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August 10, 2022

Jason Pock
Richmond American Homes of Colorado Inc.
4350 S Monaco St., Ste 500
Denver, CO 80237-3400

Re: Initial Submission Review – Harvest Crossing PA 5, 6, & 7 – Master Plan Amendment, Site Plan, & Plat
Application Number: **DA-1786-03**
Case Numbers: **2005-7007-03, 2022-4017-00, 2022-3049-00**

Comment Responses are provided by Applicant below – 8/10/2022

Plan West (Planning/LA) : RED

Kimley Horn (Civil): BLUE

Survey (Aztec): GREEN

Traffic (FHU): PURPLE

Dear Jason Pock.

Thank you for your initial submission, which we started to process on June 16th, 2022. We have reviewed your plans and attached our comments along with this cover letter. The first section of our review highlights our major comments. The following sections contain more specific comments, including those received from other city departments and community members.

Since several important issues remain, you will need to make another submission. Please revise your previous work and send us a new submission on or before August 1st, 2022.

Note that all our comments are numbered. When you resubmit, include a cover letter specifically responding to each item. The Planning Department reserves the right to reject any resubmissions that fail to address these items. If you have made any other changes to your documents other than those requested, be sure to also specifically list them in your letter.

Your estimated Administrative Decision date is set for September 7th, 2022. Please remember that all abutter notices and site notices must be posted at least 10 days prior to the decision date. These notifications are your responsibility and the lack of proper notification will cause your administrative decision date to be postponed. It is important that you obtain an updated list of adjacent property owners from the county before the notices are sent out. Take all necessary steps to ensure an accurate list is obtained.

As always, if you have any comments or concerns, please let me know. I may be reached at (303) 739-7132 or egates@auroragov.org.

Sincerely,

Erik Gates
Planner

cc: Allison Hibbs, Plan West.
Scott Campbell, Neighborhood Liaison
Cesarina Dancy, ODA
Filed: K:\\$DA\1700-1799\1786-03rev1



Initial Submission Review

SUMMARY OF KEY COMMENTS FROM ALL DEPARTMENTS

- Storm drain development fees due: 124.054 acres x \$1,242.00 = **\$154,075.07**
RE: Acknowledged
- Lot data tables need to be revised and include counts for all lots within the FDP.
RE: An overall lot-count table has been provided, reflecting proposed and actual lot counts for the entire FDP.
- There appear to be several conflicts with trees and utilities.
RE: Acknowledged and revised.
- Will the neighborhood park remain with the Metro District or is it being turned over to COA?
RE: The central 'neighborhood park' will be owned and maintained by the Metro District. The City expressed this request at time of Pre-App.
- Add or remove pedestrian ramps as requested by Civil and Traffic Engineering.
RE: Ramps additions & removals have been completed per Civil/Traffic Engineer's requests.
- Several changes to site plan notes are requested.
RE: Notes have been updated per comments.
- A phasing plan with a descriptive narrative must be provided with the Planning Departments' site plan and Public Works Departments' civil plan submittal.
RE: Phasing is now shown on sheet C.02. Phasing general notes are now provided on C.02 and C.12.
- Show the regional trail on the other side of Yale and trail connections to the regional trail.
RE: A meeting held with PROS 8/4, which determined that the 14' multi-use trail adjacent Yale Ave will create a strong and adequate connection to the neighborhoods to the east and west in lieu of an additional regional trail. A 14' multi-use trail separated from the drive lanes by 22' of landscape is provided on both sides of Yale Ave, as designated in the approved PIP, providing access to the site without encouraging pedestrians and cyclists to traverse Harvest Gulch or encroach upon the land fill site.
- Please review the comment letter from outside reviewers including Xcel Energy, MHFD, and Buckley SFB.
RE: Acknowledged

PLANNING DEPARTMENT COMMENTS

1. Community Questions, Comments, and Concerns

- 1A. There are no community comments on this first review cycle.
RE: Acknowledged

2. Completeness and Clarity of the Application

[FDP Amendment Page 1]

- 2A. This language should be included in an amendment block on the original cover page. The amendment block should provide room for additional future amendments. If there is no room on the original cover page, you can include it on this second page. Include the original cover sheet on your next submittal in either case.
RE: Acknowledged. An amendment block has been added to this page, including reference to the previously approved amendment no. 1, as it did not fit on the cover sheet. The original cover is submitted with the second submittal.

[Site Plan Page 1]

- 2B. "Filing" (and "subdivision") should not be used as part of a Site Plan title.
RE: Acknowledged. This Site Plan will be referred to as Harvest Crossing – Planning Areas 5, 6 & 7. The Plat will be revised to be named Harvest Crossing Filing No. 2, as this filing has pushed ahead of the previously submitted PA-2 (formerly filing 2)
- 2C. Add dwelling units per acre to this data block.
RE: Completed
- 2D. Maximum small lots allowed for a master plan including more than 100 DUs is 50%. No more than 35% may be front-loaded small residential lots. Please clarify.
RE: Site plan proposes 98 'front-loaded small lots', for a total of 23% small lots (435 lots with this filing). No



- 2E. small lots are being proposed in the filings to the north.
Place this language on the Landscaping sheets only.
RE: Acknowledged and revised.

3. Zoning and Land Use Comments

[Site Plan Page 3]

- 3A. 'Pulte' and 'Richmond' are not housing types recognized by the Unified Development Ordinance, UDO, for product mix standards. Lot count tables should identify counts for housing types identified in the UDO only.
RE: Table added.
- 3B. For this small master plan, small lot requirements will be evaluated at the master plan level (larger master plans are evaluated on the neighborhood level). A tracking table and map need to be utilized and updated with each filing to keep track of the following items of compliance. For this project, the map and table should be updated and part of each site plan submittal. The map and table need to address the following:
1. Location and quantities of small lots demonstrating compliance with <https://aurora.municipal.codes/UDO/146-4.2.3.A.3> which includes a maximum percentage of small lots and front-loaded lots, maximum of a single lot type; minimum percentage of standards lots; and minimum percentage of larger lots.
RE: A table has been added summarizing the lot counts for this filing individually (435 proposed lots), and in the context of the entire FDP (824 proposed lots). Currently there are 98 small lots (23%) and 63 large lots (14%) which meets the FDP requirements of at least 10% large lots and no more than 35% front-loaded small-lots.
 2. Location and quantities of UDO defined lot types <https://aurora.municipal.codes/UDO/146-4.2.3.A.8>
RE: Acknowledged
 3. The application should also identify the approach to be taken for garage mitigation requirements in <https://aurora.municipal.codes/UDO/146-4.2.3.A.7>
Other small lot requirements will be evaluated, but the above items require tracking elements to be submitted by the applicant. Some of these elements may not have been fully identified or evaluated with this review.
RE: Acknowledged
- 3C. Each housing type as identified in [Table 4.2-8](#) of the UDO should be identified on this or another map. It is especially important to identify lots for small residential lots as they must be located within 1,320 ft of a park, open space, or trail corridor of 50 ft in width. The current trail corridors shown are 30 ft only.
RE: All lots are located within 1,320 feet from a park.

4. Streets and Pedestrian Issues

[Site Plan Page 5-6]

- 4A. These are double-fronted lots. Double-fronted lots are not permitted on local and collector streets.
RE: Where unavoidable, double-fronted lots have been proposed. A 20' buffer has been provided in these instances, as required by code, and is now called out on plans.

5. Parking Issues

- 5A. There were no Parking comments on this review.
RE: Acknowledged

6. Architectural and Urban Design Issues

[Site Plan Page 34]

- 6A. Typical lot layouts should be shown earlier in the site plan after the coversheet and site plan notes.
RE: Lot typicals depicting setbacks are now included on C.01. Landscape typicals have remained at this



location in the site plan set.

- 6B. You should provide elevations for each proposed product type that comply with the design standards of Section 146-4.8, including vertical and horizontal articulation, building materials, roof forms, etc.

RE: Building elevations have been provided with this submittal.

- 6C. Do not separate lot typicals by branding styles. I.E. Richmond and Pulte. Only show lot typicals for each housing type used from Table 4.2-8 of the UDO.

RE: Branding removed from lot typical designations.

[Site Plan Page 35]

- 6D. Do not separate lot typicals by branding styles. I.E. Richmond and Pulte. Only show lot typicals for each housing type used from Table 4.2-8 of the UDO.

RE: Branding removed from lot typical designations.

7. Signage Issues

[Site Plan Page 1]

- 7A. Provide total monument signage area.

RE: Total signage area added to data table.

- 7B. There is no distinction between primary and secondary monument signs in the UDO. Remove.

RE: Distinction removed.

8. Landscaping Issues (Kelly Bish / 303-739-7189 / kbish@auroragov.org / Comments in bright teal)

[Site Plan Page 1]

- 8A. Add the design team's contact information to the cover sheet including the landscape architect.

RE: Planner/Landscape Architect contact information is included in the title block.

[Site Plan Page 14]

- 8B. While checking street trees, it seems that there does not appear to be a water/sewer connection to Lot #210.

RE: Water/sewer services have been added to Lot #210.

[Site Plan Page 21]

- 8C. Provide a 4.15 AC label for the Tract J Open Space. On Civil Engineering plans this roadway is referred to as Warren Avenue and this sheet refers to it as Warren Lane. Please show your own name consistently.

RE: Acreage added to open space tract labels. Warren Place labels on landscape sheets and in PIP have been revised to Warren Avenue. The Warren Place designation has already been applied to the local street to the north, within HCF1.

- 8D. Provide the 1.32 AC label for the Tract F private detention pond A.

RE: Acreage added to pond tract labels.

- 8E. Note that per Section 146-4.2.3.I, refer to the aurora Roadway Design and Construction Specifications Manual for sight distance triangle design parameters.

RE: Acknowledged. Note included on plans.

- 8F. No obstruction taller than 26" within the sight distance triangle.

RE: Acknowledged

[Site Plan Page 22]

- 8G. Relabel 5-KP to 7-KP on Street H.

RE: Completed

[Site Plan Page 23]

- 8H. Relabel 6-QR to 7-QR on Street I.

RE: Completed

- 8I. There is a conflict with the water connection and the street tree on Street G, please adjust.

RE: Completed

- 8J. Label street trees on S. Kewaunee Street.

RE: Completed



[Site Plan Page 24]

- 8K. There are five locations on the sheet where there is a conflict between water or sewer connections and street trees that will need to be adjusted.
RE: Completed
- 8L. There appears to be no water/sewer connection shown on Lot #210. Review the street tree location once those connections are shown.
RE: Water/sewer added and street trees adjusted accordingly.
- 8M. Correct tree-labels within the clouded area on Street I.
RE: Completed
- 8N. Correct the 5-CE leader of the northernmost CE on Street I between Street O and M.
RE: Completed
- 8O. Provide a missing label for 4 trees on Street I per the markup.
RE: Completed

[Site Plan Page 26]

- 8P. Check water and sewer service to Lot #47.
RE: Water service added.
- 8Q. Provide missing labels on plant material on the south side of Street J.
RE: Completed
- 8R. Revise label from 3-UC to 4-UC on Street J.
RE: Completed
- 8S. There are two conflicts with a street tree and water meter-see markup.
RE: Completed
- 8T. Provide a label for the 3-AR for the curbside planting on Harvest Road between Street K and N.
RE: Completed
- 8U. Revise the 3-UP label to 2-UP.
RE: Completed
- 8V. Revise leaders so they point to the correct plant material on Street J.
RE: Completed

[Site Plan Page 27]

- 8W. Relabel 5-GD to 4-GD on Sheet I.
RE: Completed
- 8X. Relabel 5-AR to 7-AR on Street P.
RE: Completed
- 8Y. Relabel 4-GI to 6-GI on Street P.
RE: Completed
- 8Z. Please add an arrow to point to the 5 trees on Street P.
RE: Completed
- 8AA. Relabel 5-AR to 4-AR on Street R.
RE: Completed
- 8BB. Revise 4-GI to 5-GI on Street R.
RE: Completed
- 8CC. Revise 4-AR to 6-AR on Street R.
RE: Completed
- 8DD. Revise 5-GI to 6-GI on Street T.
RE: Completed

[Site Plan Page 28]

- 8EE. Provide a label for 4 trees on Street I.
RE: Completed



8FF. Revise 4-CE to 5-CE on Street I.

RE: Completed

8GG. Revise 5-TG to 7-TG on Street U.

RE: Completed

8HH. Revise 5-TG to 4-TG on Street U.

RE: Completed

8II. Revise 5-QC to 7-QC on Street U.

RE: Completed

8JJ. Revise 3-CE to 5-CE on S. Kewaunee Street.

RE: Completed

[Site Plan Page 29]

8KK. Label these 3 trees on Harvest Road, see the markup.

RE: Completed

8LL. Relabel 5-UC to 2_UC on Street L.

RE: Completed

[Site Plan Page 34]

8MM. On several units, due to limited growing space, a smaller tree palette may be better for this tree selection.

RE: Acknowledged. A smaller species has been specified.

8NN. Label width of Rock Mulch on each typical unit.

RE: Completed

[Site Plan Page 35]

8OO. On several units, due to limited growing space, a smaller tree palette may be better for this tree selection.

RE: Acknowledged. A smaller species has been specified.

[Site Plan Page 36]

8PP. On the Landscape Table-Standard Right-of-Way table (Curbside Landscape Quantities), please demonstrate why 17 street sides do not meet the minimum street tree requirement.

RE: Table and plans revised to meet the minimum street tree requirements

8QQ. Please explain why Harvest Road does not show the Curbside tree and shrubs provided.

RE: Table revised to reflect number of trees/shrubs provided

8RR. On the Plant Schedule-all, ornamental grasses shall be specified at 5 gallons, not 1 gallon. Please revise planting specifications.

RE: Completed

8SS. Please provide the code required shrubs along the Harvest Road Street Frontage Buffer.

RE: Table revised to reflect the number of shrubs provided

8TT. Please provide the code required shrubs along the Kewaunee Street Frontage Buffer.

RE: Table revised to reflect the number of shrubs provided

8UU. Please provide the sod hatch and the square footage of the overall sod area to demonstrate that it does not exceed the maximum 33% of the high-use sod area. Per code, only 33% is permitted.

RE: RTF sod hatch and SF is included. Calculations have been included to demonstrate this does not exceed the maximum allowable high-use sod area

8VV. Provide a table that documents the high, medium, and low water use areas by square footage and by the percentage of the overall landscape area for the entire development.

RE: Table has been included with this submittal

8WW. Due to the labeling revisions, please check the numbers on the Landscape Tables to ensure that they are all updated.

RE: Acknowledged & Completed



9. Public Art (Roberta Bloom / 303-739-6747 / rbloom@auroragov.org)

[FDP Amendment Page 4]

- 9A. Please resubmit the public art plan as a unique document in TAB 7.
RE: Acknowledged and completed.
- 9B. The plan should include clarification regarding the future of the neighborhood park. Is this park going to remain with the Metro District, or is it being turned over to COA?
RE: Clarification added to narrative and Preliminary Location paragraphs. This park will be owned and maintained by the Metro District.

10. Transportation Planning (Tom Worker-Braddock / 303-739-7340 / tworker@auroragov.org / Comments in light blue)

- 10A. There were no comments from Transportation Planning in this review cycle.
RE: Acknowledged

REFERRAL COMMENTS FROM OTHER DEPARTMENTS AND AGENCIES

11. Civil Engineering (Julie Bingham / 303-739-7300 / jbingham@auroragov.org / Comments in green)

[Site Plan Page 1]

- 11A. The site plan will not be approved by public works until the preliminary drainage letter/report is approved.
RE: Acknowledged

[Site Plan Page 2]

- 11B. Provide the standard site plan notes. Include the following:
- 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 photometric 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 the location of lights, electrical one line, and grounding details shall be submitted 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.
RE: Notes added.
- 11C. A 5.5' sidewalk is required on the west side of the street to meet the local type 1 street standard.
RE: A 5.5' sidewalk has been added on the east side of Kewaunee Street.
- 11D. Ensure that this matches what the plat says. If tracts are being dedicated as drainage tracts in their entirety, that should be documented with the plat as well.
RE: Table updated.
- 11E. Remove collector from the description. The section matches the local type 1 section.
RE: Description removed.
- 11F. Is it Warren Place or Warren Ave? The PIP shows it as Warren Place.
RE: Warren Place has been revised to read Warren Ave.

[Site Plan Page 3]

- 11G. Provide a description of the phases and the improvements provided with each phase.
RE: Phasing general notes added.
- 11H. Advisory: ponds shall be in place before paving. Ponds shall be accepted before the issuance of any TCO/CO.



RE: Acknowledged.

[Site Plan Page 4]

- 11I. Show the opposing ramp with landing.
RE: We are coordinating with the development to the west to get their basemap. If they are proposing a ramp, we will leave ours, if during final design we discover they are not proposing a ramp, we will remove ours on the east side of Harvest Road.
- 11J. Include the RSN's.
RE: RSN's have been added.
- 11K. Typical all site plan sheets:
- Show/label the location of proposed mail kiosks.
RE: Mail Kiosks have been added.
 - Label the curb return radii for local/collector and local/arterial intersections.
RE: Curb return radii added.
 - Show the location of proposed street lights. Add the following note to all site plan sheets:
"Street light locations are conceptual. Final locations will be determined with photometric analysis submitted with the street lighting plans in the civil plan submittal."
RE: Note added.
- 11L. Show/label the location of the maintenance paths.
RE: Maintenance paths added & labeled.

[Site Plan Page 5]

- 11M. Verify with planning and traffic which of these proposed crossings are required.
RE: Pedestrian ramps updated.
- 11N. Are there receiving ramps for these ramps?
RE: Pedestrian ramps updated.
- 11O. This ramp does not appear to line up with the opposing ramp.
RE: The outside-to-outside offset is 5.5'. This dimension has been added to the plans. Please advise if this offset is unacceptable, and what the maximum allowable offset is in CoA.
- 11P. Verify with planning and traffic which of these proposed crossings are required, typical.
RE: Pedestrian crossings updated.
- 11Q. Dimension the proposed walks.
RE: Dimensions added.

[Site Plan Page 6]

- 11R. Include the tract label.
RE: Tract label added.
- 11S. Are there receiving ramps for these ramps? (typical along Harvest)
RE: Ramps have been updated to include directional crossing ramps only where receiving ramps are provided on Harvest Road.

[Site Plan Page 7]

- 11T. Verify with planning and traffic which of these proposed crossings are required, typical along Kewaunee Street.
RE: Pedestrian crossings updated.
- 11U. Why are 8' sidewalks being proposed? This does not match any of the COA sections, typical. If a different department is requiring wider walks, please dedicate sidewalk easements and provide an additional section for Street H and any other streets with this condition.
RE: The FDP requires an 8' multi-use trail connecting the parks in this planning area. A section has been provided in the Site Plan Details clarifying this condition- 8' trail with 3' of walk extending into the access easement. Because the street section within the right-of-way does not change, the standard section in the PIP has not been revised.



[Site Plan Page 9]

11V. There is no receiving ramp for this ramp.

RE: Pedestrian crossings updated.

[Site Plan Page 10]

11W. Show/label the location of the maintenance paths.

RE: Maintenance path shown & labeled.

[Site Plan Page 11]

11X. Revise text overlap.

RE: Text updated.

[Site Plan Page 13]

11Y. The max approach grade of intersecting streets with a through street shall be 3% for 100' per Section 4.05.4 in the roadway manual.

RE: Grading updated.

11Z. Provide a railing for the proposed wall. Provide a typical section and indicate the max height or height range. Walls within detention ponds shall not be taller than 4'.

RE: Required storage volumes have been updated per removal of extra 1' freeboard requirement and removal of ½ EURV requirement. With a reduction in the storage requirements, the 4' retaining wall previously shown has been fully removed from Pond A.

11AA. Does the wall encroach within the adjacent lot? The tiebacks of the wall may conflict with proposed easements.

RE: The wall was encroaching within the adjacent lot. The grading has been updated, there is no longer wall on the lot line.

11BB. Provide flow arrows and slope labels, typical for all grading sheets.

- Minimum 2% slope in unpaved areas
- Max 3:1 outside of ROW
- Max 4:1 inside ROW

RE: Callouts added.

11CC. Minimum 2% slope in the bottom of the pond. Please add slope labels.

RE: Grading updated.

11DD. Provide slope labels within the park. Minimum 2% slope in unpaved areas.

RE: Grading updated – tags added.

11EE. Show/label the 100-year WSEL. Show/label the maintenance access to the bottom of the pond and to the top of the outlet structure.

RE: Top of pond is provided – graded maintenance access has been added and is now shown. WQCV WSEL, EURV WSEL, and 100-yr WSEL are all called out and shown on the PDP. Please reference PDP for this information.

11FF. Label the pond as public or private and indicate who will maintain it.

RE: "PRIVATE DETENTION, HOA MAINTAINED" has been added to both ponds.

[Site Plan Page 14]

11GG. The max approach grade of intersecting streets with a through street shall be 3% for 100' per Section 4.05.4 in the roadway manual.

RE: Grading updated.

11HH. At a street intersection where two streets slope down to the intersection an inlet shall be placed on the through street's uphill point of curb return and on the intersecting street's uphill point of curb return. Check all intersections on all sheets.

RE: Storm inlets have been updated per CoA direction.

11II. Cross pans are not allowed on roadways with storm sewer systems.

RE: Acknowledged.



[Site Plan Page 15]

11JJ. See notes regarding the pond on sheet 13.

RE: Acknowledged.

11KK. Cross pans are not allowed on roadways with storm sewer systems, typical.

RE: Acknowledged.

11LL. At a street intersection where two streets slope down to the intersection an inlet shall be placed on the through street's uphill point of curb return and on the intersecting street's uphill point of curb return. Check all intersections on all sheets.

RE: Acknowledged.

11MM. Storm sewer is not typically permitted within curbside landscaping. Please verify this location with Aurora Water.

RE: Acknowledged.

[Site Plan Page 16]

11NN. Show the proposed sidewalk shown on the landscape plan, typical for all tracts.

RE: Sidewalks are now shown.

[Site Plan Page 17]

11OO. Max 5% longitudinal slope on all local streets, typical for all sheets.

RE: Acknowledged.

11PP. Is there a utility easement associated with this storm?

RE: Utility easement added.

11QQ. There is no receiving ramp for this ramp.

RE: Ramp added.

[Site Plan Page 18]

11RR. Provide a slope label here.

RE: Slope label added.

[Site Plan Page 19]

11SS. Minimum 2% slope in the pond bottom.

RE: Grading updated.

11TT. Show/label the 100-year WSEL. Show/label the maintenance access to the bottom of the pond and to the top of the outlet structure.

RE: Top of pond is provided – graded maintenance access has been added and is now shown. WQCV WSEL, EURV WSEL, and 100-yr WSEL are all called out and shown on the PDP. Please reference PDP for this information.

11UU. What does #7 indicate?

RE: Note #7 indicates "POND OUTFALL STRUCTURE LOCATION". This note has been added to the plans.

11VV. Label the pond as public or private and indicate who will maintain it.

RE: "PRIVATE DETENTION, HOA MAINTAINED" has been added to both ponds.

11WW. Max 4:1 slope, typical.

RE: Tag added.

11XX. Provide slope labels.

RE: Slope labels added.

11YY. Provide a label for the tract on this sheet indicating that it is a drainage tract.

RE: Label added.

[Site Plan Page 20]

11ZZ. Is there a utility easement for this storm?

RE: Utility easement added.



11AAA. Coordinate the location of sidewalks with the landscaping plan, typical for the proposed tracts.

RE: Sidewalks now shown.

11BBB. Label the slope in the road here.

RE: Label added.

11CCC. It looks like there is a hole created here.

RE: Grading has been updated to push flow to the south (Yale Ave) roadway system.

11DDD. Max 4:1 slope in ROW, typical.

RE: Grading updated to be max 4:1 slope through CoA ROW.

[Site Plan Page 27]

11EEE. Ensure all trees are a minimum of 10' from the storm sewer.

RE: Completed

[Site Plan Page 28]

11FFF. Ensure all trees are a minimum of 10' from the storm sewer.

RE: Completed

[Site Plan Page 39]

11GGG. Include the fixture type.

RE: Fixture types included with detail.

11HHH. Type SL-4 is required along Yale because it is arterial.

RE: Acknowledged.

11III. Include the fixture type.

RE: Fixture types will be Per CoA Roadway and Construction Standards Table 4.10.6.05.01. Fixture types will be coordinated with Xcel Energy during final design to ensure street light designs are to the most up-to-date standards.

[Plat Page 1]

11JJJ. This does not match what the site plan says.

RE: Plat revised for consistency

[Plat Page 3]

11KKK. Include the 5.5' sidewalk easement as shown on the site plan.

RE: Included

[Plat Page 11]

11LLL. There are several instances of public storm sewer crossing tracts. If these require utility easements per Aurora Water, please reflect those easements on the plat.

RE: Easements shown

12. Traffic Engineering (Steven Gomez / 303-739-7336 / segomez@auroragov.org / Comments in amber)

[Site Plan Page 2]

12A. Add the following note:

- The developer is responsible for signing and striping all public streets. The developer is required to place traffic control, street name, and guide signs on all public streets and private streets approaching an intersection with a public street. Signs shall be furnished and installed per the most current editions of The Manual on Uniform Traffic Control Devices (MUTCD) and City Standards and shown on the signing and striping plan for the development.

RE: Acknowledged.



[Site Plan Page 4]

- 12B. Show auxiliary lanes per TIS, typical.

RE: Lane lines are not shown on the site plan since signing & marking design typically does not begin until final design. The ROW dedications will support the typical auxiliary lane configurations per the TIA and is proposed to be shown during the final construction document phase. If the City wishes to see this design at the Site Plan stage, we can work with the City to add proposed lane linework to our collector roadway systems, but would recommend this coordination takes place during final design.

[Site Plan Page 5]

- 12C. Show Warren Ave extending to the east.

RE: Warren Ave east of Kewaunee is not a part of this project, therefore it will not be shown.

- 12D. Add opposing side ped ramp. (multiple locations)

RE: Pedestrian ramp configuration updated per CoA Traffic comments.

- 12E. Delete ramp. (multiple locations)

RE: Pedestrian ramp configuration updated per CoA Traffic comments.

- 12F. Label sight triangles, typical.

RE: Sight triangles labeled.

- 12G. Label all access points as full movement, right in/right out, etc., typ.

RE: Civil Acknowledges.

- 12H. Driveways need to be located a minimum of 75' from the adjacent street flow line, type.

RE: Driveways revised to provide as much distance from flowline as possible. Driveways into individual lots are conceptual and provided to ensure that adequate curbside landscaping will be provided. Exact locations cannot be determined without finalizing which elevation will be built on which lot.

- 12I. Show all adjacent and opposing accesses on perimeter roads, typ.

RE: Adjacent access is now shown. All intersections accesses will be proposed per the TIA.

- 12J. Potential driveway/ped ramp conflicts throughout the site.

RE: Pedestrian ramp configuration updated per CoA Traffic comments.

- 12K. If tee intersection, delete ped ramps. (multiple locations)

RE: Pedestrian ramp configuration updated per CoA Traffic comments.

- 12L. Add ped ramps here.

RE: Pedestrian ramp configuration updated per CoA Traffic comments.

[Site Plan Page 6]

- 12M. All-way STOP not allowed unless warranted, typical.

RE: Stop signs removed to eliminate all-way intersection.

[Site Plan Page 21]

- 12N. In coordination with any Postal Service requirements, mail kiosks shall be located:

- Outside of sight triangles as defined by COA Roadway Manual, standard TE-13
- Outside of the influence area (including traffic queues) for a controlled intersection (stop-controlled, signal controlled, or otherwise)
- A minimum of 30' away from stop signs (for stop sign visibility)
- A maximum of 50' away from curb ramp crossings (curb ramps to be located on both sides of roadway)
- Preferred location for mail kiosks is on side lots or other common areas for a neighborhood, and while meeting the above criteria, to avoid conflicts with mail kiosk traffic and specific homeowner ingress/egress.
- The United States Postal Service (USPS) must be included in the final determination for placement of mail kiosk within your site, what equipment is USPS approved and what is not. Please contact the USPS Growth Coordinator @ 303-853-6994

RE: Acknowledged. Mail kiosks have been located within the above-listed parameters. Plan West has contacted USPS for approval of locations as of 8/8/2022.



[Site Plan Page 22]

12O. Verify mature plant heights within sight triangles meet requirements of COA 4.04.2.10, type. All landscaping sheets.

RE: Completed

[Site Plan Page 32]

12P. Show sight triangles. it appears some fence is located within sight triangles.

RE: Sight triangles added to this sheet and fencing plan revised as necessary. Split rail fencing has been proposed to replace solid fencing along Harvest and Kewaunee to allow for visibility within sight triangles where code requires both fencing and sight triangles.

[Traffic Impact Analysis Page 1]

12Q. Verify short-term site trip assignment and associated traffic volumes/operation.

RE: The short-term site trip assignment assumes a condition where limited adjacent development has occurred and most trips will head to/from the west to reach Gun Club Road, E-470, and downtown Aurora. FHU has discussed this assumption with City staff, and they have accepted it.

12R. Provide LOS/delay summary tables for all traffic conditions. For signalized intersections provide movement, approach, and overall LOS/delay.

RE: Tables have been provided. Refer to revised TIS

12S. Provide Synchro signal timing sheets in the Appendix.

RE: Timing sheets have been provided. Refer to revised TIS.

12T. Provide Synchro vehicle queue sheets in the Appendix.

RE: Queuing sheets have been provided. Refer to revised TIS.

12U. See comments throughout the report.

RE: Comments in the report have been addressed. Several comment responses were discussed with City traffic staff to confirm appropriate resolutions.

13. Fire / Life Safety (William Polk / 303-739-7371 / wpolk@auroragov.org / Comments in blue)

[Site Plan Page 2]

13A. City of Aurora Utility notes 11,16,19-21 are typically placed on civil plans. Please work with your assigned case manager to determine if these notes need to be removed.

RE: Notes updated

13B. Add the following notes:

- The applicant has the obligation to comply with all applicable requirements of the Americans with Disabilities Act.
- The developer, his successors, and assigns, including the homeowners or merchants association, shall be responsible for the installation, maintenance, and replacement of all fire lane signs. The right-of-way for ingress and egress for service and emergency vehicles is granted over, across, on, and through 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."
- All building address numbers shall comply with the aurora city code, section 126, article vii -numbering of buildings

RE: Additional notes added.

[Site Plan Page 3]

13C. Will this site be gated? If the area of this site is gated, then the installation of any gating system will require a City of Aurora licensed contractor to obtain a building permit through the Aurora Building Division prior to the start of any work. This would be considered a structural, life safety, and electrical review within the Building Division that is conducted on behalf of the Fire Chief. If gated, provide sections for the automatic and manual gates.

RE: No – the site is not proposed to be gated.



- 13D. Advisory Comment: The developer is responsible for the construction of all on-site and off-site infrastructure needed to establish two points of emergency access to the overall site and each internal phase of construction. This requirement includes, but is not limited to, the construction of any emergency crossings improvements, looped water supply, and fire hydrant as required by the adopted fire code and city ordinances.
[RE: Acknowledged.](#)
- 13E. A phasing plan with a descriptive narrative must be provided with the Planning Departments' site plan and Public Works Departments' civil plan submittal. The phasing plan must illustrate each phase and provide a narrative that describes how the phasing will always implement the required two points of access and a looped water supply during the phased construction. Also, make sure to incorporate COA Water and Public Works phasing requirements into the phasing plan.
[RE: Phasing sheet and notes added.](#)
- 13F. Show the location of the new fire hydrants on this sheet.
[RE: Hydrants now shown.](#)
- 13G. Add the shown phasing notes.
[RE: Notes added.](#)

[Site Plan Pages 4-11]

- 13H. Provide a legend and show: Fire hydrants -new/existing, Mail Kiosks
[RE: Legend added and symbols now provided.](#)
- 13I. All existing and proposed fire hydrants must be shown on the site, utility, and landscape sheets.
[RE: Existing/proposed hydrants are now show on the new overall utility sheet.](#)
- 13J. Show all proposed mail kiosk locations on the site and landscape sheets.
[RE: Mail kiosks now shown.](#)

[Site Plan Pages 13-20]

- 13K. 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') outside the plan area shall utilize a fire hydrant symbol with an arrow identifying the distance from the symbol to the existing fire hydrant.
[RE: Existing/proposed hydrants are now show on the new overall utility sheet.](#)
- 13L. Provide Harvest Rd reference number that correlates to the provided note. Additionally, show the fire hydrants that are required along the roadway.
[RE: Reference number has now been added.](#)
- 13M. Provide an overall utility sheet that shows all proposed and existing fire hydrants that will serve this site.
[RE: Existing/proposed hydrants are now show on the new overall utility sheet.](#)
- 13N. All on-site fire hydrants are to be spaced on average of 600' or less. Whereas, off-site fire hydrants (Harvest/Warrent/Keywaunee/Yale streets) are to be spaced every 500' on alternating sides of the road.
[RE: Acknowledged.](#)

[Site Plan Pages 22-30]

- 13O. Show all proposed fire hydrants.
[RE: Hydrants now shown.](#)

[Site Plan Page 38]

- 13P. Please confirm that the U.S.P.S. has approved the appropriate mode of delivery and kiosks locations. Please provide a note that identifies the location of the mail kiosks and states compliance with ADA and Postal regulations.
[RE: Acknowledged. Plan West reached out to USPS for approval of locations and mode of delivery on 8/8/2022.](#)
- 13Q. Please work with the Planning Department to identify any addressing needs for this project.
[RE: Acknowledged. Plan West has coordinated with Planning and Phil Turner. CAD will be provided directly to Phil Turner concurrently with this second submittal.](#)



14. Aurora Water (Daniel Pershing / 303-739-7646 / ddpershi@auroragov.org / Comments in red)

[Site Plan Page 1]

- 14A. Any changes to utilities with this amendment will also require an amendment to the Master Utility Study. Otherwise, please ensure utilities on this amendment match what is shown on the approved MUS.
RE: Acknowledged.

[Site Plan Page 17]

- 14B. Show pressure zone boundary along with PRVs separating the boundaries. Again, these need to be in conformance with the approved MUS unless the MUS intends to be revised.
RE: Acknowledged – a new sheet has been added (overall utilities), this shows the PRV locations, as well as the pressure zones per the approved MUS.

15. Aurora Water/TAPS (Diana Porter / dsporter@auroragov.org)

- 15A. Storm drain development fees due: 124.054 acres x \$1,242.00 = \$154,075.07

RE: Acknowledged.

- 15B. Commercial users with meters one and one-half inches and smaller with landscaped areas not served by a separate irrigation system shall be charged an outdoor fee based upon the total landscaped area.

RE: Acknowledged.

16. PROS (Alex Grimsman / 303-739-7154 / agrimisma@auroragov.org / Comments in purple)

[Site Plan Page 1]

- 16A. Add an asterisk to the total acreage deficit for clarity that this total deficit will be provided within the PA noted.
RE: Completed.

[Site Plan Page 2]

- 16B. Note on the tract table which tracts are being used to meet the required open space and neighborhood park dedication. Note if they are trail connections being requested for credit for ease of review.
RE: Completed. The three 30' wide trail corridors, two tracts adjacent Yale Ave (I & J) and the two parks will make up the open space dedication, in addition to the large open space tract south of Yale. This has been reflected in the tract table.

[Site Plan Page 3]

- 16C. Note the east-west connection throughout the site.
RE: Street P and Street J act as east/west connections throughout the site.
- 16D. Show how the regional trail on the south side of Yale will connect to the park and further up to the Triple Creek Trail through the northern planning areas.
RE: A 14' detached trail is located on both sides of Yale Ave. A meeting was held between Plan West and PROS on 8/4 clarifying this connectivity condition.

[Site Plan Page 18]

- 16E. Are the tracts adjacent to the ROW providing the trail connection from the regional trail up to the park? If so, this needs to be a minimum 8' concrete trail within a 48' corridor (20' from all property lines).
RE: Reference to a regional trail cannot be found. The 8' multi-modal trail provides a connection from the 14' multi-modal trail adjacent Yale Ave to both parks. The 8' trail is required by the Master Plan, but does not connect to a community park or City owned park or any other destinations, and therefore should not be categorized as a 'Community Connector'. A 'Neighborhood Connector' is more appropriate, however the Applicant has provided an 8' vs. 6' trail because of commitments with in the FDP. The Site Plan has been revised to provide 10' between this trail and the adjacent fence lines, creating a strong landscape buffer, with a double row of trees for a pleasant pedestrian experience.



[Site Plan Page 22]

- 16F. If the detention pond is being requested for open space credit it will need to meet a 24-hour recovery period and provide some type of amenity within the area, outside of the 100-year floodplain. Benches, trail loop, tables, pet waste stations.

RE: Acknowledged. The detention tracts are not being proposed as open space for credit.

[Site Plan Page 24]

- 16G. Provide ramps where noted in the redlines.

RE: Pedestrian ramp configuration updated per CoA Traffic comments.

[Site Plan Page 25]

- 16H. Is this pond being requested for credit? If so, amenities will be required around the perimeter loop. Benches, tables, pet waste stations, etc.

RE: Acknowledged. The detention tracts are not being proposed as open space for credit

[Site Plan Page 28]

- 16I. Show the proposed regional trail on the south side of Yale- and provide connections across Yale.

RE: A 14' multi-use trail separated by a 22' landscape buffer is provided on both sides of Yale Ave, creating connectivity between the Harvest Crossing neighborhood and the neighborhoods to the east and west.

- 16J. Provide waste stations along the trail.

RE: Completed

- 16K. Bollard lighting should be provided within the area for security.

RE: Acknowledged. Pedestrian lighting has been included with this submittal.

[Site Plan Page 29]

- 16L. The regional trail is proposed on the south side of Yale. Make sure enough space is provided to install a 10' concrete trail connection within a 70' corridor.

RE: A 14' multi-use trail separated by a 22' landscape buffer is provided on both sides of Yale Ave, creating connectivity between the Harvest Crossing neighborhood and the neighborhoods to the east and west.

- 16M. Lighting should be provided within the open space area – also include pet waste stations along the trail network.

RE: Acknowledged. Pedestrian lighting has been included with this submittal.

[Site Plan Page 30]

- 16N. What is the surface shown? It is not called out or within the legend.

RE: Hatch represented planting beds. Further detail added with this submittal.

- 16O. Provide cut sheets for the planned playground equipment. Playground equipment should be provided to meet multiple age groups – Typically 2-5 and 5-12.

RE: Playground layout provided with this submittal to coordinate with details.

- 16P. 6' trail would be preferred.

RE: Acknowledged. 5' concrete sidewalk with 3' crusher jogging trail is provided to create an 8' wide trail.

- 16Q. Provide pedestrian or bollard lighting for security within the park spaces.

RE: Acknowledged. Pedestrian lighting has been included with this submittal.

[Site Plan Page 31]

- 16R. Provide lighting within the pocket park.

RE: Acknowledged. Pedestrian lighting has been included with this submittal.



- 16S. Call out surface type, it is not within the legend or called out. If this is a mulch or some type of planting area be cautious of cut-through traffic from the loop track to the playfield.
RE: Hatch represented planting beds. Further detail added with this submittal. Acknowledged- plantings provided to discourage cut-through.
- 16T. Provide benches in the middle of the park, the options for seating are far away from where children would be playing, and parents likely want to be closer while watching their children play.
RE: Acknowledged. Additional benches provided as suggested.

17. Real Property (Darren Akrie / 303-739-7331 / dakrie@auroragov.org / Comments in magenta)

- 17A. Real Property review forthcoming, please reach out to the reviewer directly for comments.
RE: Acknowledged. RP comments were received 8/8/2022 and incorporated into this second submittal. Responses to redlines provided on plat have been submitted with this set.

18. Xcel Energy (Donna George / 303-571-3306 / donna.l.george@xcelenergy.com)

- 17A. Please note that wherever a 10-foot-wide utility is present, the 6-foot-wide gas easement is not necessary.
RE: Acknowledged.
- 17B. As the project progresses, the property owner/developer/contractor must complete the application process for any new natural gas service via xcelenergy.com/InstallandConnect. It is then the responsibility of the developer to contact the Designer assigned to the project for approval of design details.
RE: Acknowledged.
- 17C. For additional easements that may need to be acquired by separate document for new facilities, the Designer must contact a Right-of-Way and Permits Agent.
RE: Acknowledged.

19. Mile High Flood District (Derek Clark / 303-455-6277 / submittals@udfcd.org)

- 19A. Section B.3. of the PDR states that Pond B outfalls an existing swale. Please revise to state that it will outfall the proposed Harvest Gulch improvements. This is also referenced in Section D.1. and Section D.2.
RE: Acknowledged – PDR edited to call out proposed Harvest Gulch improvements in all Sections.
- 19B. Section D.1. of the PDR states that offsite runoff is captured with basins D-15, D-20, and D-85. Seems as if these are referencing B basins as opposed to D.
RE: Basins updated to reflect correct major basin.
- 19C. Paragraph 2 of the PDR is confusing due to possible errors in basin naming. It states Basin B is conveyed to existing storm infrastructure to the north, however, it's going to Pond B according to drainage maps. Basin D is said to be conveyed to Pond A but that doesn't seem accurate either.
RE: Acknowledged – these inaccuracies have been updated.
- 19D. The detention volume spreadsheets provided in the appendices have erroneously listed the basin acreage as the "a" value for the MHFD WQ Watershed Inches equation. The "a" value should use the coefficient provided in Volume 3 of the USDCM which correlates with the drain time coefficients of Table 3-2. I will note that this did not seem to have an impact on the WQCV that was calculated by this spreadsheet.
RE: Acknowledged – the "a" value on the spreadsheet has been updated to read as 1.0 for detention design
- 19E. Please revise the outfall pipe of Pond B to an outfall approximately 1' above the Harvest Gulch channel invert.
RE: Acknowledged & addressed.
- 19F. Please show applicable outlet pipe protection on the drainage plans.
RE: Reference MHFD comment response form.
- 19G. Please label the emergency spillway for Pond B as well as show the applicable riprap protection along the embankment.
RE: Reference MHFD comment response form.



- 19H. There is more information needed about the proposed Harvest Gulch design to review this submittal:
- Since it was noted in the Master Drainage Plan, that a portion of Harvest Gulch was impeded by the D.A.D.S. site, what flow rate is the channel being designed for? Include discussion in the report.
[RE: Reference MHFD comment response form.](#)
 - The current cross-section is a trapezoidal design. Please evaluate the need for a more multi-stage channel design.
[RE: Reference MHFD comment response form.](#)
 - Please use the principles of USDCM Volume 1, Chapter 8 to inform the design of Harvest Gulch and to ensure the stream corridor required fits within the proposed site plan.
[RE: Reference MHFD comment response form.](#)

20. Buckley Space Force Base (Lawrence Aragon / 720-847-9731 / Lawrence.aragon.1@us.af.mil)

- 20A. Inform Airfield Management of cranes/booms that will be used during construction. Send map with marked location/address and MAXIMUM tip height of crane/equipment above ground level (see page 2). Airfield Management will send it to GeoBase for the Lat/Long and Elevation. Airfield Management will then in turn send it to our Terminal Procedure Representative for evaluation. This part of the process will generally take approximately five business days.
[RE: Acknowledged – if cranes/booms are to be used on site, the developer & contractor will coordinate with BSFB per your standards/regulations.](#)
- 20B. Airfield Management will inform the submitter if an FAA notification is needed IAW UFC 3-260-01 Appendix B Section 1 para. B14-5. The submitter will need to file an electronic form 7460-1 off airport form 30 days prior (14CFR Part 77 states 45 days prior) to start construction for FAA for determination at <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>. When FAA sends the determination, Airfield Management will need a copy of the PDF document. NOTE: The sooner Airfield Management is notified the more we can help without delaying your construction.
[RE: Acknowledged – if cranes/booms are to be used on site, the developer & contractor will coordinate with BSFB per your standards/regulations.](#)
- 20C. 72 hours (NLT 24 hours) prior to the crane/boom going up, Airfield Management will need to be contacted. Resend map with location, reemphasize max height of boom/crane, start and end dates, days of the week, and times it will be erect (see page 2). This will allow Airfield Management to post the NOTAMs for the Pilots in the area.
[RE: Acknowledged – if cranes/booms are to be used on site, the developer & contractor will coordinate with BSFB per your standards/regulations.](#)
- 20D. Obstruction flags will need to be on top of the crane/boom and obstruction lights may be needed if the equipment stays up between sunset and sunrise.
[RE: Acknowledged – if cranes/booms are to be used on site, the developer & contractor will coordinate with BSFB per your standards/regulations.](#)

To: Tiffany Clark, PE, CFM – SEMSWA Land Development Manager
Derek Clark, PE – MHFD Project Manager

From: Trey Farrell, PE – Project Manager

Date: August 10th, 2022

Subject: **Harvest Crossing – PA-5, 6, & 7 (Filing No. 2) – RSN 1634842 – Preliminary Drainage Report & Plan 1st Round Comment Responses - SEMSWA Case No. DPR21-00001/D22-00050**

Southeast Metro Stormwater Authority (Tiffany Clark)

1. SEMSWA has only reviewed the referred documents in regard to the interface between the proposed project and the adjacent unincorporated Arapahoe County properties. Our review and comments focus on the stormwater discharge points between the two jurisdictions.

Response: Acknowledged.

2. Please address the following on the Drainage Plans:

- Please show and label jurisdictional boundaries.

Response: Unclear which boundaries are being requested. Please provide additional information on which jurisdictional boundaries you would like shown. 'HOA maintained' and 'PSOC owned' have been added to the Gulch sheet.

- Ponding limits adjacent to Pond A appears to cover half the road, please verify and confirm that this meets City of Aurora Standards.

Response: Ponding at DP A60 has been updated to only reach centerline of Harvest Road. These now meet City of Aurora Standards.

- Please show and label the pond features for both Pond A and B

Response: Additional features have been added and are schematically shown. Please note that the Site Plan contains preliminary design. Additional hydraulic detail (spillways, forebays, outfall structures, etc.) will be provided the construction document phase.

- Show and label floodplain limits for the proposed gulch.

Response: Per the FEMA Map (attached in PDR) no floodplain limits are shown, and the site is shown to be within "Zone X" which are areas outside the FEMA regulated floodplain. The proposed Gulch cross-section is proposed per the approved master drainage report. Additionally, there are no floodplain limits shown on the master drainage report.

3. Is the channel being improved on the adjacent parcel? Consider extending the channel section further west. The proposed grading at the tie in points appears to be more narrow than existing. If the channel is not being extending, please tie in to better match existing conditions. Additionally, who will be responsible for the channel on the PSOC parcel? These flows need to be placed in an easement on the PSOC property.

Response: The Harvest Crossing site is expected to be constructed prior to the property to the west. The Harvest Crossing portion of the Gulch has been extended as far west as contours allow and the grading then ties to existing at the property line. When the western property is constructed, their design team will be required to tie into our gulch improvements to match the cross section per the approved Master Drainage Report. It is our understanding that the neighboring property will be required to connect the gulch to their site through the PSOC property – we will coordinate with their design team during final design to confirm.

Mile High Flood District (Darek Clark)

- 1) Section B.3. of the PDR states that Pond B outfalls to an existing swale. Please revise to state that it will outfall to the proposed Harvest Gulch improvements. This is also referenced in Section D.1. and Section D.2.

Response: Acknowledged – PDR edited to call out proposed Harvest Gulch improvements in all Sections.

- 2) Section D.1. of the PDR states that offsite runoff is captured with basins D-15, D-20, and D-85. Seems as if these are referencing B basins as opposed to D.

Response: Basins updated to reflect correct major basin.

- 3) Paragraph 2 of the PDR is confusing due to possible errors in basin naming. It states Basin B is conveyed to existing storm infrastructure to the north, however it's going to Pond B according to drainage maps. Basin D is said to be conveyed to Pond A but that doesn't seem accurate either.

Response: Acknowledged – these inaccuracies have been updated.

- 4) The detention volume spreadsheets provided in the appendices have erroneously listed the basin acreage as the "a" value for the MHFD WQ Watershed Inches equation. The "a" value should use the coefficient provided in Volume 3 of the USDCM which correlates with the drain time coefficients of Table 3-2. I will note that this did not seem to have an impact on the WQCV that was calculated by this spreadsheet.

Response: Acknowledged – the "a" value on the spreadsheet has been updated to read as 1.0 for detention design.

- 5) Please revise the outfall pipe of Pond B to outfall approximately 1' above the Harvest Gulch channel invert.

Response: Outfall pipe has been updated.

- 6) Please show applicable outlet pipe protection on the drainage plans.

Response: Rip-rap pads are typically designed during the construction document set. We are proposing to postpone hydraulic final design until the construction document stage – please confirm.

- 7) Please label the emergency spillway for Pond B as well as show the applicable riprap protection along the embankment.

Response: Pond emergency spillways and applicable riprap embankment protection is typically designed during the construction document set. We are proposing to postpone hydraulic final design until the construction document stage – please confirm.

- 8) There is more information needed about the proposed Harvest Gulch design in order to review this submittal:

- a. Since it was noted in the Master Drainage Plan, that a portion of Harvest Gulch was impeded by the D.A.D.S. site, what flow rate is the channel being design for? Include discussion in the report.

Response: The flow within Harvest Gulch is being designed for 184 cfs per the approved master drainage study. Additional verbiage has been added to the PDR to discuss the flow used for this design.

- b. The current cross section is a trapezoidal design. Please evaluate the need for a more multi-stage channel design.

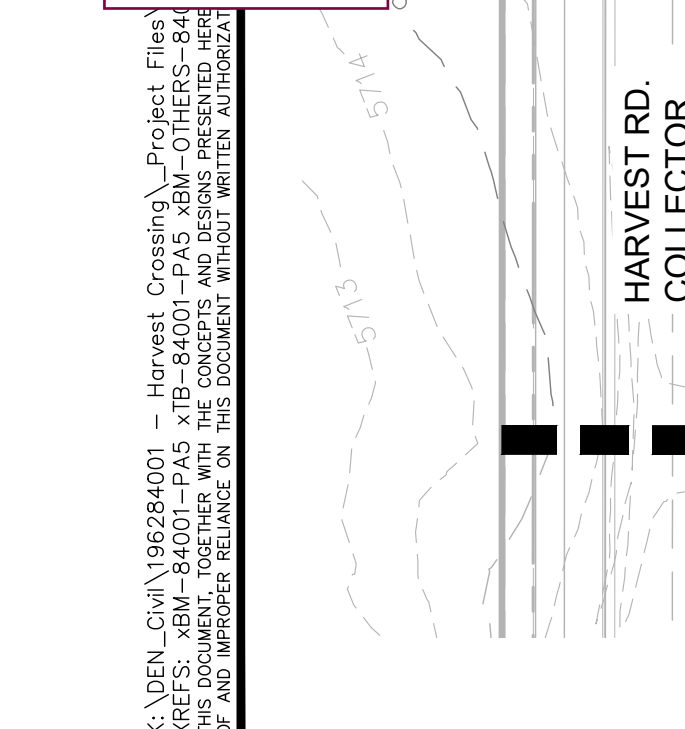
Response: The channel has been modified to conform to the approved cross-section in the master drainage report.

- c. Please use the principles of USDCM Volume 1, Chapter 8 to inform the design of Harvest Gulch and to ensure the stream corridor required fits within the proposed site plan.

Response: The channel has been modified to conform to the approved cross-section in the master drainage report. The flow rate in that report is from the approved MHFD study and all hydraulics and hydrology conform to MHFD and City of Aurora Criteria. All materials used within the creek will be determined at final design.

- 9) Are there future improvements that will be proposed in the open space to the south of the proposed channel?

Response: Yes – this area will be designated as open space for future use. No additional civil infrastructure is anticipated south of the gulch.



