, On Site Proposed Water System, for proposed sizing and preliminary alignment.

## Phasing

Phasing for Adonea Filings 3, 5, and 6 are not currently known. Regardless of the phase to be completed first, all waterlines that have a Domestic tap shall be looped per COA design criteria.

## Conclusions

This Water Report is in conformance with the City of Aurora's Public Utility Improvement Rules and Regulations Regarding Standards and Specifications. This report outlines the on-site infrastructure and adjacent developments. Any changes to the City of Aurora's infrastructure facility other than what is shown will require a reanalysis of the system.

### *Water System*

Although the proposed water system for Adonea is currently modeled without a connection to the Future Proposed 16" waterline on Powhaton, the City of Aurora requirements were still met or exceeded. Therefore, when the future connection to the 16" is built, the results will be enhanced.



## References

1. Public Utility Improvements & Regulations Regarding Standards & Specifications, City of Aurora, July 2001.
2. Cross Creek Subdivision, Regional Utility Report, High Country Engineering, April 2002, Revised July 2002.
3. Sand Creek Ranch, Master Utilities Report, Nolte Associates, Inc., September 2002.
4. Traditions A Master Planned Community Master Utility Report, CVL Consultants, Inc., April 9, 2003.
5. Master Utility Report For Eastern Hills, Meurer & Associates, Revised December 2002.



# **APPENDIX A**

## **WATER SYSTEM**

**ADONEA  
WATER REPORT  
EXISTING WATER SYSTEM DEMANDS**

**WATER SYSTEM DEMANDS**  
REFERENCE AURORA PUBLIC UTILITY IMPROVEMENTS RULES AND REGULATIONS SECTION 4.

LAND USE	AVERAGE DAY (GPM/ACRE)	MAX DAY (GPM/ACRE)	MAX HOUR (GPM/ACRE)	OCCUPANCY (PEOPLE PER UNIT)	DENSITY (UNITS/ ACRE)	(GPM/CAP)
SINGLE FAMILY	2.58	7.22	11.60	3.2	7.25	0.111
DUPLEX	4.67	13.07	21.00	2.1	20	0.111
MULTIFAMILY	7.56	21.16	95.20	1.7	40	0.111

MAX DAY : AVERAGE DAY = 2.8:1  
MAX HOUR : AVERAGE DAY = 4.5:1

EXISTING PLANNING AREA	DESCRIPTION	AREA	DENSITY	OCCUPANCY	UNITS	POPULATION	AVERAGE DAY FLOW (GPM)	MAX DAY (GPM)	MAX HOUR (GPM)	DEMAND NODES	COMMENTS
PA-1	EXISTING PARCEL-SF-STAND	71	3.1	3.2	220.1	704.32	78.33	219.31	352.46	SPLIT 33.33% TO DJ-1, DJ-2, DJ-3	
PA-2	EXISTING PARCEL-SF-STAND	10.4	4.4	3.2	45.76	146.432	16.28	45.60	73.28	SPLIT 50% TO DJ-6, DJ-7	
PA-3	EXISTING PARCEL-NAC-PARK	5	N/A				0.00	0.00	0.00		
PA-6	EXISTING PARCEL-SF-STAND	76.2	3.2	3.2	243.84	780.288	86.77	242.97	390.48	SPLIT 25% TO DJ-4, 5, 8, 9	
PA-7	EXISTING PARCEL-SF-STAND	20	2.3	3.2	46	147.2	16.37	45.84	73.66	SPLIT 33.33% TO DJ-5, DJ-7, DJ-10	
PA-8	EXISTING PARCEL-NAC- PARK	5	N/A				0.00	0.00	0.00		

NODE	AVERAGE DAY FLOW (GPM)	MAX DAY (GPM)	MAX HOUR (GPM)
DJ-1	26.11	73.10	117.49
DJ-2	26.11	73.10	117.49
DJ-3	26.11	73.10	117.49
DJ-4	21.69	60.74	97.62
DJ-5	27.15	76.02	122.17
DJ-6	8.14	22.80	36.64
DJ-7	13.60	38.08	61.19
DJ-8	21.69	60.74	97.62
DJ-9	21.69	60.74	97.62
DJ-10	5.46	15.28	24.55



**ADONEA FILING 3, 5, AND 6  
WATER REPORT  
WATER SYSTEM DEMANDS**

**WATER SYSTEM DEMANDS**

REFERENCE AURORA PUBLIC UTILITY IMPROVEMENTS RULES AND REGULATIONS SECTION 4.

LAND USE	AVERAGE DAY (GPM/ACRE)	MAX DAY (GPM/ACRE)	MAX HOUR (GPM/ACRE)	OCCUPANCY (PEOPLE PER UNIT)	DENSITY (UNITS/ ACRE)	(GPM/CAP)
SINGLE FAMILY	2.58	7.22	11.60	3.2	7.25	0.111
DUPLEX	4.67	13.07	21.00	2.1	20	0.111
MULTIFAMILY	7.56	21.16	95.20	1.7	40	0.111

MAX DAY : AVERAGE DAY = 2.8 : 1

MAX HOUR : AVERAGE DAY = 4.5:1

NODE	NUMBER OF UNITS	POPULATION	AVERAGE DAY FLOW (GPM)	MAX DAY (GPM)	MAX HOUR (GPM)
*DJ-1			26.11	73.10	117.49
*DJ-2			26.11	73.10	117.49
*DJ-3			26.11	73.10	117.49
*DJ-4			21.69	60.74	97.62
*DJ-5			27.15	76.02	122.17
*DJ-6			8.14	22.80	36.64
*DJ-7			13.60	38.08	61.19
*DJ-8			21.69	60.74	97.62
*DJ-9			21.69	60.74	97.62
*DJ-10			5.46	15.28	24.55
J1	0	0	0.00	0.00	0.00
J2	0	0	0.00	0.00	0.00
J3	0	0	0.00	0.00	0.00
J4	0	0	0.00	0.00	0.00
J5	0	0	0.00	0.00	0.00
J6	0	0	0.00	0.00	0.00
J10	0	0	0.00	0.00	0.00
J12	25	80	8.90	24.91	24.91
J17	0	0	0.00	0.00	0.00
J18	0	0	0.00	0.00	0.00
J19	0	0	0.00	0.00	0.00
J20	0	0	0.00	0.00	0.00
J22	11	35.2	3.91	10.96	10.96
J23	5	16	1.78	4.98	4.98
J24	20	64	7.12	19.93	19.93
J25	11	35.2	3.91	10.96	10.96
J26	10	32	3.56	9.96	9.96
J27	0	0	0.00	0.00	0.00
J28	24	76.8	8.54	23.91	23.91
J29	20	64	7.12	19.93	19.93
J30	7	22.4	2.49	6.97	6.97
J31	7	22.4	2.49	6.97	6.97
J32	9	28.8	3.20	8.97	8.97
J33	7	22.4	2.49	6.97	6.97
J34	8	25.6	2.85	7.97	7.97
J35	11	35.2	3.91	10.96	10.96
J36	10	32	3.56	9.96	9.96
J37	8	25.6	2.85	7.97	7.97
J38	10	32	3.56	9.96	9.96
J39	2	6.4	0.71	1.99	1.99
J40	10	32	3.56	9.96	9.96
J41	0	0	0.00	0.00	0.00
J42	15	48	5.34	14.95	14.95
J43	7	22.4	2.49	6.97	6.97
J44	10	32	3.56	9.96	9.96
J45	9	28.8	3.20	8.97	8.97
J46	14	44.8	4.98	13.95	13.95
J47	9	28.8	3.20	8.97	8.97
J48	9	28.8	3.20	8.97	8.97
J49	28	89.6	9.96	27.90	27.90
J50	21	67.2	7.47	20.92	20.92
J51	13	41.6	4.63	12.95	12.95
J52	18	57.6	6.41	17.94	17.94
J53	22	70.4	7.83	21.92	21.92
J54	18	57.6	6.41	17.94	17.94
J55	13	41.6	4.63	12.95	12.95
J56	20	64	7.12	19.93	19.93
J57	22	70.4	7.83	21.92	21.92
J58	12	38.4	4.27	11.96	11.96
J59	12	38.4	4.27	11.96	11.96
J60	28	89.6	9.96	27.90	27.90

\* SEE EXISTING WATER DEMANDS

183.27

513.15

513.15

## AVERAGE DAY

## Active Scenario: Average Day

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P1	J4	J5	30.0	150.0	-0.01	0.00
P2	DJ-2	DJ-1	24.0	150.0	237.82	0.17
P3	DJ-1	J1	24.0	150.0	0.00	0.00
P4	DJ-1	J10	12.0	150.0	211.70	0.60
P5	J10	DJ-6	12.0	150.0	153.32	0.43
P6	J12	DJ-7	12.0	150.0	102.66	0.29
P7	J2	DJ-7	8.0	150.0	0.00	0.00
P8	DJ-5	DJ-4	8.0	150.0	-21.21	0.14
P9	DJ-10	DJ-8	12.0	150.0	9.78	0.03
P10	DJ-8	J17	12.0	150.0	13.15	0.04
P11	J17	J18	12.0	150.0	7.19	0.02
P12	DJ-7	J20	8.0	150.0	-4.82	0.03
P13	J20	DJ-5	8.0	150.0	-4.82	0.03
P14	DJ-3	DJ-2	12.0	150.0	-116.39	0.33
P15	DJ-10	J23	12.0	150.0	22.76	0.06
P16	J23	J5	12.0	150.0	8.54	0.02
P17	DJ-7	J24	12.0	150.0	93.88	0.27
P18	J25	DJ-5	8.0	150.0	35.82	0.23
P19	J24	J26	12.0	150.0	67.40	0.19
P20	J17	J27	8.0	150.0	5.96	0.04
P21	J5	J6.1	30.0	150.0	8.54	0.00
P22	J6.1	J6	30.0	150.0	8.54	0.00
P23	J18	DJ-9	8.0	150.0	7.19	0.05
P24	J27	DJ-9	8.0	150.0	5.96	0.04
P25	J30	J31	8.0	150.0	-2.49	0.02
P26	J31	J32	8.0	150.0	-1.29	0.01
P27	J32	J33	8.0	150.0	-4.49	0.03
P28	J33	J34	8.0	150.0	-6.98	0.04
P29	J35	J22	8.0	150.0	-15.67	0.10
P30	J31	J37	8.0	150.0	-3.69	0.02
P31	J37	J38	8.0	150.0	-6.54	0.04
P32	J38	J39	8.0	150.0	-11.73	0.07
P33	J39	J23	8.0	150.0	-12.44	0.08
P34	J40	DJ-10	12.0	150.0	-8.66	0.02
P35	J22	J3	12.0	150.0	0.00	0.00
P36	R-2	J41	24.0	150.0	380.31	0.27
P37	J41	DJ-2	24.0	150.0	380.31	0.27
P38	J42	J43	8.0	150.0	11.32	0.07
P39	J43	J44	8.0	150.0	14.51	0.09
P40	J44	J45	8.0	150.0	9.68	0.06
P41	J45	J46	8.0	150.0	6.48	0.04
P42	J46	J40	8.0	150.0	14.49	0.09
P43	J46	J47	8.0	150.0	-12.99	0.08
P44	J48	J26	8.0	150.0	-17.17	0.11
P45	J47	J44	8.0	150.0	-1.27	0.01
P46	J48	J42	8.0	150.0	-6.62	0.04
P47	J48	J43	8.0	150.0	5.68	0.04
P48	J12	J49	8.0	150.0	-15.53	0.10
P49	J49	J50	8.0	150.0	-12.29	0.08

### Active Scenario: Average Day

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P50	J50	J51	8.0	150.0	-13.94	0.09
P52	J52	J53	8.0	150.0	0.22	0.00
P53	J53	J54	8.0	150.0	-7.61	0.05
P56	J56	J10	8.0	150.0	-58.38	0.37
P57	J55	J57	8.0	150.0	-16.12	0.10
P58	J57	J56	8.0	150.0	-23.95	0.15
P60	DJ-6	J58	12.0	150.0	156.74	0.44
P61	J58	J59	8.0	150.0	51.82	0.33
P62	J59	J51	8.0	150.0	18.57	0.12
P63	J59	J60	8.0	150.0	28.99	0.19
P64	J60	J49	8.0	150.0	13.20	0.08
P65	J60	J50	8.0	150.0	5.83	0.04
P66	J47	J48	8.0	150.0	-14.91	0.10
P67	J24	J42	8.0	150.0	23.28	0.15
P71	J38	J34	8.0	150.0	1.62	0.01
P72	J34	J35	8.0	150.0	-8.20	0.05
P73	J36	J35	8.0	150.0	-3.56	0.02
P74	J40	J22	12.0	150.0	19.59	0.06
P75	DJ-3	J19	8.0	150.0	47.38	0.30
P76	J19	DJ-6	8.0	150.0	11.56	0.07
P77	DJ-9	J6	8.0	150.0	-8.54	0.05
P78	DJ-4	DJ-3	8.0	150.0	-42.90	0.27
P79	J25	J19	8.0	150.0	-35.82	0.23
P81	DJ-10	J26	12.0	150.0	-46.66	0.13
P82	DJ-8	DJ-5	8.0	150.0	-25.06	0.16
P-60	J54	J-24	8.0	150.0	-14.02	0.09
P-61	J-24	J56	8.0	150.0	-27.31	0.17
P-62	J52	J-25	8.0	150.0	-6.63	0.04
P-63	J-25	J55	8.0	150.0	-11.49	0.07
P-65	J12	J-28	12.0	150.0	-92.11	0.26
P-66	J-28	J58	12.0	150.0	-100.65	0.29
P-67	J-24	J-29	6.0	130.0	6.17	0.07
P-68	J-29	J-25	6.0	130.0	-0.95	0.01



## Active Scenario: Average Day

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
131	J1	5,623.00	0.00	5,838.91	93.4
132	J2	5,608.04	0.00	5,838.79	99.8
133	J3	5,599.57	0.00	5,838.77	103.5
134	J4	5,583.63	0.00	5,838.77	110.4
135	J5	5,574.53	0.00	5,838.77	114.3
136	J6	5,587.91	0.00	5,838.77	108.5
137	DJ-4	5,602.47	21.69	5,838.81	102.3
138	DJ-2	5,621.39	26.11	5,838.91	94.1
139	DJ-1	5,610.57	26.11	5,838.91	98.8
140	J10	5,621.98	0.00	5,838.88	93.8
141	DJ-6	5,617.30	8.14	5,838.85	95.9
142	J12	5,604.09	4.98	5,838.80	101.5
143	DJ-7	5,605.00	13.60	5,838.79	101.2
144	DJ-10	5,584.51	5.46	5,838.77	110.0
145	DJ-5	5,605.41	27.15	5,838.79	101.0
146	DJ-8	5,583.43	21.69	5,838.77	110.5
147	J17	5,585.58	0.00	5,838.77	109.5
148	J18	5,588.80	0.00	5,838.77	108.2
150	J19	5,605.14	0.00	5,838.85	101.1
154	J20	5,609.41	0.00	5,838.79	99.2
156	DJ-3	5,609.52	26.11	5,838.88	99.2
157	J22	5,591.70	3.91	5,838.77	106.9
158	J23	5,578.19	1.78	5,838.77	112.7
160	J24	5,599.56	3.20	5,838.79	103.5
163	J25	5,608.97	0.00	5,838.81	99.4
165	J26	5,594.00	3.56	5,838.78	105.9
167	J27	5,573.41	0.00	5,838.77	114.8
168	J6.1	5,586.37	0.00	5,838.77	109.2
169	DJ-9	5,577.64	21.69	5,838.77	113.0
172	J30	5,576.01	2.49	5,838.77	113.7
173	J31	5,578.18	2.49	5,838.77	112.7
174	J32	5,580.87	3.20	5,838.77	111.6
175	J33	5,583.72	2.49	5,838.77	110.4
176	J34	5,585.40	2.85	5,838.77	109.6
177	J35	5,587.94	3.91	5,838.77	108.5
178	J36	5,592.00	3.56	5,838.77	106.8
180	J37	5,578.92	2.85	5,838.77	112.4
181	J38	5,582.61	3.56	5,838.77	110.8
183	J39	5,579.35	0.71	5,838.77	112.2
185	J40	5,587.08	3.56	5,838.77	108.9
186	J41	5,596.00	0.00	5,838.94	105.1
256	J42	5,605.53	5.34	5,838.78	100.9
258	J43	5,601.23	2.49	5,838.78	102.8
260	J44	5,597.21	3.56	5,838.78	104.5
262	J45	5,593.33	3.20	5,838.78	106.2
264	J46	5,590.30	4.98	5,838.77	107.5
267	J47	5,594.29	3.20	5,838.78	105.8
269	J48	5,599.10	3.20	5,838.78	103.7
278	J49	5,608.15	9.96	5,838.80	99.8
280	J50	5,610.83	7.47	5,838.80	98.6

### Active Scenario: Average Day

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
282	J51	5,615.90	4.63	5,838.81	96.4
284	J52	5,616.13	6.41	5,838.86	96.4
286	J53	5,619.34	7.83	5,838.86	95.0
288	J54	5,622.96	6.41	5,838.86	93.4
291	J55	5,623.47	4.63	5,838.86	93.2
293	J56	5,627.00	7.12	5,838.87	91.7
297	J57	5,626.29	7.83	5,838.86	92.0
301	J58	5,614.43	4.27	5,838.83	97.1
305	J59	5,620.04	4.27	5,838.81	94.7
308	J60	5,617.00	9.96	5,838.80	96.0
358	J-24	5,624.98	7.12	5,838.86	92.5
361	J-25	5,619.76	3.91	5,838.86	94.8
367	J-28	5,611.27	8.54	5,838.82	98.5
370	J-29	5,622.37	7.12	5,838.86	93.7

### Active Scenario: Average Day

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
187	R-2	5,839.00	Zone 4	380.31	5,839.00

MAX DAY



## Active Scenario: Max Day

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P1	J4	J5	30.0	150.0	0.00	0.00
P2	DJ-2	DJ-1	24.0	150.0	665.71	0.47
P3	DJ-1	J1	24.0	150.0	0.00	0.00
P4	DJ-1	J10	12.0	150.0	592.60	1.68
P5	J10	DJ-6	12.0	150.0	429.14	1.22
P6	J12	DJ-7	12.0	150.0	287.34	0.82
P7	J2	DJ-7	8.0	150.0	0.00	0.00
P8	DJ-5	DJ-4	8.0	150.0	-59.44	0.38
P9	DJ-10	DJ-8	12.0	150.0	27.35	0.08
P10	DJ-8	J17	12.0	150.0	36.82	0.10
P11	J17	J18	12.0	150.0	20.14	0.06
P12	DJ-7	J20	8.0	150.0	-13.55	0.09
P13	J20	DJ-5	8.0	150.0	-13.55	0.09
P14	DJ-3	DJ-2	12.0	150.0	-326.03	0.92
P15	DJ-10	J23	12.0	150.0	63.73	0.18
P16	J23	J5	12.0	150.0	23.92	0.07
P17	DJ-7	J24	12.0	150.0	262.81	0.75
P18	J25	DJ-5	8.0	150.0	100.33	0.64
P19	J24	J26	12.0	150.0	188.64	0.54
P20	J17	J27	8.0	150.0	16.68	0.11
P21	J5	J6.1	30.0	150.0	23.91	0.01
P22	J6.1	J6	30.0	150.0	23.91	0.01
P23	J18	DJ-9	8.0	150.0	20.14	0.13
P24	J27	DJ-9	8.0	150.0	16.68	0.11
P25	J30	J31	8.0	150.0	-6.97	0.04
P26	J31	J32	8.0	150.0	-3.60	0.02
P27	J32	J33	8.0	150.0	-12.56	0.08
P28	J33	J34	8.0	150.0	-19.53	0.12
P29	J35	J22	8.0	150.0	-43.88	0.28
P30	J31	J37	8.0	150.0	-10.34	0.07
P31	J37	J38	8.0	150.0	-18.32	0.12
P32	J38	J39	8.0	150.0	-32.84	0.21
P33	J39	J23	8.0	150.0	-34.82	0.22
P34	J40	DJ-10	12.0	150.0	-24.25	0.07
P35	J22	J3	12.0	150.0	0.00	0.00
P36	R-2	J41	24.0	150.0	1,064.85	0.76
P37	J41	DJ-2	24.0	150.0	1,064.85	0.76
P38	J42	J43	8.0	150.0	31.70	0.20
P39	J43	J44	8.0	150.0	40.64	0.26
P40	J44	J45	8.0	150.0	27.10	0.17
P41	J45	J46	8.0	150.0	18.14	0.12
P42	J46	J40	8.0	150.0	40.55	0.26
P43	J46	J47	8.0	150.0	-36.36	0.23
P44	J48	J26	8.0	150.0	-48.06	0.31
P45	J47	J44	8.0	150.0	-3.57	0.02
P46	J48	J42	8.0	150.0	-18.56	0.12
P47	J48	J43	8.0	150.0	15.91	0.10
P48	J12	J49	8.0	150.0	-43.46	0.28
P49	J49	J50	8.0	150.0	-34.40	0.22

### Active Scenario: Max Day

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P50	J50	J51	8.0	150.0	-39.01	0.25
P52	J52	J53	8.0	150.0	0.60	0.00
P53	J53	J54	8.0	150.0	-21.32	0.14
P56	J56	J10	8.0	150.0	-163.46	1.04
P57	J55	J57	8.0	150.0	-45.12	0.29
P58	J57	J56	8.0	150.0	-67.05	0.43
P60	DJ-6	J58	12.0	150.0	438.76	1.24
P61	J58	J59	8.0	150.0	145.07	0.93
P62	J59	J51	8.0	150.0	51.97	0.33
P63	J59	J60	8.0	150.0	81.14	0.52
P64	J60	J49	8.0	150.0	36.94	0.24
P65	J60	J50	8.0	150.0	16.31	0.10
P66	J47	J48	8.0	150.0	-41.75	0.27
P67	J24	J42	8.0	150.0	65.21	0.42
P71	J38	J34	8.0	150.0	4.54	0.03
P72	J34	J35	8.0	150.0	-22.97	0.15
P73	J36	J35	8.0	150.0	-9.97	0.06
P74	J40	J22	12.0	150.0	54.83	0.16
P75	DJ-3	J19	8.0	150.0	132.74	0.85
P76	J19	DJ-6	8.0	150.0	32.42	0.21
P77	DJ-9	J6	8.0	150.0	-23.91	0.15
P78	DJ-4	DJ-3	8.0	150.0	-120.18	0.77
P79	J25	J19	8.0	150.0	-100.33	0.64
P81	DJ-10	J26	12.0	150.0	-130.61	0.37
P82	DJ-8	DJ-5	8.0	150.0	-70.20	0.45
P-60	J54	J-24	8.0	150.0	-39.27	0.25
P-61	J-24	J56	8.0	150.0	-76.48	0.49
P-62	J52	J-25	8.0	150.0	-18.55	0.12
P-63	J-25	J55	8.0	150.0	-32.16	0.21
P-65	J12	J-28	12.0	150.0	-257.83	0.73
P-66	J-28	J58	12.0	150.0	-281.74	0.80
P-67	J-24	J-29	6.0	130.0	17.27	0.20
P-68	J-29	J-25	6.0	130.0	-2.66	0.03

## Active Scenario: Max Day

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
131	J1	5,623.00	0.00	5,838.36	93.2
132	J2	5,608.04	0.00	5,837.61	99.3
133	J3	5,599.57	0.00	5,837.47	102.9
134	J4	5,583.63	0.00	5,837.47	109.8
135	J5	5,574.53	0.00	5,837.47	113.8
136	J6	5,587.91	0.00	5,837.47	108.0
137	DJ-4	5,602.47	60.73	5,837.69	101.8
138	DJ-2	5,621.39	73.11	5,838.41	93.9
139	DJ-1	5,610.57	73.11	5,838.36	98.6
140	J10	5,621.98	0.00	5,838.20	93.5
141	DJ-6	5,617.30	22.79	5,837.97	95.5
142	J12	5,604.09	13.94	5,837.65	101.1
143	DJ-7	5,605.00	38.08	5,837.61	100.6
144	DJ-10	5,584.51	15.29	5,837.48	109.4
145	DJ-5	5,605.41	76.02	5,837.62	100.5
146	DJ-8	5,583.43	60.73	5,837.47	109.9
147	J17	5,585.58	0.00	5,837.47	109.0
148	J18	5,588.80	0.00	5,837.47	107.6
150	J19	5,605.14	0.00	5,837.98	100.7
154	J20	5,609.41	0.00	5,837.61	98.7
156	DJ-3	5,609.52	73.11	5,838.21	98.9
157	J22	5,591.70	10.95	5,837.47	106.3
158	J23	5,578.19	4.98	5,837.47	112.2
160	J24	5,599.56	8.96	5,837.57	103.0
163	J25	5,608.97	0.00	5,837.69	99.0
165	J26	5,594.00	9.97	5,837.52	105.4
167	J27	5,573.41	0.00	5,837.46	114.2
168	J6.1	5,586.37	0.00	5,837.47	108.6
169	DJ-9	5,577.64	60.73	5,837.46	112.4
172	J30	5,576.01	6.97	5,837.45	113.1
173	J31	5,578.18	6.97	5,837.45	112.2
174	J32	5,580.87	8.96	5,837.45	111.0
175	J33	5,583.72	6.97	5,837.45	109.8
176	J34	5,585.40	7.98	5,837.45	109.1
177	J35	5,587.94	10.95	5,837.46	108.0
178	J36	5,592.00	9.97	5,837.46	106.2
180	J37	5,578.92	7.98	5,837.45	111.9
181	J38	5,582.61	9.97	5,837.46	110.3
183	J39	5,579.35	1.99	5,837.46	111.7
185	J40	5,587.08	9.97	5,837.47	108.3
186	J41	5,596.00	0.00	5,838.60	105.0
256	J42	5,605.53	14.95	5,837.51	100.4
258	J43	5,601.23	6.97	5,837.50	102.2
260	J44	5,597.21	9.97	5,837.49	104.0
262	J45	5,593.33	8.96	5,837.49	105.6
264	J46	5,590.30	13.94	5,837.48	106.9
267	J47	5,594.29	8.96	5,837.49	105.2
269	J48	5,599.10	8.96	5,837.51	103.1
278	J49	5,608.15	27.89	5,837.66	99.3
280	J50	5,610.83	20.92	5,837.68	98.1

### Active Scenario: Max Day

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
282	J51	5,615.90	12.96	5,837.69	96.0
284	J52	5,616.13	17.95	5,838.05	96.0
286	J53	5,619.34	21.92	5,838.05	94.6
288	J54	5,622.96	17.95	5,838.05	93.1
291	J55	5,623.47	12.96	5,838.06	92.8
293	J56	5,627.00	19.94	5,838.10	91.3
297	J57	5,626.29	21.92	5,838.07	91.6
301	J58	5,614.43	11.96	5,837.85	96.7
305	J59	5,620.04	11.96	5,837.73	94.2
308	J60	5,617.00	27.89	5,837.69	95.5
358	J-24	5,624.98	19.94	5,838.06	92.2
361	J-25	5,619.76	10.95	5,838.05	94.4
367	J-28	5,611.27	23.91	5,837.78	98.0
370	J-29	5,622.37	19.94	5,838.05	93.3



### Active Scenario: Max Day

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
187	R-2	5,839.00	Zone 4	1,064.85	5,839.00

MAX HOUR

### Active Scenario: Max Hour

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P1	J4	J5	30.0	150.0	-0.01	0.00
P2	DJ-2	DJ-1	24.0	150.0	1,069.76	0.76
P3	DJ-1	J1	24.0	150.0	0.00	0.00
P4	DJ-1	J10	12.0	150.0	952.26	2.70
P5	J10	DJ-6	12.0	150.0	689.55	1.96
P6	J12	DJ-7	12.0	150.0	461.71	1.31
P7	J2	DJ-7	8.0	150.0	0.00	0.00
P8	DJ-5	DJ-4	8.0	150.0	-95.58	0.61
P9	DJ-10	DJ-8	12.0	150.0	43.93	0.12
P10	DJ-8	J17	12.0	150.0	59.17	0.17
P11	J17	J18	12.0	150.0	32.37	0.09
P12	DJ-7	J20	8.0	150.0	-21.83	0.14
P13	J20	DJ-5	8.0	150.0	-21.83	0.14
P14	DJ-3	DJ-2	12.0	150.0	-524.10	1.49
P15	DJ-10	J23	12.0	150.0	102.41	0.29
P16	J23	J5	12.0	150.0	38.44	0.11
P17	DJ-7	J24	12.0	150.0	422.34	1.20
P18	J25	DJ-5	8.0	150.0	161.27	1.03
P19	J24	J26	12.0	150.0	303.13	0.86
P20	J17	J27	8.0	150.0	26.81	0.17
P21	J5	J6.1	30.0	150.0	38.43	0.02
P22	J6.1	J6	30.0	150.0	38.43	0.02
P23	J18	DJ-9	8.0	150.0	32.37	0.21
P24	J27	DJ-9	8.0	150.0	26.81	0.17
P25	J30	J31	8.0	150.0	-11.20	0.07
P26	J31	J32	8.0	150.0	-5.79	0.04
P27	J32	J33	8.0	150.0	-20.19	0.13
P28	J33	J34	8.0	150.0	-31.39	0.20
P29	J35	J22	8.0	150.0	-70.53	0.45
P30	J31	J37	8.0	150.0	-16.62	0.11
P31	J37	J38	8.0	150.0	-29.45	0.19
P32	J38	J39	8.0	150.0	-52.77	0.34
P33	J39	J23	8.0	150.0	-55.97	0.36
P34	J40	DJ-10	12.0	150.0	-38.98	0.11
P35	J22	J3	12.0	150.0	0.00	0.00
P36	R-2	J41	24.0	150.0	1,711.36	1.21
P37	J41	DJ-2	24.0	150.0	1,711.36	1.21
P38	J42	J43	8.0	150.0	50.95	0.33
P39	J43	J44	8.0	150.0	65.30	0.42
P40	J44	J45	8.0	150.0	43.55	0.28
P41	J45	J46	8.0	150.0	29.15	0.19
P42	J46	J40	8.0	150.0	65.17	0.42
P43	J46	J47	8.0	150.0	-58.43	0.37
P44	J48	J26	8.0	150.0	-77.22	0.49
P45	J47	J44	8.0	150.0	-5.73	0.04
P46	J48	J42	8.0	150.0	-29.83	0.19
P47	J48	J43	8.0	150.0	25.56	0.16
P48	J12	J49	8.0	150.0	-69.81	0.45
P49	J49	J50	8.0	150.0	-55.27	0.35

### Active Scenario: Max Hour

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P50	J50	J51	8.0	150.0	-62.68	0.40
P52	J52	J53	8.0	150.0	0.97	0.01
P53	J53	J54	8.0	150.0	-34.27	0.22
P56	J56	J10	8.0	150.0	-262.71	1.68
P57	J55	J57	8.0	150.0	-72.52	0.46
P58	J57	J56	8.0	150.0	-107.76	0.69
P60	DJ-6	J58	12.0	150.0	705.07	2.00
P61	J58	J59	8.0	150.0	233.12	1.49
P62	J59	J51	8.0	150.0	83.52	0.53
P63	J59	J60	8.0	150.0	130.39	0.83
P64	J60	J49	8.0	150.0	59.36	0.38
P65	J60	J50	8.0	150.0	26.21	0.17
P66	J47	J48	8.0	150.0	-67.10	0.43
P67	J24	J42	8.0	150.0	104.81	0.67
P71	J38	J34	8.0	150.0	7.30	0.05
P72	J34	J35	8.0	150.0	-36.91	0.24
P73	J36	J35	8.0	150.0	-16.02	0.10
P74	J40	J22	12.0	150.0	88.12	0.25
P75	DJ-3	J19	8.0	150.0	213.42	1.36
P76	J19	DJ-6	8.0	150.0	52.15	0.33
P77	DJ-9	J6	8.0	150.0	-38.43	0.25
P78	DJ-4	DJ-3	8.0	150.0	-193.19	1.23
P79	J25	J19	8.0	150.0	-161.27	1.03
P81	DJ-10	J26	12.0	150.0	-209.89	0.60
P82	DJ-8	DJ-5	8.0	150.0	-112.85	0.72
P-60	J54	J-24	8.0	150.0	-63.11	0.40
P-61	J-24	J56	8.0	150.0	-122.91	0.78
P-62	J52	J-25	8.0	150.0	-29.81	0.19
P-63	J-25	J55	8.0	150.0	-51.69	0.33
P-65	J12	J-28	12.0	150.0	-414.31	1.18
P-66	J-28	J58	12.0	150.0	-452.74	1.28
P-67	J-24	J-29	6.0	130.0	27.76	0.32
P-68	J-29	J-25	6.0	130.0	-4.28	0.05



## Active Scenario: Max Hour

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
131	J1	5,623.00	0.00	5,837.47	92.8
132	J2	5,608.04	0.00	5,835.65	98.5
133	J3	5,599.57	0.00	5,835.32	102.0
134	J4	5,583.63	0.00	5,835.31	108.9
135	J5	5,574.53	0.00	5,835.31	112.8
136	J6	5,587.91	0.00	5,835.31	107.0
137	DJ-4	5,602.47	97.61	5,835.85	101.0
138	DJ-2	5,621.39	117.50	5,837.57	93.5
139	DJ-1	5,610.57	117.50	5,837.47	98.2
140	J10	5,621.98	0.00	5,837.07	93.1
141	DJ-6	5,617.30	36.63	5,836.51	94.8
142	J12	5,604.09	22.41	5,835.75	100.2
143	DJ-7	5,605.00	61.20	5,835.65	99.8
144	DJ-10	5,584.51	24.57	5,835.33	108.5
145	DJ-5	5,605.41	122.17	5,835.67	99.6
146	DJ-8	5,583.43	97.61	5,835.32	109.0
147	J17	5,585.58	0.00	5,835.32	108.1
148	J18	5,588.80	0.00	5,835.32	106.7
150	J19	5,605.14	0.00	5,836.54	100.1
154	J20	5,609.41	0.00	5,835.66	97.9
156	DJ-3	5,609.52	117.50	5,837.10	98.5
157	J22	5,591.70	17.59	5,835.32	105.4
158	J23	5,578.19	8.01	5,835.31	111.2
160	J24	5,599.56	14.40	5,835.55	102.1
163	J25	5,608.97	0.00	5,835.85	98.2
165	J26	5,594.00	16.02	5,835.44	104.5
167	J27	5,573.41	0.00	5,835.30	113.3
168	J6.1	5,586.37	0.00	5,835.31	107.7
169	DJ-9	5,577.64	97.61	5,835.29	111.5
172	J30	5,576.01	11.20	5,835.27	112.2
173	J31	5,578.18	11.20	5,835.27	111.2
174	J32	5,580.87	14.40	5,835.27	110.1
175	J33	5,583.72	11.20	5,835.27	108.8
176	J34	5,585.40	12.82	5,835.28	108.1
177	J35	5,587.94	17.59	5,835.29	107.0
178	J36	5,592.00	16.02	5,835.28	105.3
180	J37	5,578.92	12.82	5,835.27	110.9
181	J38	5,582.61	16.02	5,835.28	109.3
183	J39	5,579.35	3.19	5,835.30	110.7
185	J40	5,587.08	16.02	5,835.33	107.4
186	J41	5,596.00	0.00	5,838.05	104.7
256	J42	5,605.53	24.03	5,835.41	99.5
258	J43	5,601.23	11.20	5,835.40	101.3
260	J44	5,597.21	16.02	5,835.37	103.0
262	J45	5,593.33	14.40	5,835.36	104.7
264	J46	5,590.30	22.41	5,835.35	106.0
267	J47	5,594.29	14.40	5,835.37	104.3
269	J48	5,599.10	14.40	5,835.40	102.2
278	J49	5,608.15	44.82	5,835.78	98.5
280	J50	5,610.83	33.62	5,835.82	97.3

### Active Scenario: Max Hour

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
282	J51	5,615.90	20.84	5,835.85	95.2
284	J52	5,616.13	28.84	5,836.70	95.4
286	J53	5,619.34	35.24	5,836.70	94.0
288	J54	5,622.96	28.84	5,836.71	92.5
291	J55	5,623.47	20.84	5,836.73	92.3
293	J56	5,627.00	32.04	5,836.82	90.8
297	J57	5,626.29	35.24	5,836.76	91.1
301	J58	5,614.43	19.22	5,836.22	96.0
305	J59	5,620.04	19.22	5,835.93	93.4
308	J60	5,617.00	44.82	5,835.83	94.7
358	J-24	5,624.98	32.04	5,836.73	91.6
361	J-25	5,619.76	17.59	5,836.71	93.9
367	J-28	5,611.27	38.43	5,836.06	97.3
370	J-29	5,622.37	32.04	5,836.71	92.7

### Active Scenario: Max Hour

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
187	R-2	5,839.00	Zone 4	1,711.36	5,839.00

MAX DAY WITH FIRE  
FLOW



## Active Scenario: MAX DAY WITH FIRE FLOW AT J56

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P1	J4	J5	30.0	150.0	-0.01	0.00
P2	DJ-2	DJ-1	24.0	150.0	1,526.83	1.08
P3	DJ-1	J1	24.0	150.0	0.00	0.00
P4	DJ-1	J10	12.0	150.0	1,453.72	4.12
P5	J10	DJ-6	12.0	150.0	294.25	0.83
P6	J12	DJ-7	12.0	150.0	243.23	0.69
P7	J2	DJ-7	8.0	150.0	0.00	0.00
P8	DJ-5	DJ-4	8.0	150.0	-97.09	0.62
P9	DJ-10	DJ-8	12.0	150.0	18.76	0.05
P10	DJ-8	J17	12.0	150.0	37.21	0.11
P11	J17	J18	12.0	150.0	20.35	0.06
P12	DJ-7	J20	8.0	150.0	-48.68	0.31
P13	J20	DJ-5	8.0	150.0	-48.68	0.31
P14	DJ-3	DJ-2	12.0	150.0	-460.92	1.31
P15	DJ-10	J23	12.0	150.0	63.45	0.18
P16	J23	J5	12.0	150.0	23.53	0.07
P17	DJ-7	J24	12.0	150.0	253.83	0.72
P18	J25	DJ-5	8.0	150.0	106.80	0.68
P19	J24	J26	12.0	150.0	181.73	0.52
P20	J17	J27	8.0	150.0	16.86	0.11
P21	J5	J6.1	30.0	150.0	23.52	0.01
P22	J6.1	J6	30.0	150.0	23.52	0.01
P23	J18	DJ-9	8.0	150.0	20.35	0.13
P24	J27	DJ-9	8.0	150.0	16.86	0.11
P25	J30	J31	8.0	150.0	-6.97	0.04
P26	J31	J32	8.0	150.0	-3.59	0.02
P27	J32	J33	8.0	150.0	-12.55	0.08
P28	J33	J34	8.0	150.0	-19.52	0.12
P29	J35	J22	8.0	150.0	-43.77	0.28
P30	J31	J37	8.0	150.0	-10.35	0.07
P31	J37	J38	8.0	150.0	-18.33	0.12
P32	J38	J39	8.0	150.0	-32.95	0.21
P33	J39	J23	8.0	150.0	-34.94	0.22
P34	J40	DJ-10	12.0	150.0	-27.21	0.08
P35	J22	J3	12.0	150.0	0.00	0.00
P36	R-2	J41	24.0	150.0	2,060.85	1.46
P37	J41	DJ-2	24.0	150.0	2,060.85	1.46
P38	J42	J43	8.0	150.0	30.50	0.19
P39	J43	J44	8.0	150.0	39.08	0.25
P40	J44	J45	8.0	150.0	25.91	0.17
P41	J45	J46	8.0	150.0	16.95	0.11
P42	J46	J40	8.0	150.0	37.47	0.24
P43	J46	J47	8.0	150.0	-34.47	0.22
P44	J48	J26	8.0	150.0	-47.05	0.30
P45	J47	J44	8.0	150.0	-3.20	0.02
P46	J48	J42	8.0	150.0	-17.69	0.11
P47	J48	J43	8.0	150.0	15.55	0.10
P48	J12	J49	8.0	150.0	-30.14	0.19

### Active Scenario: MAX DAY WITH FIRE FLOW AT J56

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P49	J49	J50	8.0	150.0	-27.67	0.18
P50	J50	J51	8.0	150.0	-34.01	0.22
P52	J52	J53	8.0	150.0	0.60	0.00
P53	J53	J54	8.0	150.0	-21.32	0.14
P56	J56	J10	8.0	150.0	-1,159.46	7.40
P57	J55	J57	8.0	150.0	-45.12	0.29
P58	J57	J56	8.0	150.0	-67.05	0.43
P60	DJ-6	J58	12.0	150.0	394.66	1.12
P61	J58	J59	8.0	150.0	131.75	0.84
P62	J59	J51	8.0	150.0	46.97	0.30
P63	J59	J60	8.0	150.0	72.82	0.46
P64	J60	J49	8.0	150.0	30.36	0.19
P65	J60	J50	8.0	150.0	14.58	0.09
P66	J47	J48	8.0	150.0	-40.23	0.26
P67	J24	J42	8.0	150.0	63.14	0.40
P71	J38	J34	8.0	150.0	4.65	0.03
P72	J34	J35	8.0	150.0	-22.85	0.15
P73	J36	J35	8.0	150.0	-9.97	0.06
P74	J40	J22	12.0	150.0	54.72	0.16
P75	DJ-3	J19	8.0	150.0	229.99	1.47
P76	J19	DJ-6	8.0	150.0	123.20	0.79
P77	DJ-9	J6	8.0	150.0	-23.52	0.15
P78	DJ-4	DJ-3	8.0	150.0	-157.82	1.01
P79	J25	J19	8.0	150.0	-106.80	0.68
P81	DJ-10	J26	12.0	150.0	-124.71	0.35
P82	DJ-8	DJ-5	8.0	150.0	-79.18	0.51
P-60	J54	J-24	8.0	150.0	-39.27	0.25
P-61	J-24	J56	8.0	150.0	-76.48	0.49
P-62	J52	J-25	8.0	150.0	-18.55	0.12
P-63	J-25	J55	8.0	150.0	-32.16	0.21
P-65	J12	J-28	12.0	150.0	-227.04	0.64
P-66	J-28	J58	12.0	150.0	-250.95	0.71
P-67	J-24	J-29	6.0	130.0	17.27	0.20
P-68	J-29	J-25	6.0	130.0	-2.66	0.03

## Active Scenario: MAX DAY WITH FIRE FLOW AT J56

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
131	J1	5,623.00	0.00	5,836.79	92.5
132	J2	5,608.04	0.00	5,835.51	98.4
133	J3	5,599.57	0.00	5,835.38	102.0
134	J4	5,583.63	0.00	5,835.38	108.9
135	J5	5,574.53	0.00	5,835.38	112.9
136	J6	5,587.91	0.00	5,835.38	107.1
137	DJ-4	5,602.47	60.73	5,835.75	100.9
138	DJ-2	5,621.39	73.11	5,836.98	93.3
139	DJ-1	5,610.57	73.11	5,836.79	97.9
140	J10	5,621.98	0.00	5,835.91	92.6
141	DJ-6	5,617.30	22.79	5,835.79	94.5
142	J12	5,604.09	13.94	5,835.54	100.1
143	DJ-7	5,605.00	38.08	5,835.51	99.7
144	DJ-10	5,584.51	15.29	5,835.39	108.5
145	DJ-5	5,605.41	76.02	5,835.56	99.6
146	DJ-8	5,583.43	60.73	5,835.38	109.0
147	J17	5,585.58	0.00	5,835.38	108.1
148	J18	5,588.80	0.00	5,835.38	106.7
150	J19	5,605.14	0.00	5,835.97	99.9
154	J20	5,609.41	0.00	5,835.53	97.8
156	DJ-3	5,609.52	73.11	5,836.61	98.3
157	J22	5,591.70	10.95	5,835.38	105.4
158	J23	5,578.19	4.98	5,835.38	111.3
160	J24	5,599.56	8.96	5,835.47	102.1
163	J25	5,608.97	0.00	5,835.65	98.1
165	J26	5,594.00	9.97	5,835.43	104.5
167	J27	5,573.41	0.00	5,835.38	113.3
168	J6.1	5,586.37	0.00	5,835.38	107.7
169	DJ-9	5,577.64	60.73	5,835.37	111.5
172	J30	5,576.01	6.97	5,835.36	112.2
173	J31	5,578.18	6.97	5,835.36	111.3
174	J32	5,580.87	8.96	5,835.36	110.1
175	J33	5,583.72	6.97	5,835.36	108.9
176	J34	5,585.40	7.98	5,835.36	108.1
177	J35	5,587.94	10.95	5,835.37	107.0
178	J36	5,592.00	9.97	5,835.37	105.3
180	J37	5,578.92	7.98	5,835.36	110.9
181	J38	5,582.61	9.97	5,835.37	109.4
183	J39	5,579.35	1.99	5,835.37	110.8
185	J40	5,587.08	9.97	5,835.38	107.4
186	J41	5,596.00	0.00	5,837.66	104.6
256	J42	5,605.53	14.95	5,835.42	99.5
258	J43	5,601.23	6.97	5,835.41	101.3
260	J44	5,597.21	9.97	5,835.40	103.1
262	J45	5,593.33	8.96	5,835.40	104.7
264	J46	5,590.30	13.94	5,835.39	106.0
267	J47	5,594.29	8.96	5,835.40	104.3
269	J48	5,599.10	8.96	5,835.41	102.2
278	J49	5,608.15	27.89	5,835.55	98.4

### Active Scenario: MAX DAY WITH FIRE FLOW AT J56

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
280	J50	5,610.83	20.92	5,835.56	97.2
282	J51	5,615.90	12.96	5,835.57	95.0
284	J52	5,616.13	17.95	5,831.99	93.4
286	J53	5,619.34	21.92	5,831.99	92.0
288	J54	5,622.96	17.95	5,831.99	90.4
291	J55	5,623.47	12.96	5,832.00	90.2
293	J56	5,627.00	1,015.93	5,832.04	88.7
297	J57	5,626.29	21.92	5,832.01	89.0
301	J58	5,614.43	11.96	5,835.70	95.7
305	J59	5,620.04	11.96	5,835.60	93.3
308	J60	5,617.00	27.89	5,835.56	94.6
358	J-24	5,624.98	19.94	5,832.00	89.6
361	J-25	5,619.76	10.95	5,831.99	91.8
367	J-28	5,611.27	23.91	5,835.64	97.1
370	J-29	5,622.37	19.94	5,831.99	90.7



**Active Scenario: MAX DAY WITH FIRE FLOW AT J56**

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
187	R-2	5,839.00	Zone 4	2,060.85	5,839.00

## Active Scenario: MAX DAY WITH FIRE FLOW AT J57

Label	Start Node	Stop Node	Diameter (In)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P1	J4	J5	30.0	150.0	0.00	0.00
P2	DJ-2	DJ-1	24.0	150.0	1,524.31	1.08
P3	DJ-1	J1	24.0	150.0	0.00	0.00
P4	DJ-1	J10	12.0	150.0	1,451.20	4.12
P5	J10	DJ-6	12.0	150.0	294.70	0.84
P6	J12	DJ-7	12.0	150.0	243.40	0.69
P7	J2	DJ-7	8.0	150.0	0.00	0.00
P8	DJ-5	DJ-4	8.0	150.0	-96.95	0.62
P9	DJ-10	DJ-8	12.0	150.0	18.81	0.05
P10	DJ-8	J17	12.0	150.0	37.21	0.11
P11	J17	J18	12.0	150.0	20.35	0.06
P12	DJ-7	J20	8.0	150.0	-48.56	0.31
P13	J20	DJ-5	8.0	150.0	-48.56	0.31
P14	DJ-3	DJ-2	12.0	150.0	-460.46	1.31
P15	DJ-10	J23	12.0	150.0	63.45	0.18
P16	J23	J5	12.0	150.0	23.53	0.07
P17	DJ-7	J24	12.0	150.0	253.87	0.72
P18	J25	DJ-5	8.0	150.0	106.76	0.68
P19	J24	J26	12.0	150.0	181.76	0.52
P20	J17	J27	8.0	150.0	16.86	0.11
P21	J5	J6.1	30.0	150.0	23.53	0.01
P22	J6.1	J6	30.0	150.0	23.53	0.01
P23	J18	DJ-9	8.0	150.0	20.35	0.13
P24	J27	DJ-9	8.0	150.0	16.86	0.11
P25	J30	J31	8.0	150.0	-6.97	0.04
P26	J31	J32	8.0	150.0	-3.59	0.02
P27	J32	J33	8.0	150.0	-12.55	0.08
P28	J33	J34	8.0	150.0	-19.52	0.12
P29	J35	J22	8.0	150.0	-43.77	0.28
P30	J31	J37	8.0	150.0	-10.35	0.07
P31	J37	J38	8.0	150.0	-18.33	0.12
P32	J38	J39	8.0	150.0	-32.95	0.21
P33	J39	J23	8.0	150.0	-34.94	0.22
P34	J40	DJ-10	12.0	150.0	-27.20	0.08
P35	J22	J3	12.0	150.0	0.00	0.00
P36	R-2	J41	24.0	150.0	2,057.87	1.46
P37	J41	DJ-2	24.0	150.0	2,057.87	1.46
P38	J42	J43	8.0	150.0	30.51	0.19
P39	J43	J44	8.0	150.0	39.09	0.25
P40	J44	J45	8.0	150.0	25.91	0.17
P41	J45	J46	8.0	150.0	16.95	0.11
P42	J46	J40	8.0	150.0	37.49	0.24
P43	J46	J47	8.0	150.0	-34.48	0.22
P44	J48	J26	8.0	150.0	-47.05	0.30
P45	J47	J44	8.0	150.0	-3.21	0.02
P46	J48	J42	8.0	150.0	-17.69	0.11
P47	J48	J43	8.0	150.0	15.55	0.10
P48	J12	J49	8.0	150.0	-30.19	0.19

### Active Scenario: MAX DAY WITH FIRE FLOW AT J57

Label	Start Node	Stop Node	Diameter (in)	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
P49	J49	J50	8.0	150.0	-27.70	0.18
P50	J50	J51	8.0	150.0	-34.03	0.22
P52	J52	J53	8.0	150.0	-195.76	1.25
P53	J53	J54	8.0	150.0	-217.69	1.39
P56	J56	J10	8.0	150.0	-1,156.49	7.38
P57	J55	J57	8.0	150.0	267.89	1.71
P58	J57	J56	8.0	150.0	-747.06	4.77
P60	DJ-6	J58	12.0	150.0	394.82	1.12
P61	J58	J59	8.0	150.0	131.80	0.84
P62	J59	J51	8.0	150.0	46.99	0.30
P63	J59	J60	8.0	150.0	72.85	0.46
P64	J60	J49	8.0	150.0	30.38	0.19
P65	J60	J50	8.0	150.0	14.58	0.09
P66	J47	J48	8.0	150.0	-40.23	0.26
P67	J24	J42	8.0	150.0	63.15	0.40
P71	J38	J34	8.0	150.0	4.65	0.03
P72	J34	J35	8.0	150.0	-22.86	0.15
P73	J36	J35	8.0	150.0	-9.97	0.06
P74	J40	J22	12.0	150.0	54.72	0.16
P75	DJ-3	J19	8.0	150.0	229.67	1.47
P76	J19	DJ-6	8.0	150.0	122.91	0.78
P77	DJ-9	J6	8.0	150.0	-23.53	0.15
P78	DJ-4	DJ-3	8.0	150.0	-157.68	1.01
P79	J25	J19	8.0	150.0	-106.76	0.68
P81	DJ-10	J26	12.0	150.0	-124.74	0.35
P82	DJ-8	DJ-5	8.0	150.0	-79.13	0.51
P-60	J54	J-24	8.0	150.0	-235.63	1.50
P-61	J-24	J56	8.0	150.0	-389.49	2.49
P-62	J52	J-25	8.0	150.0	177.81	1.13
P-63	J-25	J55	8.0	150.0	280.85	1.79
P-65	J12	J-28	12.0	150.0	-227.16	0.64
P-66	J-28	J58	12.0	150.0	-251.07	0.71
P-67	J-24	J-29	6.0	130.0	133.92	1.52
P-68	J-29	J-25	6.0	130.0	113.99	1.29

## Active Scenario: MAX DAY WITH FIRE FLOW AT J57

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
131	J1	5,623.00	0.00	5,836.79	92.5
132	J2	5,608.04	0.00	5,835.52	98.4
133	J3	5,599.57	0.00	5,835.39	102.0
134	J4	5,583.63	0.00	5,835.39	108.9
135	J5	5,574.53	0.00	5,835.39	112.9
136	J6	5,587.91	0.00	5,835.39	107.1
137	DJ-4	5,602.47	60.73	5,835.76	100.9
138	DJ-2	5,621.39	73.11	5,836.98	93.3
139	DJ-1	5,610.57	73.11	5,836.79	97.9
140	J10	5,621.98	0.00	5,835.92	92.6
141	DJ-6	5,617.30	22.79	5,835.80	94.5
142	J12	5,604.09	13.94	5,835.55	100.1
143	DJ-7	5,605.00	38.08	5,835.52	99.7
144	DJ-10	5,584.51	15.29	5,835.39	108.5
145	DJ-5	5,605.41	76.02	5,835.57	99.6
146	DJ-8	5,583.43	60.73	5,835.39	109.0
147	J17	5,585.58	0.00	5,835.39	108.1
148	J18	5,588.80	0.00	5,835.39	106.7
150	J19	5,605.14	0.00	5,835.98	99.9
154	J20	5,609.41	0.00	5,835.54	97.8
156	DJ-3	5,609.52	73.11	5,836.62	98.3
157	J22	5,591.70	10.95	5,835.39	105.4
158	J23	5,578.19	4.98	5,835.39	111.3
160	J24	5,599.56	8.96	5,835.48	102.1
163	J25	5,608.97	0.00	5,835.65	98.1
165	J26	5,594.00	9.97	5,835.44	104.5
167	J27	5,573.41	0.00	5,835.38	113.3
168	J6.1	5,586.37	0.00	5,835.39	107.7
169	DJ-9	5,577.64	60.73	5,835.38	111.5
172	J30	5,576.01	6.97	5,835.37	112.2
173	J31	5,578.18	6.97	5,835.37	111.3
174	J32	5,580.87	8.96	5,835.37	110.1
175	J33	5,583.72	6.97	5,835.37	108.9
176	J34	5,585.40	7.98	5,835.37	108.2
177	J35	5,587.94	10.95	5,835.38	107.1
178	J36	5,592.00	9.97	5,835.38	105.3
180	J37	5,578.92	7.98	5,835.37	111.0
181	J38	5,582.61	9.97	5,835.37	109.4
183	J39	5,579.35	1.99	5,835.38	110.8
185	J40	5,587.08	9.97	5,835.39	107.4
186	J41	5,596.00	0.00	5,837.66	104.6
256	J42	5,605.53	14.95	5,835.43	99.5
258	J43	5,601.23	6.97	5,835.42	101.3
260	J44	5,597.21	9.97	5,835.41	103.1
262	J45	5,593.33	8.96	5,835.41	104.7
264	J46	5,590.30	13.94	5,835.40	106.0
267	J47	5,594.29	8.96	5,835.41	104.3
269	J48	5,599.10	8.96	5,835.42	102.2
278	J49	5,608.15	27.89	5,835.56	98.4



### Active Scenario: MAX DAY WITH FIRE FLOW AT J57

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
280	J50	5,610.83	20.92	5,835.57	97.2
282	J51	5,615.90	12.96	5,835.57	95.0
284	J52	5,616.13	17.95	5,830.62	92.8
286	J53	5,619.34	21.92	5,830.81	91.5
288	J54	5,622.96	17.95	5,831.04	90.0
291	J55	5,623.47	12.96	5,830.04	89.4
293	J56	5,627.00	19.94	5,832.07	88.7
297	J57	5,626.29	1,014.95	5,829.70	88.0
301	J58	5,614.43	11.96	5,835.71	95.7
305	J59	5,620.04	11.96	5,835.60	93.3
308	J60	5,617.00	27.89	5,835.57	94.6
358	J-24	5,624.98	19.94	5,831.33	89.3
361	J-25	5,619.76	10.95	5,830.45	91.2
367	J-28	5,611.27	23.91	5,835.65	97.1
370	J-29	5,622.37	19.94	5,830.82	90.2

**Active Scenario: MAX DAY WITH FIRE FLOW AT J57**

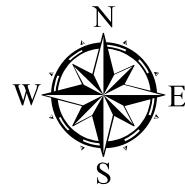
ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
187	R-2	5,839.00	Zone 4	2,057.87	5,839.00

## **APPENDIX B**

### **RELATED FIGURES, GRAPHS & TABLES**

## PARKLANDS





#### LEGEND:

- Manhole**
- Denver\_ECCV, Metro
- Owner, Type, Function**
- Aurora MH
  - Aurora Diversion Box
  - Aurora Drop MH
  - Aurora Vault MH
- Private Assets**
- UNITTYPE**
- Manhole
  - Acid Trap
  - Grease Trap
  - Sand Trap
- Wastewater\_Fitting**
- UNITTYPE**
- Cleanout
  - ⊕ Joint
  - ⊕ Other
  - ⊕ Tee
  - ⊕ Wastewater\_Valve
- Wastewater\_Misc**
- UNITTYPE**
- LS
  - NA
  - VAULT
  - Fire\_Hydrants
- Sewer Main**
- Metro, Denver, ECCV, Arap Co
  - Aurora
  - Aurora, Forced Main
  - Aurora, Creek Crossing
  - Aurora, Encased
  - Private
  - Lined Pipe
  - Abandoned
- OWNER, UNIT\_FUNCTION**
- Aurora
  - Aurora, Forced Main
  - Aurora, Creek Crossing
  - Aurora, Encased
  - Private
  - Lined Pipe
  - Abandoned
- Sewer\_Security\_Areas**
- Address Points
  - Street Name Geocoded Line
- Aurora**
- City Limits
  - Section Corners Point
  - Parcel Lines
  - Easement Line
  - Plats Poly
  - Mapbook Plat Page Poly
  - Section Line Poly

**\* RESTRICTED AREA \***

**AURORA WATER SECURITY AREA**

THIS INFORMATION HAS BEEN  
BLOCKED FOR SECURITY  
PURPOSES. CONTACT AURORA  
WATER, ENGINEERING DIVISION  
FOR DETAILS AT (303)-739-7376

#### NOTES:

THE CITY OF AURORA, WATER  
DEPARTMENT ASSUMES NO  
RESPONSIBILITY OR LIABILITY  
OF ANY KIND TO ANY USER OF  
THIS MAP.