RATIONAL CALCULATIONS SUMMARY					
DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	PEAK FLOWS (CFS)		
			Q2	Q100	
Basins					
A5	A-05	1.47	0.72	2.38	
A10	A-10	0.80	0.82	3.05	
A15	A-15	2.55	2.45	9.79	
A20	A-20	0.61	1.06	3.10	
A25	A-25	1.86	2.25	8.66	
A30	A-30	0.81	0.77	3.12	
A35	A-35	2.93	1.22	4.26	
A40	A-40	4.38	4.41	16.50	
A45	A-45	0.84	1.06	3.63	
A46	A-46	0.34	0.16	0.52	
A50	A-50	1.44			
A55	A-55	2.24			
A60	A-60	1.12			
A65	A-65	0.62			
A70	A-70	2.29			
D15	D-15	1.00			
D20	D-20	1.24			
D25	D-25	2.33			
D30	D-30	2.97			
D35	D-35	2.62			
D40	D-40	0.55			
D45	D-45	2.04	0.61	2.03	
D50	D-50	1.00	1.38	4.50	
In sump. For sump inlets - show overflow path arrows and cross include a weir calculation in the PDR showing the 100-year elevation in the cross section at the City has been requiring that requirement of SDDTC Section design "All inlets in sump that provide an emergency overflow, overflows shall be designed for a 100-year assuming the storm sewer is full." This is required on both the final drainage plans in most cases where it is obvious that the overflows are not impacting minimum freeboard from the water on over the emergency overflow shed floor elevation is 1'.			1.11	1.19	4.47
			1.44	1.41	5.59
			2.15	2.53	8.45
			0.68	1.46	4.23
			0.64	1.36	3.93
			0.60	1.30	3.75
			2.00	2.05	8.30
			2.89	2.88	11.65
			2.14	2.19	8.57
		3.85	1.67	5.51	
		0.89	1.53	4.46	
		6.41	2.39	7.67	
		18.17	6.08	19.47	
		3.13	1.98	6.13	
		2.45	1.18	6.67	
		0.96	1.72	5.03	
		0.18	0.36	1.04	
		1.19	1.19	6.81	
		1.91	1.67	6.74	
B50	B-50	1.15	1.21	4.69	
B55	B-55	2.66	2.39	9.53	
B60	B-60	2.30	2.57	9.93	
B65	B-65	2.87	2.95	11.91	
B70	B-70	0.22	0.49	1.46	
B85	B-85	4.39	1.94	6.13	
B90	B-90	1.25	1.84	6.23	
B95	B-95	1.40	1.35	5.44	
B100	B-100	1.80	1.64	6.59	
B105	B-105	1.52	1.46	5.85	
B110	B-110	2.17	2.00	8.09	
B115	B-115	2.22	2.22	8.47	
B120	B-120	6.07	5.30	20.53	
B125	B-125	3.99	3.50	13.61	
B130	B-130	0.94	0.94	3.80	
B145	B-145	1.09	0.53	1.76	
B146	B-146	0.14	0.31	0.90	
B150	B-150	0.14	0.31	0.90	
B155	B-155	0.89	0.90	4.94	
B160	B-160	2.99	2.74	11.09	
B165	B-165	0.81	0.79	3.19	
B170	B-170	3.28	2.88	11.12	
E5	E-05	1.69	1.69	6.84	
E10	E-10	1.93	1.79	7.25	
E15	E-15	1.42	2.25	7.18	
OS1	OS-1	12.21	1.15	3.78	
TOTAL		155.62	125.12	454.99	
Drainage Basin Totals					
Basin A	Basin A	24.33	23.04	84.62	
Basin B	Basin B	86.74	65.58	236.65	
Basin C	Basin C	13.69	16.36	58.93	
Basin D	Basin D	13.74	13.26	49.74	
Basin E	Basin E	4.90	5.73	21.27	
Basin OS-1	Basin OS-1	12.21	1.15	3.78	
TOTAL		155.61	125.12	454.99	

PROPOSED DRAINAGE LEGEND

- # = BASIN DESIGNATION
- AC = AREA IN ACRES
- C2 = 2-YR RUNOFF COEFFICIENT
- C100 = 100-YR RUNOFF COEFFICIENT
- # = DESIGN POINT
- - - PROPOSED BASIN BOUNDARY
- PROPOSED FLOW ARROW
- [] MAX SUMP INLET PONDING

Approval box should be in lower right corner of sheet. Only required on final sheet of drain plan.

Approved For One Year From This Date

City Engineer _____	Date _____
_____	Date _____

Number PDP and PDR sheets throughout the project.

been updated

ed to meet CoA requirements for freeboard to adjacent properties.

KEY MAP
N.T.S.

NORTH

GRAPHIC SCALE IN FEET
0 20 40 60 80

811 Know what's below.
Call before you dig.

HARVEST CROSSING PA5

PRELIMINARY DRAINAGE PLAN

AURORA, CO

Kimley»Horn

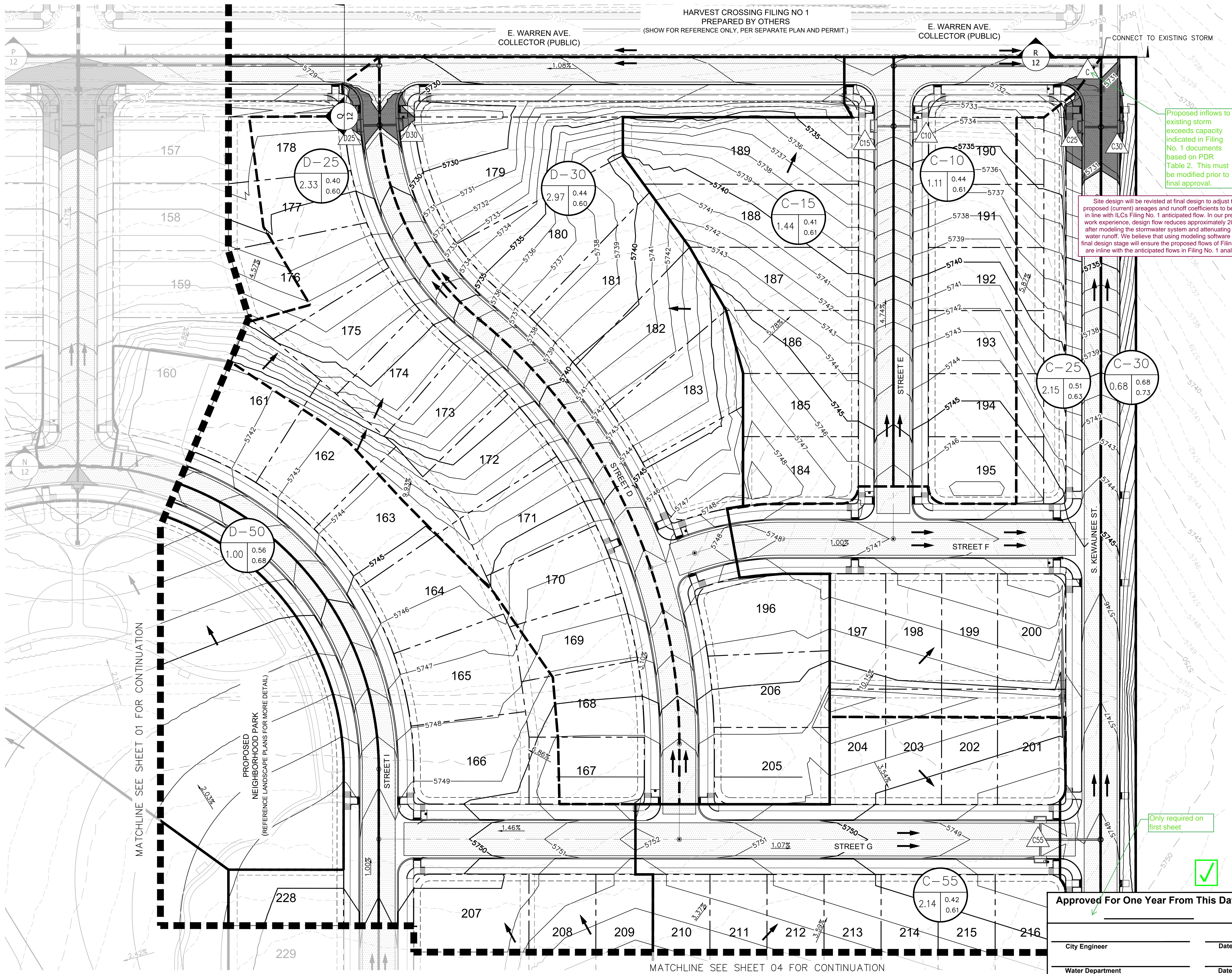
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
4582 SOUTH ULSTER STREET, SUITE 1500
DENVER, CO 80237 (303) 228-2300

DESIGNED JBP	DRAWN MSP	CHECKED TAF
SCALE (H): 1"=40'		
SCALE (V): N/A		
DATE: MAY 2022		SHEET NO.
PROJECT NO. 196284001		01
DWG. NAME PDP-PA5.dwg		

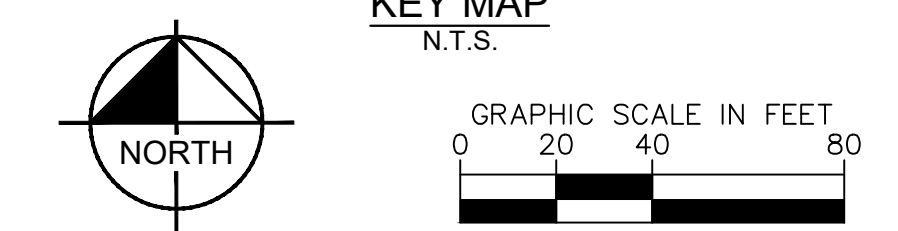
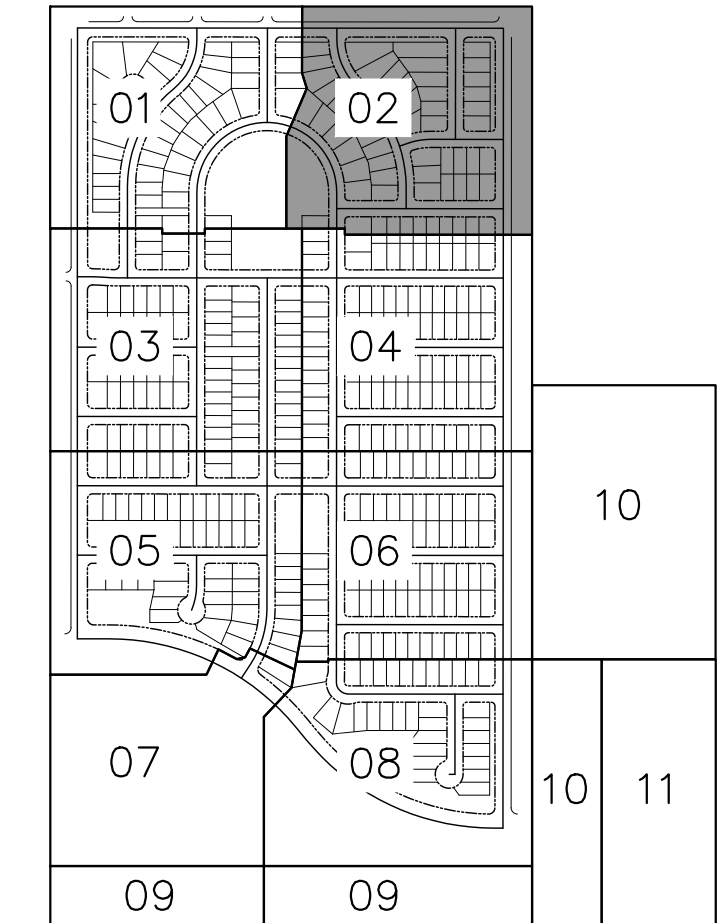
FOR CLIENT REVIEW. NOT FOR CONSTRUCTION.

of 12 sheets

K:\VEN_Civil\196284001 - Harvest Crossing\Drainage\PA5\CADD\VPD-PA5.dwg Jun 06, 2022 Jason Peterson
XREFS: XEM-84001-PA5 XTB-OTHERS-84001 XVS-84001 XLS-84001 XSD-84001 XEM-84001 XEC-84001 XEC-84001 XEC-84001 XEC-84001
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- PROPOSED DRAINAGE LEGEND**
- # = BASIN DESIGNATION
 - AC = AREA IN ACRES
 - C2 = 2-YR RUNOFF COEFFICIENT
 - C100 = 100-YR RUNOFF COEFFICIENT
 - # = DESIGN POINT
 - PROPOSED BASIN BOUNDARY
 - PROPOSED FLOW ARROW
 - MAX SUMP INLET PONDING



**HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN**

AURORA, CO



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DENVER, CO 80237 (303) 228-2300

Approved For One Year From This Date

City Engineer	Date
Water Department	Date

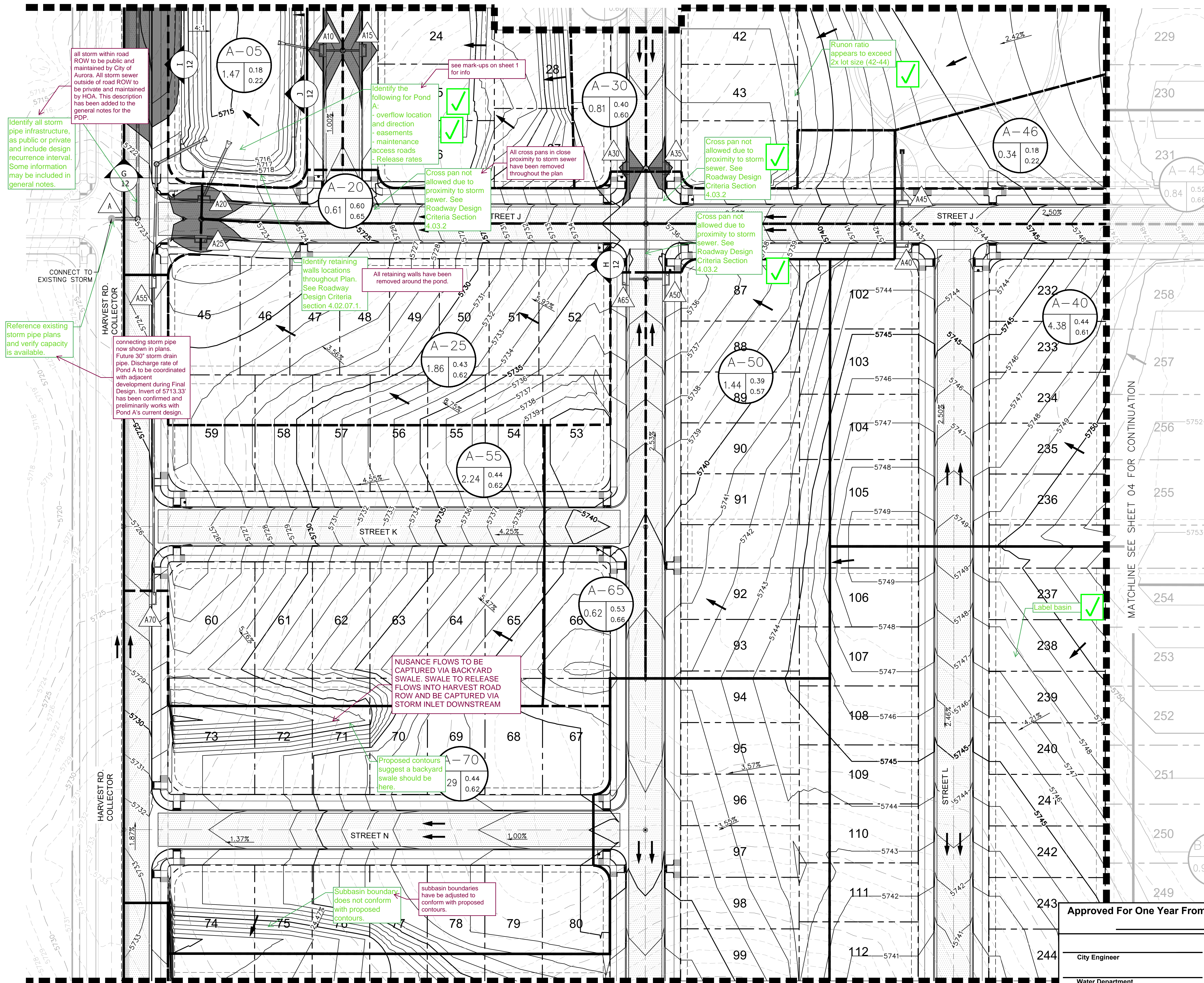
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SCALE (V): N/A		
DATE: MAY 2022		
PROJECT NO.: 196284001		
DWG. NAME: PDP-PA5.dwg		
SHEET NO.: 02		
of 12 sheets		

FOR CLIENT REVIEW, NOT FOR CONSTRUCTION.

CASE NO.: TBD

K:\VEN_Civil\196284001 - Harvest Crossing\PA5\Drainage\PA5\CADD\VPD-PA5.dwg Jun 06, 2022 Jason Peterson
XREFS: XEM-84001-PA5 XSB-84001-PA5 XSD-84001-PA5 XSM-84001-PA5 XSO-84001-PA5 XSW-84001-PA5 XST-84001-PA5 XTH-84001-PA5
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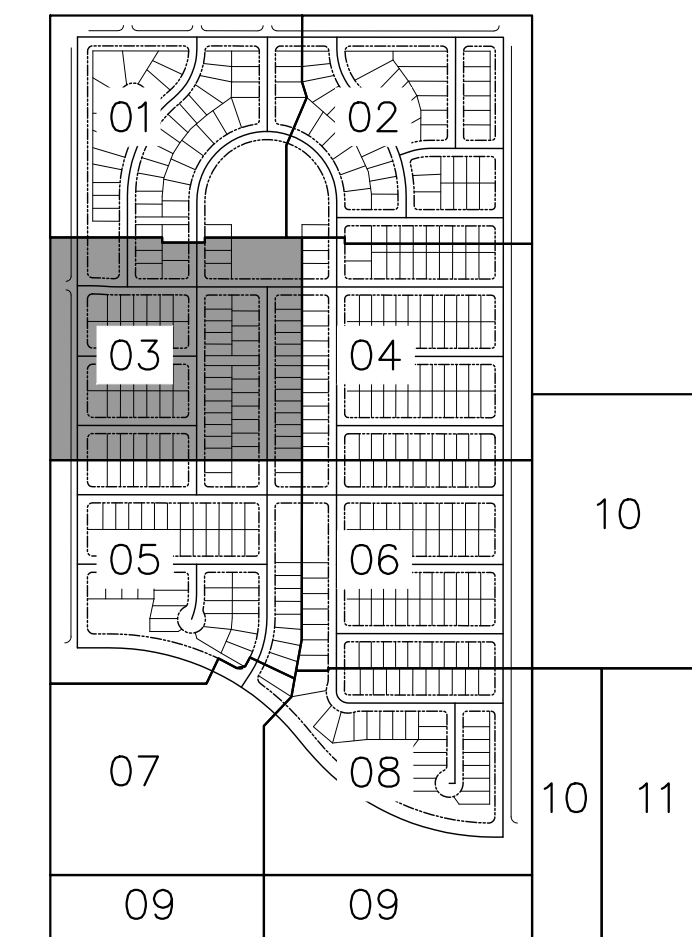
MATCHLINE SEE SHEET 01 FOR CONTINUATION



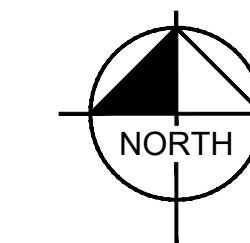
MATCHLINE SEE SHEET 05 FOR CONTINUATION

PROPOSED DRAINAGE LEGEND

- # = BASIN DESIGNATION
AC = AREA IN ACRES
C2 = 2-YR RUNOFF COEFFICIENT
C100 = 100-YR RUNOFF COEFFICIENT
- # = DESIGN POINT
- PROPOSED BASIN BOUNDARY
- PROPOSED FLOW ARROW
- MAX SUMP INLET PONDING



KEY MAP
N.T.S.



GRAPHIC SCALE IN FEET
0 20 40 80



Know what's below.
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HARVEST CROSSING PA5 PRELIMINARY DRAINAGE PLAN

AURORA, CO

Kimley»Horn

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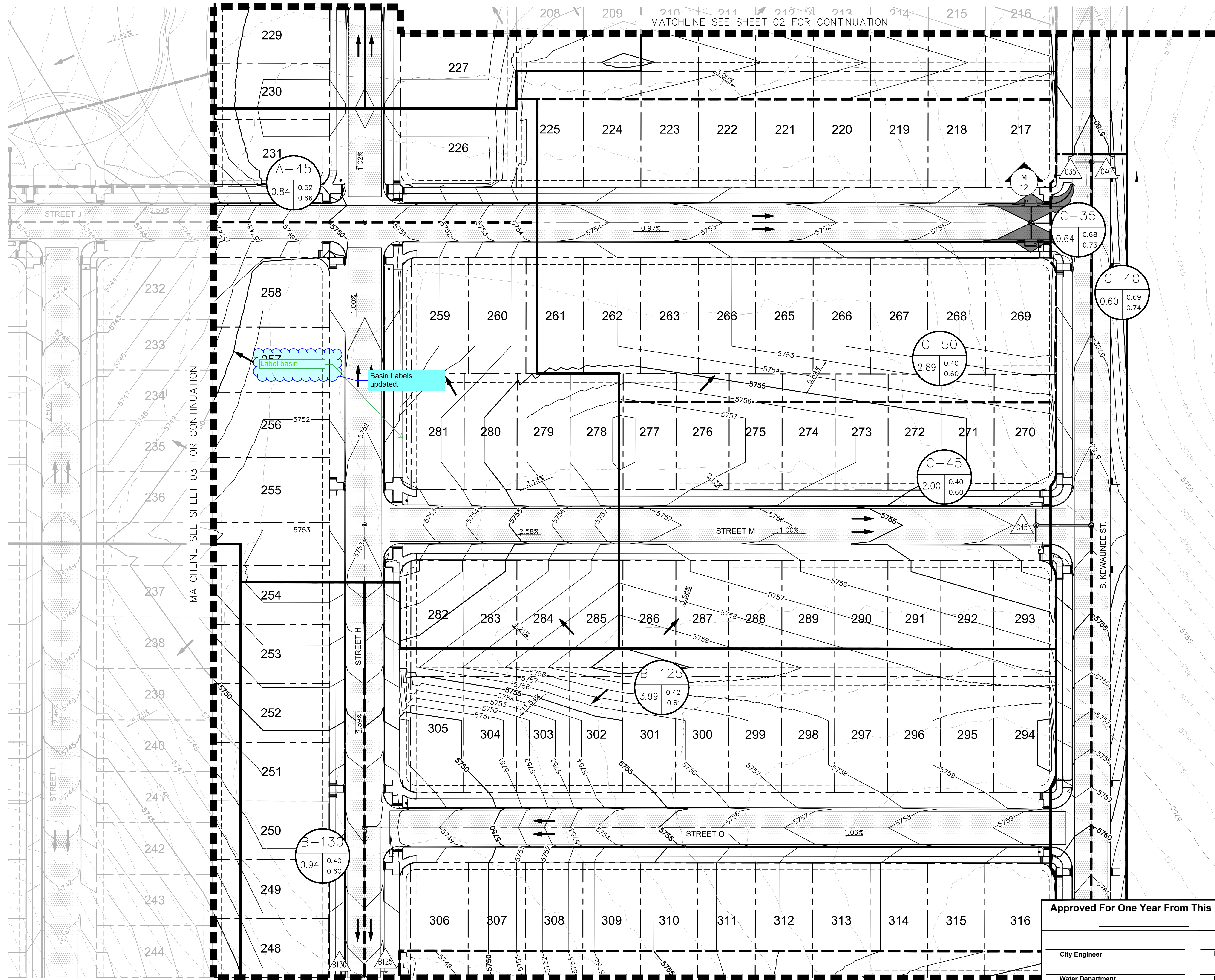
City Engineer	Date
Water Department	Date

FOR CLIENT
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CONSTRUCTION.

DESIGNED JBP	DRAWN MSP	CHECKED TAF
SCALE (H): 1"=40' SCALE (V): N/A		
DATE: MAY 2022		
PROJECT NO. 196284001		
DWG. NAME PDP-PA5.dwg		
SHEET NO. 03		
of 12 sheets		

CASE NO.: TBD

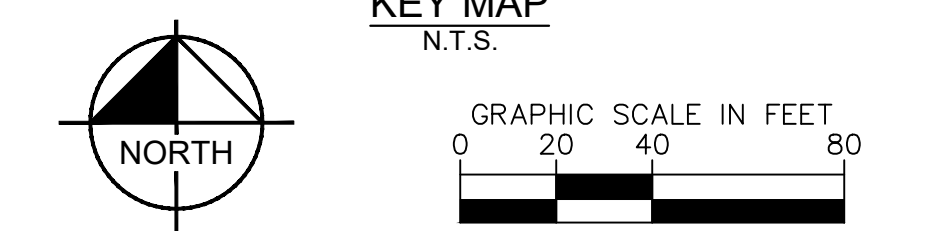
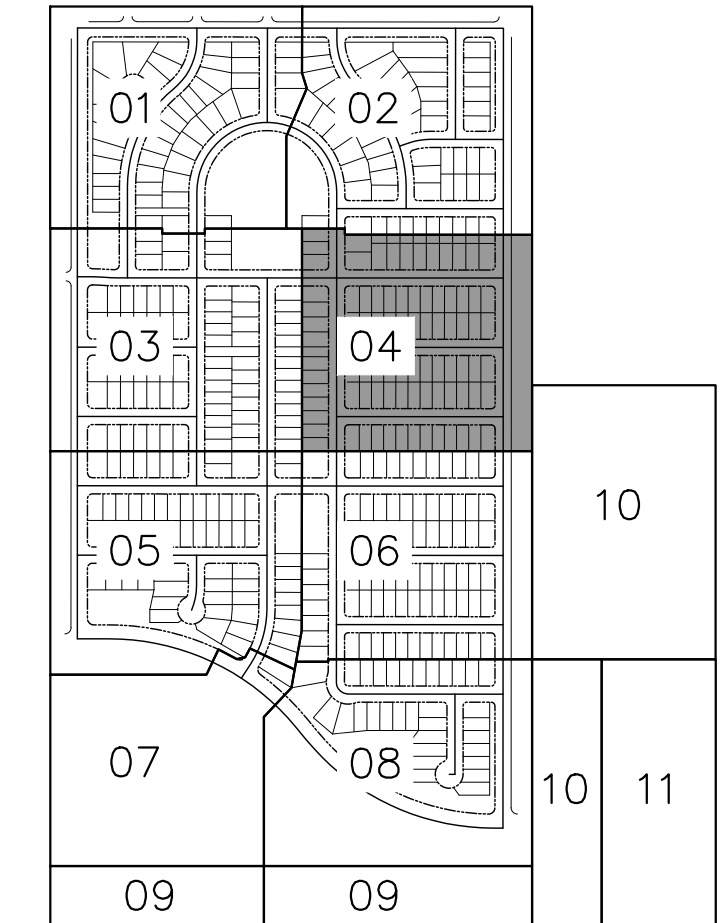
K:\VEN_Civil\196284001 - Harvest Crossing\Project Files\Eng\Drainage\PA5\CADD\VPD-PA5.dwg Jun 06, 2022 Jason Peterson
XREFS: XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5
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PROPOSED DRAINAGE LEGEND

#	# = BASIN DESIGNATION
AC	AC = AREA IN ACRES
C2	C2 = 2-YR RUNOFF COEFFICIENT
C100	C100 = 100-YR RUNOFF COEFFICIENT

#	# = DESIGN POINT
---	PROPOSED BASIN BOUNDARY
→	PROPOSED FLOW ARROW
■	MAX SUMP INLET PONDING



HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN

AURORA, CO



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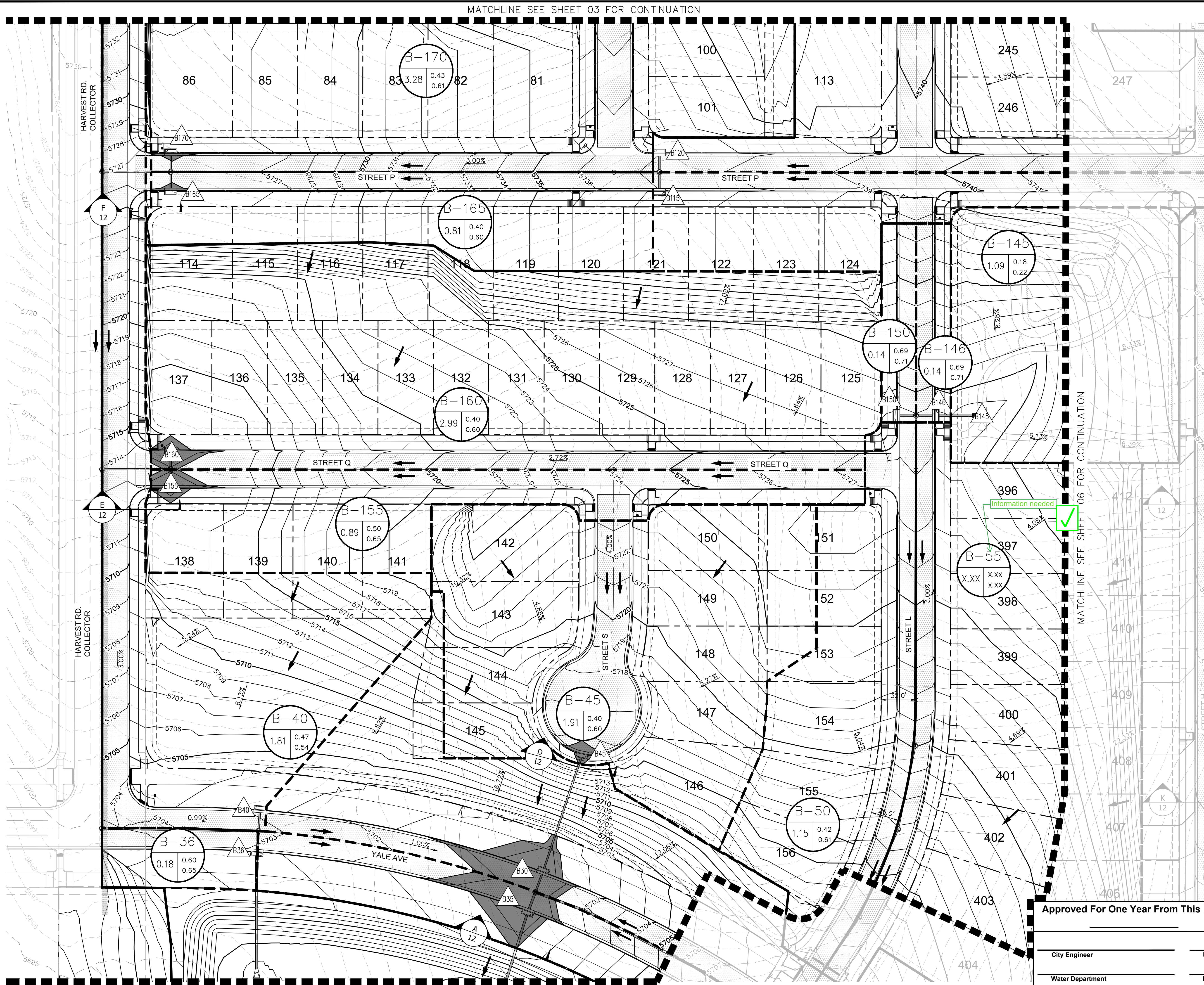
City Engineer	Date
Water Department	Date

FOR CLIENT REVIEW, NOT FOR CONSTRUCTION.

DESIGNED JBP	DRAWN MSP	CHECKED TAF
SCALE (H): 1"=40' SCALE (V): N/A		
DATE: MAY 2022		
PROJECT NO. 196284001		
DWG. NAME PDP-PA5.dwg		
SHEET NO. 04		
of 12 sheets		

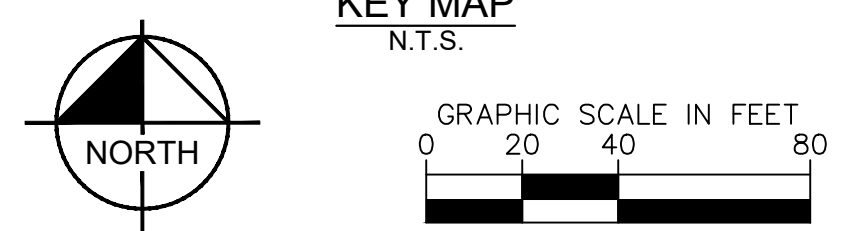
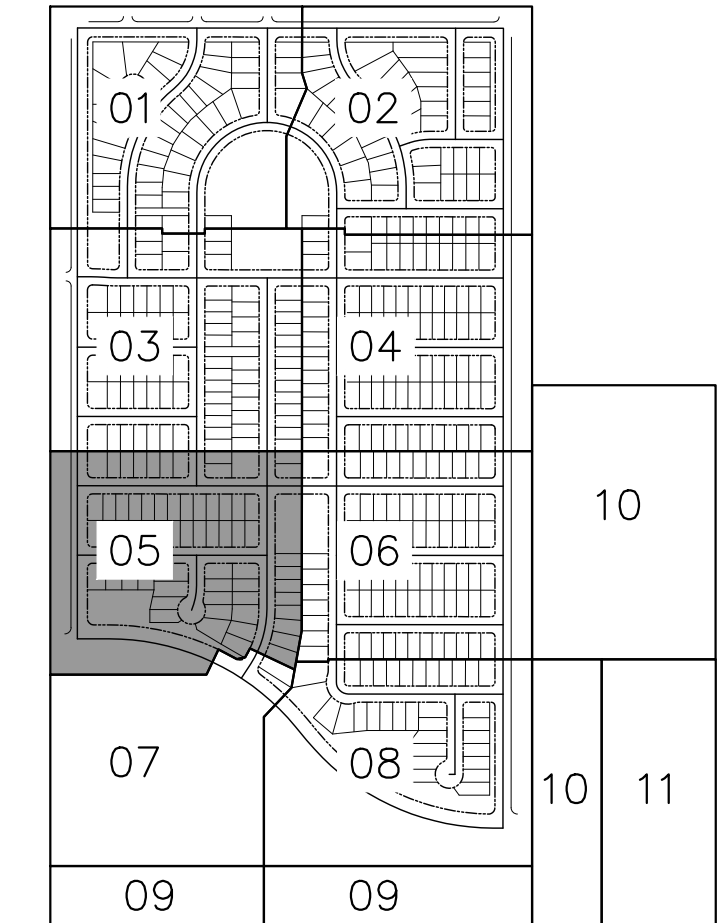
CASE NO.: TBD

K:\VEN_Civil\196284001 - Harvest Crossing\Drawings\PA5\CADD\VPD-PA5.dwg Jun 06, 2022 Jason Peterson
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PROPOSED DRAINAGE LEGEND

#	# = BASIN DESIGNATION
AC	AC = AREA IN ACRES
C2	C2 = 2-YR RUNOFF COEFFICIENT
C100	C100 = 100-YR RUNOFF COEFFICIENT
#	# = DESIGN POINT
---	PROPOSED BASIN BOUNDARY
→	PROPOSED FLOW ARROW
■	MAX SUMP INLET PONDING



**HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN**

AURORA, CO



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Approved For One Year From This Date

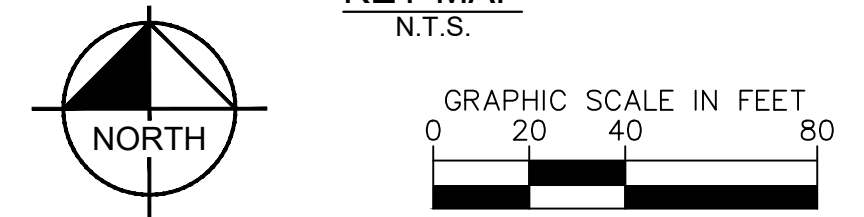
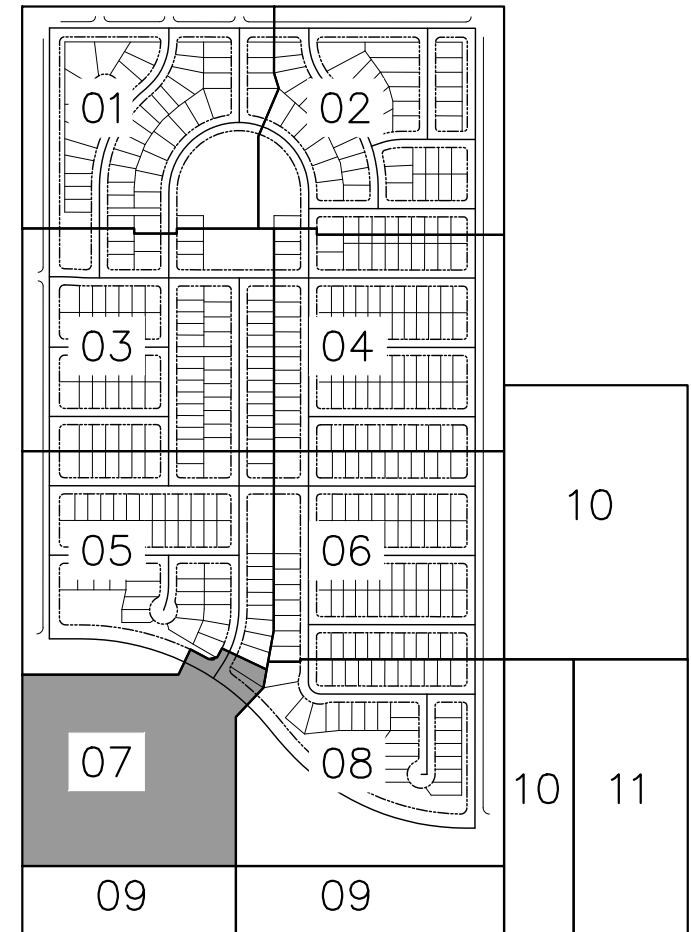
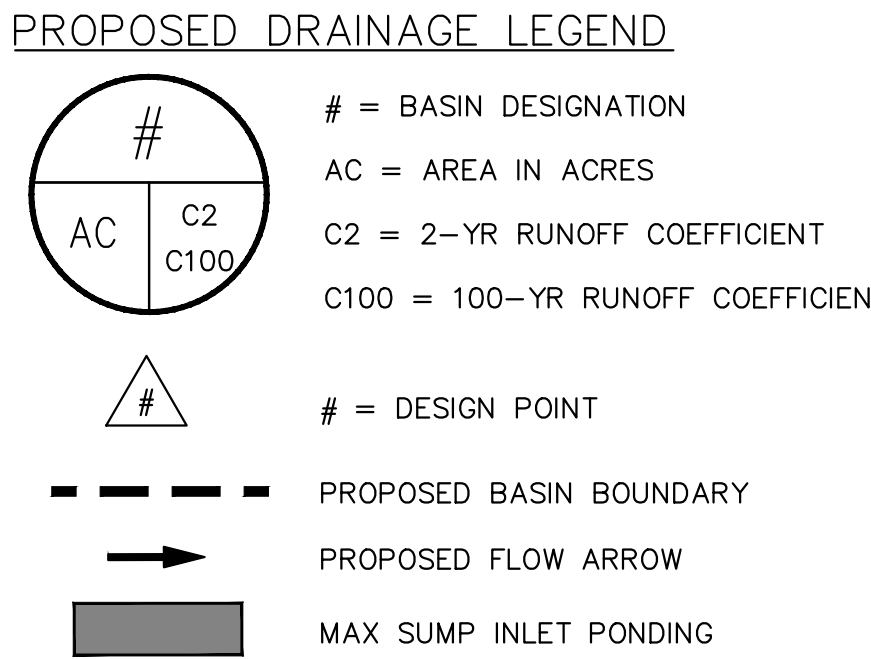
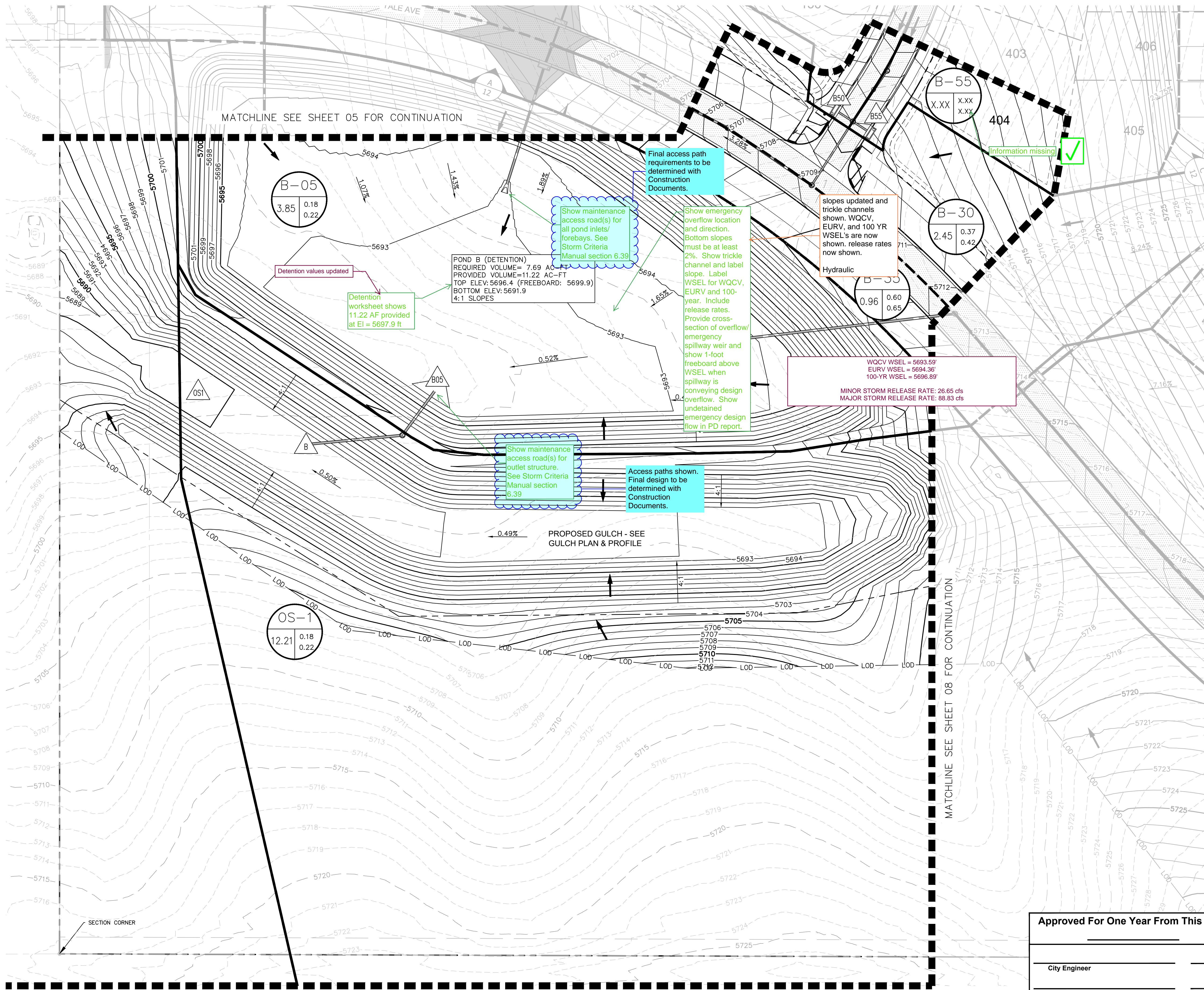
City Engineer	Date
Water Department	Date

FOR CLIENT
REVIEW, NOT FOR
CONSTRUCTION.

DESIGNED JBP	DRAWN MSP	CHECKED TAF
SCALE (H): 1"=40' SCALE (V): N/A		
DATE: MAY 2022		
PROJECT NO. 196284001		
DWG. NAME PDP-PA5.dwg		
SHEET NO. 05		
of 12 sheets		

CASE NO.: TBD

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XREFS: XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5 XEM-84001-PA5
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HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN

AURORA, CO

Kimley»Horn

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DENVER, CO 80237 (303) 228-2300

Approved For One Year From This Date

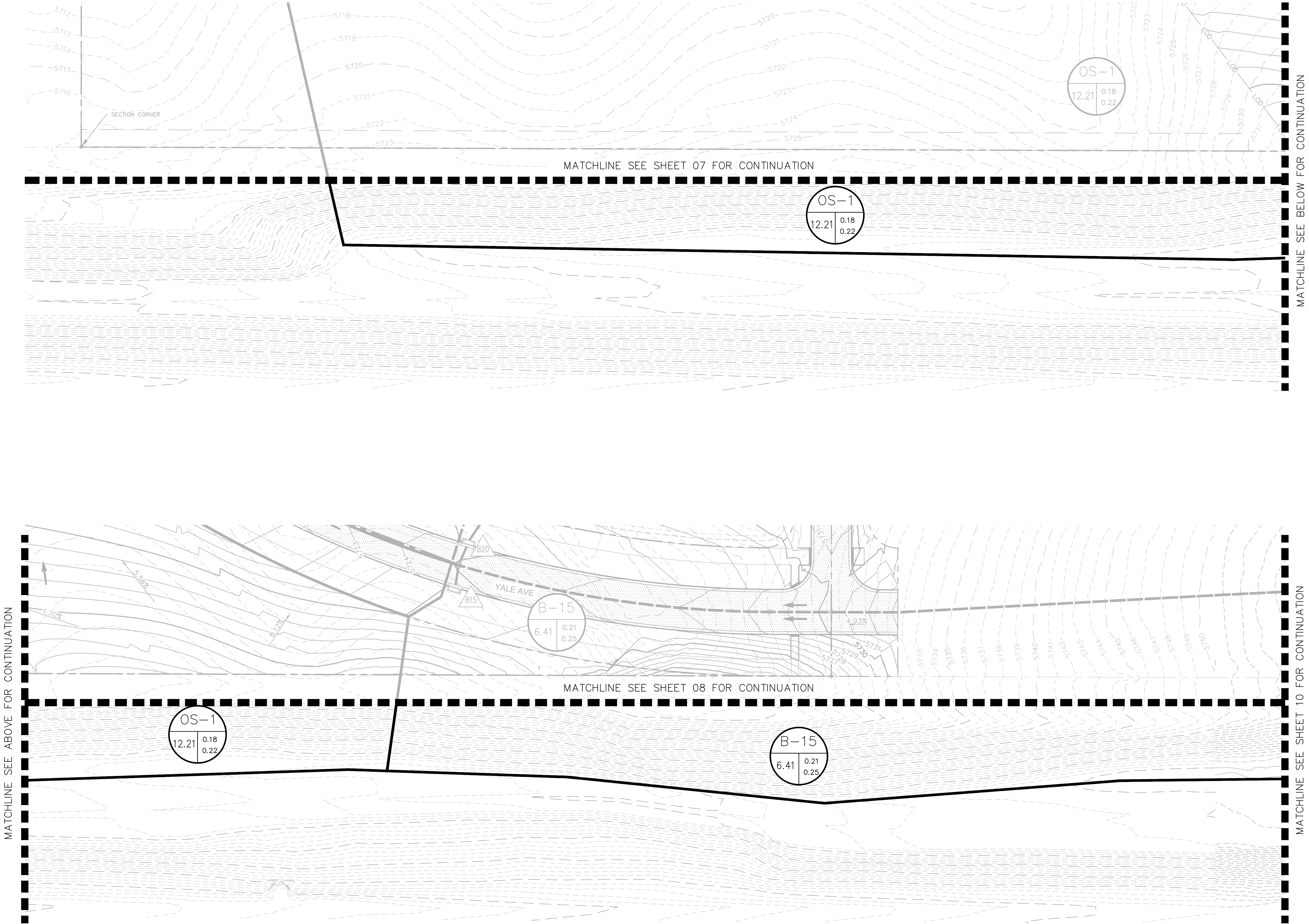
City Engineer	Date
Water Department	Date

FOR CLIENT REVIEW, NOT FOR CONSTRUCTION.