LOCATIONS ON THIS MAP ARE  
APPROXIMATE AND ARE INTENDED  
TO SERVE AS AN AID IN GRAPHIC  
REPRESENTATION ONLY.

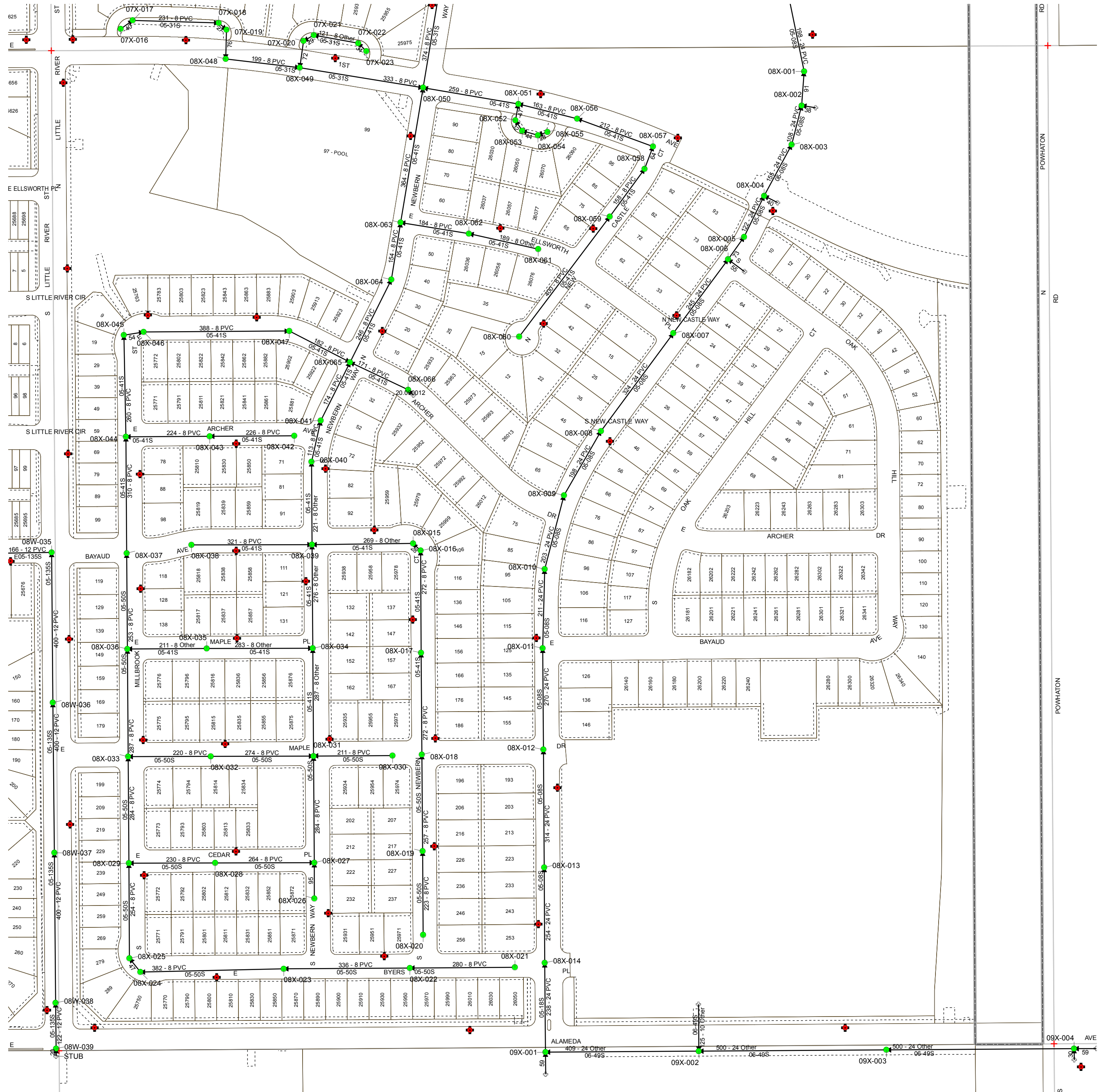
BEFORE EXCAVATION CALL THE  
CITY OF AURORA WATER  
OPERATIONS AT (303)-326-8645  
TO SCHEDULE FIELD LOCATIONS  
OF WATER, STORM AND SANITARY  
LINES.

PLEASE REPORT ANY ERRORS OR  
OMISSIONS ON THIS MAP TO THE  
CITY OF AURORA, AURORA WATER,  
ENGINEERING DIVISION, GIS  
SECTION.

**PLOT DATE:**  
March 16, 2014

SEE PAGE - 07X

SEE PAGE - 08W



SEE PAGE - 08Y

2014

City of Aurora, Colorado - Aurora Water

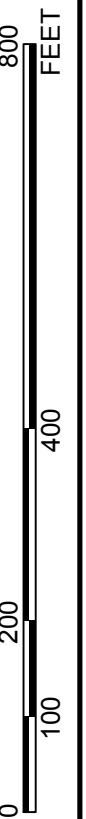
15151 East Alameda Parkway, Aurora, Colorado 80012  
website: www.auroragov.org phone: 303.739.7370 fax: 303.739.7491

TRS: SE1/4 SEC08 T4S R65W

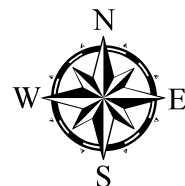


SEWER  
RESTRICTED

08X







## Manhole

- Denver\_ECCV, Metro  
**Owner, Type, Function**  
● Aurora MH  
■ Aurora Diversion Box  
● Aurora Drop MH  
 Aurora Vault MH

## Private Assets

## UNITTYPE

-  Manhole
-  Acid Trap
-  Grease Trap
-  Sand Trap





## Wastewater\_Fitting

## UNITTYPE










- Cleanout
- ⊕ Joint
- ⊕ Other
- ⊕ Tee
- ⊕ Wastewater Valve

## Wastewater Misc








## UNITTYPE

-  LS
-  NA
-  VAULT
-  Fire\_Hydrants

## Sewer Main

-  Metro, Denver, ECCV, Arap Co  
**OWNER, UNIT\_FUNCTION**  
 Aurora,  
 Aurora, Forced Main  
 Aurora, Creek Crossing  
 Aurora, Encased  
 Private,  
 Lined Pipe  
 Abandoned  
 Sewer\_Security\_Areas  
 Address Points  
 Street Name Geocoded Line

## Aurora

-  City Limits
-  Section Corners Point
-  Parcel Lines
-  Easement Line
-  Plats Poly
-  Mapbook Plat Page Poly
-  Section Line Poly

**\* RESTRICTED AREA \***

**AURORA WATER SECURITY AREA**

THIS INFORMATION HAS BEEN  
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PURPOSES. CONTACT AURORA  
WATER, ENGINEERING DIVISION  
FOR DETAILS AT (303)-739-7376

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THIS MAP

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**BEFORE EXCAVATION CALL THE CITY OF AURORA WATER OPERATIONS AT (303)-326-8645 TO SCHEDULE FIELD LOCATIONS OF WATER, STORM AND SANITARY LINES.**

PLEASE REPORT ANY ERRORS OR OMISSIONS ON THIS MAP TO THE CITY OF AURORA, AURORA WATER, ENGINEERING DIVISION, GIS SECTION.

PLOT DATE:

March 16, 2014

SEE PAGE - 08X



SEE PAGE - 07Y

# 2014

City of Aurora, Colorado - Aurora Water

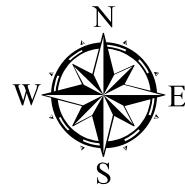
15151 East Alameda Parkway, Aurora, Colorado 80012  
phone: 303.739.7370 fax: 303.739.7371  
website: [www.auroragov.org](http://www.auroragov.org)

TRS: NE1/4 SEC08 T4S R65W

SEWER  
RESTRICTED

07X





LEGEND:

Fire\_Hydrants

Water\_Valves

UNIT\_TYPE

ARV

Ball

Butterfly

BFZV

BO

CK

FLAPGATE

GV

PRV

Plug

ZV

Water\_Fittings

UNITTYPE

Building

Cap

Cross

Encase End

Hydrant Tee

Main Tee

Meter Tee

Other

Outlet

Plug

Reducer

Service Tee

Wet Tap

Water\_Test\_Stations

Water\_Pumps\_PumpStations

UNIT\_TYPE

PS

PS

PUMP

Water\_Meter

Water\_Manhole

Water\_Misc

Water\_Storage

Water\_Wells

Water\_Mains

CCV, Denver, ECCV

OWNER, WATER\_TYPE

Aurora, Potable

Private, Potable

Abandoned\_Mains

Pressure\_Zones

Water\_Facilities\_Security\_Area

Address Points

Easement Line

Parcels

Street Name Geocoded Line

City Limits

FUTURE UTILITIES CORRIDOR

THIS IS THE PROPOSED LOCATION FOR A 66" WATER LINE WITH FOUR ALTERNATE ROUTES. IF YOU HAVE ANY QUESTIONS REGARDING ANY CONSTRUCTION WITHIN THIS CORRIDOR PLEASE CONTACT THE CITY OF AURORA, CAPITAL PROJECTS DIVISION (720)-859-4300

\* RESTRICTED AREA \*

AURORA WATER SECURITY AREA

THIS INFORMATION HAS BEEN BLOCKED FOR SECURITY PURPOSES. CONTACT AURORA WATER, ENGINEERING DIVISION FOR DETAILS AT (303)-739-7376

NOTES:

THE CITY OF AURORA, WATER DEPARTMENT ASSUMES NO RESPONSIBILITY OR LIABILITY OF ANY KIND TO ANY USER OF THIS MAP.

LOCATIONS ON THIS MAP ARE APPROXIMATE AND ARE INTENDED TO SERVE AS AN AID IN GRAPHIC REPRESENTATION ONLY.

BEFORE EXCAVATION CALL THE CITY OF AURORA WATER OPERATIONS AT (303)-326-8645 TO SCHEDULE FIELD LOCATIONS OF WATER, STORM AND SANITARY LINES.

PLEASE REPORT ANY ERRORS OR OMISSIONS ON THIS MAP TO THE CITY OF AURORA, AURORA WATER, ENGINEERING DIVISION, GIS SECTION.

PLOT DATE:

March 16, 2014

SEE PAGE - 07X

SEE PAGE - 08W



ZONE 4

SEE PAGE - 08Y

2014

City of Aurora, Colorado - Aurora Water

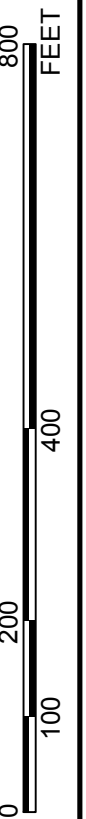
15151 East Alameda Parkway, Aurora, Colorado 80012  
website: www.auroragov.org phone: 303.739.7370 fax: 303.739.7491

TRS: SE1/4 SEC08 T4S R65W

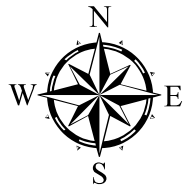


VALVE RESTRICTED

08X







**LEGEND:**

● Fire\_Hydrants

● Water\_Valves

UNIT\_TYPE

● ARV

● Ball

● Butterfly

● BFZV

● BO

● CK

△ FLAPGATE

● GV

● PRV

● Plug

● ZV

Water\_Fittings

UNITTYPE

■ Building

● Cap

● Cross

● Encase End

● Hydrant Tee

● Main Tee

● Meter Tee

● Other

● Outlet

● Plug

● Reducer

● Service Tee

● Wet Tap

● Water\_Test\_Stations

Water\_Pumps\_PumpStations

UNIT\_TYPE

■ PS

■ PS

■ PUMP

■ Water\_Meter

■ Water\_Manhole

■ Water\_Misc

■ Water\_Storage

■ Water\_Wells

Water\_Mains

● CCV, Denver, ECGV

OWNER, WATER\_TYPE

— Aurora, Potable

— Private, Potable

— Abandoned\_Mains

— Pressure\_Zones

Water\_Facilities\_Security\_Area

Address Points

— Easement Line

— Parcels

— Street Name Geocoded Line

— City Limits

**FUTURE UTILITIES CORRIDOR**

THIS IS THE PROPOSED LOCATION FOR A 66" WATER LINE WITH FOUR ALTERNATE ROUTES. IF YOU HAVE ANY QUESTIONS REGARDING ANY CONSTRUCTION WITHIN THIS CORRIDOR PLEASE CONTACT THE CITY OF AURORA, CAPITAL PROJECTS DIVISION (720)-859-4300

**\* RESTRICTED AREA \***

AURORA WATER SECURITY AREA

THIS INFORMATION HAS BEEN BLOCKED FOR SECURITY PURPOSES. CONTACT AURORA WATER, ENGINEERING DIVISION FOR DETAILS AT (303)-739-7376

**NOTES:**

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LOCATIONS ON THIS MAP ARE APPROXIMATE AND ARE INTENDED TO SERVE AS AN AID IN GRAPHIC REPRESENTATION ONLY.

BEFORE EXCAVATION CALL THE CITY OF AURORA, WATER OPERATIONS AT (303)-326-8645 TO SCHEDULE FIELD LOCATIONS OF WATER, STORM AND SANITARY LINES.

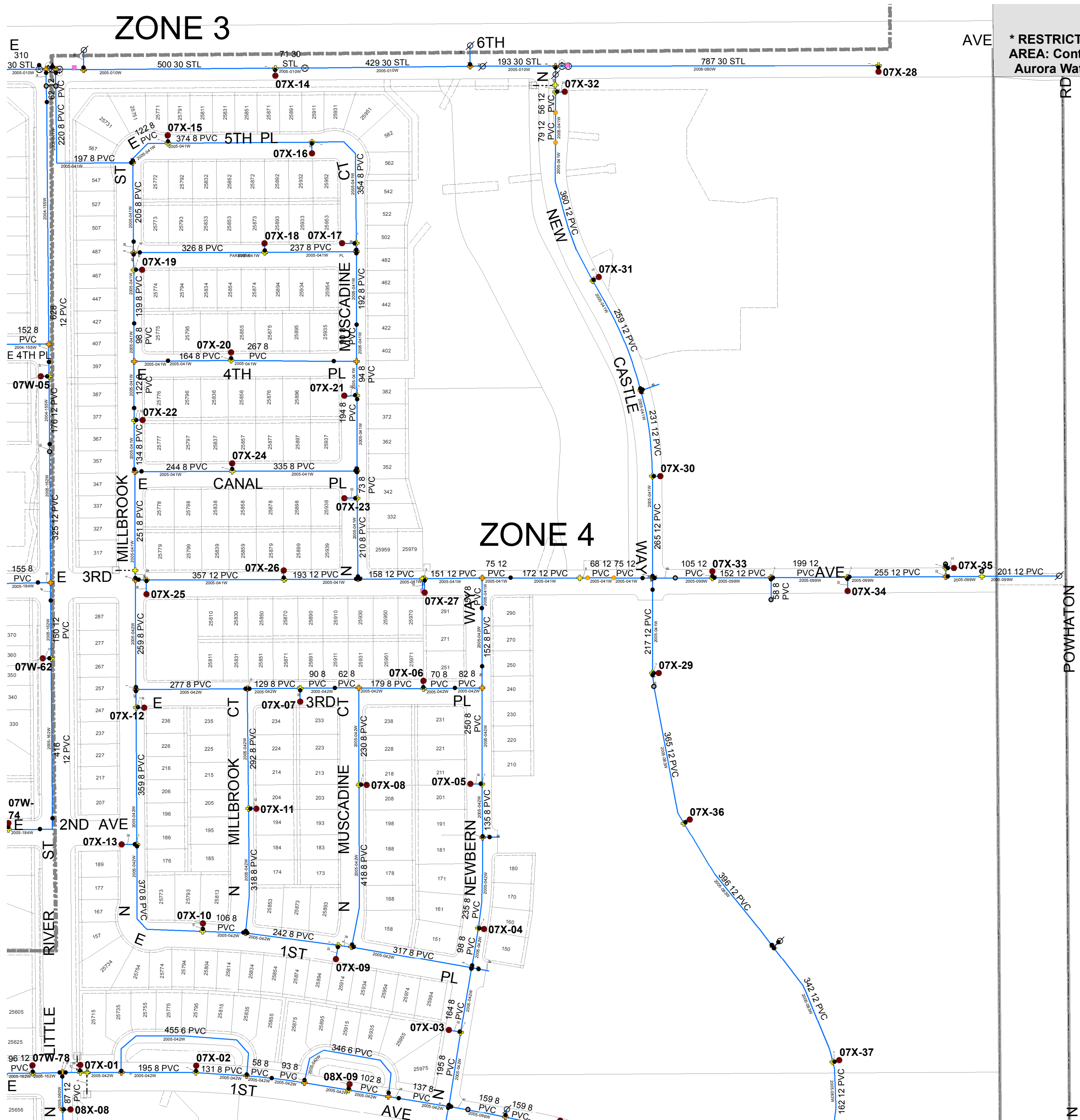
PLEASE REPORT ANY ERRORS OR OMISSIONS ON THIS MAP TO THE CITY OF AURORA, AURORA WATER, ENGINEERING DIVISION, GIS SECTION.

**PLOT DATE:**

March 16, 2014

SEE PAGE - 06X

SEE PAGE - 07W



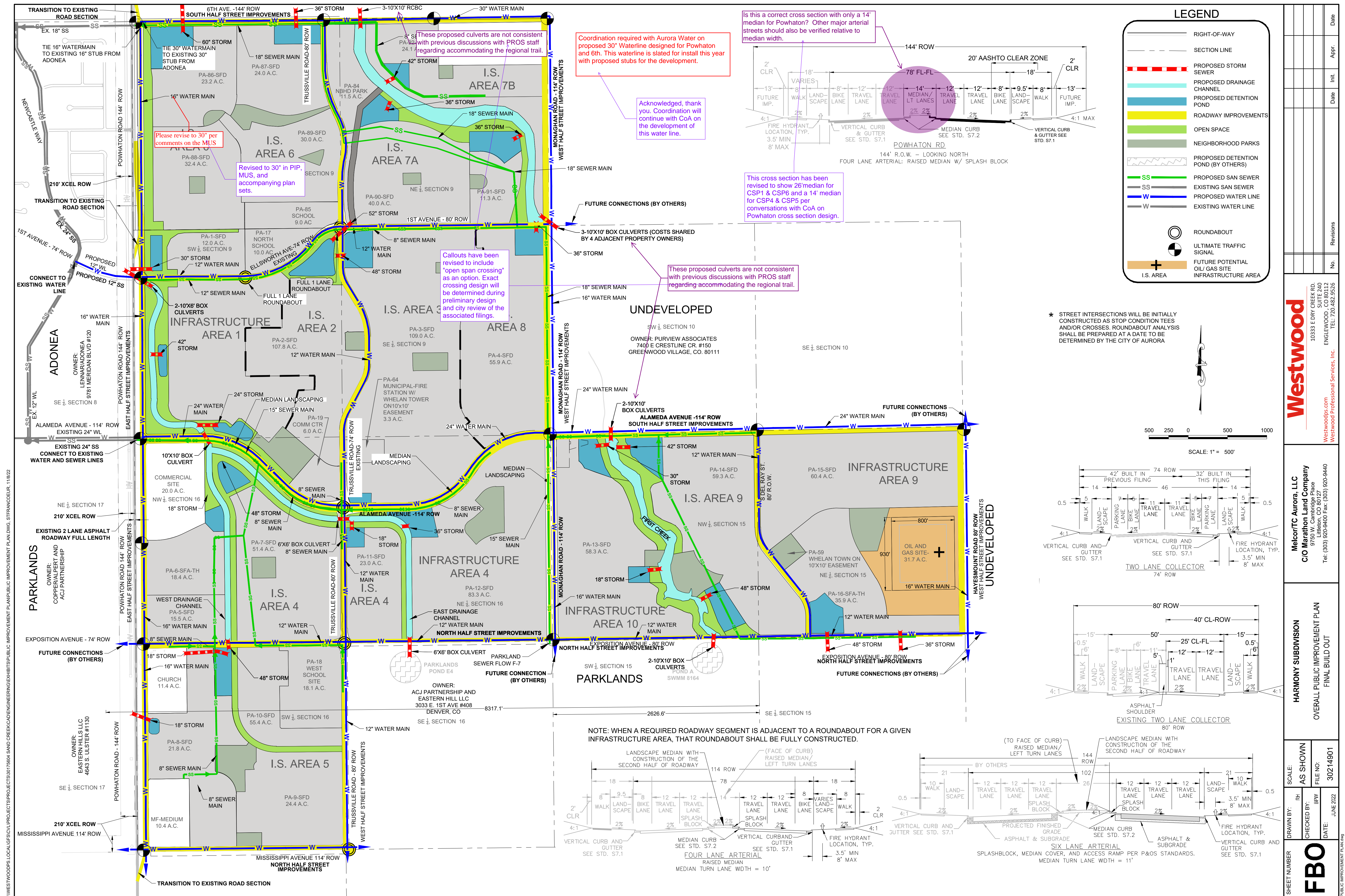
\* RESTRICTED AREA: Contact Aurora Water

SEE PAGE - 07Y

SEE PAGE - 08X

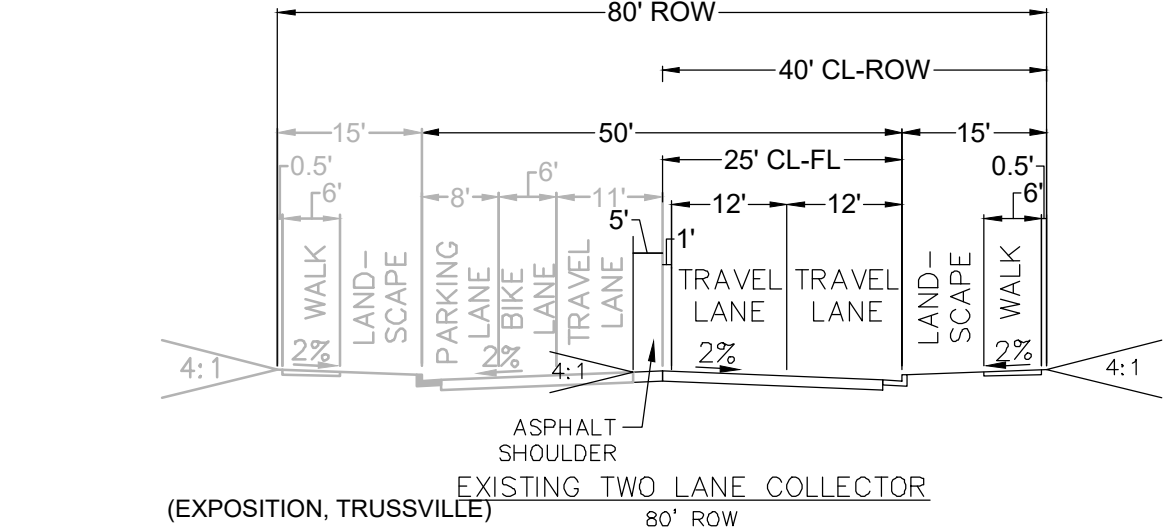
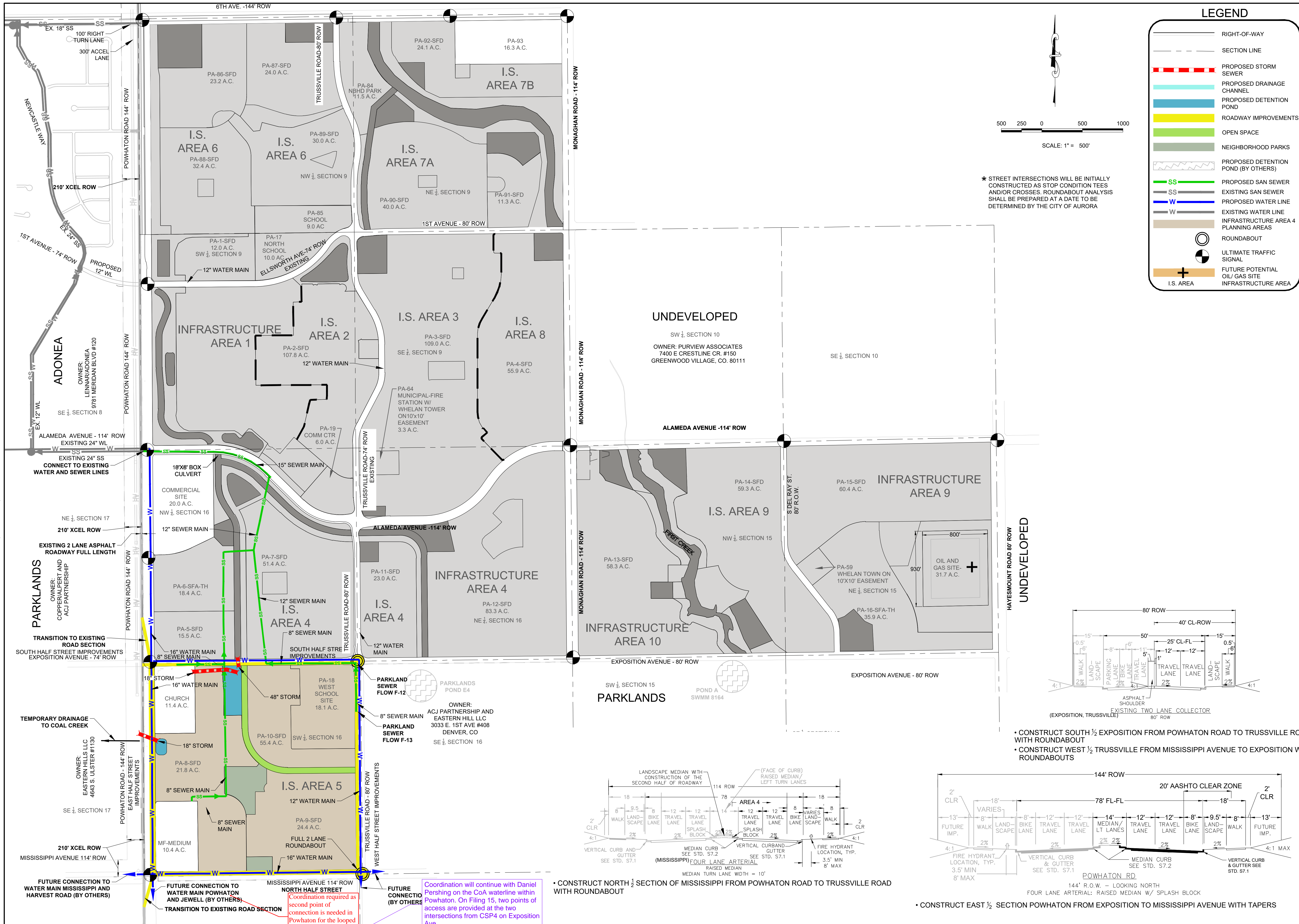




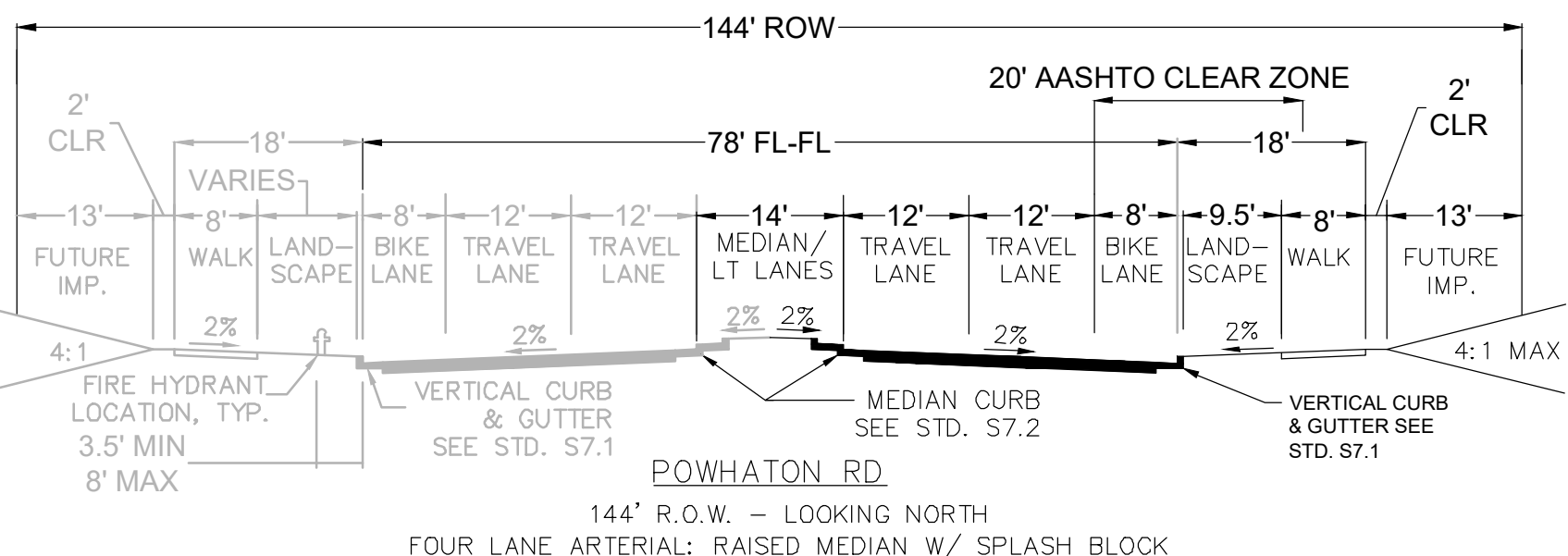
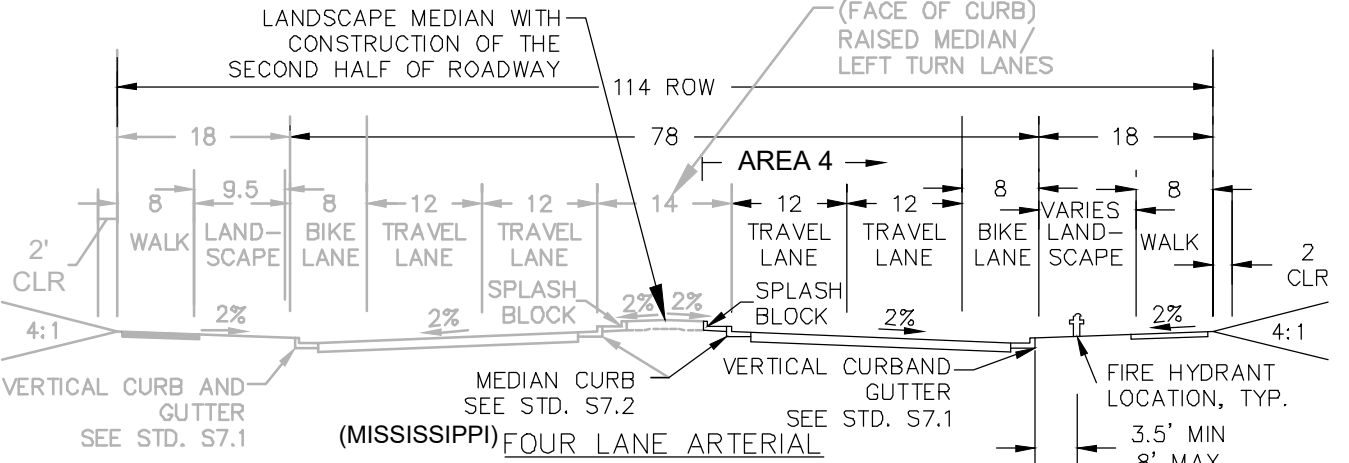




\\WESTWOOD\LOCAL\GIS\PROJECTS\PROJECTS\30175604 SAND CREEK\CAD\ENGINEERING\BIBS\PUBLIC IMPROVEMENT PLAN\DWG, SITFRANCEJ.R. 11/8/22



- CONSTRUCT SOUTH 1/2 EXPOSITION FROM POWHATON ROAD TO TRUSSVILLE ROAD WITH ROUNDABOUT
- CONSTRUCT WEST 1/2 TRUSSVILLE FROM MISSISSIPPI AVENUE TO EXPOSITION WITH ROUNDABOUTS



- CONSTRUCT EAST 1/2 SECTION POWHATON FROM EXPOSITION TO MISSISSIPPI AVENUE WITH TAPERS

5	SHEET NUMBER	DRAWN BY:	RH	SCALE:															
		CHECKED BY:		AS SHOWN															
		FILE NO:		30214901															
		DATE:		JUNE 2022															
HARMONY SUBDIVISION					Melcor/TC Aurora, LLC					<div>Westwood</div> <div>10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.3526</div> <div>Westwoodps.com Westwood Professional Services, Inc.</div>									
PUBLIC IMPROVEMENT PLAN					C/O Marathon Land Company														
					9750 W. Cambridge Place Littleton, CO 80127														
					Tel: (303) 920-9400 Fax: (303) 920-9440														
										12-14-21									

**Westwood**

**Melcor/TC Aurora, LLC**  
C/O Marathon Land Company

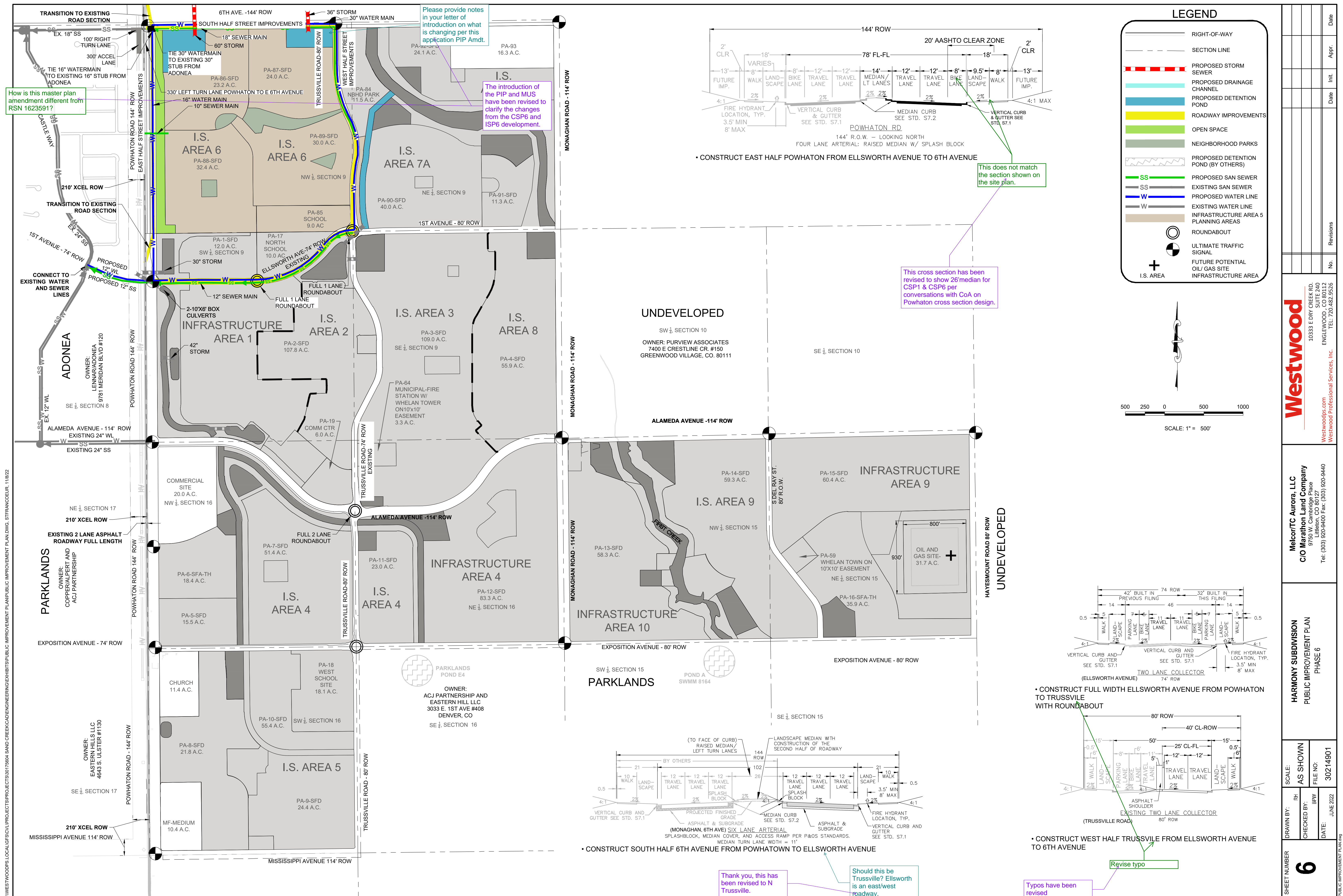
**HARMONY SUBDIVISION**  
PUBLIC IMPROVEMENT PLAN  
PHASE 5

10333 E DRY CREEK RD.  
SUITE 240  
ENGLEWOOD, CO 80112  
TEL: 720.482.9526

12/14/21

REVISE LAYOUT OF I.S. AREA 4











NOTES:

1. THE DEVELOPER, HIS SUCCESSORS AND ASSIGNS, INCLUDING THE HOMEOWNERS OR MERCHANTS ASSOCIATION, SHALL BE RESPONSIBLE FOR INSTALLATION, MAINTENANCE AND REPLACEMENT OF ALL FIRE LANE SIGNS AS REQUIRED BY THE CITY OF AURORA.
2. ALL SIGNS MUST CONFORM TO THE HARMONY FDP AND THE CITY OF AURORA SIGN CODE.
3. RIGHT OF WAY FOR INGRESS AND EGRESS FOR SERVICE AND EMERGENCY VEHICLES IS GRANTED OVER, ACROSS, ON AND THROUGH ANY AND ALL PRIVATE ROADS AND WAYS NOW OR HEREAFTER ESTABLISHED ON THE DESCRIBED PROPERTY, AND THE SAME ARE HEREBY DESIGNATED AS "SERVICE/EMERGENCY AND UTILITY EASEMENTS" AND SHALL BE POSTED "NO PARKING-FIRE LANE."
4. THE APPLICANT, DEVELOPER, OWNER, AND ASSIGNEES HAVE THE OBLIGATION TO COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT.
5. 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 OR LANDSCAPE PLAN ON FILE IN THE PLANNING DEPARTMENT. ALL LANDSCAPING WILL BE INSTALLED PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY.
6. ALL CROSSINGS OR ENCROACHMENTS INTO EASEMENTS AND RIGHTS-OF-WAY OWNED BY THE CITY OF AURORA ("CITY") IDENTIFIED AS BEING PRIVATELY-OWNED AND MAINTAINED HEREIN ARE ACKNOWLEDGED BY THE UNDERSIGNED AS BEING SUBJECT TO CITY'S USE AND OCCUPANCY OF SAID EASEMENTS OR RIGHTS-OF-WAY. THE UNDERSIGNED, ITS SUCCESSORS AND ASSIGNS, FURTHER AGREES TO REMOVE, REPAIR, REPLACE, RELOCATE, MODIFY, OR OTHERWISE ADJUST SAID CROSSINGS OR ENCROACHMENTS UPON REQUEST FROM THE CITY AND AT NO EXPENSE TO THE CITY. THE CITY RESERVES THE RIGHT TO MAKE FULL USE OF THE EASEMENTS AND RIGHTS-OF-WAY AS MAY BE NECESSARY OR CONVENIENT AND THE CITY RETAINS ALL RIGHTS TO OPERATE, MAINTAIN, INSTALL, REPAIR, REMOVE OR RELOCATE ANY CITY FACILITIES LOCATED WITHIN SAID EASEMENTS AND RIGHTS-OF-WAY AT ANY TIME AND IN SUCH A MANNER AS IT DEEMS NECESSARY OR CONVENIENT.
7. THE APPROVAL OF THIS DOCUMENT DOES NOT CONSTITUTE FINAL APPROVAL OF GRADING, DRAINAGE, UTILITY, PUBLIC IMPROVEMENTS AND BUILDING PLANS. CONSTRUCTION PLANS MUST BE REVIEWED AND APPROVED BY THE APPROPRIATE AGENCY PRIOR TO THE ISSUANCE OF BUILDING PERMITS.
8. ALL BUILDING ADDRESS NUMBERS SHALL COMPLY WITH THE AURORA CITY CODE, SECTION 126, ARTICLE VII-NUMBERING OF BUILDINGS.
9. ALL ROOFTOP MECHANICAL EQUIPMENT AND VENTS GREATER THAN EIGHT (8) INCHES IN DIAMETER MUST BE SCREENED. SCREENING MAY BE DONE EITHER WITH AN EXTENDED PARAPET WALL OR A FREESTANDING SCREEN WALL. SCREENS SHALL BE AT LEAST AS HIGH AS THE EQUIPMENT THEY HIDE. IF EQUIPMENT IS VISIBLE BECAUSE SCREENS DON'T MEET THE MINIMUM HEIGHT REQUIREMENT, THE DIRECTOR OF PLANNING MAY REQUIRE CONSTRUCTION MODIFICATIONS PRIOR TO THE ISSUANCE OF A PERMANENT CERTIFICATE OF OCCUPANCY.
10. NOTWITHSTANDING ANY SURFACE IMPROVEMENTS, LANDSCAPING, PLANTING OR CHANGES SHOWN IN THESE SITE OR CONSTRUCTION PLANS, OR ACTUALLY CONSTRUCTED OR PUT IN PLACE, ALL UTILITY EASEMENTS MUST REMAIN UNOBSTRUCTED AND FULLY ACCESSIBLE ALONG THEIR ENTIRE LENGTH TO ALLOW FOR ADEQUATE MAINTENANCE EQUIPMENT. ADDITIONALLY, NO INSTALLATION, PLANTING, CHANGE IN THE SURFACE, ETC., SHALL INTERFERE WITH THE OPERATION OF THE UTILITY LINES PLACED WITHIN THE EASEMENT. BY SUBMITTING THESE SITE OR CONSTRUCTION PLANS FOR APPROVAL, THE LANDOWNER RECOGNIZES AND ACCEPTS THE TERMS, CONDITIONS AND REQUIREMENTS OF THIS NOTE.
11. FINAL GRADE SHALL BE AT LEAST SIX (6) INCHES BELOW ANY EXTERIOR WOOD SIDING ON THE PREMISES.
12. ALL INTERESTED PARTIES ARE HEREBY ALERTED THAT THIS SITE PLAN IS SUBJECT TO ADMINISTRATIVE CHANGES AND AS SHOWN ON THE ORIGINAL SITE PLAN ON FILE IN THE AURORA CITY PLANNING OFFICE AT THE MUNICIPAL BUILDING. A COPY OF THE OFFICIAL CURRENT PLAN MAY BE PURCHASED THERE. LIKEWISE, SITE PLANS ARE REQUIRED TO AGREE WITH THE APPROVED SUBDIVISION PLAT OF RECORD AT THE TIME OF A BUILDING PERMIT; AND IF NOT, MUST BE AMENDED TO AGREE WITH THE PLAT AS NEEDED, OR VICE VERSA.
13. ERRORS IN APPROVED SITE PLANS RESULTING FROM COMPUTATIONS OR INCONSISTENCIES IN THE DRAWINGS MADE BY THE APPLICANT ARE THE RESPONSIBILITY OF THE PROPERTY OWNER OF RECORD. WHERE FOUND, THE CURRENT MINIMUM CODE REQUIREMENTS WILL APPLY AT THE TIME OF BUILDING PERMIT. PLEASE BE SURE THAT ALL PLAN COMPUTATIONS ARE CORRECT.
14. ALL REPRESENTATIONS AND COMMITMENTS MADE BY APPLICANTS AND PROPERTY OWNERS AT PUBLIC HEARINGS REGARDING THIS PLAN ARE BINDING UPON THE APPLICANT, PROPERTY OWNER, AND ITS HEIRS, SUCCESSORS, AND ASSIGNS.
15. ARCHITECTURAL FEATURES, SUCH AS BAY WINDOWS, FIREPLACES, ROOF OVERHANGS, GUTTERS, EAVES, FOUNDATIONS, FOOTINGS, CANTILEVERED WALLS, ETC., ARE NOT ALLOWED TO ENCROACH INTO ANY EASEMENT OR FIRE LANE.
16. ALL STREET TRAFFIC SIGNS PROVIDED BY THE HARMONY DEVELOPMENT SHALL BE FURNISHED AND INSTALLED PER MUTCD STANDARDS.
17. FIRE LANE AND HANDICAPPED PARKING SIGNS, SIGN DETAILS, HANDICAPPED PARKING STALL DETAILS, AND LOCATIONS SHALL BE APPROVED WITH THE CIVIL PLANS, "SIGNAGE AND STRIPING" PACKAGE.
18. NEW AND EXISTING BUILDINGS SHALL BE PROVIDED WITH APPROVED ADDRESS IDENTIFICATION THAT IS LEGIBLE AND PLACED IN A POSITION THAT IS VISIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY. NUMBERS SHALL BE NOT LESS THAN 4" HIGH WITH A MINIMUM STROKE WIDTH OF 1/2 INCH. (2015 IFC, 505.1)
19. IN LOCATIONS WHERE UTILITY EASEMENTS OVERLAP DRAINAGE EASEMENTS, ONLY SUBSURFACE UTILITIES SHALL BE PERMITTED WITHIN THE PORTION OF THE UTILITY EASEMENT THAT OVERLAPS THE DRAINAGE EASEMENT. INSTALLATION OF ABOVE GROUND UTILITIES WITHIN A DRAINAGE EASEMENT REQUIRES PRIOR WRITTEN APPROVAL BY THE CITY ENGINEER.
20. 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.
21. ALL BUILDING ADDRESS NUMBERS SHALL COMPLY WITH CITY CODE OF THE CITY OF AURORA-VOLUME II - CHAPTER 126 - ARTICLE VII - SECTIONS 126-271 THROUGH 126-282.
22. ACCESSIBLE EXTERIOR ROUTES\* SHALL BE PROVIDED FROM PUBLIC TRANSPORTATION STOPS, ACCESSIBLE PARKING AND ACCESSIBLE PASSENGER LOADING ZONES AND PUBLIC SIDEWALKS TO 60% OF THE ACCESSIBLE BUILDING ENTRANCE THEY SERVE. THE ACCESSIBLE ROUTE BETWEEN ACCESSIBLE PARKING AND ACCESSIBLE BUILDING ENTRANCES SHALL BE THE MOST PRACTICAL DIRECT ROUTE. THE ACCESSIBLE ROUTE MUST BE LOCATED WITHIN A SIDEWALK. NO SLOPE ALONG THIS ROUTE MAY EXCEED 1:20 WITHOUT PROVIDING A RAMP WITH A MAXIMUM SLOPE OF 1:12 AND HANDRAILS. CROSSWALKS ALONG THIS ROUTE SHALL BE WIDE ENOUGH TO WHOLLY CONTAIN THE CURB RAMP WITH A MINIMUM WIDTH OF 36" AND SHALL BE PAINTED WITH WHITE STRIPES. THE CITY OF AURORA ENFORCES HANDICAPPED ACCESSIBILITY REQUIREMENTS BASED ON THE 2015 INTERNATIONAL BUILDING CODE, CHAPTER 11, AND THE ICC A117.1-2009.
23. THE 2015 INTERNATIONAL FIRE CODE, SECTION 510, REQUIRES ALL BUILDINGS TO BE ASSESSED FOR ADEQUATE EMERGENCY RESPONDER RADIO COVERAGE (ERRC). AT THE TIME THE STRUCTURE IS AT FINAL FRAME AND FINAL ELECTRICAL INSPECTIONS, THE GENERAL CONTRACTOR (GC) WILL BE REQUIRED TO HIRE AN APPROVED AND QUALIFIED INDEPENDENT 3RD PARTY TO ASSESS THE RADIO FREQUENCY LEVELS WITHIN THE STRUCTURE. ONCE COMPLETED, THE 3RD PARTY WILL PROVIDE THE RESULTS OF THE TEST TO BOTH THE GC AND THE AURORA BUILDING DIVISION AS TO WHETHER THE STRUCTURE PASSED OR FAILED THE PRELIMINARY RADIO SURVEILLANCE. A STRUCTURE THAT HAS PASSED THIS SURVEILLANCE REQUIRES NO FURTHER ACTION BY THE GC. A FAILED RADIO SURVEILLANCE WILL REQUIRE A LICENSED CONTRACTOR TO SUBMIT PLANS TO THE AURORA BUILDING DIVISION TO OBTAIN A BUILDING PERMIT FOR THE INSTALLATION OF AN ERRC SYSTEM PRIOR TO INSTALLATION. THIS ASSESSMENT AND INSTALLATION IS AT THE OWNER OR DEVELOPER'S EXPENSE. FUTURE INTERIOR OR EXTERIOR MODIFICATIONS TO THE STRUCTURE AFTER THE ORIGINAL CERTIFICATE OF OCCUPANCY IS ISSUED WILL REQUIRE A REASSESSMENT FOR ADEQUATE RADIO FREQUENCY COVERAGE.

ATTENTION BUILDING DIVISION: per ARTICLE xi, C.O.A. Building and Zoning Code, Section 22-425 through 22-434, AN ACOUSTIC ANALYSIS, PREPARED BY AN ACOUSTIC EXPERT THAT WILL IDENTIFY BUILDING DESIGN FEATURES NECESSARY TO ACCOMPLISH EXTERIOR NOISE REDUCTION TO ACHIEVE INTERIOR NOISE LEVELS NOT EXCEEDING INFLUENCE (LDN VALUE TO BE DETERMINED FOR EACH PROJECT) UNDER WORSE-CASE NOISE CONDITIONS.

Add this note.

Add this note and completed table to the drawings.