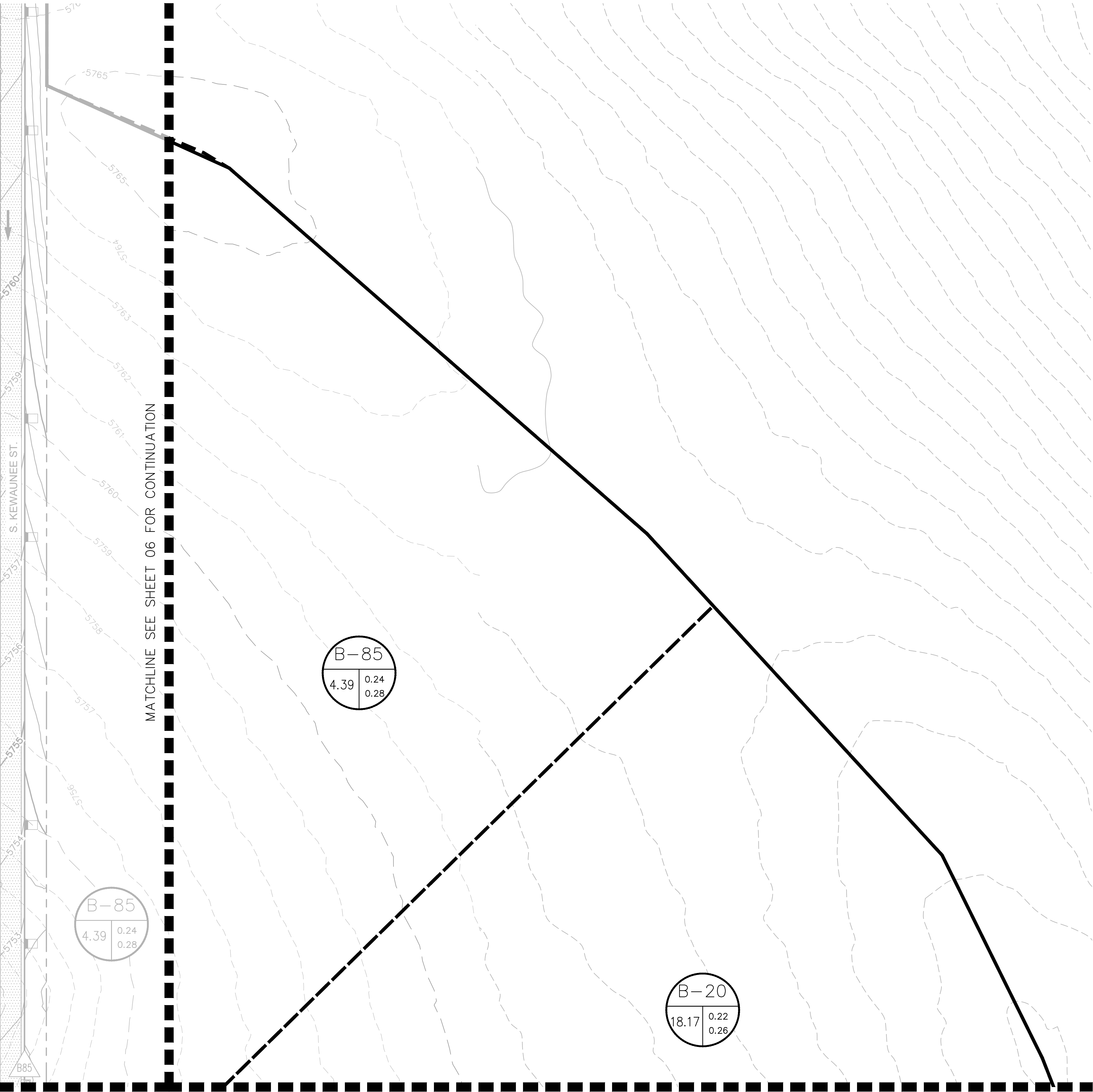
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DATE: MAY 2022		
PROJECT NO. 196284001		
DWG. NAME PDP-PA5.dwg		
SHEET NO. 07		
of 12 sheets		

CASE NO.: TBD

K:\DEN_Civil\196284001 - Harvest Crossing_Preliminary Drainage\PA5\CADD\VPD-PA5.dwg Jun 06, 2022 Jason Peterson
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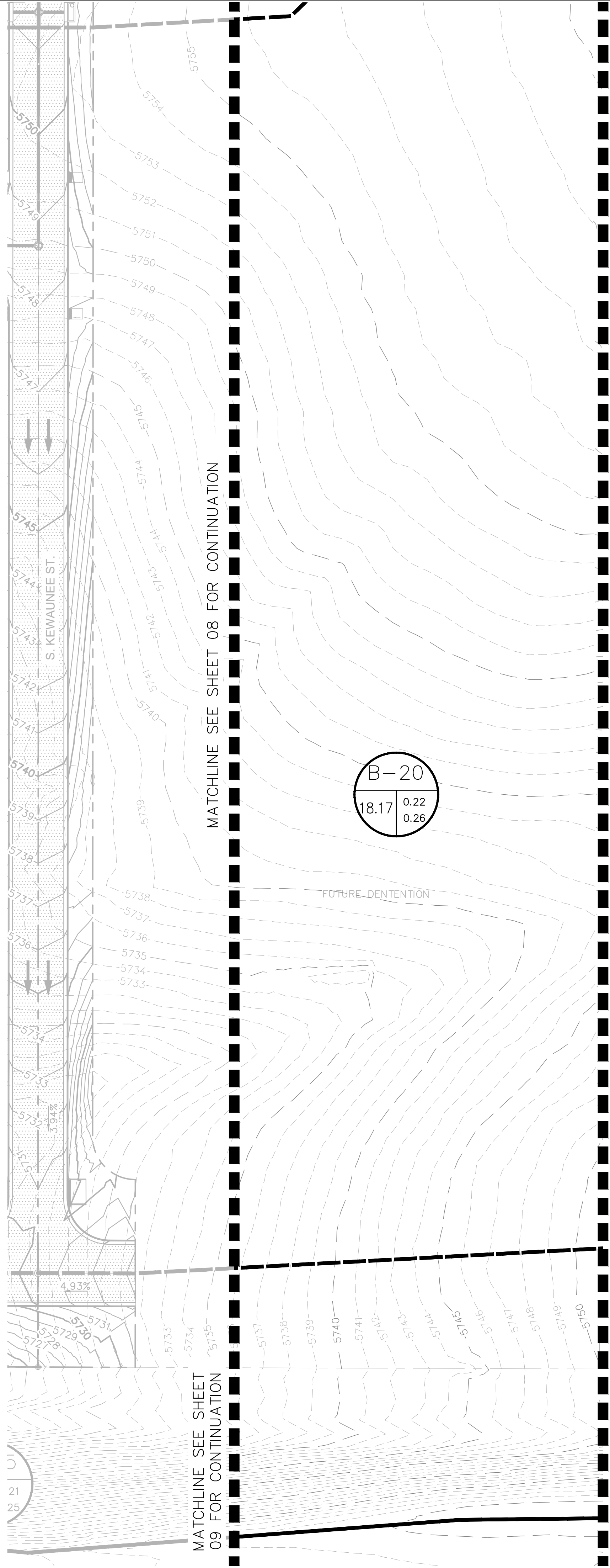


K:\DEN_Civil\196284001 - Harvest Crossing\Drainage\PA5\CADD\VPD-PA5.dwg Jun 06, 2022 Jason Peterson
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MATCHLINE SEE SHEET 08 FOR CONTINUATION

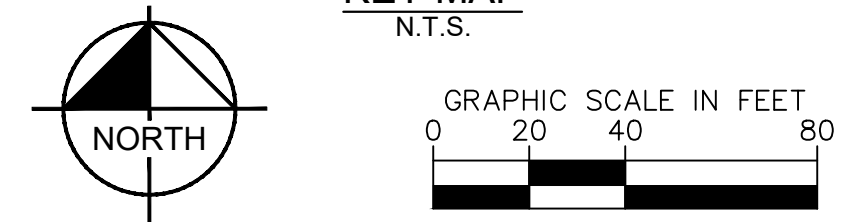
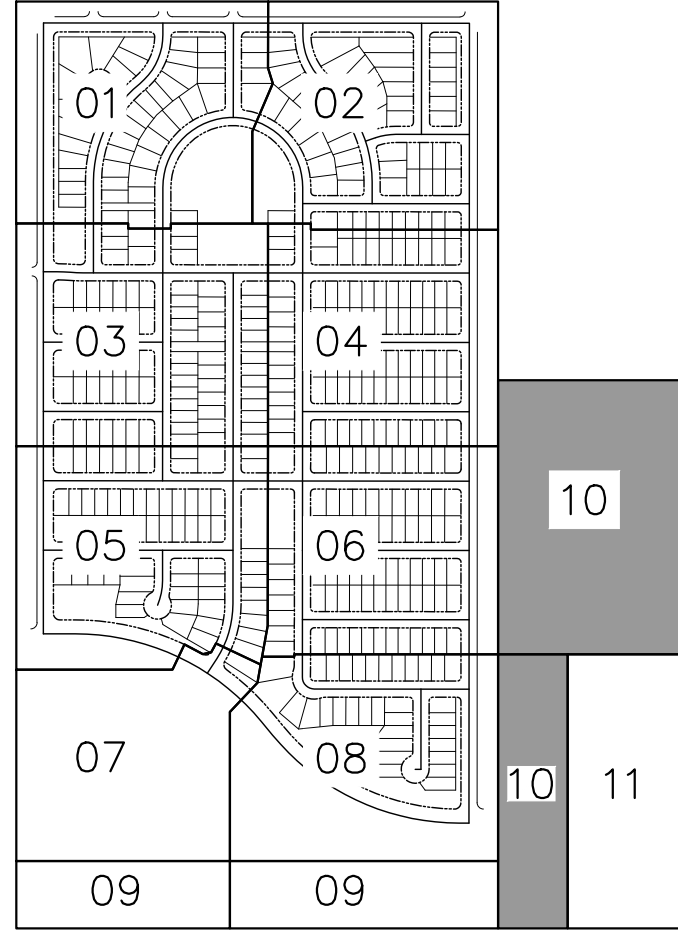
MATCHLINE SEE SHEET 11 FOR CONTINUATION



- PROPOSED DRAINAGE LEGEND
- # = BASIN DESIGNATION
 - AC = AREA IN ACRES
 - C2 = 2-YR RUNOFF COEFFICIENT
 - C100 = 100-YR RUNOFF COEFFICIENT
 - # = DESIGN POINT
 - PROPOSED BASIN BOUNDARY
 - PROPOSED FLOW ARROW
 - MAX SUMP INLET PONDING

Approved For One Year From This Date

City Engineer	Date
Water Department	Date



HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN

AURORA, CO

Kimley»Horn

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DENVER, CO 80237 (303) 228-2300

FOR CLIENT REVIEW- NOT FOR CONSTRUCTION.	SCALE (H): 1"=40'		
	SCALE (V): N/A		
	DATE: MAY 2022		SHEET NO. 10
	PROJECT NO. 196284001		
	DWG. NAME PDP-PA5.dwg		of 12 sheets

DWG. NAME
PDP-PA5.dwg

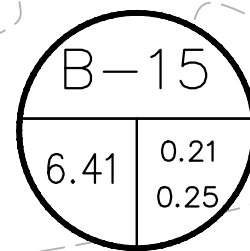
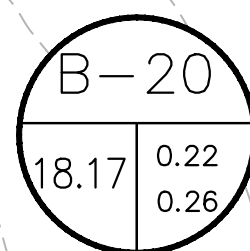
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CASE NO.: TBD

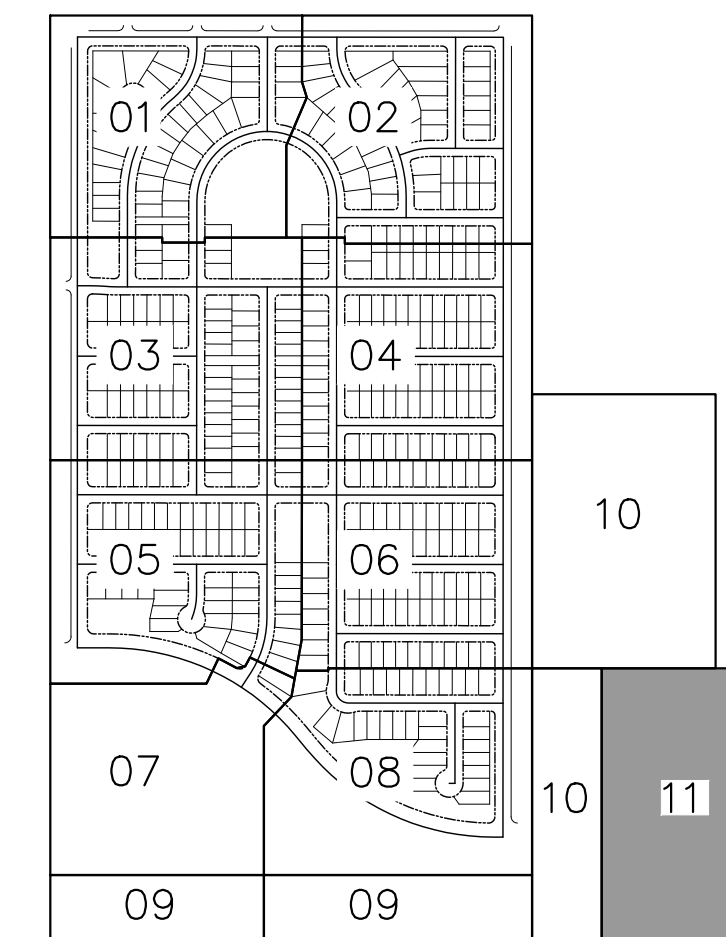
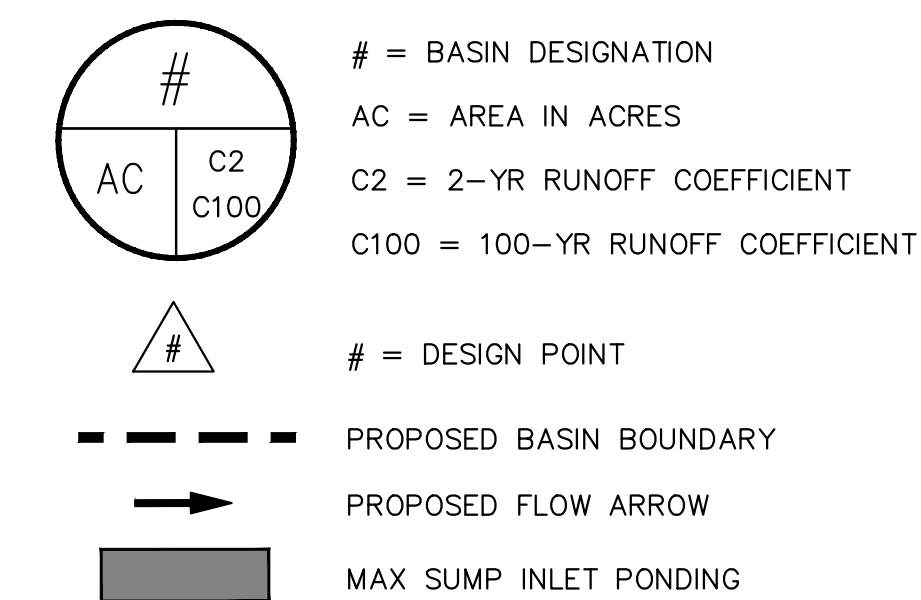
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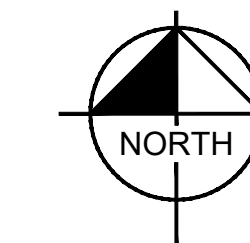
MATCHLINE SEE SHEET 10 FOR CONTINUATION



PROPOSED DRAINAGE LEGEND



KEY MAP
N.T.S.



GRAPHIC SCALE IN FEET

A horizontal line with vertical tick marks at 0, 20, 40, and 80. The segment between 0 and 20 is white, 20 and 40 is black, 40 and 80 is white, and the segment after 80 is black.



Know what's below.
Call before you dig.

HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN

AURORA, CO

Kimley»»Horror

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DENVER, CO 80237 (303) 228-2300

Approved For One Year From This Date


City Engineer	Date
Water Department	Date

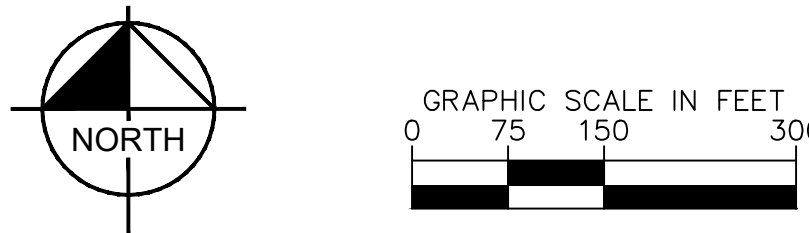
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REVIEW. NOT FOR
CONSTRUCTION




DESIGNED JBP	DRAWN MSP	CHECKED TAF
SCALE (H): 1"=40'		
SCALE (V): N/A		
DATE: MAY 2022		SHEET NO. 11
PROJECT NO. 196284001		
DWG. NAME PDP-PA5.dwg		

hts	0.	CASE NO.: TBD
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 <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> <p style="font-size: 1.2em; margin: 0;">Know what's below. Call before you dig.</p> </div>				
<h2 style="margin: 0;">HARVEST CROSSING PA5</h2> <h1 style="margin: 0;">EXISTING DRAINAGE</h1>				
<h3 style="margin: 0;">AURORA, CO</h3>				
<h1 style="margin: 0;">Kimley»Horn</h1> <p style="margin: 5px 0 0 0;">  </p> <p style="margin: 0;">  2022 KIMLEY-HORN AND ASSOCIATES, INC. 4682 SOUTH ULSTER STREET, SUITE 1500 DENVER, CO 80237 (303) 228-2300 </p>				
<p style="transform: rotate(-45deg); font-weight: bold; font-size: 1.2em;">FOR CLIENT REVIEW, NOT FOR CONSTRUCTION.</p>	DESIGNED		DRAWN	CHECKED
	JBP		MSP	TAF
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	DATE:			SHEET NO.
	PROJECT NO.			<h1 style="font-size: 3em; margin: 0;">13</h1>
	DWG. NAME			
EXDR-PA5.dwg			of 11 sheets	

City Engineer	Date
Water Department	Date

FOR CLIENT REVIEW, NOT FOR CONSTRUCTION.	JBP		MSP		TAF	
	SCALE (H): 1"=40'					
	SCALE (V): N/A					
	DATE:					SHEET NO. <div style="font-size: 2em; font-weight: bold;">13</div>
	April 2022					
PROJECT NO.						
196284001						
DWG. NAME						
EXDR-PA5.dwg						
					of 11 sheets	

CASE NO.: TBD

Send in the State Monument Records for the aliquot corners used in the plat.

Send in the Certificate of Taxes Due show they are paid in full up to and through the plat approval date of recording. Obtained from the County Treasurer's office.

items are in re-submittal package

DEDICATION

KNOW ALL PEOPLE BY THESE PRESENTS THAT THE UNDERSIGNED WARRANT THEY ARE THE OWNER(S) OF A PARCEL OF LAND BEING A PORTION OF THAT PARCEL DESCRIBED IN THE DOCUMENT RECORDED UNDER RECEPTION NUMBER B8090223 IN THE RECORDS OF THE ARAPAHOE COUNTY, COLORADO, CLERK AND RECORDER; SITUATED IN THE WEST HALF OF SECTION 29, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN; CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO; BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 29, FROM WHICH THE WEST QUARTER CORNER OF SAID SECTION 29 BEARS SOUTH 00°02'41" WEST, A DISTANCE OF 2650.64 FEET, WITH ALL BEARINGS HEREIN RELATIVE THERETO;

THENCE SOUTH 00°02'41" WEST, ALONG THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 29, A DISTANCE OF 2,051.37 FEET;

THENCE SOUTH 89°57'19" EAST, DEPARTING SAID WEST LINE, A DISTANCE OF 80.00 FEET TO THE POINT OF BEGINNING, BEING A POINT ON THE EASTERLY RIGHT-OF-WAY OF SOUTH HARVEST ROAD AS DEDICATED IN THE DOCUMENT RECORDED AT RECEPTION NO. E2030267 AND THE SOUTHERLY RIGHT-OF-WAY OF EAST WARREN AVENUE AS SHOWN ON HARVEST CROSSING FILING NO. 1 AS RECORDED AT RECEPTION NO. _____, BOTH IN SAID RECORDS;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING THREE (3) COURSES;

1. SOUTH 89°57'16" EAST, A DISTANCE OF 1,590.72 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 20.00 FEET;
2. SOUTHEASTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 89°58'59", AN ARC LENGTH OF 31.41 FEET;
3. SOUTH 89°58'17" EAST, A DISTANCE OF 32.00 FEET TO A POINT ON THE EAST LINE OF SAID PARCEL DESCRIBED IN THE DOCUMENT RECORDED UNDER RECEPTION NUMBER B8090223;

THENCE SOUTH 00°01'43" WEST, ALONG SAID EAST LINE, A DISTANCE OF 3,232.75 FEET TO A POINT ON THE SOUTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 29;

THENCE NORTH 89°48'06" WEST, ALONG SAID SOUTH LINE, A DISTANCE OF 1,722.18 FEET TO THE SOUTHWEST CORNER OF SAID SECTION 29;

THENCE NORTH 00°00'48" EAST, ALONG THE WEST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 29, A DISTANCE OF 815.56 FEET TO SOUTHWEST CORNER OF SAID SOUTH HARVEST ROAD;

THENCE SOUTH 89°59'12" EAST, A DISTANCE OF 80.00 FEET TO THE SOUTHEAST CORNER OF SAID SOUTH HARVEST ROAD;

THENCE ALONG SAID EASTERLY RIGHT-OF-WAY OF SOUTH HARVEST ROAD THE FOLLOWING TWO (2) COURSES;

1. NORTH 00°00'48" EAST, A DISTANCE OF 1833.22 FEET;
2. NORTH 00°02'41" EAST, A DISTANCE OF 599.33 FEET TO THE POINT OF BEGINNING.

CONTAINING AN AREA OF 124.054 ACRES, (5,403,808 SQUARE FEET), MORE OR LESS.

HAVE LAID OUT, PLATTED, AND SUBDIVIDED THE SAME INTO LOTS, BLOCKS, AND TRACTS AS SHOWN ON THIS PLAT UNDER THE NAME AND STYLE OF HARVEST CROSSING SUBDIVISION FILING NO. 3, AND BY THESE PRESENTS DO HEREBY DEDICATE TO THE CITY OF AURORA, COLORADO, FOR THE PERPETUAL USE OF THE PUBLIC, THE STREETS, AND EASEMENTS, AND TRACTS B,F,G,H, AND J AS SHOWN HEREON AND NOT PREVIOUSLY DEDICATED TO THE PUBLIC.

COVENANTS

THE UNDERSIGNED OWNER(S), 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.

OWNER

HARVEST & JEWELL, LLC, A COLORADO LIMITED LIABILITY COMPANY

BY: _____

NAME: _____

TITLE: _____

STATE OF _____)

COUNTY OF _____)SS

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20____ AD. BY _____, AS _____

OF HARVEST & JEWELL, LLC, A COLORADO LIMITED LIABILITY COMPANY..

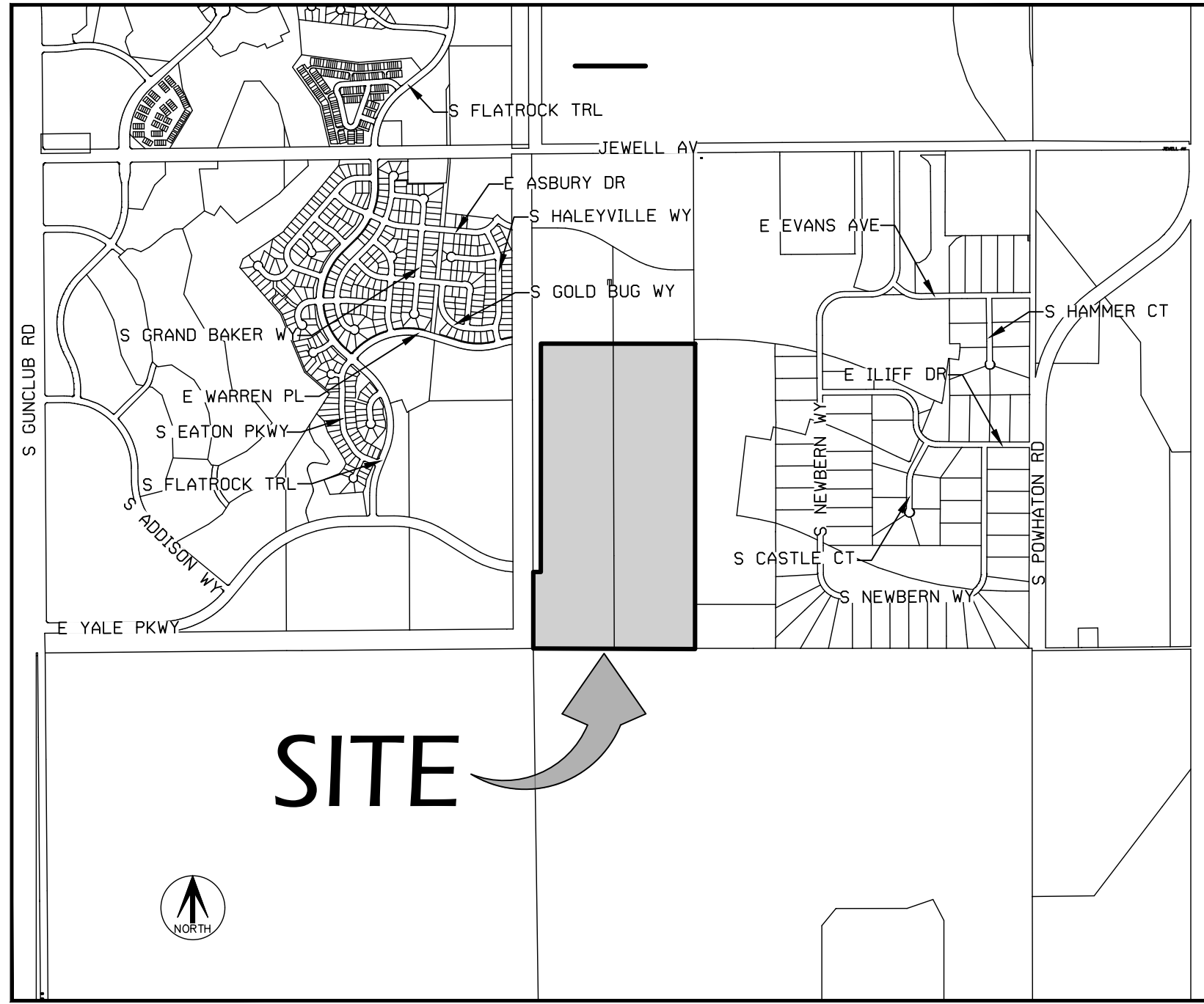
WITNESS MY HAND AND OFFICIAL SEAL

NOTARY PUBLIC

MY COMMISSION EXPIRES:

HARVEST CROSSING SUBDIVISION FILING NO. 3

SITUATED IN THE WEST HALF OF SECTION 29,
TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO.



VICINITY MAP

SCALE 1" = 1500'

Will need a reception #

acknowledged

Aztec responses in blue
Jim Lynch 2022-08-09

CONTRACT PURCHASER

RICHMOND AMERICAN HOMES OF COLORADO, INC., A DELAWARE CORPORATION

BY: _____

NAME: _____

TITLE: _____

STATE OF _____)

COUNTY OF _____)SS

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20____ AD. BY _____, AS _____

OF RICHMOND AMERICAN HOMES OF COLORADO, INC., A DELAWARE CORPORATION.

WITNESS MY HAND AND OFFICIAL SEAL

NOTARY PUBLIC

MY COMMISSION EXPIRES:

MORTGAGE HOLDER

THE UNDERSIGNED AS MORTGAGE HOLDERS ON PART OR ALL OF THE HEREON SHOWN REAL PROPERTY, DO HEREBY AGREE AND CONSENT TO THE PLATTING OF SAID PROPERTY AS SHOWN HEREON.

JEWELL DEVELOPERS, INC., A COLORADO CORPORATION

BY: _____

NAME: _____

TITLE: _____

note removed

This does not match what the site plan says.

for Tract added

GENERAL 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 UPON THE ASSUMED BEARING S00°02'41"W ALONG THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 29, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6TH P.M., BEING MONUMENTED BY A FOUND METAL PIPE WITH A 2-1/2" ALUMINUM CAP STAMPED "T4S R65W S19 S20 S30 S29 1984 PLS 13155" IN RANGE BOX AT THE NORTHWEST CORNER AND BY A FOUND NO. 5 REBAR WITH A 1-1/2" ALUMINUM CAP STAMPING ILLEGIBLE AT THE WEST QUARTER CORNER, WITH ALL BEARINGS CONTAINED HEREIN BEING RELATIVE THERETO.
3. THE EASEMENT AREA WITHIN EACH LOT 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 F, G, H AND J ARE GRANTED TO THE CITY OF AURORA FOR PUBLIC LAND PURPOSES AND WILL BE CONSTRUCTED BY THE DEVELOPER TO CITY OF AURORA SPECIFICATIONS.
5. TRACTS A-E, I, AND K-V ARE TO BE PRIVATELY OWNED AND MAINTAINED.
6. DISTANCES ON THIS PLAT ARE GROUND DISTANCES EXPRESSED IN U.S. SURVEY FEET AND DECIMALS THEREOF. A U.S. SURVEY FOOT IS DEFINED AS EXACTLY 1200/3937 METERS.
7. LAND TITLE GUARANTEE COMPANY TITLE COMMITMENT ORDER NO. ABC70716282-6 WITH AN EFFECTIVE DATE OF 05/31/2022 AT 5:00 P.M. WAS RELIED UPON FOR RECORD INFORMATION REGARDING EASEMENT(S) AND ENCUMBRANCES(S). THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY AZTEC CONSULTANTS, INC. TO DETERMINE OWNERSHIP, RIGHT(S)-OF-WAY, EASEMENT(S), OR OTHER MATTERS OF PUBLIC RECORD.
8. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT(S) OR LAND BOUNDARY MONUMENT(S), OR ACCESSORY COMMITS A CLASS TWO MISDEMEANOR PURSUANT TO 18-4-508 CRS.
9. 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.
10. THE EASEMENTS HEREON SHOWN AND LABELED 6' GAS EASEMENT ARE FOR THE EXCLUSIVE USE AS GAS EASEMENTS; EXCEPT OTHER UTILITIES, SERVICE WALKS, AND DRIVEWAYS MAY CROSS SAID EASEMENTS AT SUBSTANTIALLY RIGHT ANGLES.

acknowledged

Will need a date

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY I WAS IN RESPONSIBLE CHARGE OF THE SURVEY WORK USED IN THE PREPARATION OF THIS PLAT; THE POSITIONS OF THE PLATTED POINTS 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 _____, 20____.

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.

JAMES E. LYNCH, LICENSED PROFESSIONAL LAND SURVEYOR
COLORADO P.L.S. NO. 37933
FOR AND ON BEHALF OF AZTEC CONSULTANTS, INC.

NOTICE: 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.

NOTICE: PER THE STATE OF COLORADO BOARD OF LICENSURE FOR ARCHITECTS, PROFESSIONAL ENGINEERS, AND PROFESSIONAL LAND SURVEYORS RULE 1.6.B.2 THE WORD "CERTIFY" AS USED HEREON MEANS AN EXPRESSION OF PROFESSIONAL OPINION AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED. THE SURVEY REPRESENTED HEREON HAS BEEN PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE AND IS BASED UPON MY KNOWLEDGE, INFORMATION AND BELIEF.

CLERK AND RECORDERS CERTIFICATE

ACCEPTED FOR FILING IN THE OFFICE OF THE COUNTY CLERK AND RECORDER OF ARAPAHOE COUNTY, COLORADO ON THIS _____ DAY OF _____, 20____ A.D. AT _____ CLOCK ____M.

COUNTY CLERK AND RECORDER _____ DEPUTY _____

BOOK NO.: _____

PAGE NO.: _____

RECEPTION NO.: _____

removed

delete this certificate

CITY OF AURORA APPROVALS

THE FOREGOING INSTRUMENT IS APPROVED FOR FILING AND CONVEYANCE OF STREETS, EASEMENTS, AND TRACTS F, G, H, AND J 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 AND TRACT B ONLY AFTER CONSTRUCTION HAS BEEN COMPLETED BY THE SUBDIVIDER TO CITY OF AURORA SPECIFICATIONS.

CITY ENGINEER _____ DATE _____

PLANNING DIRECTOR _____ DATE _____

LAST REVISED: 6/7/2022

AzTEC CONSULTANTS, INC. <small>300 East Mineral Ave., Suite 1 Littleton, Colorado 80122 Phone: (303) 713-1898 Fax: (303) 713-1897 www.aztecconsultants.com</small>	DEVELOPER RICHMOND AMERICAN HOMES OF COLORADO, INC. 4350 S. MONACO STREET #500 DENVER, COLORADO (720) 977-3841	
	DATE OF PREPARATION:	03-17-2022
	SCALE:	N/A
SHEET 1 OF 11		

AzTec Proj. No: 21421-37 Drawn By: RBA

HARVEST CROSSING SUBDIVISION FILING NO. 3

SITUATED IN THE WEST HALF OF SECTION 29,
TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO.

monument records included
with re-submittal

send in the State
Monument record

send in the State
Monument record

send in the State
Monument record

add street names

street names have
not been assigned
at this time

send in the State
Monument record

send in the State
Monument record

POINT OF COMMENCEMENT
NW COR., SEC. 29, T4S, R65W, 6TH P.M.
FOUND METAL PIPE WITH 2-1/2" ALUMINUM CAP
IN RANGE BOX STAMPED "LS 13155"

70' ACCESS ESMT
REC. NO. B1214291

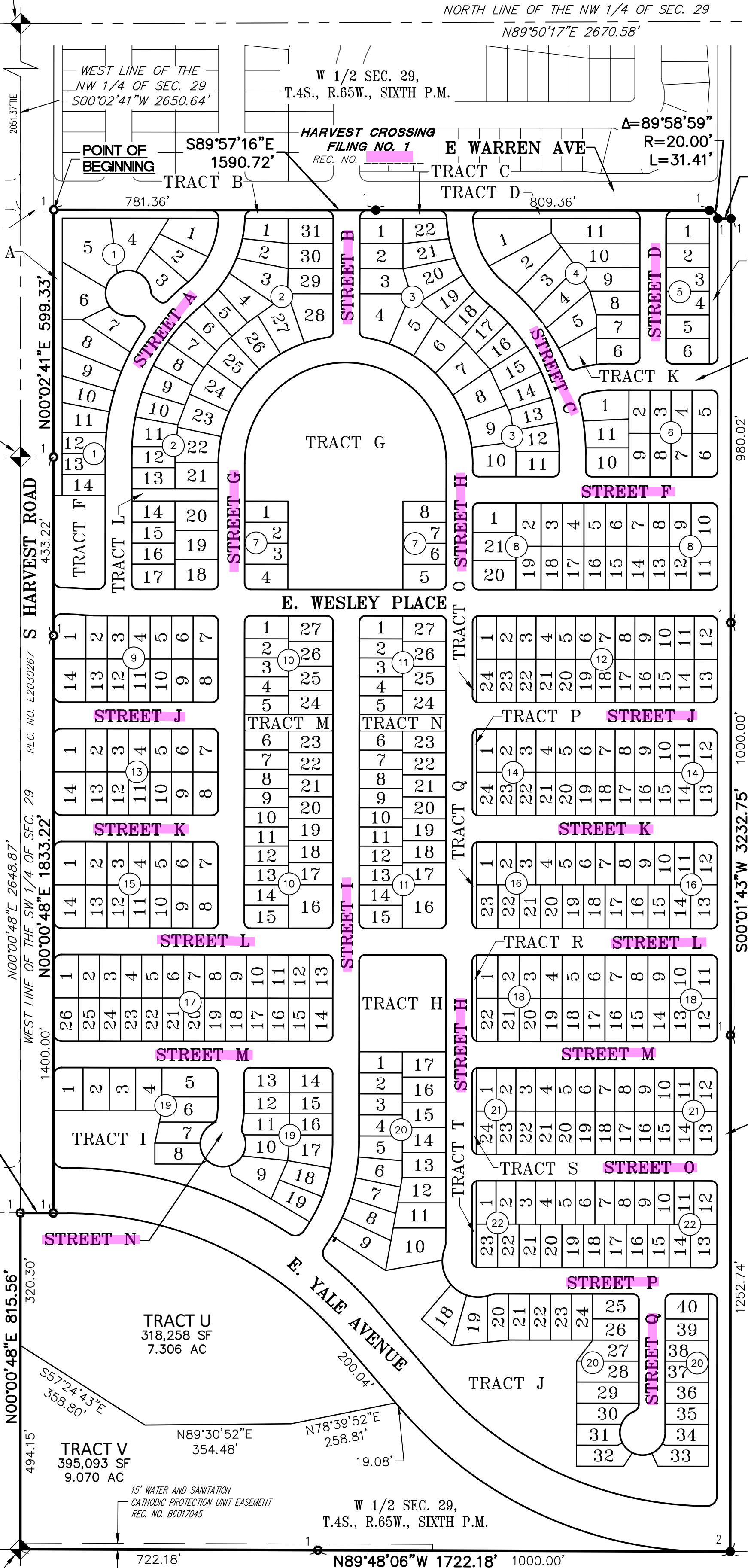
WEST 1/4 COR., SEC. 29,
T4S, R65W, 6TH P.M.
FOUND NO. 5 REBAR WITH
1-1/2" ALUMINUM CAP -
ILLEGIBLE

UNPLATTED
NO RECORDING INFORMATION AVAILABLE

WEST LINE OF THE SW 1/4 OF SEC. 29
N00°00'48"E 2648.87'
N00°00'48"E 1835.22'

110' ROADWAY ESMT
REC. NO. B5109237
REC. NO. B1214291

SW COR., SEC. 29
T4S, R65W, 6TH P.M.
FOUND 1-1/2" ALUMINUM CAP
IN 2-1/2" PIPE - ILLEGIBLE

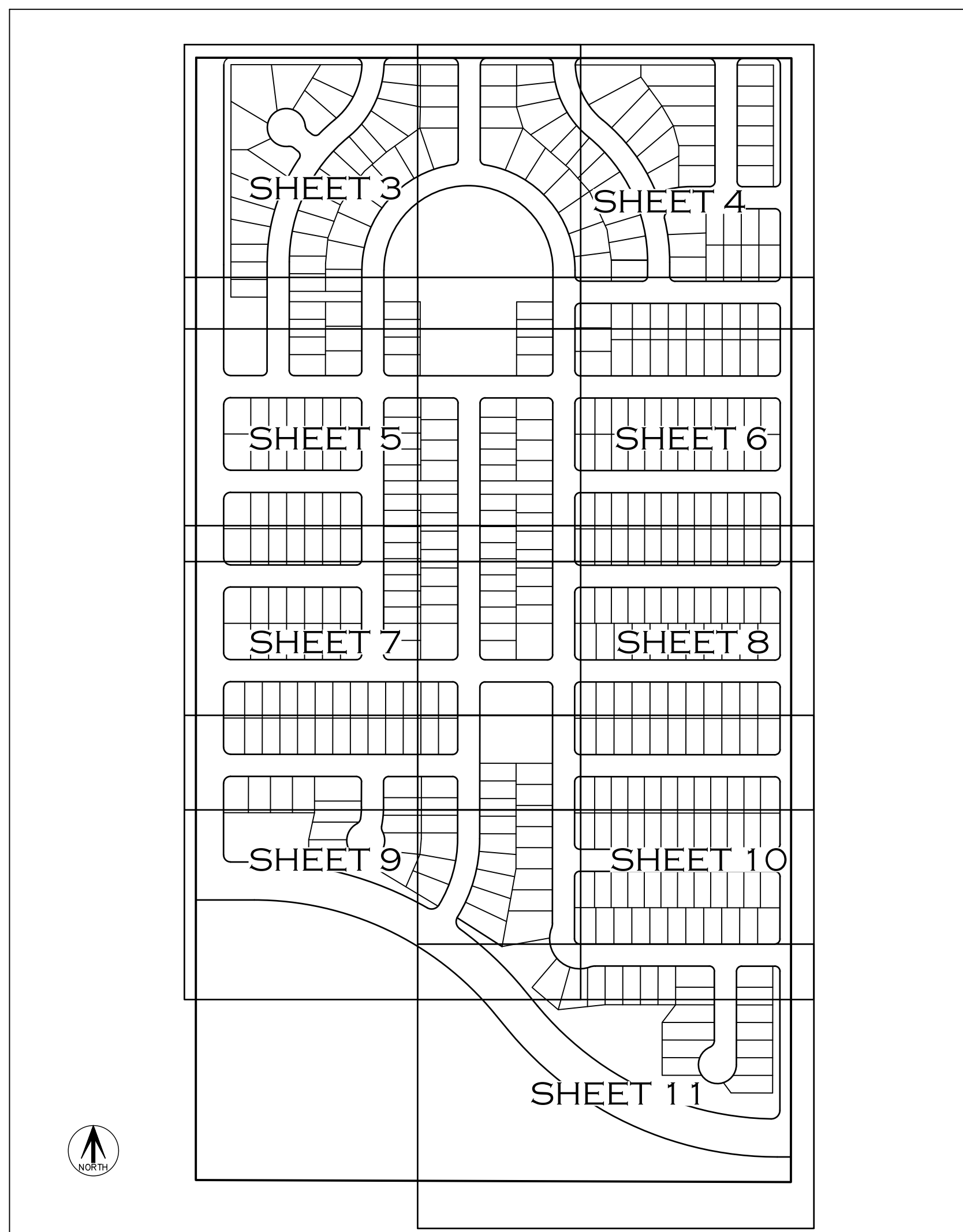


LINE TABLE		
LINE	BEARING	LENGTH
L1	S50°45'44"E	16.43'
L2	S50°45'44"E	16.43'
L3	N00°02'44"E	16.45'
L4	S05°14'46"W	5.79'
L5	S20°39'26"W	22.22'
L6	S38°18'28"W	18.19'
L7	N48°55'12"E	33.01'
L8	N00°02'44"E	40.16'
L9	N00°02'44"E	16.76'
L10	S89°57'16"E	54.02'
L11	N00°02'33"E	35.00'
L12	N00°02'44"E	40.16'
L13	N00°02'44"E	16.89'
L14	S58°06'21"W	17.41'
L15	S14°25'56"E	24.30'
L16	N00°02'44"E	11.25'
L17	N00°02'44"E	11.25'
L18	S89°57'16"E	23.00'
L19	N89°48'06"W	52.74'
L20	S32°53'45"W	26.52'
L21	N32°53'45"E	19.59'

CURVE TABLE			
CURVE	DELTA	RADIUS	LENGTH
C1	92°32'00"	20.00'	32.30'
C2	85°04'15"	15.00'	22.27'
C3	46°06'20"	20.00'	16.09'
C4	46°06'20"	20.00'	16.09'
C5	85°04'15"	15.00'	22.27'
C6	91°03'16"	20.00'	31.78'
C7	89°27'50"	20.00'	31.23'
C8	90°00'03"	20.00'	31.42'
C9	90°00'00"	20.00'	31.42'
C10	82°00'15"	15.00'	21.47'
C11	90°00'00"	15.00'	23.56'
C12	90°00'00"	15.00'	23.56'
C13	88°20'22"	20.00'	30.84'
C14	88°20'22"	20.00'	30.84'
C15	90°00'00"	15.00'	23.56'
C16	90°00'00"	15.00'	23.56'
C17	81°17'17"	15.00'	21.28'
C18	90°00'00"	20.00'	31.42'
C19	90°00'00"	20.00'	31.42'
C20	90°00'00"	15.00'	23.56'
C21	84°33'41"	15.00'	22.14'
C22	92°32'00"	20.00'	32.30'
C24	90°01'01"	15.00'	23.57'
C25	90°00'00"	15.00'	23.56'
C26	90°00'00"	20.00'	31.42'
C27	89°58'59"	15.00'	23.56'
C28	90°01'01"	15.00'	23.57'
C29	90°00'00"	15.00'	23.56'
C30	85°48'57"	15.00'	22.47'
C31	17°55'49"	218.00'	68.22'
C32	90°00'00"	15.00'	23.56'
C33	90°00'00"	15.00'	23.56'
C34	89°58'59"	15.00'	23.56'
C35	90°01'01"	15.00'	23.57'
C36	90°00'00"	15.00'	23.56'
C37	90°00'00"	15.00'	23.56'
C38	90°00'00"	15.00'	23.56'
C39	90°00'00"	15.00'	23.56'
C40	89°58'04"	20.00'	31.40'
C41	90°37'36"	20.00'	31.63'

CURVE TABLE			
CURVE	DELTA	RADIUS	LENGTH
C42	90°00'00"	15.00'	23.56'
C43	90°00'00"	15.00'	23.56'
C44	90°00'00"	15.00'	23.56'
C45	90°00'00"	15.00'	23.56'
C46	90°00'00"	15.00'	23.56'
C47	90°00'00"	15.00'	23.56'
C48	90°00'00"	15.00'	23.56'
C49	90°00'00"	15.00'	23.56'
C50	90°00'00"	15.00'	23.56'
C51	89°58'59"	15.00'	23.56'
C52	90°01'01"	15.00'	23.57'
C53	90°00'00"	15.00'	23.56'
C54	90°00'00"	15.00'	23.56'
C55	90°00'00"	15.00'	23.56'
C56	89°58'04"	20.00'	31.40'
C57	90°01'56"	20.00'	31.43'
C58	89°58'59"	15.00'	23.56'
C59	90°01'01"	15.00'	23.57'
C60	90°00'00"	15.00'	23.56'
C61	90°00'00"	15.00'	23.56'
C62	90°00'00"	15.00'	23.56'
C63	90°00'00"	15.00'	23.56'
C64	89°58'04"	20.00'	31.40'
C65	90°01'56"	20.00'	31.43'
C66	89°58'59"	15.00'	23.56'
C67	90°01'01"	15.00'	23.57'
C68	90°00'00"	15.00'	23.56'
C69	90°00'00"	15.00'	23.56'
C70	90°00'00"	15.00'	23.56'
C71	90°00'00"	15.00'	23.56'
C72	89°58'04"	20.00'	31.40'
C73	90°01'56"	20.00'	31.43'
C74	89°58'59"	15.00'	23.56'
C75	90°01'01"	15.00'	23.57'
C76	90°00'00"	15.00'	23.56'
C77	90°00'00"	15.00'	23.56'
C78	90°00'00"	15.00'	23.56'
C79	88°19'13"	25.43'	39.19'
C80	89°59'57"	25.00'	39.27'
C81	90°01'56"	20.00'	31.43'

CURVE TABLE			
CURVE	DELTA	RADIUS	LENGTH
C82	90°00'00"	15.00'	23.56'
C83	8°52'23"	218.00'	33.76'
C84	53°29'19"	20.00'	18.67'
C85	40°43'41"	20.00'	14.22'
C86	11°32'16"	282.00'	56.79'
C87	90°00'00"	15.00'	23.56'
C88	90°00'00"	15.00'	23.56'
C89	20°03'00"	45.00'	15.75'
C90	20°03'00"	45.00'	15.75'
C91	90°00'00"	15.00'	23.56'
C92	67°15'10"	20.00'	23.48'
C93	90°00'00"	15.00'	23.56'
C94	89°58'59"	15.00'	23.56'
C95	88°40'47"	25.00'	38.69'
C96	83°16'55"	25.00'	36.34'
C97	90°00'00"	15.00'	23.56'
C98	89°58'59"	15.00'	23.56'
C99	90°01'01"	15.00'	23.57'
C100	90°00'00"	15.00'	23.56'
C101	90°00'00"	15.00'	23.56'
C102	89°58'59"	15.00'	23.56'
C103	90°01'01"	15.00'	23.57'
C104	90°00'00"	15.00'	23.56'
C105	90°00'00"	15.00'	23.56'
C106	3°55'42"	700.75'	48.05'
C107	3°22'40"	636.75'	37.54'
C108	4°25'56"	700.75'	54.21'
C109	3°50'17"	636.75'	42.65'



KEY MAP
N.T.S.

MONUMENT SYMBOL LEGEND

- SET 18" LONG NO. 5 X 18" REBAR WITH 1-1/4" YELLOW PLASTIC CAP STAMPED "AZTEC LS 37933"
- FOUND NO. 5 REBAR WITH 1-1/4" YELLOW PLASTIC CAP STAMPED "AZTEC LS 37933"
- FOUND NO. 4 REBAR
- SECTION CORNER AS SHOWN HEREON

FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC.

AzTEC
CONSULTANTS, INC.

300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

DEVELOPER
**RICHMOND AMERICAN HOMES
OF COLORADO, INC.**
4350 S. MONACO STREET #500
DENVER, COLORADO
(720) 977-3841

DATE OF
PREPARATION: 03-17-2022

SCALE: 1" = 200'

SHEET 2 OF 11

AzTec Proj. No: 21421-37

Drawn By: RBA

HARVEST CROSSING SUBDIVISION FILING NO. 3

SITUATED IN THE WEST HALF OF SECTION 29,
TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO.

Change the 10' U.E. covering the 6' G.E. - since the Gas easement is exclusive, the 10' U.E. will need to be revised to a 4' U.E. adjacent to the 6' G.E. Thus creating a 10' area for these easements (apply to all situations hereon) (Typ.)

add: Dedicated to the City of Aurora as Street Right-of-Way - sq. feet

added

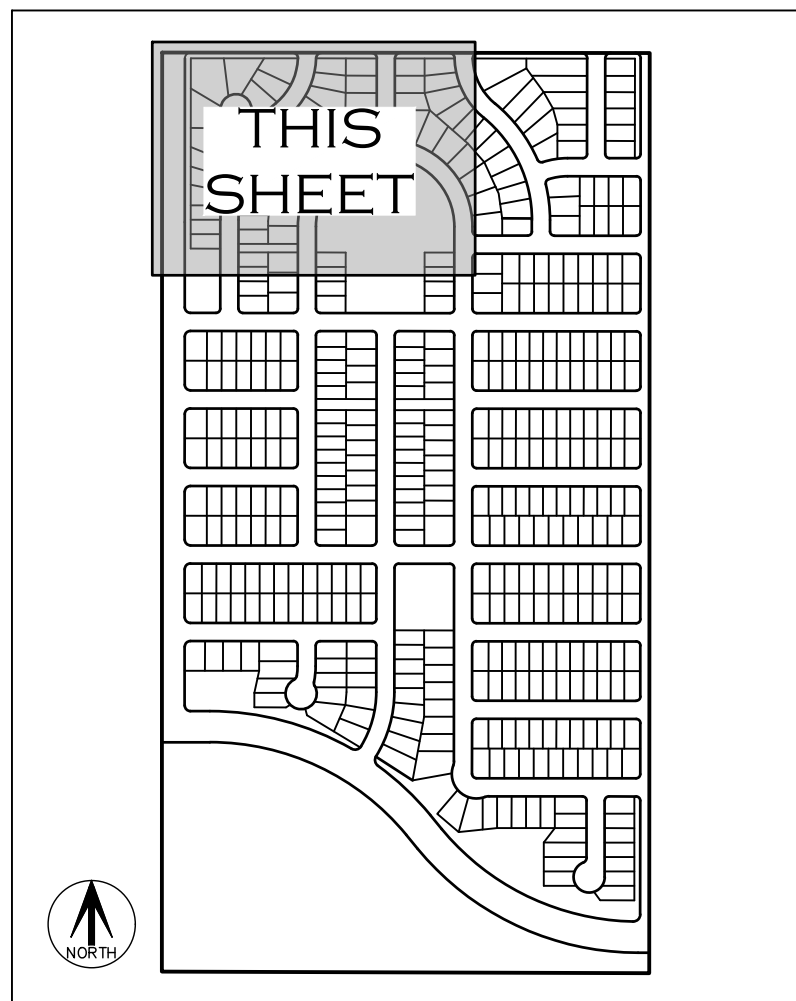
removed

Include the 5.5' sidewalk easement as shown on the site plan.

sidewalk easements added

revised

these line dimensions should add up to total length



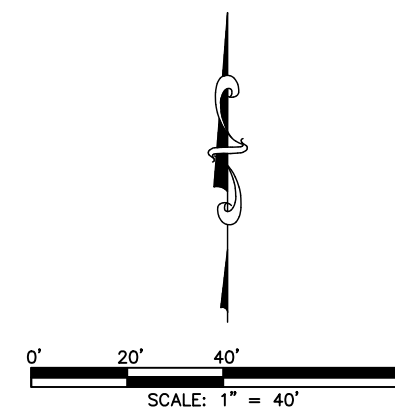
KEY MAP
N.T.S.

SEE SHEET 2 FOR
MONUMENT LEGEND

SEE SHEET 2 FOR LINE
AND CURVE TABLES

LEGEND

- ## BLOCK NUMBER
- U.E. UTILITY EASEMENT
- G.E. GAS EASEMENT
- S.D.E. SIGHT DISTANCE EASEMENT
- (ROW) RIGHT-OF-WAY
- (NR) DENOTES NON-RADIAL
- MONUMENT BOXES WITH A REASONABLY PERMANENT MONUMENT BEARING THE LICENSE NUMBER OF THE RESPONSIBLE SURVEYOR, TO BE SET AFTER CONSTRUCTION IS COMPLETE PER SEC. 147-47 AURORA CITY CODE AND PER SEC. 38-51-105-(9) (a) & (b) COLORADO REVISED STATUTES 2020.



FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC.

AzTEC
CONSULTANTS, INC.

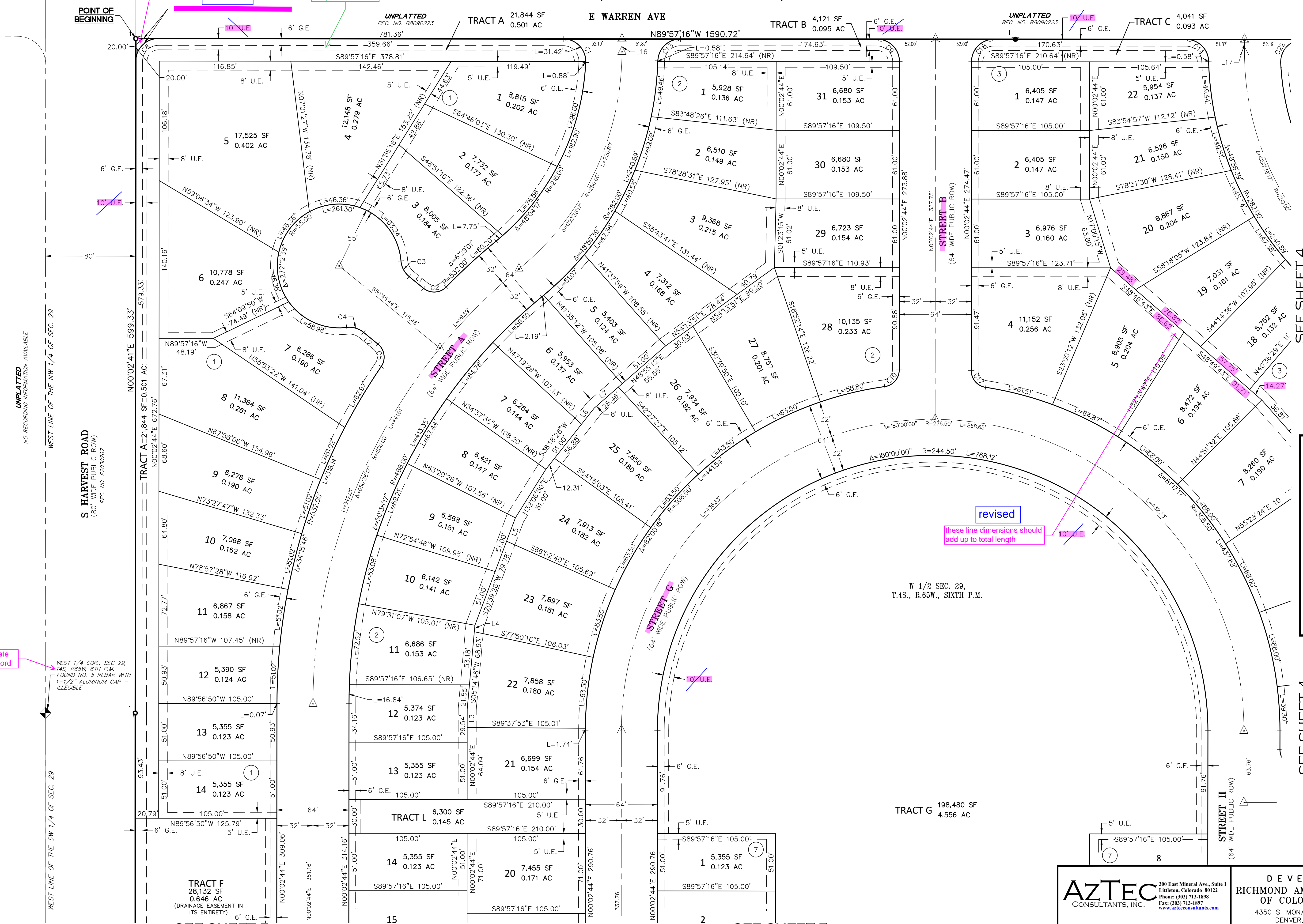
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

AzTec Proj. No: 21421-37

Drawn By: RBA

DEVELOPER
**RICHMOND AMERICAN HOMES
OF COLORADO, INC.**
4350 S. MONACO STREET #500
DENVER, COLORADO
(720) 977-3841

DATE OF PREPARATION:	03-17-2022
SCALE:	1" = 40'
SHEET 3 OF 11	



SEE SHEET 5

SEE SHEET 5

SEE SHEET 4

SEE SHEET 4

W 1/2 SEC. 29,
T.4S., R.65W., SIXTH P.M.

TRACT G 198,480 SF
4.556 AC

TRACT A 21,844 SF
0.501 AC

TRACT B 4,121 SF
0.095 AC

TRACT C 4,041 SF
0.093 AC

TRACT F 28,132 SF
0.646 AC
(DRAINAGE EASEMENT IN
ITS ENTIRETY)

SITUATED IN THE WEST HALF OF SECTION 29,
TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO.

DATE OF PREPARATION:	03-17-2022
SCALE:	1" = 40'

S H E E T 4 O F 11



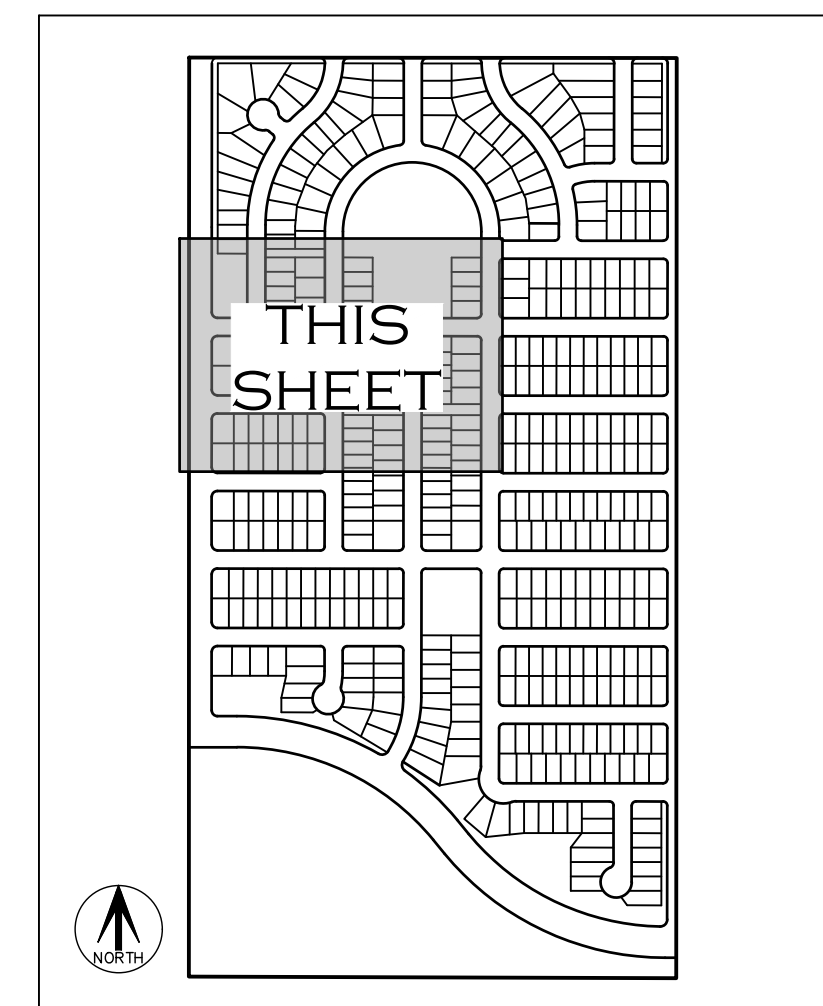
HARVEST CROSSING SUBDIVISION FILING NO. 3

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SEE SHEET 3

SEE SHEET 3

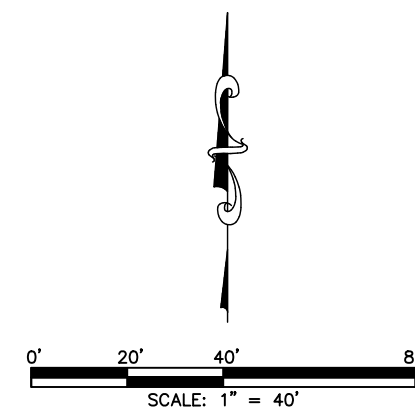


KEY MAP
N.T.S.

SEE SHEET 2 FOR
MONUMENT LEGEND

SEE SHEET 2 FOR LINE
AND CURVE TABLES

LEGEND	
##	BLOCK NUMBER
U.E.	UTILITY EASEMENT
G.E.	GAS EASEMENT
S.D.E.	SIGHT DISTANCE EASEMENT
(ROW)	RIGHT-OF-WAY
(NR)	DENOTES NON-RADIAL
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FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC.

AzTEC
CONSULTANTS, INC.
300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

DEVELOPER
RICHMOND AMERICAN HOMES
OF COLORADO, INC.
4350 S. MONACO STREET #500
DENVER, COLORADO
(720) 977-3841

DATE OF PREPARATION:	03-17-2022
SCALE:	1" = 40'
SHEET 5 OF 11	

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WEST LINE OF THE SW 1/4 OF SEC. 29

UNPLATTED
NO RECORDING INFORMATION AVAILABLE

HARVEST ROAD
(80' WIDE PUBLIC ROW)
REC. NO. E2020267



SEE SHEET 7

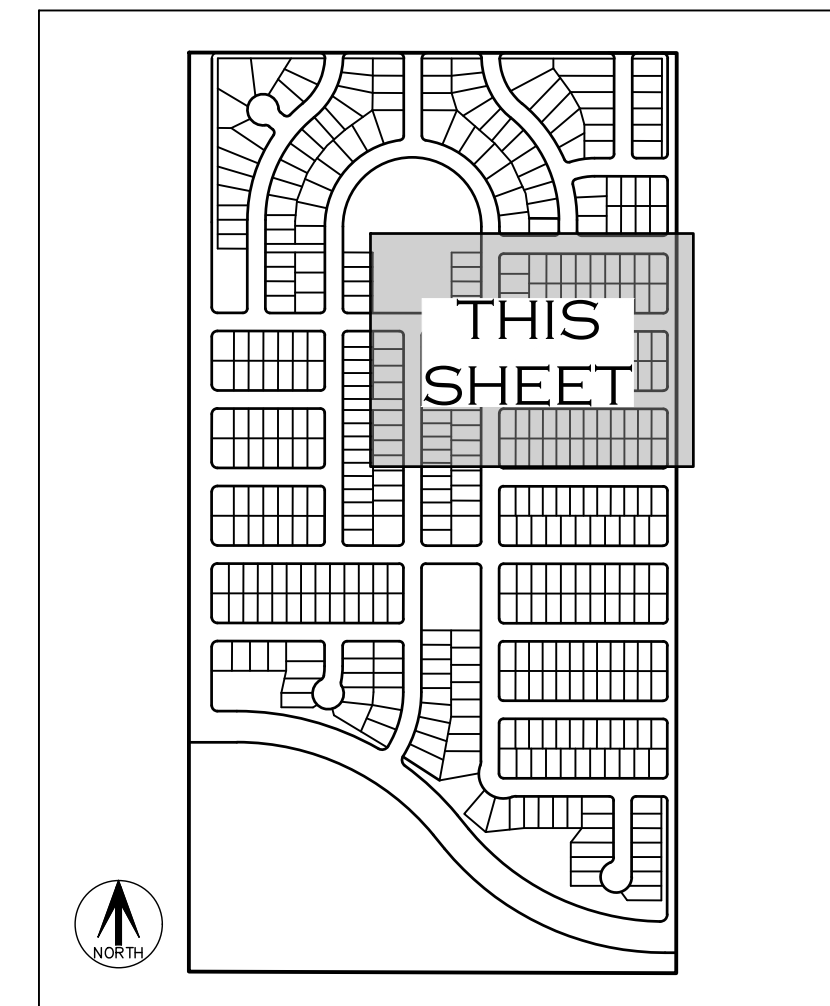
SEE SHEET 7

SEE SHEET 6

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SEE SHEET 4

SEE SHEET 4



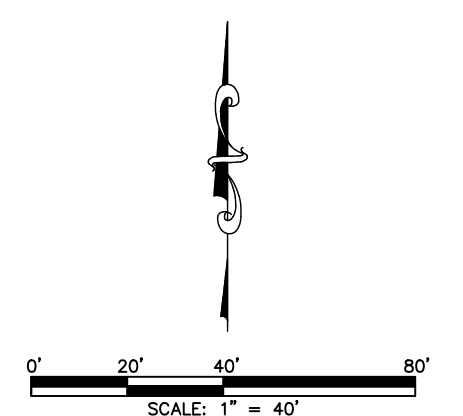
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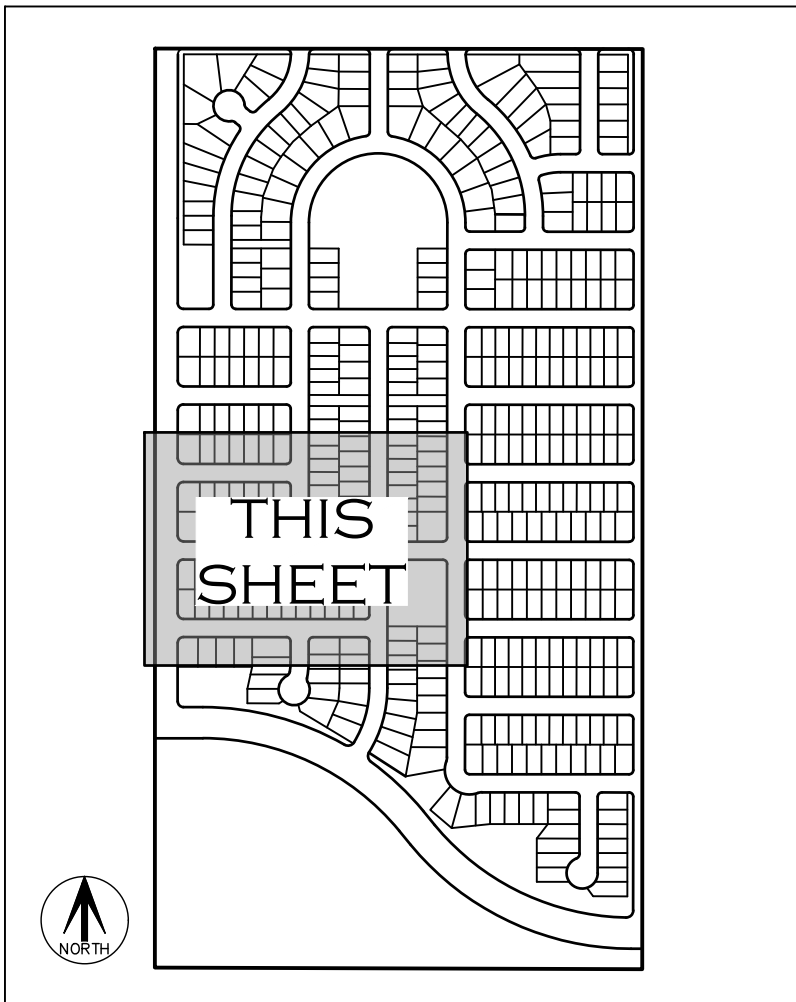
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DATE OF PREPARATION:	03-17-2022
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S H E E T 6 O F 11	

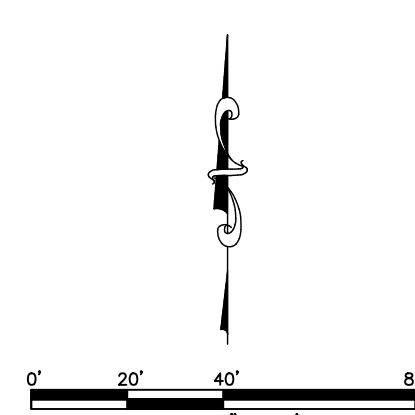
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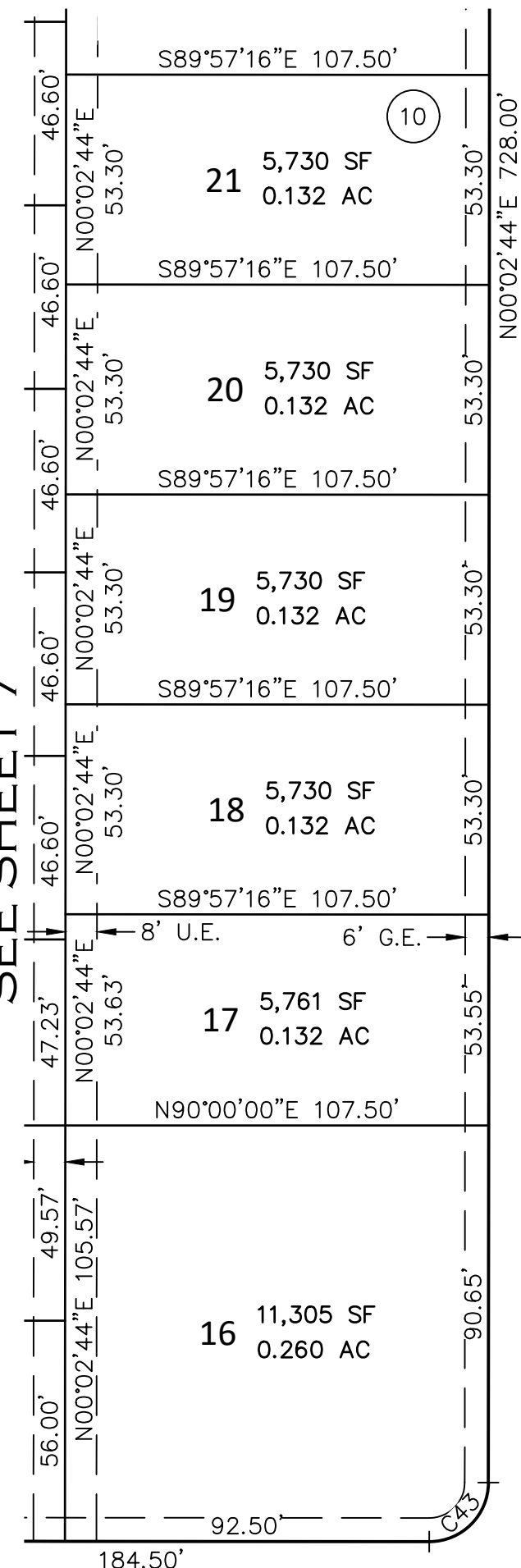
DEVELOPER		DATE OF PREPARATION:	03-17-2022
RICHMOND AMERICAN HOMES OF COLORADO, INC.		SCALE:	1" = 40'
4350 S. MONACO STREET #500 DENVER, COLORADO (720) 977-3841		SHEET 7 OF 11	

AzTec Proj. No: 21421-37
AzTec CONSULTANTS, INC.
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Littleton, Colorado 80122
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Drawn By: RBA

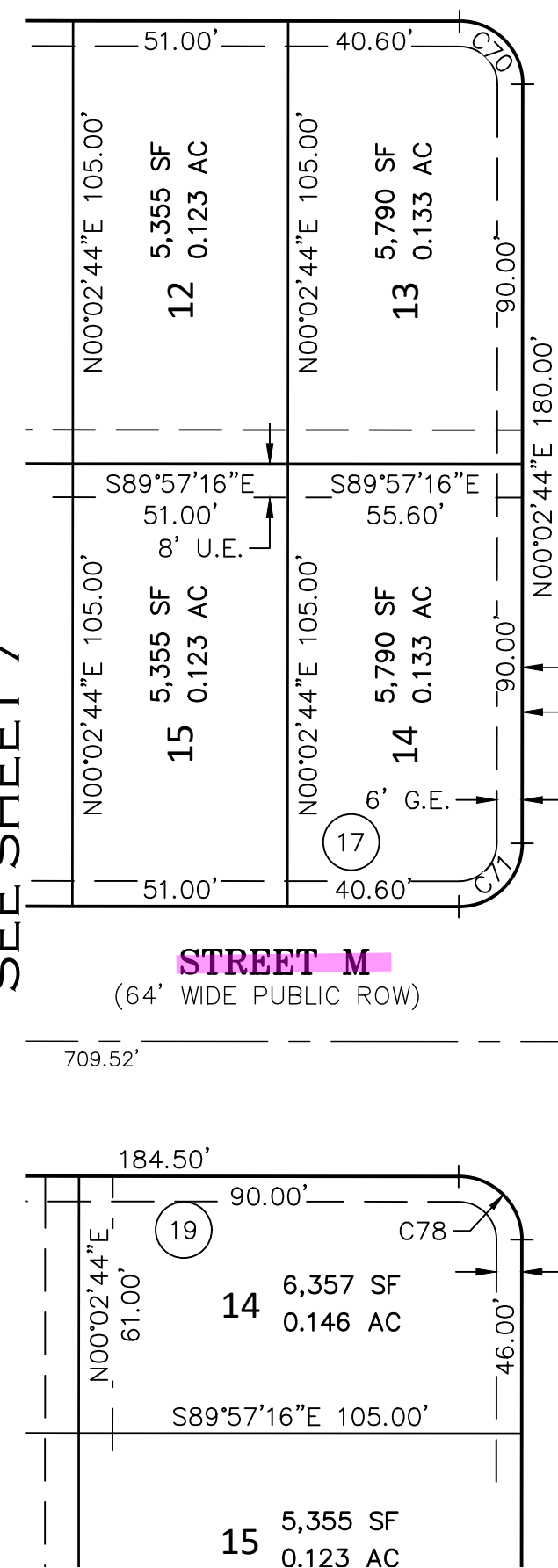
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SEE SHEET 6

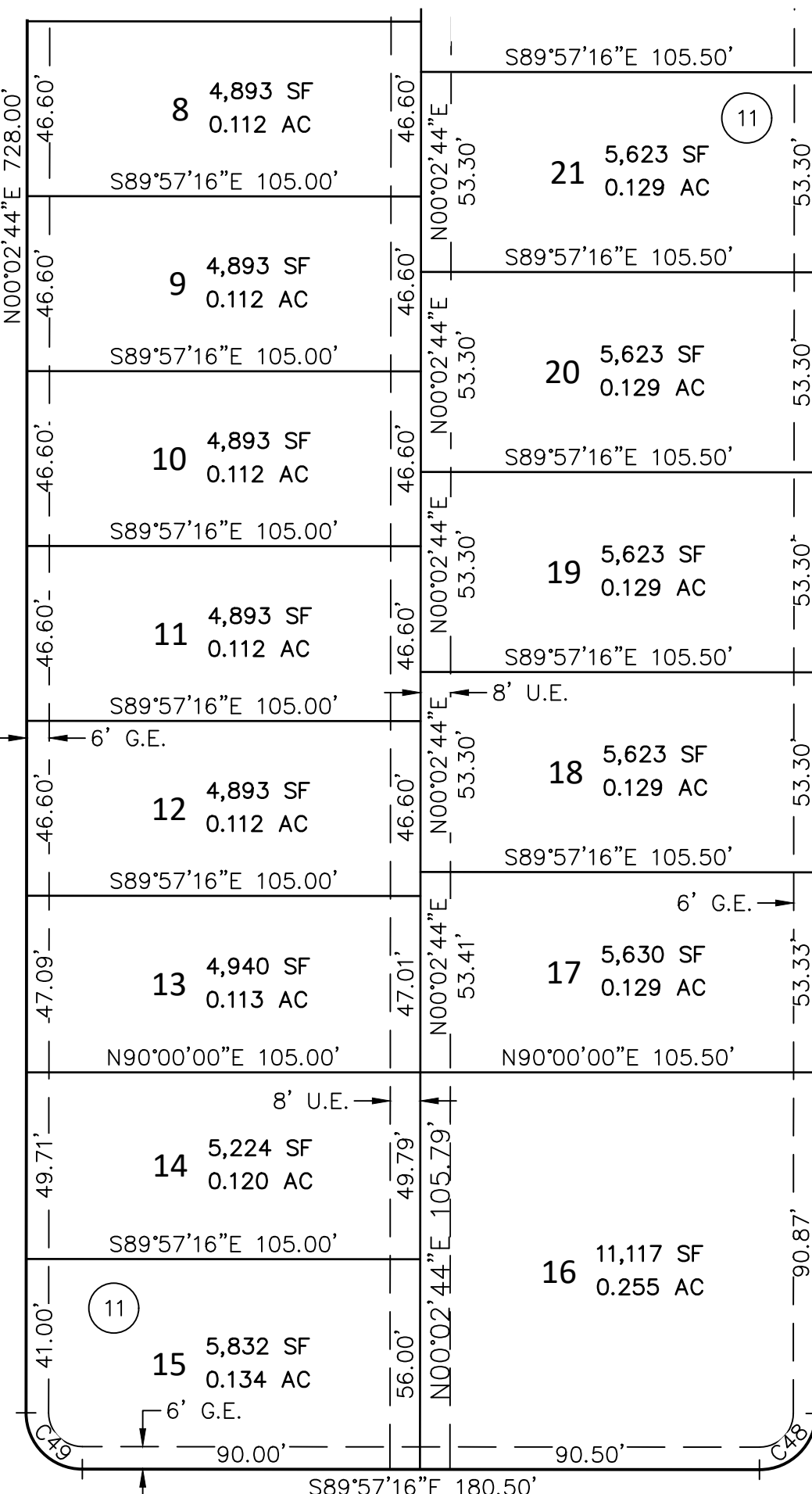
SEE SHEET 7



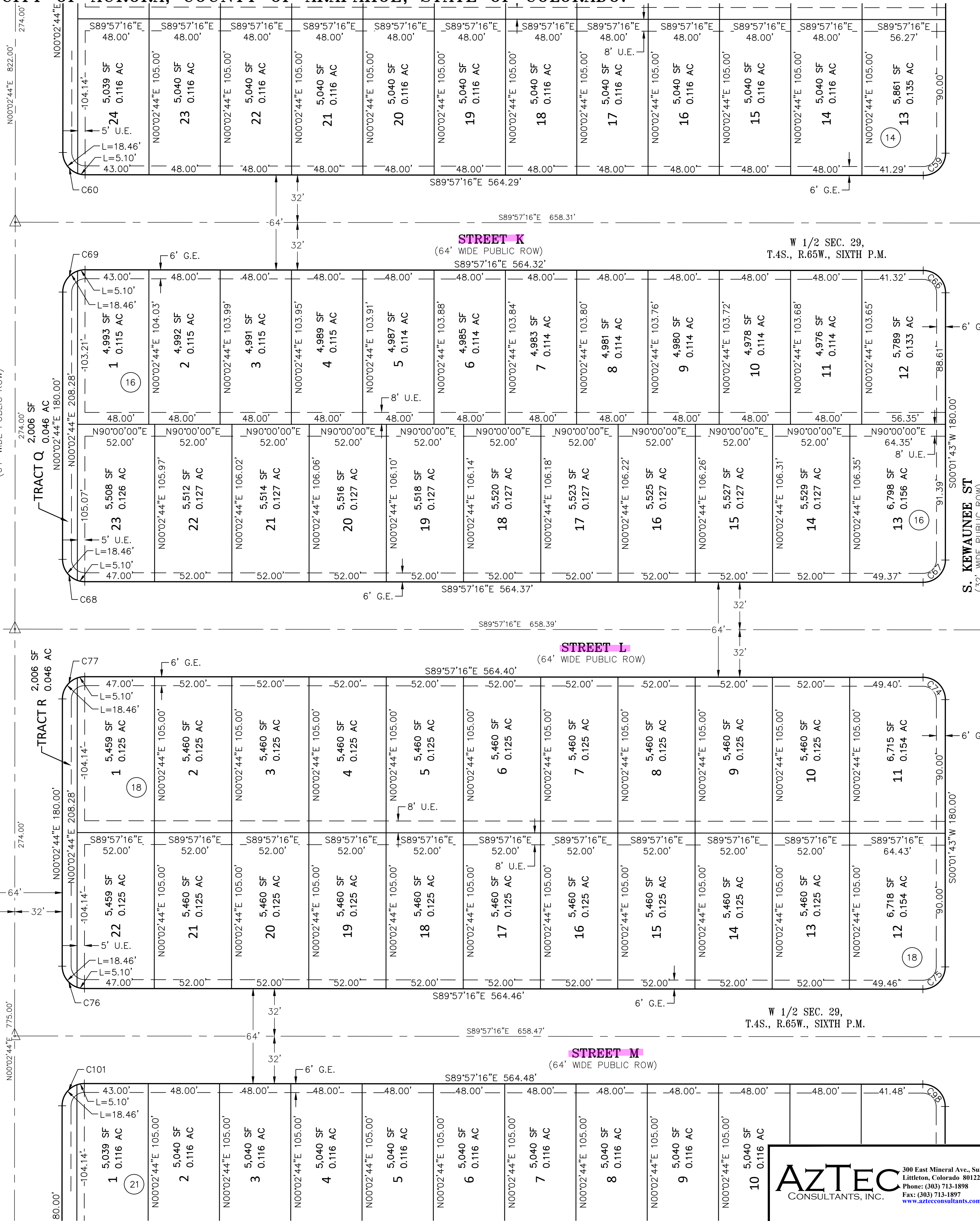
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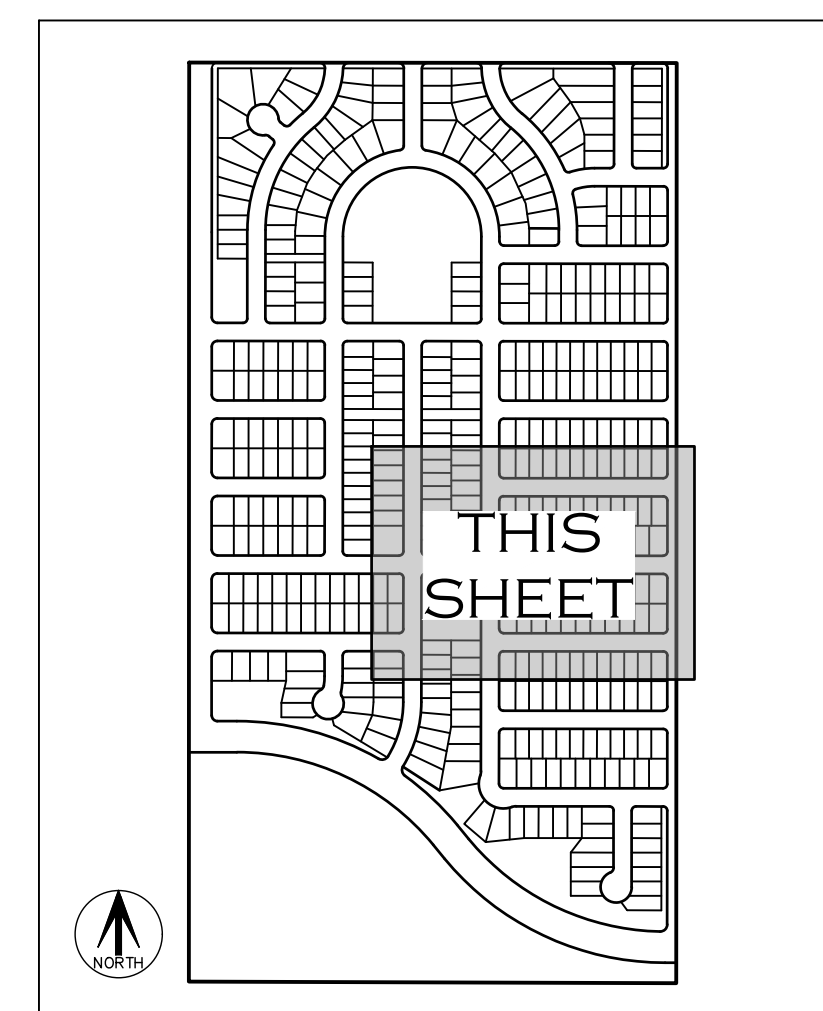
SEE SHEET 10



SEE SHEET 10



SEE SHEET 10



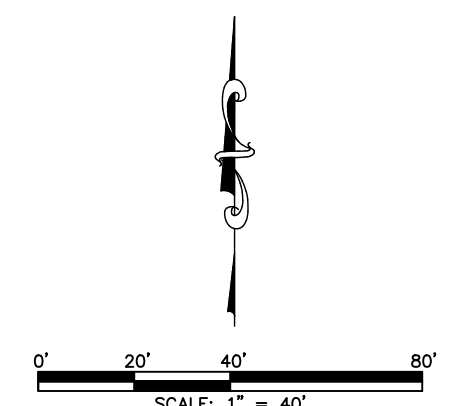
KEY MAP
N.T.S.

SEE SHEET 2 FOR
MONUMENT LEGEND

SEE SHEET 2 FOR LINE
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COLORADO REVISED STATUTES 2020.



FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC

UNPLATTED
REC. NO. B8090223

note
added

AZTEC
CONSULTANTS, INC.

300 East Mineral Ave., Suite 1
Littleton, Colorado 80121
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Fax: (303) 713-1897
www.aztecconsultants.com

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RICHMOND AMERICAN HOMES
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4350 S. MONACO STREET #500
DENVER, COLORADO
(720) 977-3841

DATE OF PREPARATION:	03-17-2022
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SHEET 8 OF 11	


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SEE SHEET 7

SEE SHEET 10-



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FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC

DEVELOPER
RICHMOND AMERICAN HOMES
OF COLORADO, INC.
4350 S. MONACO STREET #500

DATE OF PREPARATION:	03-17-2022
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SCALE:	1" = 40'
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SHEET 9 OF 11

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AzTec Proj. No.: 21421-37 Drawn By: RBA

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DENVER, COLORADO
(720) 977-3841

SEE SHEET 11

show the match to
this page here

shown

UNPLATTED
NO RECORDING INFORMATION AVAILABLE

N00°00'48"E 815.56'

S HARVEST ROAD
(80' WIDE PUBLIC ROW)
REC. NO. E2030267

TRACT I 57,451 SF
1.319 AC

TRACT U 318,258 SF
7.306 AC

W 1/2 SEC. 29,
T.4S., R.65W., SIXTH P.M.

EAST YALE AVENUE
(110' WIDE PUBLIC ROW)

TRACT H 49,469 SF
1.136 AC

6,435
0.148
'16"E 1

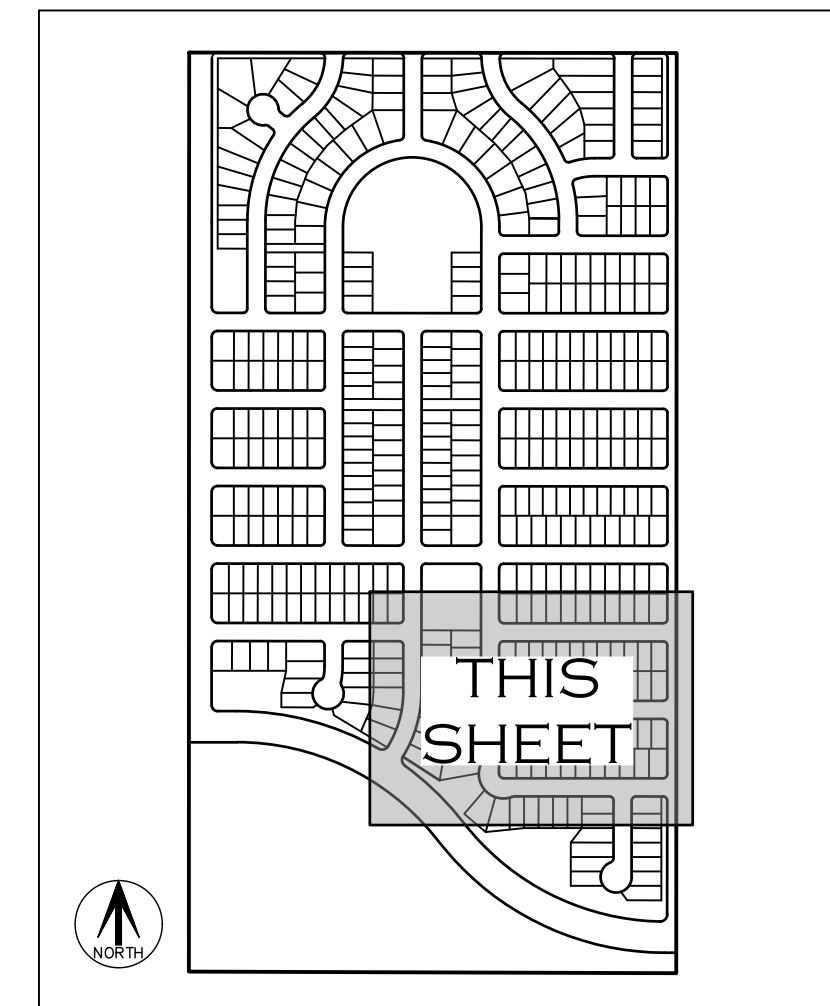
06 SF	
46 AC	

227.00'
2,006 SF
0.046 AC

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SEE SHEET 10

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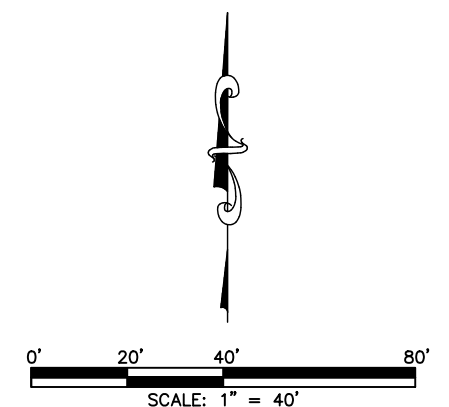
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SEE SHEET 2 FOR
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SEE SHEET 2 FOR LINE
AND CURVE TABLES



FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC

UNPLATTED
REC. NO. B8090223

note
added

add Tract
designation here

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S H E E T 10 O F 11	

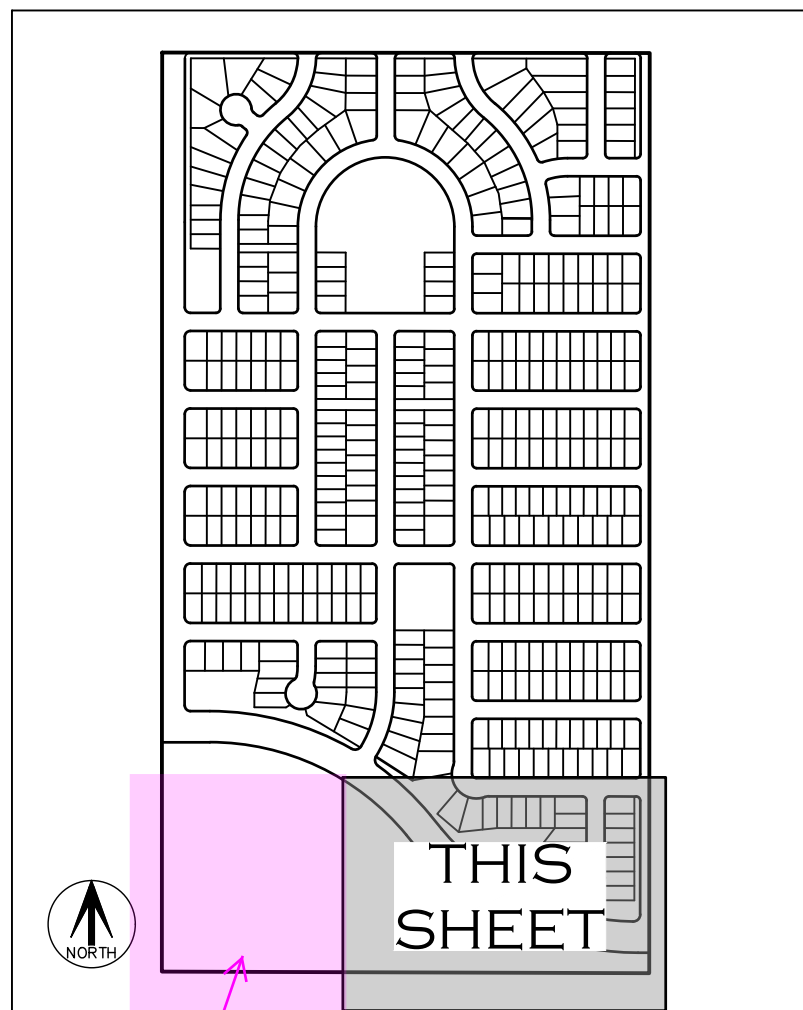
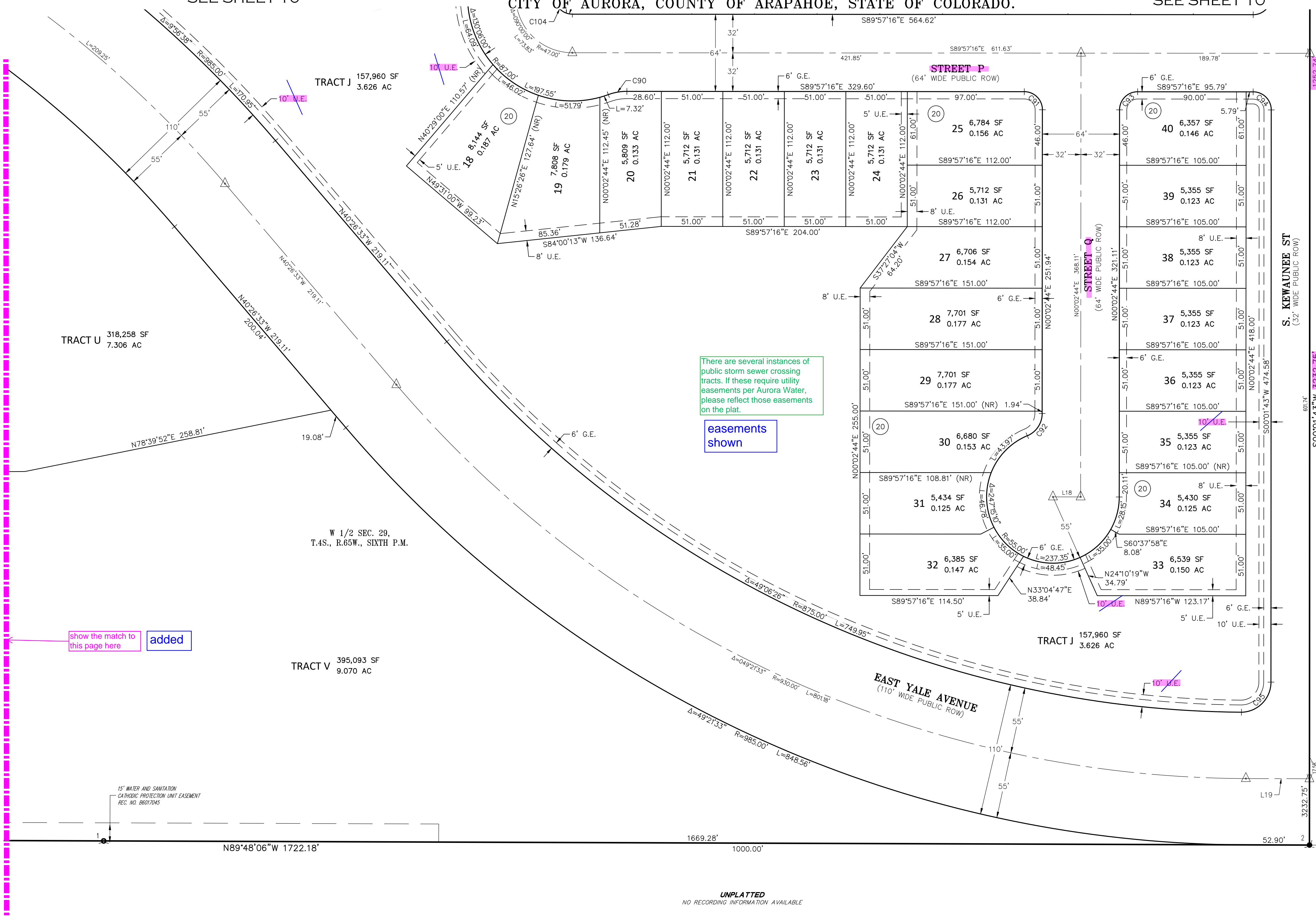
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SEE SHEET 10

SEE SHEET 10



note added

add this page showing the portion of the proposed Tracts and easements

added

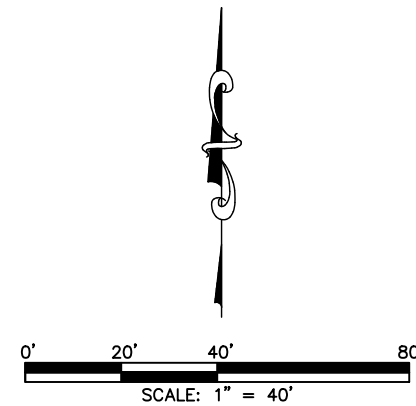
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note added

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area revised



FOR REVIEW

FOR AND ON BEHALF OF
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DEVELOPER
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DENVER, COLORADO
(720) 977-3841

DATE OF PREPARATION:	03-17-2022
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SHEET 11 OF 11	

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Please provide your response to comments adjacent to the comment made on the page prior to upload.

PRELIMINARY DRAINAGE REPORT

Harvest Crossing Filing No. 3

PA – 5

Aurora, Colorado

Richmond American Homes,

Prepared for:

Richmond American Homes
43560 S. Monaco Street
Denver, CO 80237

Prepared by:

Tamara Connolly, P.E.
Kimley-Horn and Associates, Inc.
4582 South Ulster Street - Suite 1500
Denver, Colorado 80237
(303) 228-2300

Please check formal name: Harvest Crossing Subdivision Filing No. 3

Addressed

City of Aurora comments provided by:

Chris Olson, PE

colson@auroragov.com

Please address additional comments provided by SEMSWA and Mile High Flood District. (Following this sheet)

Advisory Note: PDR approval is required prior to Civil Plan Approval

Approved For One Year From This Date

City Engineer

Date

Water Department

Date

Kimley»Horn

Project #: 196284001

Prepared: June 2022

MAINTENANCE ELIGIBILITY PROGRAM (MEP)

MHFD Referral Review Comments

For Internal MHFD Use Only.	
MEP ID:	106325
Submittal ID:	10009044
Partner ID:	1634842
MEP Phase:	Referral

Date: June 29, 2022
To: Andrew Earles
Via Aurora Website
RE: MHFD Referral Review Comments

Project Name:	HARVEST CROSSING FLG #03 (RSN 1634842)
Location:	Aurora
Drainageway:	Harvest Gulch

This letter is in response to the request for our comments concerning the referenced project. We have reviewed this proposal only as it relates to maintenance eligibility of major drainage features, in this case:

- Harvest Gulch, Pond B Outfall and Emergency Spillway

We have the following comments to offer:

- 1) Section B.3. of the PDR states that Pond B outfalls to an existing swale. Please revise to state that it will outfall to the proposed Harvest Gulch improvements. This is also referenced in Section D.1. and Section D.2.
- 2) Section D.1. of the PDR states that offsite runoff is captured with basins D-15, D-20, and D-85. Seems as if these are referencing B basins as opposed to D.
- 3) Paragraph 2 of the PDR is confusing due to possible errors in basin naming. It states Basin B is conveyed to existing storm infrastructure to the north, however it's going to Pond B according to drainage maps. Basin D is said to be conveyed to Pond A but that doesn't seem accurate either.
- 4) The detention volume spreadsheets provided in the appendices have erroneously listed the basin acreage as the "a" value for the MHFD WQ Watershed Inches equation. The "a" value should use the coefficient provided in Volume 3 of the USDCM which correlates with the drain time coefficients of Table 3-2. I will note that this did not seem to have an impact on the WQCV that was calculated by this spreadsheet.
- 5) Please revise the outfall pipe of Pond B to outfall approximately 1' above the Harvest Gulch channel invert.
- 6) Please show applicable outlet pipe protection on the drainage plans.
- 7) Please label the emergency spillway for Pond B as well as show the applicable riprap protection along the embankment.
- 8) There is more information needed about the proposed Harvest Gulch design in order to review this submittal:
 - a. Since it was noted in the Master Drainage Plan, that a portion of Harvest Gulch was impeded by the D.A.D.S. site, what flow rate is the channel being design for? Include discussion in the report.

The flow rate the channel is being designed for is 184 cfs. This is based on the calculated flow rate for Harvest Gulch per the 2008 Murphy Creek Outfall Systems Planning Study by Moser and Associates. Further discussion has been included in the report.

b. Major Drainageways

Harvest Gulch, Murphy Creek Tributary 4000E, is located on the south side of the site. Approximately 110 acres of Lowry Landfill was rerouted away from the Harvest Gulch natural channel, leaving only 100.6 acres tributary in Harvest Crossing. All developments upstream of Harvest Gulch will have full-spectrum detention ponds prior to being discharged into the natural channel onsite. The existing major drainageway will be shortened to begin downstream of Yale Avenue; future Harvest Gulch will split the dedicated open space and future single family residential area located south of Yale Avenue. With the proposed design, the length of the Harvest Gulch flowline within the project site has been reduced to 705'.

Project Name: PROJECT NAME
MEP ID: #####/#####
Date: 7/12/22

Mile High Flood District (MHFD)
MEP Referral Review Comments

- b. The current cross section is a trapezoidal design. Please evaluate the need for a more multi-stage channel design.
- c. Please use the principles of USDCM Volume 1, Chapter 8 to inform the design of Harvest Gulch and to ensure the stream corridor required fits within the proposed site plan.
- 9) Are there future improvements that will be proposed in the open space to the south of the proposed channel?

MHFD requires responses to the review comments, please include these responses with any future submittal.

We appreciate the opportunity to review this proposal. Please feel free to contact me with any questions or concerns.

Sincerely,



Derek Clark, PE
Project Manager
Mile High Flood District



7437 South Fairplay Street
Centennial, CO 80112-4486

June 27, 2022

City of Aurora Engineering

RE: Harvest Crossing Filing No. 3
SEMSWA Case No. DPR21-00001/D22-00050

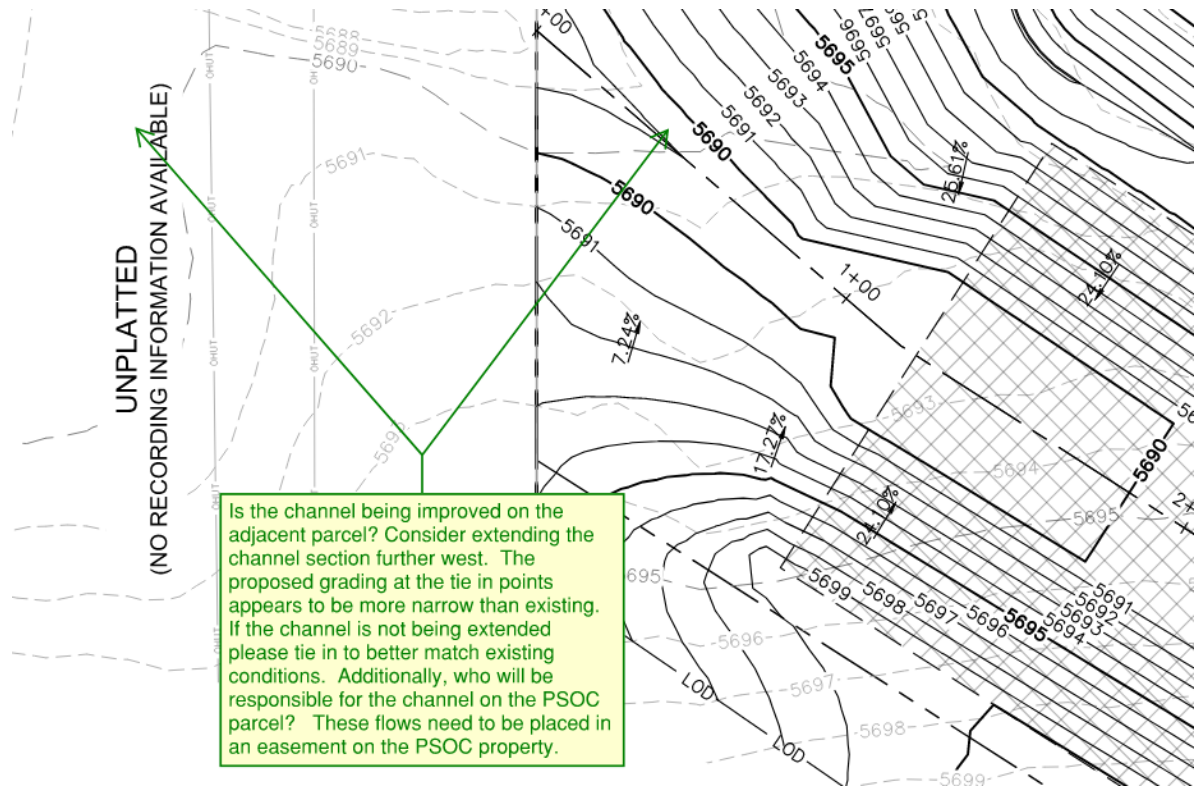
Dear City of Aurora Engineering,

Thank you for your referral request to the Southeast Metro Stormwater Authority (SEMSWA) regarding the proposed Harvest Crossing Filing No. 3 project. SEMSWA appreciates the opportunity to review the Drainage Report and Plans and offers the following comments:

General Comments:

1. SEMSWA has only reviewed the referred documents in regard to the interface between the proposed project and the adjacent unincorporated Arapahoe County properties. Our review and comments focus on the stormwater discharge points between the two jurisdictions.
2. Please address the following on the Drainage Plans:
 - Please show and label jurisdictional boundaries.
 - Ponding limits adjacent to Pond A appears to cover half the road, please verify and confirm that this meets City of Aurora Standards.
 - Please show and label the pond features for both Pond A and B
 - Show and label floodplain limits for the proposed gulch.