THIS SHALL CONSTITUTE A CONTRACT THAT SHALL GUARANTEE TO THE GOVERNING BODY THAT BEFORE THE ISSUANCE OF THE FINAL BUILDING PERMIT THE OVERALL SITE WILL MEET THE ACCESSIBILITY REQUIREMENTS OF STATE HOUSE BILL 03-1221. THE SITE PLAN WILL REFLECT THE APPROPRIATE NUMBER OF ACCESSIBILITY POINT VALUE PER DWELLING UNITS FOR PERSONS WITH DISABILITIES, AS PROVIDED IN C.R.S. 9-5-105. ACCESSIBLE UNITS SHALL BE CONSTRUCTED IN SUCH A MANNER AS TO BE EASILY ACCESSIBLE AND ADAPTABLE FOR PERSONS WITH DISABILITIES AND WILL COMPLY WITH THE MOST CURRENT VERSION OF THE AMERICAN NATIONAL STANDARD FOR THE BUILDING AND FACILITIES PROVIDING ACCESSIBILITY AND USABILITY FOR PHYSICALLY HANDICAPPED PEOPLE, PROMULGATED BY THE AMERICAN NATIONAL STANDARD INSTITUTE, COMMONLY CITED AS ICC A117.1 – 2009. OWNER OF PROPERTY FOR THE ABOVE PERMIT: \_\_\_\_\_.

IMPLEMENTATION PLAN

2015 - INTERNATIONAL BUILDING CODE	COLORADO STATE HOUSE BILL 03-1221
ACCESSIBLE DWELLING UNITS:	ACCESSIBLE DWELLING UNITS:
REQUIRED:	REQUIRED:
PROVIDED:	PROVIDED:

Added notes and standard block.

Remove duplicate note.

Removed notes

Remove this note.

Added note

Add standard PROS note.

Parks, recreation improvements, trails, and open space areas provided to satisfy land dedication requirements in accordance with approved development plans or provided by a metropolitan district or other appropriate jurisdiction or owners association in accordance with approved metropolitan district service plans shall be open to the general public.

Add signal escrow note:  
(Applicant/owner name, address, phone) shall be responsible for payment of 25% of the traffic signalization costs for the intersection of 6th Avenue and Powhatan Road, and 25% of the traffic signalization costs for the intersection of 6th Avenue and Trussville Road, if and when traffic signal warrants are satisfied. Traffic signal warrants to consider shall be as described in the most recently adopted version of Manual on Uniform Traffic Control Devices, as of the date or dates of any such warrant studies. For warrant purposes, the minor street approach traffic shall typically be comprised of all through and left-turn movement and 50% of right turn movements unless otherwise determined by the traffic engineer. Pursuant to 147-37.5 of city code, the percentage of the traffic signalization costs identified above shall be paid to the city by the applicant / owner, to be held in escrow for such purpose, prior to the issuance of a building permit for the related development or as otherwise required by city code. The percentage above will be applied to the entire traffic signalization cost as estimated at the time of the escrow deposit to calculate specific dollar funding requirement.

Add standard conduit note for arterial roadways:  
Applicant shall install two 2" conduits and pull boxes to be owned/maintained by the City of Aurora, for future fiber optic interconnect of traffic signals along arterial roadways.  
Conduit  
•Conduit material shall be Schedule 80 HDPE (or similar).  
•A # 14 AWG stranded copper conductor shall be installed for city underground locating purposes.  
•A nylon pull tape with a minimum 1,250 lb tensile strength shall be installed in all new conduit.  
Pull Box  
•Pull boxes shall be 30"x48"x24", with two-piece interlocking lids.  
•City conduit shall be installed into City Pull Boxes.

Notes added to plan sheet.

SHEET NUMBER	1.1	DRAWN BY: STP	CHECKED BY: BPW	DATE: DECEMBER 2022	SCALE: AS SHOWN	FILE NO: 8130214922	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 GENERAL NOTES	Melo/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	Westwood 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 Westwoodpro.com Westwood Professional Services, Inc.	No.	Revisions	Date	Init.	Appr.	Date



Include the lot corner radius on all frontage calculations. There are several lots that do not match the plat for lot frontage.

Lot corner radii added to frontage.

FILING	BLOCK #	LOT #	SQUARE FOOTAGE	FRONTAGE	SETBACKS			CLASSIFICATION
				FT	FRONT	SIDE	SIDE*	
				FT	FT	FT	FT	
16	1	1	7944	56.21	10	5	10	LARGE SINGLE FAMILY
16	1	2	7426	66.00	10	5		LARGE SINGLE FAMILY
16	1	3	7446	66.00	10	5		LARGE SINGLE FAMILY
16	1	4	7466	66.00	10	5		LARGE SINGLE FAMILY
16	1	5	7487	66.00	10	5		LARGE SINGLE FAMILY
16	1	6	7507	66.00	10	5		LARGE SINGLE FAMILY
16	1	7	6853	60.00	10	5		LARGE SINGLE FAMILY
16	1	8	6870	60.00	10	5		LARGE SINGLE FAMILY
16	1	9	6887	60.00	10	5		LARGE SINGLE FAMILY
16	1	10	6904	60.00	10	5		LARGE SINGLE FAMILY
16	1	11	6921	60.00	10	5		LARGE SINGLE FAMILY
16	1	12	6937	60.00	10	5		LARGE SINGLE FAMILY
16	1	13	6954	60.01	10	5		LARGE SINGLE FAMILY
16	1	14	8351	61.14	10	5		LARGE SINGLE FAMILY
16	1	15	8231	53.17	10	5		LARGE SINGLE FAMILY
16	1	16	6284	55.94	10	5		LARGE SINGLE FAMILY
16	1	17	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	18	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	19	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	20	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	21	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	22	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	23	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	24	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	25	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	26	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	27	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	28	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	29	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	30	6900	60.00	10	5		LARGE SINGLE FAMILY
16	1	31	7475	65.00	10	5		LARGE SINGLE FAMILY
16	2	1	8209	57.75	10	5	10	LARGE SINGLE FAMILY
16	2	2	5538	30.00	10	5		LARGE SINGLE FAMILY
16	2	3	5538	30.00	10	5		LARGE SINGLE FAMILY
16	2	4	5538	30.00	10	5		LARGE SINGLE FAMILY
16	2	5	5538	30.00	10	5		LARGE SINGLE FAMILY
16	2	6	5538	30.00	10	5		LARGE SINGLE FAMILY
16	2	7	5538	30.00	10	5		LARGE SINGLE FAMILY
16	2	8	5538	30.00	10	5		LARGE SINGLE FAMILY
16	2	9	8209	57.75	10	5	10	LARGE SINGLE FAMILY
16	2	10	7899	57.75	10	5	10	LARGE SINGLE FAMILY
16	2	11	5462	30.00	10	5		STANDARD SINGLE FAMILY
16	2	12	5462	30.00	10	5		STANDARD SINGLE FAMILY
16	2	13	5462	30.00	10	5		STANDARD SINGLE FAMILY
16	2	14	5462	30.00	10	5		STANDARD SINGLE FAMILY
16	2	15	5462	30.00	10	5		STANDARD SINGLE FAMILY
16	2	16	5462	30.00	10	5		STANDARD SINGLE FAMILY
16	2	17	5462	30.00	10	5		STANDARD SINGLE FAMILY
16	2	18	7899	57.75	10	5	10	LARGE SINGLE FAMILY
16	3	1	7835	36.00	10	5	10	LARGE SINGLE FAMILY
16	3	2	5552	30.00	10	5		STANDARD SINGLE FAMILY
16	3	3	5552	30.00	10	5		STANDARD SINGLE FAMILY
16	3	4	5552	30.00	10	5		STANDARD SINGLE FAMILY
16	3	5	5552	30.00	10	5		STANDARD SINGLE FAMILY
16	3	6	5552	30.00	10	5		STANDARD SINGLE FAMILY
16	3	7	5552	30.00	10	5		STANDARD SINGLE FAMILY
16	3	8	5552	30.00	10	5		STANDARD SINGLE FAMILY
16	3	9	7835	36.00	10	5	10	LARGE SINGLE FAMILY
16	3	10	7688	36.00	10	5	10	LARGE SINGLE FAMILY
16	3	11	5448	30.00	10	5		STANDARD SINGLE FAMILY
16	3	12	5448	30.00	10	5		STANDARD SINGLE FAMILY
16	3	13	5448	30.00	10	5		STANDARD SINGLE FAMILY
16	3	14	5448	30.00	10	5		STANDARD SINGLE FAMILY
16	3	15	5448	30.00	10	5		STANDARD SINGLE FAMILY
16	3	16	5448	30.00	10	5		STANDARD SINGLE FAMILY
16	3	17	5448	30.00	10	5		STANDARD SINGLE FAMILY
16	3	18	7688	36.00	10	5	10	LARGE SINGLE FAMILY
16	4	1	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	2	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	3	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	4	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	5	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	6	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	7	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	8	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	9	6900	60.00	10	5		LARGE SINGLE FAMILY
16	4	10	6900	60.00	10	5		LARGE SINGLE FAMILY
16	5	1	7102	30.00	10	5	10	LARGE SINGLE FAMILY
16	5	2	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	3	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	4	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	5	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	6	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	7	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	8	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	9	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	10	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	11	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	12	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	13	6717	46.50	10	5	10	STANDARD SINGLE FAMILY
16	5	14	6717	46.50	10	5	10	STANDARD SINGLE FAMILY
16	5	15	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	16	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	17	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	18	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	19	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	20	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	21	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	22	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	23	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	24	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	25	5500	30.00	10	5		STANDARD SINGLE FAMILY
16	5	26	7102	30.00	10	5	10	LARGE SINGLE FAMILY

Revised to single

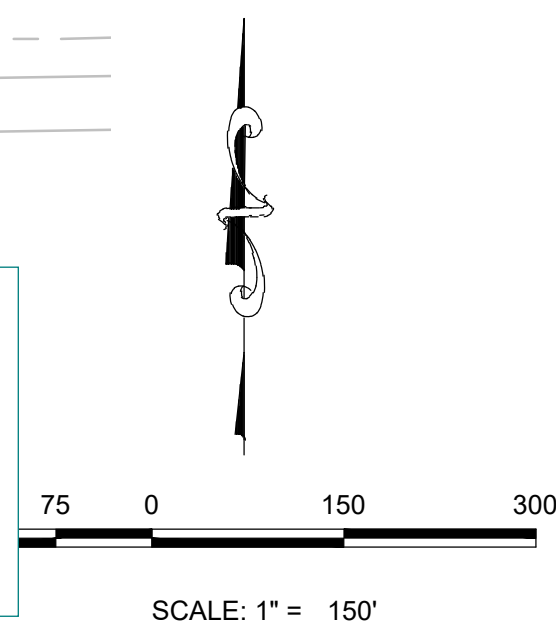
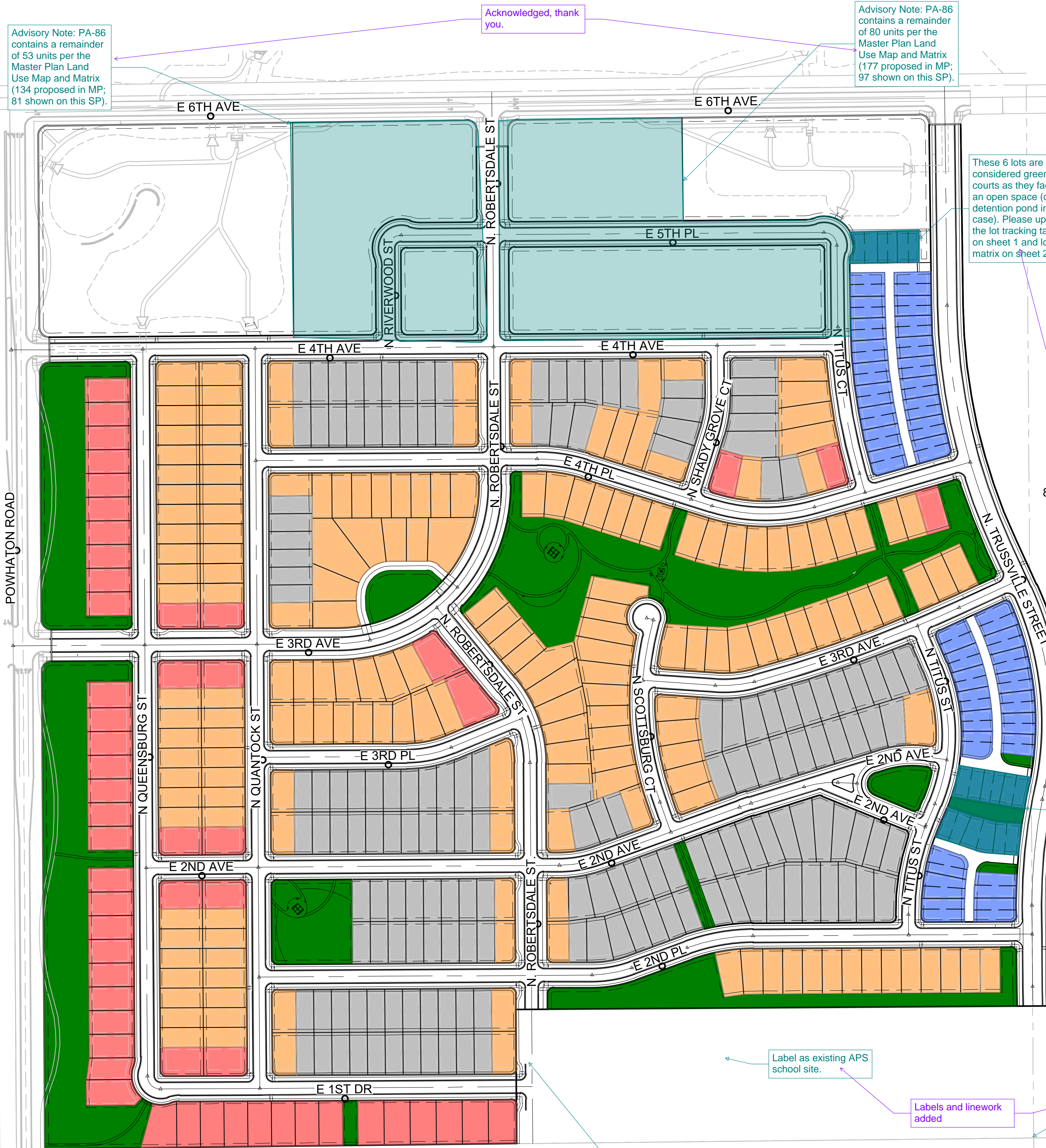
Check the lot frontage. It should include the lot corner radius on corner lots (36.7+15).

Correct to "single", typical on all rows.

FILING	BLOCK #	LOT #	SQUARE FOOTAGE	FRONTAGE	SETBACKS			CLASSIFICATION
				FRONT	SIDE	SIDE*		
16	6	1	6585	46.00	10	5	10	STANDARD SINGLE FAMILY
16	6	2	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	3	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	4	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	5	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	6	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	7	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	8	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	9	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	10	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	11	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	12	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	13	6617	46.27	10	5	10	STANDARD SINGLE FAMILY
16	6	14	6623	46.37	10	5	10	STANDARD SINGLE FAMILY
16	6	15	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	16	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	17	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	18	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	19	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	20	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	21	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	22	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	23	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	24	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	25	4894	45.00	10	5		SMALL SINGLE FAMILY
16	6	26	6585	46.00	10	5	10	STANDARD SINGLE FAMILY
16	7	1	4843	45.00	10	5		SMALL SINGLE FAMILY
16	7	2	4843	45.00	10	5		SMALL SINGLE FAMILY
16	7	3	4843	45.00	10	5		SMALL SINGLE FAMILY
16	7	4	4843	45.00	10	5		SMALL SINGLE FAMILY
16	7	5	5514	36.70	10	5	10	STANDARD SINGLE FAMILY
16	7	10	3451	36.68	10	5	10	STANDARD SINGLE FAMILY
16	7	11	4787	45.00	10	5		SMALL SINGLE FAMILY
16	7	12	4787	45.00	10	5		SMALL SINGLE FAMILY
16	7	13	4787	45.00	10	5		SMALL SINGLE FAMILY
16	7	14	4787	45.00	10	5		SMALL SINGLE FAMILY
16	7	15	4787	45.00	10	5		SMALL SINGLE FAMILY
16	7	16	4787	45.00	10	5		SMALL SINGLE FAMILY
16	7	17	4787	45.00	10	5		SMALL SINGLE FAMILY
16	7	18	4787	45.00	10	5		SMALL SINGLE FAMILY
16	8	1	6372	45.00	10	5	10	STANDARD SINGLE FAMILY
16	8	2	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	3	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	4	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	5	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	6	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	7	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	8	4828	45.04	10	5		SMALL SINGLE FAMILY
16	8	9	5011	45.60	10	5		SMALL SINGLE FAMILY
16	8	10	5480	47.10	10	5		SMALL SINGLE FAMILY
16	8	11	6223	48.52	10	5		SMALL SINGLE FAMILY
16	8	12	7041	48.54	10	5		SMALL SINGLE FAMILY
16	8	13	10762	39.93	10	5	10	STANDARD SINGLE FAMILY
16	8	14	6590	47.06	10	5	10	STANDARD SINGLE FAMILY
16	8	15	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	16	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	17	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	18	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	19	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	20	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	21	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	22	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	23	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	24	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	25	4815	45.00	10	5		SMALL SINGLE FAMILY
16	8	26	6372	45.00	10	5	10	STANDARD SINGLE FAMILY
16	9	1	6379	45.00	10	5	10	STANDARD SINGLE FAMILY
16	9	2	3536	50.00	10	5		STANDARD SINGLE FAMILY
16	9	3	3816	50.08	10	5		STANDARD SINGLE FAMILY
16	9	4	6071	50.63	10	5		STANDARD SINGLE FAMILY
16	9	5	6542	51.50	10	5		STANDARD SINGLE FAMILY
16	9	6	7003	51.40	10	5		STANDARD SINGLE FAMILY
16	9	7	6800	51.68	10	5		STANDARD SINGLE FAMILY
16	9	8	9640	53.51	10	5	10	STANDARD SINGLE FAMILY
16	9	9	11170	83.39	10	5	10	LARGE SINGLE FAMILY
16	9	10	6715	50.00	10	5		STANDARD SINGLE FAMILY
16	9	11	8209	50.46	10	5		STANDARD SINGLE FAMILY
16	9	12	6119	57.00	10	5		STANDARD SINGLE FAMILY
16	9	13	5344	50.00	10	5		STANDARD SINGLE FAMILY
16	9	14	5344	50.00	10	5		STANDARD SINGLE FAMILY
16	9	15	5344	50.00	10	5		STANDARD SINGLE FAMILY
16	9	16	5344	50.00	10	5		STANDARD SINGLE FAMILY
16	9	17	5344	50.00	10	5		STANDARD SINGLE FAMILY
16	9	18	6365	45.00	10	5	10	STANDARD SINGLE FAMILY
16	10	1	7102	50.00	10	5	10	STANDARD SINGLE FAMILY
16	10	2	4950	45.00	10	5		SMALL SINGLE FAMILY
16	10	3	4950	45.00	10	5		SMALL SINGLE FAMILY
16	10	4	4950	45.00	10	5		SMALL SINGLE FAMILY
16	10	5	4950	45.00	10	5		SMALL SINGLE FAMILY
16	10	6	4950	45.00	10	5		SMALL SINGLE FAMILY
16	10	7	4950	45.00	10	5		SMALL SINGLE FAMILY
16	10	8	6277	42.50	10	5	10	STANDARD SINGLE FAMILY
16	10	9	5750	50.00	10	5		STANDARD SINGLE FAMILY
16	10	10	5750	50.00	10	5		STANDARD SINGLE FAMILY
16	10	11	5750	50.00	10	5		STANDARD SINGLE FAMILY
16	10	12	5750	50.00	10	5		STANDARD SINGLE FAMILY
16	10	13	5750	50.00	10	5		STANDARD SINGLE FAMILY
16	10	14	5750	50.00	10	5		STANDARD SINGLE FAMILY
16	10	15	5750	50.00	10	5		STANDARD SINGLE FAMILY

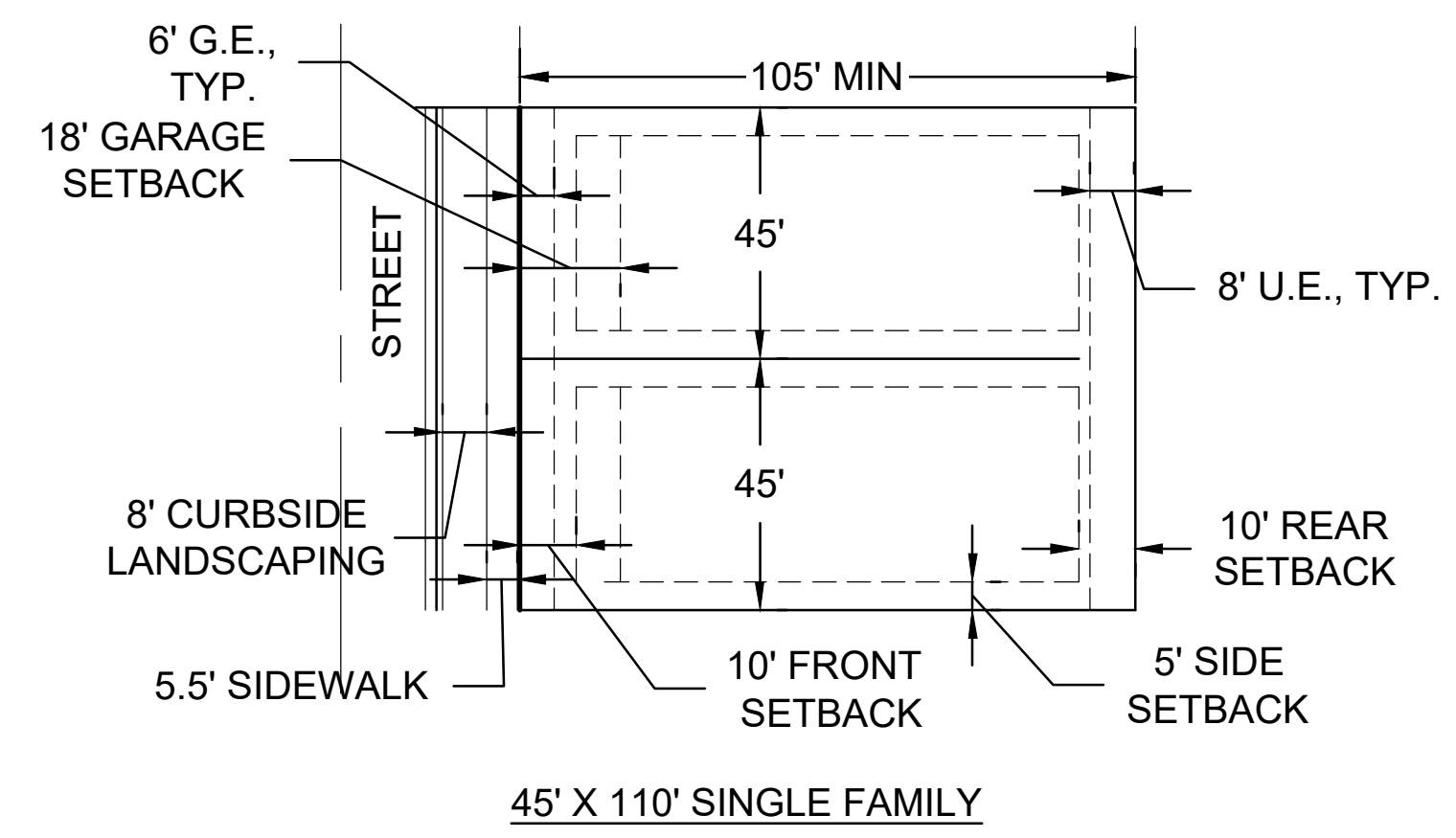
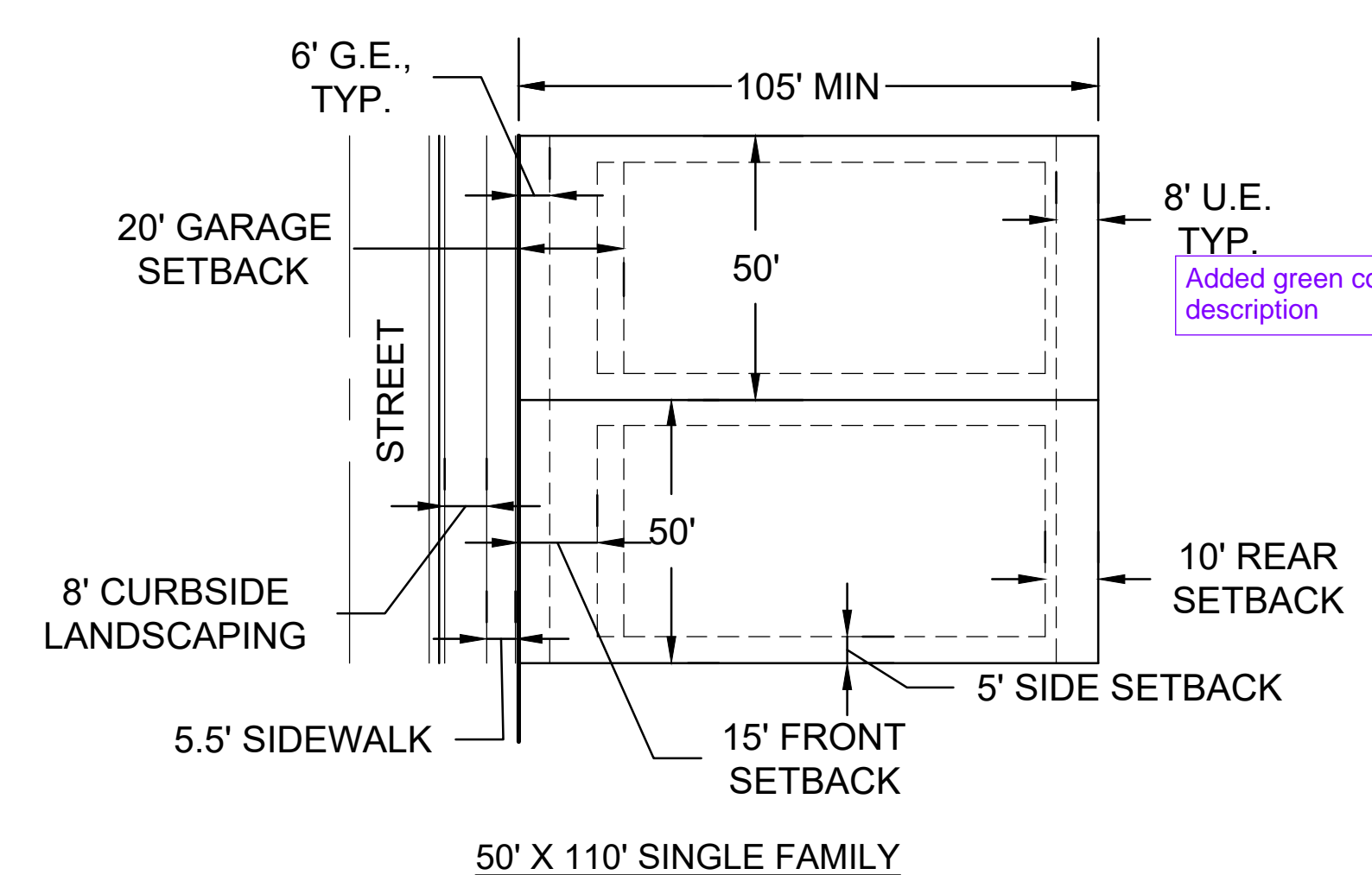
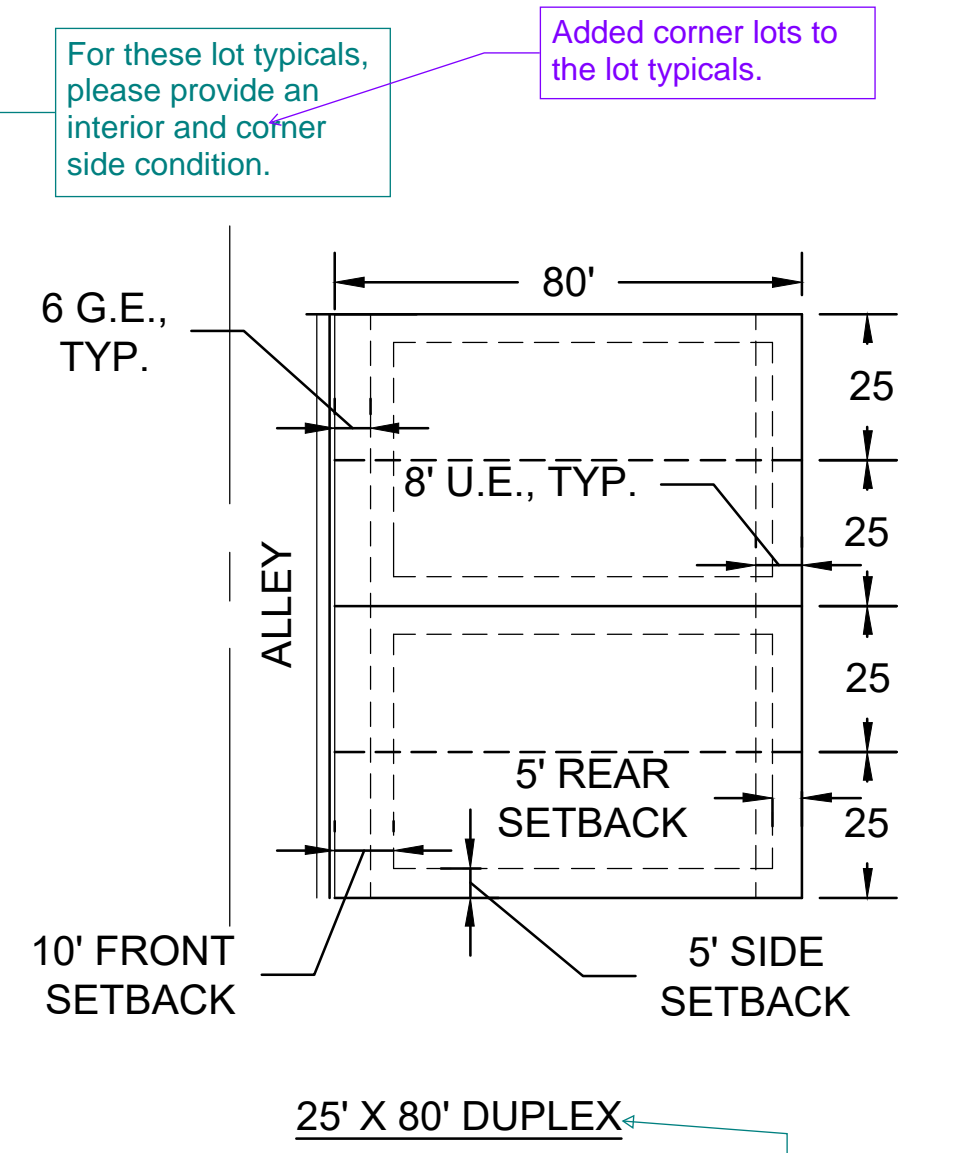
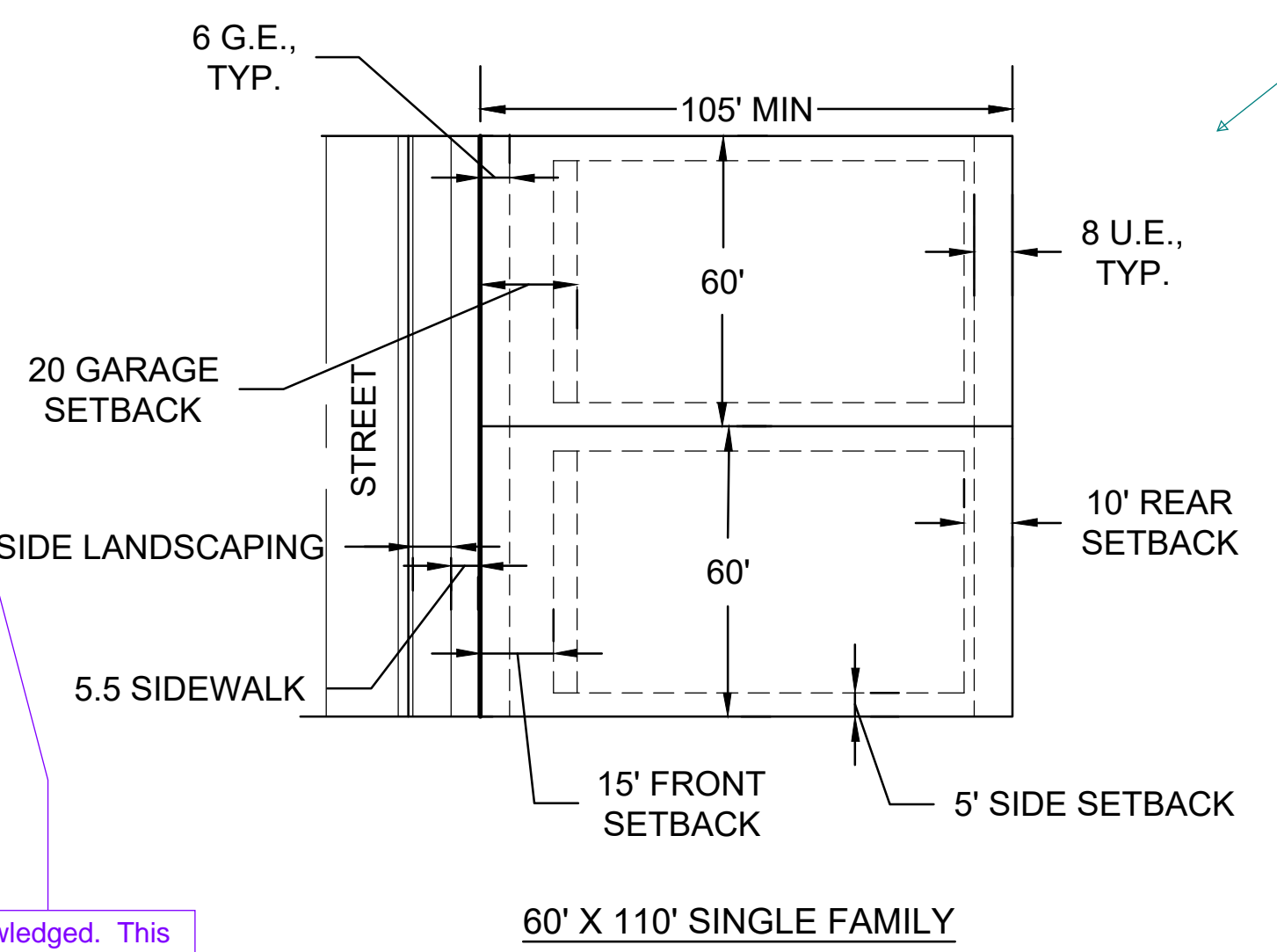
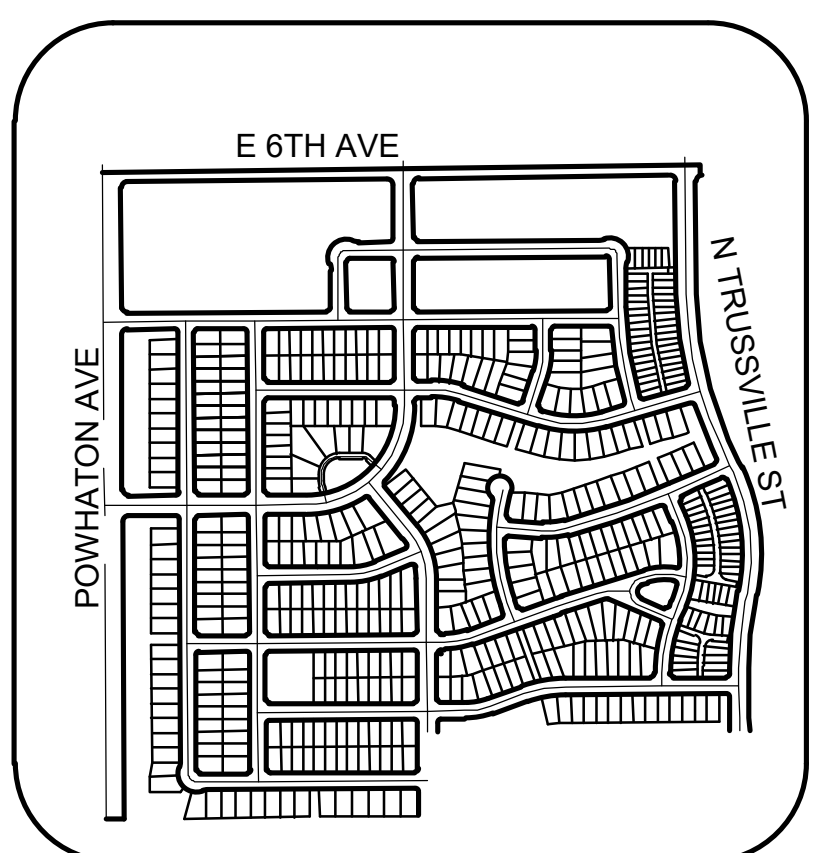


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LOT TYPE LEGEND

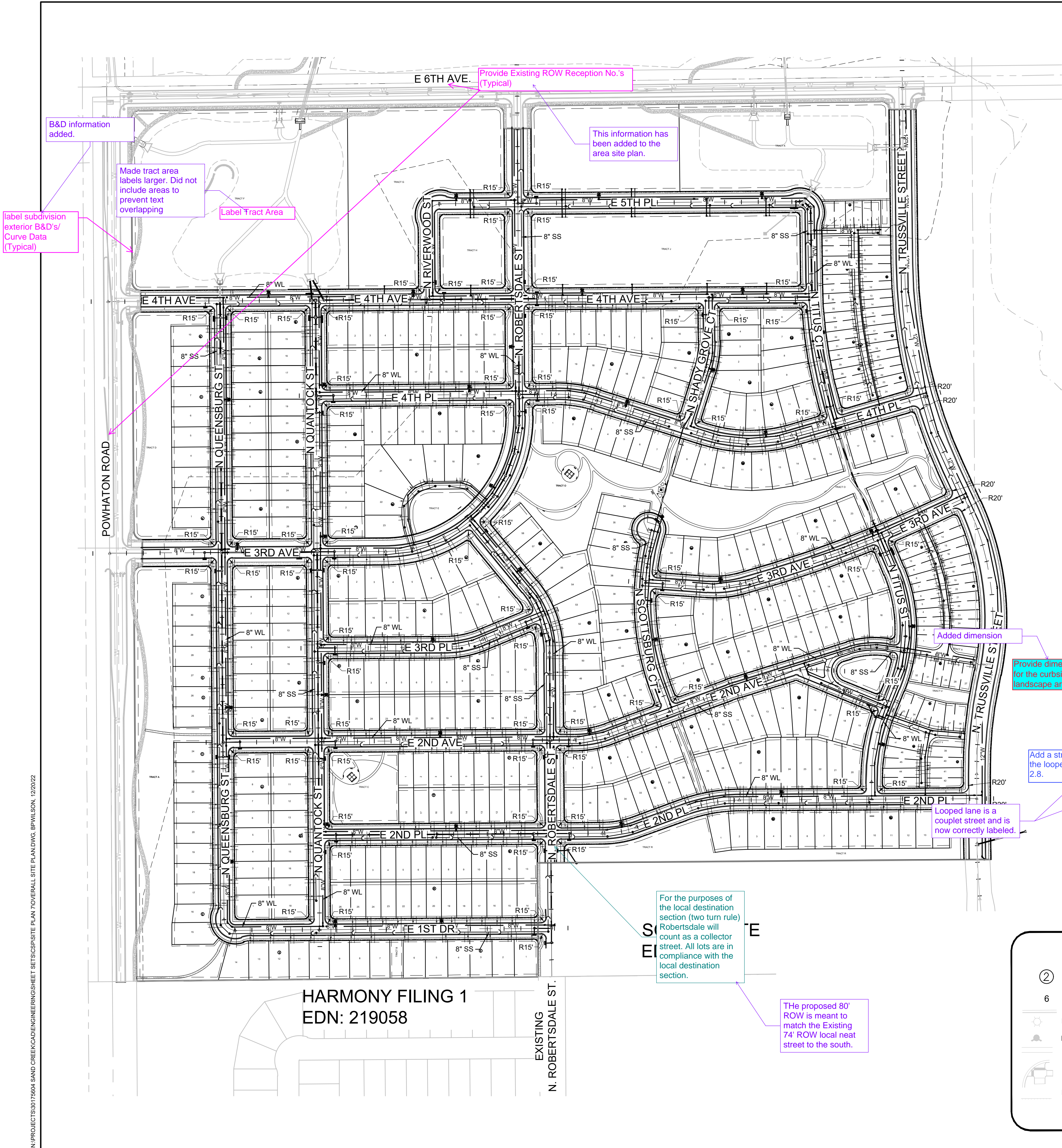
UNIT COUNT		
56		FRONT LOAD HOMES SINGLE FAMILY DWELLING 60' X 110' (LARGE)
189		FRONT LOAD HOMES SINGLE FAMILY DWELLING 50' X 110' (STANDARD)
165		FRONT LOAD HOMES SINGLE FAMILY DWELLING 45' X 110' (SMALL)
90		ALLEY LOADED HOMES FAMILY ATTACHED (DUPLEX) 50' X 80'
		OPEN SPACE / PARK



SHEET NUMBER	1.3	DRAWN BY: D.J.G.	CHECKED BY: B.P.W.	DATE: DECEMBER 2022	SCALE: AS SHOWN	FILE NO: 8130214922	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 OVERALL LOT TYPE	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	Westwood 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodpro.com Westwood Professional Services, Inc.	No.	Revisions	Date	Init.	Appr.	Date



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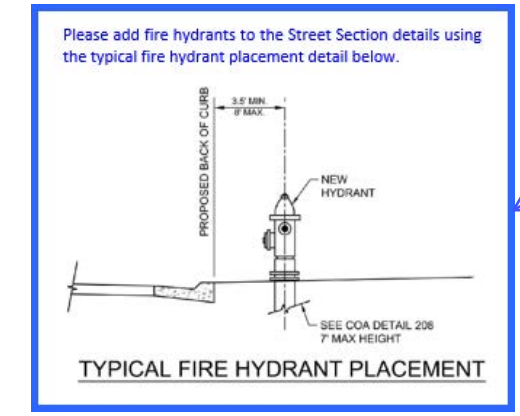
- NOTES:
1. TYPICAL CURB & GUTTER RETURN RADII PER TABLE 4.04.5.03 OF THE ROADWAY MANUAL. SEE AREA SITE PLANS FOR DETAILS.
  2. ALL PROPOSED INTERSECTIONS ARE CLASSIFIED AS FULL MOVEMENT EXCEPT THE INTERSECTION OF POWHATON AND E 4TH AVE, WHICH IS A RIGHT IN, RIGHT OUT INTERSECTION.

**Public Works Roadway Design and Construction Specifications**

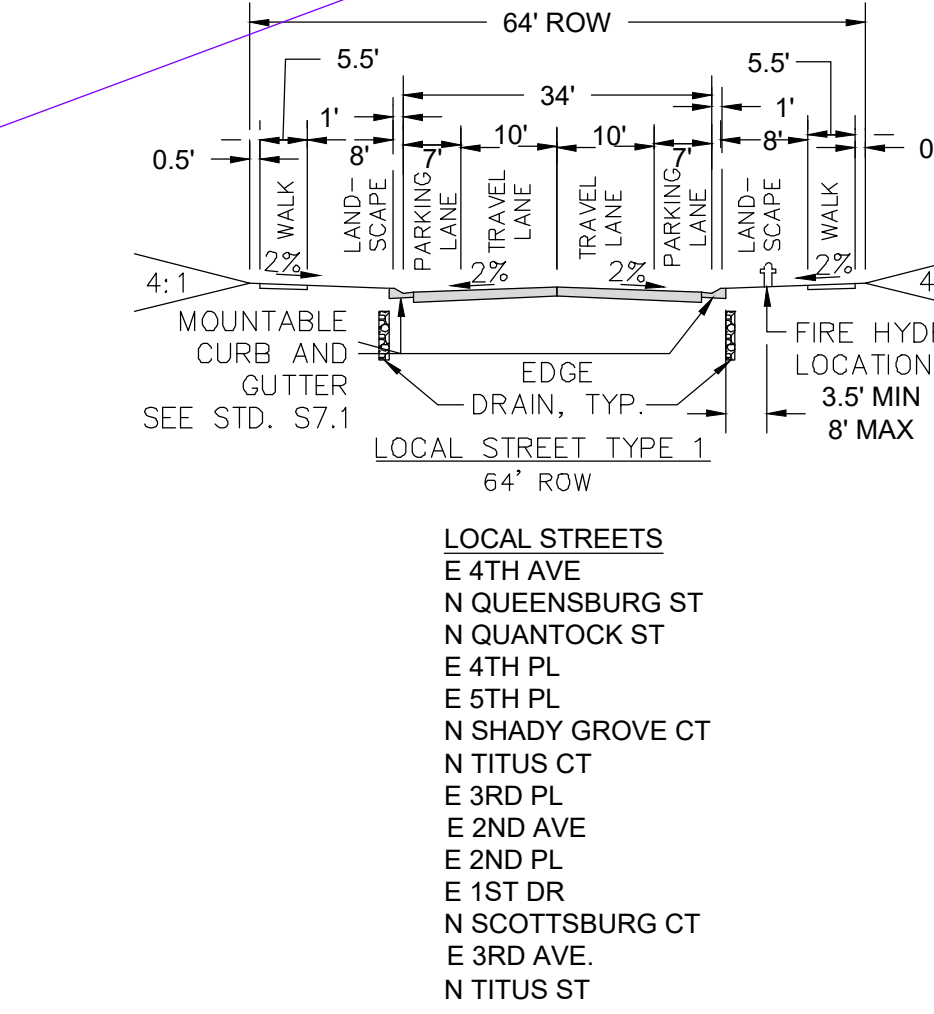
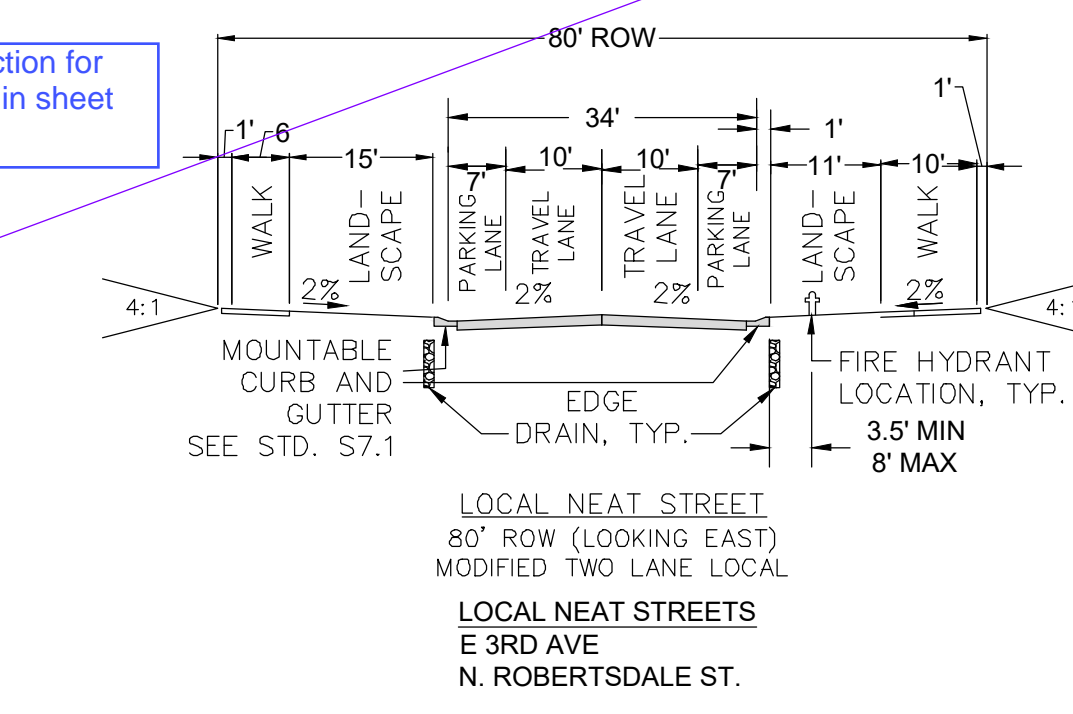
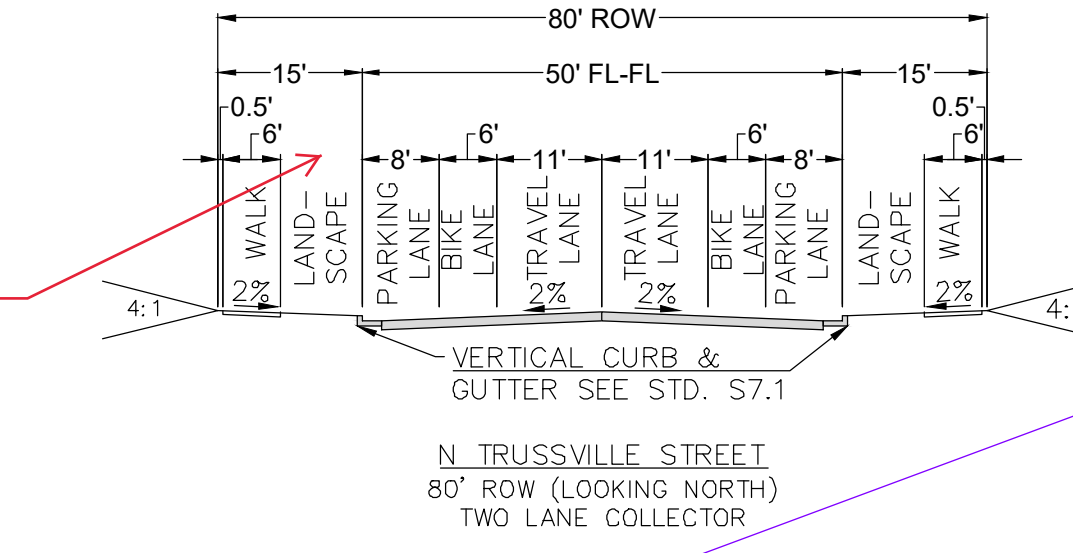
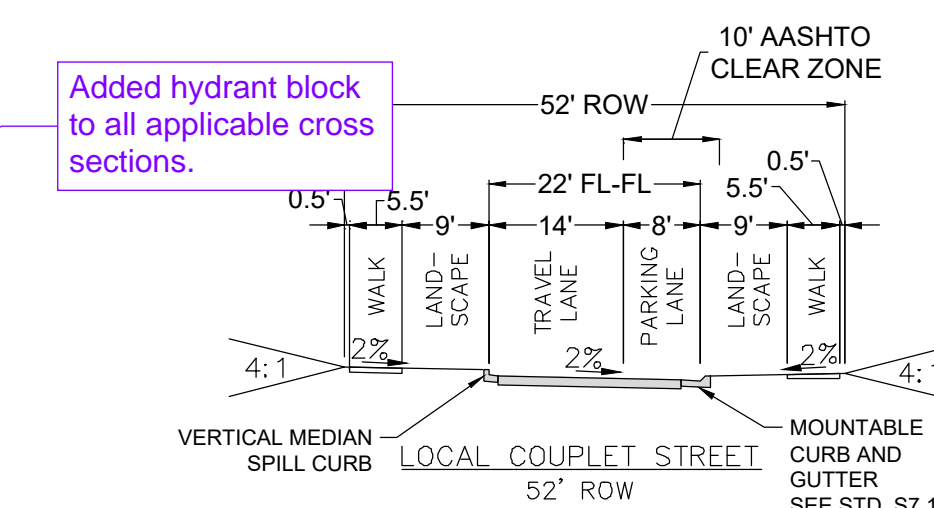
- 4.04.1.06 Dead end streets (public or private) shall have a turnaround at the end within a minimum property line radius of 55 feet and a minimum flow line radius of 45 feet. If two or more curb cuts with hard paved driveways are provided, then the minimum property line radius shall be 45 feet and the minimum flow line radius shall be 35 feet. Hammerhead turnarounds, where permitted by the City Engineer, shall be posted at all times for "No Parking - Fire Lane" and shall not be utilized for any purpose other than emergency vehicle access.

**OPTIONS:**

- Where approved by the Public Works City Engineer and Fire/Life Safety Group within the Aurora Building Division, a temporary alternative surfacing material within the cul-de-sac bulb could be an option. Along with the Public Works requirements and specifications, Fire/Life Safety will require the following:
  - In the area where the alternative surfacing material is utilized within the cul-de-sac bulb it will be dedicated as a public street or designated as a private street built to a public street standard. Where these two options are not utilized, a dedicated fire lane easement must be provided through our Public Works Real Property Group.
  - Use of alternative fire lane surfacing materials other than asphalt or concrete will require a license agreement through Public Works Real Property Group. The license agreement must reflect a termination date for the temporary use of the surfacing material and construction of roadway to the Public Works standards.
  - The alternative surfacing material utilized must support a minimum imposed live load of 85,000 lbs. with a maximum axle load designated by the Public Works standard.



ALL FIRE HYDRANTS SHALL BE LOCATED NOT LESS THAN THREE FEET - SIX INCHES (3'- 6") AND NOT MORE THAN EIGHT FEET (8') FROM THE BACK OF CURB TO THE CENTER OF THE HYDRANT AND BE UNOBSTRUCTED ON THE STREET SIDE. MINIMUM CLEARANCE ON ALL OTHER SIDES SHALL BE FIVE FEET (5'). FIRE HYDRANTS MUST BE GRADE STAKED IN THE FIELD. FIRE HYDRANTS ARE NOT ALLOWED IN SIDEWALKS.