7437 South Fairplay Street, Centennial, CO 80112-4486
Phone: 303-858-8844 Fax: 303-649-2149 www.semswa.org



Thank you for the opportunity to review and comment on this application. We look forward to continued coordination on this project. Please feel free to contact me if you have any questions.

Sincerely,

Tiffany Clark, PE, CFM
Land Development Manager

cc: Paul Danley, Executive Director, SEMSWA
Case File

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Appendix A – Drainage Maps

Appendix B – NRCS Soils Report and FEMA MAPS

Appendix C – Hydrologic Computations

Appendix D – Detention Computations

Appendix E – Hydraulic Computations

Phasing is indicated on the Site Plan, but not identified in this PDR. Phasing must be described in the PDR text and shown on the Plan. Hydrologic analysis of different phases may be required and multiple plan sheets may be needed.

Addressed - Phasing plan now included in PDR appendix. Phasing generally follows the major drainage basins of site. Discussion included in the report.

ENGINEER'S CERTIFICATION

This report and plan for the drainage design of Harvest Crossing PA-5 was prepared by me (or under my direct supervision) in accordance with the provisions of City of Aurora Storm Drainage Design and Technical Criteria and was designed to comply with the provisions thereof.

Tamara Connolly, P.E.

Registered Professional Engineer

State of Colorado No. 52027

A. Introduction

The purpose of this preliminary drainage report is to outline the Drainage Design for the proposed Harvest Crossing PA-5 Development (The Site or the Project), located at the northeast corner of Harvest Road and North of E Yale Ave.

The purpose of this report is to demonstrate that the proposed single-family project conforms to the established drainage patterns set forth in the *Master Drainage Report for the Harvest Crossing/Villages at Murphy Creek*.

The Master Drainage Report referenced herein is EDN 221085 (The MASTER DRAINAGE REPORT), originally completed by Innovative Land Consultants, Inc. approved 04/05/2021. The drainage design will also conform to the current *City of Aurora Storm Drainage and Technical Criteria Manual* (The Criteria) which supplements the Mile High Flood District *Urban Storm Drainage Criteria Manual* (The Manual).

Include references and RSN/EDN numbers for all adjacent developments

1. Location

The project is located in the west half of section 29, township 4 south, range 70 west, the sixth principle meridian, county of Arapahoe, State of Colorado. The site is bounded by E Warren Ave to the North and Harvest to the west, and undeveloped land to the east and south.

RSN provided for subdivision to north added to this paragraph here. subdivisions to the east and west of site have been labeled as "future" and have not been assigned an RSN as of the date of submission for this report.

A vicinity map is provided below for reference: (Not to Scale)

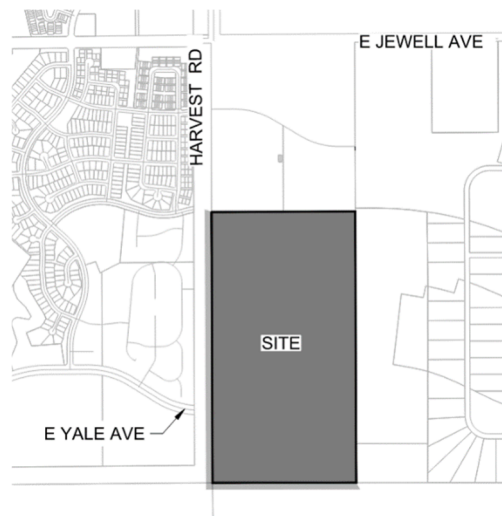


Figure 1: Vicinity Map

2. *Proposed Development*

The proposed Site will consist of approximately 124 acres containing 435 single-family detached units along with associated infrastructure to support the community. Open park space is proposed at various locations within the community.

The site is currently zoned as R-2. The proposed detached single family lots shall comply with the general standards found in the Aurora Unified Development Ordinance, section 146-4.

The site's onsite imperviousness at full buildout is 34%. Composite imperviousness calculated utilizing The Criteria Table 1: Runoff Coefficients and Percent's Impervious. Please refer to Appendix C for Table 1, impervious computations, and hydraulic computations. There are no irrigation canals or ditches located on the property.

The planned design includes routing the developed runoff from the Site through grading and storm drain design to the proposed Ponds A & B. Pond A will be located on the west side of the site and Pond B is located towards the southwestern boundary of the site. This Preliminary Drainage Report includes the preliminary analysis of the drainage related to the site layout and grading of Harvest Crossing PA-5. A Final Drainage Report for this site will be prepared with subsequent development submittals to ensure that storm drainage infrastructure is appropriately sized to serve the overall development at full build out.

Existing Geotechnical & Geologic Features

A Draft Geotechnical Site Development Study dated May 28, 2021 was prepared by A.G. Wassenaar, Inc.

Per this report, Site development considerations should include provisions for the presence of expansive clays and shallow claystone bedrock and moderately to well cemented sandstone.

According to a USDA web soil report accessed May 10, 2022, the site is majority hydrologic soil group C and D soils. USDA web soil report is referenced in **Appendix B**.

Requested Variances

1. **There are no variances requested at this time for this Preliminary Drainage Report. Any future Variance requests will be coordinated with City of Aurora.**

Advisory Note: COA is allowing the following variances consistent with future revisions to the COA SDDTCM:

- 1) The detention pond may use nested detention volumes to detain the WQCV, EURV and 100YR Volumes
- 2) The required freeboard for the top-of-embankment must be at least 1-foot above the water surface elevation when the emergency spillway is conveying the maximum design or emergency flow.

B. Historic Drainage

1. Overall Sub-Basin Description

Currently, the Site consists of undeveloped land. A natural ridgeline running north/south is located roughly in the center of the site. This natural ridge splits historic flow. The majority of the site flows towards the Murphy Creek basin, while the northeastern portion of the site flows towards the Coal Creek basin. Currently the site is covered by natural grasses and slopes on site are roughly between 3% - 9%.

"FIRM" Addressed

The Site falls within Zone X according to FEMA FRIM map number 08005C0212K panel 0212K. The FEMA FRIM Map is referenced in **Appendix B**.

2. Drainage Patterns Through Property

The Master Drainage Report identifies five existing drainage basins A, B2, B3, C3 and OS-911. Basin's A, B2, B3 and OS-911 flows to the west and is tributary to Murphy Creek. Basin C3 flows to the east and is tributary to Coal Creek. The majority of the site sheet flows to two small swales located on site (Design point 3 and 7, See Figure 2). There are two swales on the west side of the site. Basin C3 and B2 sheet flow to offsite basins. Basin OS-911 sheet flows into a swale within basin A. The swales located towards the edge of the site carry flow off the site to the ultimate outfall. There is no storm infrastructure currently onsite capturing any flow.

3. Outfalls Downstream from Property

Murphy Creek is approximately 0.44 Miles to the West of the Site. The outlet structure and ultimate outfall of the western detention pond (Pond A) routes to an existing storm drain located in Harvest Ave. The ultimate outfall being Murphy Creek. The outlet structure and ultimate outfall of the southwestern detention pond (Pond B) routes to an existing swale out falling into murphy creek. Both these outfalls adhere to the historical drainage patterns.

Coal Creek is approximately 1.0 miles to the East of the site. Flows will outfall to existing storm to the north of the site, which will outfall within an existing swale east of S. Kewaunee and ultimately outfall into coal creek.

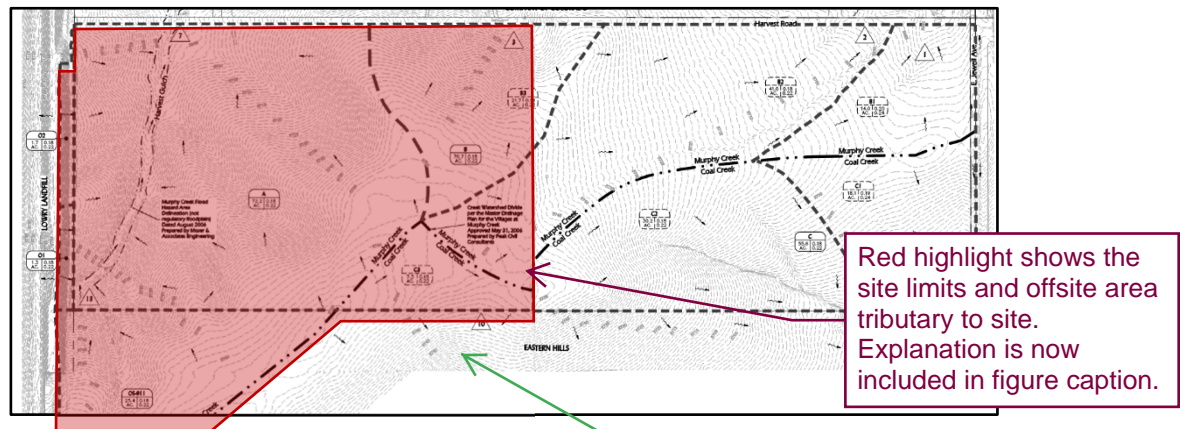


Figure 2: Snip of Master Drainage Plan (Full size in Appendix A-1)

Unclear what the red highlight region is indicating

C. DRAINAGE DESIGN CRITERIA

1. List References

The “City of Aurora Storm Drainage Design and Technical Criteria”, revised October 2010 (the Criteria) and the “Urban Storm Drainage Criteria Manual” Volumes 1, 2, and 3 (The Manual), with latest revisions, were used when preparing the storm calculations. This report is intended to serve as a Site-Specific Preliminary Drainage Report for the Harvest Crossing PA-5 Single Family Development.

2. Hydrologic Criteria

Rainfall and Storm Design Frequencies

According to the Criteria section 3.31, the design storms for the Project are the 2-year and 100-year frequency events.

Chapter 5 of the Criteria was used to determine the time of concentrations, rainfall intensities, and runoff coefficients to calculate the peak runoff for each storm event. The Manual, adopted by the City of Aurora, was used to calculate runoff using the Rational Method for sub-basins less than 90 acres in size.

“The Manual” figures RA-1 through RA-6, were used to determine the rainfall P1 values for the rainfall intensity values see **Appendix C**. One-hour rainfall depths used for the calculations at the site are as outlined below:

Rainfall figures not shown in Appendix C

Addressed - added to appendix B.

Table 1: Rainfall Depths						
	2-year	5-year	10-year	25-year	50-year	100-year
1-hr	0.99"	1.39"	1.62"	2.00"	2.34"	2.67"

Calculation Method

The rational method was used to calculate run-off coefficients of 2-yr and 100-yr flows. Three land uses for the calculations, Single-Family (which included half streets within the alleys), Paved Street and Landscape.

The 2-yr Coefficients used in calculations are 0.40 (Single-Family), 0.69 (Local), 0.72 (Harvest), 0.70 (Warren), 0.68 (Kewaunee), 0.60(Yale), 0.87(Paved Area) and 0.18(Landscape Tract). And 100-yr Coefficients are 0.60 (Single-Family), 0.74 (Local), 0.78 (Harvest), 0.76 (Warren), 0.73 (Kewaunee), 0.65(Yale), 0.93(Paved Area) and 0.22(Landscape Tract). See **Appendix C** for results.

Detention Volume Computation Method

The required detention volume was calculated using The Criteria outlined in section 6.30. The total required volume is equal to the 100-yr runoff volume plus half the EURV as well as an additional 20% of the Water Quality event to account for sedimentation. The water quality event and EURV were calculated using the methods outlined in Volume 2 of The Manual. The 100-year required storage was calculated using equations (6.1) outlined in section 6.33 of The Criteria Manual. The 100-year required storage was also calculated using the Mile High Flood District criteria and the more conservative of the two results was used. See **Appendix D** for results.

$$V = KA$$

$$\text{For the 100-year, } K_{100} = (1.78 - 0.002I^2 - 3.56)/900 \quad (6.1)$$

Where V=required volume for the 100

I= Developed basin imperviousness (%)

A= Tributary Area (acres)

3. Hydraulic Criteria

The storm sewer layout will be designed horizontally along with inlet locations to gravity-flow in the 2-year storm and to convey the 100-year storm with the HGLs one foot below the rim elevations of the storm structures. The HGLs associated with the 2-year and 100-year storm events will be modeled in AutoCAD Civil 3D Hydraflow Storm Sewers Extension and will be provided within a future Final Drainage Report. An emergency overtopping route has been designed to allow these flows to reach the Ponds if the

underground infrastructure becomes clogged. The emergency outfall elevation is outlined and hatched in the Preliminary Drainage Plan shown in **Appendix A**.

This is not shown or not apparent from plan notes and legend

D. Drainage Plan

1. General Concept

Stormwater will generally flow to the west side of the site (Pond A), the Southwest area of the site (Pond B) and the to the north (anticipated existing Storm Infrastructure) in accordance with the Master Drainage report via overland flow, channelized flow within the roadway systems and ultimately storm sewer conveyance.

Offsite runoff is captured within basins D-15, D-20 and D-85 which are located on the south and southeast side of the site. These basins are discussed in further detail in descriptions below. Flows will be detained by the proposed detention ponds and release at flow rates required by The Criteria via outlet control structures. Pond outfall flows will then be conveyed by either an existing swale or storm infrastructure to the ultimate outfall to Murphy Creek and Coal Creek.

The property owner is responsible for maintaining the proposed storm infrastructure within the property, and the metro district is responsible for maintaining the proposed detention ponds.

2. Specific Details

The proposed drainage of the project will adhere to the existing drainage pattern of the site. The existing ridgeline will be a high point on the site splitting the flows of the site. Detention ponds will on the west side of the site to capture the respective flows split by the ridgeline. Both Pond A and Pond B will ultimately outfall to the Murphy Creek. The remaining flow, delineated in Basin's B, C and E, will be captured via existing storm infrastructure and will ultimately outfall to Murphy Creek and Coal Creek.

Onsite flows within Basins C, D and E will be conveyed via private storm drain to existing storm infrastructure to the north end of the site. The flows will be routed to existing detention ponds constructed within Harvest Crossing Filing No.1 designed by ILC Consultants shown in **Appendix C**. The Basins located within Harvest Crossing Filing No.1 correspond with the Harvest Crossing as follows. Basin C corresponds with ILC's Basin OB. Basin D corresponds with ILC's Basin OA2 Basin E corresponds with ILC's Basin OA1.

Table 2: Basin Comparison					
Basin ID	AC	C2	C100	Q2	Q100
OB (ILC)	14.10	0.39	0.60	13.38	55.08
C	13.69	0.46	0.63	16.36	58.93
OA1(ILC)	3.93	0.40	0.60	4.07	15.87
E	4.90	0.44	0.61	5.73	21.27
OA2(ILC)	13.79	0.33	0.61	12.62	60.71
D	13.74	0.40	0.55	13.26	49.74

The above table highlights the differences between Harvest Crossing Filing No. 1 design (ILC) and the Filing No. 3 (Current) calculations. Acreages and runoff coefficients slightly vary which results in different Q2 and Q100 values. Site design will be revisited at final design to adjust the proposed (Current) acreages and runoff coefficients to be more inline with ILCs Filing No. 1 anticipated flow. The goal at final design is to ensure the proposed flows of Filing No. 3 are inline with the anticipated flows in Filing No. 1 analysis.

Basin A's flows will be conveyed via private storm drain to propose detention pond (Pond A) located on the west edge of the site. Basin B and E flows will be conveyed via private storm drain to existing infrastructure to the north end of the site and ultimately be detained offsite in Pond B2 per Master Drainage Report. Basin C flows will be conveyed via private storm drain to existing infrastructure to the north end of the site and ultimately be detained offsite in Pond C3 per Master Drainage Report. Basin D's flows will be conveyed via private storm drain to propose detention pond (Pond A) located on the southwest area of the site.

← Pond B Addressed

The proposed Ponds have been sized to attenuate the WQCV, EURV, and 100-year events, providing 2.64 acre-feet of storage for the western pond (Pond A). As well as 7.68 acre-feet of storage for the southwestern pond (Pond B).

After the water has been detained, Pond A will discharge into existing storm drain at a maximum rate of 6.97cfs (10yr) and 23.2 cfs (100 yr). The existing infrastructure will route the flow to discharge into Murphy Creek. Pond B will detain and release flow at a maximum

rate of 26.01 cfs (10 yr) and 86.7 cfs (100 yr) Pond B will discharge flow into an existing swale ultimately out falling into Murphy Creek. Release rates were calculated using City of Aurora Drainage Criteria Manual section 6.33.

Both Ponds will incorporate the use of forebay structures, trickle channels and micropools designed in accordance with the manual. Ponds A and B will retain the WQCV for at least 40 hrs along with the EURV and 100-year for 72 hrs. Calculations for the detention Ponds are provided in **Appendix D**.

Harvest Gulch

Per the approved Master drainage study the Harvest Gulch (The GULCH) is being proposed on the southern portion of the site. Within the previous approved report this gulch was preliminary sized at 705' long by 123' wide. Currently the gulch is preliminary designed to have 0.5% longitudinal slope with 4:1 side bank. An 18' bench is shown between Pond B and the gulch. This bench can be used for pedestrian circulation and maintenance access.

A low flow trickle condition will be designed during final construction documents per the criteria. landscaping will be proposed in the area. The applicant will coordinate with the public works department on plant type and locations.

3. Sub-basin Description

A standalone Drainage Area Map has been provided in this submittal, to illustrate the sub-basins proposed with this project. Individual sub-basin details such as runoff, coefficient calculations, and imperviousness percentages are provided in Appendix C. The 2-year and 100-year peak flows are provided below with full calculations provided in **Appendix C**.

On-Site Basins

Sub-basins A-05

Sub-basin A-05 is 1.47 acres and is located west side of the Site and is one of the 15 sub-basins on the Project that sheet flows to Pond A at the west side of the Site. This sub-basin flows to design point A05. This sub-basin will utilize natural slope of the land to flow to Pond A.

Sub-basins A-10

Sub-basin A-10 is 0.80 acres and is located on the west side of the Site and is one of the 15 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A10, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-15

Sub-basin A-15 is 2.55 acres and is located on the west area of the Site and is one of the 15 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A15, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-20

Sub-basin A-20 is 0.61 acres and is located on the west side of the Site and is one of the 15 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A20, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-25

Sub-basin A-25 is 1.86 acres and is located on west side of the Site and is one of the 15 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A25, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-30

Sub-basin A-30 is 0.81 acres and is located on the west towards the middle of the Site and is one of the 15 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A30, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-35

Sub-basin A-35 is 2.93 acres and is located toward the center of the norther portion of the Site. Basin A-35 is one of the 15 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A35, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-40

Sub-basin A-40 is 4.38 acres and is located within the center of Site and is one of the 15 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A40, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-45

Sub-basin A-45 is 0.84 acres and is located within the center of the Site and is one of the 15 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A45, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-46

Sub-basin A-46 is 0.34 acres and is located within the center of the Site and is one of the 14 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A46, which is an area inlet. This sub-basin will utilize sheet flow to facilitate flow to proposed private storm sewer.

Sub-basins A-50

Sub-basin A-50 is 1.44 acres and is located near the center of the Site and is one of the 14 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A-50, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-55

Sub-basin A-55 is 2.24 acres and is located west side of Site and is one of the 14 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A55, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-60

Sub-basin A-60 is 1.12 acres and is located northwest area of the Site and is one of the 14 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A60, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-65

Sub-basin A-65 is 0.62 acres and is located on the west towards the center of the Site and is one of the 14 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A65, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins A-70

Sub-basin A-70 is 2.29 acres and is located on the west towards the center of the Site and is one of the 14 sub-basins on the Project that drains via private storm drains to Pond A at the west side of the Site. This sub-basin flows to design point A70, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-05

Sub-basin B-05 is 3.85 acres and is located in the southwest area of the Site and is one of the 35 sub-basins on the Project that drains via sheet flow to Pond B located at the southwest area of the Site. This sub-basin flows to design point D05, which is a Pond B. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed pond.

Sub-basins B-10

Sub-basin B-10 is 5.7 acres and is located in the southeast of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D10, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

"B05"? Please
correct all DP
references

Addressed - all
DP references
updated.

Sub-basins B-15

Sub-basin B-15 is 6.37 acres and is located in the southeast corner of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D15, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-20

Sub-basin B-20 is 18.17 acres and is located in the southeast area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D20, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-25

Sub-basin B-25 is 3.13 acres and is located in the south area of the site of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D25, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-30

Sub-basin B-30 is 2.45 acres and is located on the south area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D30, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-35

Sub-basin B-35 is 0.96 acres and is located on the south edge of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D35, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-36

Sub-basin B-36 is 0.18 acres and is located in the southwest corner of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D36, which is an inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-40

Sub-basin B-40 is 1.81 acres and is located in the southwest area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D40, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-45

Sub-basin B-45 is 1.91 acres and is located in the southwest area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D45, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-50

Sub-basin B-50 is 1.15 acres and is located in the south area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D50, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-55

Sub-basin B-55 is 2.66 acres and is located in the south area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D55, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-60

Sub-basin B-60 is 2.30 acres and is located in the southeast area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D60, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-65

Sub-basin B-65 is 2.87 acres and is located in the southeast area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D65, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-70

Sub-basin B-70 is 0.22 acres and is located in the southeast area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D70, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-75

Sub-basin B-75 is 0.99 acres and is located on the south eastern area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D75, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-80

Sub-basin B-80 is 1.65 acres and is located in the southeast area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D80, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-85

Sub-basin B-85 is 4.39 acres and is located on the eastern edge of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D85, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-90

Sub-basin B-90 is 1.25 acres and is located on eastern edge of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D90, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-95

Sub-basin B-95 is 1.40 acres and is located on the eastern area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D95, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-100

Sub-basin B-100 is 1.80 acres and is located in the south east area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D100, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-105

Sub-basin B-105 is 1.52 acres and is located in the eastern area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D105, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-110

Sub-basin B-110 is 2.17 acres and is located in the eastern area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D110, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-115

Sub-basin B-115 is 2.22 acres and is located on the eastern edge of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D115, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-120

Sub-basin B-120 is 6.07 acres and is located in the center of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D120, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-125

Sub-basin B-125 is 3.99 acres and is located towards the eastern edge of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D125, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.



"B125"

Addressed

Sub-basins B-130

Sub-basin B-130 is 0.94 acres and is located near the center of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D-130, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-145

Sub-basin B-145 is 1.09 acres and is located near the center of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D145, which is an area inlet. This sub-basin will utilize sheet to facilitate flow to proposed private storm sewer.

Sub-basins B-146

Sub-basin B-146 is 0.14 acres and is located near the center of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D146, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-150

Sub-basin B-150 is 0.14 acres and is located near the center of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D150, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-155

Sub-basin B-155 is 0.89 acres and is located near the western area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D155, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-160

Sub-basin B-160 is 2.99 acres and is located in the western area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D160, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-165

Sub-basin B-165 is 0.81 acres and is located in the western area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D165, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins B-170

Sub-basin B-170 is 3.28 acres and is located in the western area of the Site and is one of the 35 sub-basins on the Project that drains via private storm drains to Pond B located at the southwest area of the Site. This sub-basin flows to design point D170, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-10

Sub-basin C-10 is 1.11 acres and is located on the north east edge Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C10, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-15

Sub-basin C-15 is 1.44 acres and is located on the north eastern edge of the Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C15, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-25

Sub-basin C-25 is 2.15 acres and is located on the northeastern edge of the Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C25, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-30

Sub-basin C-30 is 0.68 acres and is located on the north eastern edge of the Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C30, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-35

Sub-basin C-35 is 0.64 acres and is located on the eastern edge of the Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C-35, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-40

Sub-basin C-40 is 0.60 acres and is located on the eastern boundary of the Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C40, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-45

Sub-basin C-45 is 2.00 acres and is located on the eastern boundary of the Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C45, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-50

Sub-basin C-50 is 2.89 acres and is located on the east side of the Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C50, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins C-55

Sub-basin C-55 is 2.14 acres and is located towards the north east area of the Site and is one of the 9 sub-basins on the Project that drains via private storm drains to existing storm infrastructure at the northeast side of the Site. This sub-basin flows to design point C55, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins D-15

Sub-basin D-15 is 1.00 acres and is located on the north edge of the Site and is one of the 8 sub-basins on the Project that drains via private storm drains to existing storm infrastructure located north of the Site. This sub-basin flows to design point B15, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins D-20

Sub-basin D-20 is 1.24 acres and is located north edge of the Site and is one of the 8 sub-basins on the Project that drains via private storm drains to existing storm infrastructure located north of the Site. This sub-basin flows to design point B20, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

"D15". Please
correct all DP
references

Addressed - all
DP references
updated.

Sub-basins D-25

Sub-basin D-25 is 2.33 acres and is located on the north edge of the Site and is one of the 8 sub-basins on the Project that drains via private storm drains to existing storm infrastructure located north of the Site. This sub-basin flows to design point B25, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins D-30

Sub-basin D-30 is 2.97 acres and is located on the northern edge of the Site and is one of the 8 sub-basins on the Project that drains via private storm drains to existing storm infrastructure located north of the Site. This sub-basin flows to design point B30, which is a sump inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins D-35

Sub-basin D-35 is 2.62 acres and is located in the northern center of the Site and is one of the 8 sub-basins on the Project that drains via private storm drains to existing storm infrastructure located north of the Site. This sub-basin flows to design point B35, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins D-40

Sub-basin D-40 is 0.55 acres and is located in the northern center of the Site and is one of the 8 sub-basins on the Project that drains via private storm drains to existing storm infrastructure located north of the Site. This sub-basin flows to design point B40, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins D-45

Sub-basin D-45 is 2.04 acres and is located in the northern center of the Site and is one of the 8 sub-basins on the Project that drains via private storm drains to existing storm infrastructure located north of the Site. This sub-basin flows to design point B45, which is an area inlet. This sub-basin will utilize sheet flow to facilitate flow to proposed private storm sewer.

Sub-basins D-50

Sub-basin D-50 is 1.00 acres and is located in the northern center of the Site and is one of the 8 sub-basins on the Project that drains via private storm drains to existing storm infrastructure located north of the Site. This sub-basin flows to design point B50, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins E-05

Sub-basin E-05 is 1.69 acres and is located on the northwestern edge of the Site and is one of the 3 sub-basins on the Project that drains via private storm drains to existing infrastructure at the northwestern area of the Site. This sub-basin flows to design point E05, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins E-10

Sub-basin E-10 is 1.93 acres and is located on the northwestern area of the Site and is one of the 3 sub-basins on the Project that drains via private storm drains to existing infrastructure at the northwestern area of the Site. This sub-basin flows to design point E10, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basins E-15

Sub-basin E-15 is 1.42 acres and is located in the northwestern corner of the Site and is one of the 3 sub-basins on the Project that drains via private storm drains to existing infrastructure at the northwestern area of the Site. This sub-basin flows to design point E15, which is an on-grade inlet. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

4. Water Quality and Detention

Pond Volumes Table		
Description	Pond A	Pond B
WQCV	0.371 ac-ft	1.13 ac-ft
EURV	0.965 ac-ft	2.51 ac-ft
100-yr + ½ EURV	2.64 ac-ft	7.68 ac-ft
Bottom Elevation	5715.0	5692.0
Top of Pond	5719.5 (Freeboard 5721.5)	5697.9(Freeboard 5699.9)
Basin Properties		
Area	23.26 Acres	87.0 Acres
Imperviousness	44.39%	31.73%

Summary of results:

The Ponds will drain the WQCV and EURV within 40 hours and 72 Hours respectively, as outlines in the MHFD standards.

Service access for the pond is provided as described below:

The access from Pond A occurs from the northwest corner of the pond off Harvest Road. Service access of the pond bottom is provided along a gravel path this is designed to accordance with the criteria, having minimum width of 8', Maximum longitudinal slope of 10%. The outfall for the pond includes a storm sewer that discharges into an existing storm sewer infrastructure that ultimately discharges unto Murphy Creek.

The access from Pond B occurs from the northern area of the pond, south of E Yale ave. Service access of the pond bottom is provided along a gravel path this is designed to accordance with the criteria, having minimum width of 8', Maximum longitudinal slope of 10%. The outfall for the pond includes a storm sewer that discharges into an existing swale that conveys flows to existing storm sewer infrastructure that ultimately discharges unto Murphy Creek.

E. Conclusion

1. Compliance with Standards

The project complies with the City of Aurora criteria for storm drainage design. City of Aurora Storm Drainage Design and Technical Criteria and the Urban Storm Drainage Criteria Manual Volumes 1, 2, and 3 have been adhered to in the design of the storm sewer system as well as Best Management Practices.

2. Summary of Concept

The project's runoff generated within the site will be collected using curb and gutter, swales, sheet flow and storm drain systems that will convey stormwater runoff to the proposed Ponds and existing storm infrastructure. Stormwater will be detained and released at a rate consistent with MHFD and City of Aurora Criteria Manual to the existing swale and storm drain system and comply with the applicable master plans and outfall systems planning studies as noted previously in this report.

List of References

Storm Drainage Design and Technical Criteria, City of Aurora; October 2010.

Urban Storm Drainage Criteria Manual, Volumes 1-3, Urban Drainage and Flood Control District, Updated August 2018.

Harvest Crossing/The Villages at Murphy Creek Master Historic Drainage Plan (221085); ILC, April 5, 2021

Master Drainage Report (221085MD1 1900-ARAP-E 13W); ILC, April 5, 2021

Flood Insurance Rate Map, Map Number 08005CO212K, Federal Emergency Management Agency; December 17, 2010.

Custom Soil Resource Report, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. May 10, 2021.

Appendix A- Drainage Maps



(SHOW FOR REFERENCE ONLY, PER SEPARATE PLAN AND PERMIT.)

COLLECTOR (PUBLIC)

POND A (DETENTION)
REQUIRED VOLUME= 2.65 AC-FT
PROVIDED VOLUME=2.94 AC-FT
TOP ELEV:5719.5 (FREEBOARD: 5721.5)
BOTTOM ELEV:5714.5
4:1 SLOPES

MATCHLINE SEE SHEET 03 FOR CONTINUATION

PROPOSED
NEIGHBORHOOD PARK
(REFERENCE LANDSCAPE PLANS FOR MORE DETAIL)

Kimley»»Horn

PROJECT NAME: Harvest Crossing PA-5 DATE: 6/6/2022
PROJECT NUMBER: 196284001
CALCULATED BY: JBP
CHECKED BY:

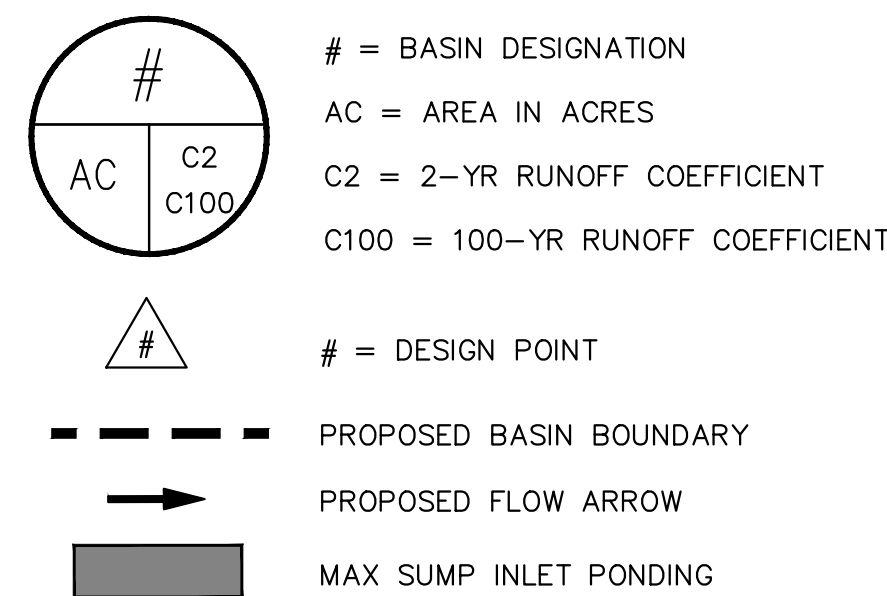
DATE: 6/6/2022

RATIONAL CALCULATIONS SUMMARY

Design Point	Tributary Basins	Tributary Area (AC)	Peak Flows (CFS)			
			Q2	Q100		
Basins	A-5	A-05	1.47	0.72	2.38	
	A-10	A-10	0.80	0.82	3.05	
	A-15	A-15	2.55	2.45	9.79	
	A-20	A-20	0.61	1.06	3.10	
	A-25	A-25	1.86	2.25	8.66	
	A-30	A-30	0.81	0.77	3.12	
	A-35	A-35	2.93	1.22	4.26	
	A-40	A-40	4.38	4.41	16.50	
	A-45	A-45	0.84	1.06	3.83	
	A-46	A-46	0.34	0.16	0.52	
	A-50	A-50	1.44	1.19	4.71	
	A-55	A-55	2.24	2.17	8.33	
	A-60	A-60	1.12	1.70	5.23	
	A-65	A-65	0.62	0.77	2.60	
	A-70	A-70	2.29	2.28	8.75	
	D15	D-15	1.00	1.50	5.56	
	D20	D-20	1.24	1.72	6.27	
	D25	D-25	2.33	2.22	8.93	
	D30	D-30	2.97	2.97	10.89	
	D35	D-35	2.62	2.31	9.33	
	D40	D-40	0.55	0.55	2.23	
	D45	D-45	2.04	0.61	2.03	
	D50	D-50	1.00	1.38	4.50	
		C10	C-10	1.11	1.19	4.47
		C15	C-15	1.44	1.41	5.59
C25		C-25	2.15	2.53	8.45	
C30		C-30	0.68	1.46	4.23	
C35		C-35	0.64	1.36	3.93	
C40		C-40	0.60	1.30	3.75	
C45		C-45	2.00	2.05	8.30	
C50		C-50	2.89	2.88	11.65	
C55		C-55	2.14	2.19	8.57	
		B5	B-05	3.85	1.67	5.51
	B10	B-10	0.89	1.53	4.46	
	B15	B-15	6.41	2.39	7.67	
	B20	B-20	12.17	6.08	19.47	
	B25	B-25	3.13	1.98	6.13	
	B30	B-30	2.45	2.18	6.67	
	B35	B-35	0.96	1.72	5.03	
	B36	B-36	0.18	0.36	1.04	
	B40	B-40	1.81	2.19	6.81	
	B45	B-45	1.91	1.67	6.74	
	B50	B-50	1.15	1.21	4.69	
	B55	B-55	2.66	2.39	9.53	
	B60	B-60	2.30	2.57	9.93	
	B65	B-65	2.87	2.95	11.91	
	B70	B-70	0.22	0.49	1.46	
	B75	B-75	0.99	0.87	3.51	
	B80	B-80	1.65	2.19	7.45	
	B85	B-85	4.39	1.94	6.13	
	B90	B-90	1.25	1.84	6.23	
	B95	B-95	1.40	1.35	5.44	
	B100	B-100	1.80	1.64	6.59	
	B105	B-105	1.52	1.46	5.85	
	B110	B-110	2.17	2.00	8.09	
	B115	B-115	2.22	2.22	8.47	
	B120	B-120	6.07	5.30	20.53	
B125	B-125	3.99	3.50	13.61		
B130	B-130	0.94	0.94	3.80		
B145	B-145	1.09	0.53	1.76		
B146	B-146	0.14	0.31	0.90		
B150	B-150	0.14	0.31	0.90		
B155	B-155	0.89	1.40	4.94		
B160	B-160	2.99	2.74	11.09		
B165	B-165	0.81	0.79	3.19		
B170	B-170	3.28	2.88	11.12		

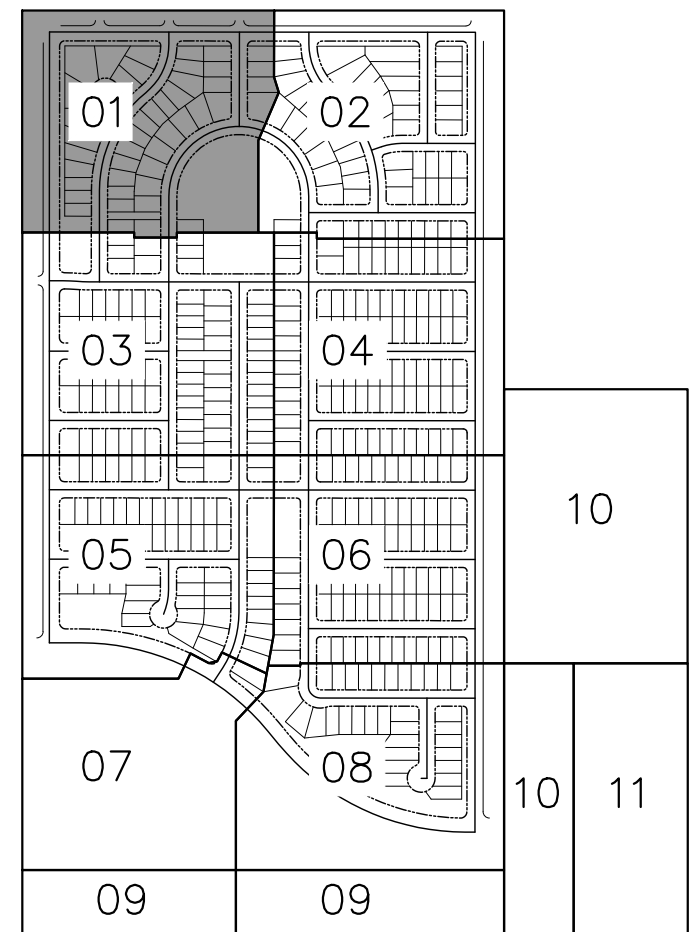
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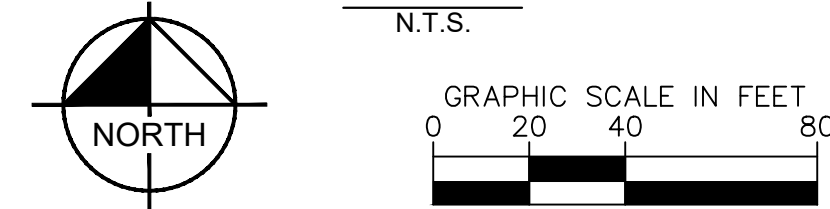


Approved For One Year From This Date

City Engineer	Date
Water Department	Date



KEY MAP
N.T.S.



811 Know what's below.
Call before you dig.

HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN

AURORA, CO

Kimley»Horn

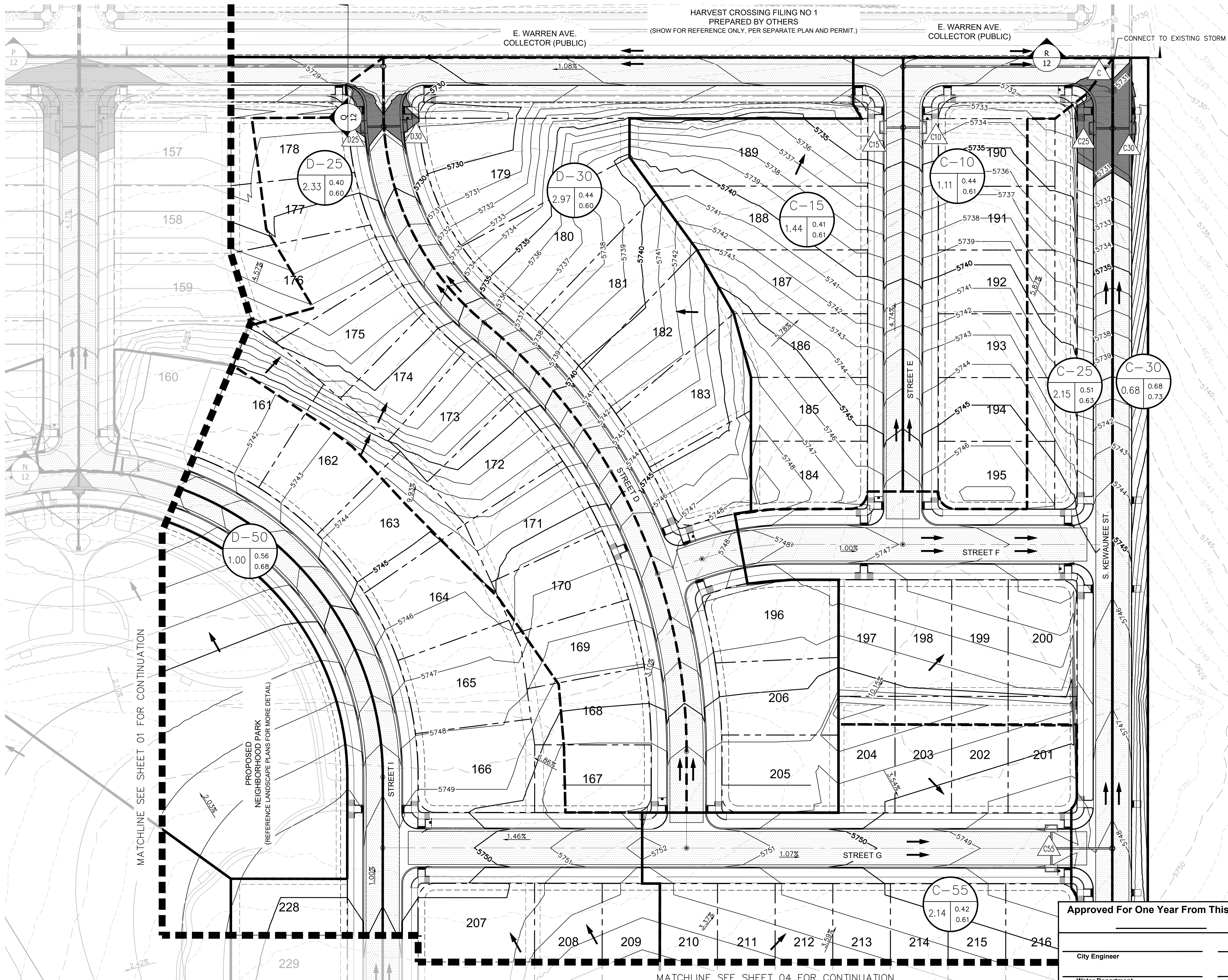
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DENVER, CO 80237 (303) 228-2300

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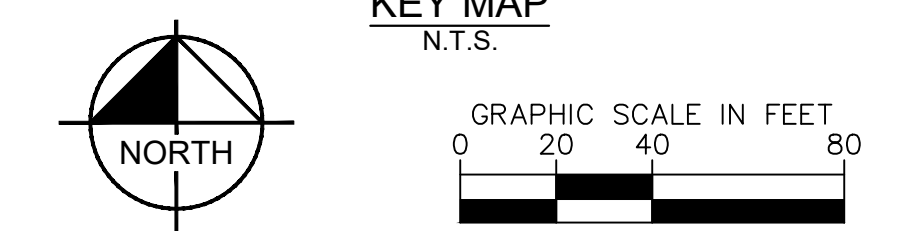
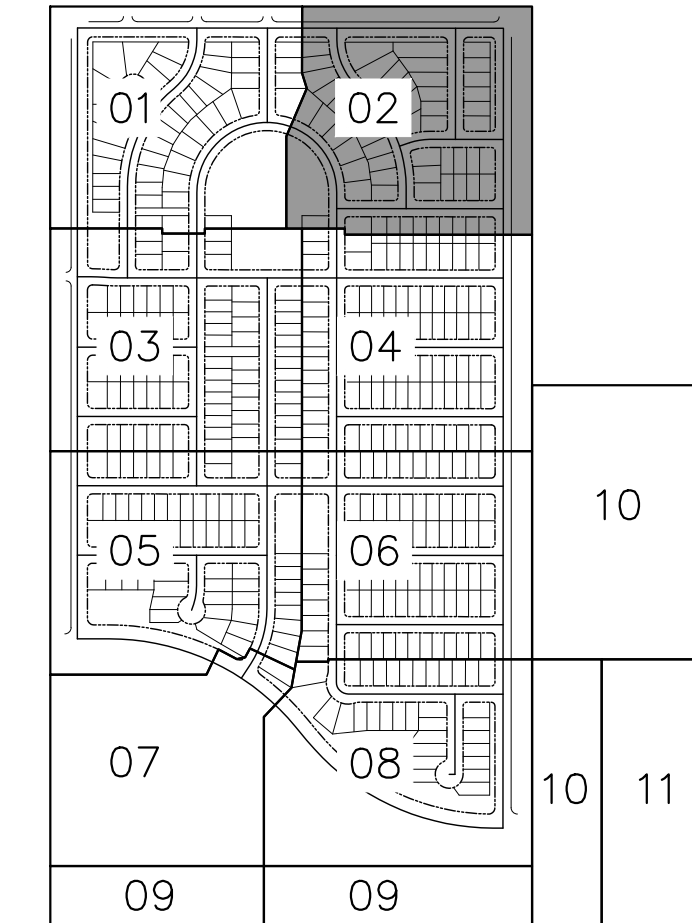
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- AC = AREA IN ACRES
- C2 = 2-YR RUNOFF COEFFICIENT
- C100 = 100-YR RUNOFF COEFFICIENT
- # = DESIGN POINT
- PROPOSED BASIN BOUNDARY
- PROPOSED FLOW ARROW
- MAX SUMP INLET PONDING



**HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN**

AURORA, CO

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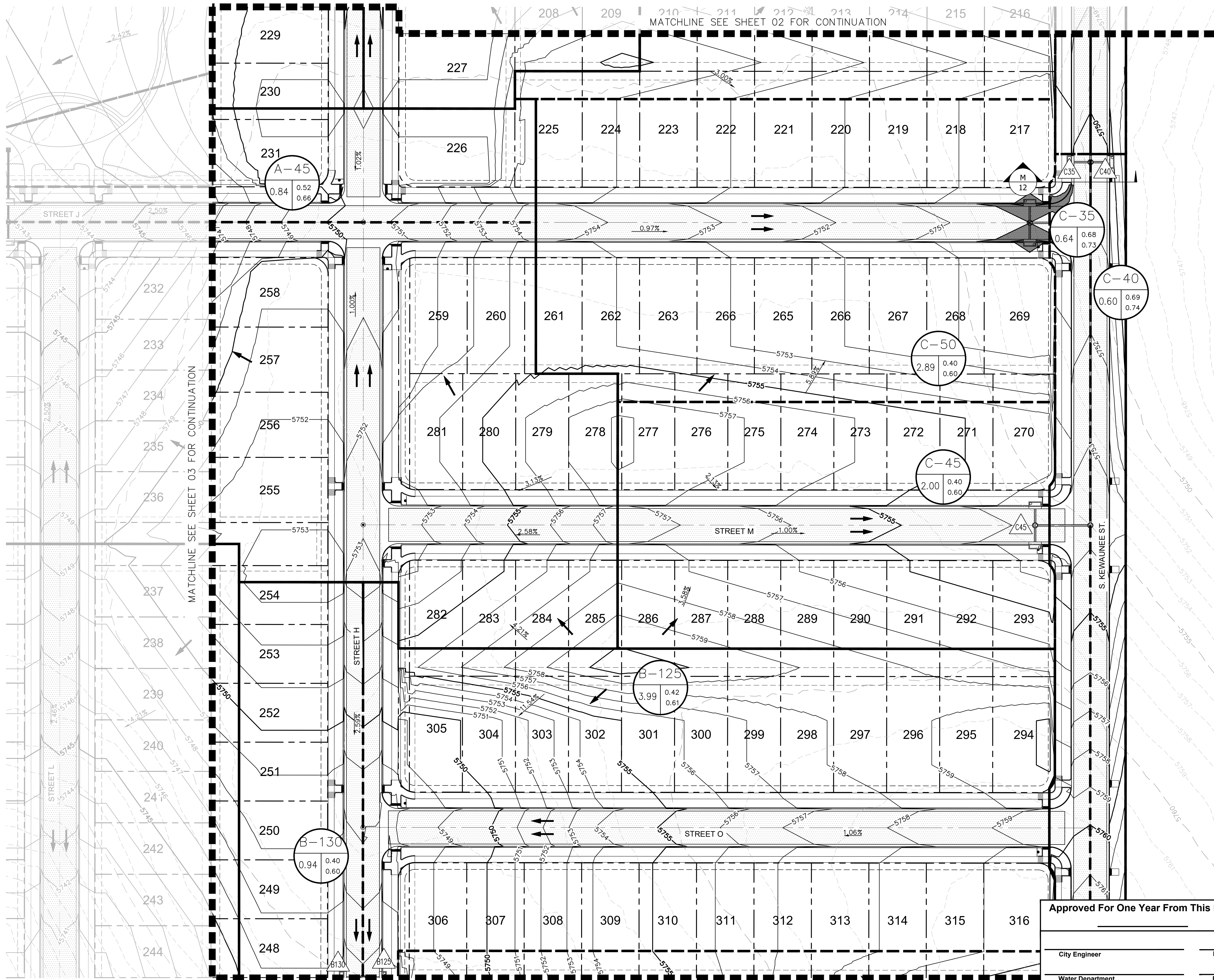
Approved For One Year From This Date

City Engineer	Date
Water Department	Date

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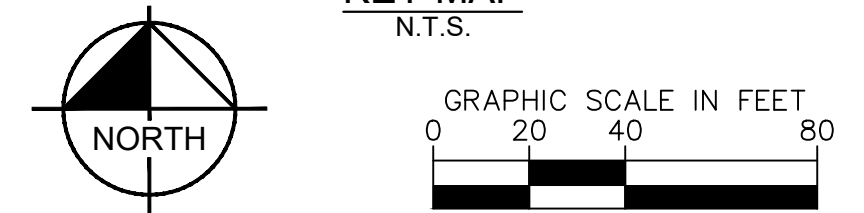
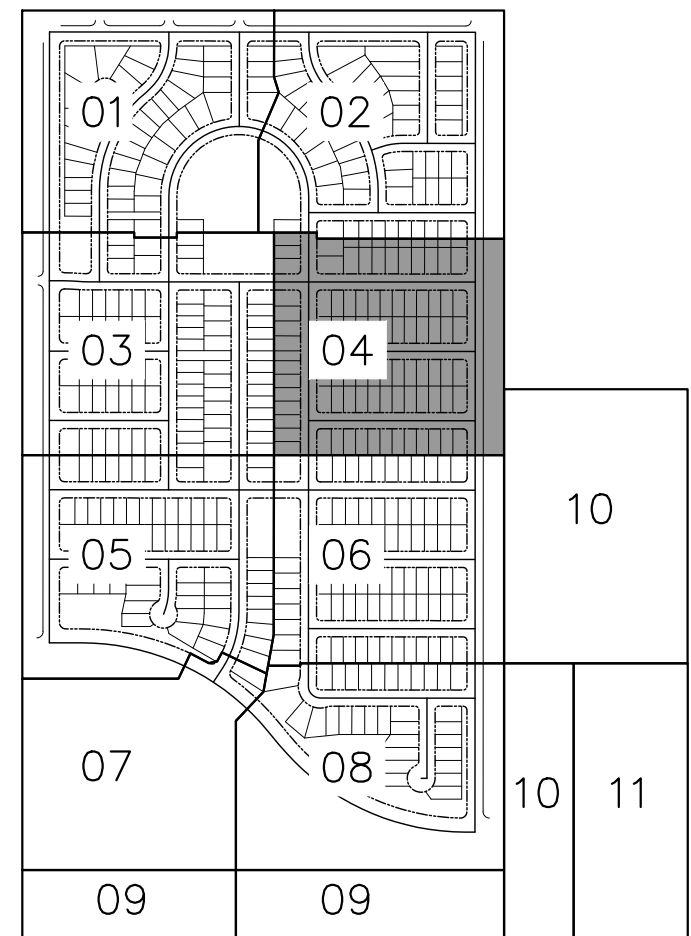
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- PROPOSED BASIN BOUNDARY
- PROPOSED FLOW ARROW
- MAX SUMP INLET PONDING



HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN

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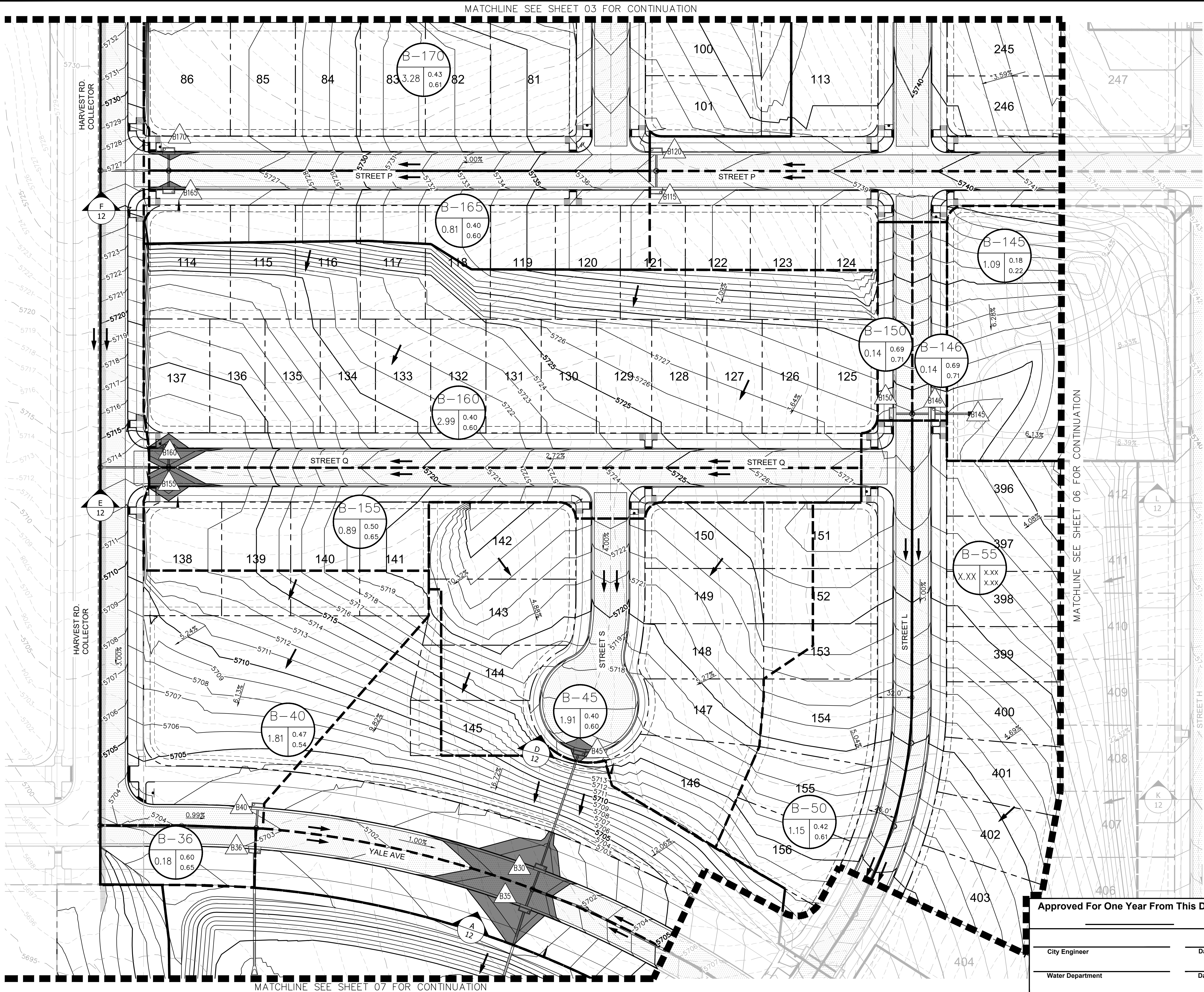
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Water Department _____ Date _____

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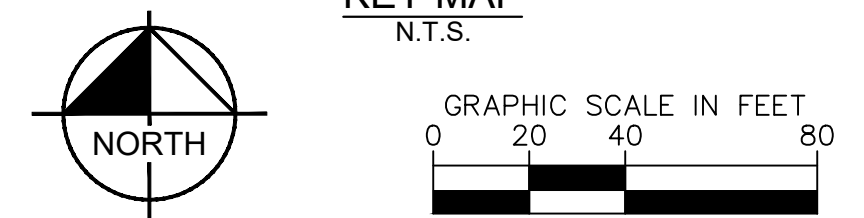
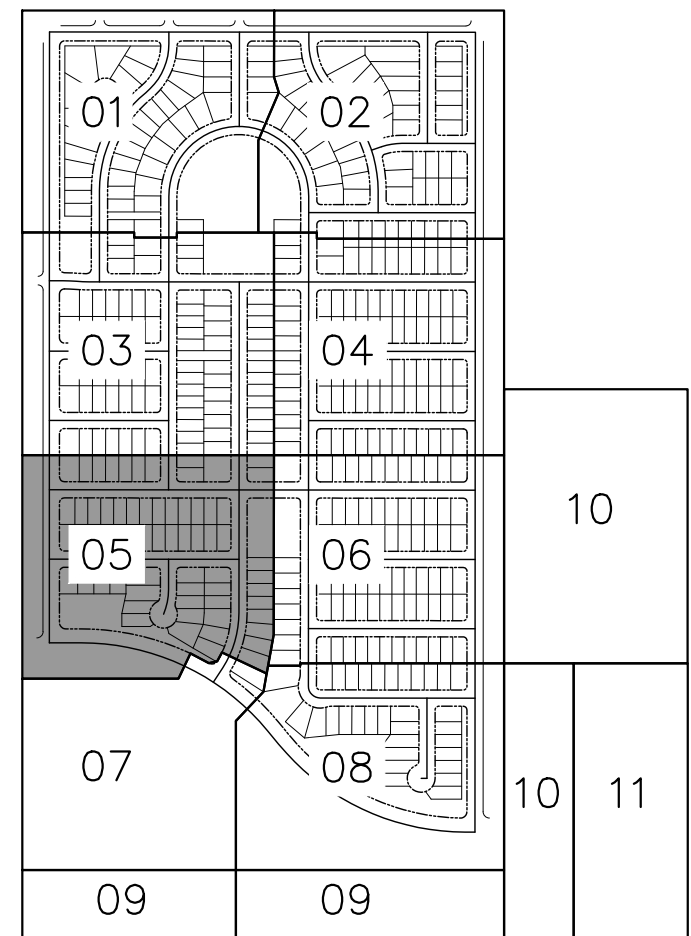
CASE NO.: TBD

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C100 = 100-YR RUNOFF COEFFICIENT
- # = DESIGN POINT
- PROPOSED BASIN BOUNDARY
- PROPOSED FLOW ARROW
- MAX SUMP INLET PONDING



HARVEST CROSSING PA5
PRELIMINARY DRAINAGE PLAN

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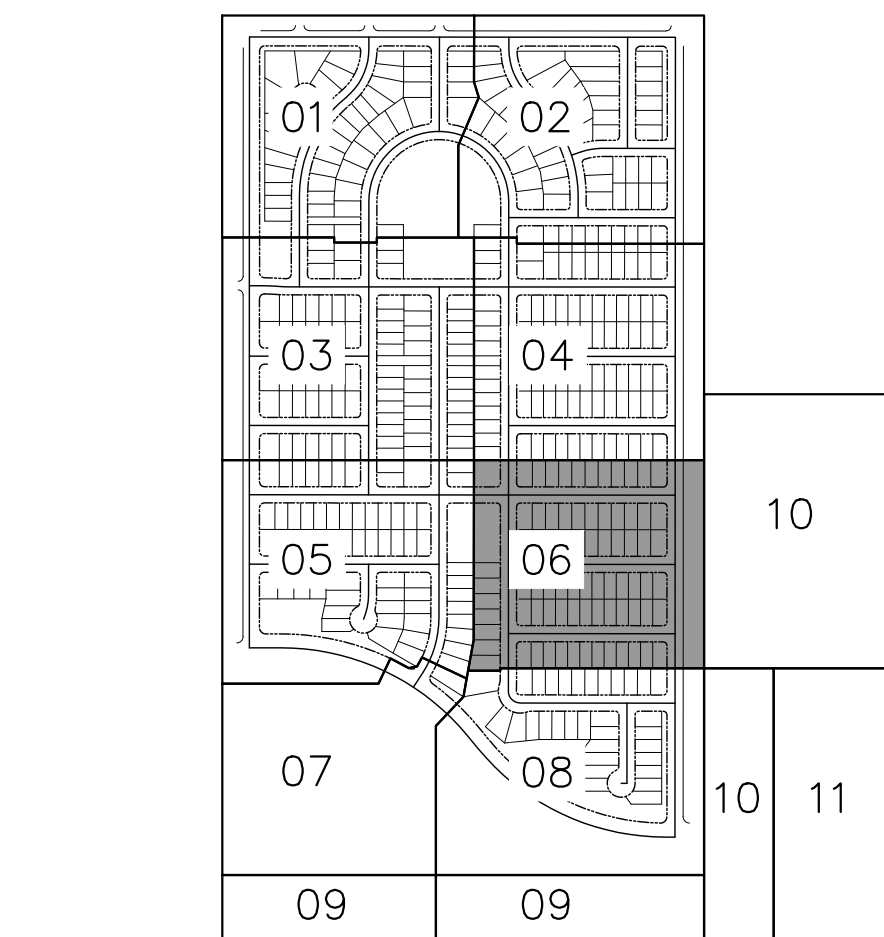
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Water Department _____ Date _____

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DATE: MAY 2022		
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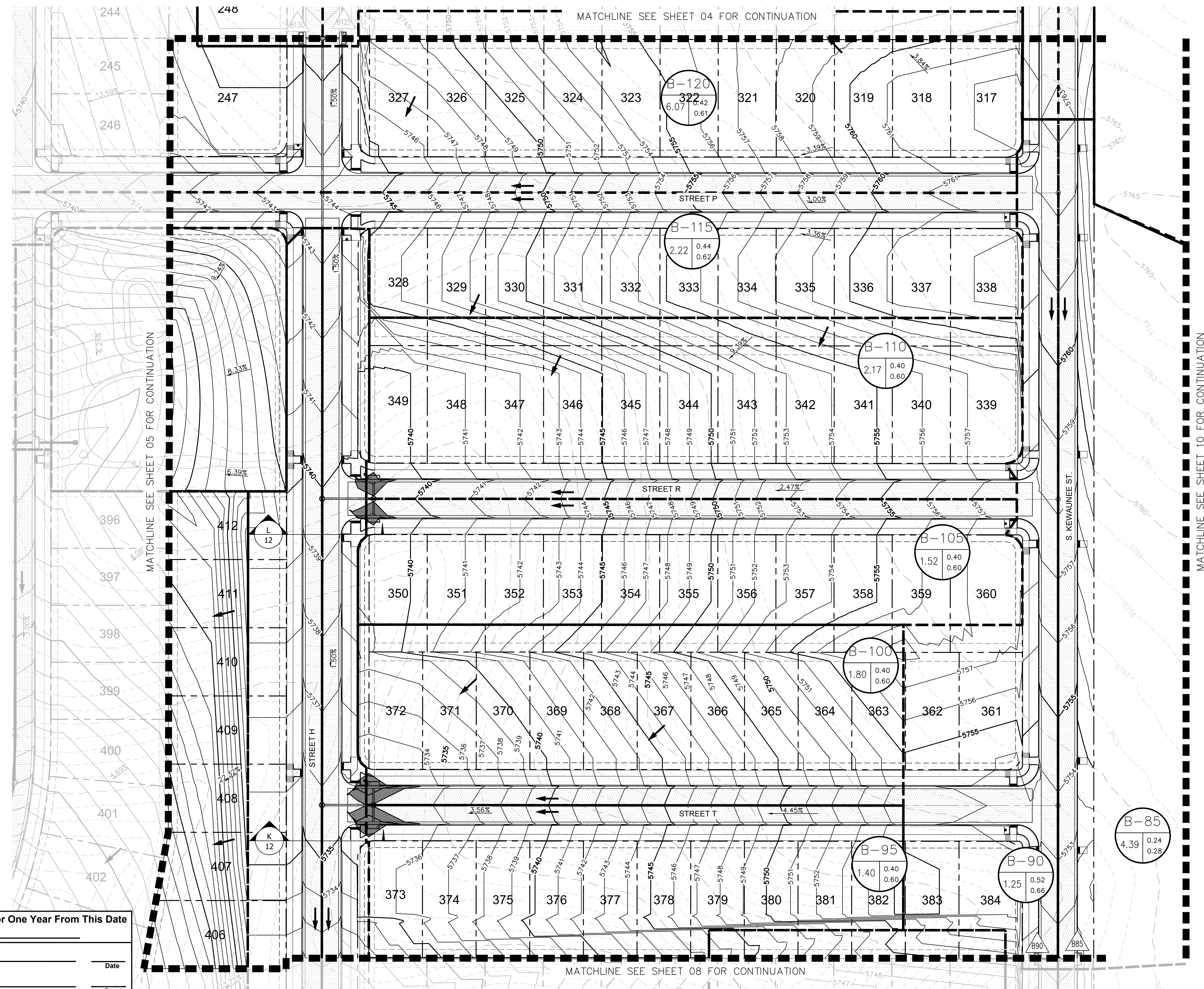
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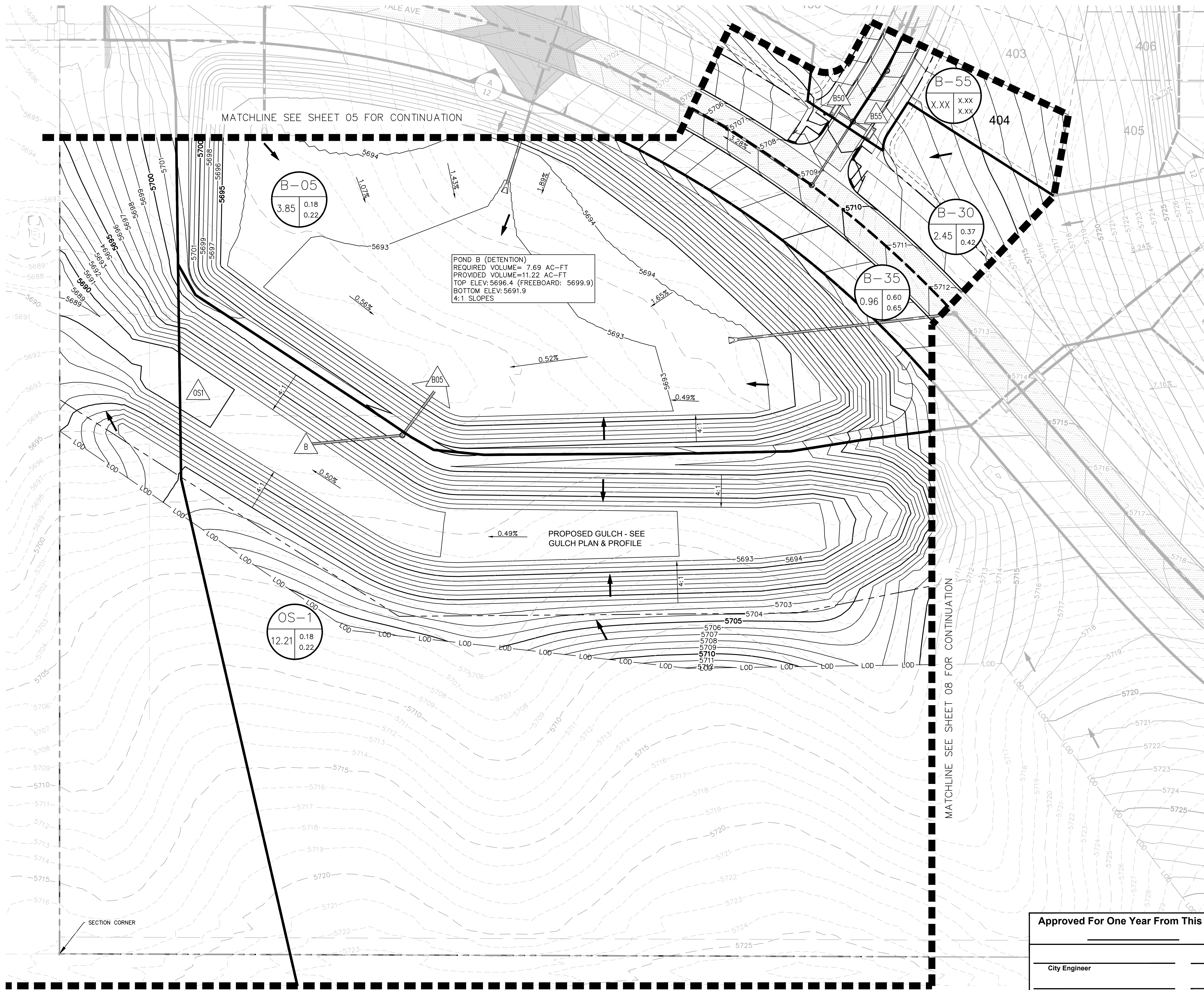
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Water Department	Date

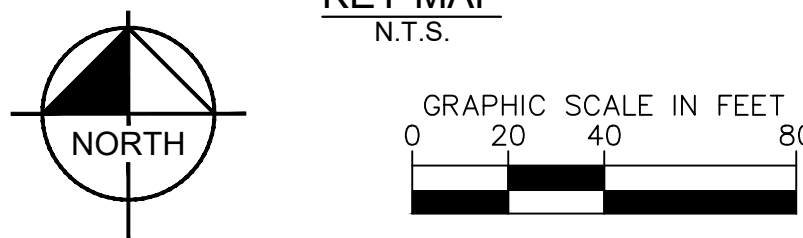
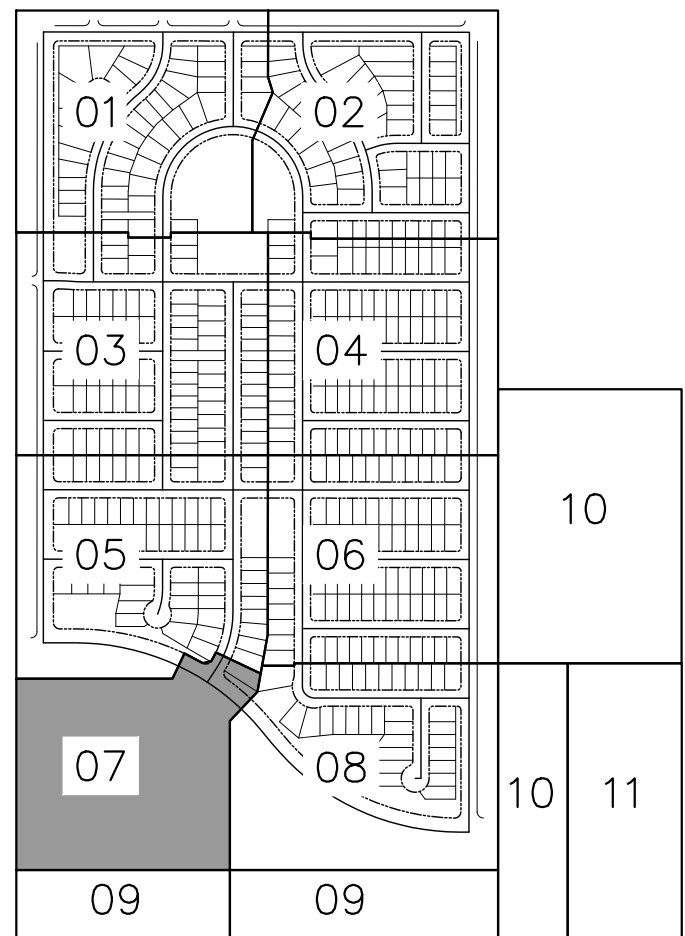
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	# = DESIGN POINT
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	PROPOSED FLOW ARROW
	MAX SUMP INLET PONDING



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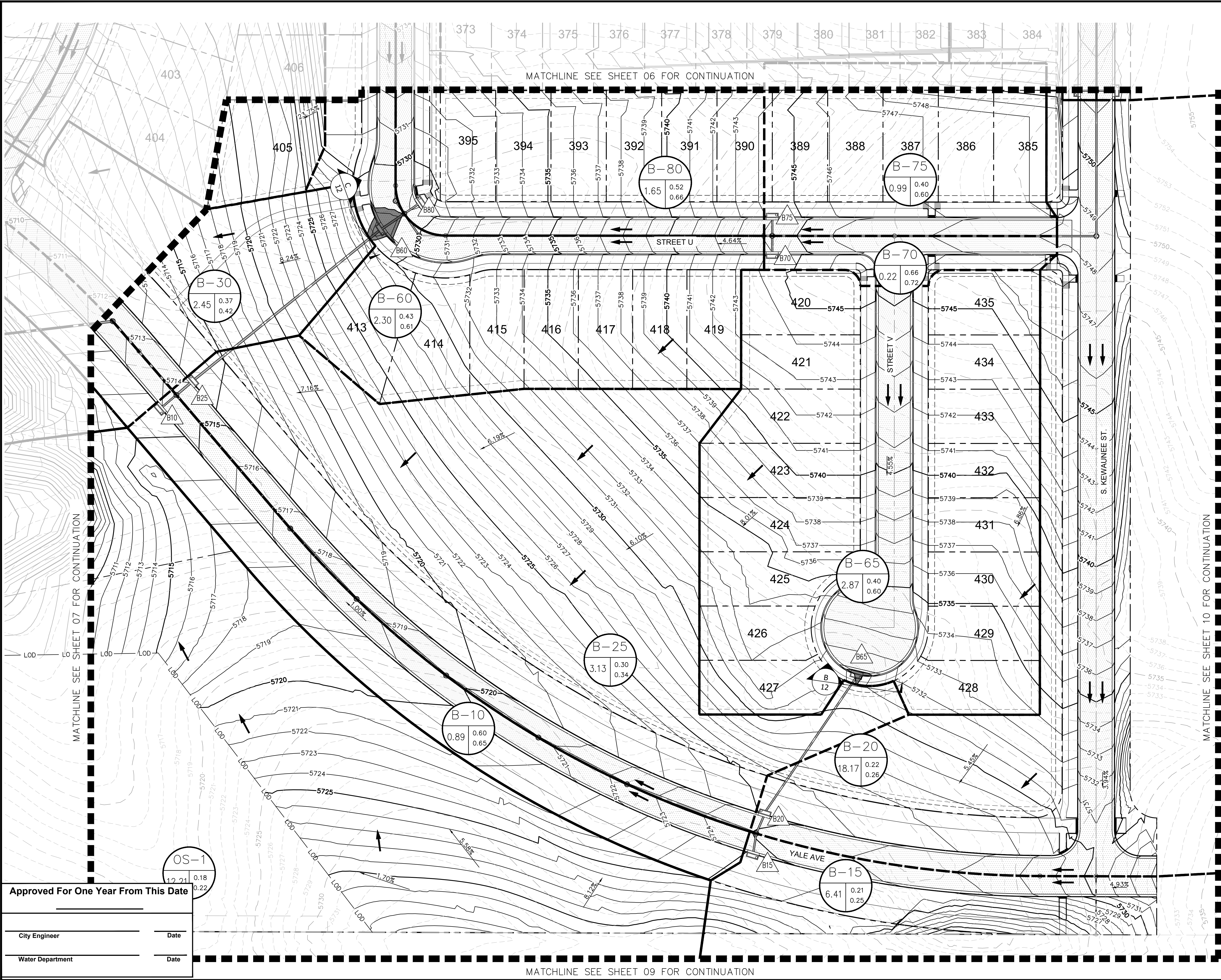
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Water Department	Date

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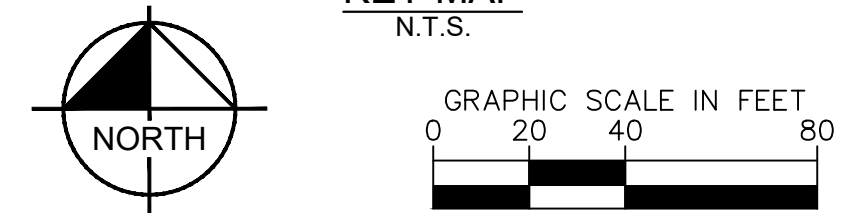
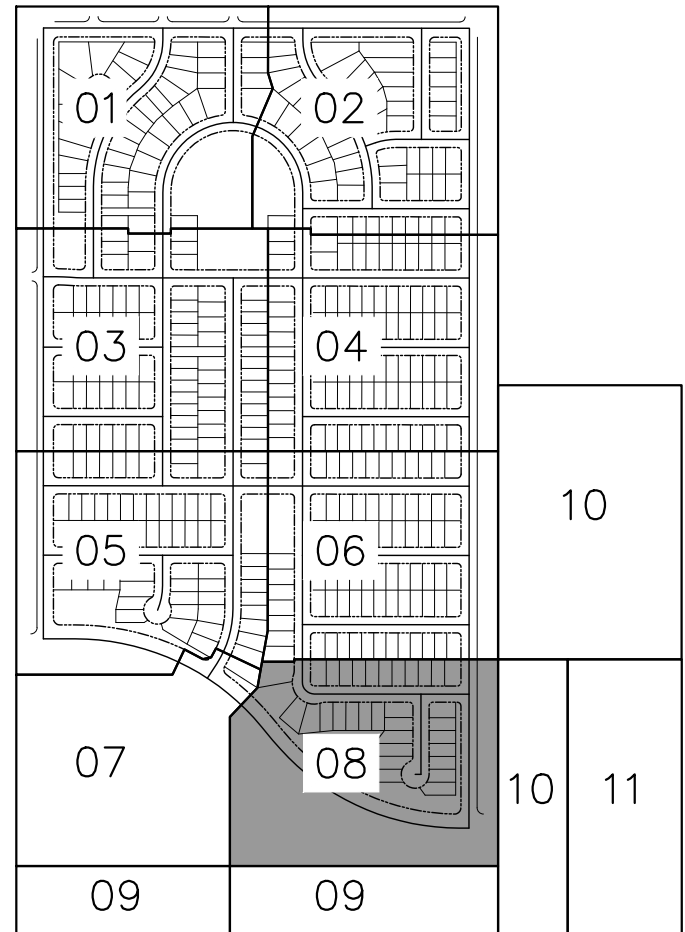
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	# = DESIGN POINT
	PROPOSED BASIN BOUNDARY
	PROPOSED FLOW ARROW
	MAX SUMP INLET PONDING



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PRELIMINARY DRAINAGE PLAN**

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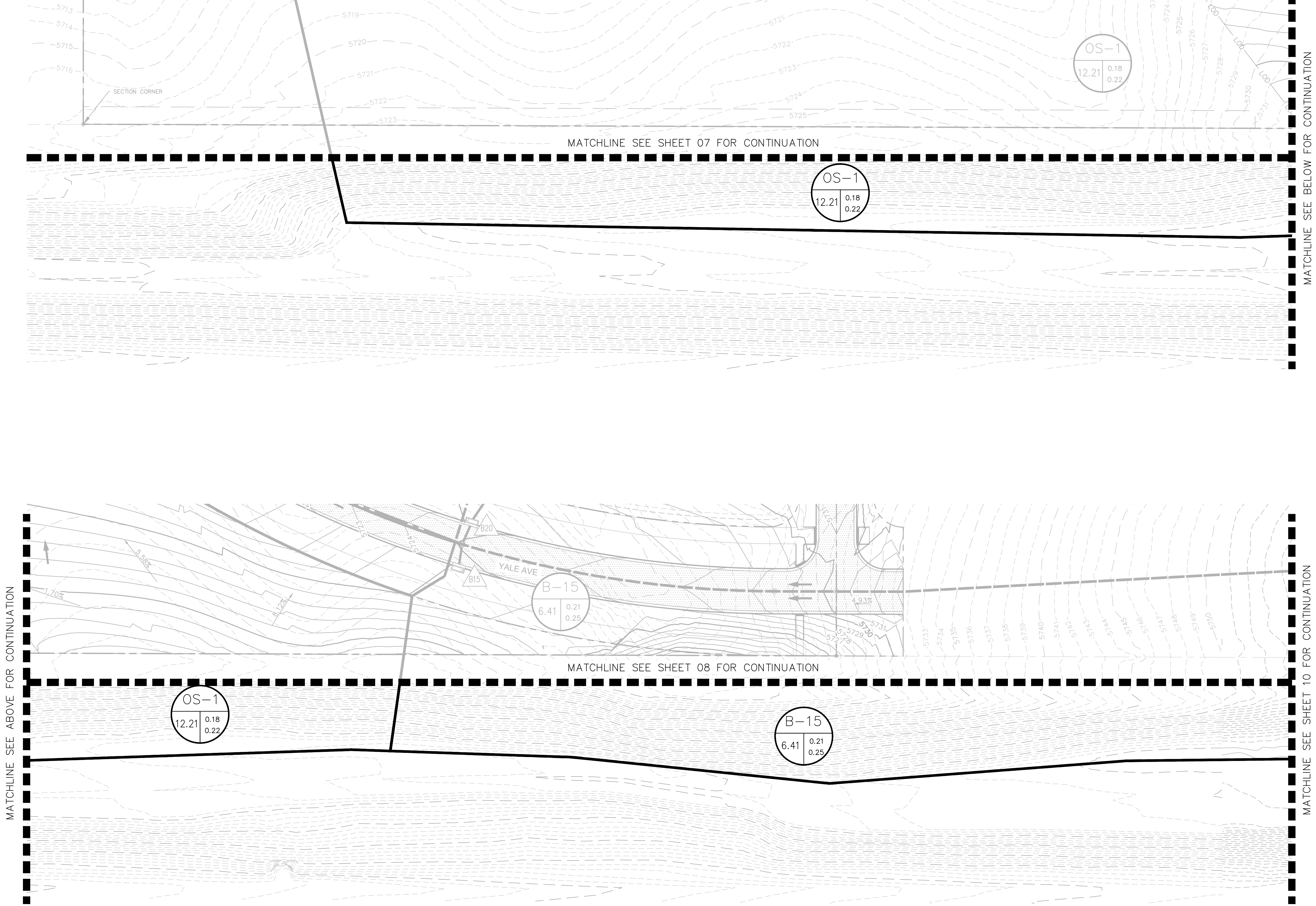
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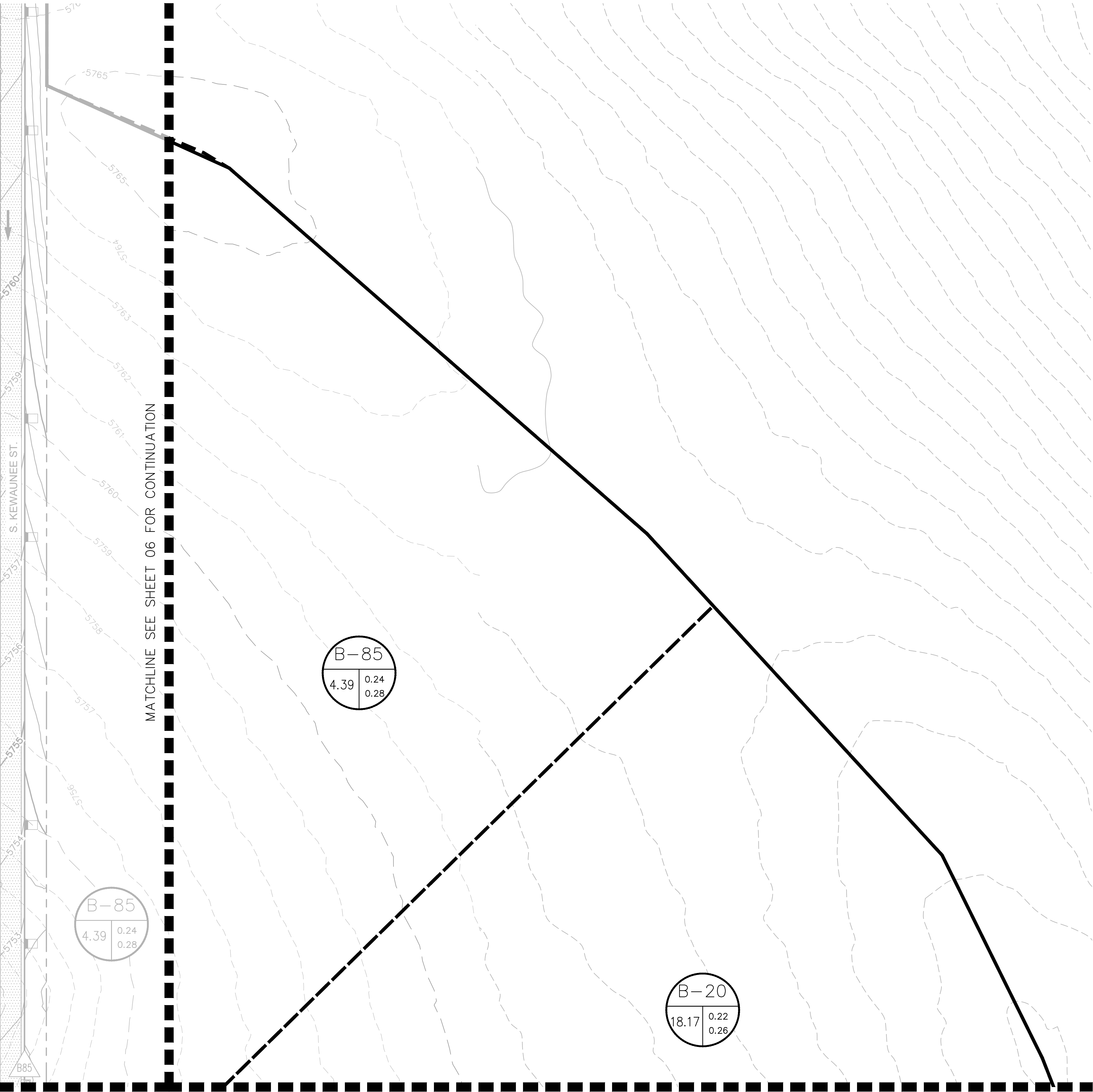
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Water Department	Date

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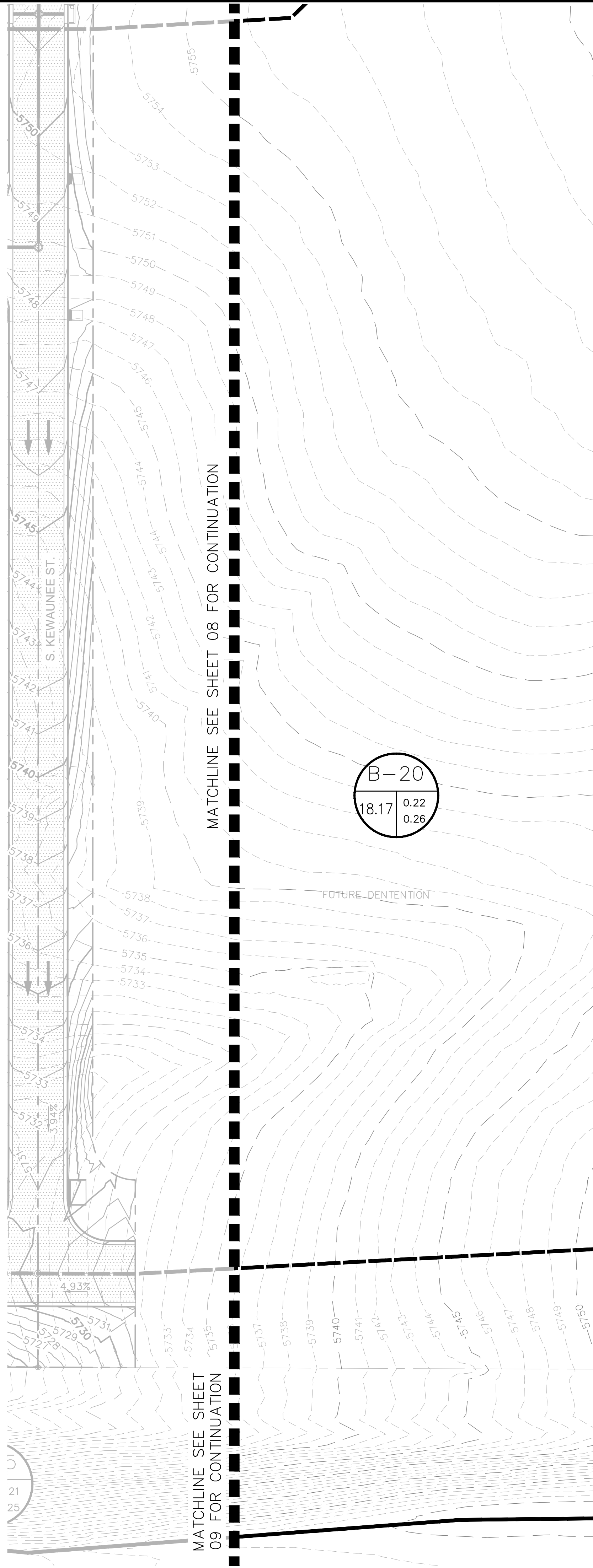


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MATCHLINE SEE SHEET 11 FOR CONTINUATION



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09 FOR CONTINUATION

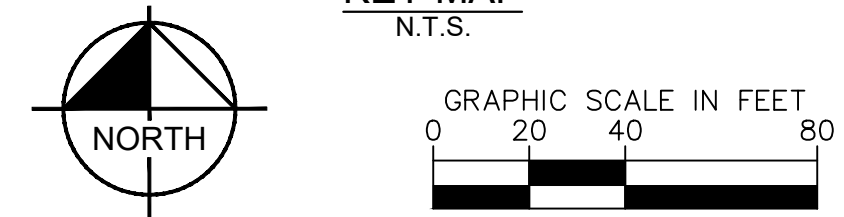
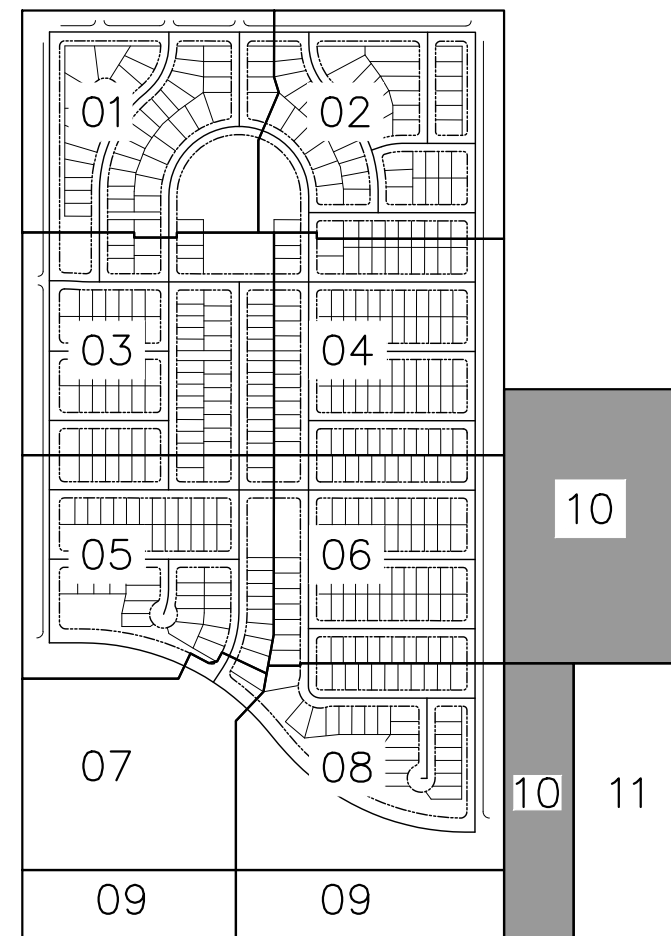
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- PROPOSED FLOW ARROW
- MAX SUMP INLET PONDING