**LEGEND**

② BLOCK NUMBER OF HARMONY SUBDIVISION	PROP MID-BLOCK RAMP(METRO)	PROP CONCRETE PAN (METRO)	PROP LANDSCAPE BENCH(METRO)
6 LOT NUMBER	STREET CENTERLINE	PROP FENCING/POSTS(METRO)	SIGHT TRIANGLE LINE
PROP CURB & GUTTER(METRO)	PUBLIC STREET	DESIGNATED SMALL LOT	PROPOSED CONCRETE PAN
PROP LIGHT POLE(METRO)	RIGHT-OF-WAY	PROPOSED MID-BLOCK RAMP	PROPOSED MANHOLE
EXISTING FIRE HYDRANT	PROPERTY LOT LINE	PROPOSED CURB & GUTTER	
PROP CURB RETURN SIDEWALK(METRO)	EDGE OF PAVEMENT	PROPOSED LIGHT POLE	
PROP CURB RETURN SIDEWALK RAMP "HCR" (METRO)	SECTION LINE	PROPOSED FIRE HYDRANT	
PROP TEMPORARY ROAD BARRIER (METRO)	PROPOSED EASEMENT	PROPOSED SIDEWALK	
	EXISTING EASEMENT	PROPOSED CURB RETURN SIDEWALK RAMP	
	CSP BOUNDARY	PROPOSED TEMPORARY ROAD BARRIER	
	FILING BOUNDARY		
	PEDESTRIAN ACCESSIBILITY ROUTE		

HARMONY FILING 1  
EDN: 219058

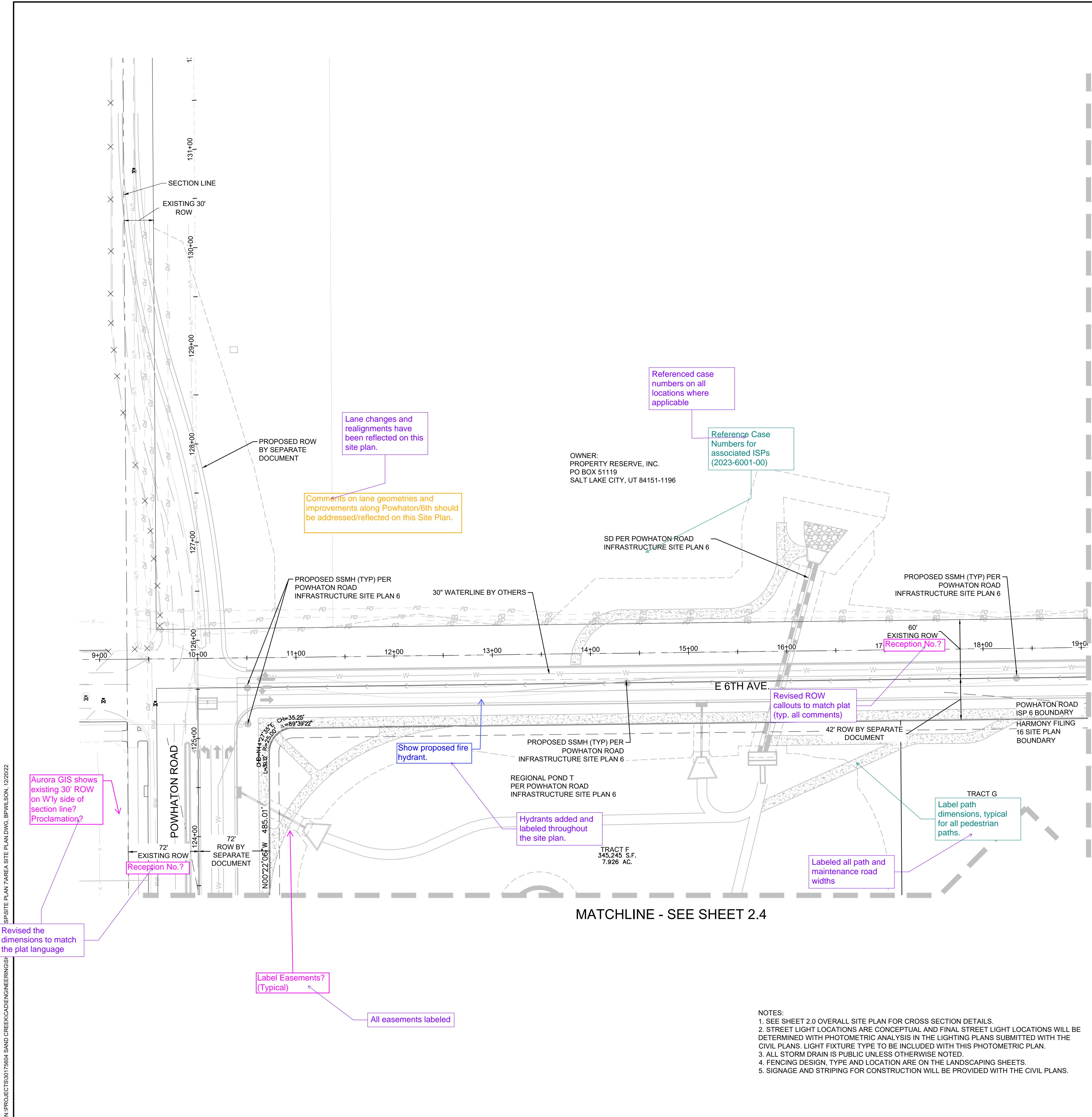
For the purposes of the local destination section (two turn rule) Robertsdale will count as a collector street. All lots are in compliance with the local destination section.

The proposed 80' ROW is meant to match the Existing 74' ROW local neat street to the south.

SHEET NUMBER	DRAWN BY: STF	CHECKED BY: BPW	DATE: DECEMBER 2022	SCALE: AS SHOWN	FILE NO: 8130214922	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 OVERALL SITE PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	Westwood 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodpro.com Westwood Professional Services, Inc.	No.	Revisions	Date	Init.	Appr.	Date



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**LEGEND**

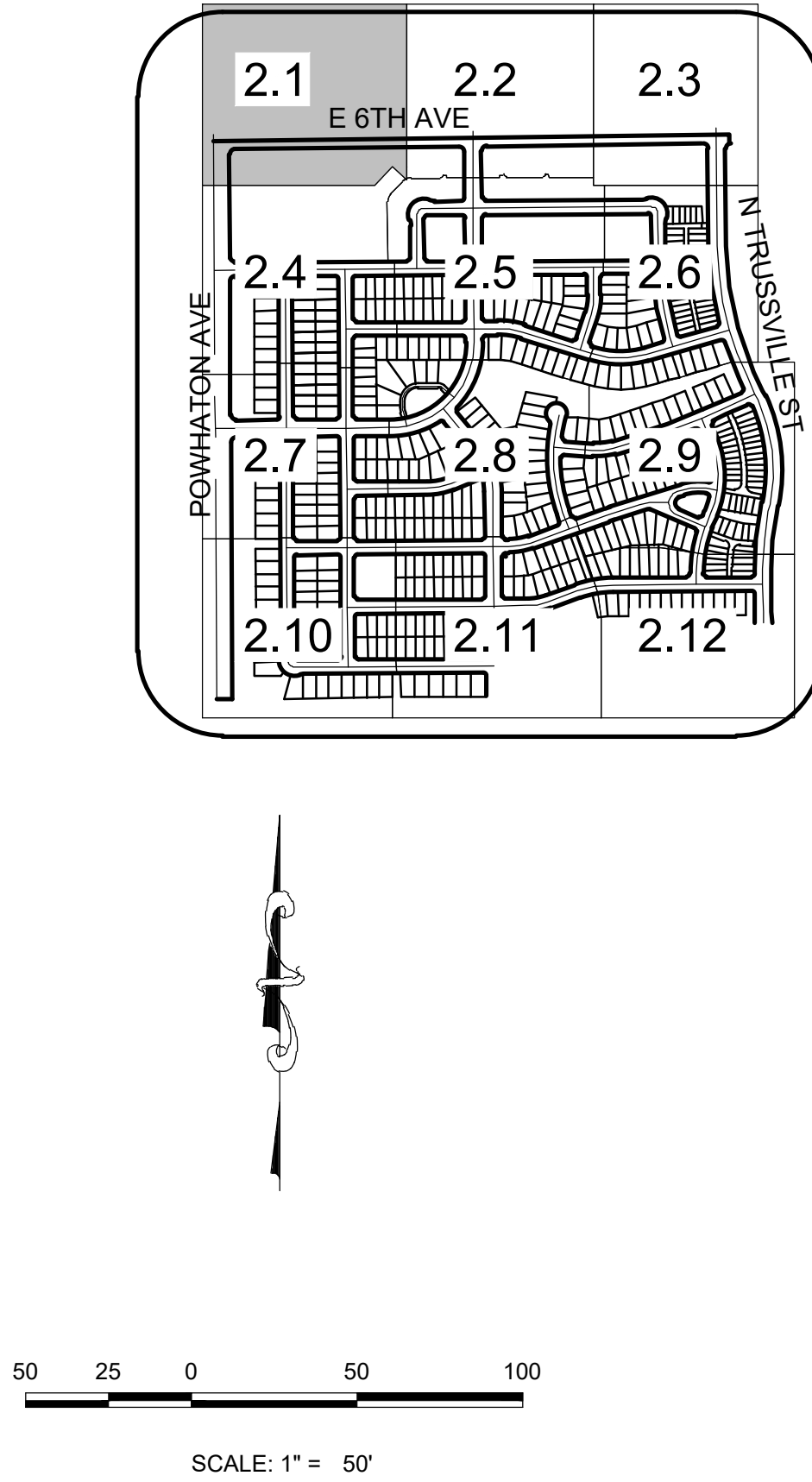
② BLOCK NUMBER OF HARMONY SUBDIVISION	PROPOSED MID-BLOCK RAMP(METRO)
6 LOT NUMBER	STREET CENTERLINE
PROPOSED CURB & GUTTER(METRO)	PUBLIC STREET
PROPOSED LIGHT POLE(METRO)	RIGHT-OF-WAY
EXISTING FIRE HYDRANT	PROPERTY LOT LINE
PROPOSED SIDEWALK(METRO)	EDGE OF PAVEMENT
PROPOSED CURB RETURN SIDEWALK RAMP "HCR" (METRO)	SECTION LINE
PROPOSED TEMPORARY ROAD BARRIER (METRO)	PROPOSED EASEMENT
PROPOSED CONCRETE PAN (METRO)	EXISTING EASEMENT
PROPOSED CURB & GUTTER	CSP BOUNDARY
PROPOSED LIGHT POLE	FILING BOUNDARY
PROPOSED FIRE HYDRANT	PEDESTRIAN ACCESSIBILITY ROUTE
PROPOSED SIDEWALK	PROPOSED LANDSCAPE BENCH(METRO)
PROPOSED CURB RETURN SIDEWALK RAMP	PROPOSED FENCING/POSTS(METRO)
PROPOSED TEMPORARY ROAD BARRIER	SIGHT TRIANGLE LINE
	DESIGNATED SMALL LOT
	PROPOSED CONCRETE PAN
	PROPOSED BUILDING ENVELOPE
	PROPOSED MID-BLOCK RAMP
	PROPOSED MANHOLE

**NOTES:**

- SEE SHEET 2.0 OVERALL SITE PLAN FOR CROSS SECTION DETAILS.
- STREET LIGHT LOCATIONS ARE CONCEPTUAL AND FINAL STREET LIGHT LOCATIONS WILL BE DETERMINED WITH PHOTOMETRIC ANALYSIS IN THE LIGHTING PLANS SUBMITTED WITH THE CIVIL PLANS. LIGHT FIXTURE TYPE TO BE INCLUDED WITH THIS PHOTOMETRIC PLAN.
- ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED.
- FENCING DESIGN, TYPE AND LOCATION ARE ON THE LANDSCAPING SHEETS.
- SIGNAGE AND STRIPING FOR CONSTRUCTION WILL BE PROVIDED WITH THE CIVIL PLANS.

**SIGNAGE:**

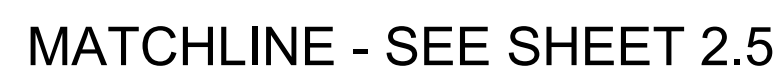
A STOP R1-1 30"x30" SINGLE LANE 36"x36" MULT-LANE	B E Main St D3-1 VARIES X 12"	C YIELD R1-2 36"x36" SINGLE LANE 48"x48" MULT-LANE	D DO NOT ENTER R5-1 30"x30" SINGLE LANE 36"x36" MULT-LANE	E ONE WAY R6-1 36"x12" SINGLE LANE 54"x18" MULT-LANE	F SPEED LIMIT 25 R2-1 24"x30" SINGLE LANE 30"x36" MULTI-LANE
G HERE TO GO R1-5 36"x36"	H FLASHING BEACON REQUIRED AT UNCONTROLLED INTERSECTIONS	I W11-2 30"x30" SINGLE LANE 36"x36" MULT-LANE	J R3-2 24"x24" SINGLE LANE 36"x36" MULT-LANE	K W2-6 24"x24" SINGLE LANE 36"x36" MULTI-LANE	L W16-9P 24"x12"
M W11-1 30"x30" SINGLE LANE 36"x36" MULT-LANE	N W16-9P 24"x12"	O W11-2 30"x30" SINGLE LANE 36"x36" MULT-LANE	P R8-3 24"x24"		



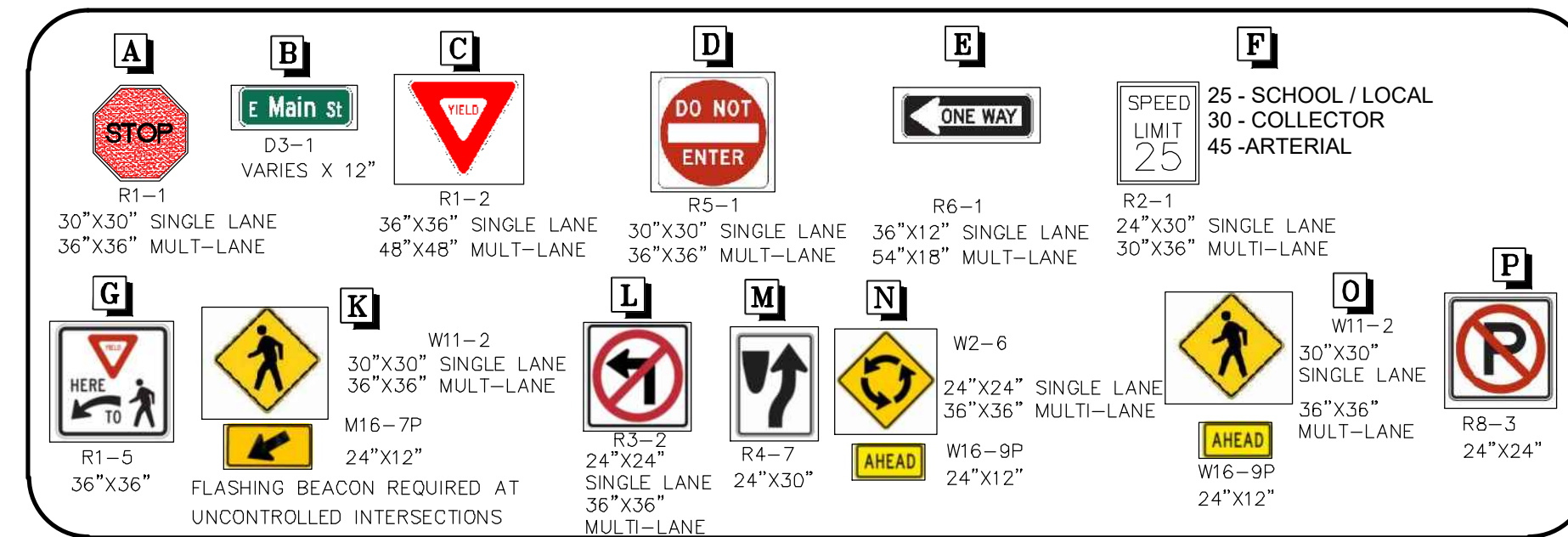
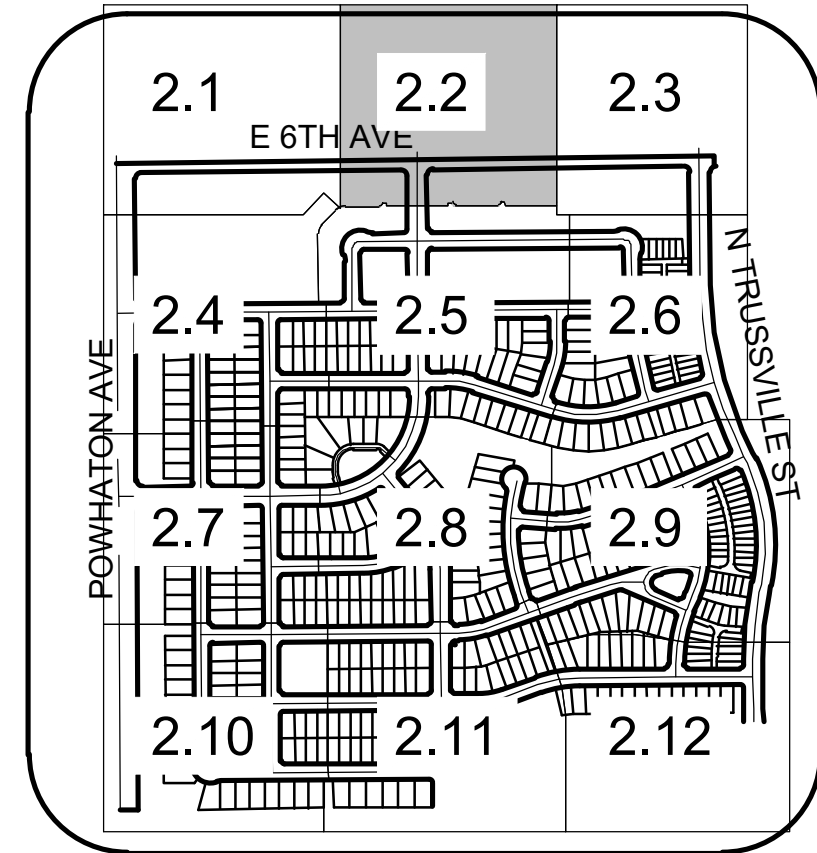
SHEET NUMBER	DRAWN BY: STF	CHECKED BY: BPW	DATE: DECEMBER 2022	SCALE: AS SHOWN	FILE NO: 8130214922	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA SITE PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	Westwood Westwoodps.com 10333 E DRY CREEK RD, SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526	Revisions	No.	Date	Init.	Apr.	Date

**2.1**





- MATCHLINE - SEE SHEET 2.3

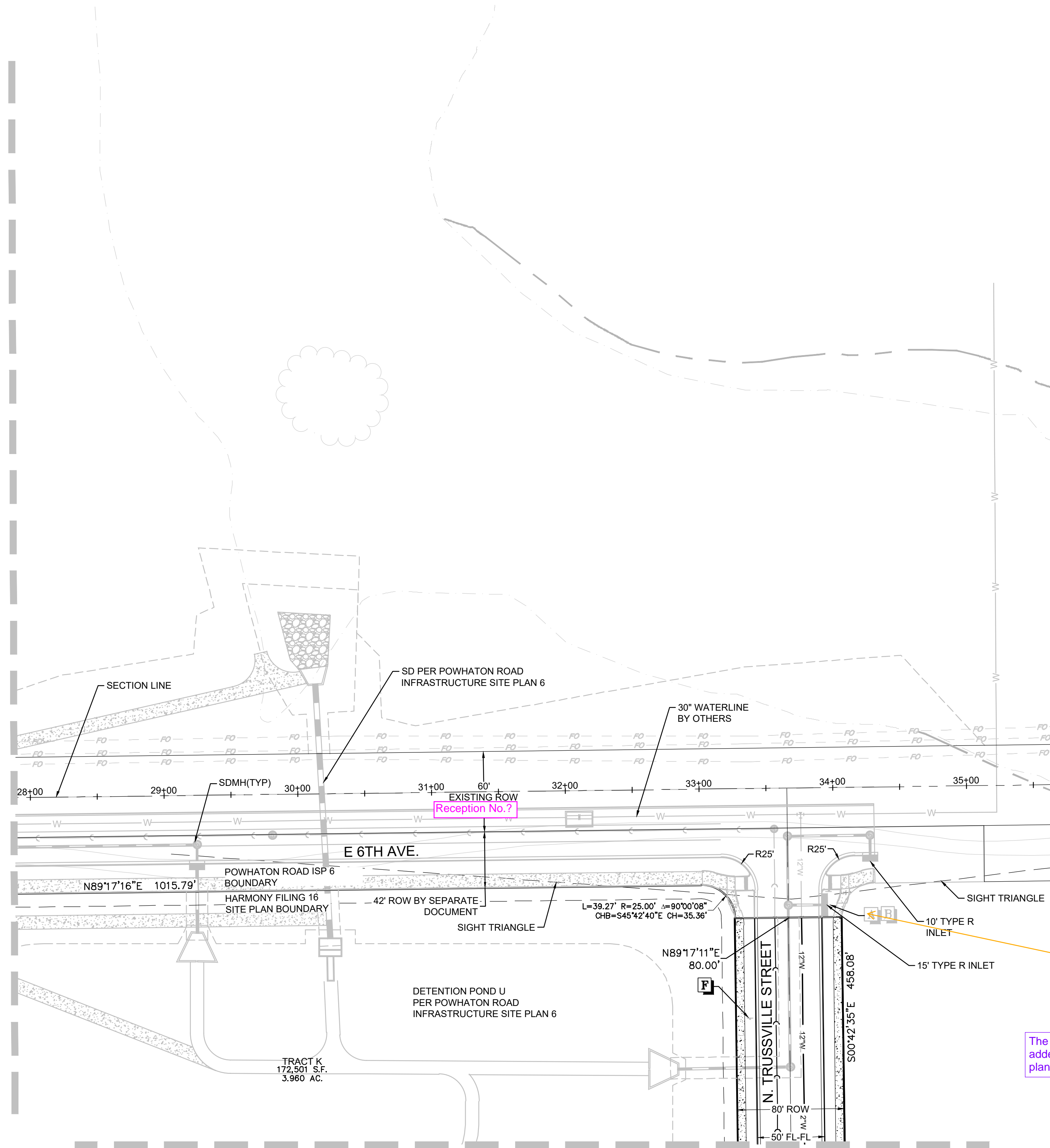


SHEET NUMBER	DRAWN BY:	SCALE:	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA SITE PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	<div>Westwood</div> <div>10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526</div> <div>Westwoods.com Westwood Professional Services, Inc.</div>	<table><thead><tr><th>No.</th><th>Revisions</th><th>Date</th><th>Init.</th><th>Appr.</th><th>Date</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	No.	Revisions	Date	Init.	Appr.	Date																								
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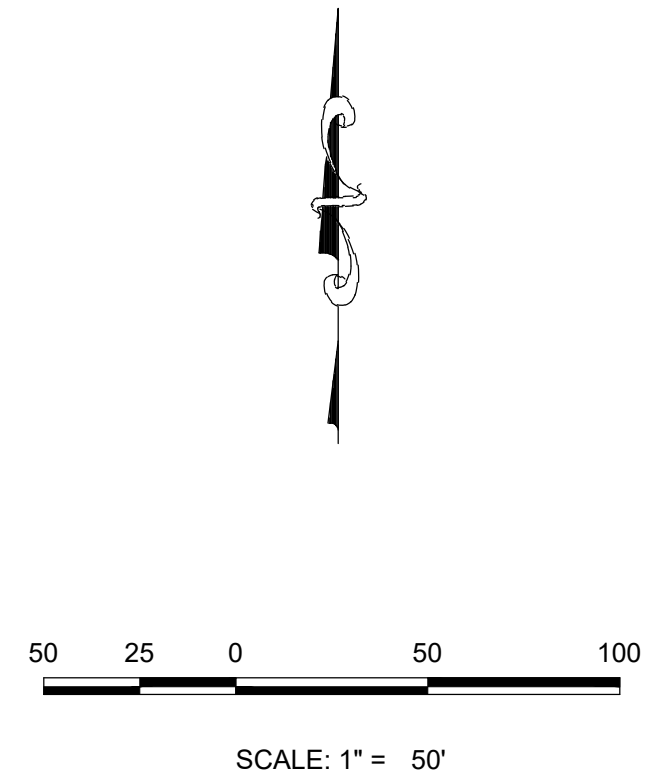
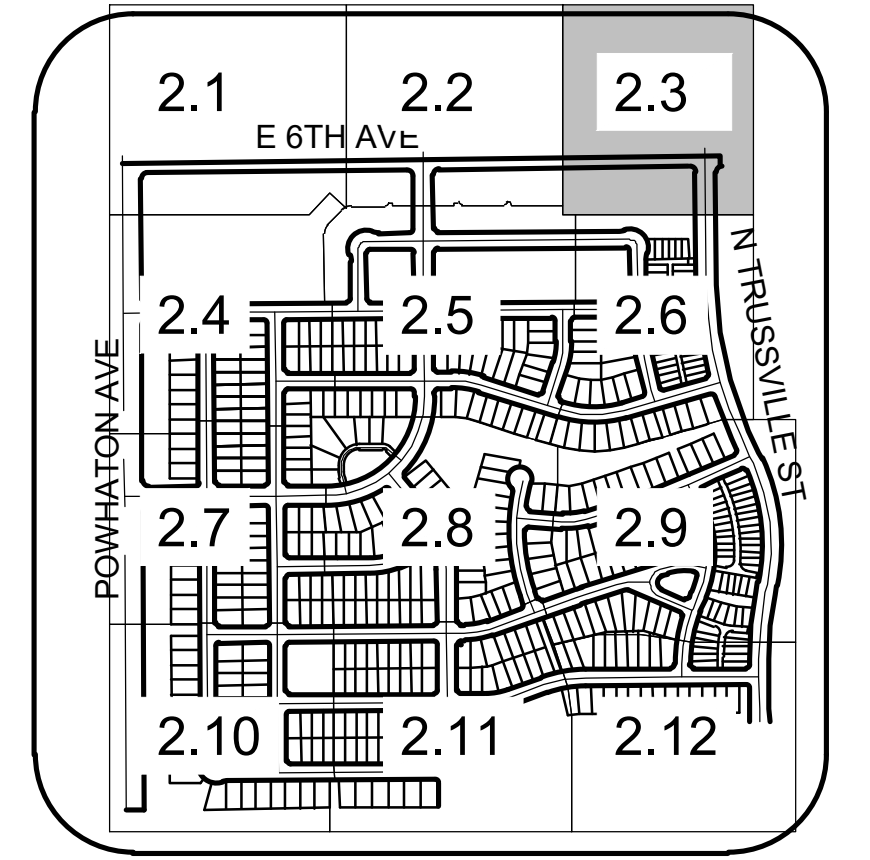
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MATCHLINE - SEE SHEET 2.2



MATCHLINE - SEE SHEET 2.6

- NOTES:
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  2. STREET LIGHT LOCATIONS ARE CONCEPTUAL AND FINAL STREET LIGHT LOCATIONS WILL BE DETERMINED WITH PHOTOMETRIC ANALYSIS IN THE LIGHTING PLANS SUBMITTED WITH THE CIVIL PLANS. LIGHT FIXTURE TYPE TO BE INCLUDED WITH THIS PHOTOMETRIC PLAN.
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**LEGEND**

②	BLOCK NUMBER OF HARMONY SUBDIVISION	—	PROP MID-BLOCK RAMP(METRO)
6	LOT NUMBER	—	STREET CENTERLINE
—	PROP CURB & GUTTER(METRO)	—	PUBLIC STREET
—	PROP LIGHT POLE(METRO)	—	RIGHT-OF-WAY
—	EXISTING FIRE HYDRANT	—	PROPERTY LOT LINE
—	PROP SIDEWALK(METRO)	—	EDGE OF PAVEMENT
—	PROP CURB RETURN SIDEWALK RAMP "HCR" (METRO)	—	SECTION LINE
—	PROP TEMPORARY ROAD BARRIER (METRO)	—	PROPOSED EASEMENT
—	PROP CONCRETE PAN (METRO)	—	EXISTING EASEMENT
—	PROPOSED CURB & GUTTER	—	CSP BOUNDARY
—	PROPOSED LIGHT POLE	—	FILING BOUNDARY
—	PROPOSED FIRE HYDRANT	—	PEDESTRIAN ACCESSIBILITY ROUTE
—	PROPOSED SIDEWALK	—	PROP LANDSCAPE BENCH(METRO)
—	PROPOSED CURB RETURN SIDEWALK RAMP	—	PROP FENCING/POSTS(METRO)
—	PROPOSED TEMPORARY ROAD BARRIER	—	SIGHT TRIANGLE LINE
		—	DESIGNATED SMALL LOT
		—	PROPOSED CONCRETE PAN
		—	PROPOSED BUILDING ENVELOPE
		—	PROPOSED MID-BLOCK RAMP
		—	PROPOSED MANHOLE

<b>A</b> STOP R1-1 30"x30" SINGLE LANE 36"x36" MULT-LANE	<b>B</b> E Main St VARIES X 12" R1-2 36"x36" SINGLE LANE 48"x48" MULT-LANE	<b>C</b> YIELD R1-2 36"x36" SINGLE LANE 48"x48" MULT-LANE	<b>D</b> DO NOT ENTER R5-1 30"x30" SINGLE LANE 36"x36" MULT-LANE	<b>E</b> ONE WAY R6-1 36"x12" SINGLE LANE 54"x18" MULT-LANE	<b>F</b> SPEED LIMIT 25 R2-1 24"x30" SINGLE LANE 30"x36" MULTI-LANE
<b>G</b> HERE TO R1-5 36"x36"	<b>H</b> FLASHING BEACON REQUIRED AT UNCONTROLLED INTERSECTIONS R1-5 36"x36"	<b>I</b> W11-2 30"x30" SINGLE LANE 36"x36" MULT-LANE M16-7P 24"x12"	<b>J</b> R3-2 24"x24" SINGLE LANE 36"x36" MULT-LANE	<b>K</b> W11-2 30"x30" SINGLE LANE 36"x36" MULT-LANE M16-7P 24"x12"	<b>L</b> W2-6 24"x24" SINGLE LANE 36"x36" MULTI-LANE W16-9P 24"x12"
<b>M</b> R4-7 24"x30"	<b>N</b> W11-2 30"x30" SINGLE LANE 36"x36" MULT-LANE M16-7P 24"x12"	<b>O</b> W11-2 30"x30" SINGLE LANE 36"x36" MULT-LANE M16-7P 24"x12"	<b>P</b> R8-3 24"x24"		

**Westwood**  
10333 E DRY CREEK RD.  
SUITE 240  
ENGLEWOOD, CO 80112  
TEL: 720.482.9526  
Westwoodps.com  
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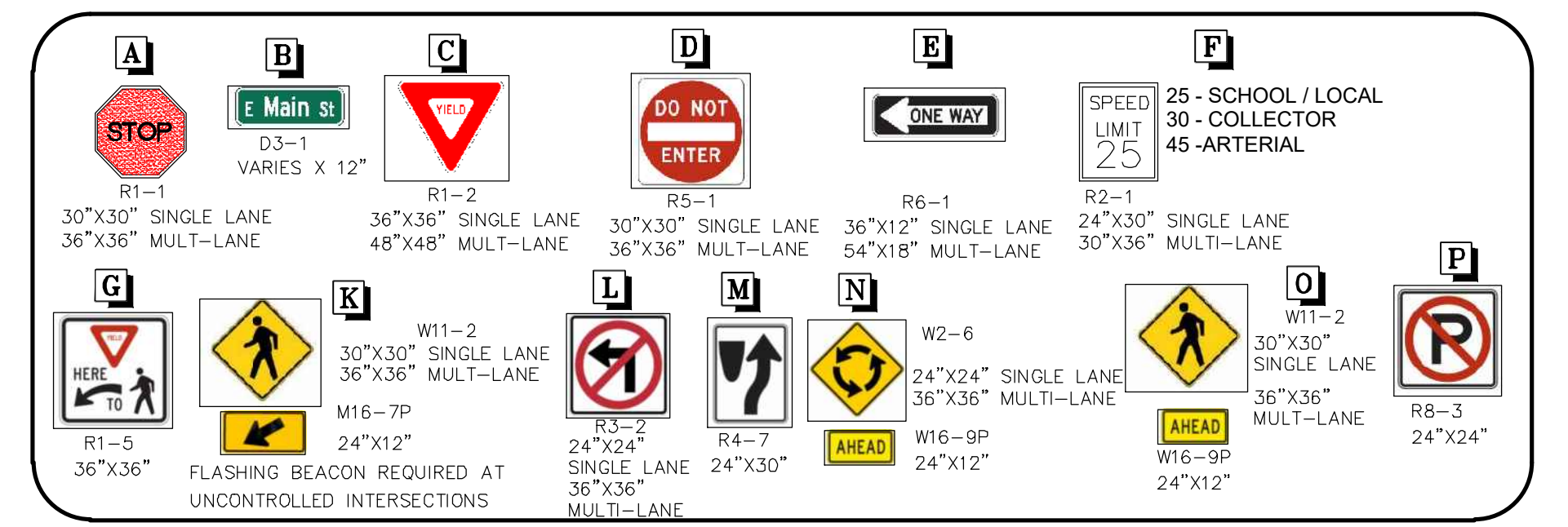
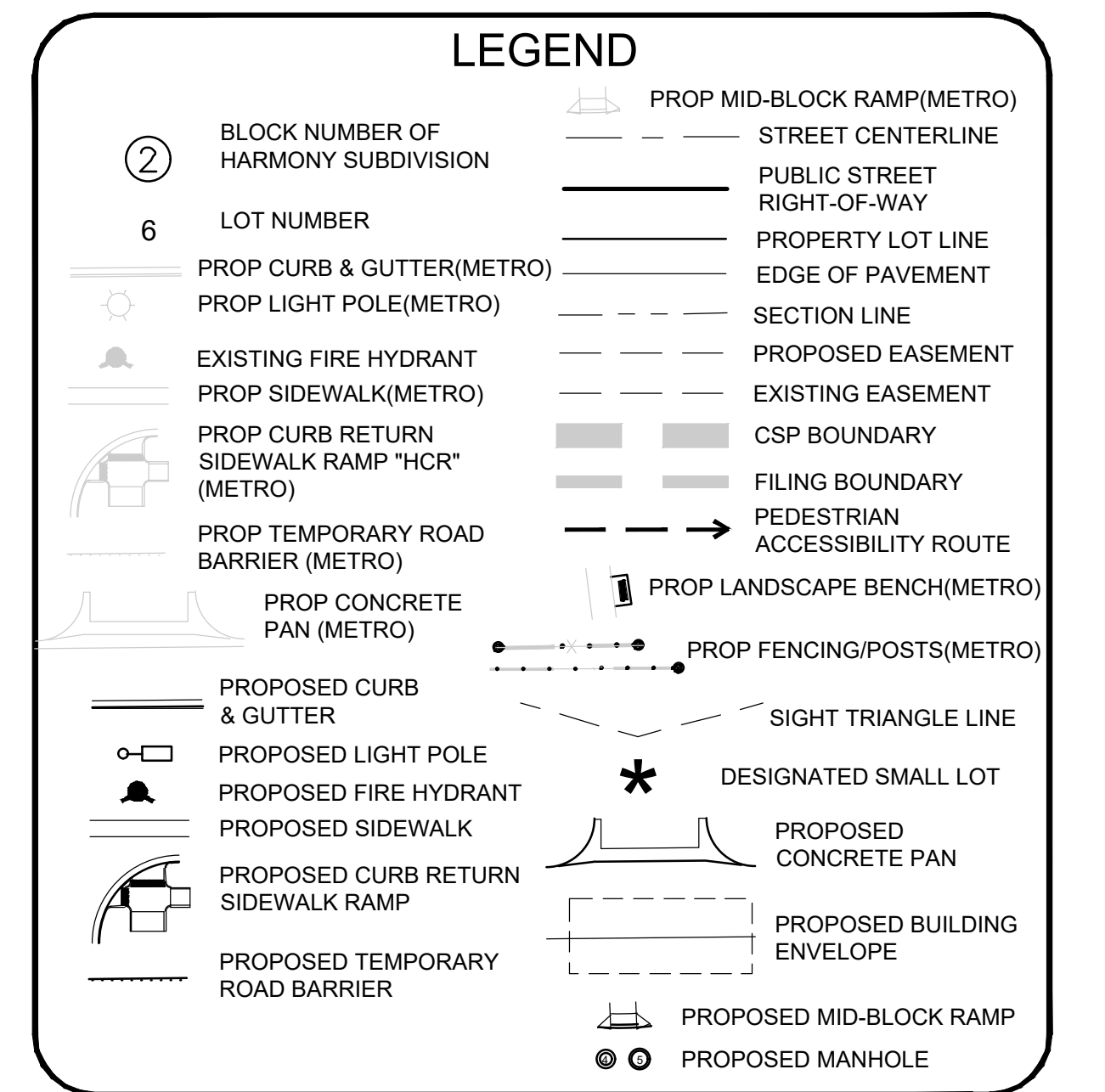
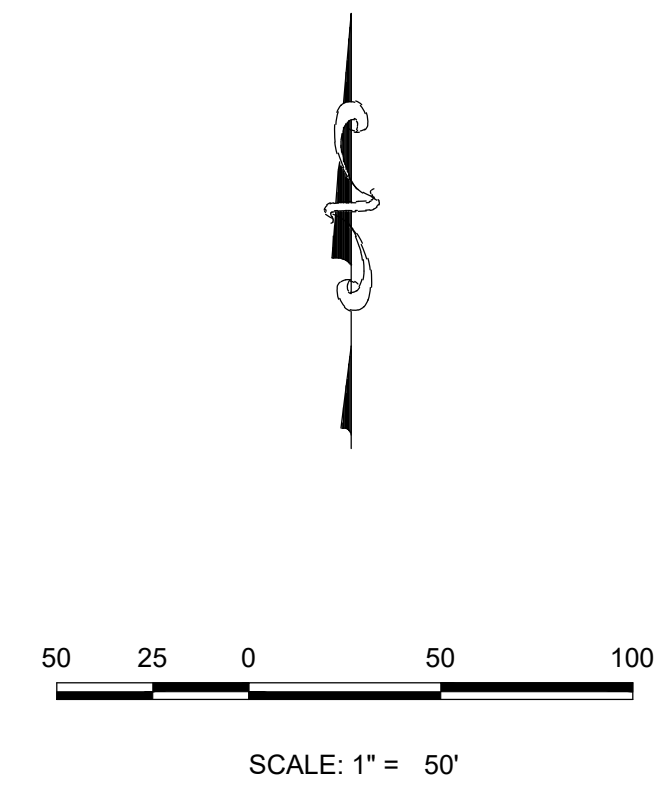
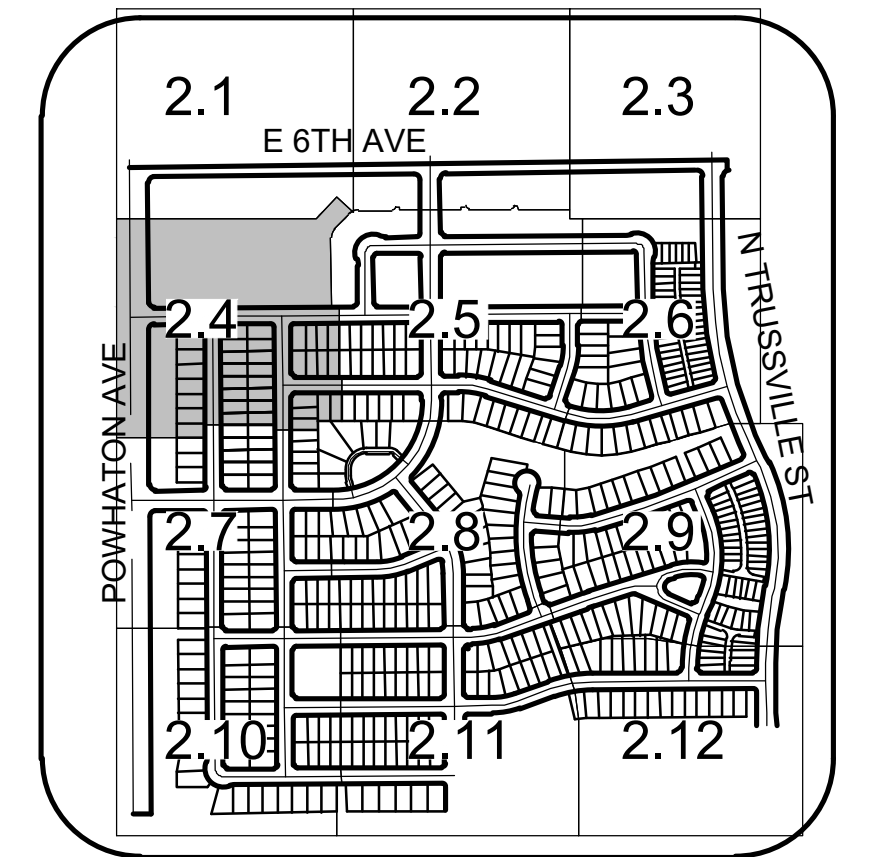
**Melcor/TC Aurora, LLC**  
C/O Marathon Land Company  
9750 W. Cambridge Place  
Littleton, CO 80127  
Tel: (303) 920-9400 Fax: (303) 920-9440

**HARMONY SUBDIVISION**  
CIVIL SITE PLAN NO. 6  
AREA SITE PLAN

SCALE: AS SHOWN  
DRAWN BY: STF  
CHECKED BY: BPW  
FILE NO: 8130214922  
DATE: DECEMBER 2022

SHEET NUMBER  
**2.3**





NOTES:

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MATCHLINE - SEE SHEET 2.1

MATCHLINE - SEE SHEET 2.5

MATCHLINE - SEE SHEET 2.7

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**Westwood**

10333 E DRY CREEK RD.  
SUITE 240  
ENGLEWOOD, CO 80112  
TEL: 720.482.9526

[Westwoodps.com](http://Westwoodps.com)  
Westwood Professional Services, Inc.

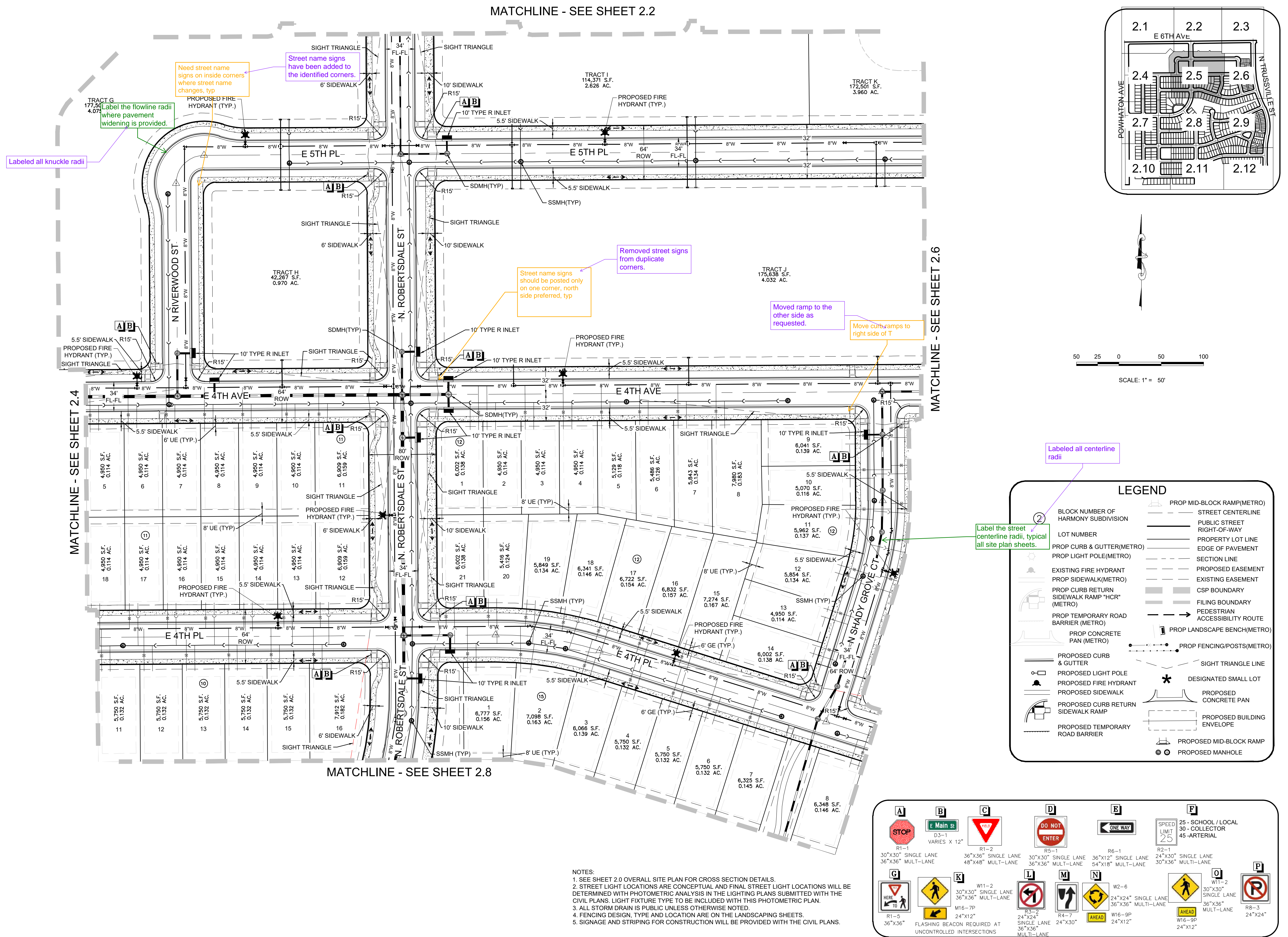
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CIVIL SITE PLAN NO. 6  
AREA SITE PLAN**

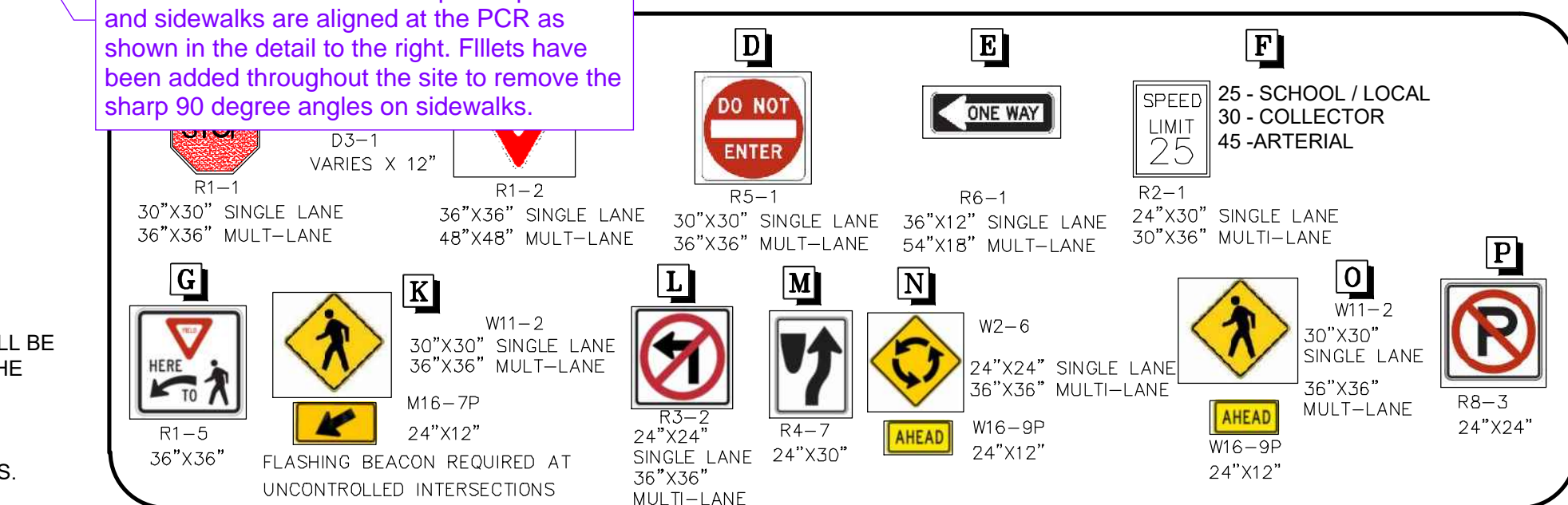
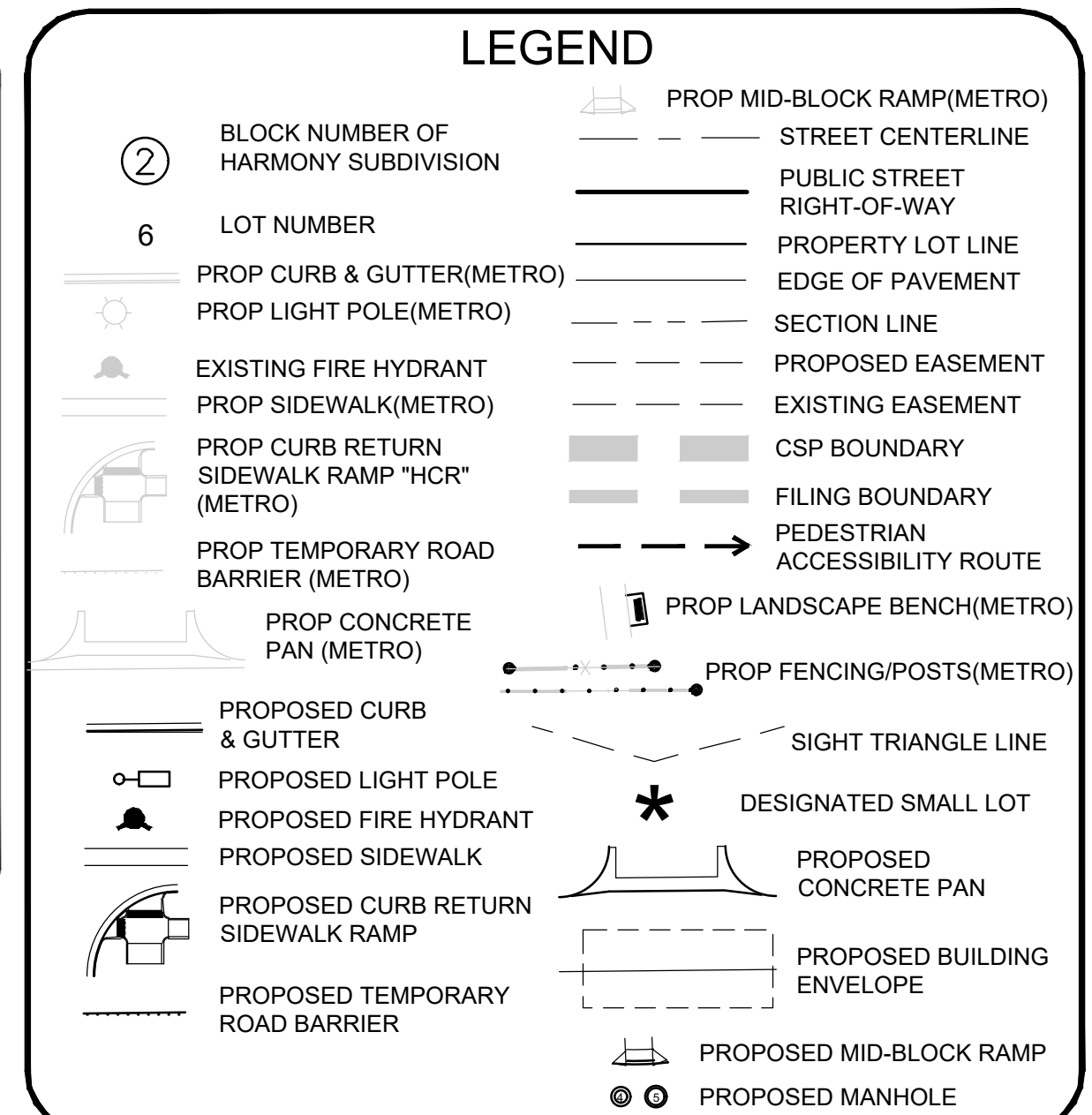
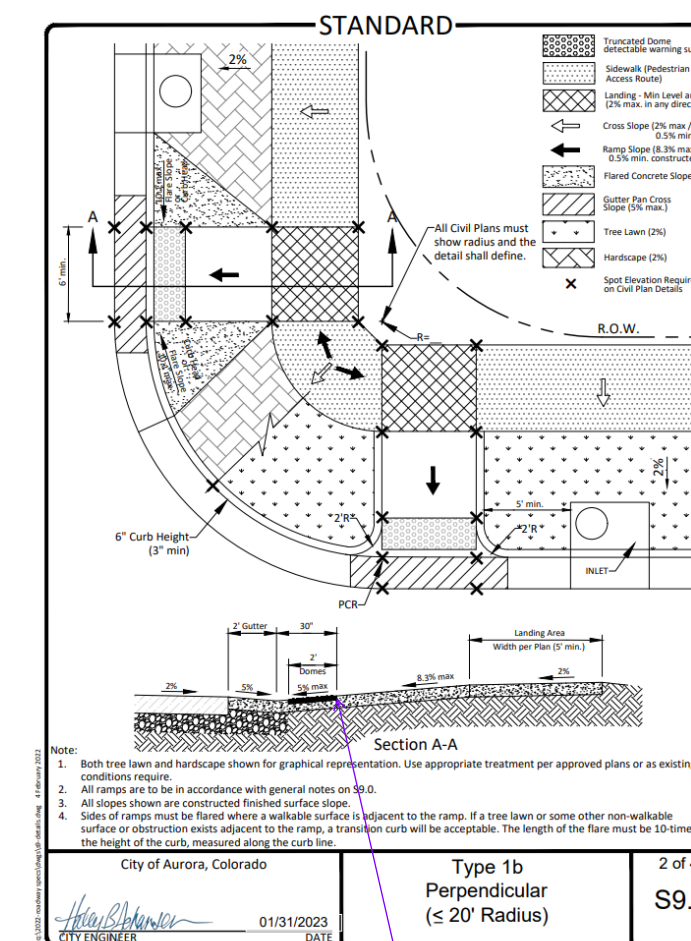
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DATE:	
DECEMBER 2022	

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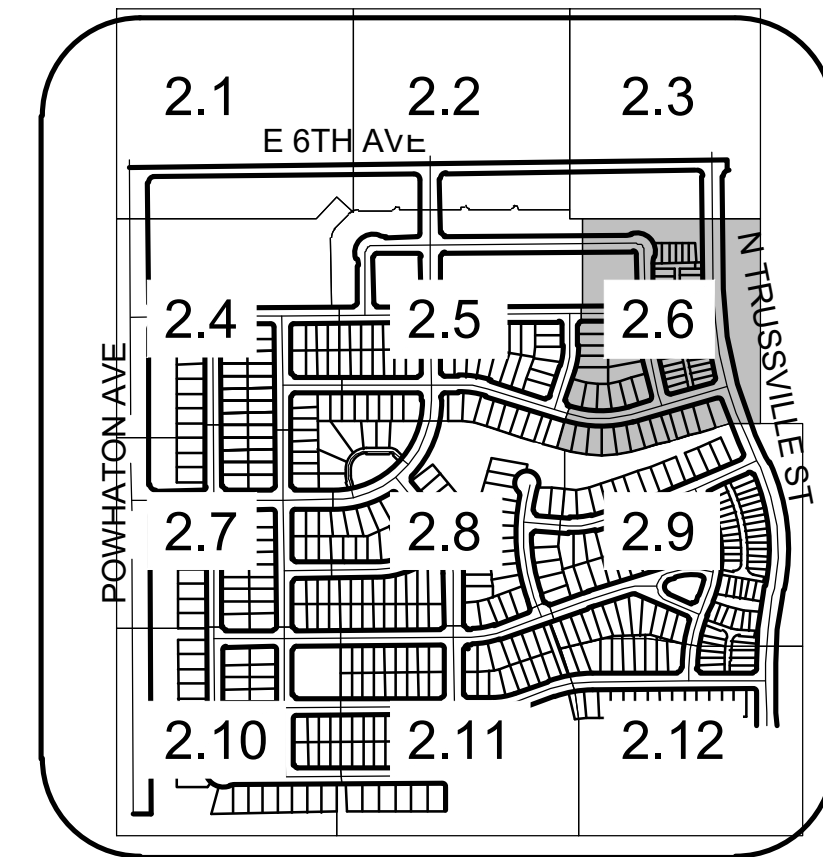
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50 25 0 50 100

SCALE: 1" = 50'

FUTURE  
HARMONY

SECTION LINE -

Sight triangles have been moved behind the ramps.