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HARVEST CROSSING PA5 PRELIMINARY DRAINAGE PLAN

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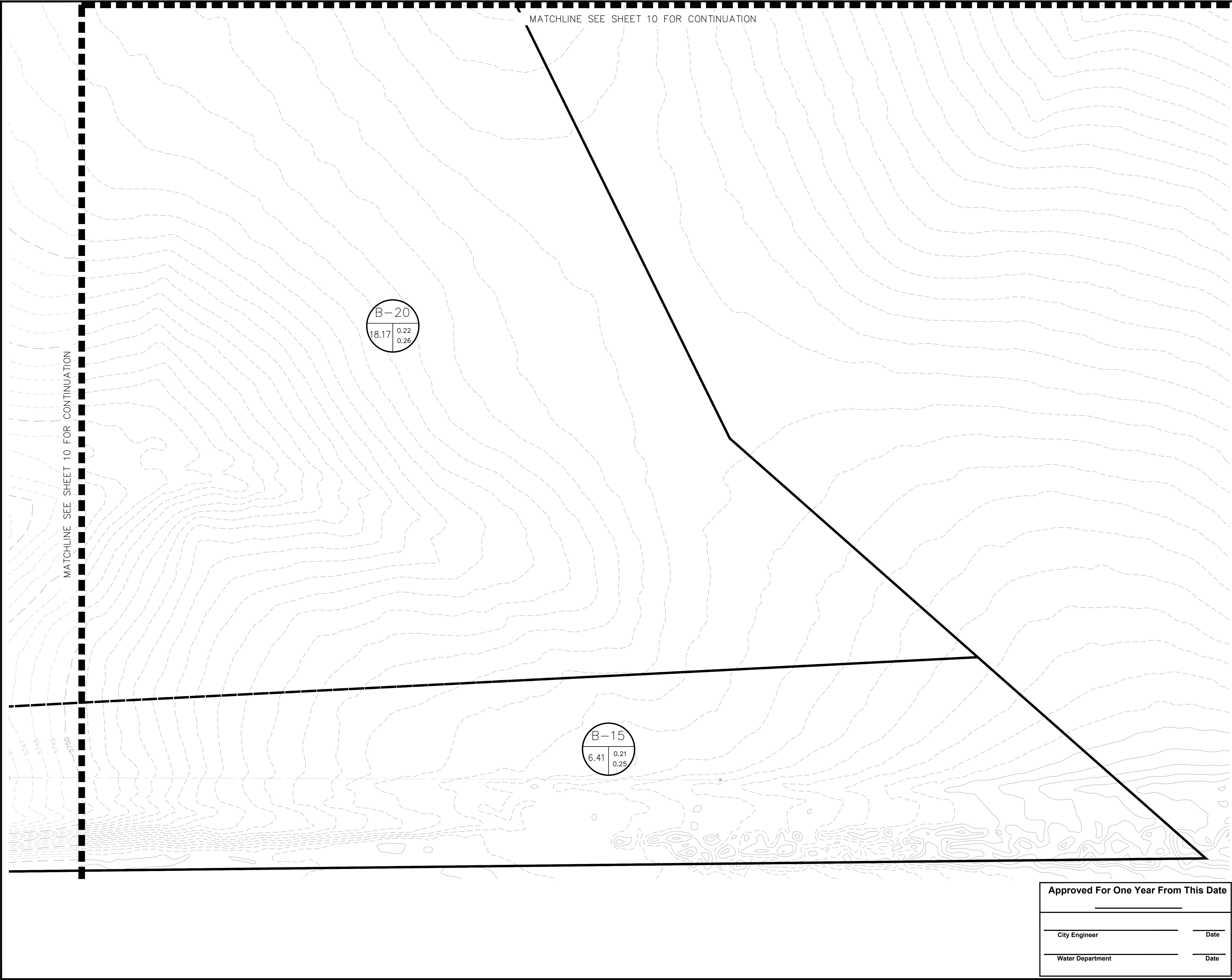
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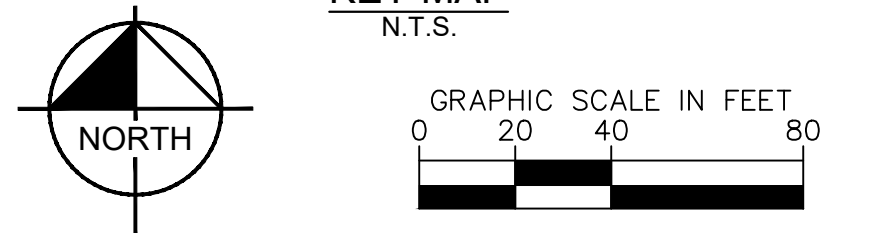
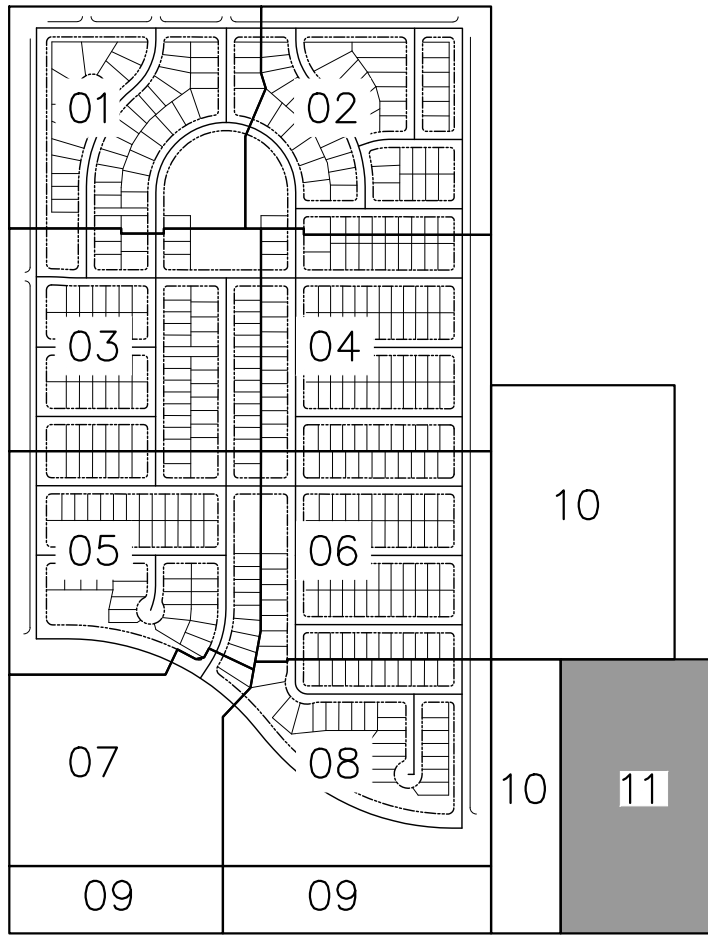
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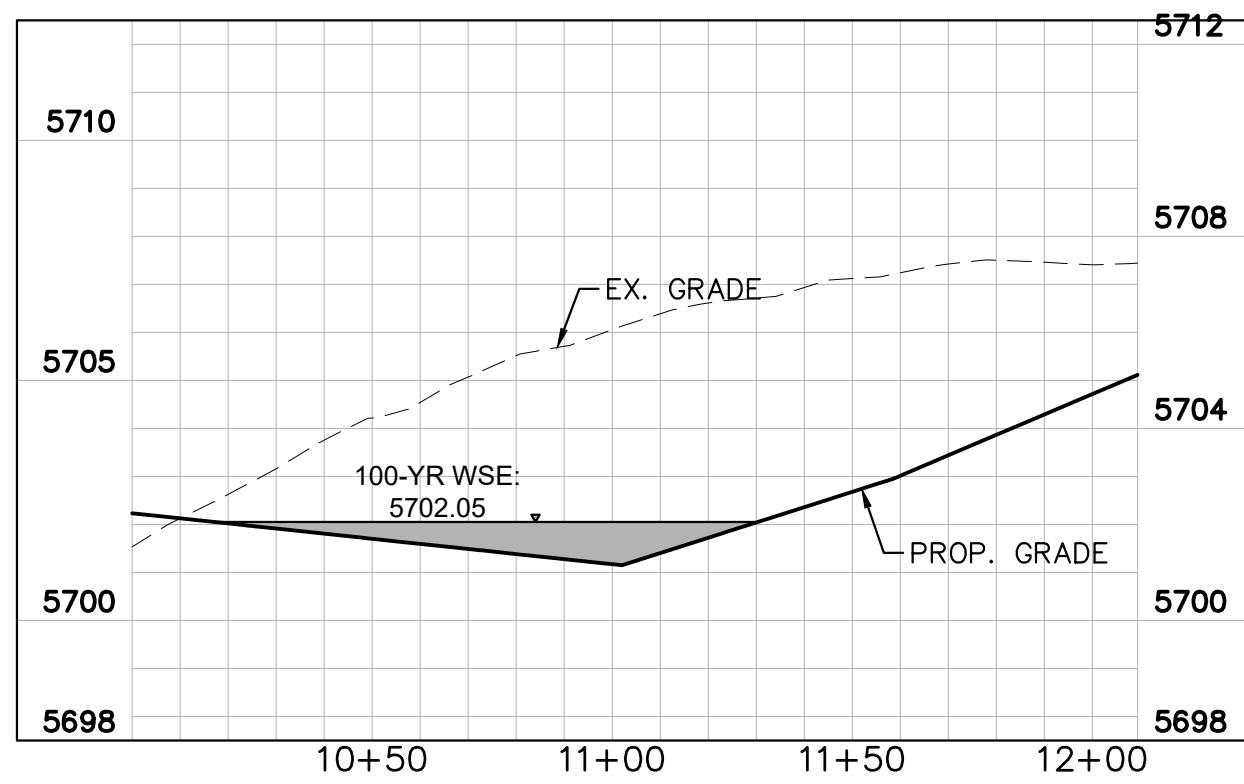
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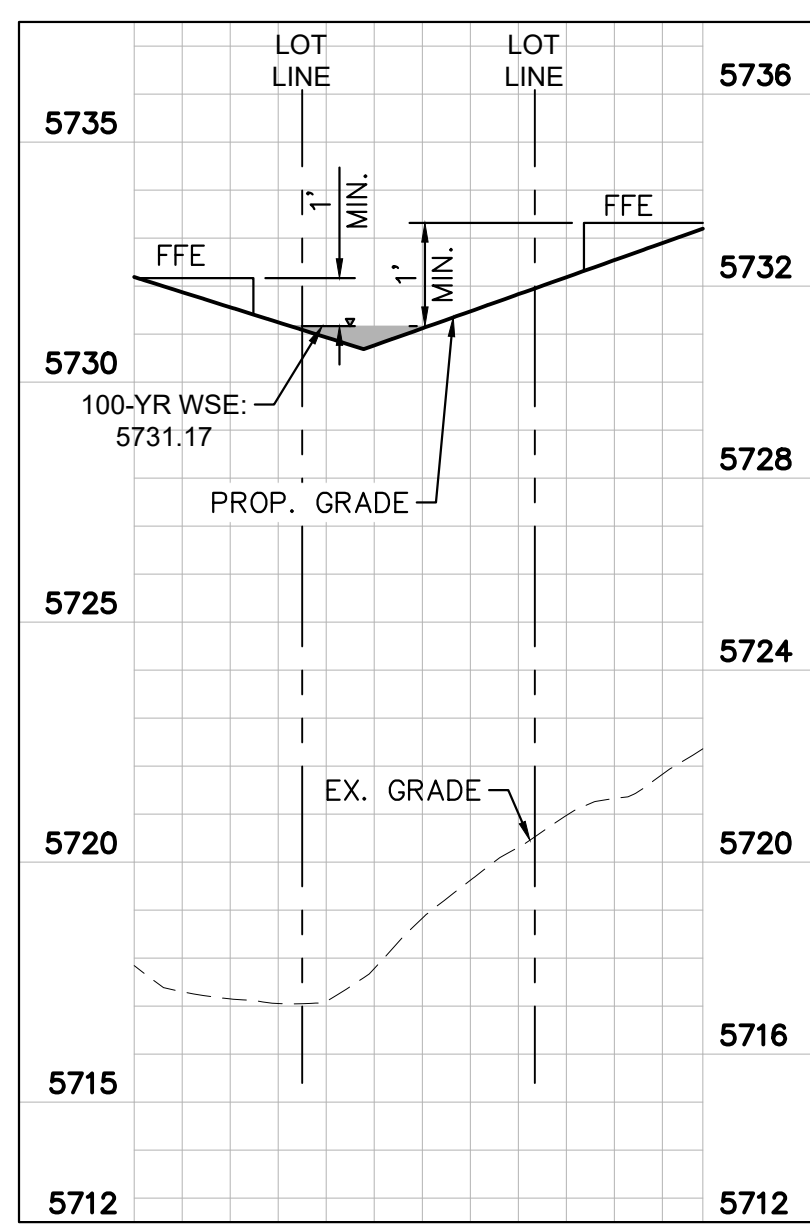
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MAY 2022		
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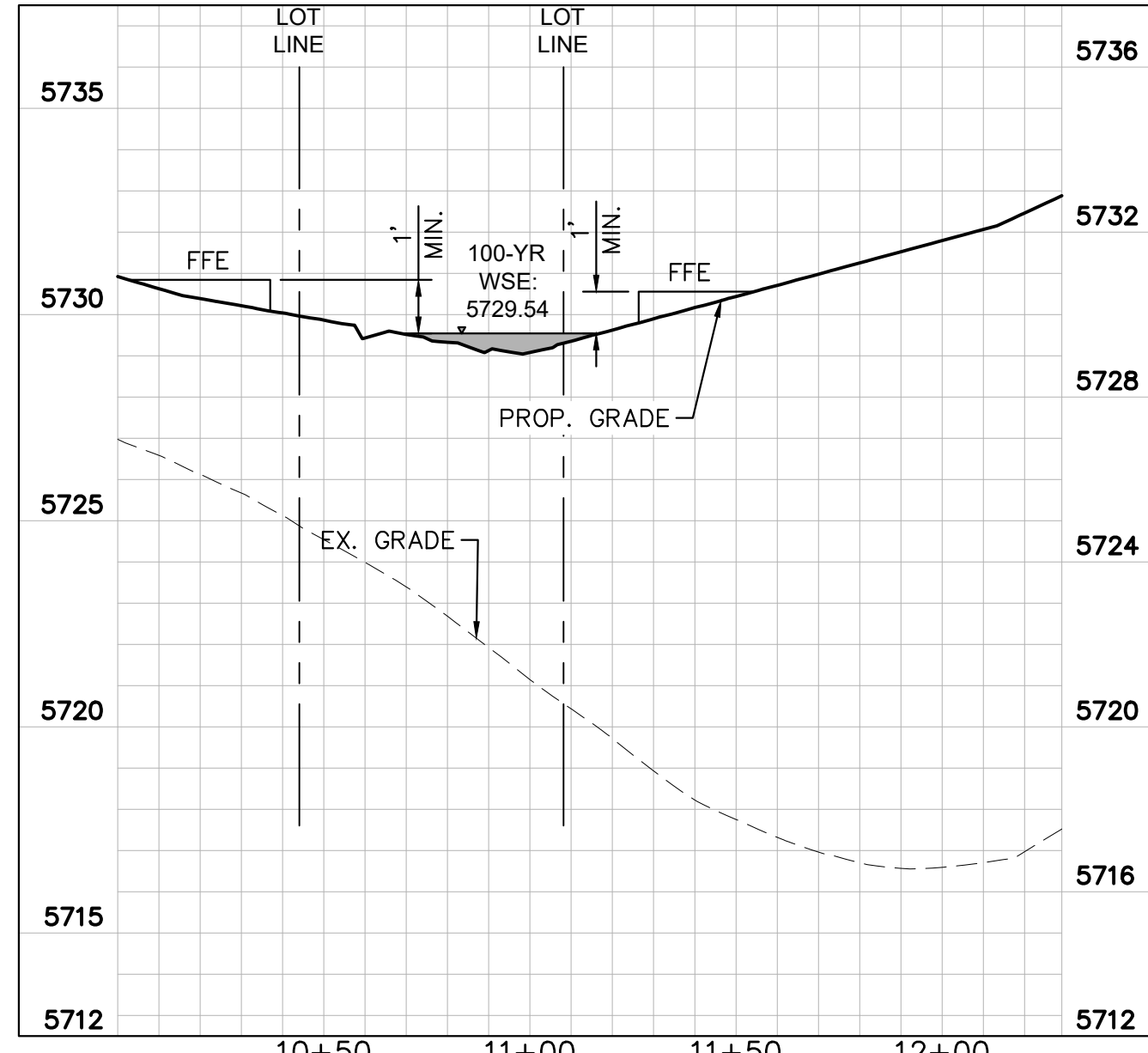
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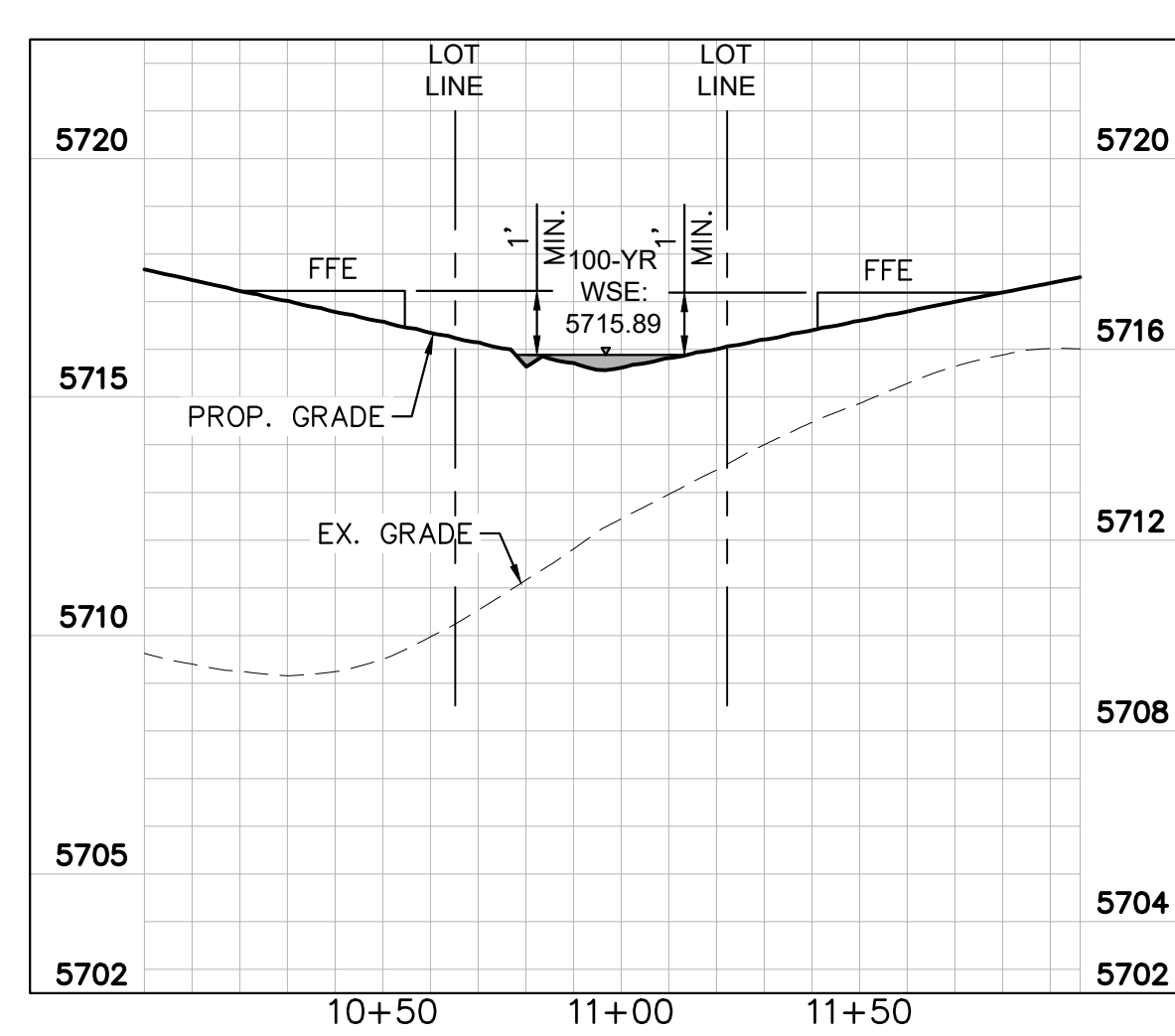
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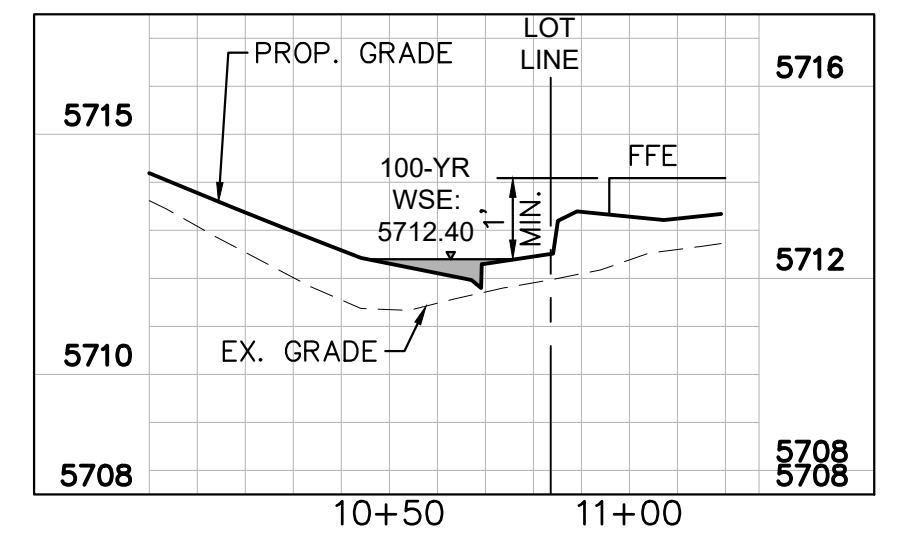
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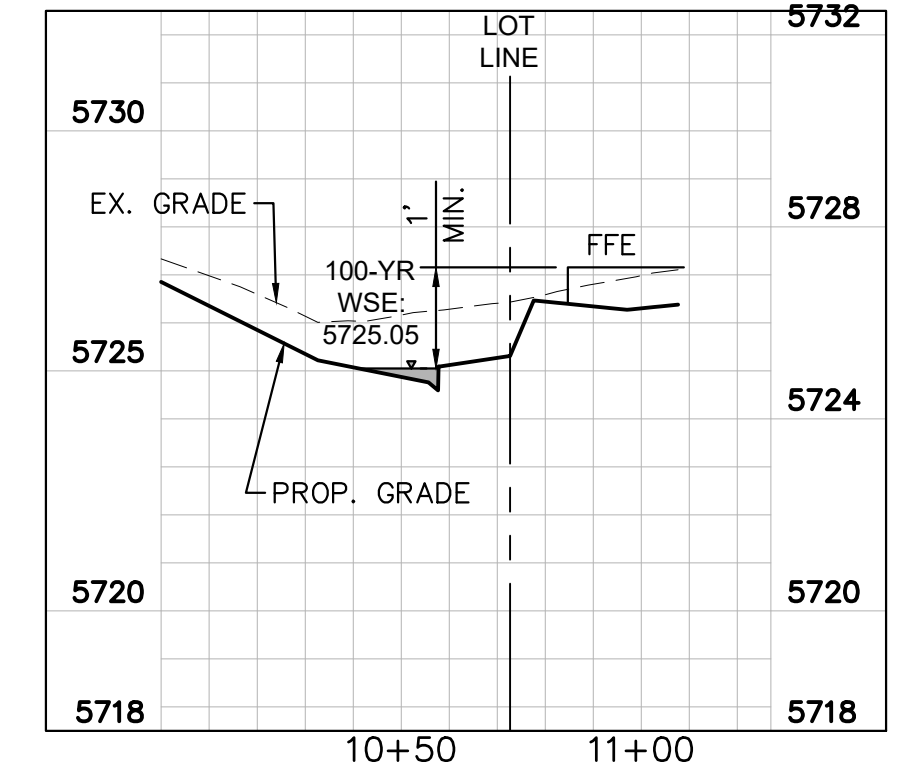
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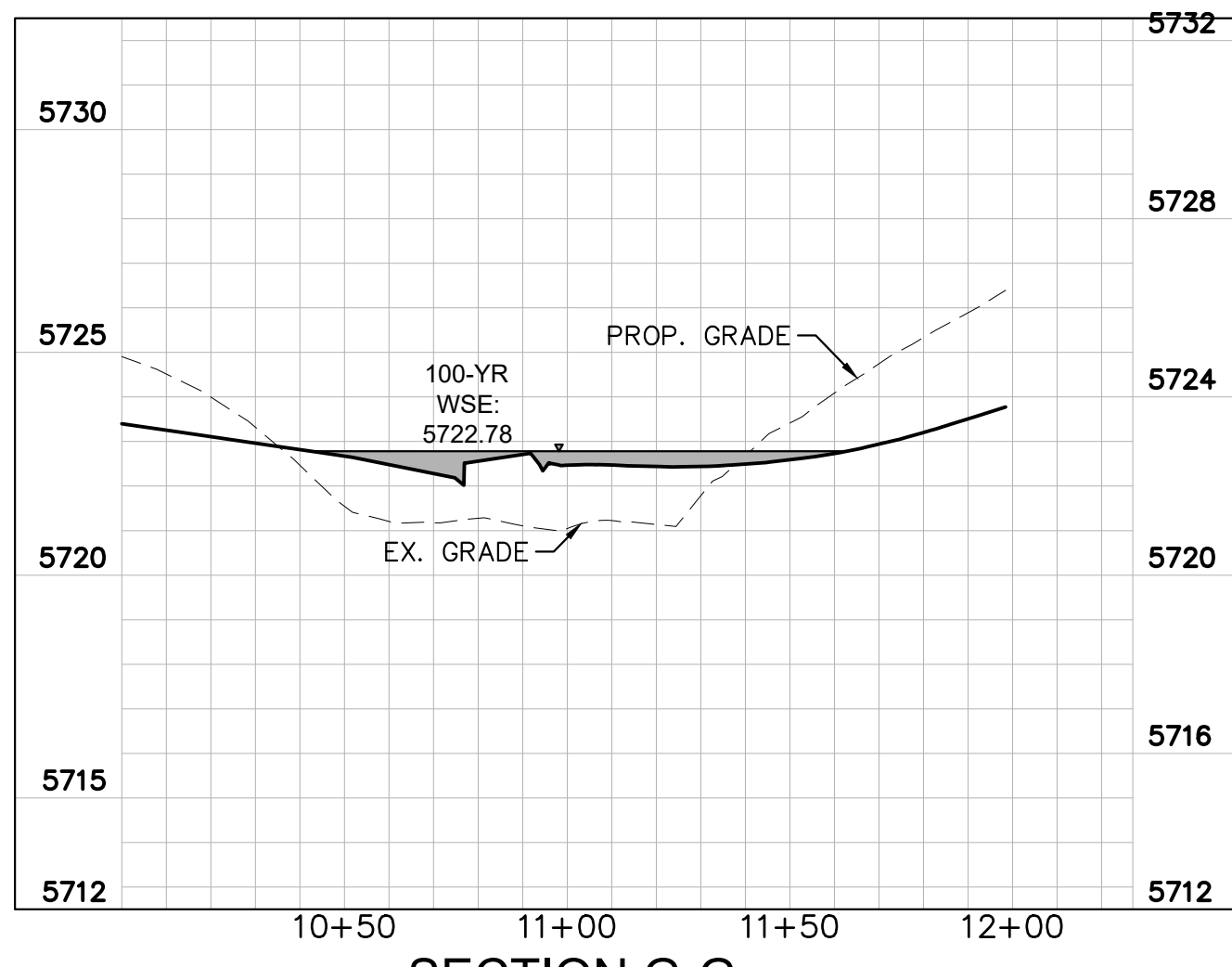
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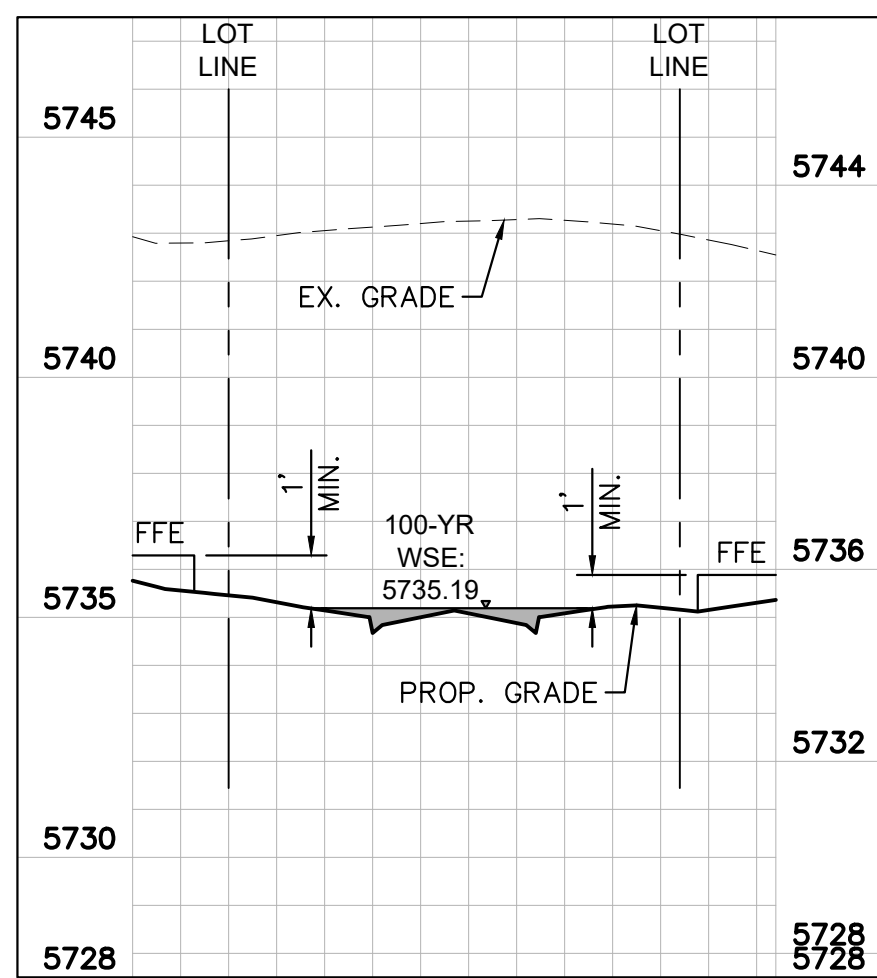
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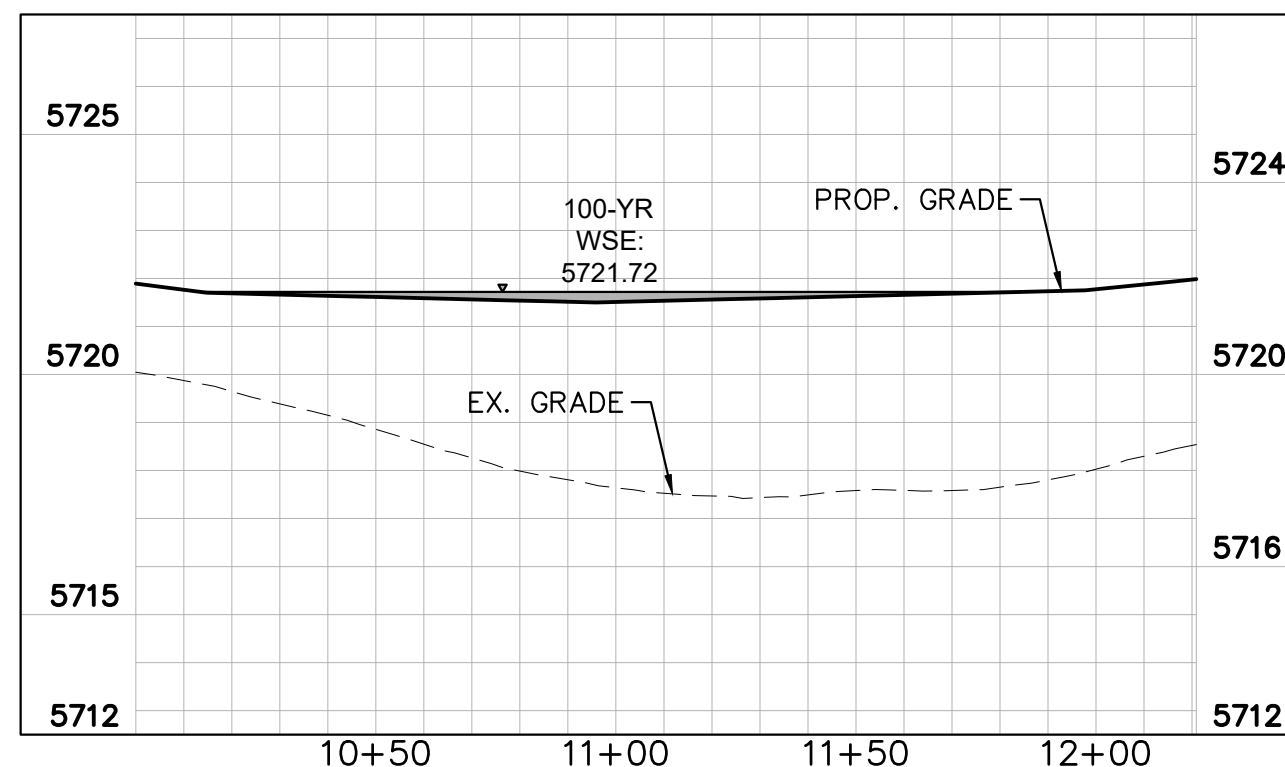
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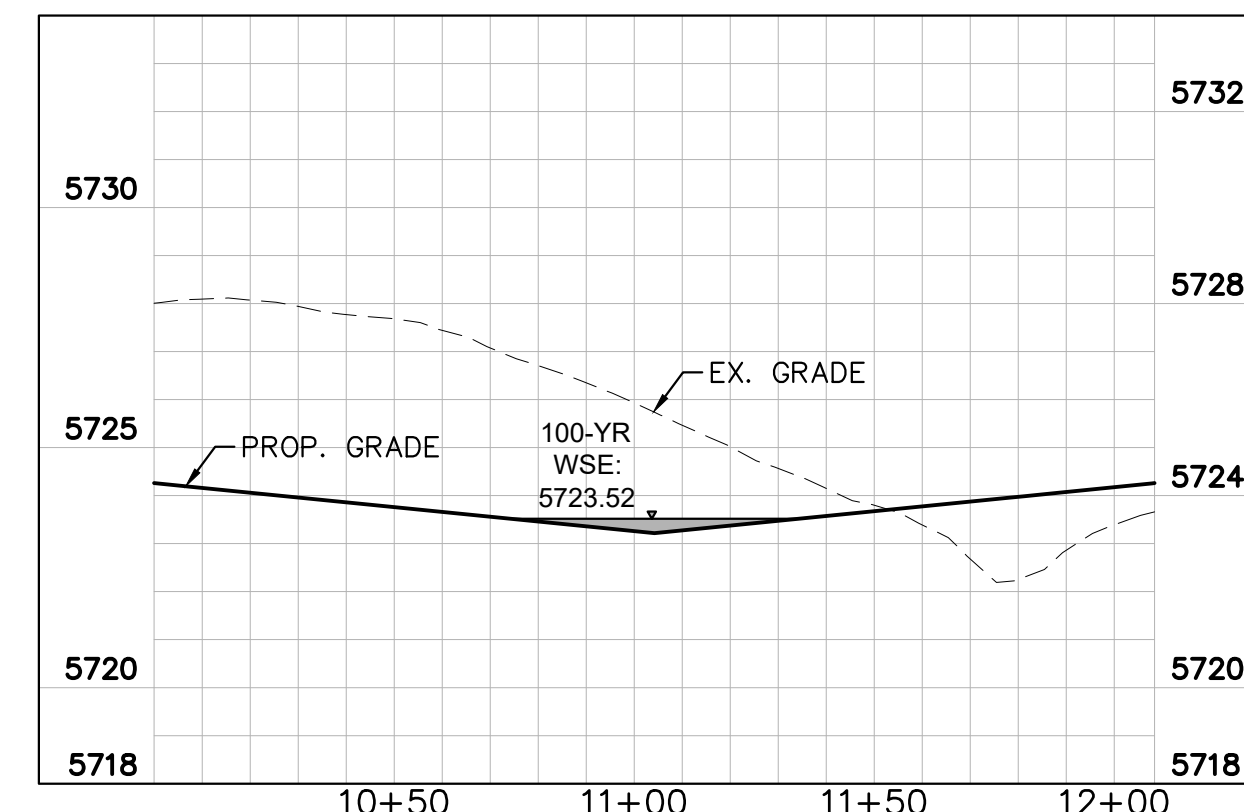
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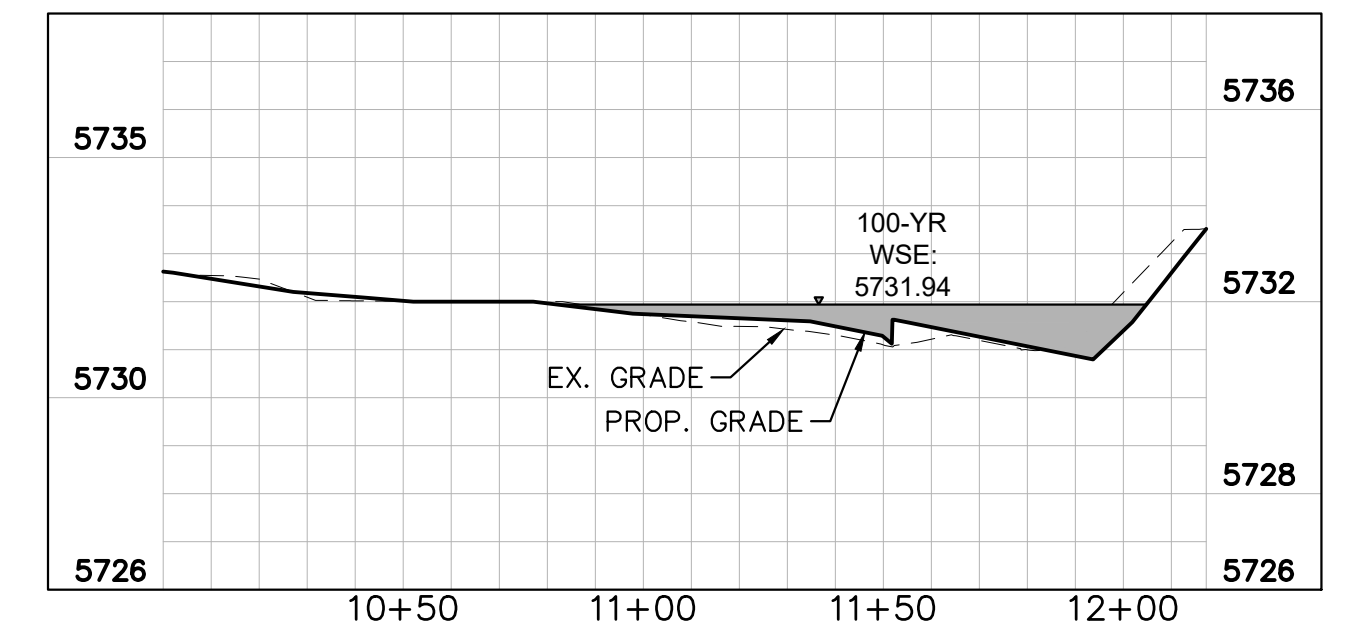
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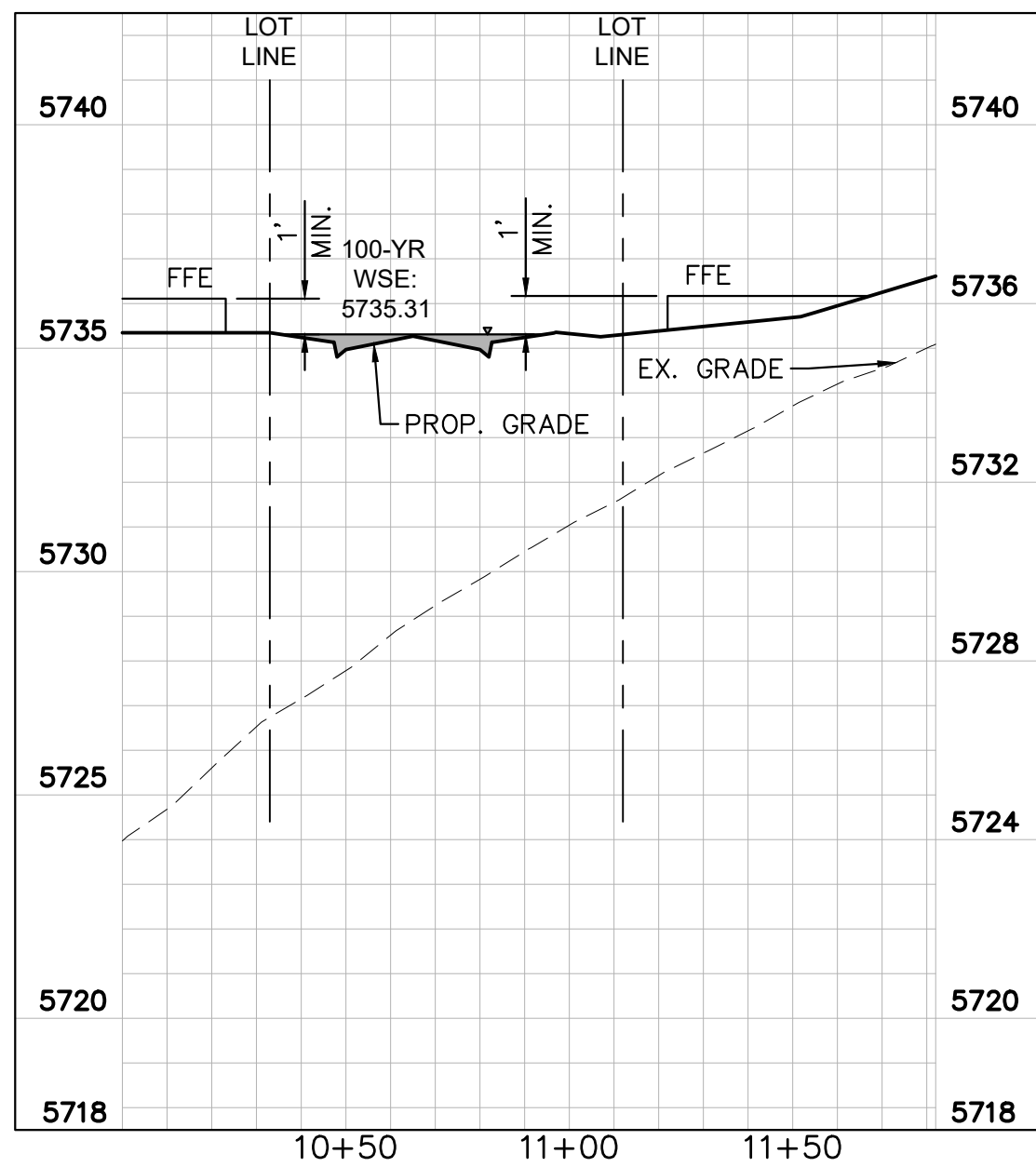
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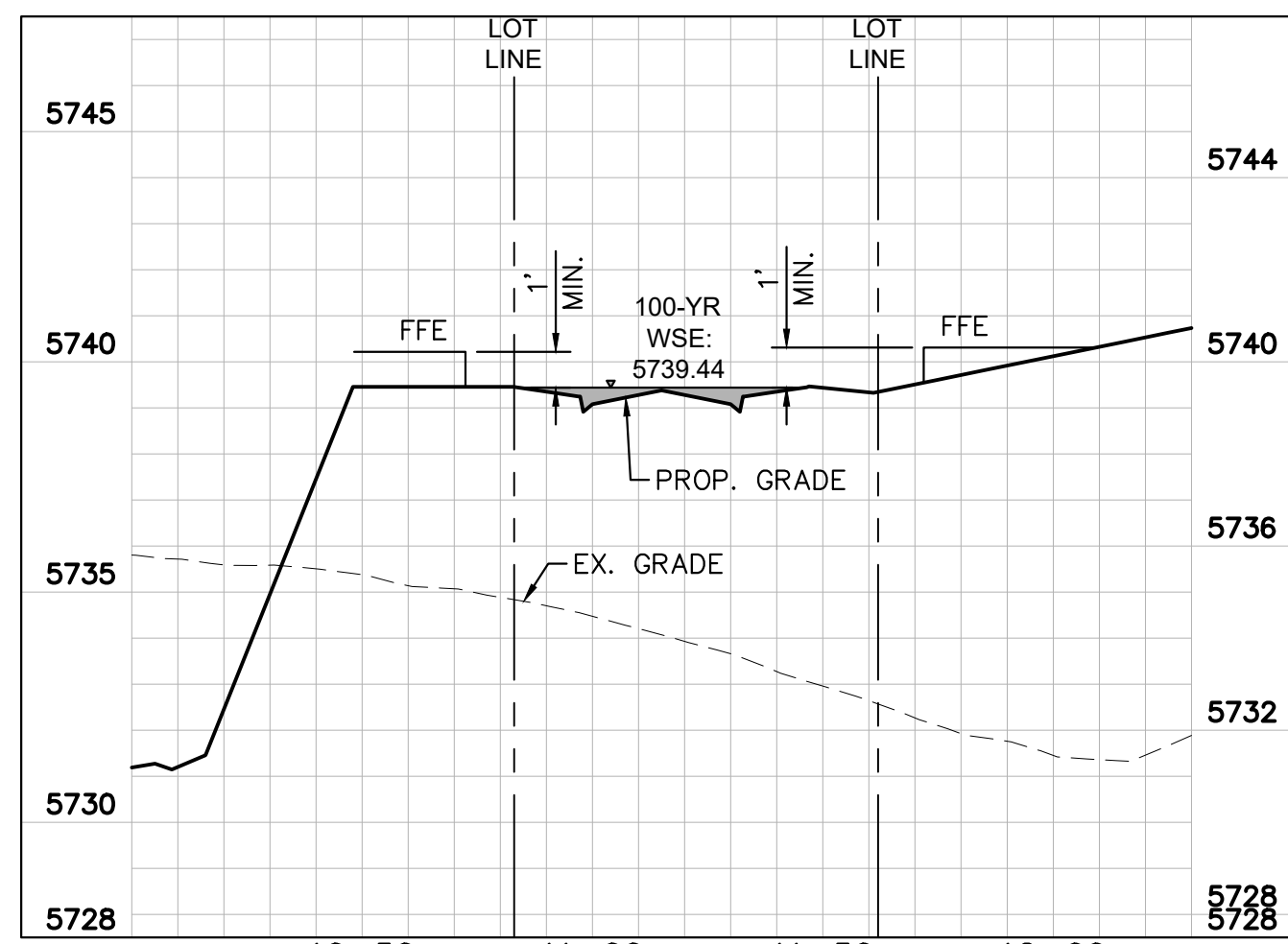
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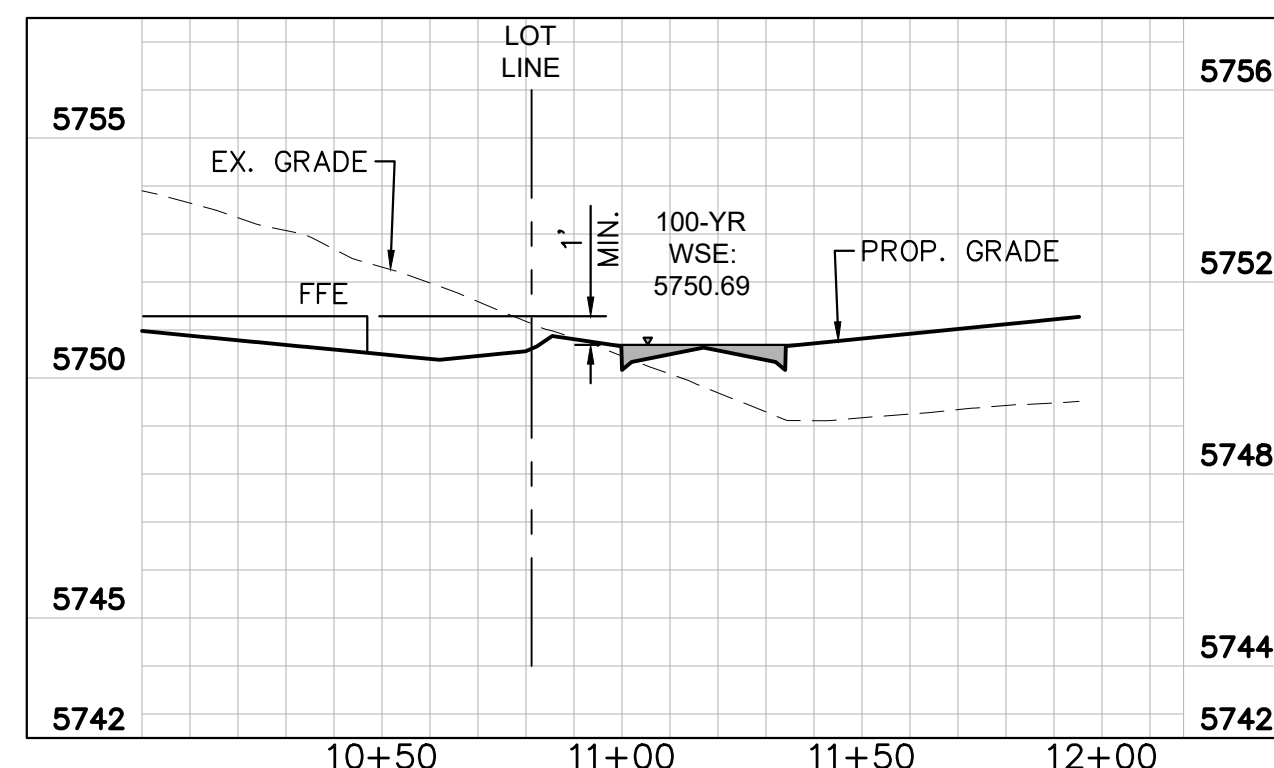
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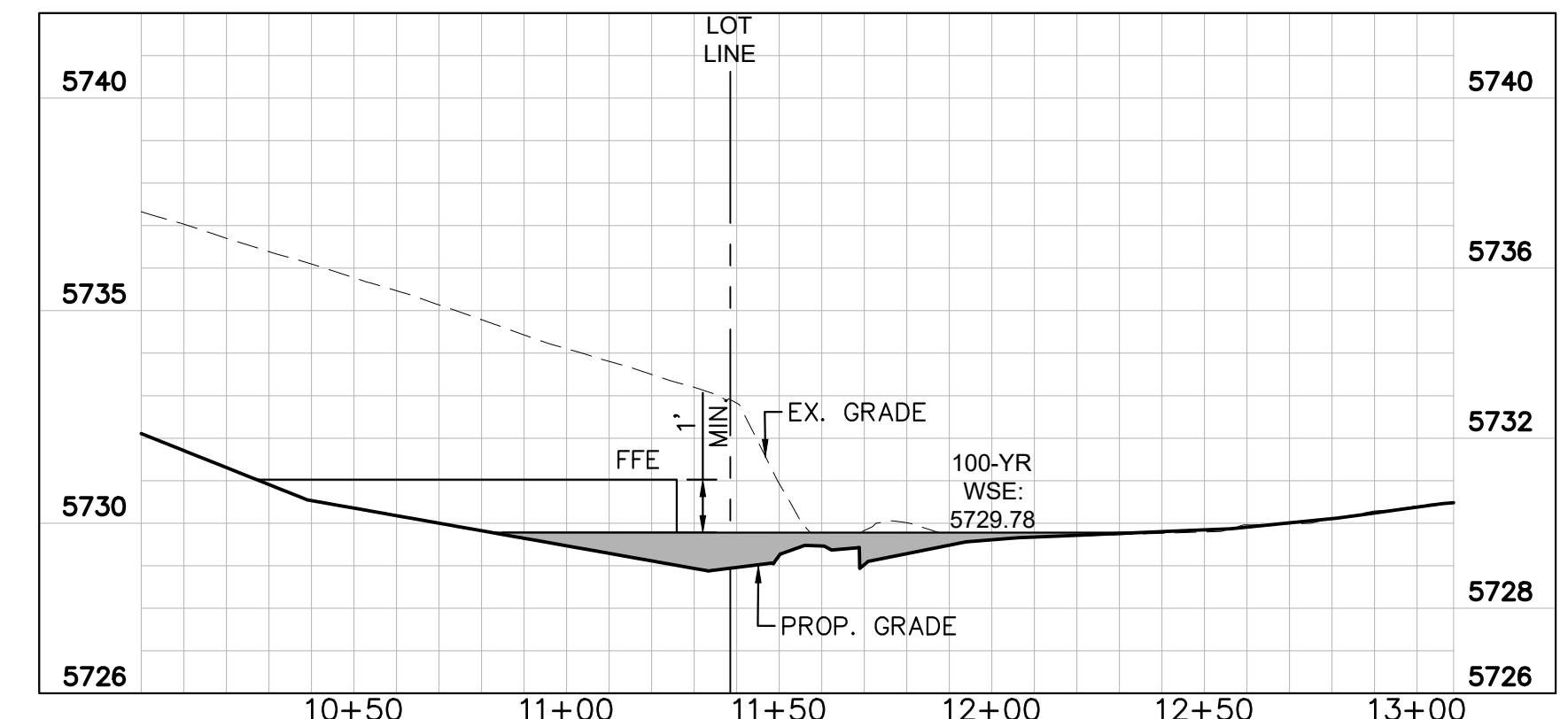
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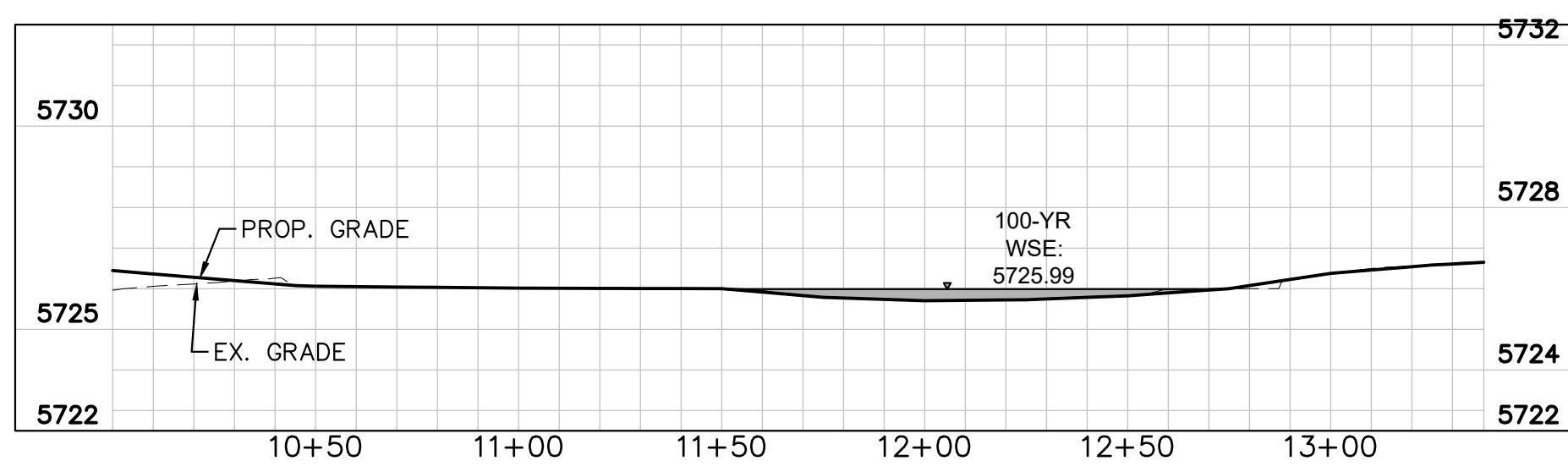
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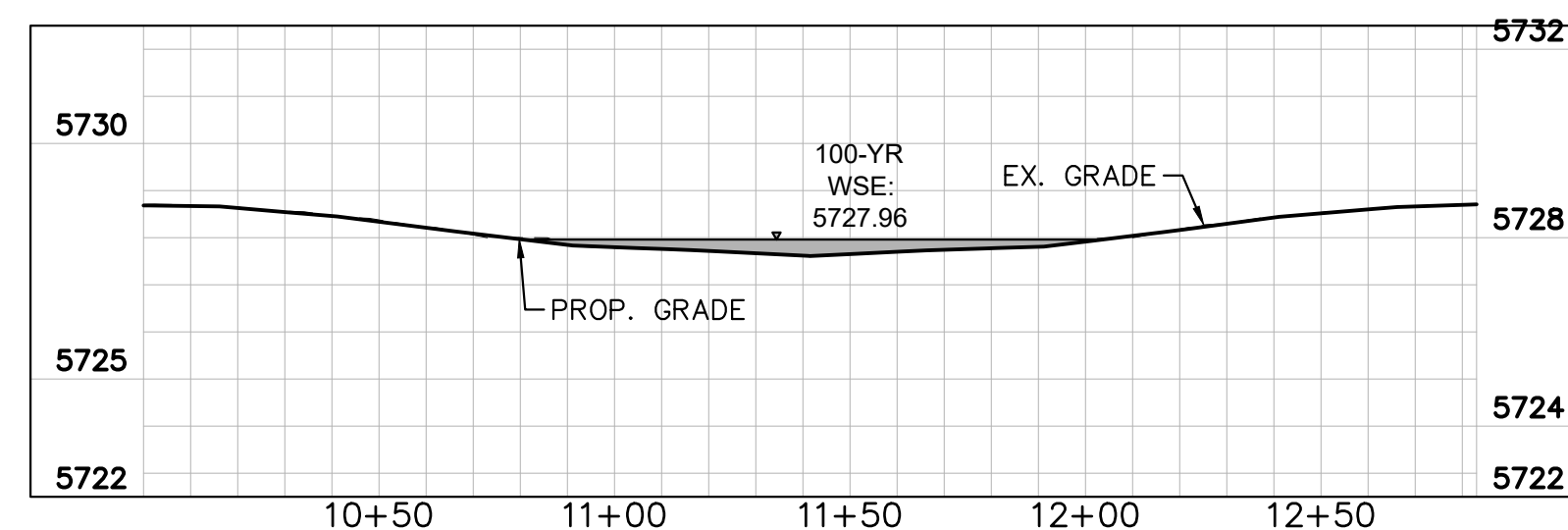
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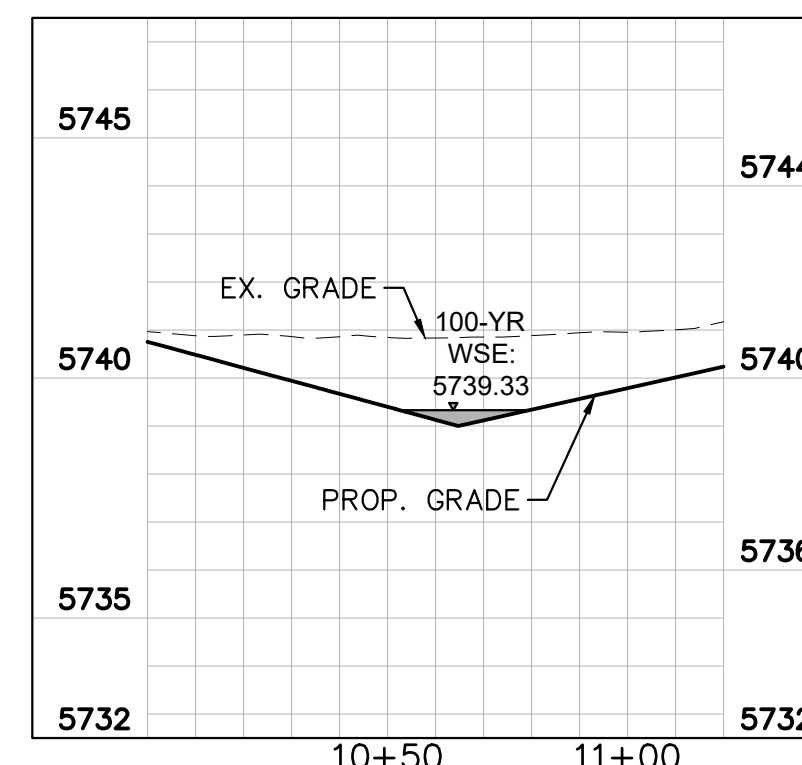
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SECTION O-O




SECTION P-P



SECTION N-N

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Water Department	Date



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PRELIMINARY DRAINAGE PLAN

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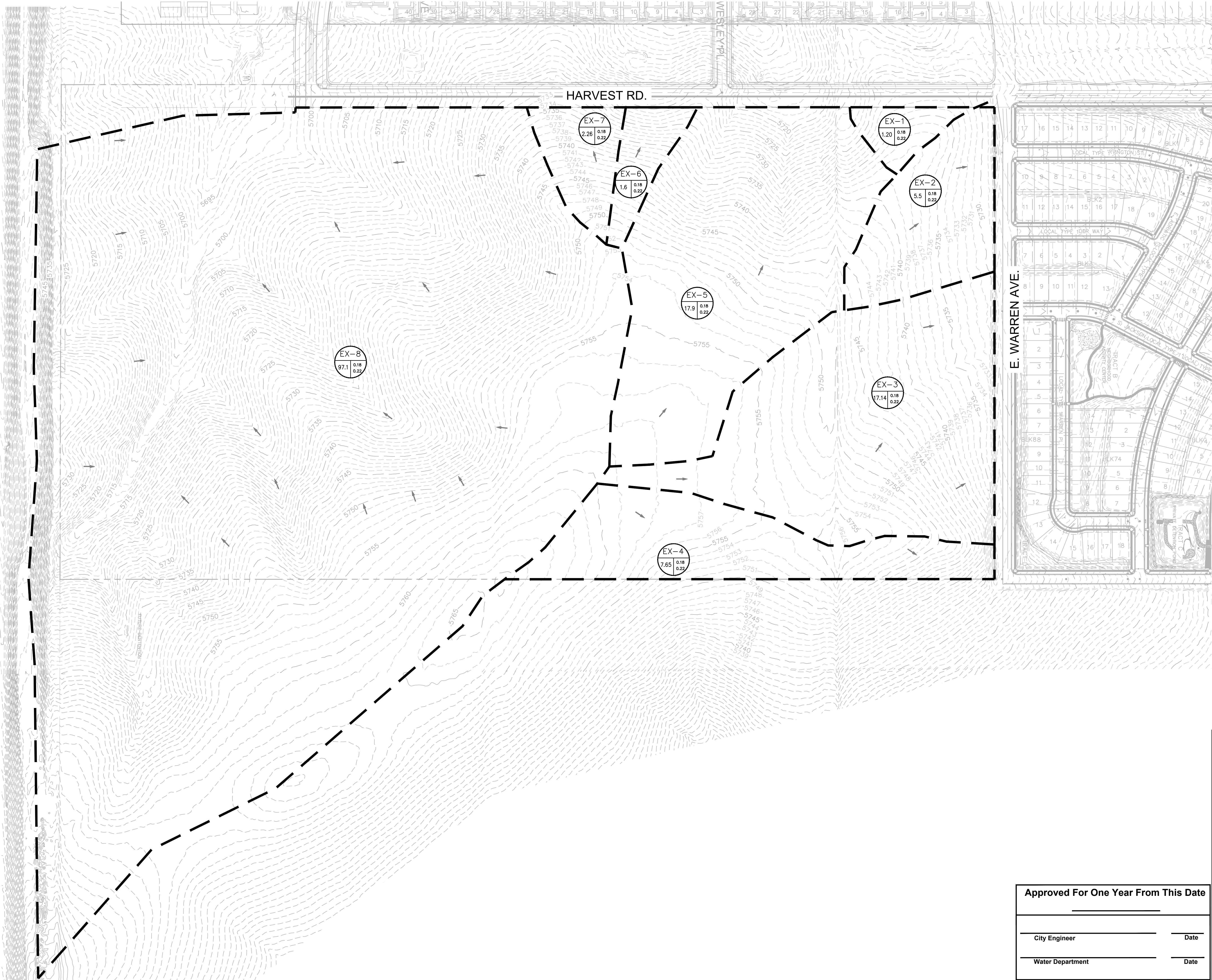
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PROJECT NO. 196284001		
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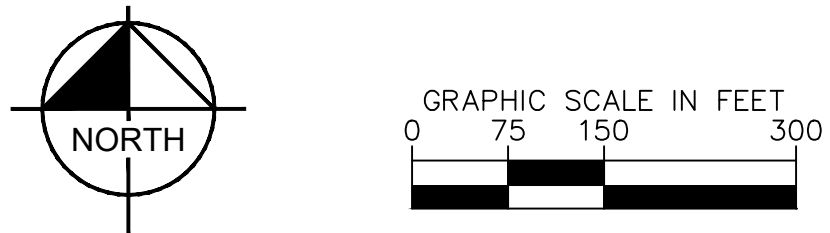
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XREFS: XTB-84001-PA5.dwg; OTHERS: 84001.XTB-84001-PA5.dwg; CDD-84001-PA5.dwg; CDD-84001-PA5.dwg
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- # = DESIGN POINT
- PROPOSED BASIN BOUNDARY
- PROPOSED FLOW ARROW