Reposition sight triangles to be at the stop sign, typ.

Curb ramps should be as close as possible to the intersection, and as much as possible have the sidewalk lead into a ramp, typ several locations

The ramps and sidewalk alignments along the site are designed to std detail S9.1 per the revised 2023 standards. Ramps are placed and sidewalks are aligned at the PCR as shown in the detail to the right. Fillets have been added throughout the site to remove the sharp 90 degree angles on sidewalks.

Show how this alley connects to the street, typical.

Driveway linework added to display alley connections.

Revised alley ROW corners to ensure fire truck turn radius requirements.

The minimum inside turning radius of a 23' Fire Lane is 29'. The minimum outside turning radius is 52'. These turns do not appear to be compliant.

The ramps have been left on the north side of the intersection. Shifting to the south would not allow the crossing to line up with a lot line and there is crowding with the proposed 10' inlet.

Move curb ramps to

# ATCHLINE - SEE SHEET 2.3

Is this a sidewalk through

Is this an intended sidewalk/pathway through the tract?

Yes, thank you,  
labeled sidewalk

Ramp has been moved to the other side of the street to align correctly.

PROJECTS\30175604 SAND CREEK\CAD\ENGINEERING\SHEET SETS\CSP\SITE PLAN 7\AREA SITE PLAN.DWG. BP\WILSON, 12/20/22



Aurora GIS shows existing 30' ROW on W/ly side of section line? Proclamation?

Revised the dimensions to match the plat language

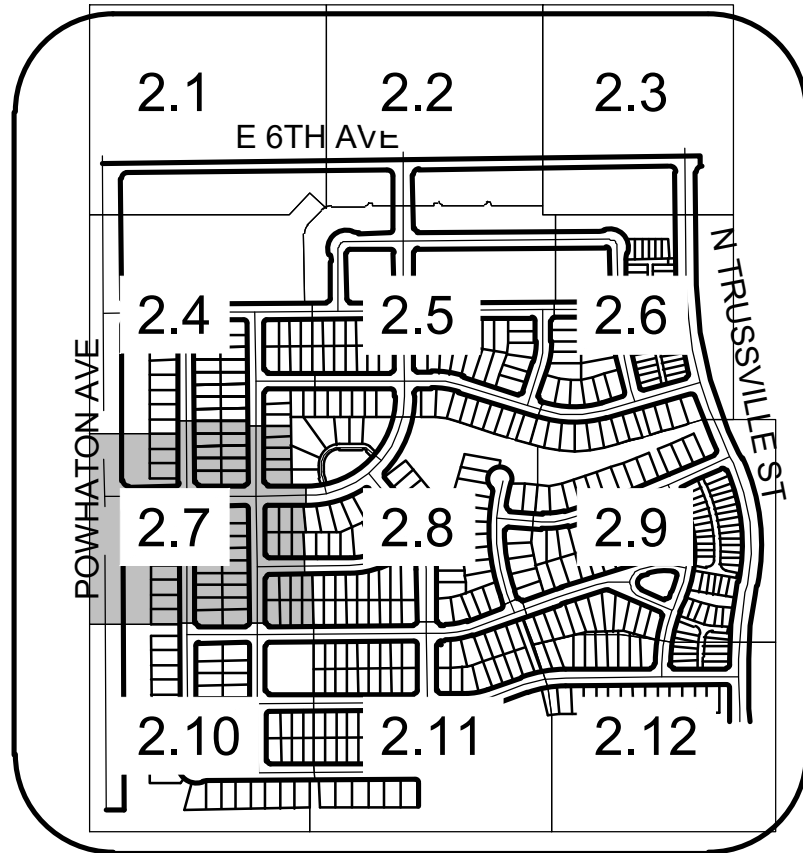
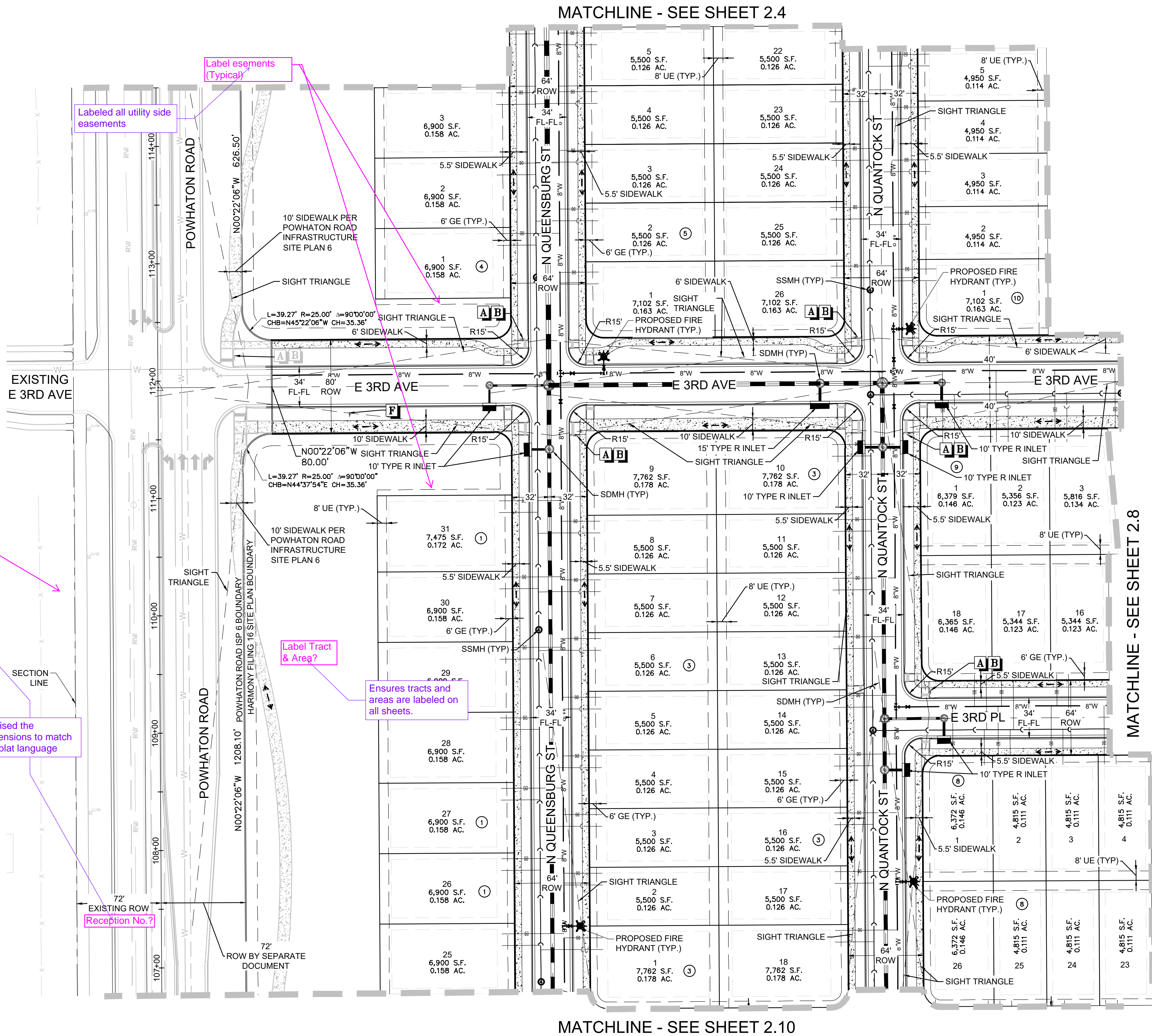
Reception No.?

Label easements (Typical)

Labeled all utility side easements

Label Tract & Area?

Ensures tracts and areas are labeled on all sheets.



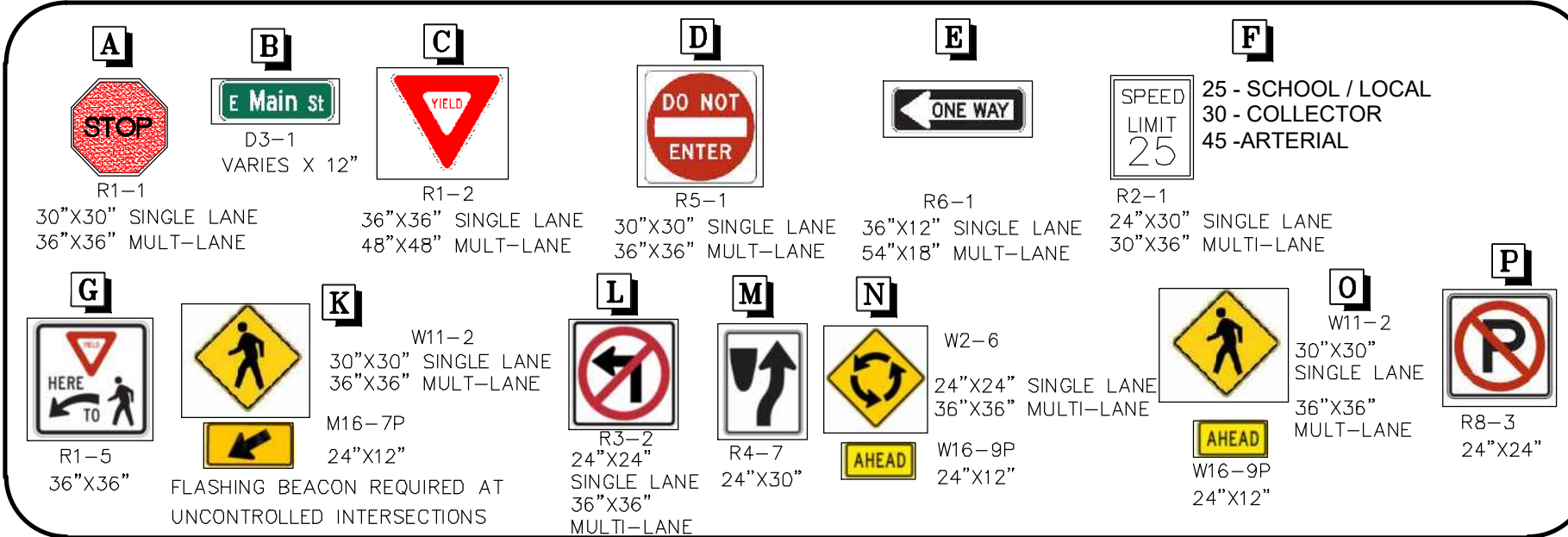
50 25 0 50 100

SCALE: 1" = 50'

MATCHLINE - SEE SHEET 2.8

### LEGEND

- |   |  |   |                                |
|---|--|---|--------------------------------|
| ② | BLOCK NUMBER OF HARMONY SUBDIVISION          | — | PROP MID-BLOCK RAMP(METRO)     |
| 6 | LOT NUMBER                                   | — | STREET CENTERLINE              |
| — | PROP CURB & GUTTER(METRO)                    | — | PUBLIC STREET RIGHT-OF-WAY     |
| — | PROP LIGHT POLE(METRO)                       | — | PROPERTY LOT LINE              |
| — | EXISTING FIRE HYDRANT                        | — | EDGE OF PAVEMENT               |
| — | PROP SIDEWALK(METRO)                         | — | SECTION LINE                   |
| — | PROP CURB RETURN SIDEWALK RAMP "HCR" (METRO) | — | PROPOSED EASEMENT              |
| — | PROP TEMPORARY ROAD BARRIER (METRO)          | — | EXISTING EASEMENT              |
| — | PROP CONCRETE PAN (METRO)                    | — | CSP BOUNDARY                   |
| — | —  | — | FILING BOUNDARY                |
| — | —  | — | PEDESTRIAN ACCESSIBILITY ROUTE |
| — | —  | — | PROP LANDSCAPE BENCH(METRO)    |
| — | —  | — | PROP FENCING/POSTS(METRO)      |
| — | —  | — | SIGHT TRIANGLE LINE            |
| — | —  | — | DESIGNATED SMALL LOT           |
| — | —  | — | PROPOSED CONCRETE PAN          |
| — | —  | — | PROPOSED BUILDING ENVELOPE     |
| — | —  | — | PROPOSED MID-BLOCK RAMP        |
| — | —  | — | PROPOSED MANHOLE               |

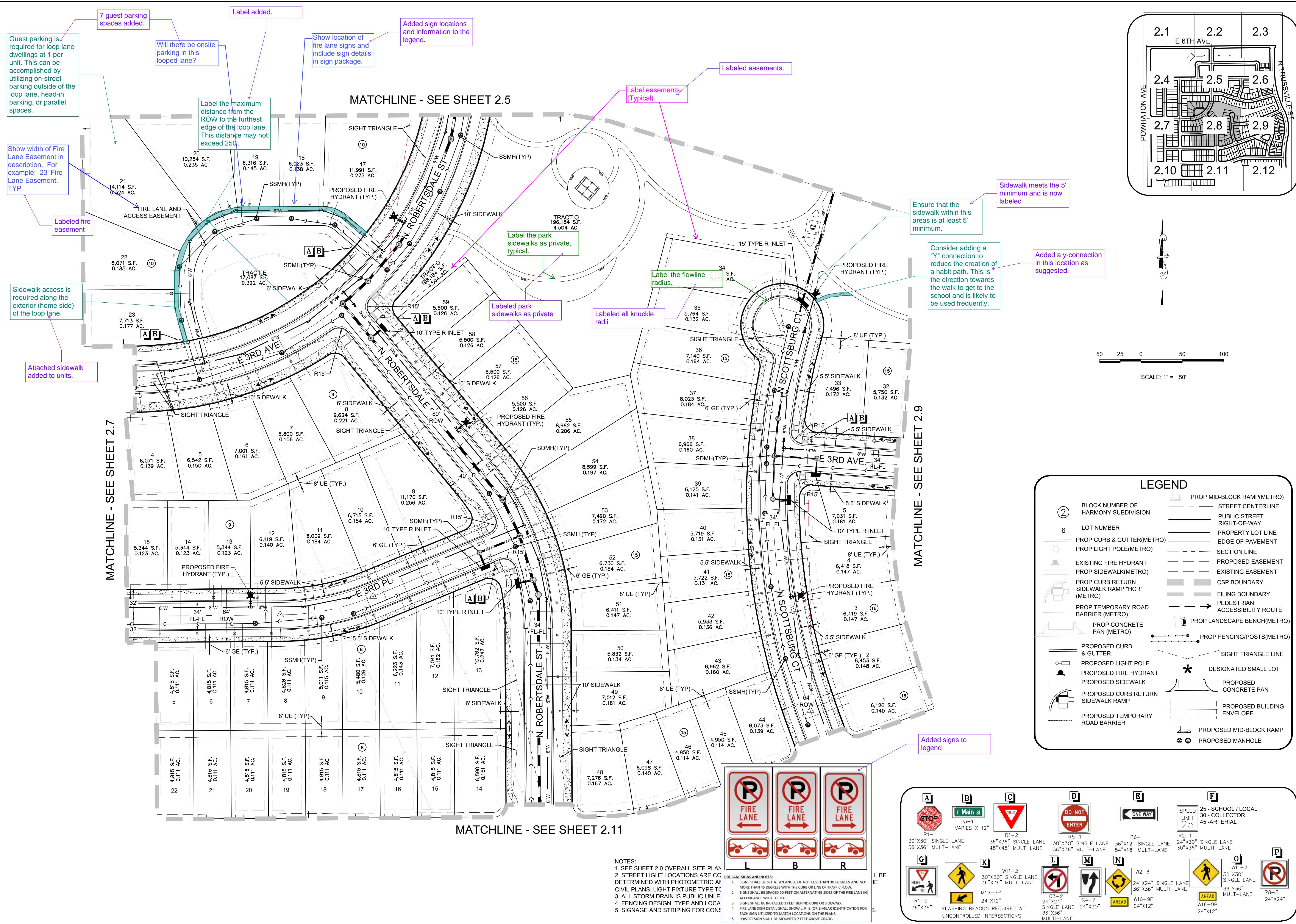



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2.7

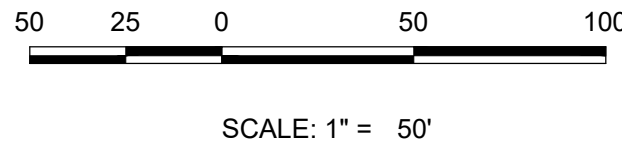
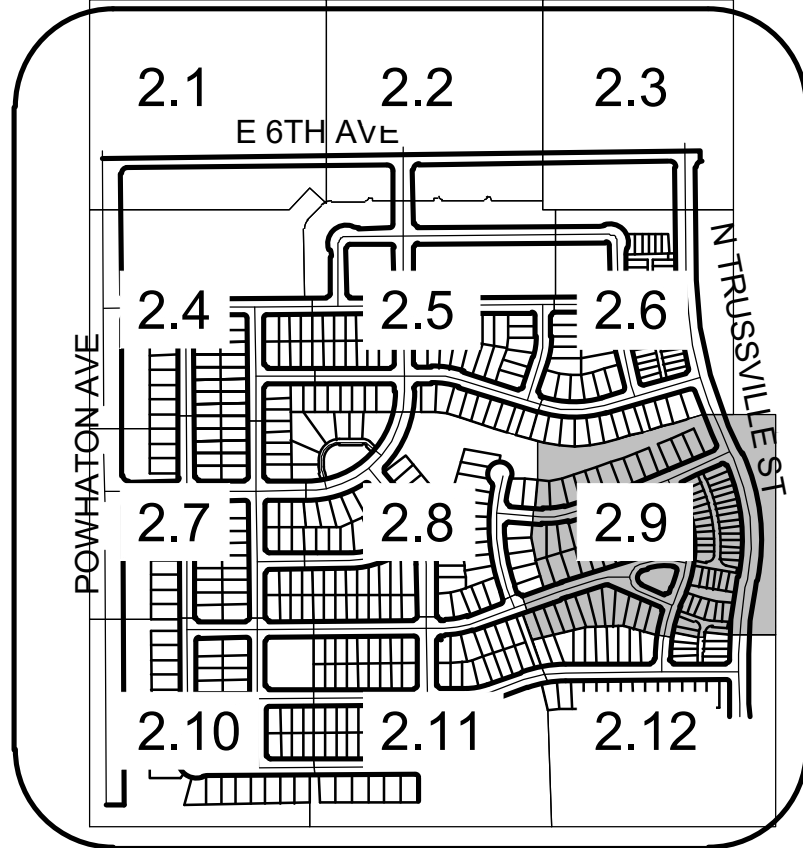




SHEET NUMBER  <b>2.8</b>	DRAWN BY:	SCALE:	<b>HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA SITE PLAN</b>	<b>Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440</b>	 <b>Westwood</b> 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.462.9526 Westwoods.com Westwood Professional Services, Inc.						
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**LEGEND**

2	BLOCK NUMBER OF HARMONY SUBDIVISION	PROPOSED MID-BLOCK RAMP(METRO)	STREET CENTERLINE
6	LOT NUMBER	PUBLIC STREET RIGHT-OF-WAY	PROPERTY LOT LINE
PROPOSED CURB & GUTTER(METRO)	EDGE OF PAVEMENT	SECTION LINE	PROPOSED EASEMENT
PROPOSED LIGHT POLE(METRO)	EXISTING EASEMENT	CSP BOUNDARY	FILING BOUNDARY
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PROPOSED CURB RETURN SIDEWALK RAMP "HCR" (METRO)	PROPOSED CONCRETE PAN	PROPOSED BUILDING ENVELOPE	PROPOSED MID-BLOCK RAMP
PROPOSED TEMPORARY ROAD BARRIER (METRO)	PROPOSED MANHOLE		
PROPOSED CURB & GUTTER			
PROPOSED LIGHT POLE			
PROPOSED FIRE HYDRANT			
PROPOSED SIDEWALK			
PROPOSED CURB RETURN SIDEWALK RAMP			
PROPOSED TEMPORARY ROAD BARRIER			

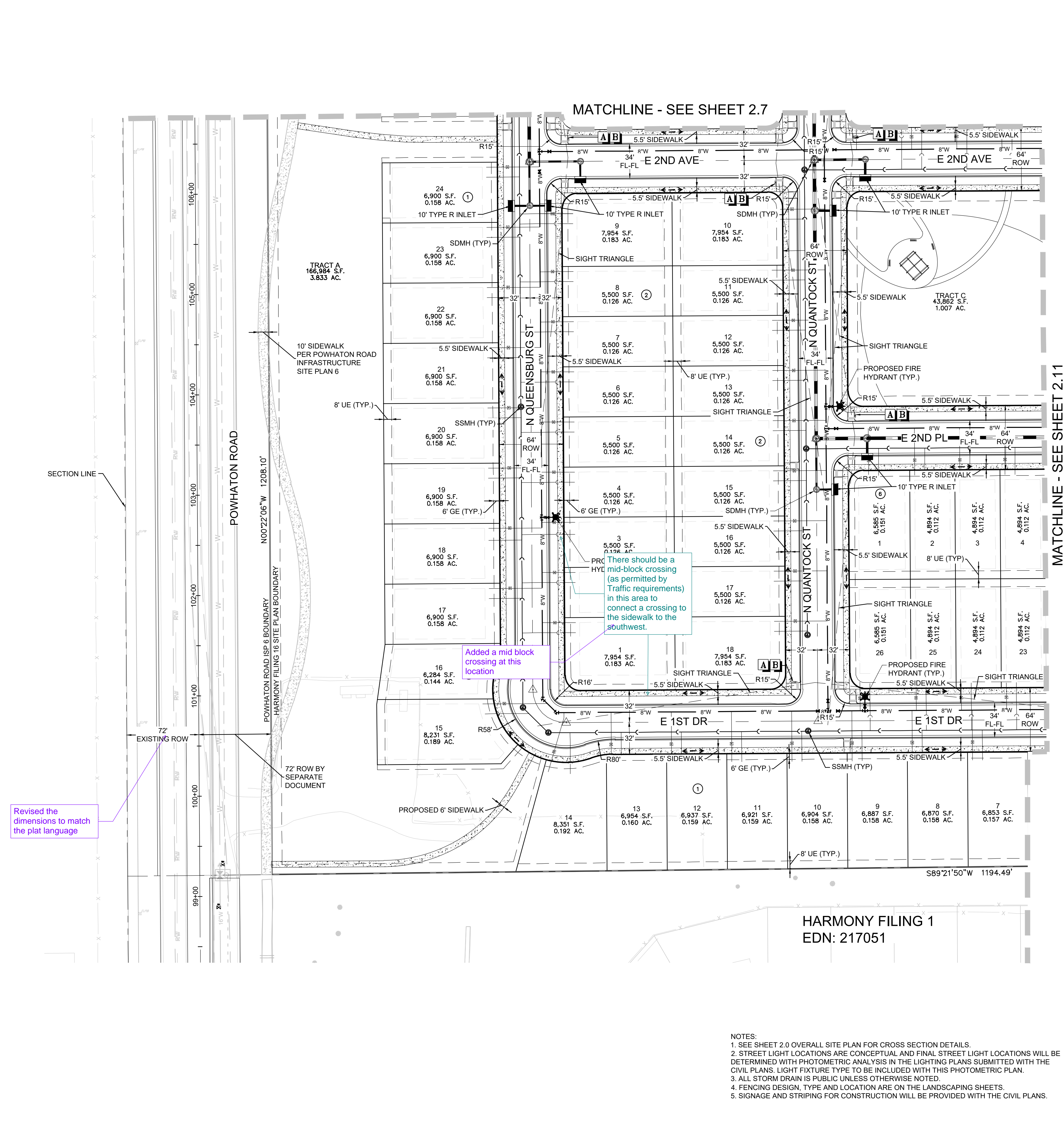
<b>A</b> STOP R1-1 30"x30" SINGLE LANE 36"x36" MULTI-LANE	<b>B</b> E Main St VARIES X 12"	<b>C</b> YIELD R1-2 30"x36" SINGLE LANE 48"x48" MULTI-LANE	<b>D</b> DO NOT ENTER R5-1 30"x30" SINGLE LANE 36"x36" MULTI-LANE	<b>E</b> ONE WAY R6-1 36"x12" SINGLE LANE 54"x18" MULTI-LANE	<b>F</b> SPEED LIMIT 25 R2-1 24"x30" SINGLE LANE 30"x36" MULTI-LANE
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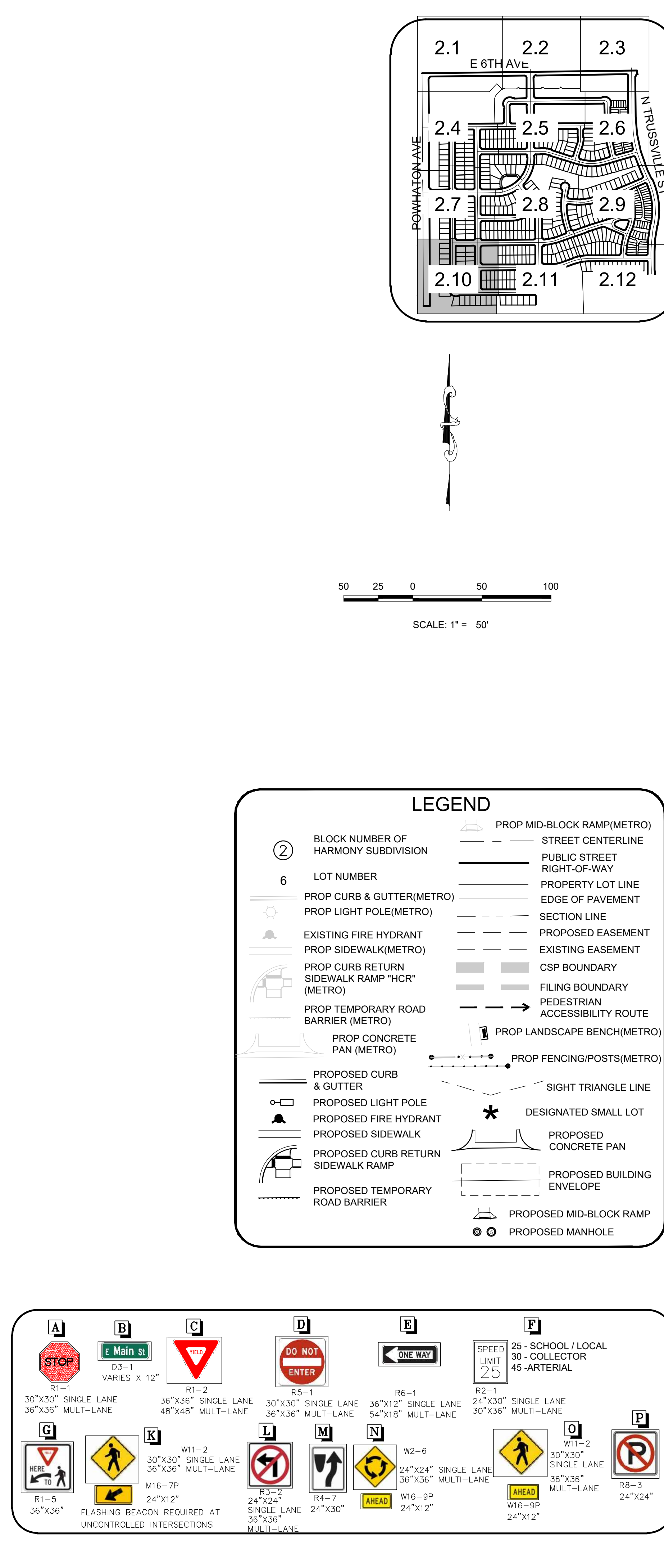
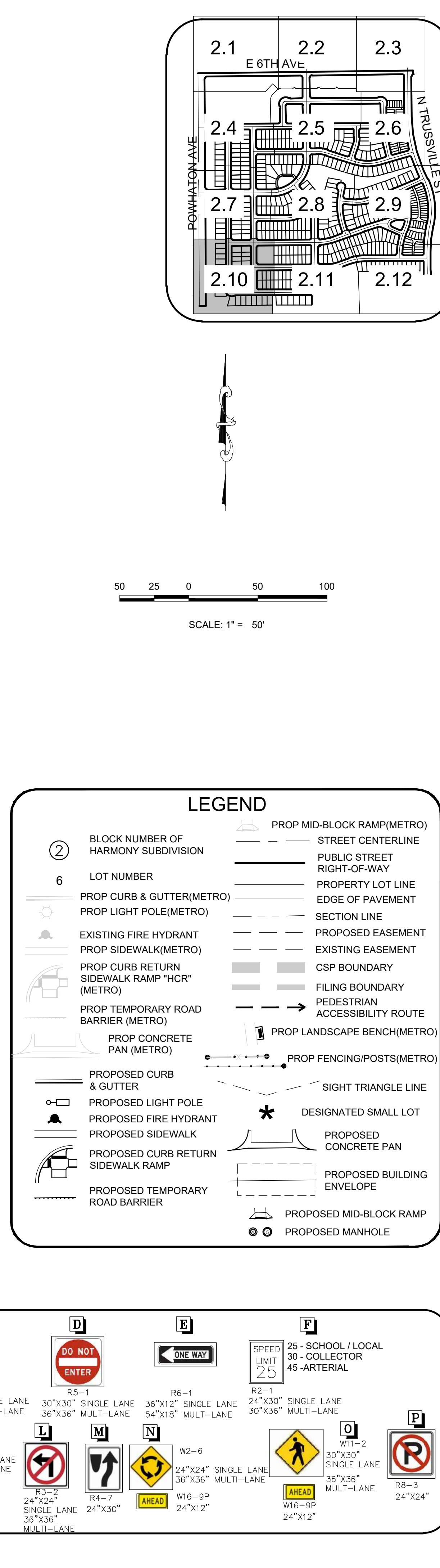




The site plan illustrates the intersection of E 2nd Ave and N Quantock St. It details the proposed locations for fire hydrants, sight triangles, and various street features like sidewalks and inlets. Property lots are numbered 1 through 11, with their respective areas and dimensions provided. The plan also shows the location of Tract C and the proposed fire hydrant locations. The intersection is marked with a cross, and the surrounding streets are labeled. The plan includes a north arrow and a scale bar.

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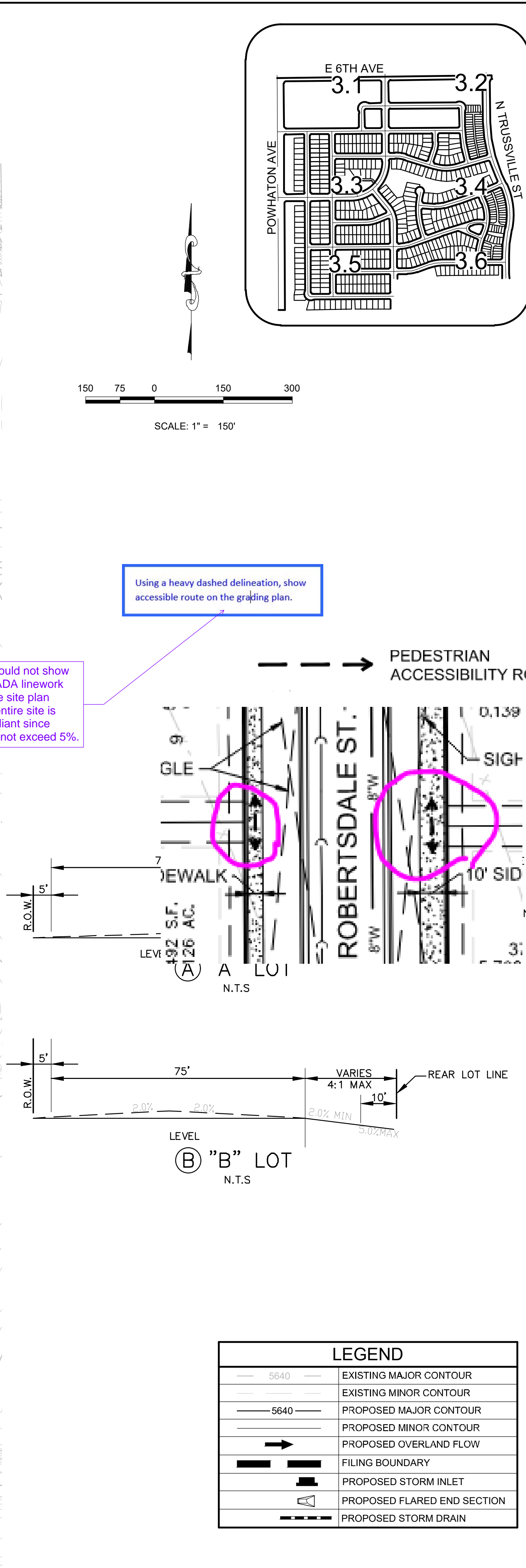
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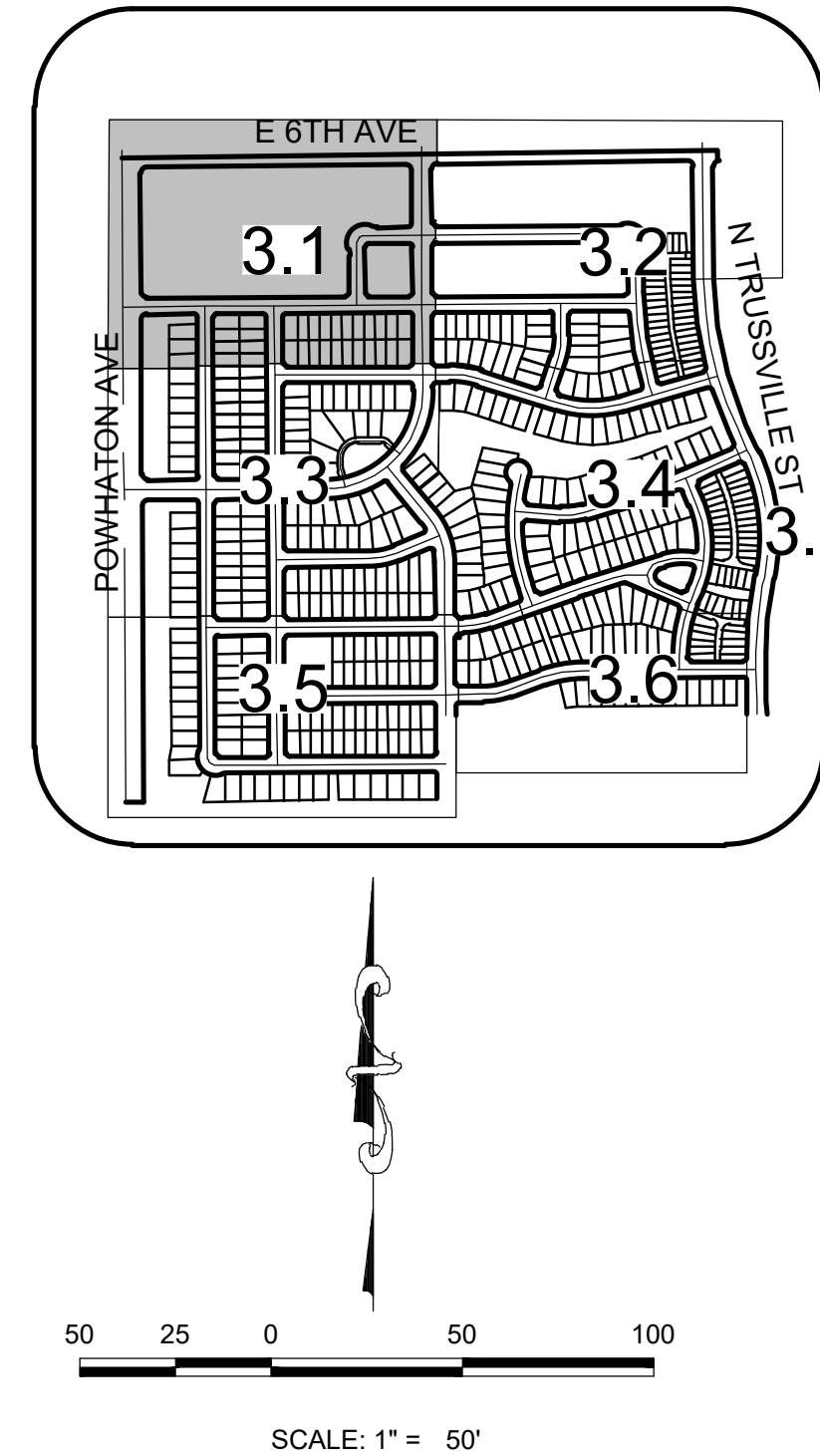
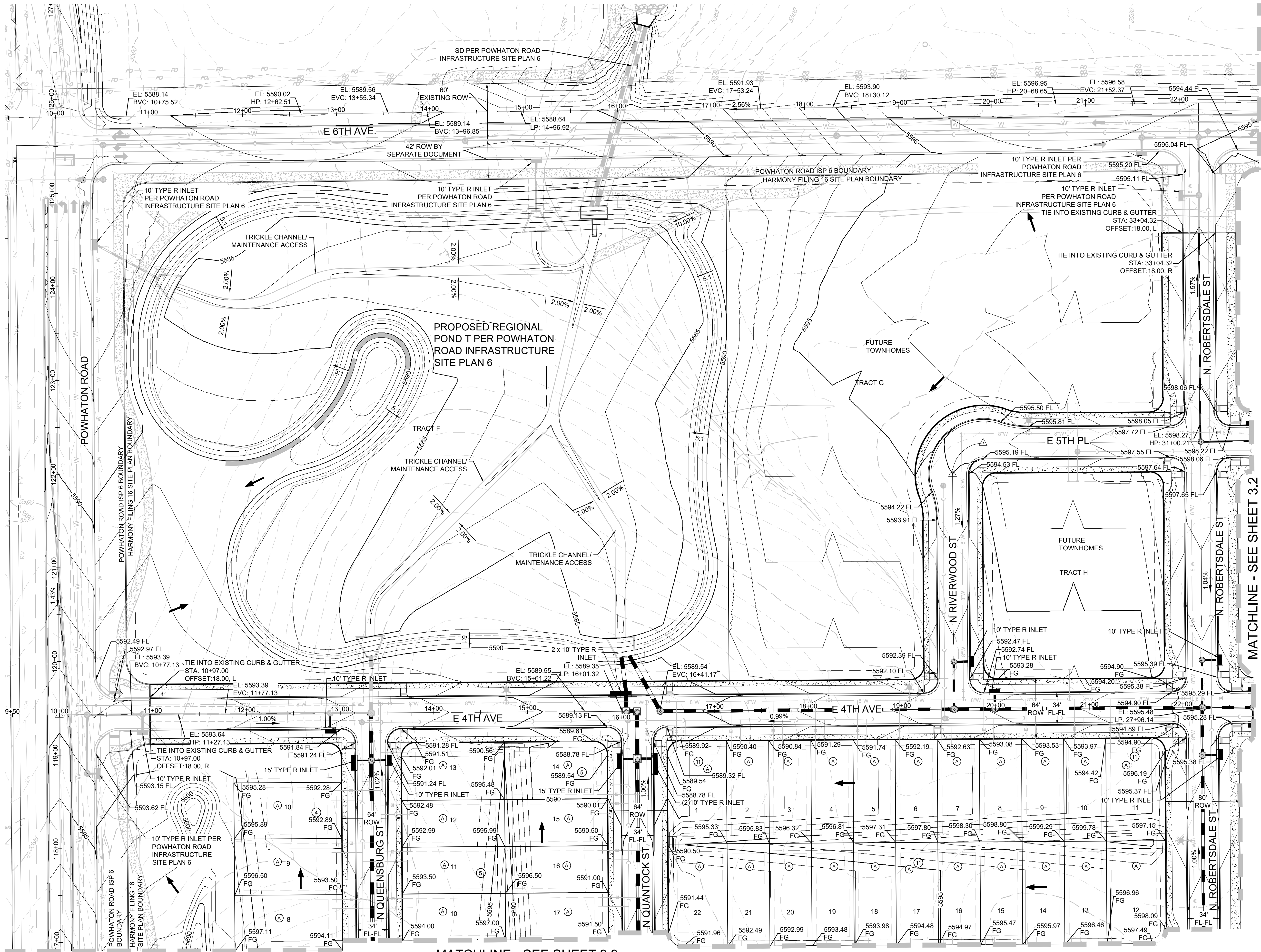




SHEET NUMBER  <b>3.0</b>	DRAWN BY: STF	SCALE: AS SHOWN	<b>HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 OVERALL GRADING PLAN</b>	<b>Melcor/TC Aurora, LLC C/O Marathon Land Company</b> 3711 E. 1st Avenue Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	 <b>Westwoods.com</b> <b>Westwood Professional Services, Inc.</b> 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526	ROUTE						
	CHECKED BY: BPM	FILE NO:				No.	Revisions	Date	Init.	Appr.		
	DATE: DECEMBER 2022	8130214922										



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LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED OVERLAND FLOW
	FILING BOUNDARY
	PROPOSED STORM INLET
	PROPOSED FLARED END SECTION
	PROPOSED STORM DRAIN

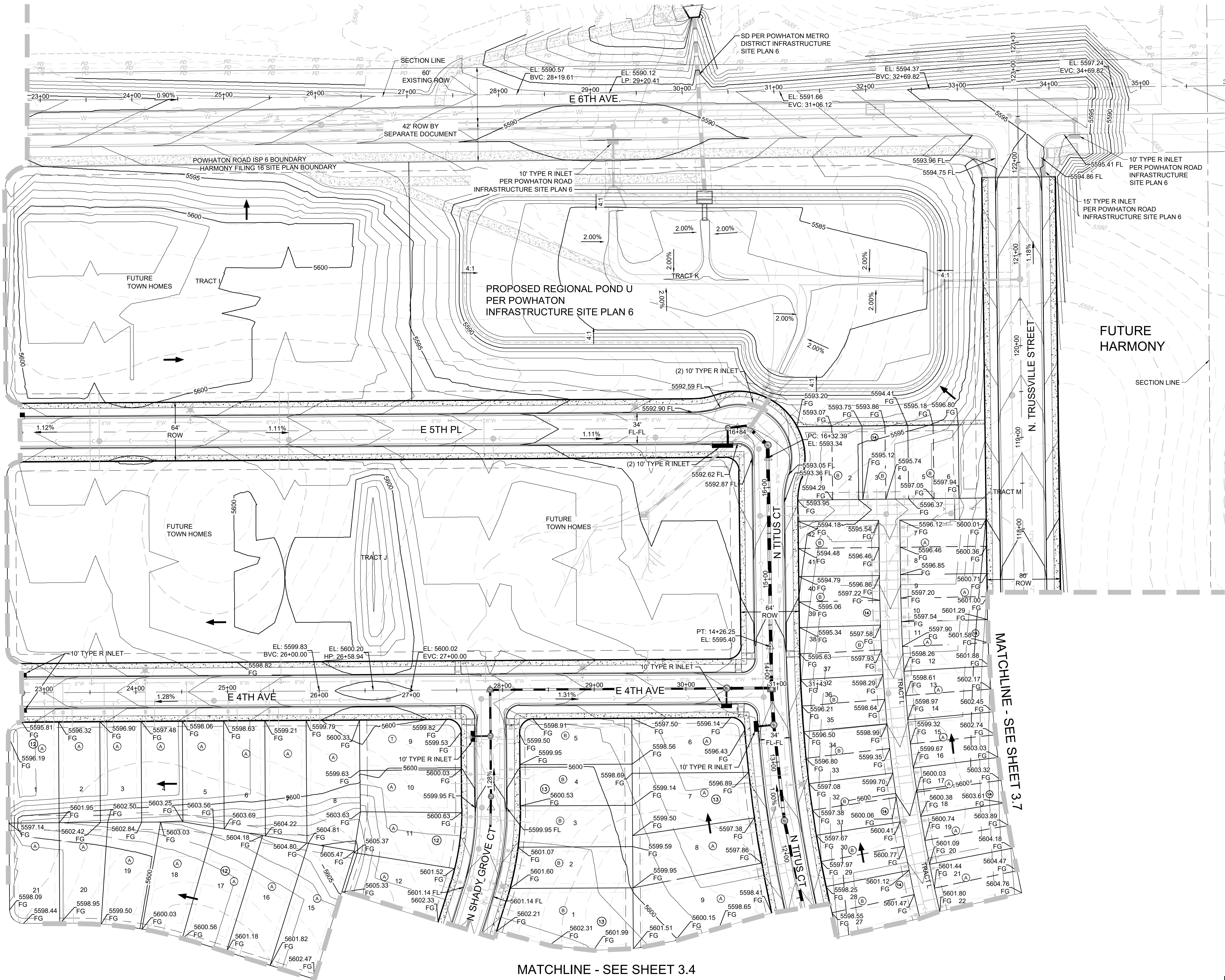
NOTES:  
1. ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED

SHEET NUMBER <b>3.1</b>	DRAWN BY: STF CHECKED BY: BPW DATE: DECEMBER 2022	SCALE: AS SHOWN FILE NO: 8130214922	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA GRADING PLAN		Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440		<b>Westwood</b> 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodpro.com Westwood Professional Services, Inc.		Revisions No. Date Init. Apr. Date	

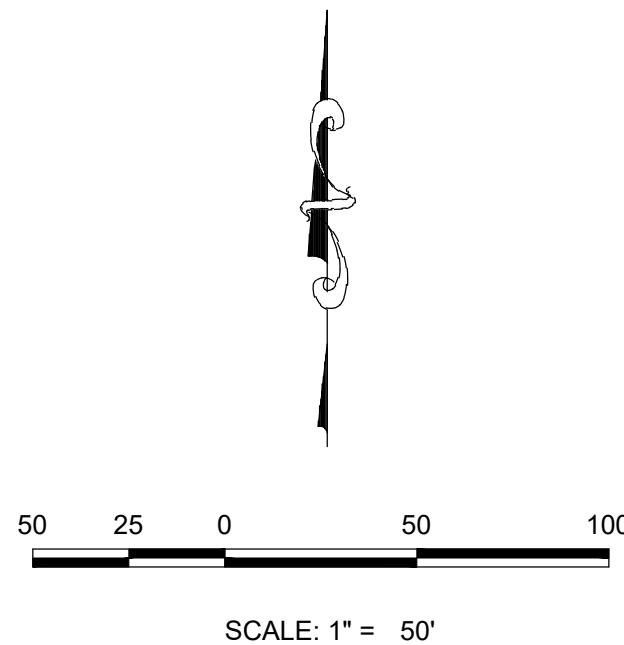
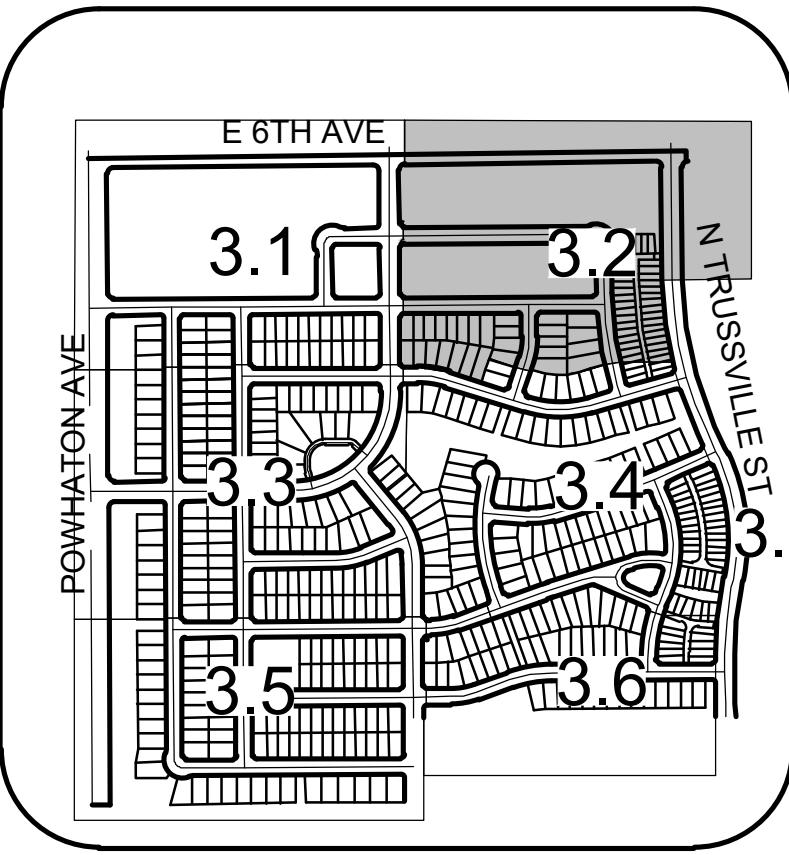


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MATCHLINE - SEE SHEET 3.2



MATCHLINE - SEE SHEET 3.4



LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED OVERLAND FLOW
	FILING BOUNDARY
	PROPOSED STORM INLET
	PROPOSED FLARED END SECTION
	PROPOSED STORM DRAIN

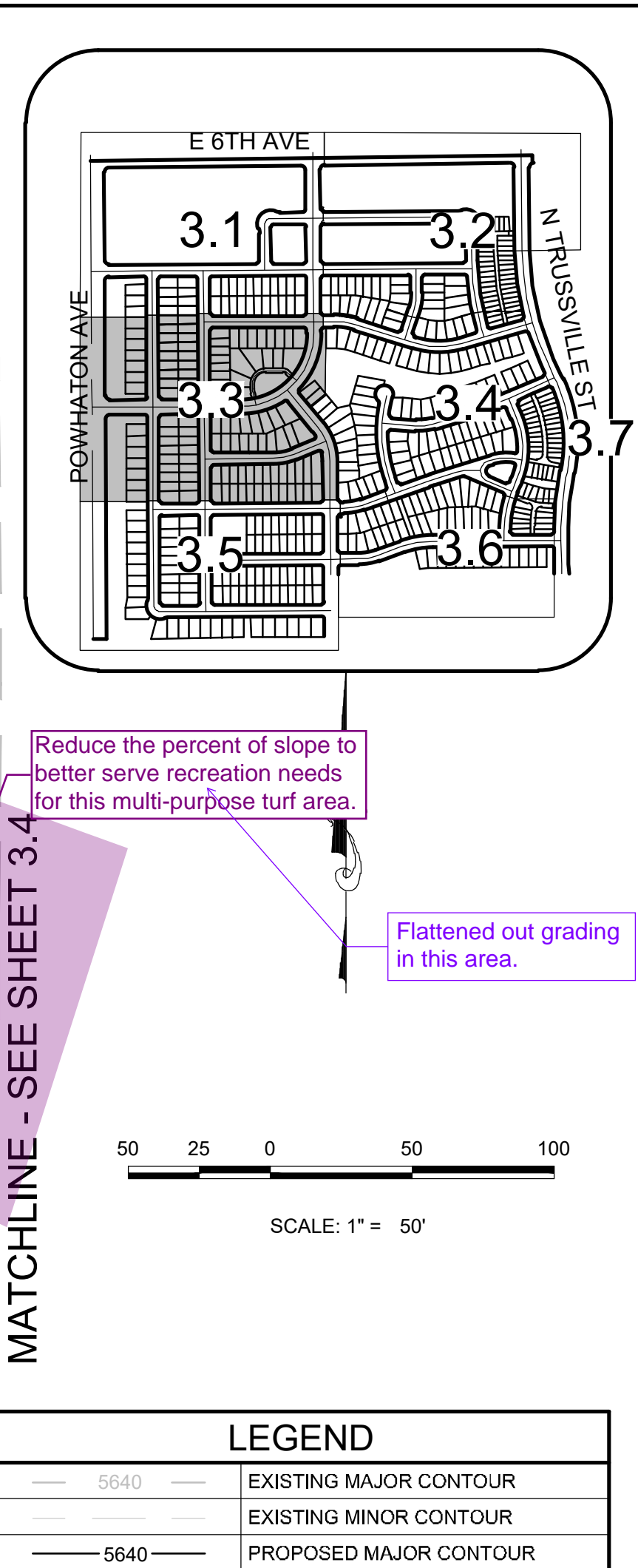
NOTES:

1. ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED

SHEET NUMBER	3.2	DRAWN BY:	STF	SCALE:	AS SHOWN	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA GRADING PLAN	Melo/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	<b>Westwood</b> 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodps.com Westwood Professional Services, Inc.	Revisions	No.	Init.	Apr.	Date
		CHECKED BY:	BPW	FILE NO:	8130214922				Date				



HEET 3.5



MATCHLINE - SEE SHEET 3.4

Reduce the percent of slope to better serve recreation needs for this multi-purpose turf area.

50 25 0

SCALE: 1" = 50'

LEGEND

— 5640 —	EXISTING MAINTENANCE
— 5640 —	EXISTING MAINTENANCE
— 5640 —	PROPOSED MAINTENANCE

**LEGEND**

	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED OVERLAND FLOW
	FILING BOUNDARY
	PROPOSED STORM INLET
	PROPOSED FLARED END SECTION
	PROPOSED STORM DRAIN

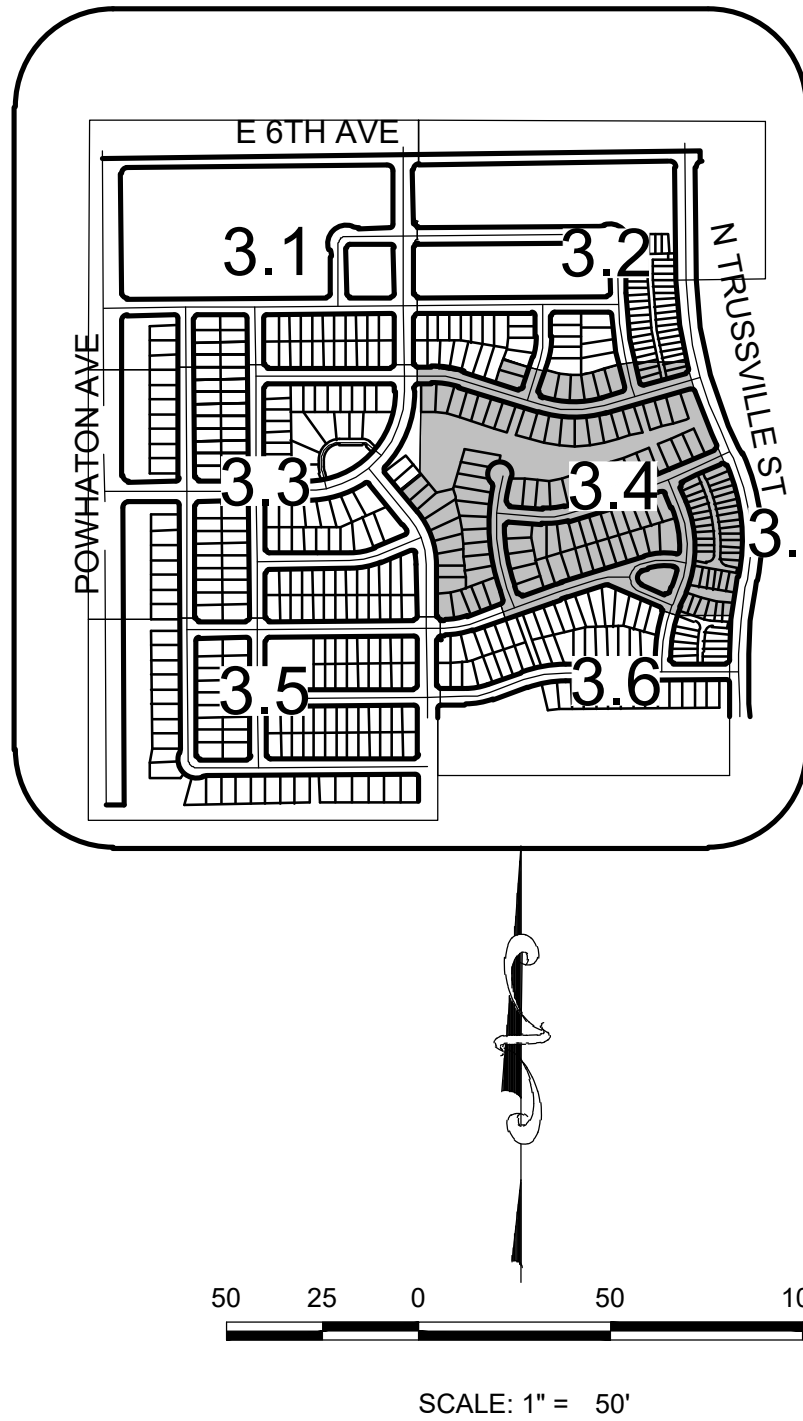
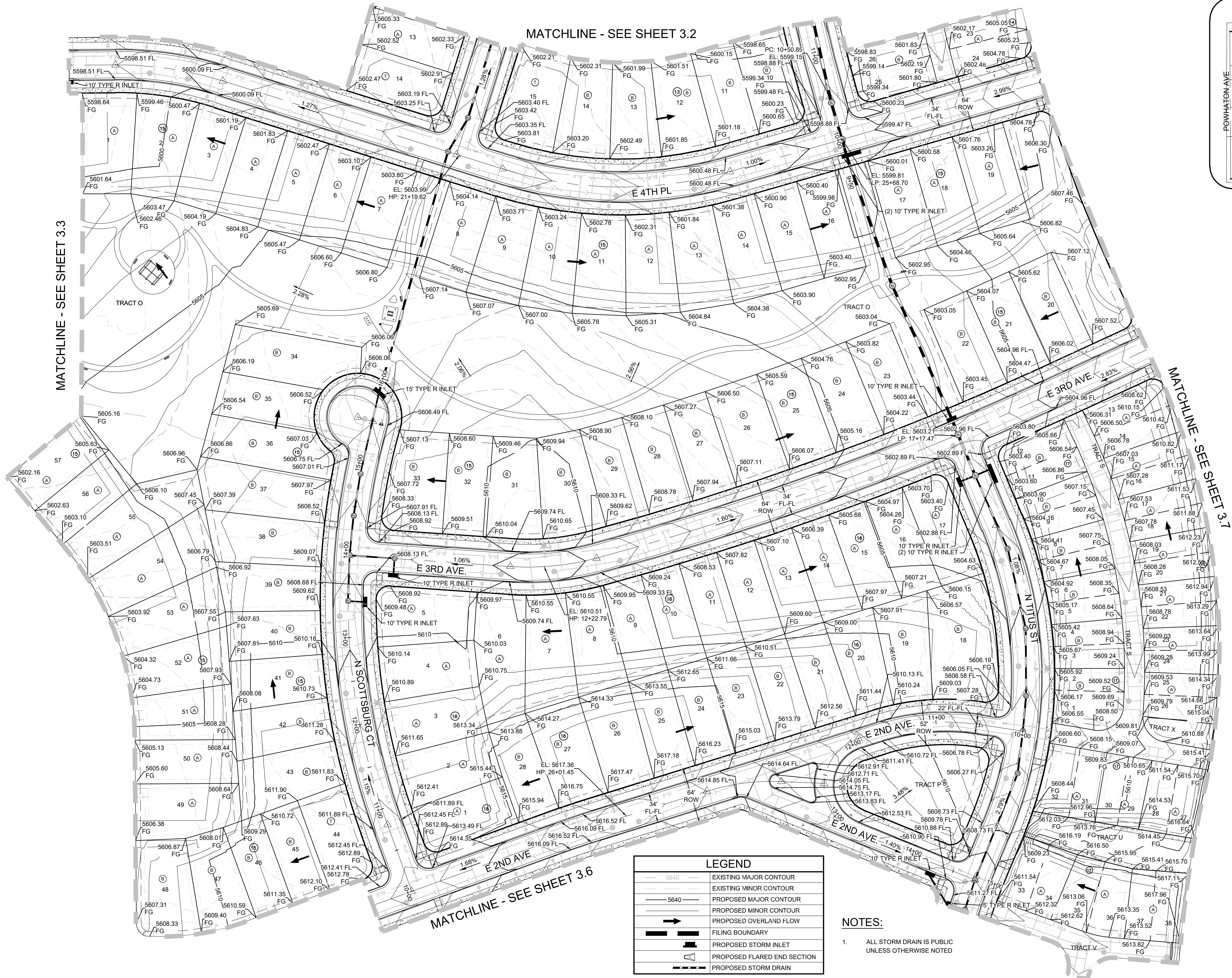
**NOTES:**

ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED

1. ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED



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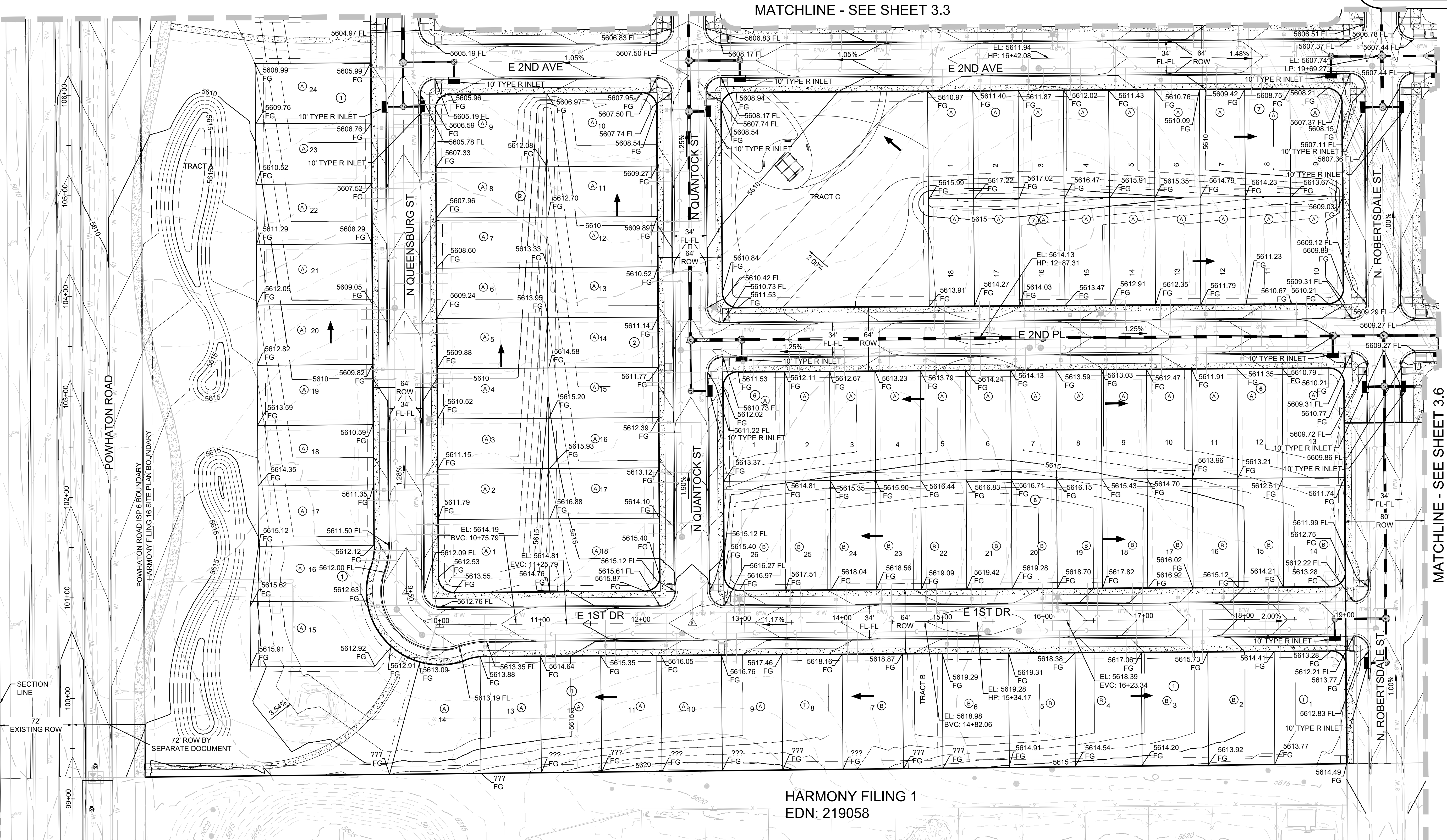


SHEET NUMBER	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	AS SHOWN	FILE NO:	No.	Revisions	Date	Appr.	Date
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HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA GRADING PLAN							Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440				
							Westwood 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodpro.com Westwood Professional Services, Inc.				



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LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED OVERLAND FLOW
	FILING BOUNDARY
	PROPOSED STORM INLET
	PROPOSED FLARED END SECTION
	PROPOSED STORM DRAIN



MATCHLINE - SEE SHEET 3.3

MATCHLINE - SEE SHEET 3.6

HARMONY FILING 1  
EDN: 219058

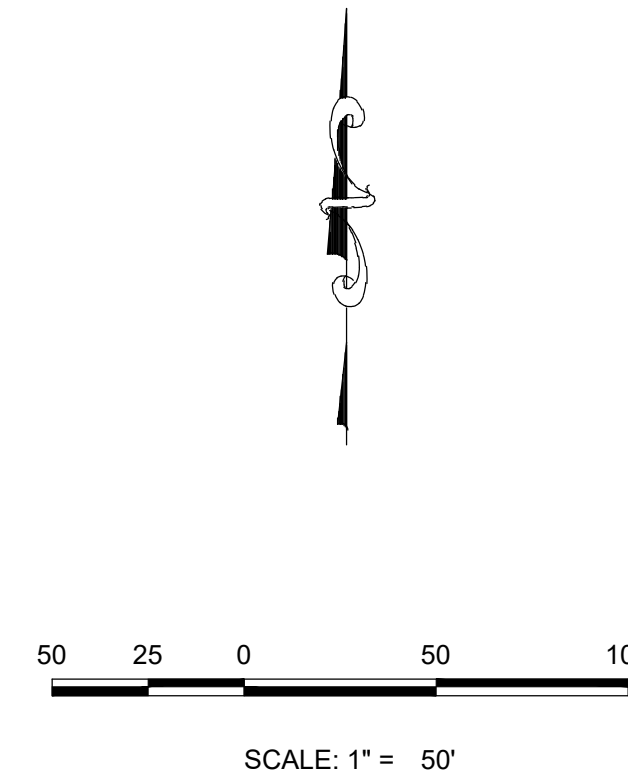
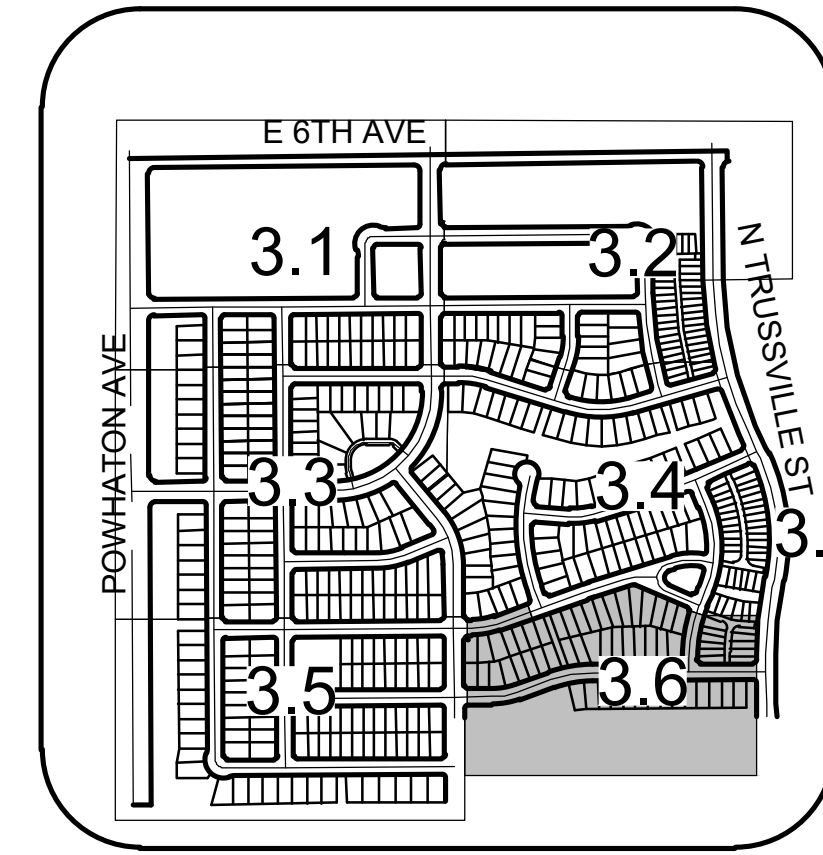
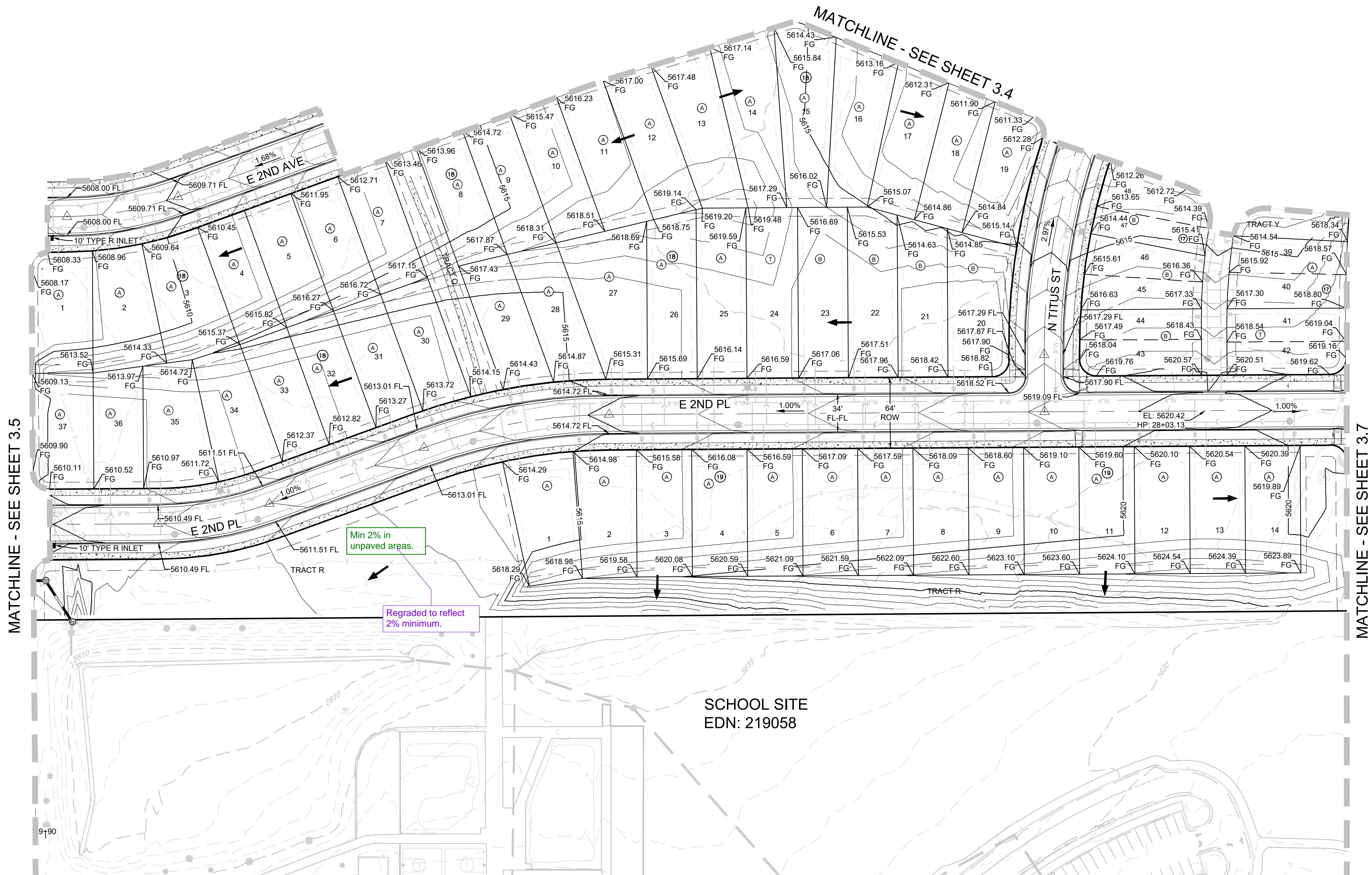
NOTES:

1. ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED

SHEET NUMBER	DRAWN BY:		SCALE:	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA GRADING PLAN		Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440		Westwood 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodpro.com Westwood Professional Services, Inc.		Revisions		No.	
	STF	BPW		AS SHOWN	FILE NO:					Date	Init.	Apr.	Date
3.5					8130214922								



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LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED OVERLAND FLOW
	FILING BOUNDARY
	PROPOSED STORM INLET
	PROPOSED FLARED END SECTION
	PROPOSED STORM DRAIN

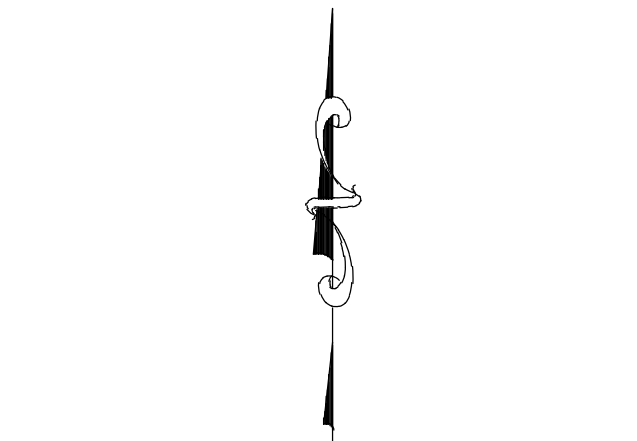
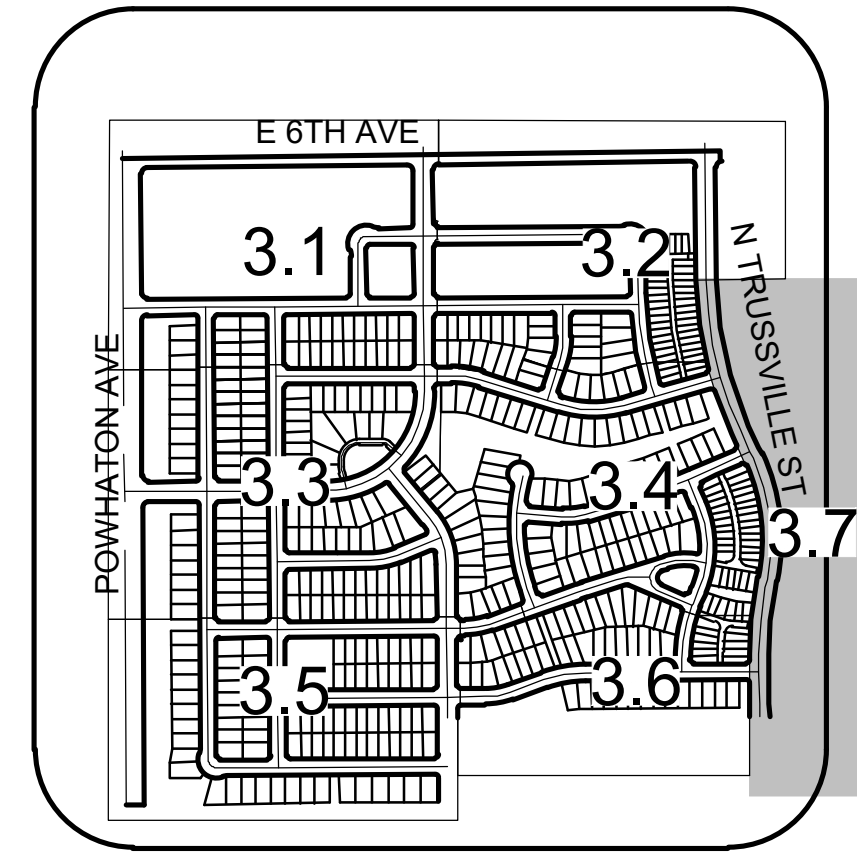
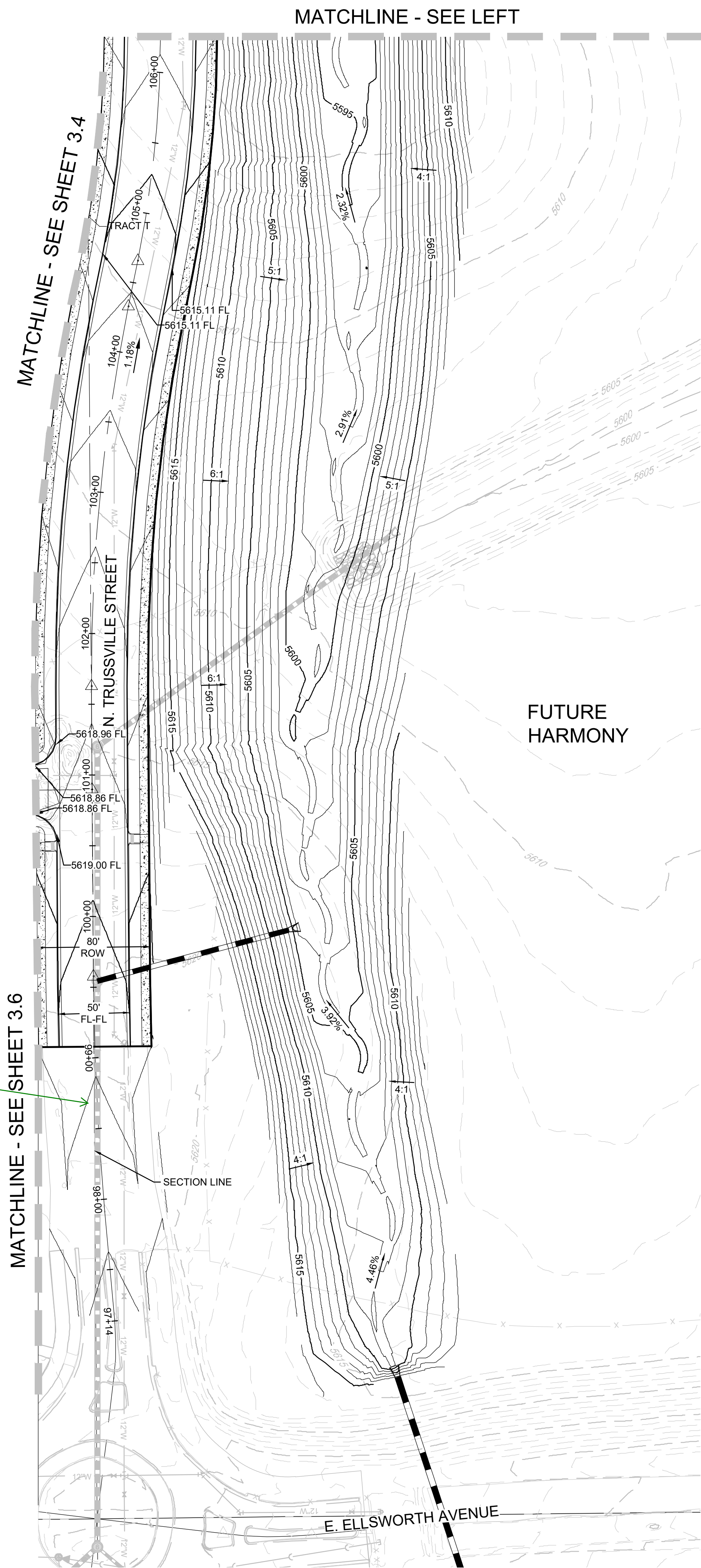
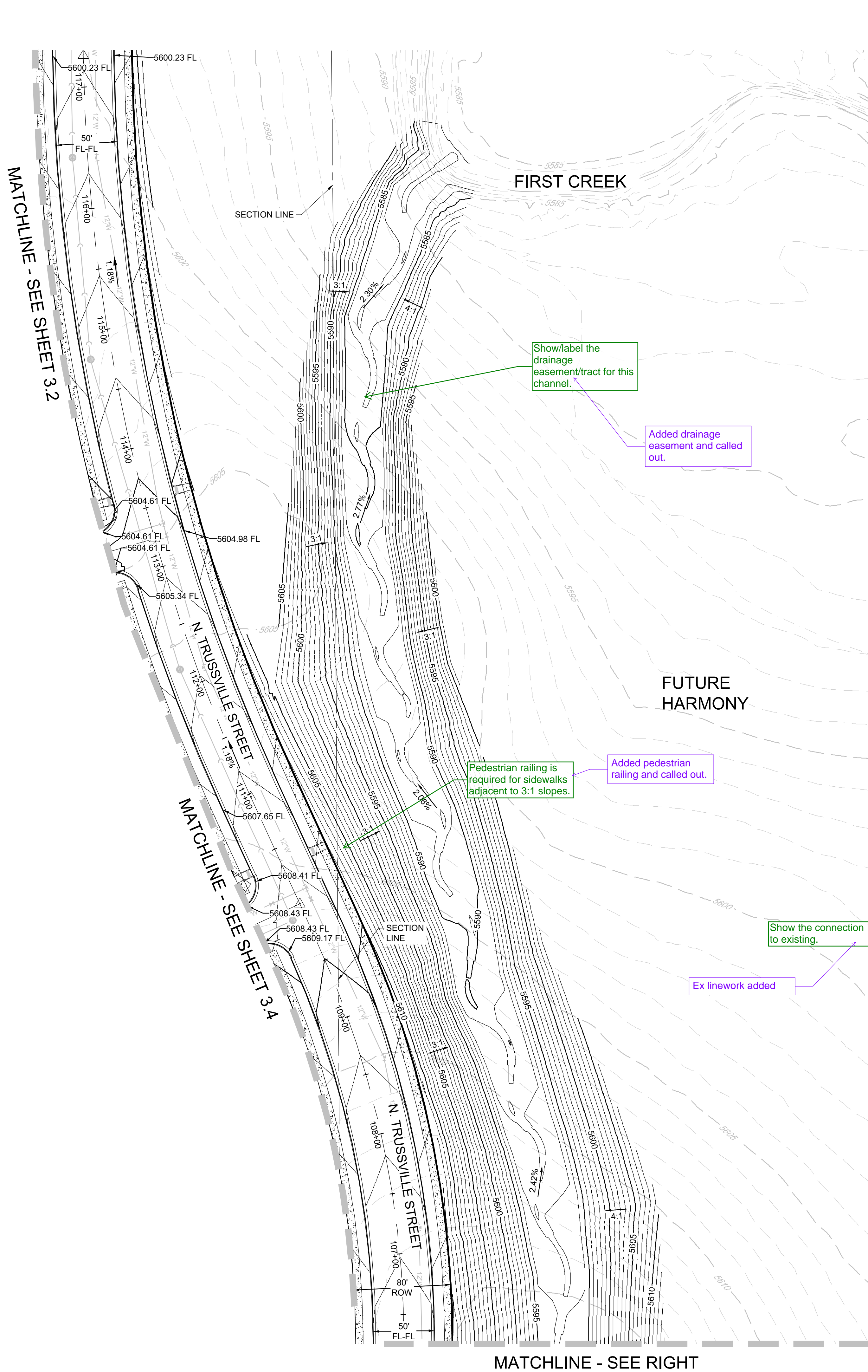
NOTES:

1. ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED

SHEET NUMBER	3.6	DRAWN BY: STF	CHECKED BY: BPW	DATE: DECEMBER 2022	SCALE: AS SHOWN	FILE NO: 8130214922	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA GRADING PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	<b>Westwood</b> Westwoodpro.com Westwood Professional Services, Inc.	Revisions			Date		
										No.	Init.	Apr.	Date		



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SCALE: 1" = 50'

LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED OVERLAND FLOW
	FILING BOUNDARY
	PROPOSED STORM INLET
	PROPOSED FLARED END SECTION
	PROPOSED STORM DRAIN

NOTES:

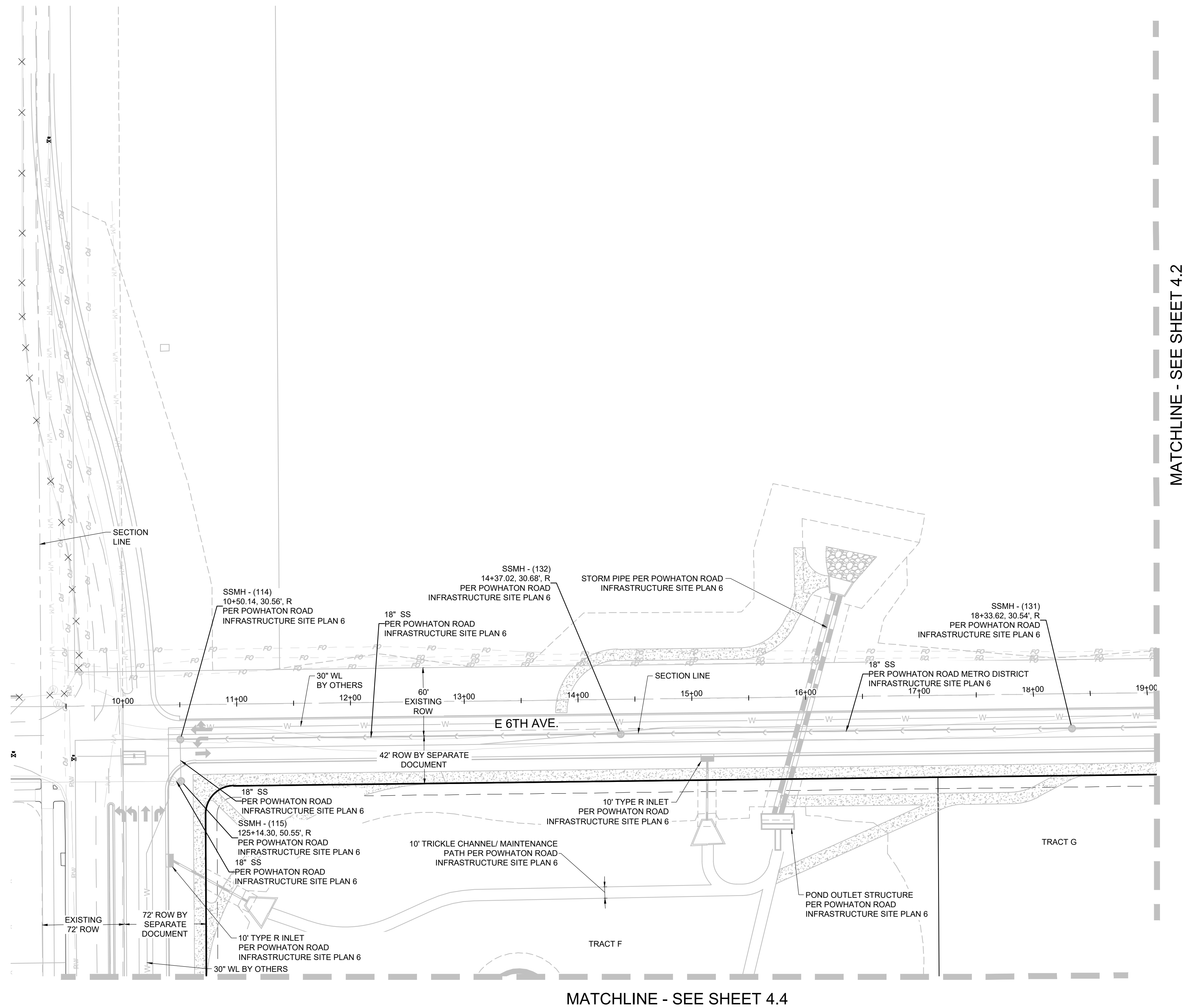
1. ALL STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED

SHEET NUMBER	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA GRADING PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	Westwood 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodps.com Westwood Professional Services, Inc.	Revisions			Date		
								No.	Init.	Apr.	Date	Apr.	Date
3.7	STF	AS SHOWN	8/30/21	AS SHOWN	8/30/21	8/30/21	8/30/21						
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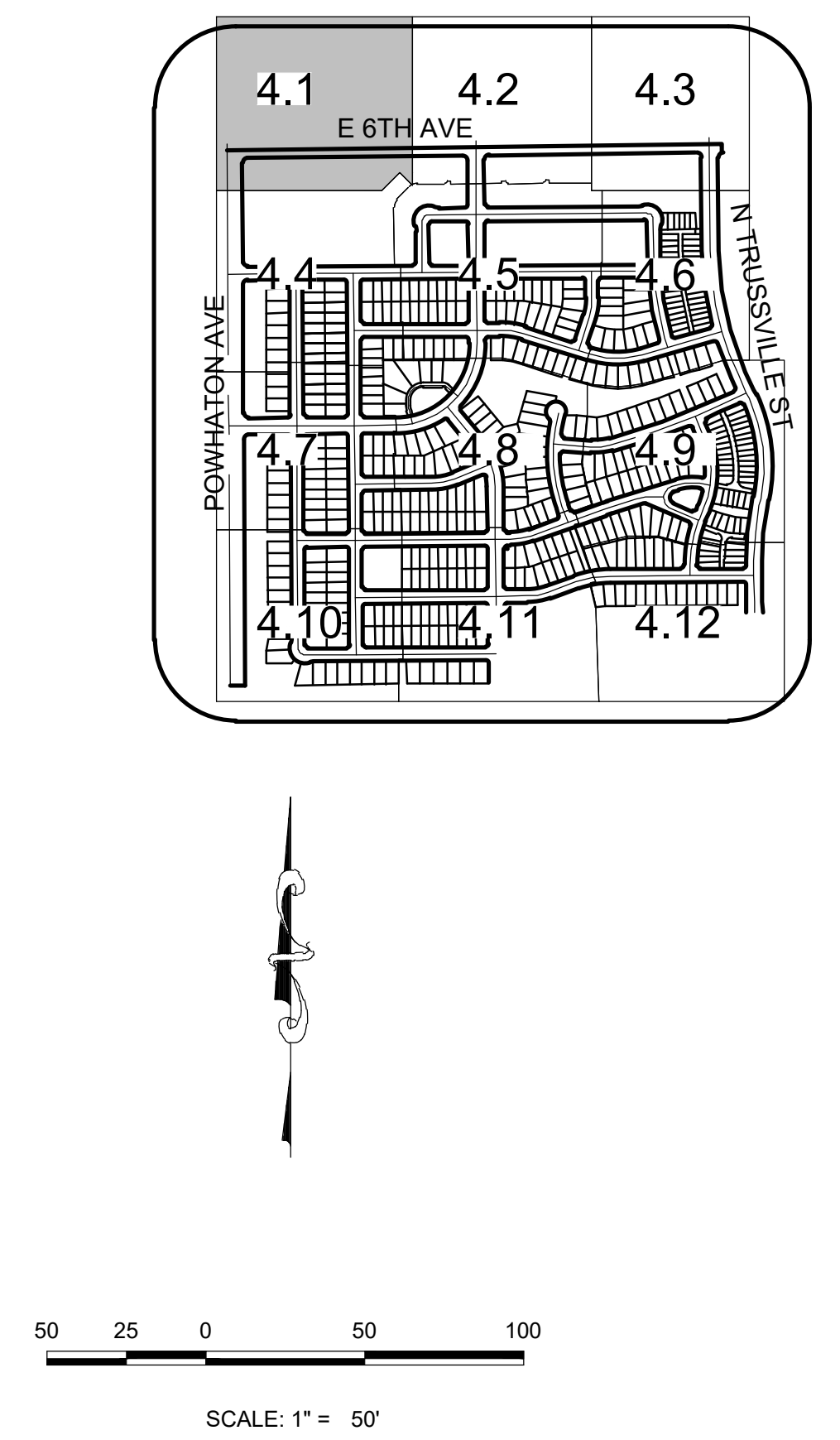






















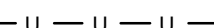










MATCHLINE - SEE SHEET 4.2




## UTILITY LEGEND

	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	PROPOSED GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
			PROPOSED STORM DRAIN WITH MANHOLE
	FILING NO 12 BOUNDARY		EASEMENT LINE
	PROPOSED IRRIGATION SLEEVE		RIGHT-OF-WAY
	CENTERLINE		PROPERTY LINE
	PROPOSED WATER METER		PROPOSED SWALE
	PROPOSED IRRIGATION		PROPOSED AREA INLET
	PROPOSED UNDER DRAIN		AIR RELEASE VALVE
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		STREET LIGHT
	EXISTING FIRE HYDRANT		LOT NUMBER
			BLOCK NUMBER

## ABBREVIATIONS

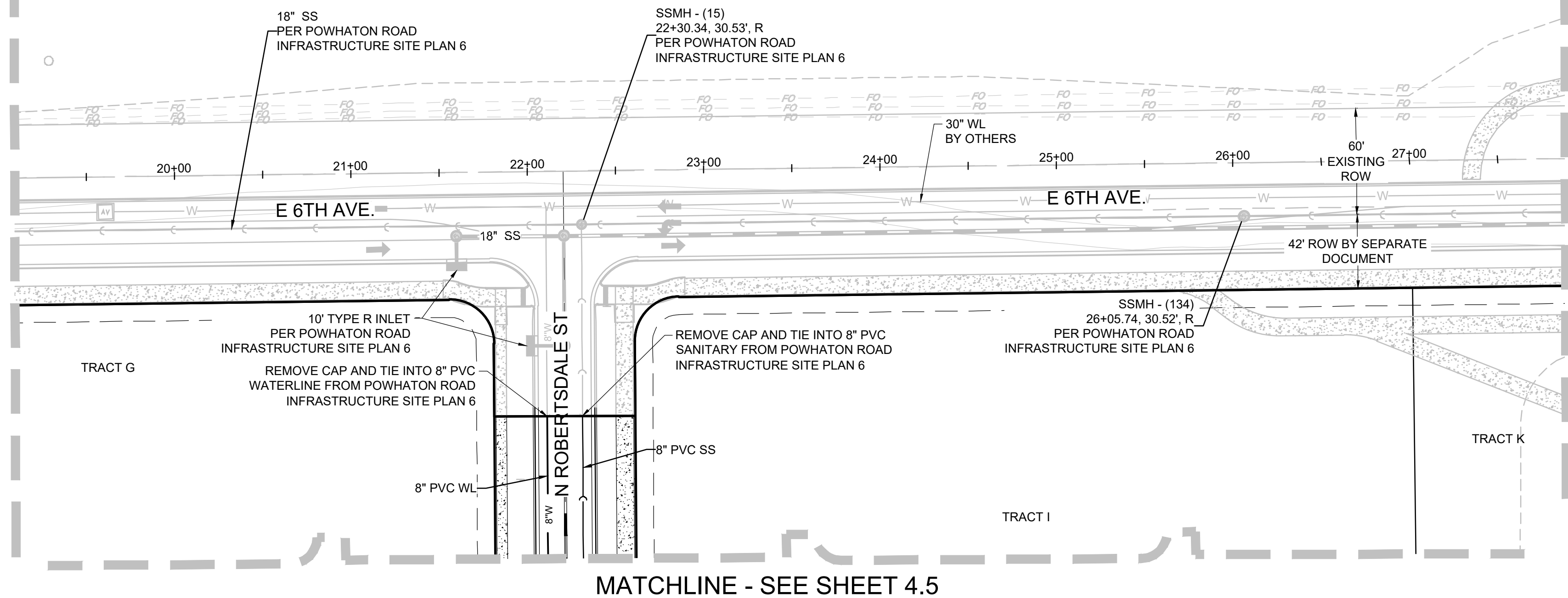
AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCBC	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	RW	RAW WATER LINE
EVC	END VERTICAL CURVE	SD	STORM DRAIN
EVP	END VERTICAL PROFILE	SL	SECTION LINE
FG	FINISHED GROUND	SO	EDGE OF 6' SHOULDER OFFSET
FL	FLOW LINE	SS	SANITARY SEWER
HP	HIGH POINT	STA	STATION
INV	INVERT	TC	TOP OF CURB
K	CURVATURE COEFFICIENT	T.O.S.	TOP OF PIPE
LF	LINEAR FEET	UE	UTILITY EASEMENT
MH	MANHOLE	VC	VERTICAL CURVE
N.T.S.	NOT TO SCALE	WL	WATER LINE
PL	PROPERTY LINE	WSE	WATER SURFACE ELEVATION
PVC	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		

**NOTE:**  
THE IMPROVEMENTS SHOWN ON THIS SHEET  
ARE PROPOSED WITH POWHATON ROAD  
INFRASTRUCTURE SITE PLAN 6 AND ARE  
SHOWN FOR REFERENCE ONLY.

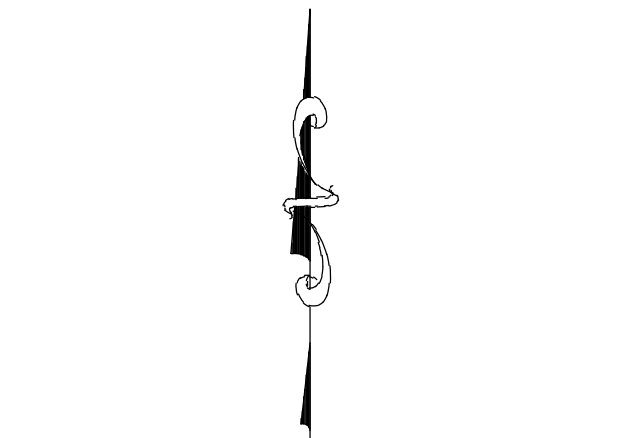
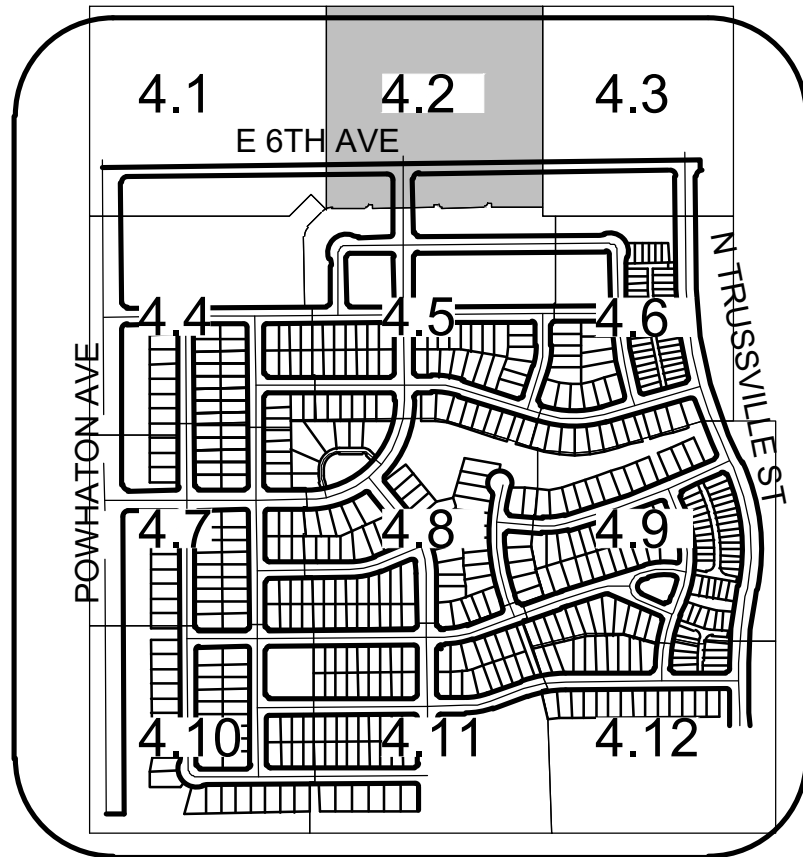
SHEET NUMBER  <div>4.1</div>	DRAWN BY:	SCALE:	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA UTILITY PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127  Tel: (303) 920-9400 Fax: (303) 920-9440	  10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD , CO 80112 TEL: 720.482.9526  <a href="http://Westwoods.com">Westwoods.com</a> <b>Westwood Professional Services, Inc.</b>	No.	Revisions	Date	Init.	Appr.	Date		
	CHECKED BY:	AS SHOWN											
	DATE:	FILE NO:											

N:\PROJECTS\30175604 SAND CREEK\CAD\ENGINEERING\SSHEETS\CS\SITE PLAN 7\AREA UTILITY PLAN.DWG, BPWILSON, 12/20/22

MATCHLINE - SEE SHEET 4.1



MATCHLINE - SEE SHEET 4.3



SCALE: 1" = 50'

#### UTILITY LEGEND

	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	PROPOSED GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
	FILING NO 12 BOUNDARY		PROPOSED STORM INLET
	PROPOSED IRRIGATION SLEEVE		PROPOSED STORM DRAIN WITH MANHOLE
	CENTERLINE		EASEMENT LINE
	RIGHT-OF-WAY		PROPOSED SWALE
	PROPERTY LINE		PROPOSED AREA INLET
	PROPOSED WATER METER		AIR RELEASE VALVE
	IRR		STREET LIGHT
	PROPOSED UNDER DRAIN		LOT NUMBER
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		BLOCK NUMBER
	EXISTING FIRE HYDRANT		

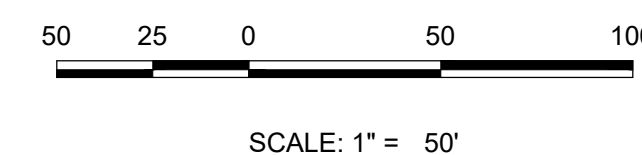
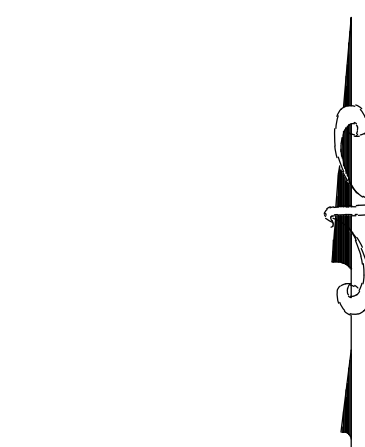
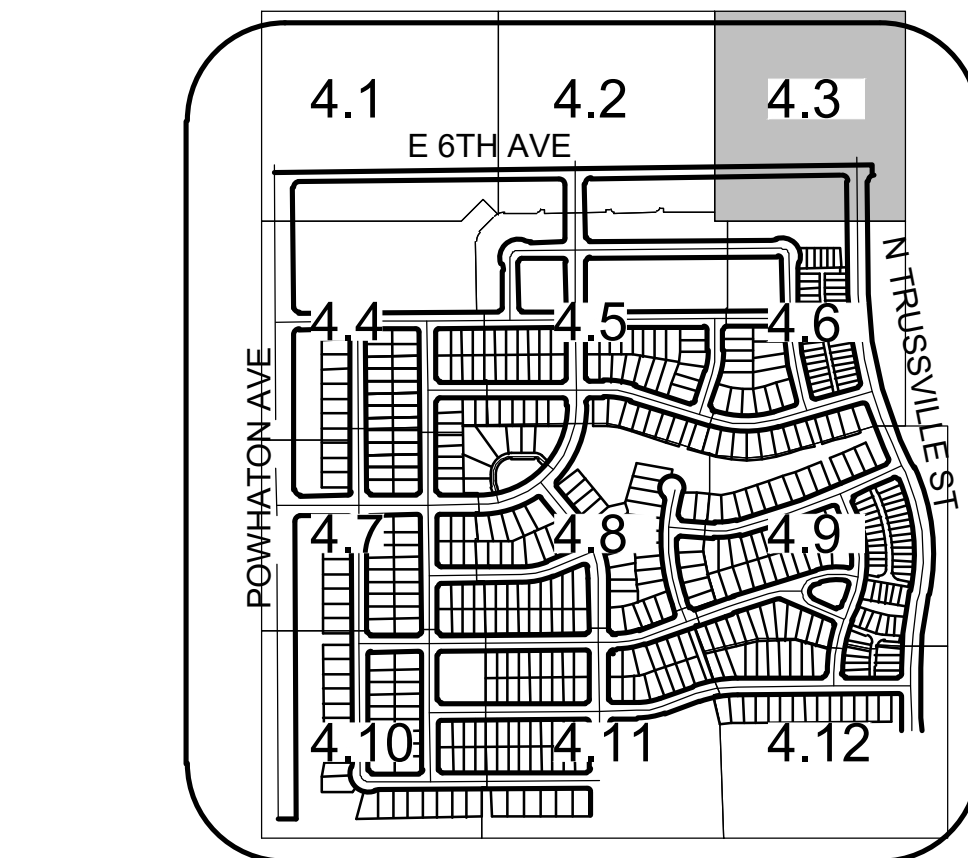
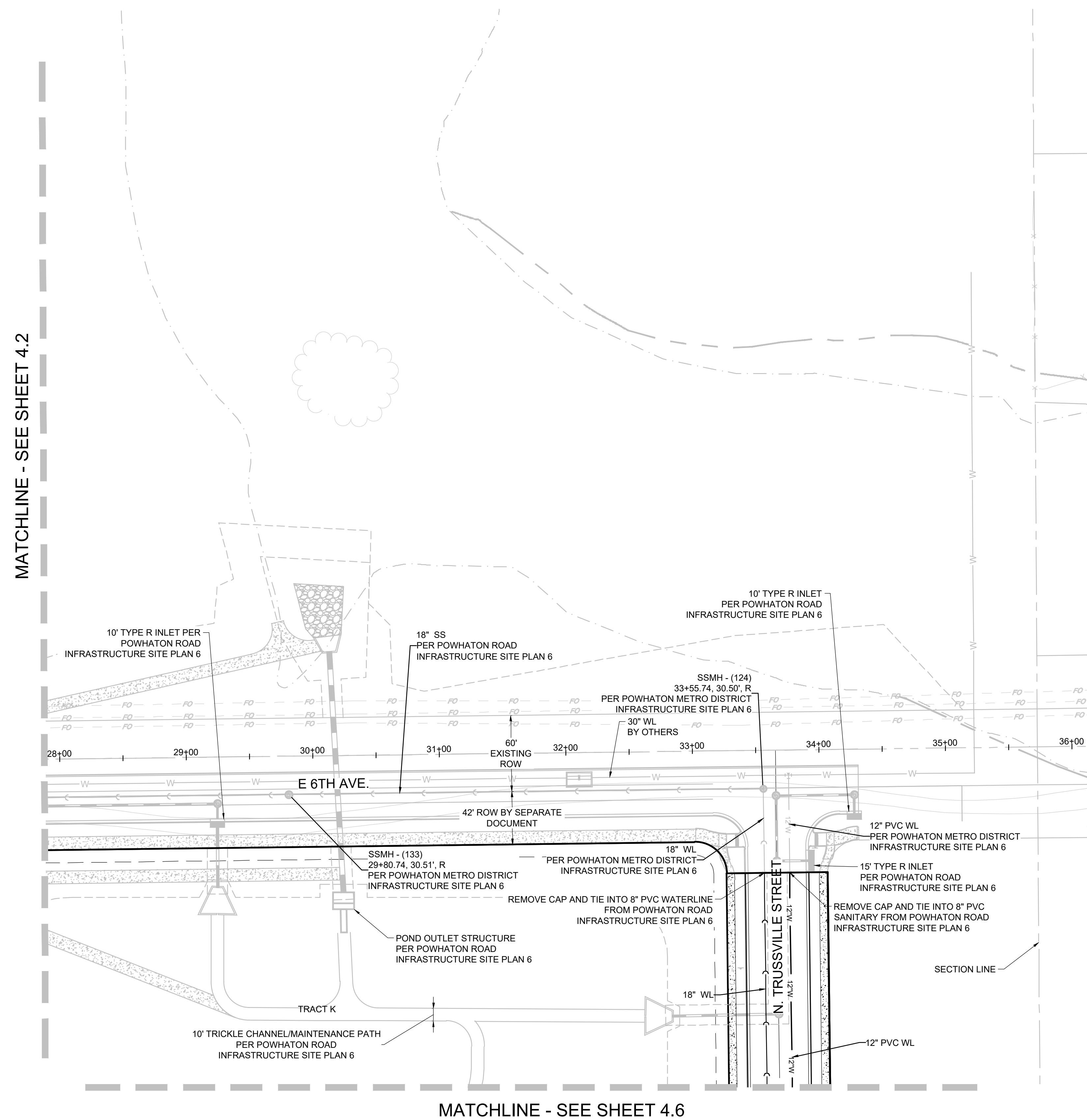
#### ABBREVIATIONS

AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCBC	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	RW	RAW WATER LINE
EVC	END VERTICAL CURVE	SD	STORM DRAIN
EVP	END VERTICAL PROFILE	SL	SECTION LINE
FG	FINISHED GROUND	SO	EDGE OF 6' SHOULDER OFFSET
FL	FLOW LINE	SS	SANITARY SEWER
HP	HIGH POINT	STA	STATION
INV	INVERT	TC	TOP OF CURB
K	CURVATURE COEFFICIENT	T.O.S.	TOP OF PIPE
LF	LINEAR FEET	UE	UTILITY EASEMENT
MH	MANHOLE	VC	VERTICAL CURVE
N.T.S.	NOT TO SCALE	WL	WATER LINE
PL	PROPERTY LINE	WSE	WATER SURFACE ELEVATION
PVC	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		








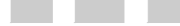












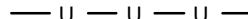




**NOTE:**  
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SHEET NUMBER <b>4.2</b>	DRAWN BY: STF	CHECKED BY: BPW	DATE: DECEMBER 2022	SCALE: AS SHOWN	FILE NO: 8130214922	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA UTILITY PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	<b>Westwood</b> 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodpc.com Westwood Professional Services, Inc.	Revisions No. Date Init. Apr. Date






## UTILITY LEGEND

	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	EXISTING GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
	PROPOSED STORM INLET		
	FILING NO 12 BOUNDARY		PROPOSED STORM DRAIN WITH MANHOLE
	PROPOSED IRRIGATION SLEEVE		EASEMENT LINE
	CENTERLINE		
	RIGHT-OF-WAY		PROPOSED SWALE
	PROPERTY LINE		PROPOSED AREA INLET
	PROPOSED WATER METER		AIR RELEASE VALVE
	PROPOSED IRRIGATION		STREET LIGHT
	PROPOSED UNDER DRAIN		LOT NUMBER
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		BLOCK NUMBER
	EXISTING FIRE HYDRANT		

## ABBREVIATIONS

AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCCB	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	RW	RAW WATER LINE
EVC	END VERTICAL CURVE	SD	STORM DRAIN
EVP	END VERTICAL PROFILE	SL	SECTION LINE
FG	FINISHED GROUND	SS	EDGE OF 6' SHOULDER OFFSET
FL	FLOW LINE	SO	SANITARY SEWER
HP	HIGH POINT	STA	STATION
INV	INVERT	TC	TOP OF CURB
K	CURVATURE COEFFICIENT	T.O.S.	TOP OF PIPE
LF	LINEAR FEET	UE	UTILITY EASEMENT
MH	MANHOLE	VC	VERTICAL CURVE
N.T.S.	NOT TO SCALE	WL	WATER LINE
PL	PROPERTY LINE	WSE	WATER SURFACE ELEVATION
PVC	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		

**NOTE:**  
THE IMPROVEMENTS SHOWN ON THIS SHEET  
ARE PROPOSED WITH POWHATON ROAD  
INFRASTRUCTURE SITE PLAN 6 AND ARE  
SHOWN FOR REFERENCE ONLY.

SHEET NUMBER  4.3	DRAWN BY: STF	SCALE: AS SHOWN	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6  AREA UTILITY PLAN   MelcorTC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	  10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD , CO 80112 TEL: 720.482.9526  Westwoods.com Westwood Professional Services, Inc.	No.	Revisions	Date	Init.	Appr.	
	CHECKED BY:	FILE NO:								
	DATE:	8130214922								
		DECEMBER 2022								

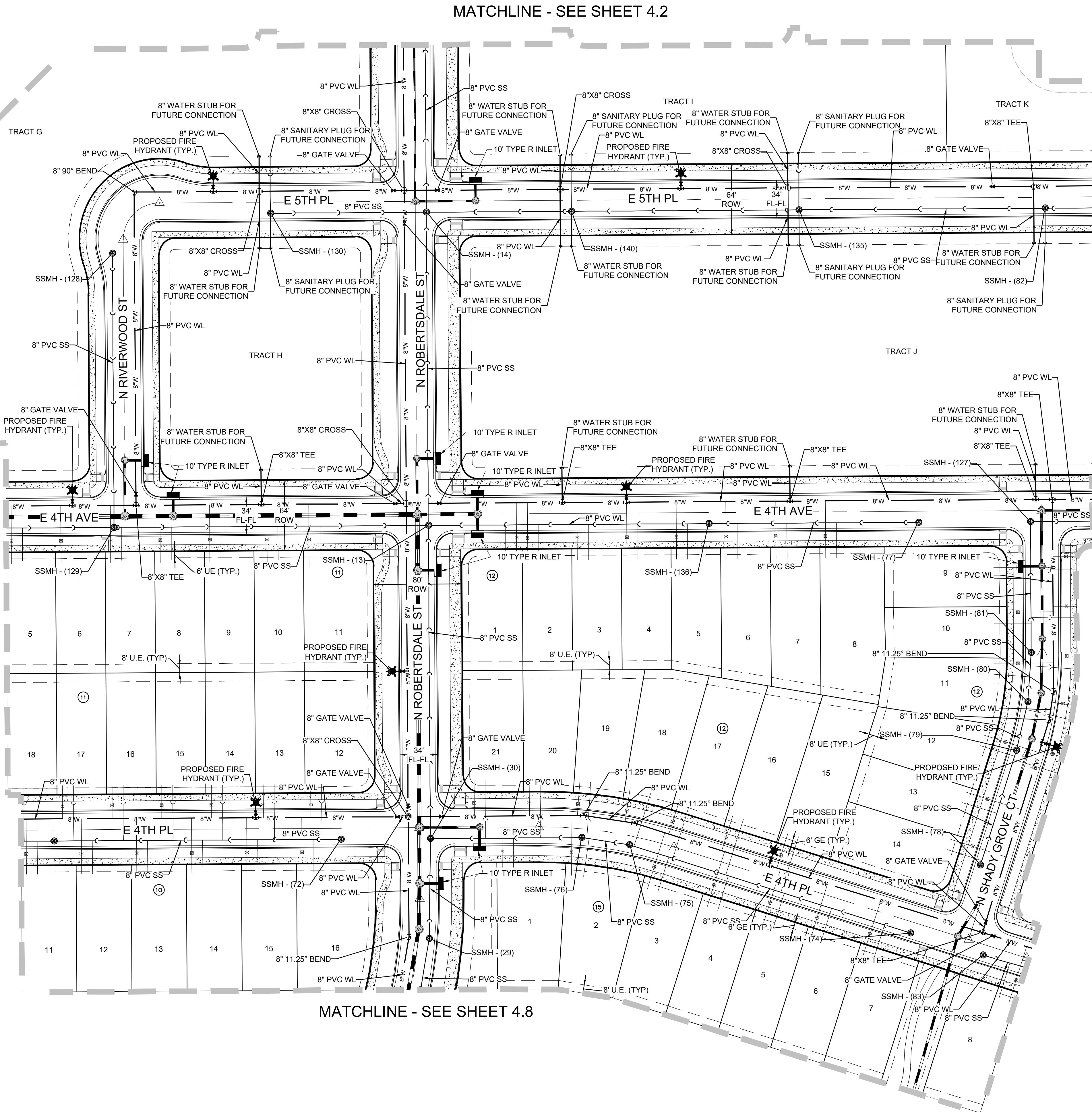






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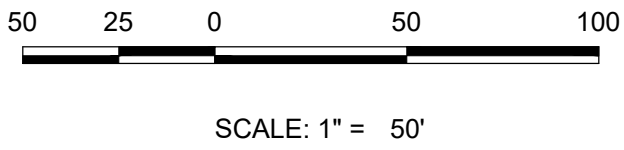
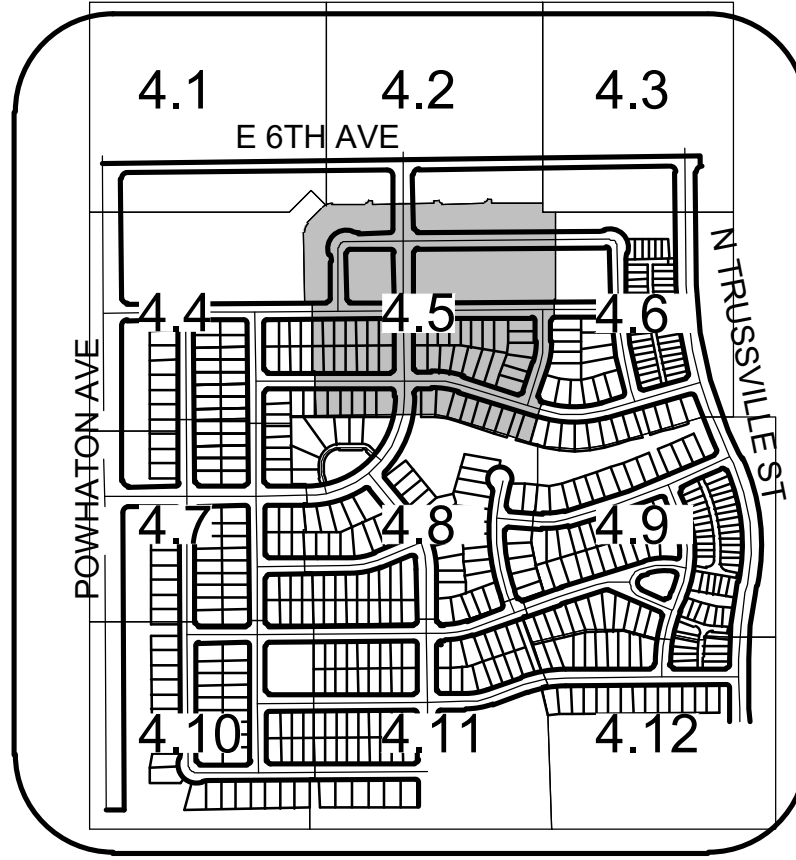
MATCHLINE - SEE SHEET 4.4



MATCHLINE - SEE SHEET 4.8

MATCHLINE - SEE SHEET 4.2

MATCHLINE - SEE SHEET 4.6



UTILITY LEGEND

	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	PROPOSED GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
	FILING NO 12 BOUNDARY		PROPOSED STORM INLET
	PROPOSED IRRIGATION SLEEVE		PROPOSED STORM DRAIN WITH MANHOLE
	CENTERLINE		EASEMENT LINE
	RIGHT-OF-WAY		PROPOSED SWALE
	PROPERTY LINE		PROPOSED AREA INLET
	PROPOSED WATER METER		AIR RELEASE VALVE
	PROPOSED IRRIGATION		STREET LIGHT
	PROPOSED UNDER DRAIN		LOT NUMBER
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		BLOCK NUMBER
	EXISTING FIRE HYDRANT		

ABBREVIATIONS

AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCBC	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	RW	RAW WATER LINE
EVC	END VERTICAL CURVE	SD	STORM DRAIN
EVP	END VERTICAL PROFILE	SL	SECTION LINE
FG	FINISHED GROUND	SO	EDGE OF 6' SHOULDER OFFSET
FL	FLOW LINE	SS	SANITARY SEWER
HP	HIGH POINT	STA	STATION
INV	INVERT	TC	TOP OF CURB
K	CURVATURE COEFFICIENT	T.O.S.	TOP OF PIPE
LF	LINEAR FEET	UE	UTILITY EASEMENT
MH	MANHOLE	VC	VERTICAL CURVE
N.T.S.	NOT TO SCALE	WL	WATER LINE
PL	PROPERTY LINE	WSE	WATER SURFACE ELEVATION
PVC	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		

Westwood

10333 E DRY CREEK RD.  
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Westwoodpc.com  
Westwood Professional Services, Inc.

Melcor/TC Aurora, LLC  
C/O Marathon Land Company  
9750 W. Cambridge Place  
Littleton, CO 80127  
Tel: (303) 920-9400 Fax: (303) 920-9440

HARMONY SUBDIVISION  
CIVIL SITE PLAN NO. 6  
AREA UTILITY PLAN

SCALE:  
AS SHOWN

DRAWN BY: STF

CHECKED BY: BPW

DATE: DECEMBER 2022

8130214922

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No.

Revisions

Apr.

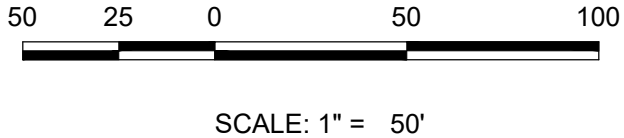
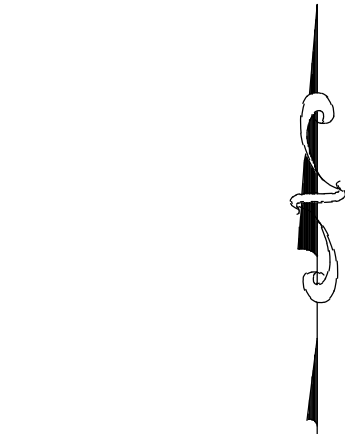
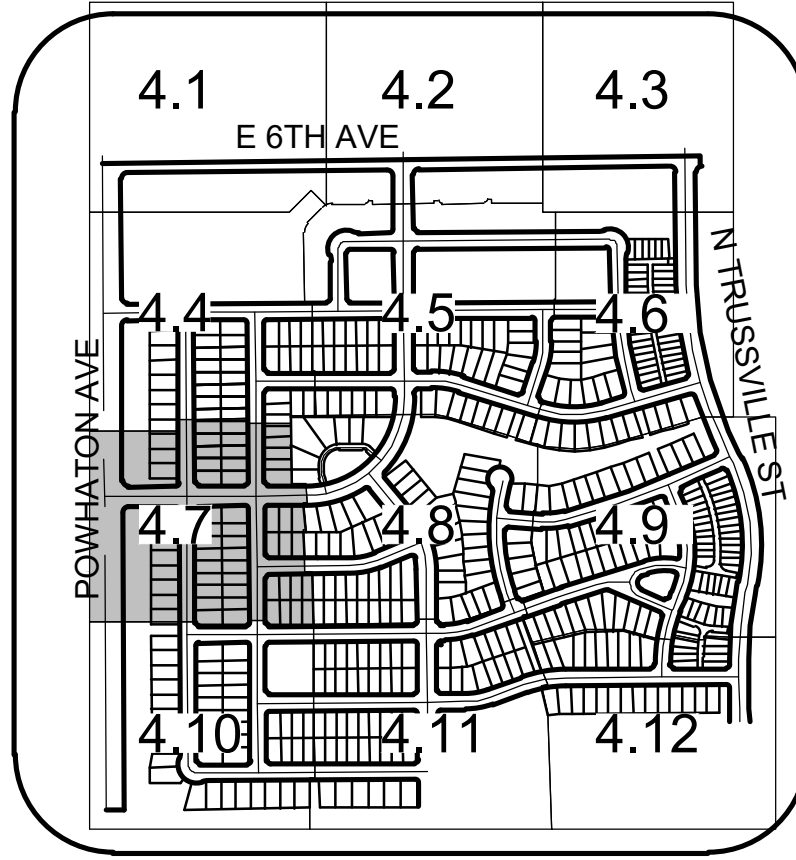
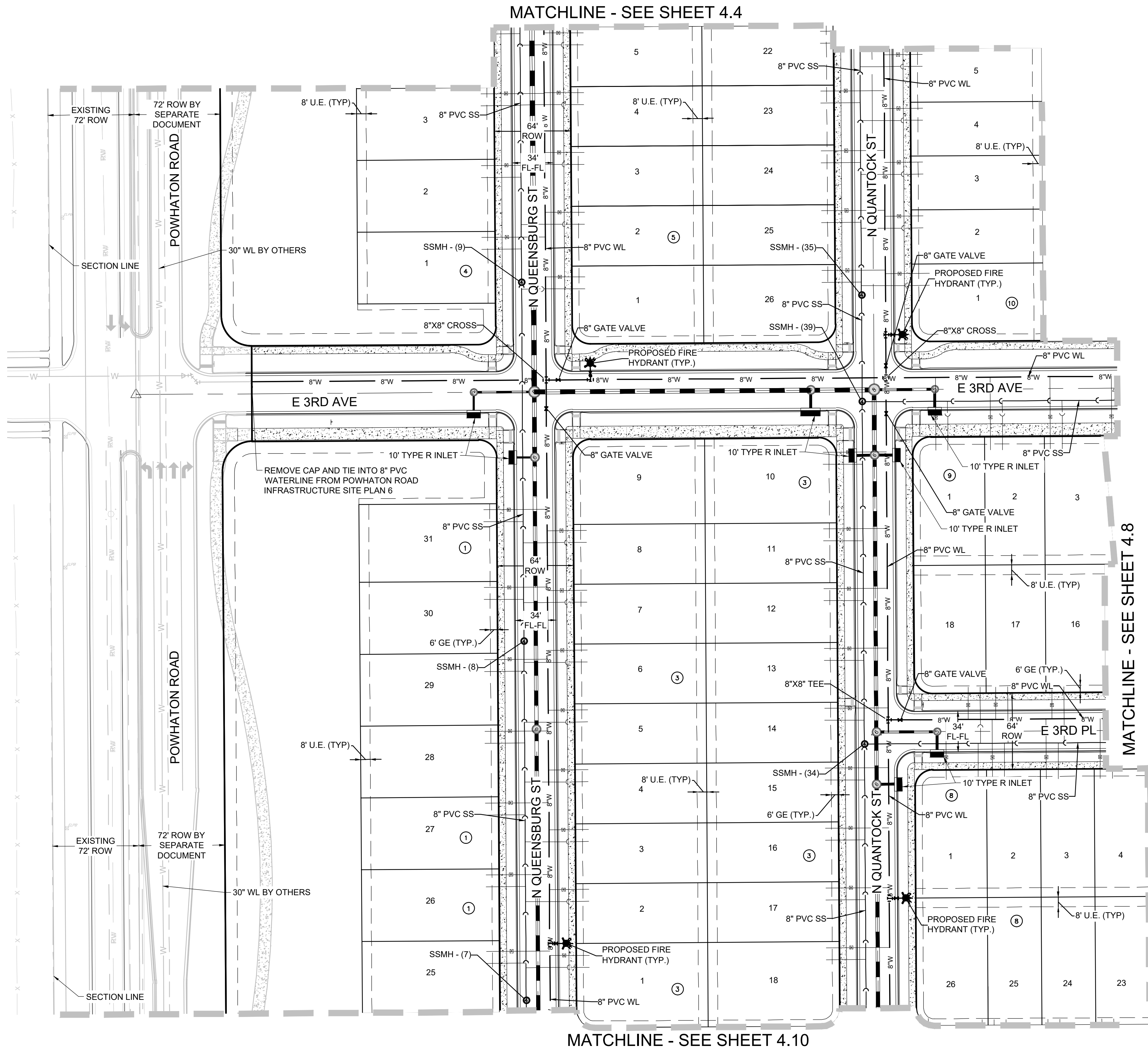
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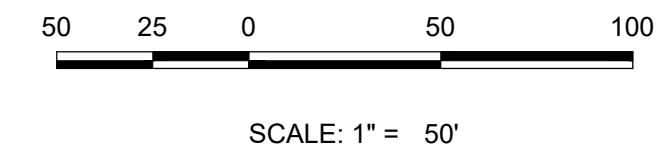
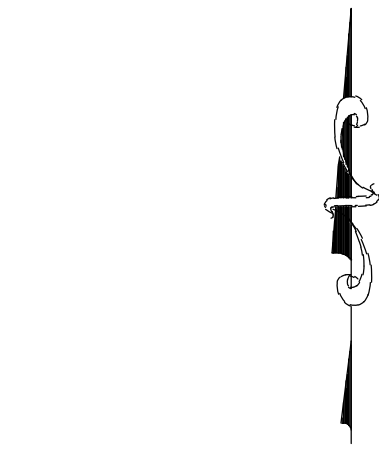
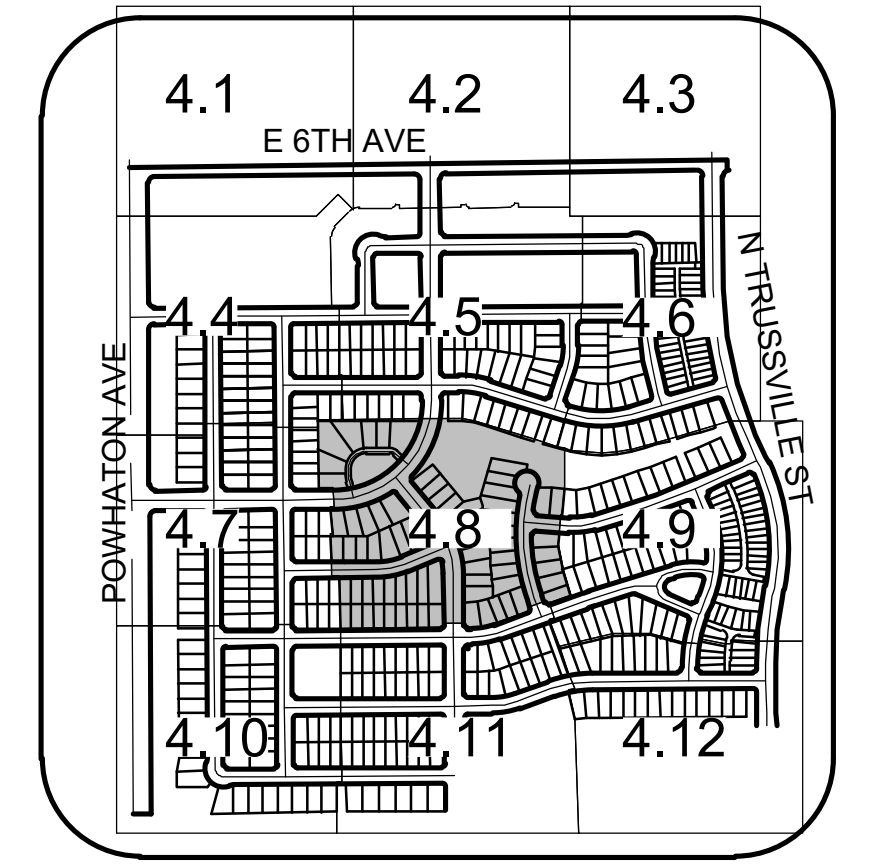
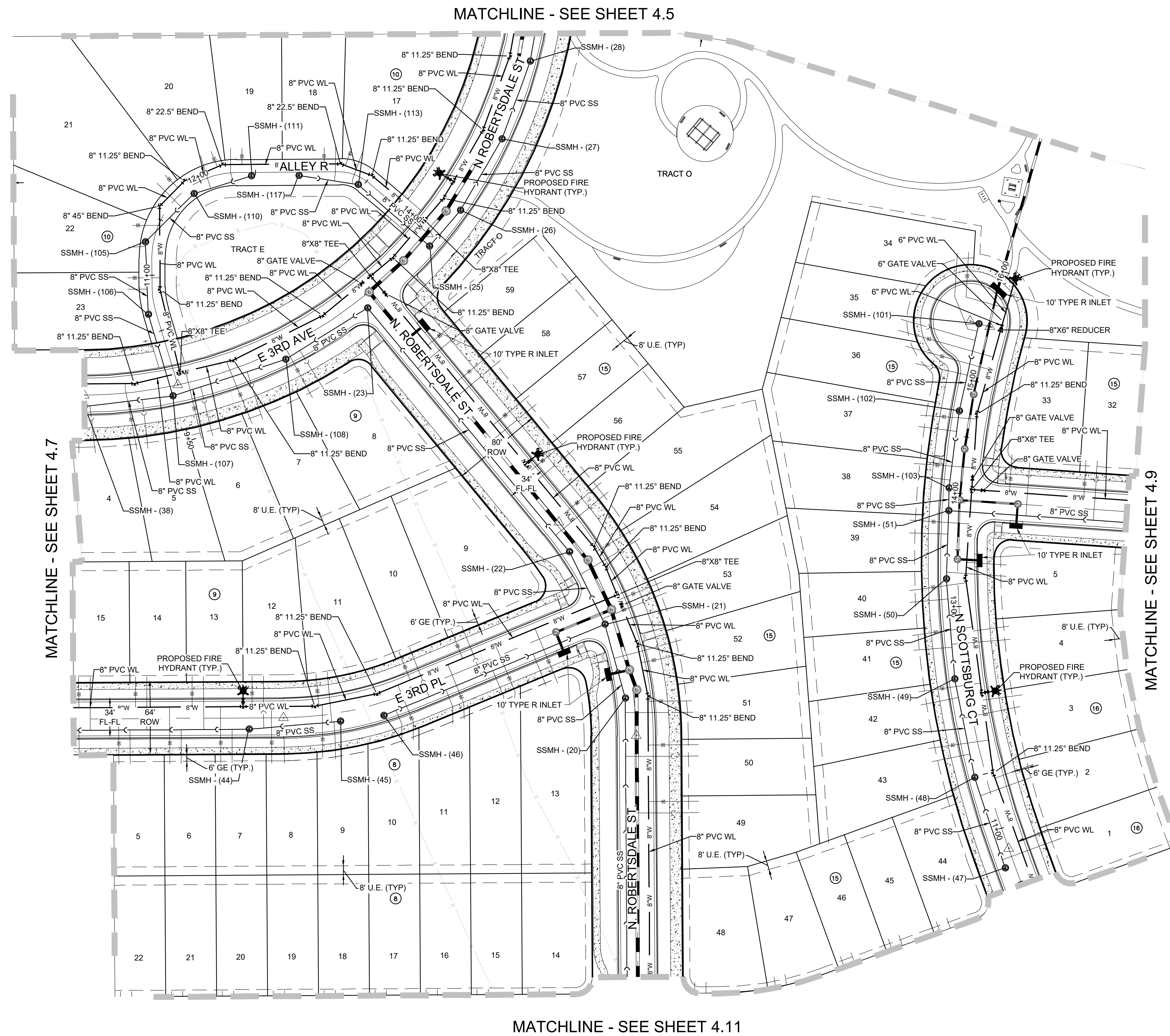


UTILITY LEGEND			
	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	PROPOSED GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
	FILING NO 12 BOUNDARY		PROPOSED STORM INLET
	PROPOSED IRRIGATION SLEEVE		PROPOSED STORM DRAIN WITH MANHOLE
	CENTERLINE		EASEMENT LINE
	RIGHT-OF-WAY		PROPOSED SWALE
	PROPERTY LINE		PROPOSED AREA INLET
	PROPOSED WATER METER		AIR RELEASE VALVE
	PROPOSED IRRIGATION		STREET LIGHT
	PROPOSED UNDER DRAIN		LOT NUMBER
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		BLOCK NUMBER
	EXISTING FIRE HYDRANT		













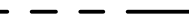











ABBREVIATIONS			
AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCBC	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	RW	RAW WATER LINE
EVC	END VERTICAL CURVE	SD	STORM DRAIN
EVP	END VERTICAL PROFILE	SL	SECTION LINE
FG	FINISHED GROUND	SO	EDGE OF 6' SHOULDER OFFSET
FL	FLOW LINE	SS	SANITARY SEWER
HP	HIGH POINT	STA	STATION
INV	INVERT	TC	TOP OF CURB
K	CURVATURE COEFFICIENT	T.O.S.	TOP OF PIPE
LF	LINEAR FEET	UE	UTILITY EASEMENT
MH	MANHOLE	VC	VERTICAL CURVE
N.T.S.	NOT TO SCALE	WL	WATER LINE
PL	PROPERTY LINE	WSE	WATER SURFACE ELEVATION
PVC	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		

SHEET NUMBER	DRAWN BY:		SCALE:	AS SHOWN		4.7						
	STF	BFW	DATE:	DEC 2022	FILE NO:							
	CHECKED BY:		8130214922		HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA UTILITY PLAN							
						Revisions						
						No.						
						Date						
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## UTILITY LEGEND

	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	PROPOSED GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
	FILING NO 12 BOUNDARY		PROPOSED STORM DRAIN WITH MANHOLE
	PROPOSED IRRIGATION SLEEVE		PROPOSED STORM DRAIN WITH MANHOLE
	CENTERLINE		EASEMENT LINE
	RIGHT-OF-WAY		PROPOSED SWALE
	PROPERTY LINE		PROPOSED AREA INLET
	PROPOSED WATER METER		AIR RELEASE VALVE
	PROPOSED IRRIGATION		STREET LIGHT
	PROPOSED UNDER DRAIN		LOT NUMBER
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		BLOCK NUMBER
	EXISTING FIRE HYDRANT		

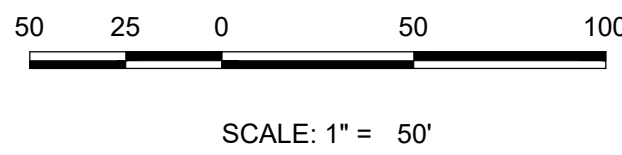
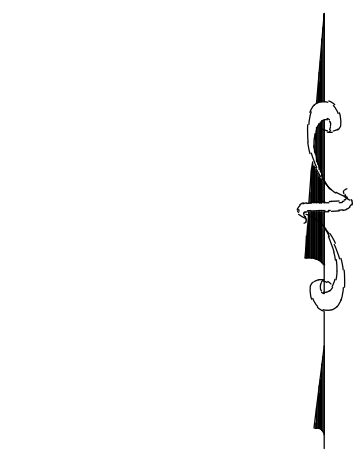
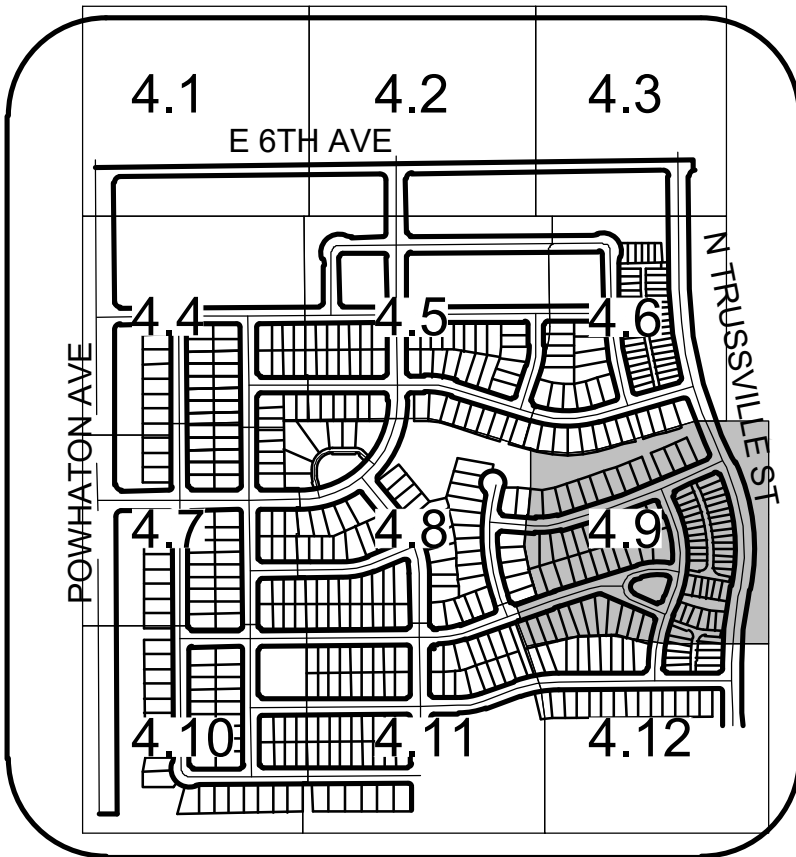
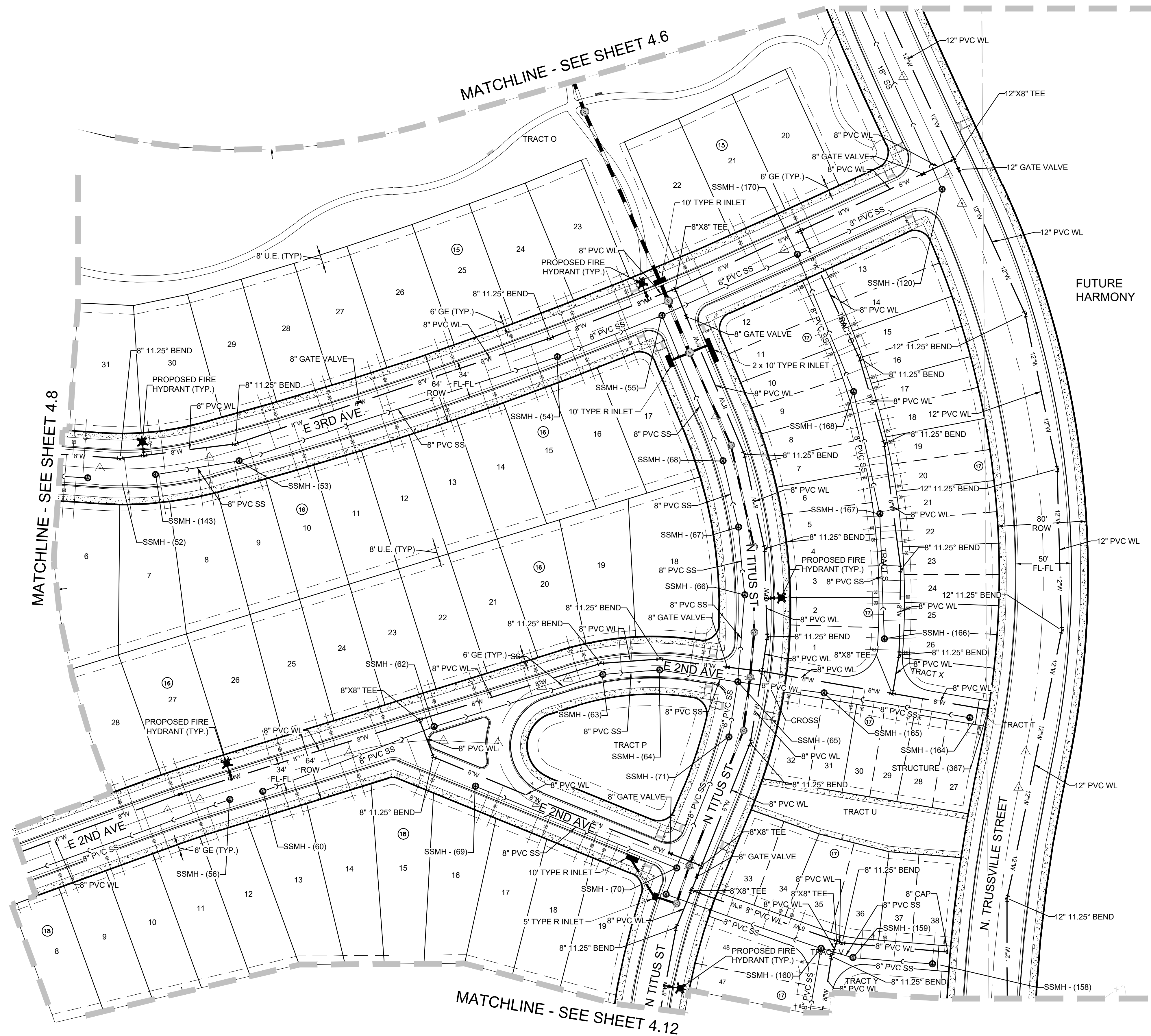
## ABBREVIATIONS

AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCBC	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCPI	REINFORCED CONCRETE PIPE
EL	ELEVATION	RCP	REINFORCED CONCRETE PIPE
EP	EDGE OF PAVEMENT	ROW	RIGHT OF WAY
EVC	END VERTICAL CURVE	RW	RAW WATER LINE
EVP	END VERTICAL PROFILE	SD	STORM DRAIN
FG	FINISHED GROUND	SL	SECTION LINE
FL	FLOW LINE	SS	EDGE OF 6' SHOULDER OFFSET
HP	HIGH POINT	SO	SANITARY SEWER
INV	INVERT	STA	STATION
K	CURVATURE COEFFICIENT	TC	TOP OF CURB
LF	LINEAR FEET	T.O.S.	TOP OF PIPE
MH	MANHOLE	UE	UTILITY EASEMENT
N.T.S.	NOT TO SCALE	VC	VERTICAL CURVE
PL	PROPERTY LINE	WL	WATER LINE
PVC	POLYVINYL CHLORIDE	WSE	WATER SURFACE ELEVATION
PVI	POINT OF VERTICAL INTERSECTION		

SHEET NUMBER  <b>4.8</b>	DRAWN BY:	SCALE:	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA UTILITY PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 <a href="http://Westwoods.com">Westwoods.com</a> Westwood Professional Services, Inc.						
	CHECKED BY:	AS SHOWN									
	DATE:	FILE NO:									
		8130214922									
	DECEMBER 2022										



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UTILITY LEGEND

	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	PROPOSED GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
	FILING NO 12 BOUNDARY		PROPOSED STORM INLET
	PROPOSED IRRIGATION SLEEVE		PROPOSED STORM DRAIN WITH MANHOLE
	CENTERLINE		EASEMENT LINE
	RIGHT-OF-WAY		PROPOSED SWALE
	PROPERTY LINE		PROPOSED WATER METER
	PROPOSED WATER METER		PROPOSED AREA INLET
	PROPOSED IRRIGATION		AIR RELEASE VALVE
	PROPOSED UNDER DRAIN		STREET LIGHT
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		LOT NUMBER
	EXISTING FIRE HYDRANT		BLOCK NUMBER

ABBREVIATIONS

AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCBC	REINFORCED CONCRETE BOX CULVERT
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INV	INVERT	TC	TOP OF CURB
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N.T.S.	NOT TO SCALE	WL	WATER LINE
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PVC	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		

No.	Revisions	Date	Appr.	Date

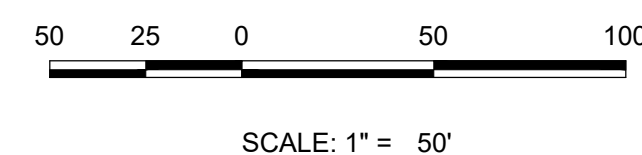
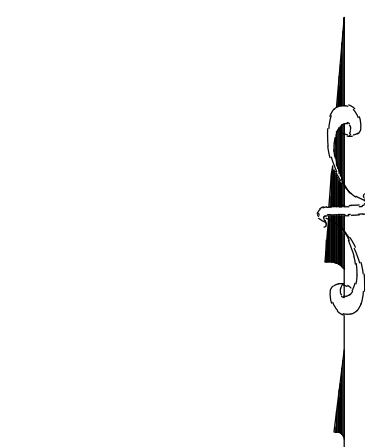
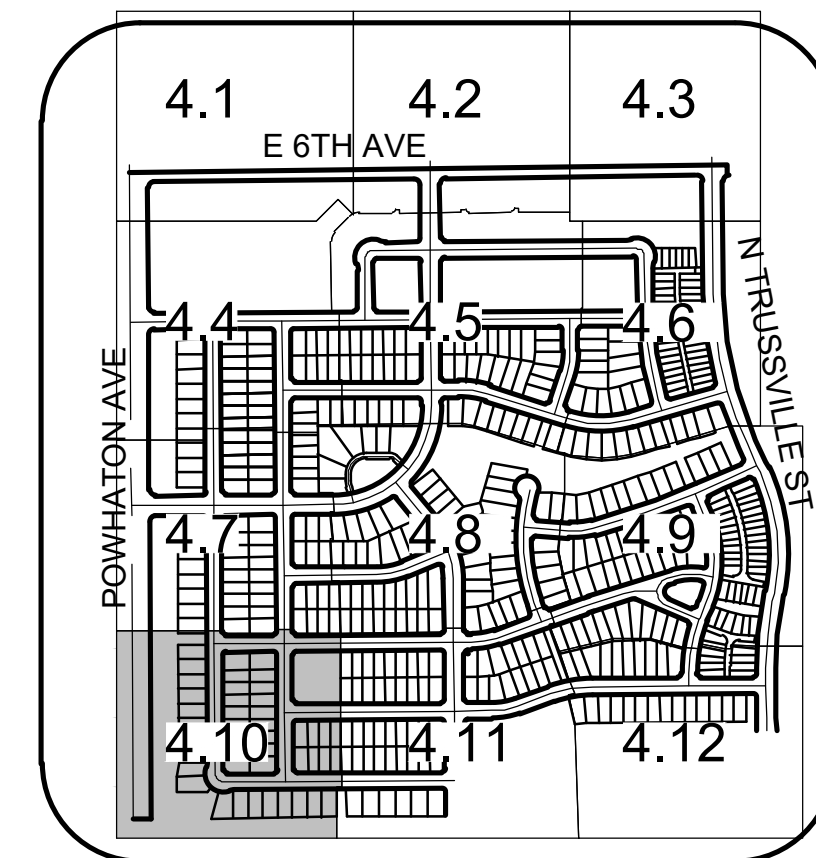
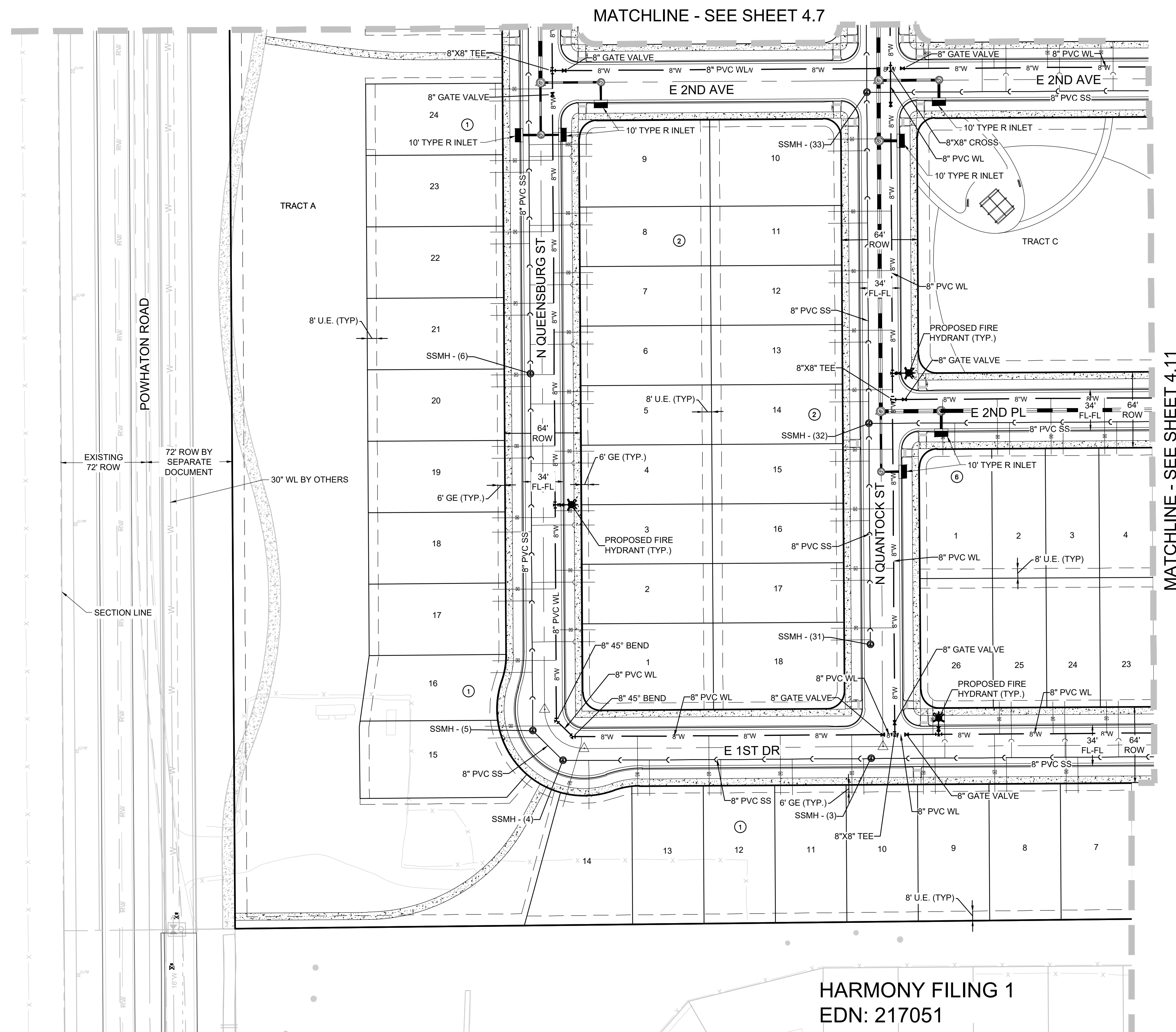
**Westwood**  
10333 E DRY CREEK RD.  
SUITE 240  
ENGLEWOOD, CO 80112  
TEL: 720.482.9526  
Westwoodpc.com  
Westwood Professional Services, Inc.

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













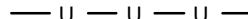




HARMONY SUBDIVISION  
CIVIL SITE PLAN NO. 6  
AREA UTILITY PLAN

DRAWN BY:	SCALE:
STF	AS SHOWN
CHECKED BY:	FILE NO:
BPW	8130214922
DATE:	
DECEMBER 2022	





## UTILITY LEGEND

	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	EXISTING GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
	PROPOSED STORM INLET		
	FILING NO 12 BOUNDARY		PROPOSED STORM DRAIN WITH MANHOLE
	PROPOSED IRRIGATION SLEEVE		
	CENTERLINE		EASEMENT LINE
	RIGHT-OF-WAY		PROPOSED SWALE
	PROPERTY LINE		PROPOSED AREA INLET
	PROPOSED WATER METER		AIR RELEASE VALVE
	PROPOSED IRRIGATION		STREET LIGHT
	PROPOSED UNDER DRAIN		LOT NUMBER
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		BLOCK NUMBER
	EXISTING FIRE HYDRANT		

## ABBREVIATIONS

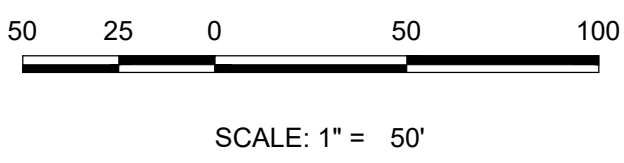
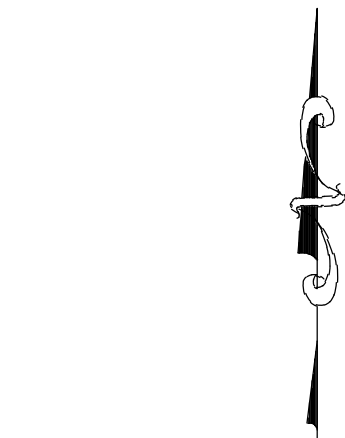
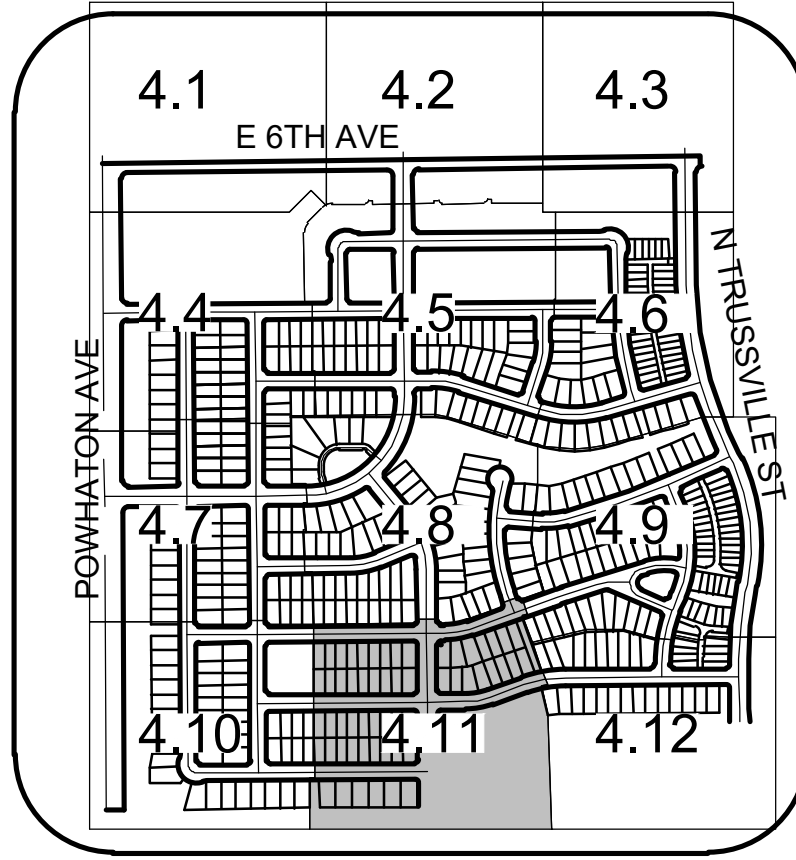
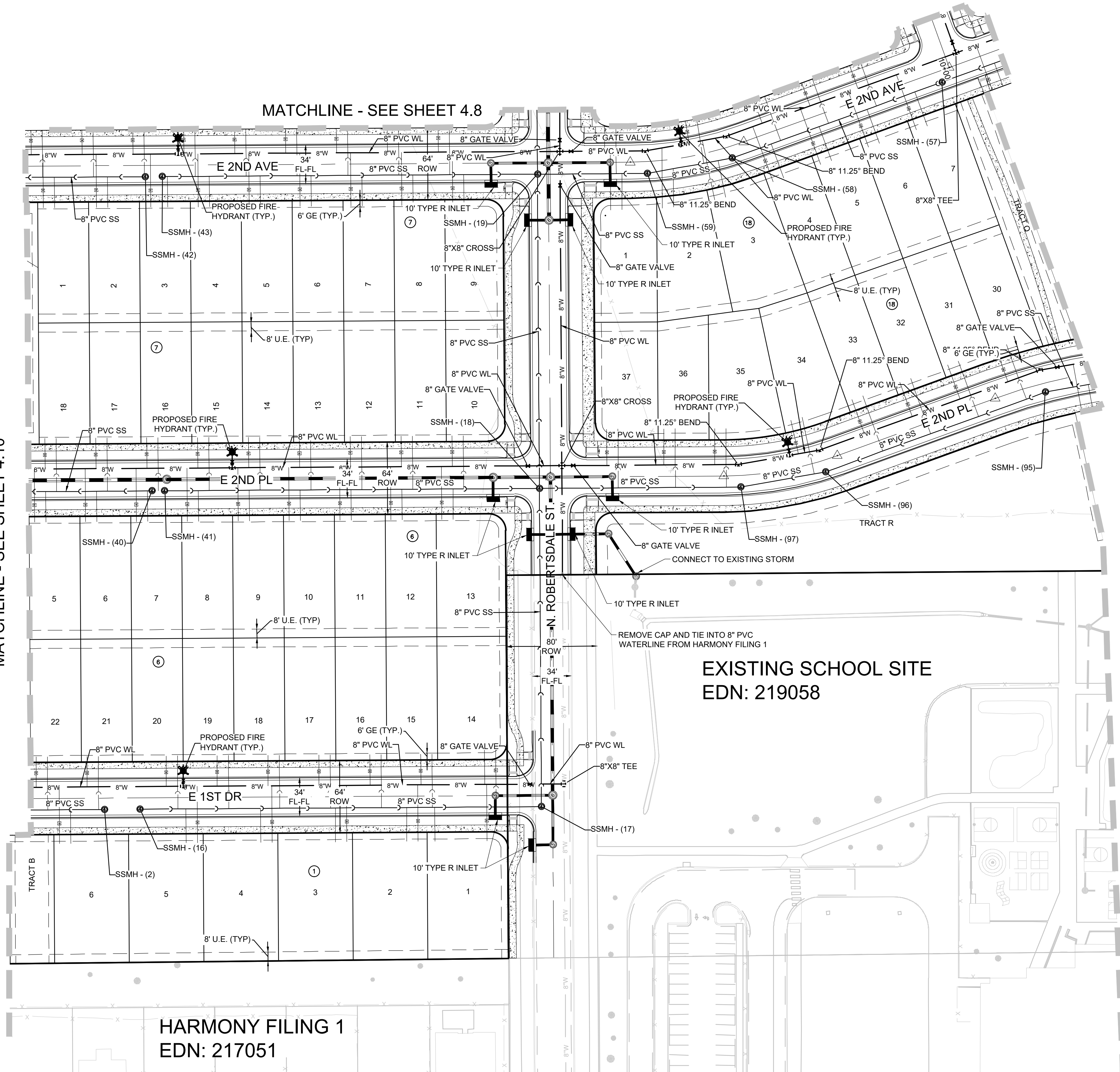
AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCCB	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	RW	RAW WATER LINE
EVC	END VERTICAL CURVE	SD	STORM DRAIN
FVP	END VERTICAL PROFILE	SL	SECTION LINE
FG	FINISHED GROUND	SS	EDGE OF 6' SHOULDER OFFSET
FL	FLOW LINE	SO	SANITARY SEWER
HP	HIGH POINT	STA	STATION
INV	INVERT	TC	TOP OF CURB
K	CURVATURE COEFFICIENT	T.O.S.	TOP OF PIPE
LF	LINEAR FEET	UE	UTILITY EASEMENT
M.H.	MANHOLE	VC	VERTICAL CURVE
N.T.S.	NOT TO SCALE	WL	WATER LINE
PL	PROPERTY LINE	WSE	WATER SURFACE ELEVATION
PVC	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		

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N:\PROJECTS\30175604 SAND CREEK\CAD\ENGINEERING\SSHEETS\CS\B\SITE PLAN\AREA UTILITY PLAN.DWG, BPWILSON, 12/20/22

MATCHLINE - SEE SHEET 4.10



UTILITY LEGEND

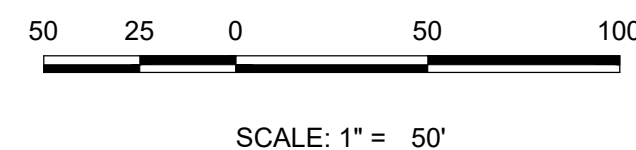
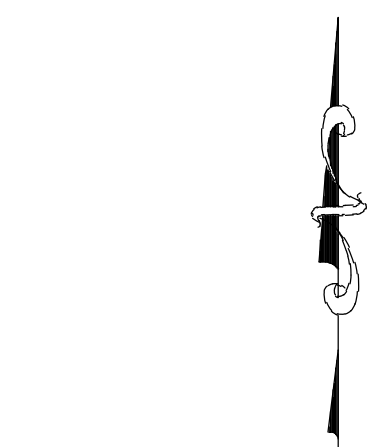
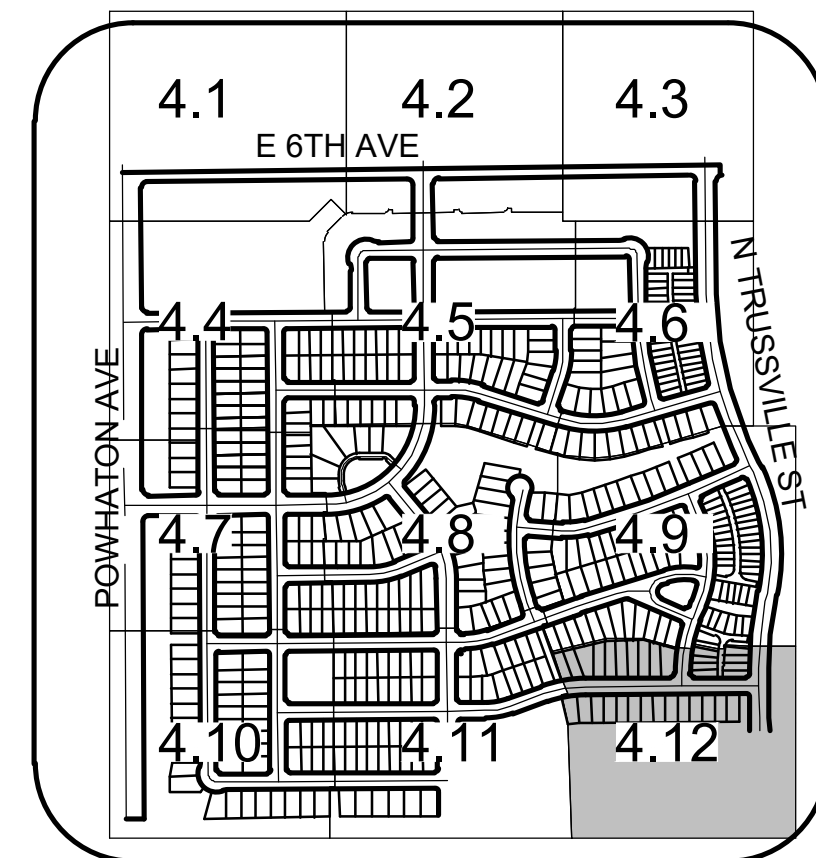
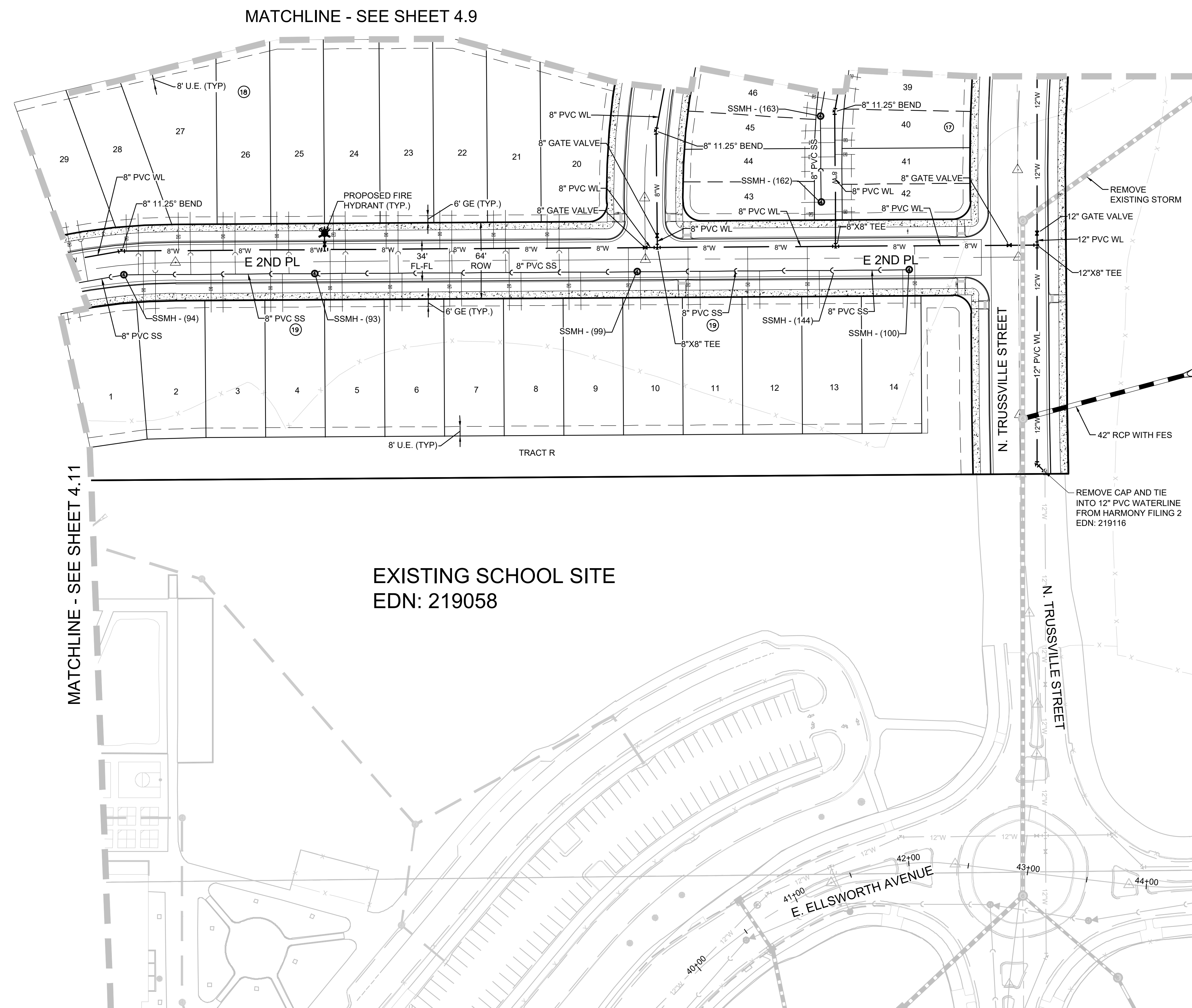
	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	PROPOSED GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
	FILING NO 12 BOUNDARY		PROPOSED STORM INLET
	PROPOSED IRRIGATION SLEEVE		PROPOSED STORM DRAIN WITH MANHOLE
	CENTERLINE		EASEMENT LINE
	RIGHT-OF-WAY		PROPOSED SWALE
	PROPERTY LINE		PROPOSED AREA INLET
	PROPOSED WATER METER		AIR RELEASE VALVE
	PROPOSED IRRIGATION		STREET LIGHT
	PROPOSED UNDER DRAIN		LOT NUMBER
	PROPOSED 6" FIRE HYDRANT ASSEMBLY		BLOCK NUMBER
	EXISTING FIRE HYDRANT		

ABBREVIATIONS














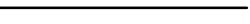









AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCBC	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	RAW	RAW WATER LINE
EVC	END VERTICAL CURVE	SD	STORM DRAIN
EVP	END VERTICAL PROFILE	SL	SECTION LINE
FG	FINISHED GROUND	SO	EDGE OF 6' SHOULDER OFFSET
FL	FLOW LINE	SS	SANITARY SEWER
HP	HIGH POINT	STA	STATION
INV	INVERT	TC	TOP OF CURB
K	CURVATURE COEFFICIENT	T.O.S.	TOP OF PIPE
LF	LINEAR FEET	UE	UTILITY EASEMENT
MH	MANHOLE	VC	VERTICAL CURVE
N.T.S.	NOT TO SCALE	WL	WATER LINE
PL	PROPERTY LINE	WSE	WATER SURFACE ELEVATION
PVC	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		

SHEET NUMBER	DRAWN BY: STF	CHECKED BY: BPW	DATE: DECEMBER 2022	SCALE: AS SHOWN	FILE NO: 8130214922	HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA UTILITY PLAN	Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440	<b>Westwood</b> 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoodpc.com Westwood Professional Services, Inc.	Revisions	No.	Date	Init.	Apr.	Date






## UTILITY LEGEND

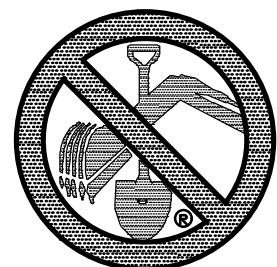
	PROPOSED 8" WATERLINE UNLESS OTHERWISE NOTED		PROPOSED CAP W/ BLOW OFF
	PROPOSED GATE VALVE		EXISTING TREE
	PROPOSED 8" SANITARY SEWER WITH MANHOLE UNLESS OTHERWISE NOTED		PROPOSED FLARED END SECTION
			PROPOSED STORM INLET
	FLING NO 12 BOUNDARY		PROPOSED STORM DRAIN WITH MANHOLE
	PROPOSED IRRIGATION SLEEVE		
	CENTERLINE		EASEMENT LINE
	RIGHT-OF-WAY		
	PROPERTY LINE		PROPOSED SWALE
	PROPOSED WATER METER		PROPOSED AREA INLET
	PROPOSED IRRIGATION		AIR RELEASE VALVE
	PROPOSED UNDER DRAIN		STREET LIGHT
	PROPOSED 6" FIRE HYDRANT ASSEMBLY	11	LOT NUMBER
	EXISTING FIRE HYDRANT	6	BLOCK NUMBER

ABBREVIATIONS			
AD	ANGLE DIFFERENCE	PVT	POINT OF VERTICAL TANGENT
BVC	BEGIN VERTICAL CURVE	RCBT	REINFORCED CONCRETE BOX CULVERT
BVP	BEGIN VERTICAL PROFILE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	ROW	RIGHT OF WAY
EP	EDGE OF PAVEMENT	RW	RAW WATER LINE
EVC	END VERTICAL CURVE	SD	STORM DRAIN
EVP	END VERTICAL PROFILE	SL	SECTION LINE
FG	FINISHED GROUND	SO	EDGE OF 6' SHOULDER OFFSET
FL	FLOW LINE	SS	SANITARY SEWER
HP	HIGH POINT	STA	STATION
INV	INVERT	TC	TOP OF CURB
K	CURVATURE COEFFICIENT	T.O.S.	TOP OF PIPE
LH	LINEAR FEET	UE	UTILITY EASEMENT
MF	MANHOLE	VC	VERTICAL CURVE
N.T.S.	NOT TO SCALE	WL	WATER LINE
P	PROPERTY LINE	WSE	WATER SURFACE ELEVATION
PL	POLYVINYL CHLORIDE		
PVI	POINT OF VERTICAL INTERSECTION		

SHEET NUMBER  <b>4.12</b>	DRAWN BY:	STF	SCALE:  <b>AS SHOWN</b>	<b>HARMONY SUBDIVISION CIVIL SITE PLAN NO. 6 AREA UTILITY PLAN</b>	<b>Melcor/TC Aurora, LLC C/O Marathon Land Company 9750 W. Cambridge Place Littleton, CO 80127 Tel: (303) 920-9400 Fax: (303) 920-9440</b>	 10333 E DRY CREEK RD. SUITE 240 ENGLEWOOD, CO 80112 TEL: 720.482.9526 <a href="http://Westwoodps.com">Westwoodps.com</a> Westwood Professional Services, Inc.						
	CHECKED BY:	BFW										
	DATE:	DECEMBER 2022										
							No.	Revisions	Date	Init.	Appr.	Date



N:\PROJECTS\30175604 SAND CREEK\CAD\ENGINEERING\SHSHEET SETS\CS\SITE PLAN 7P\PHASING PLAN.DWG. D:\JUNINEE, 12/20/22



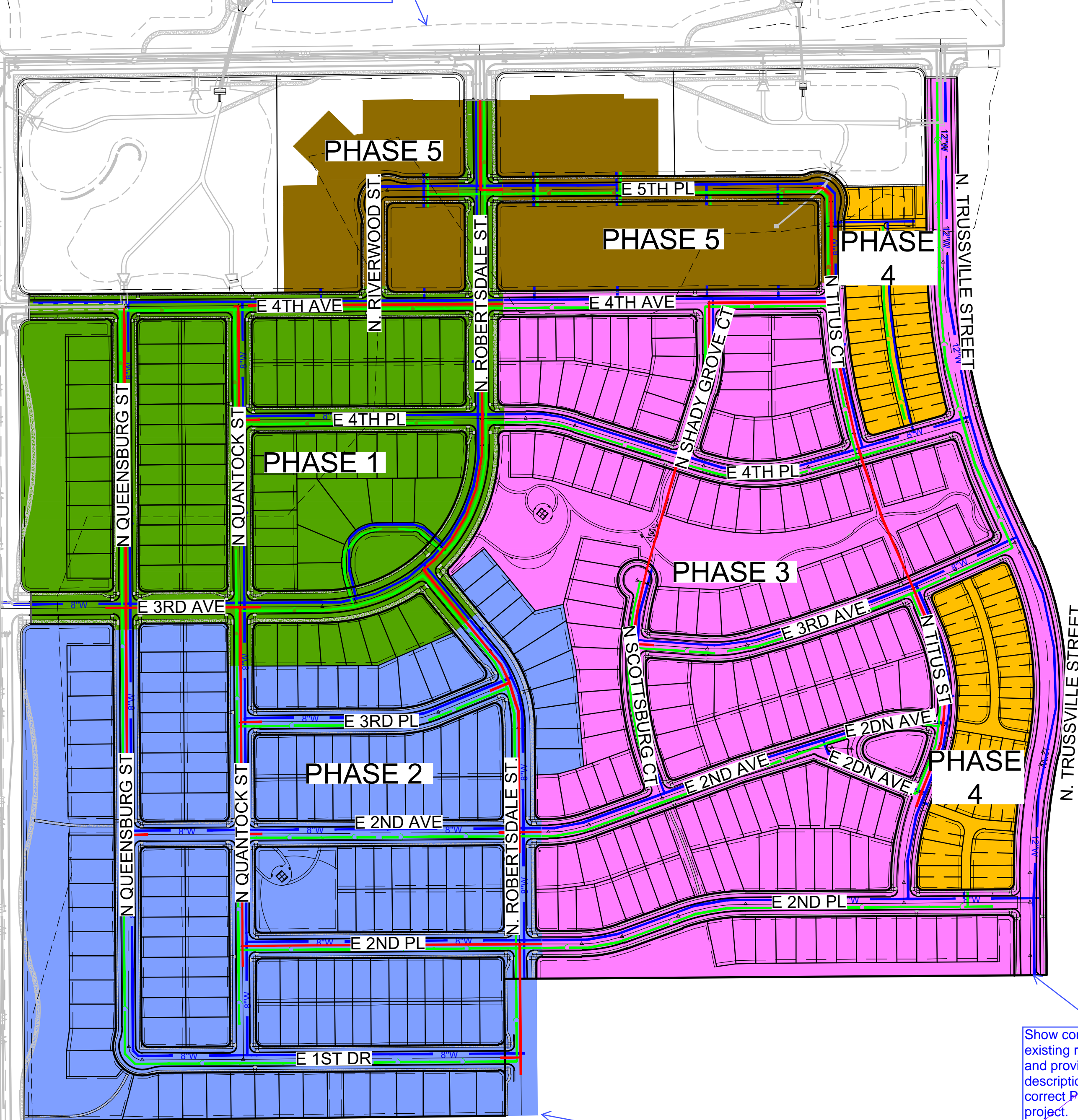
CALL UNCC  
TWO WORKING DAYS  
**BEFORE YOU DIG**  
1-800-922-1987  
534-6700 METRO DENVER AREA  
UTILITY NOTIFICATION CENTER OF COLORADO

# HARMONY FILING 16 PHASING PLAN



The progress of these northern road plans is being coordinated with the adjacent property owner and the City of Aurora staff.

Ask reference status of roads?



REQUIREMENTS FOR PHASED CONSTRUCTION SITES AND PROJECTS:

1. PRIOR TO ANY ABOVE GROUND LEVEL CONSTRUCTION OR TRACTION OF A STRUCTURE, WHETHER THE PRINCIPAL STRUCTURE MATERIALS ARE COMBUSTIBLE OR OF A NON-COMBUSTIBLE NATURE, THERE SHALL BE ADEQUATE ALL-WEATHER ACCESS ROADWAYS PROVIDED FOR USE BY EMERGENCY VEHICLE APPARATUS. FIRE ACCESS PROVIDED BY THE PROPERTY OWNER SHALL BE MAINTAINED TO ADEQUATELY SUPPORT FIRE APPARATUS UP TO 85,000 LBS. THESE TEMPORARY SITE ACCESS ROADWAYS SHALL NOT BE LESS THAN 23 FT. WIDTH WITH A STANDARD TURNING RADIUS OF 20 FT. INSIDE AND 52 FT. OUTSIDE. A HAMMERHEAD OR THREE-POINT TURNAROUND WILL BE REQUIRED ON DEAD-END FIRE APPARATUS ROADS IN EXCESS OF 150 FT. THE MATERIAL USED TO CONSTRUCT THESE ROADWAYS MAY BE OF ANY ONE OF OR A COMBINATION OF SEVERAL AGGREGATE MATERIALS AVAILABLE APPROVED MATERIALS INCLUDE: PRIMED ROAD BASE MATERIAL, RIVER ROCK, CRUSHED GRANITE OR OTHER AGGREGATE WITH NOT LESS THAN ONE-INCH NOMINAL SIZE DESIGNATION AS APPROVED. THE IFC REPRESENTATIVE MAY APPROVE OTHER ROADWAY MATERIALS. IN NO WAY SHALL THE DESIGNATION IN THIS POLICY BE INTENDED OR CONSTRUED PROHIBIT ASPHALT PAVING OR ADDITIONAL REQUIREMENTS AS NECESSARY.
2. THE DEVELOPER SHALL PROVIDE TWO DISTINCT POINTS OF EMERGENCY ACCESS TO THE OVERALL SITE AND A LOOPED WATER SUPPLY TO EACH PHASE OF THE DEVELOPMENT AS APPROVED BY THE LIFE SAFETY REPRESENTATIVE FOR THE AURORA FIRE DEPARTMENT. THE DEVELOPER SHALL CONSTRUCT ANY OFF-SITE ROADWAY OR EMERGENCY CROSSINGS IMPROVEMENTS PER CITY STANDARDS NECESSARY TO FACILITATE EMERGENCY VEHICULAR ACCESS TO THIS SITE.
3. EACH PORTION OF THE OVERALL SITE IS REQUIRED TO HAVE TWO DISTINCT POINTS OF ACCESS DURING EACH PHASE OF CONSTRUCTION. EACH PHASE MUST PROVIDE SUFFICIENT ROADWAYS TO ASSURE EMERGENCY VEHICLE ACCESS TO WITHIN 150 FT. OF ALL EXTERIOR PORTIONS OF ALL BUILDINGS. SUFFICIENT FIRE HYDRANTS ON A LOOPED WATER LINE SYSTEM TO PROVIDE THE REQUIRED FIRE FLOWS FOR EACH SITE.
4. ACCESS TO BUILDINGS FOR THE PURPOSE OF FIRE DEPARTMENT VEHICLE ACCESS SHALL BE PROVIDED AT ALL TIMES DURING CONSTRUCTION. CONSTRUCTION MATERIALS SHALL NOT BLOCK ACCESS TO BUILDINGS, HYDRANTS OR FIRE APPLIANCES.

Existing waterlines are now shown in the plan. This note 2 should be satisfied.

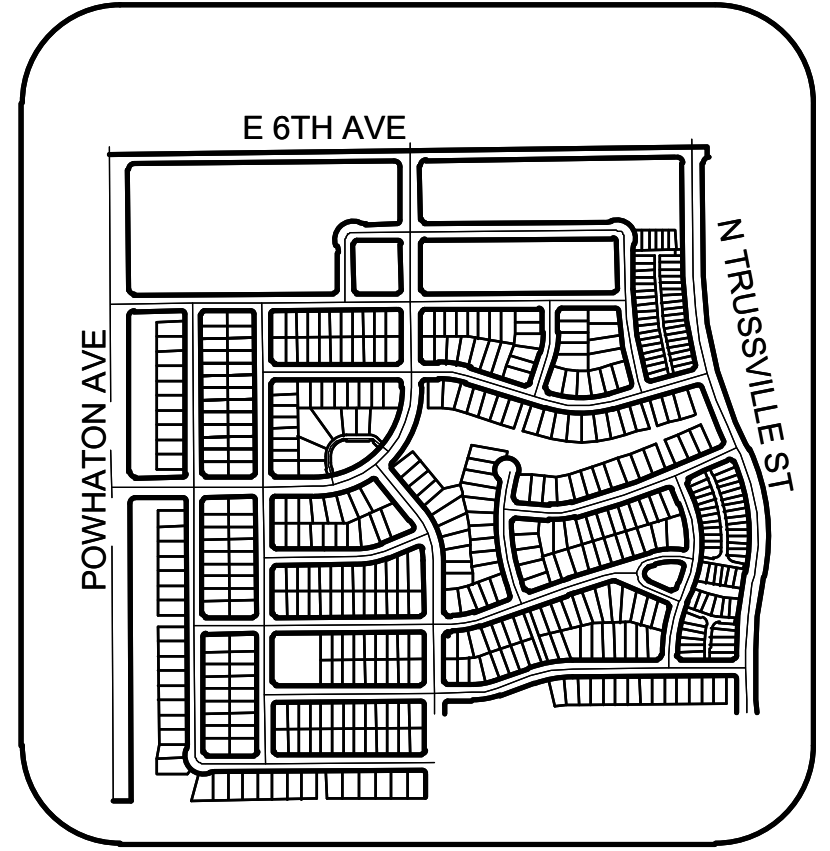
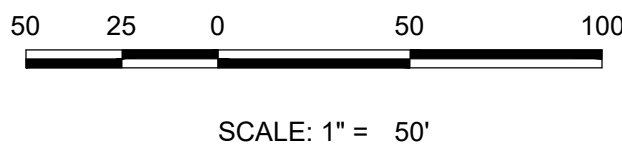
Phasing details need to include two points of access and looped water supply. See note 2.

Show connection to existing roadway and provide description in the correct Phase of project.

Show connection to existing roadway and provide description in the correct Phase of project.

Existing roadway linework and utilities now shown for connections.

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- PHASE 5



## FILING 16 IMPROVEMENTS:

- ON-SITE INFRASTRUCTURE
1. WATER, SANITARY SEWER AND STORM DRAIN UTILITIES AS DEFINED WITHIN THE CONSTRUCTION PLAN DOCUMENTS.
  2. CURB, GUTTER AND ASPHALT AS DEFINED WITHIN THE CONSTRUCTION PLAN DOCUMENTS.
  3. SIGNAGE AND LIGHTING AS DEFINED WITHIN THE CONSTRUCTION PLAN DOCUMENTS.
  4. LANDSCAPING SHALL BE PROVIDED.
  5. STREET LANDSCAPING SHALL BE COMPLETED AS ADJACENT PROPERTY PARCELS ARE CONSTRUCTED.
  6. ALL ITEMS IN THE SPECIFIC PHASE (INCLUDING THOSE ITEMS CONSTRUCTED IN PREVIOUS PHASES) SHALL BE INITIALLY ACCEPTED PRIOR TO THE FIRST CERTIFICATE OF OCCUPANCY IN THE SUBJECT PHASE.

## FILING 16 - PHASING

### GENERAL NOTES:

1. THE DEVELOPER SHALL PROVIDE TWO DISTINCT POINTS OF EMERGENCY ACCESS TO THE OVERALL SITE AND A LOOPED WATER SUPPLY TO EACH PHASE OF THE DEVELOPMENT. THE DEVELOPER SHALL CONSTRUCT, WITH APPROVED PLAN REVISION FROM THE CITY, ANY OFF-SITE ROADWAY OR EMERGENCY CROSSINGS IMPROVEMENTS PER CITY STANDARDS NECESSARY TO FACILITATE EMERGENCY VEHICULAR ACCESS TO THIS SITE.
2. ALL ROADWAYS INTERNAL TO EACH PHASE WITHIN THE FILING NO. 16 BOUNDARY SHALL BE CONSTRUCTED TO FULL WIDTH INCLUDING STRIPING, SIDEWALKS, MEDIAN, STORM DRAIN, INLETS, STREET LIGHTING, ETC. AS SHOWN ON THE FILING 16 CD'S.

### PHASE 1:

PHASE 1 SHALL INCLUDE THE FOLLOWING ROADWAYS AND ADJACENT HOMES WHERE APPLICABLE:

- EAST 4TH AVE FROM POWHATON RD TO N. ROBERTSDALE ST.
- EAST 4TH PL FROM N. QUANTOCK ST. TO N. ROBERTSDALE ST.
- EAST 3RD AVE FROM POWHATON RD TO N. ROBERTSDALE ST.
- N. QUEENSBURG ST FROM EAST 3RD AVE TO EAST 4TH AVE.
- N. QUANTOCK ST. FROM MID BLOCK BETWEEN EAST 3RD PL AND EAST 3RD AVE TO EAST 4TH AVE.
- N. ROBERTSDALE ST FROM EAST 3RD AVE TO 6TH AVE.

PHASE 1 SHALL INCLUDE THE CONSTRUCTION OF THE POCKET PARK NORTH OF THE INTERSECTION OF E 3RD AVE AND N. ROBERTSDALE ST.

### PHASE 2:

PHASE 2 SHALL INCLUDE THE FOLLOWING ROADWAYS AND ADJACENT HOMES WHERE APPLICABLE:

- E. 3RD PL.
- E. 2ND AVE BETWEEN N. QUEENSBURG ST. AND N. ROBERTSDALE ST.
- E. 2ND PL. BETWEEN N. QUEENSBURG ST. AND N. ROBERTSDALE ST.
- E. 1ST DR.
- N. QUEENSBURG ST. FROM E. 3RD AVE. AND E. 1ST DR.
- N. QUANTOCK ST. FROM E. 3RD AVE. AND E. 1ST DR.
- N. ROBERTSDALE ST. FROM HARMONY PHASE 1 TO E. 3RD AVE.

PHASE 2 SHALL INCLUDE THE CONSTRUCTION OF THE POCKET PARK BETWEEN INTERSECTION E. 2ND AVE/N. QUANTOCK ST. AND E. 2ND PL./N. QUANTOCK ST.

### PHASE 3:

PHASE 3 SHALL INCLUDE THE FOLLOWING ROADWAYS AND ALL ADJACENT HOMES WHERE APPLICABLE:

- E. 4TH AVE. FROM N. ROBERTSDALE ST. TO N. TITUS CT.
- E. 4TH PL. FROM N. ROBERTSDALE ST. TO N. TRUSSVILLE ST.
- E. 3RD AVE. FROM N. SCOTTSBURG CT. TO N. TRUSSVILLE ST.
- E. 2ND AVE. FROM N. ROBERTSDALE ST. TO N. TITUS ST.
- E. 2ND PL. FROM N. ROBERTSDALE ST. TO N. TRUSSVILLE ST.
- N. SHADY GROVE CT.
- N. TITUS CT. FROM E. 4TH AVE. TO E. 4TH PL.
- N. SCOTTSBURG CT.
- N. TITUS ST.

PHASE 3 SHALL INCLUDE THE OPEN SPACE BETWEEN N. ROBERTSDALE ST. AND N. TRUSSVILLE ST. AND E. 4TH PL AND E. 3RD AVE.

### PHASE 4:

PHASE 4 SHALL INCLUDE THE CONSTRUCTION OF ALL DUPLEX HOMES, TRACTS AND RELATED ALLEYS.

### PHASE 5:

PHASE 5 SHALL INCLUDE THE CONSTRUCTION OF ALL TOWNHOUSES, TRACTS AND RELATED ALLEYS.

**BASIS OF BEARINGS**  
BEARINGS ARE BASED IN ACCORDANCE WITH THE CITY OF AURORA HORIZONTAL CONTROL, UPON THE EAST LINE OF THE SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, BEARING SOUTH 0°29'32" WEST, 2627.72 FEET AND BEING MONUMENTED AT THE CENTER QUARTER OF SAID SECTION 16 BY A FOUND 2-1/2 INCH DIAMETER ALUMINUM PIPE WITH A 3-1/4 INCH ALUMINUM CAP STAMPED "T4S R65W C1/4 S16 2008 PLS 35593" AND AT THE SOUTH 1/4 CORNER OF SAID SECTION 16 BY A FOUND NO. 6 REBAR WITH A 3-1/4 INCH DIAMETER ALUMINUM CAP STAMPED "T4S R65W 1/4 S16/S21 2017 PLS 24657".

PREPARED UNDER THE SUPERVISION OF

BRIAN P. WILSON  
COLORADO P.E. 0050067

DRAWN BY:		CHECKED BY:		DATE:		NO.		Revisions		Date	
AS SHOWN		BPW		81/30214922							
FILING 16 CONSTRUCTION DRAWINGS		FILING 16 CONSTRUCTION DRAWINGS		FILING 16 CONSTRUCTION DRAWINGS							
HARMONY SUBDIVISION		HARMONY SUBDIVISION		HARMONY SUBDIVISION							
C/O Marathon Land Company		C/O Marathon Land Company		C/O Marathon Land Company							
9750 W. Cambridge Place		9750 W. Cambridge Place		9750 W. Cambridge Place							
Littleton, CO 80127		Littleton, CO 80127		Littleton, CO 80127							
Tel: (303) 920-9400 Fax: (303) 920-9440		Tel: (303) 920-9400 Fax: (303) 920-9440		Tel: (303) 920-9400 Fax: (303) 920-9440							
Melcor/TC Aurora, LLC		Melcor/TC Aurora, LLC		Melcor/TC Aurora, LLC							
10333 E DRY CREEK RD.		10333 E DRY CREEK RD.		10333 E DRY CREEK RD.							
SUITE 240		SUITE 240		SUITE 240							
ENGLEWOOD, CO 80112		ENGLEWOOD, CO 80112		ENGLEWOOD, CO 80112							
TEL: 720.482.9526		TEL: 720.482.9526		TEL: 720.482.9526							
Westwoodpc.com		Westwoodpc.com		Westwoodpc.com							
Westwood Professional Services, Inc.		Westwood Professional Services, Inc.		Westwood Professional Services, Inc.							
Westwood		Westwood		Westwood							





LSC TRANSPORTATION CONSULTANTS, INC.

1889 York Street  
Denver, CO 80206  
(303) 333-1105  
FAX (303) 333-1107  
E-mail: [lsc@lscdenver.com](mailto:lsc@lscdenver.com)

**TIS can not be  
approved until  
the MTIS is  
approved** <sup>1</sup>

**2040 Background traffic volumes higher  
than MTIS 2040 Background traffic vols.  
2040 lane geometry not matching MTIS  
2040 lane geometry** <sup>2</sup>

**Responses by Chris McGranahan** <sup>3</sup>  
**LSC Transportation Consultants, Inc.**  
**March 16, 2023**

November 30, 2022

Mr. James Spehalski  
Marathon Land Company  
9750 W. Cambridge Place  
Littleton, CO 80127

Re: Harmony Phase 6  
Aurora, CO  
LSC #220300

Dear Mr. Spehalski:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact analysis for the proposed Harmony Phase 6 development. As shown on Figure 1, the site is located south of E. 6<sup>th</sup> Avenue and east of S. Powhaton Road in eastern Aurora, Colorado.

## REPORT CONTENTS

The report contains the following: the existing roadway and traffic conditions in the vicinity of the site including the lane geometries, traffic controls, posted speed limits, etc.; the existing weekday peak-hour traffic volumes; the existing daily traffic volumes in the area; the typical weekday site-generated traffic volume projections for the site; the assignment of the projected traffic volumes to the area roadways; the projected 2024 and 2040 background and resulting total traffic volumes on the area roadways; the site's projected traffic impacts; and any recommended roadway improvements to mitigate the site's traffic impacts.

## RECENT TRAFFIC STUDIES

LSC prepared an updated master traffic impact study (MTIS) for the entire Harmony Master Plan, dated November 4, 2022.

LSC has also prepared site-specific traffic reports for the ASP Harmony Ridge P-8 School, dated October 12, 2018, Harmony Phase 3, dated November 4, 2020, Harmony Phase 4, dated July 16, 2021, and Harmony Phase 5, dated April 29, 2022.

## LAND USE AND ACCESS

The site is proposed to include 663 residential dwelling units including a mix of single-family detached and attached dwelling units. Three full-movement access points are proposed to Trussville Street. A three-quarter movement (left-in/right-in/right-out-only) and a right-in/



# Summary of Comments on 2023-02-17 - TIS - 1st Referral Traffic Comments With LSC Response.pdf

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Page: 1

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☰ Number: 1 Author: djkaiser Subject: Text Box Date: 1/27/2023 12:20:12 PM -07'00'

---

**TIS can not be approved until the MTIS is approved**

↩ Author: kdferrin Subject: Sticky Note Date: 3/8/2023 11:21:09 AM -07'00'  
LSC Response: Noted

---

☰ Number: 2 Author: djkaiser Subject: Text Box Date: 1/27/2023 12:26:25 PM -07'00'

---

**2040 Background traffic volumes higher than MTIS 2040 Background traffic vols.  
2040 lane geometry not matching MTIS 2040 lane geometry**

↩ Author: kdferrin Subject: Sticky Note Date: 3/16/2023 4:29:26 PM  
LSC Response: The Background traffic for this project includes all Harmony traffic unrelated to Filing 6 whereas the Background traffic for the MTIS assumed no Harmony related traffic. The 2040 Total volumes are consistent between the two reports.

---

☰ Number: 3 Author: lsc Subject: Text Box Date: 3/16/2023 4:26:45 PM

---

[Responses by Chris McGranahan](#)  
[LSC Transportation Consultants, Inc.](#)  
March 16, 2023

Note that the traffic counts were conducted prior to the recent widening project of S. Powhatan Road in the vicinity of the site which included the extension of E. 1<sup>st</sup> Avenue to S. Powhatan Road.

### 2024 and 2040 Background Traffic

Figure 4a shows the estimated 2024 background traffic volumes and background lane geometry and traffic control for the study area. The background traffic volumes are based on a two percent annual growth rate for through traffic on S. Powhatan Road plus estimates of additional traffic projected to be generated with the extension of E. 1<sup>st</sup> Avenue to S. Powhatan Road, by buildout of Harmony Phases 1 to 5, and by buildout of Phase 1 of the Sky Ranch development located south of I-70 between S. Powhatan Road and Hayesmount Road. The 2024 background traffic volumes assume E. 6<sup>th</sup> Avenue has not been constructed east of Trussville Road and Monaghan Road has not been constructed north of E. Ellsworth Avenue.

Need to explain why this 2040 background traffic has more than the MTIS 2040 background traffic. What additional has come in now that isn't identified in the MTIS?

Figure 5a shows the estimated 2040 background traffic volumes and Figure 5b shows the 2040 background lane geometry and traffic control for the study area. The 2040 background traffic volumes are based on 2040 total volumes shown in the recently updated Harmony MTIS.

### Existing, 2024, and 2040 Background Levels of Service


Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay and LOS F is indicative of a high level of congestion or delay. Attached are specific level of service definitions for signalized and unsignalized intersections.

The intersections in Figures 3 through 5b were analyzed to determine the existing, 2024, and 2040 background levels of service using Synchro. Table 1 shows the level of service analysis results. The level of service reports are attached.

1. **S. Powhatan Road/E. 6<sup>th</sup> Avenue:** All movements at this unsignalized intersection currently operate at LOS "B" or better during both morning and afternoon peak-hours. By 2024 the eastbound left-turn movement is projected to operate at LOS "F" during the morning and afternoon peak-hours if it remains stop-sign controlled. It is expected to operate at an overall LOS "D" during the peak hours through 2040 as a traffic signal controlled intersection.
2. **E. 6<sup>th</sup> Avenue/N. Robertsdale Street:** This intersection was analyzed only in the total traffic scenarios.
3. **E. 6<sup>th</sup> Avenue/Trussville Street:** This future signalized intersection was only analyzed for the 2040 background traffic scenario. It is expected to operate at an overall LOS "A" during both morning and afternoon peak-hours through 2040.
7. **S. Powhatan Road/E. 3<sup>rd</sup> Avenue:** All movements at this stop-sign controlled intersection are expected to operate at LOS "C" or better during both peak-hours through 2040 assu-




---

 Number: 1      Author: djkaiser      Subject: Callout      Date: 1/27/2023 12:23:02 PM -07'00'

---

Need to explain why this 2040 background traffic has more than the MTIS 2040 background traffic. What additional has come in now that isn't identified in the MTIS?

 Author: kdferrin      Subject: Sticky Note      Date: 3/16/2023 4:29:53 PM

---

LSC Response: The Background traffic for this project includes all Harmony traffic unrelated to Filing 6 whereas the Background traffic for the MTIS assumed no Harmony related traffic. The 2040 Total volumes are consistent between the two reports.

ISP not showing  
WB RT lane

1

Table 8 (Page 1 of 2)  
Recommended Improvements to Public Street Network  
Harmony Phase 6  
Aurora, CO  
LSC #220300; November, 2022

Inter-section No.	Intersection Location	Recommended Improvements by 2024 <sup>(1)</sup>	Responsibility	Recommended Improvements by 2040 <sup>(1)</sup>	Responsibility
#1	S. Powhatan Road/E. 6th Avenue	WB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	SB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Others
		WB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	EB to SB RT Accel - construct lane - 1 @ 390 feet and 160-foot transition taper	Applicant
		NB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	NB LT - construct 2nd lane - 2 @ 275 feet and 325-foot transition taper	Others
		NB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant		
		SB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant		
		Traffic signalization when warranted	Applicant/Others		
#2	E. 6th Avenue/N. Robertsdale St	EB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	WB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant
#3	E. 6th Avenue/Trussville Street	EB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant	EB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Others
		NB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Applicant	WB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant
				WB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Others
				SB LT - construct lane - 1 @ 200 feet and 120-foot transition taper	Others
				SB RT - construct lane - 1 @ 200 feet and 120-foot transition taper	Others
				Traffic signalization when warranted	Applicant/Others
#7	S. Powhatan Road Road/E. 3rd Avenue	NB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant		
		NB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Others		
		SB LT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant		
#9	S. Powhatan Road/E. 1st Avenue/ Ellsworth Avenue	NB RT - construct lane - 1 @ 275 feet and 160-foot transition taper	Applicant		
		Traffic signalization when warranted	Applicant/Others		

(1) A transition taper of 13.5:1 was used for Major and Minor Arterials based on a posted speed limit of 45 mph (160 feet).  
Dual left-turn lanes have transition taper lengths of 325 feet. An appropriate redirect taper for 45 mph is 45:1  
A transition taper of 10:1 was used for all Collectors based on a posted speed limit of 35 mph (120 feet). An appropriate redirect taper for 35 mph is 20:1




---

 Number: 1      Author: djkaiser      Subject: Callout      Date: 1/27/2023 1:25:59 PM -07'00'

---


ISP not showing WB RT lane

 Author: kdferrin      Subject: Sticky Note      Date: 3/16/2023 4:30:12 PM  
LSC Response: The ISP has been revised to show the recommended lane

---

 Number: 2      Author: djkaiser      Subject: Line      Date: 1/27/2023 1:27:10 PM -07'00'

---


 Number: 3      Author: djkaiser      Subject: Inserted Text      Date: 1/27/2023 1:36:11 PM -07'00'  
has a couple inconsi

---

 Number: 4      Author: djkaiser      Subject: Callout      Date: 1/27/2023 1:27:04 PM -07'00'

---

Separate RT lanes lane not identified on ISP

 Author: kdferrin      Subject: Sticky Note      Date: 3/16/2023 4:30:31 PM  
LSC Response: The TIS has been revised to remove these recommendations as E. 6th Avenue has three through lanes and right right-turn volume is less than 50 vph

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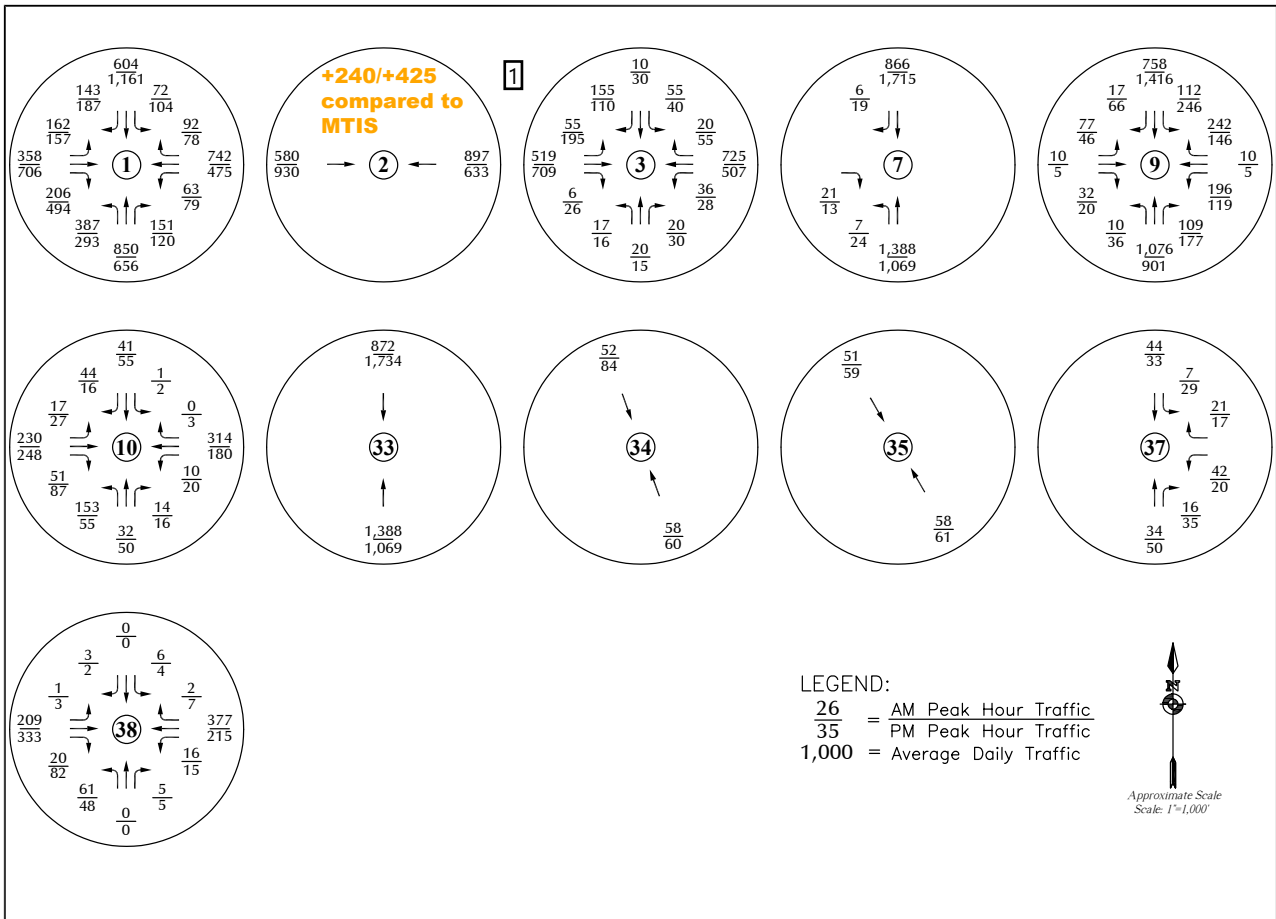



Figure 5a  
 Year 2040  
 Background Traffic  
 Harmony Phase 6 (LSC #220300)




---

 Number: 1      Author: djkaiser      Subject: Text Box      Date: 1/27/2023 10:43:20 AM -07'00'

---

**+240/+425 compared to MTIS**

 Author: kdferrin      Subject: Sticky Note      Date: 3/16/2023 4:30:55 PM

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LSC Response: The Background traffic for this project includes all Harmony traffic unrelated to Filing 6 whereas the Background traffic for the MTIS assumed no Harmony related traffic. The 2040 Total volumes are consistent between the two reports.

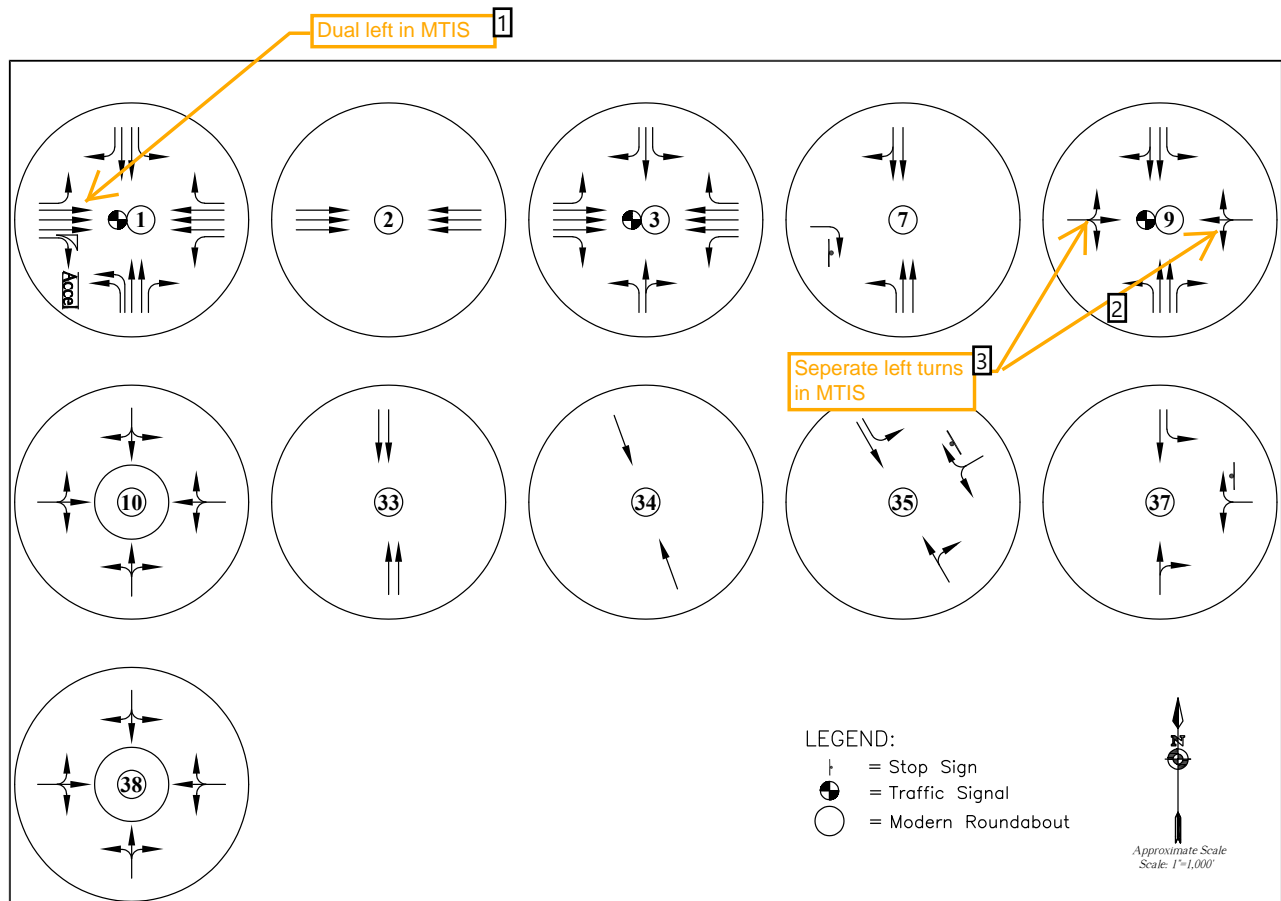


Figure 5b

## Year 2040 Background Lane Geometry and Traffic Control

Harmony Phase 6 (LSC #220300)



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Number: 1 Author: djkaiser Subject: Callout Date: 1/27/2023 11:05:54 AM -07'00'

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## Dual left in MTIS

Author: kdferrin Subject: Sticky Note Date: 3/16/2023 4:31:06 PM

LSC Response: The 2040 Background Lane Geometry is currently being revised in the MTIS to show a single eastbound left-turn lane to be consistent with the lane geometry shown in the 2040 Total scenario.

Number: 2 Author: djkaiser Subject: Line Date: 1/27/2023 11:08:05 AM -07'00'

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Number: 3 Author: djkaiser Subject: Callout Date: 1/27/2023 11:08:01 AM -07'00'

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## Seperate left turns in MTIS

Author: kdferrin Subject: Sticky Note Date: 3/16/2023 4:31:36 PM

LSC Response: Powhaton Road was recently widened. The project also included the extension of E. 1st Avenue to Powhaton Road. The recommended lane geometry shows the 1st Avenue approach as constructed. The MTIS is also being revised to be consistent with the existing conditions.

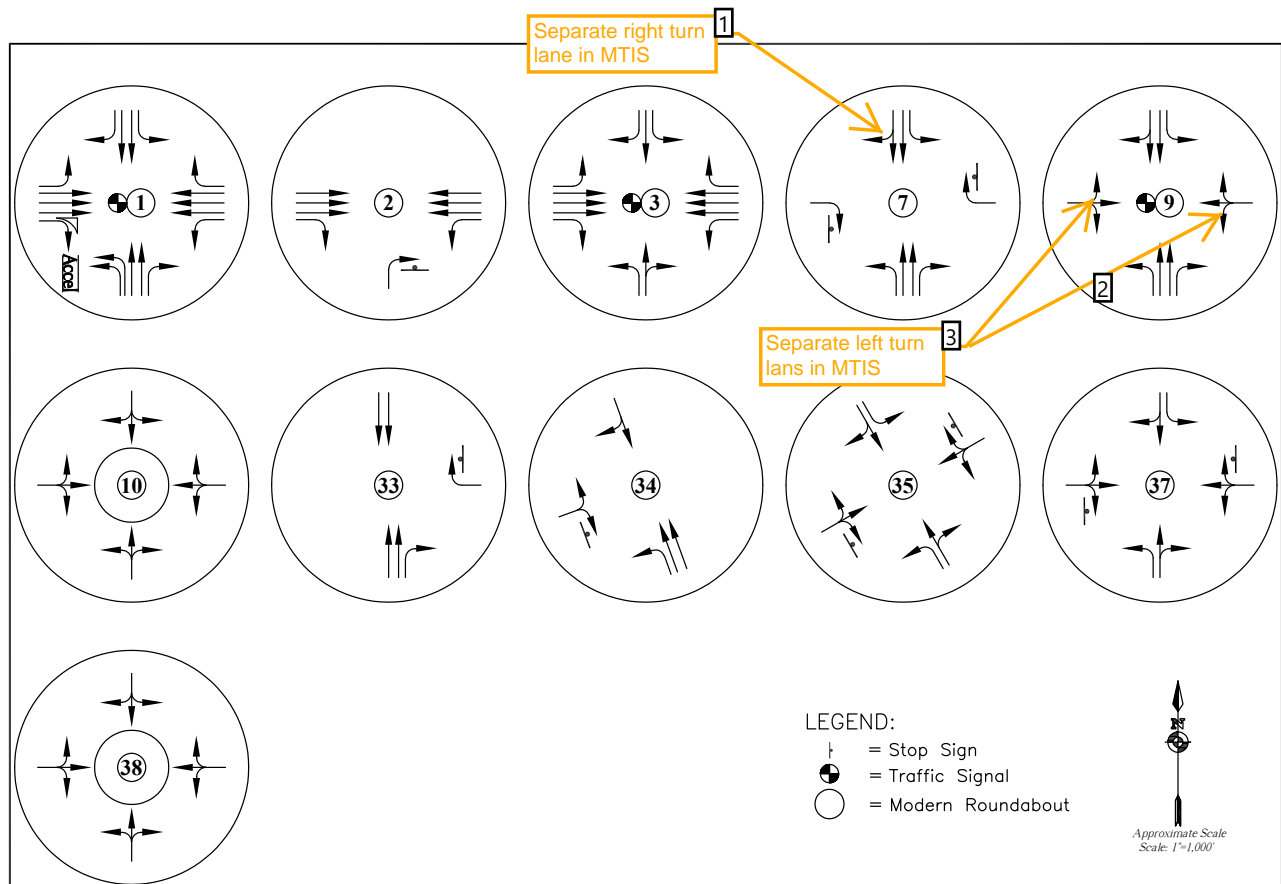


Figure 10b

**Year 2040 Total  
Lane Geometry and Traffic Control**  
Harmony Phase 6 (LSC #220300)



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Number: 1 Author: djkaiser Subject: Callout Date: 1/27/2023 11:55:57 AM -07'00'

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## Separate right turn lane in MTIS

Author: kdferrin Subject: Sticky Note Date: 3/16/2023 4:31:59 PM

LSC Response: Powhatan Road was recently widened and a southbound right-turn lane approaching E. 3rd Avenue was not constructed as part of the w. The MTIS is also being revised to be consistent with the existing conditions.

Number: 2 Author: djkaiser Subject: Line Date: 1/27/2023 11:56:44 AM -07'00'

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Number: 3 Author: djkaiser Subject: Callout Date: 1/27/2023 11:56:41 AM -07'00'

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## Separate left turn lanes in MTIS

Author: kdferrin Subject: Sticky Note Date: 3/16/2023 4:32:18 PM

LSC Response: Powhatan Road was recently widened. The project also included the extension of E. 1st Avenue to Powhatan Road. The recommended lane geometry shows the 1st Avenue approach as constructed. The MTIS is also being revised to be consistent with the existing conditions.