HARVEST CROSSING PA5
EXISTING DRAINAGE

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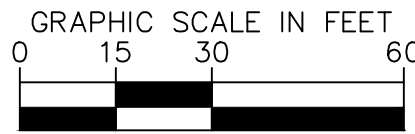
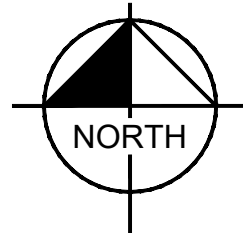
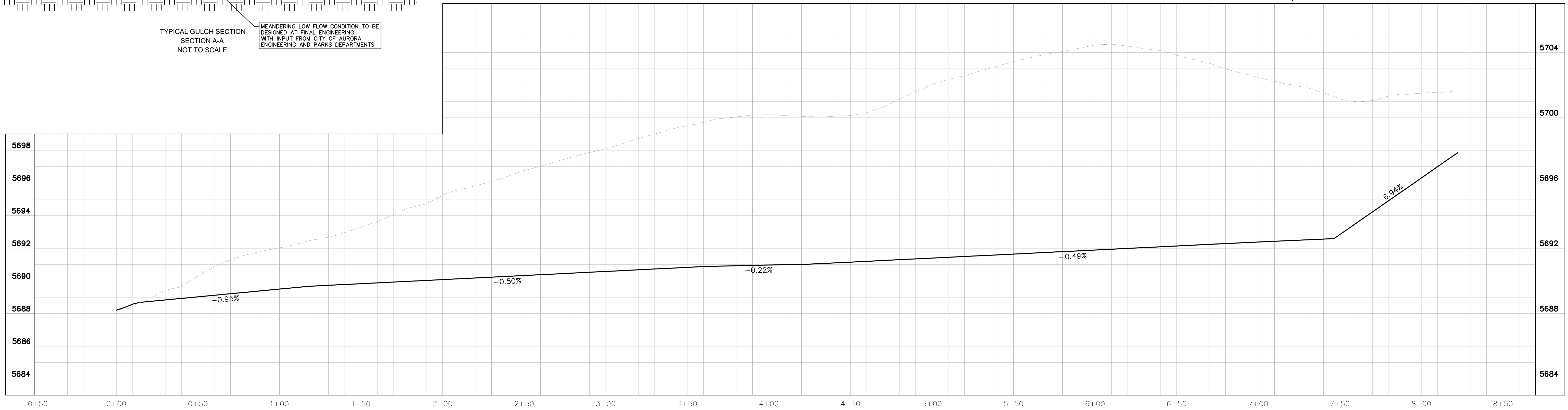
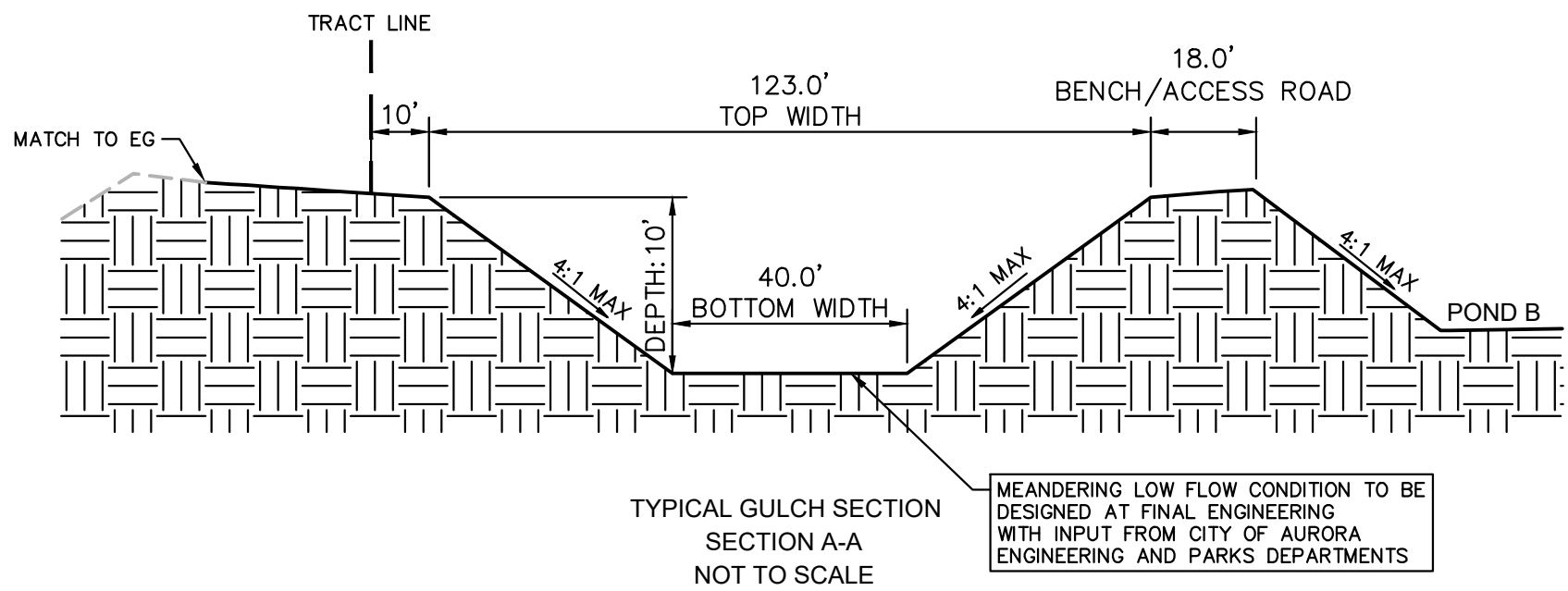
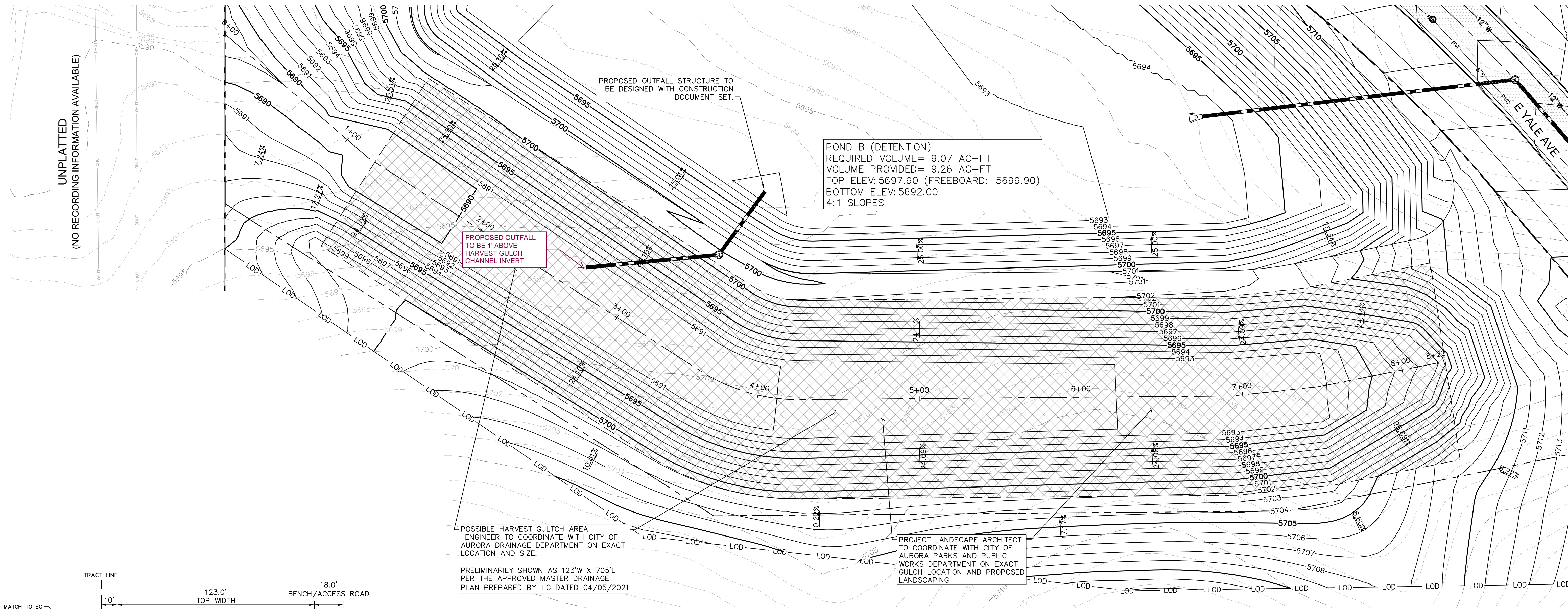
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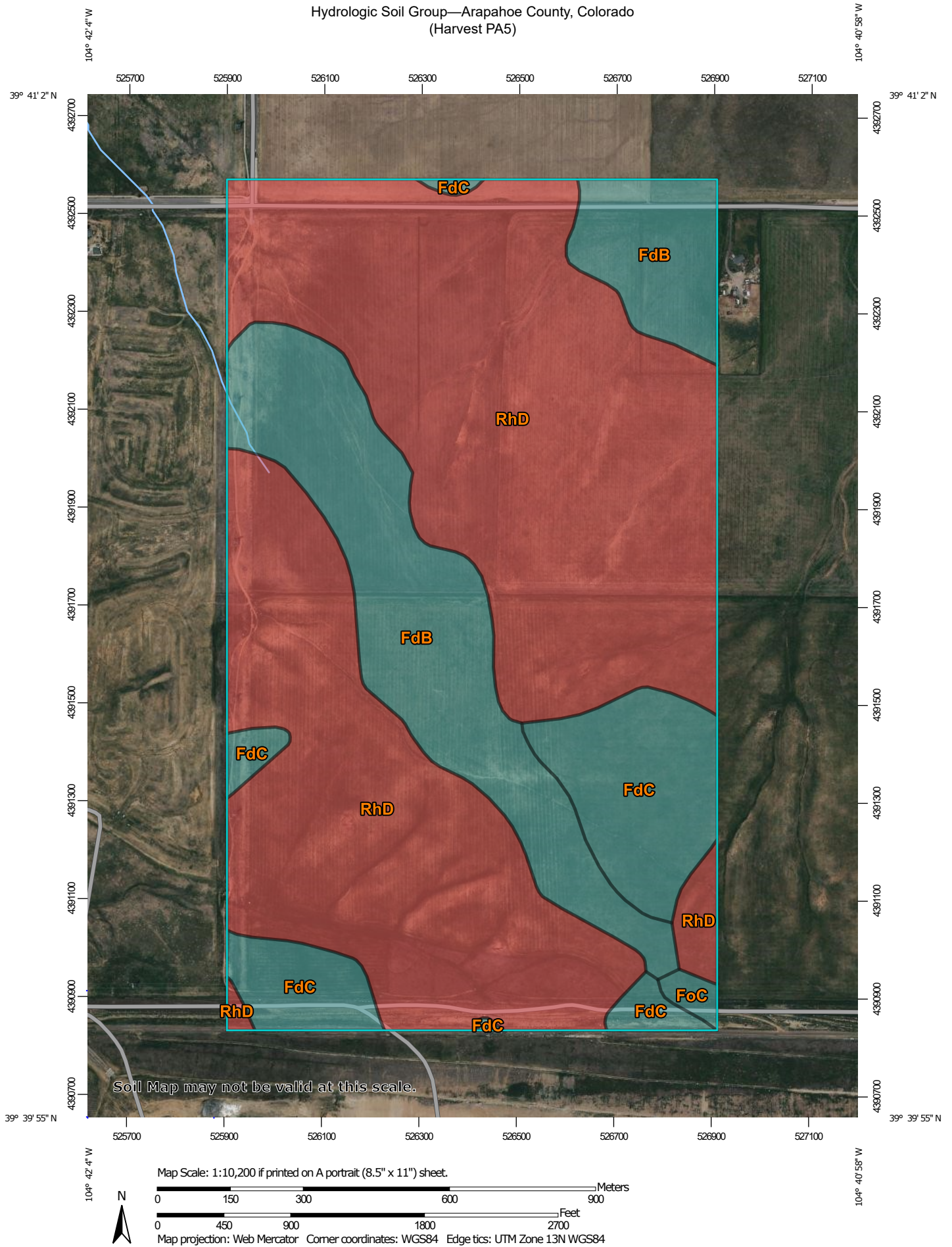
of 11 shts

CASE NO.: TBD



Appendix B- NRCS Soils Report and FEMA MAPS

Hydrologic Soil Group—Arapahoe County, Colorado
(Harvest PA5)



Hydrologic Soil Group—Arapahoe County, Colorado
(Harvest PA5)

MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Arapahoe County, Colorado
 Survey Area Data: Version 17, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 9, 2021—Jun 12, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
FdB	Fondis silt loam, 1 to 3 percent slopes	C	92.1	21.2%
FdC	Fondis silt loam, 3 to 5 percent slopes	C	48.9	11.3%
FoC	Fondis-Colby silt loams, 3 to 5 percent slopes	C	2.2	0.5%
RhD	Renohill-Buick loams, 3 to 9 percent slopes	D	290.8	67.0%
Totals for Area of Interest			434.0	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMCO-3, #0202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

Base map information shown on this FIRM was provided by the Arapahoe County and Cities of Aurora and Littleton GIS depts. The coordinate system used for production of the digital FIRM is Universal Transverse Mercator, Zone 13N, referenced to the North American Datum of 1983 and the GRS 80 spheroid, Western Hemisphere.

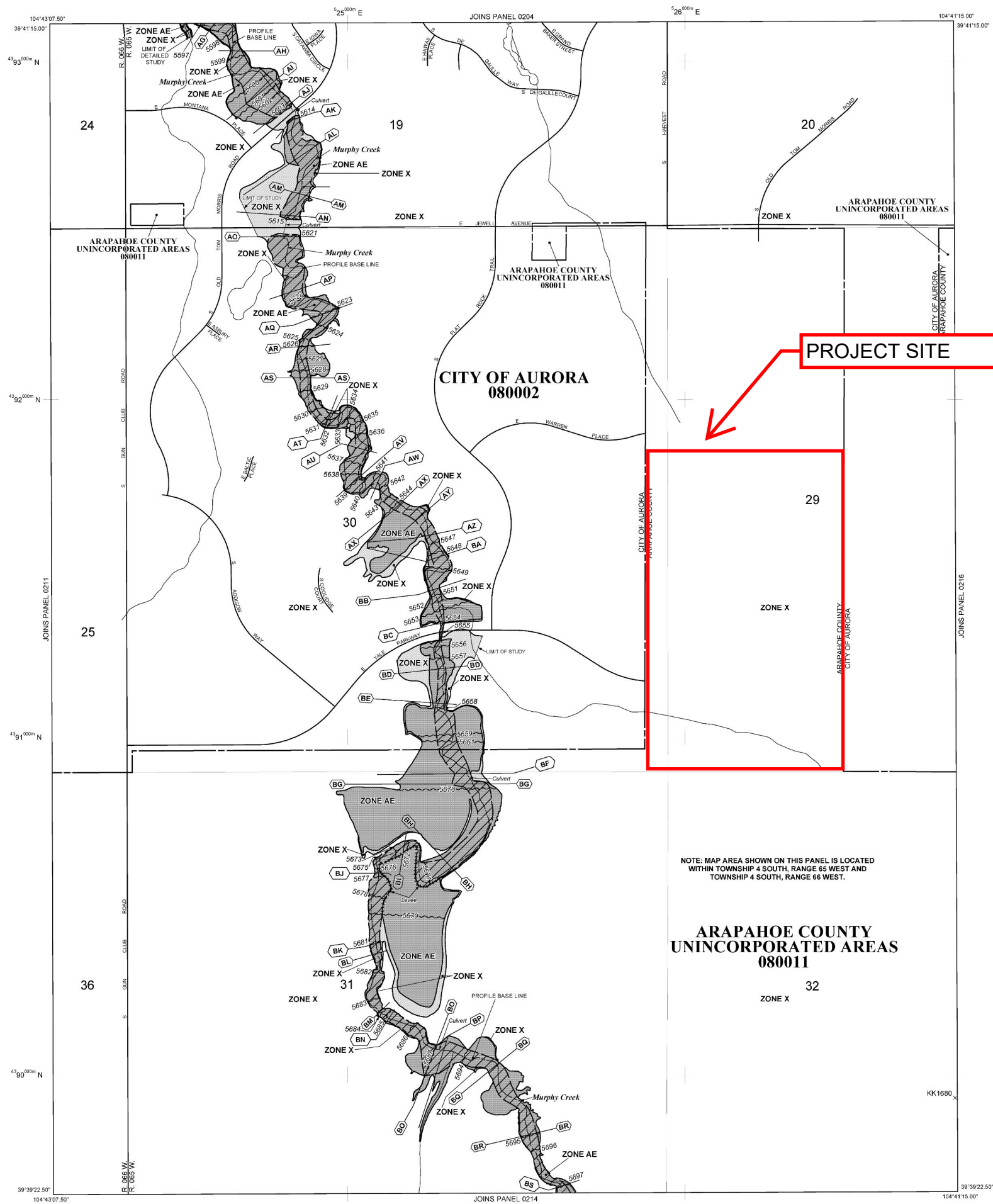
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msc.fema.gov/>.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2827) or visit the FEMA website at <http://www.fema.gov/>.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

Base Flood Elevation line and value; elevation in feet*

Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

Cross section line

Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

1000-meter Universal Transverse Mercator grid ticks, zone 13

5000-foot grid ticks: New York State Plane coordinate system, east zone (FIPSZONE 3101), Transverse Mercator

Bench mark (see explanation in Notes to Users section of this FIRM panel)

River Mile

MAP REPOSITORIES

Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

April 17, 1989

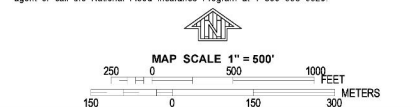
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

March 4, 1991 December 3, 1992 August 15, 1995

December 17, 2010 - to update map format, to change Special Flood Hazard Areas, and to change Base Flood Elevations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



PANEL 0212K

FIRM FLOOD INSURANCE RATE MAP

ARAPAHOE COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 212 OF 725

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY NUMBER PANEL SUFFIX

ARAPAHOE COUNTY 080011 0212 K

AURORA, CITY OF 080002 0212 K

Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 08005C0212K

MAP REVISED DECEMBER 17, 2010

Federal Emergency Management Agency

Appendix C- Hydrologic Computations

IMPERVIOUS CALCS

<u>Basin D (North Outfall: Existing Storm)</u>			
Type	Area (Ac)	Imperv Value	Result
Lots	9.73	45.0	437.8
Local Row	0.84	74.8	62.7
Landscape	2.43	5.0	12.1
Warren	0.68	76.9	51.9
Sidewalk	0.08	100.0	7.8
Total	13.74		572.3
	Total	41.6	
<u>Basin C (North East Outfall: Existing Storm)</u>			
Type	Area (Ac)	Imperv Value	Result
Lots	10.29	45.0	462.8
Local Row	0.47	74.8	34.9
Landscape	0.20	5.0	1.0
Warren	0.16	76.9	12.4
Kewaunee	2.56	73.3	187.7
Sidewalk	0.01	100.0	1.3
Total	13.69		700.1
	Total	51.1	
<u>Basin A (Outfall: West Pond)</u>			
Type	Area (Ac)	Imperv Value	Result
Lots	16.09	45.0	724.0
Local Row (Full)	2.44	74.8	182.3
Landscape	4.50	5.0	22.5
Harvest	1.27	79.8	101.5
Sidewalk	0.03	100.0	2.7
Total	24.33		1033.0
	Total	42.5	
<u>Basin B (Outfall: South Pond)</u>			
Type	Area (Ac)	Imperv Value	Result
Lots	39.67	45.0	1785.3
Local Row (Full)	3.42	74.8	255.7
Landscape	35.73	5.0	178.7
Harvest	0.70	79.8	55.6
Yale	5.07	62.9	318.7
Sidewalk	0.04	100.0	3.7
Kewaunee	2.11	73.3	154.6
Total	86.74		2752.4
	Total	31.7	
<u>Basin E (NorthWestern Outfall: Existing Storm)</u>			
Type	Area (Ac)	Imperv Value	Result
Lots	3.90	45.0	175.3
Local Row	0.04	74.8	2.7
Landscape	0.25	5.0	1.2
Harvest	0.20	79.8	16.2
Warren	0.45	76.9	34.9
Sidewalk	0.06	100.0	5.8
Total	4.90		236.1
	Total	48.2	
<u>Basin OS-1 (Outfall: South Gulch)</u>			
Type	Area (Ac)	Imperv Value	Result
Lots	0.00	45.0	0.0
Local Row (Full)	0.00	74.8	0.0
Landscape	12.21	5.0	61.1
Harvest	0.00	79.8	0.0
Yale	0.00	62.9	0.0
Sidewalk	0.00	100.0	0.0
Kewaunee	0.00	73.3	0.0
Total	12.21		61.1
	Total	5.00	

WEIGHTED IMPERVIOUSNESS AND C VALUES FOR ROAD CROSS SECTIONS

		Coefficient					
Weighted ROW Values			C2	C5	C10	C100	
Local		Length	Imperv Value				
	PV	47	100	0.87	0.88	0.9	0.93
	LS	17	5	0.18	0.19	0.2	0.22
	Total	74.76563		0.69	0.70	0.71	0.74
							Weighted
Harvest		Length	Imperv Value				
	PV	31.5	100	0.87	0.88	0.9	0.93
	LS	8.5	5	0.18	0.19	0.2	0.22
	Total	79.8125		0.72	0.73	0.75	0.78
							Weighted
Warren		Length	Imperv Value				
	PV	26.5	100	0.87	0.88	0.9	0.93
	LS	8.5	5	0.18	0.19	0.2	0.22
	Total	76.92857		0.70	0.71	0.73	0.76
							Weighted
Kewaunee		Length	Imperv Value				
	PV	46	100	0.87	0.88	0.9	0.93
	LS	18	5	0.18	0.19	0.2	0.22
	Total	73.28125		0.68	0.69	0.70	0.73
							Weighted
Yale		Length	Imperv Value				
	PV	67	100	0.87	0.88	0.9	0.93
	LS	43	5	0.18	0.19	0.2	0.22
	Total	62.86364		0.60	0.61	0.63	0.65
							Weighted

DATE: 6/6/2022

SOL: 1																Assum predominant NRCS Soil Type D				
LAND USE		Single-Family AREA	Local AREA	Harvest AREA	Waren AREA	Keownse AREA	Yale AREA	Paved Area AREA	Landscape Tract AREA											
2-YEAR COEFF	0.40	0.69	0.72	0.70	0.68	0.60	0.87	0.18												
5-YEAR COEFF	0.45	0.70	0.73	0.71	0.69	0.61	0.88	0.19												
10-YEAR COEFF	0.50	0.71	0.75	0.73	0.70	0.63	0.90	0.20												
100-YEAR COEFF	0.60	0.74	0.78	0.76	0.73	0.65	0.93	0.22												
IMPERVIOUS %	45%	74.77%	79.81%	76.93%	73.28%	62.86%	100.00%	5%												
DESIGN BASIN	DESIGN POINT	Single-Family AREA (AC)	Local AREA (AC)	Harvest AREA (AC)	Waren AREA (AC)	Keownse AREA (AC)	Yale AREA (AC)	Paved Area AREA (AC)	Landscape Tract AREA (AC)	TOTAL AREA (AC)	C(2)	C(5)	C(10)	C(100)	Imp %					
Basin																				
A-05	A5								1.47	1.47	0.18	0.19	0.20	0.22	5%					
A-10	A10	0.64	0.16						0.80	0.46	0.50	0.54	0.63	51%						
A-15	A15	2.40						0.03	0.12	2.55	0.40	0.44	0.49	0.59	44%					
A-20	A20	0.01	0.49						0.11	0.61	0.61	0.62	0.65	62%						
A-25	A25	1.66	0.20						1.86	0.43	0.48	0.52	0.62	48%						
A-30	A30	0.81							0.81	0.40	0.45	0.50	0.60	45%						
A-35	A35	0.67	0.19						2.93	0.26	0.30	0.34	0.38	19%						
A-40	A40	3.51	0.34	0.17	0.43	0.44	0.48	0.52	0.61	4.88	0.48	0.52	0.61	48%						
A-45	A45	0.50	0.34						0.84	0.52	0.55	0.59	0.66	57%						
A-46	A46							0.34	0.34	0.18	0.19	0.20	0.22	5%						
A-50	A50	1.29	0.03						1.44	0.13	0.14	0.15	0.17	42%						
A-55	A55	1.98		0.26					2.24	0.44	0.48	0.53	0.62	49%						
A-60	A60	0.31	0.05	0.75				0.12	1.12	0.60	0.62	0.64	0.69	65%						
A-65	A65	0.35	0.27						0.62	0.53	0.56	0.59	0.66	58%						
A-70	A70	2.03		0.26					2.29	0.44	0.48	0.53	0.62	49%						
D-15	D15	0.78	0.05		0.11			0.02	0.40	0.45	0.49	0.53	0.62	49%						
D-20	D20	0.89	0.05	0.20				0.01	1.24	0.46	0.50	0.54	0.62	49%						
D-25	D25	2.30	0.02	0.02				0.04	2.33	0.40	0.45	0.50	0.60	45%						
D-30	D30	2.14	0.18	0.34				0.04	2.27	0.44	0.48	0.52	0.60	48%						
D-35	D35	2.62							2.62	0.40	0.45	0.50	0.60	45%						
D-40	D40	0.55							0.55	0.40	0.45	0.50	0.60	45%						
D-45	D45								2.04	0.40	0.18	0.19	0.20	0.22	5%					
D-50	D50	0.45	0.55						2.04	0.56	0.59	0.62	0.68	61%						
C-10	C10	0.89	0.02		0.13	0.02		0.01	0.04	1.11	0.44	0.48	0.53	0.61	49%					
C-15	C15	1.39	0.02		0.04				1.44	0.41	0.46	0.51	0.61	46%						
C-25	C25	1.04	0.29		0.66			0.16	2.15	0.51	0.54	0.57	0.63	53%						
C-30	C30								0.68	0.68	0.69	0.70	0.73	73%						
C-35	C35								0.64	0.68	0.69	0.70	0.73	73%						
C-40	C40								0.60	0.69	0.70	0.71	0.74	75%						
C-45	C45	2.00	0.60						2.60	0.40	0.45	0.50	0.60	45%						
C-50	C50	2.89							2.89	0.40	0.45	0.50	0.60	45%						
C-55	C55	2.00	0.14						2.14	0.42	0.47	0.51	0.61	47%						
B-05	B5								0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
B-10	B10								3.85	0.18	0.19	0.20	0.22	5%						
B-15	B15								0.89	0.60	0.61	0.63	0.65	63%						
B-20	B20	0.04	1.00						0.81	0.21	0.22	0.23	0.25	10%						
B-25	B25								18.17	0.22	0.23	0.24	0.26	10%						
B-30	B30	0.08	0.01						2.27	0.13	0.30	0.31	0.32	0.34	21%					
B-35	B35							0.04	1.33	2.45	0.37	0.38	0.40	0.42	32%					
B-36	B36								0.06	0.60	0.60	0.61	0.65	63%						
B-40	B40	0.26		0.70				0.20	0.65	1.81	0.47	0.48	0.50	0.54	46%					
B-45	B45	1.91							1.91	0.40	0.45	0.50	0.60	45%						
B-50	B50	1.02						0.02	1.15	0.42	0.47	0.51	0.61	47%						
B-55	B55	2.55	0.06					0.04	2.66	0.40	0.45	0.50	0.60	45%						
B-60	B60	2.07	0.23						2.30	0.43	0.48	0.52	0.61	48%						
B-65	B65	2.87							2.87	0.40	0.45	0.50	0.60	45%						
B-70	B70	0.02	0.20						0.22	0.66	0.67	0.69	0.72	72%						
B-75	B75	0.99							0.99	0.40	0.45	0.50	0.60	45%						
B-80	B80	0.96	0.69						1.65	0.52	0.56	0.59	0.66	58%						
B-85	B85				0.56				4.39	0.24	0.25	0.26	0.28	14%						
B-90	B90	0.70			0.55				1.25	0.52	0.56	0.59	0.66	57%						
B-95	B95	1.40	0.00						1.40	0.40	0.45	0.50	0.60	45%						
B-100	B100	1.77	0.03						1.80	0.40	0.45	0.50	0.60	45%						
B-105	B105	1.50	0.02						1.52	0.40	0.45	0.50	0.60	45%						
B-110	B110	2.17							2.17	0.40	0.45	0.50	0.60	45%						
B-115	B115	1.94	0.26						2.22	0.44	0.48	0.53	0.62	49%						
B-120	B120	5.43	0.54					0.09	6.07	0.42	0.47	0.51	0.61	47%						
B-125	B125	3.66	0.33						3.99	0.42	0.47	0.52	0.61	47%						
B-130	B130	0.94							0.94	0.40	0.45	0.50	0.60	45%						
B-145	B145							1.09	1.09	0.18	0.19	0.20	0.22	5%						
B-146	B146		0.14						0.14	0.69	0.70	0.71	0.74	75%						
B-150	B150		0.14						0.14	0.69	0.70	0.71	0.74	75%						
B-155	B155	0.60	0.29						0.89	0.50	0.53	0.57	0.65	55%						
B-160	B160								2.99	0.40	0.45	0.50	0.60	45%						
B-165	B165	0.81							0.81	0.40	0.45	0.50	0.60	45%						
B-170	B170	2.95	0.33						3.28	0.43	0.48	0.52	0.61	48%						
E-05	E5	1.69							0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
E-10	E10	1.93							1.93	0.40	0.45	0.50	0.60	45%						
E-15	E15	0.42	0.04	0.20	0.45			0.06	0.75	1.42	0.53	0.55	0.58	0.63	56%					
OS-1	OS1								0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									12.21	0.18	0.19	0.20	0.22	5%						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
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									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
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									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
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									0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						

STANDARD FORM SF-2 Time of Concentration

Please note all equations used and ensure COA equations are used (not MHFD/UDFCD)

All equations used are from COA standards. Equations listed at bottom of SF-2 form show COA equations.

PROJECT NAME: Harvest Crossing PA-5
PROJECT NUMBER: 196284001
CALCULATED BY: JBP
CHECKED BY:

DATE: 6/6/2022

SUB-BASIN DATA			INITIAL TIME (T _i)			TRAVEL TIME (T _t)					T _c CHECK (URBANIZED BASINS)					FINAL T _c
DESIGN BASIN (1)	AREA Ac (2)	C5 (3)	LENGTH Ft (4)	SLOPE % (5)	T _i Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	C _v (9)	VEL fps (11)	T _t Min. (12)	COMP. t _c (13)	TOTAL LENGTH (14)	TOTAL SLOPE (15)	TOTAL IMP. (16)	T _c Min. (17)	Min. (18)
Basins																
A-05	1.470	0.190	77	25.0%	5.0	270	2.0%	7.0	1.0	4.5	9.6	347	7.1%	5%	27.4	9.6
A-10	0.800	0.500	143	1.0%	13.2	442	4.0%	20.0	4.0	1.8	15.0	585	3.3%	51%	20.7	15.0
A-15	2.550	0.443	165	3.0%	10.7	456	4.0%	20.0	4.0	1.9	12.6	621	3.7%	44%	22.1	12.6
A-20	0.608	0.606	100	4.5%	5.5	533	3.5%	20.0	3.7	2.4	7.9	633	3.7%	62%	18.6	7.9
A-25	1.864	0.477	50	2.0%	6.4	563	3.5%	20.0	3.7	2.5	8.9	613	3.4%	48%	21.3	8.9
A-30	0.813	0.450	76	1.0%	10.4	469	1.7%	20.0	2.6	3.0	13.4	545	1.6%	45%	23.0	13.4
A-35	2.925	0.283	400	1.5%	26.2	437	1.8%	20.0	2.6	2.8	28.9	837	1.6%	19%	32.2	28.9
A-40	4.376	0.480	78	1.0%	10.0	806	2.5%	20.0	3.2	4.2	14.3	884	2.4%	48%	23.9	14.3
A-45	0.838	0.552	110	1.0%	10.5	407	3.0%	20.0	3.5	2.0	12.5	517	2.6%	57%	19.4	12.5
A-46	0.342	0.190	50	2.0%	9.4	125	3.0%	7.0	1.2	1.7	11.1	175	2.7%	5%	27.0	11.1
A-50	1.439	0.433	129	1.0%	13.9	353	1.0%	20.0	2.0	2.9	16.8	482	1.0%	42%	24.2	16.8
A-55	2.242	0.483	133	1.0%	13.1	570	4.0%	20.0	4.0	2.4	15.4	703	3.4%	49%	21.6	15.4
A-60	1.123	0.620	57	2.0%	5.3	767	1.0%	20.0	2.0	6.4	11.7	824	1.1%	65%	22.2	11.7
A-65	0.618	0.560	128	1.0%	11.2	277	1.0%	20.0	2.0	2.3	13.5	405	1.0%	58%	20.1	13.5
A-70	2.287	0.482	89	1.0%	10.7	597	1.8%	20.0	2.6	3.8	14.5	686	1.7%	49%	23.3	14.5
D-15	0.997	0.488	76	25.0%	3.3	181	3.5%	20.0	3.7	0.8	4.1	257	9.9%	49%	18.5	5.0
D-20	1.238	0.495	147	10.0%	6.2	160	3.5%	20.0	3.7	0.7	7.0	307	6.6%	50%	18.7	7.0
D-25	2.328	0.454	82	1.0%	10.7	657	4.0%	20.0	4.0	2.7	13.5	739	3.7%	45%	22.5	13.5
D-30	2.971	0.477	105	1.0%	11.7	684	4.0%	20.0	4.0	2.9	14.6	789	3.6%	48%	22.3	14.6
D-35	2.620	0.450	100	1.0%	11.9	638	2.0%	20.0	2.8	3.8	15.7	738	1.9%	45%	24.2	15.7
D-40	0.553	0.450	72	1.0%	10.1	214	1.0%	20.0	2.0	1.8	11.9	286	1.0%	45%	21.5	11.9
D-45	2.040	0.190	180	1.0%	22.4	168	1.0%	7.0	0.7	4.0	26.4	348	1.0%	5%	31.1	26.4
D-50	1.004	0.588	100	1.0%	9.4	540	2.3%	20.0	3.0	3.0	12.4	640	2.1%	61%	19.7	12.4
C-10	1.106	0.482	90	1.0%	10.8	320	2.7%	20.0	3.3	1.6	12.4	410	2.3%	49%	20.6	12.4
C-15	1.444	0.460	100	1.0%	11.7	322	2.7%	20.0	3.3	1.6	13.4	422	2.3%	46%	21.1	13.4
C-25	2.151	0.538	133	1.0%	11.9	611	5.0%	20.0	4.5	2.3	14.2	744	4.3%	55%	20.3	14.2
C-30	0.679	0.690	20	2.0%	2.7	844	4.0%	20.0	4.0	3.5	6.2	864	4.0%	73%	17.3	6.2
C-35	0.641	0.690	15	2.0%	2.3	798	2.5%	20.0	3.2	4.2	6.5	813	2.5%	73%	18.0	6.5
C-40	0.601	0.700	15	2.0%	2.3	794	2.5%	20.0	3.2	4.2	6.4	809	2.5%	75%	17.7	6.4
C-45	2.000	0.450	78	2.0%	8.4	334	1.0%	20.0	2.0	2.8	11.1	412	1.2%	45%	22.5	11.1
C-50	2.890	0.450	80	2.0%	8.5	416	1.0%	20.0	2.0	3.5	11.9	496	1.2%	45%	23.4	11.9
C-55	2.142	0.467	116	2.0%	9.9	320	1.0%	20.0	2.0	2.7	12.6	436	1.3%	47%	22.2	12.6
B-05	3.850	0.190	133	20.0%	7.1	342	2.0%	7.0	1.0	5.8	12.8	475	7.0%	5%	28.2	12.8

STANDARD FORM SF-2

Time of Concentration

PROJECT NAME: Harvest Crossing PA-5
 PROJECT NUMBER: 196284001
 CALCULATED BY: JBP
 CHECKED BY:

DATE: 6/6/2022

SUB-BASIN DATA			INITIAL TIME (T _i)			TRAVEL TIME (T _t)					T _c CHECK (URBANIZED BASINS)					FINAL T _c
DESIGN BASIN (1)	AREA Ac (2)	C5 (3)	LENGTH Ft (4)	SLOPE % (5)	T _i Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	C _v (9)	VEL fps (11)	T _t Min. (12)	COMP. t _c (13)	TOTAL LENGTH (14)	TOTAL SLOPE (15)	TOTAL IMP. (16)	T _c Min. (17)	Min.
B-10	0.890	0.610	30	2.0%	3.9	663	1.5%	20.0	2.4	4.5	8.4	693	1.5%	63%	20.6	8.4
B-15	6.406	0.223	500	7.0%	18.8	954	2.0%	20.0	2.8	5.6	24.4	1454	3.7%	10%	36.5	24.4
B-20	18.174	0.229	500	2.5%	26.3	954	3.0%	20.0	3.5	4.6	30.9	1454	2.8%	10%	38.0	30.9
B-25	3.128	0.305	372	6.0%	15.5	245	4.0%	20.0	4.0	1.0	16.5	617	5.2%	21%	26.2	16.5
B-30	2.451	0.382	220	7.0%	10.2	473	2.0%	20.0	2.8	2.8	13.0	693	3.6%	32%	25.2	13.0
B-35	0.957	0.610	40	2.0%	4.5	476	2.0%	20.0	2.8	2.8	7.3	516	2.0%	63%	18.7	7.3
B-36	0.180	0.610	40	2.0%	4.5	104	1.0%	20.0	2.0	0.9	5.4	144	1.3%	63%	16.5	5.4
B-40	1.805	0.482	300	7.0%	10.3	62	1.0%	20.0	2.0	0.5	10.8	362	6.0%	46%	19.8	10.8
B-45	1.911	0.450	156	1.0%	14.9	227	3.0%	20.0	3.5	1.1	16.0	383	2.2%	45%	21.2	16.0
B-50	1.147	0.467	75	1.0%	10.0	415	4.0%	20.0	4.0	1.7	11.8	490	3.5%	47%	20.8	11.8
B-55	2.657	0.452	200	2.0%	13.3	468	4.0%	20.0	4.0	2.0	15.3	668	3.4%	45%	22.3	15.3
B-60	2.300	0.475	40	2.0%	5.8	728	1.5%	20.0	2.4	5.0	10.7	768	1.5%	48%	24.4	10.7
B-65	2.870	0.450	105	2.0%	9.7	365	4.5%	20.0	4.2	1.4	11.1	470	3.9%	45%	20.9	11.1
B-70	0.222	0.673	25	2.0%	3.1	221	1.0%	20.0	2.0	1.8	4.9	246	1.1%	72%	15.9	5.0
B-75	0.990	0.450	137	1.0%	13.9	226	1.0%	20.0	2.0	1.9	15.8	363	1.0%	45%	22.3	15.8
B-80	1.650	0.555	70	2.0%	6.6	700	1.5%	20.0	2.4	4.8	11.4	770	1.5%	58%	22.3	11.4
B-85	4.390	0.254	350	2.5%	21.4	195	1.5%	20.0	2.4	1.3	22.7	545	2.1%	14%	29.4	22.7
B-90	1.250	0.556	25	2.0%	4.0	713	1.5%	20.0	2.4	4.9	8.8	738	1.5%	57%	22.1	8.8
B-95	1.404	0.450	91	1.0%	11.4	447	4.8%	20.0	4.4	1.7	13.1	538	4.2%	45%	21.2	13.1
B-100	1.803	0.454	125	1.0%	13.2	450	4.8%	20.0	4.4	1.7	15.0	575	4.0%	45%	21.4	15.0
B-105	1.519	0.453	91	1.0%	11.3	536	5.0%	20.0	4.5	2.0	13.3	627	4.4%	45%	21.5	13.3
B-110	2.170	0.450	106	1.0%	12.3	520	5.0%	20.0	4.5	1.9	14.2	626	4.3%	45%	21.6	14.2
B-115	2.219	0.482	77	1.0%	9.9	1,000	3.5%	20.0	3.7	4.5	14.4	1077	3.3%	49%	23.9	14.4
B-120	6.070	0.468	133	1.0%	13.4	1,000	3.5%	20.0	3.7	4.5	17.8	1133	3.2%	47%	24.8	17.8
B-125	3.993	0.471	135	1.0%	13.4	700	1.8%	20.0	2.6	4.4	17.8	835	1.6%	47%	24.9	17.8
B-130	0.940	0.450	70	1.0%	10.0	325	2.0%	20.0	2.8	1.9	11.9	395	1.8%	45%	21.5	11.9
B-145	1.090	0.190	74	8.9%	6.9	175	2.3%	7.0	1.1	2.7	9.7	249	4.3%	5%	27.2	9.7
B-146	0.135	0.700	80	5.2%	3.8	100	5.1%	20.0	4.5	0.4	4.1	180	5.1%	75%	14.0	5.0
B-150	0.135	0.700	18	2.0%	2.5	149	5.0%	20.0	4.5	0.6	3.0	167	4.7%	75%	14.0	5.0
B-155	0.890	0.533	18	2.0%	3.5	612	4.0%	20.0	4.0	2.6	6.1	630	3.9%	55%	19.8	6.1
B-160	2.990	0.450	157	2.0%	11.9	610	4.0%	20.0	4.0	2.5	14.4	767	3.6%	45%	22.8	14.4
B-165	0.810	0.450	78	1.0%	10.5	429	3.0%	20.0	3.5	2.1	12.6	507	2.7%	45%	21.7	12.6
B-170	3.278	0.475	137	1.0%	13.4	800	2.0%	20.0	2.8	4.7	18.1	937	1.9%	48%	25.1	18.1
E-05	1.685	0.450	100	2.0%	9.5	414	2.3%	20.0	3.0	2.3	11.7	514	2.2%	45%	22.1	11.7
E-10	1.933	0.450	163	2.0%	12.1	360	2.3%	20.0	3.0	2.0	14.1	523	2.2%	45%	22.2	14.1
E-15	1.416	0.552	59	5.0%	4.5	337	1.0%	20.0	2.0	2.8	7.3	396	1.6%	56%	19.5	7.3
OS-1	12.210	0.190	500	5.2%	21.5	6,224	0.5%	7.0	0.5	209.6	231.1	6724	0.9%	5%	150.3	150.3



P₁ (1-Hour Rainfall) = 0.99

DATE: 6/6/2022

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE		TRAVEL TIME			REMARKS	
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF	tc (min)	C*A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCIT Y		tt (min)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
Basins																					
		A-05	A-05	1.47	0.18	9.55	0.26	2.73	0.72												
		A-10	A-10	0.80	0.46	15.00	0.37	2.25	0.82												
		A-15	A-15	2.55	0.40	12.63	1.01	2.43	2.45												
		A-20	A-20	0.61	0.60	7.86	0.36	2.93	1.06												
		A-25	A-25	1.86	0.43	8.91	0.80	2.80	2.25												
		A-30	A-30	0.81	0.40	13.39	0.33	2.37	0.77												
		A-35	A-35	2.93	0.26	28.93	0.77	1.59	1.22												
		A-40	A-40	4.38	0.44	14.29	1.92	2.30	4.41												
		A-45	A-45	0.84	0.52	12.50	0.43	2.44	1.06												
		A-46	A-46	0.34	0.18	11.08	0.06	2.57	0.16												
		A-50	A-50	1.44	0.39	16.82	0.56	2.13	1.19												
		A-55	A-55	2.24	0.44	15.43	0.98	2.22	2.17												
		A-60	A-60	1.12	0.60	11.66	0.68	2.52	1.70												
		A-65	A-65	0.62	0.53	13.52	0.33	2.36	0.77												
		A-70	A-70	2.29	0.44	14.46	1.00	2.29	2.28												
		D-15	D-15	1.00	0.45	5.00	0.45	3.36	1.50												
		D-20	D-20	1.24	0.46	6.95	0.57	3.05	1.72												
		D-25	D-25	2.33	0.40	13.47	0.94	2.36	2.22												
		D-30	D-30	2.97	0.44	14.56	1.30	2.28	2.97												
		D-35	D-35	2.62	0.40	15.68	1.05	2.20	2.31												
		D-40	D-40	0.55	0.40	11.90	0.22	2.49	0.55												
		D-45	D-45	2.04	0.18	26.38	0.37	1.67	0.61												
		D-50	D-50	1.00	0.56	12.36	0.56	2.45	1.38												
		C-10	C-10	1.11	0.44	12.38	0.49	2.45	1.19												
		C-15	C-15	1.44	0.41	13.37	0.59	2.37	1.41												
		C-25	C-25	2.15	0.51	14.16	1.09	2.31	2.53												
		C-30	C-30	0.68	0.68	6.18	0.46	3.16	1.46												
		C-35	C-35	0.64	0.68	6.51	0.44	3.11	1.36												
		C-40	C-40	0.60	0.69	6.44	0.41	3.12	1.30												
		C-45	C-45	2.00	0.40	11.14	0.80	2.56	2.05												
		C-50	C-50	2.89	0.40	11.93	1.16	2.49	2.88												
		C-55	C-55	2.14	0.42	12.59	0.90	2.43	2.19												



PROJECT NAME: Harvest Crossing PA-5
PROJECT NUMBER: 196284001
CALCULATED BY: JBP
CHECKED BY: 0

P₁ (1-Hour Rainfall) = 0.99

DATE: 6/6/2022

[illegible]



P₁ (1-Hour Rainfall) =	0.99
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DATE: 6/6/2022

[illegible]



STANDARD FORM SF-3
STORM DRAINAGE DESIGN - RATIONAL METHOD 2 YEAR EVENT

PROJECT NAME: Harvest Crossing PA-5
PROJECT NUMBER: 196284001
CALCULATED BY: JBP
CHECKED BY: 0

P₁ (1-Hour Rainfall) = 0.99

DATE: 6/6/2022

[illegible]





DATE: 6/6/2022

$$P_1 \text{ (1-Hour Rainfall)} = 2.67$$

CHECKED BY: 0

STORM LINE		DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS	
			DESIGN BASIN	AREA (AC)	RUNOFF COEFF	tc (min)	C* A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY		tt (min)
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
		B5	B-05	3.85	0.22	12.85	0.85	6.51	5.51													
		B10	B-10	0.89	0.65	8.42	0.58	7.71	4.46													
		B15	B-15	6.41	0.25	24.41	1.63	4.71	7.67													
		B20	B-20	18.17	0.26	30.90	4.73	4.12	19.47													
		B25	B-25	3.13	0.34	16.49	1.06	5.79	6.13													
		B30	B-30	2.45	0.42	12.99	1.03	6.47	6.67													
		B35	B-35	0.96	0.65	7.31	0.62	8.09	5.03													
		B36	B-36	0.18	0.65	5.38	0.12	8.88	1.04													
		B40	B-40	1.81	0.54	10.77	0.97	7.01	6.81													
		B45	B-45	1.91	0.60	15.98	1.15	5.88	6.74													
		B50	B-50	1.15	0.61	11.77	0.69	6.76	4.69													
		B55	B-55	2.66	0.60	15.29	1.59	6.01	9.53													
		B60	B-60	2.30	0.61	10.70	1.41	7.03	9.93													
		B65	B-65	2.87	0.60	11.13	1.72	6.92	11.91													
		B70	B-70	0.22	0.72	5.00	0.16	9.06	1.46													
		B75	B-75	0.99	0.60	15.83	0.59	5.91	3.51													
		B80	B-80	1.65	0.66	11.40	1.09	6.85	7.45													
		B85	B-85	4.39	0.28	22.72	1.25	4.91	6.13													
		B90	B-90	1.25	0.66	8.81	0.82	7.58	6.23													
		B95	B-95	1.40	0.60	13.06	0.84	6.46	5.44													
		B100	B-100	1.80	0.60	14.95	1.09	6.07	6.59													
		B105	B-105	1.52	0.60	13.31	0.91	6.40	5.85													
		B110	B-110	2.17	0.60	14.21	1.30	6.22	8.09													
		B115	B-115	2.22	0.62	14.40	1.37	6.18	8.47													
		B120	B-120	6.07	0.61	17.81	3.68	5.57	20.53													
		B125	B-125	3.99	0.61	17.82	2.44	5.57	13.61													
		B130	B-130	0.94	0.60	11.89	0.56	6.73	3.80													
		B145	B-145	1.09	0.22	9.67	0.24	7.32	1.76													
		B146	B-146	0.14	0.74	5.00	0.10	9.06	0.90													
		B150	B-150	0.14	0.74	5.00	0.10	9.06	0.90													
		B155	B-155	0.89	0.65	6.05	0.58	8.59	4.94													
		B160	B-160	2.99	0.60	14.39	1.79	6.18	11.09													
		B165	B-165	0.81	0.60	12.59	0.49	6.56	3.19													
		B170	B-170	3.28	0.61	18.13	2.01	5.53	11.12													
		E5	E-05	1.69	0.60	11.73	1.01	6.77	6.84													


$$P_1 \text{ (1-Hour Rainfall)} = 2.67$$

DATE: 6/6/2022

[illegible]



DATE: 6/6/2022

[illegible]



PROJECT NAME: Harvest Crossing PA-5

DATE: 6/6/2022

PROJECT NUMBER: 196284001

CALCULATED BY: JBP

CHECKED BY:

RATIONAL CALCULATIONS SUMMARY

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	PEAK FLOWS (CFS)	
			Q2	Q100
Basins				
A5	A-05	1.47	0.72	2.38
A10	A-10	0.80	0.82	3.05
A15	A-15	2.55	2.45	9.79
A20	A-20	0.61	1.06	3.10
A25	A-25	1.86	2.25	8.66
A30	A-30	0.81	0.77	3.12
A35	A-35	2.93	1.22	4.26
A40	A-40	4.38	4.41	16.50
A45	A-45	0.84	1.06	3.63
A46	A-46	0.34	0.16	0.52
A50	A-50	1.44	1.19	4.71
A55	A-55	2.24	2.17	8.33
A60	A-60	1.12	1.70	5.23
A65	A-65	0.62	0.77	2.60
A70	A-70	2.29	2.28	8.75
D15	D-15	1.00	1.50	5.56
D20	D-20	1.24	1.72	6.27
D25	D-25	2.33	2.22	8.93
D30	D-30	2.97	2.97	10.89
D35	D-35	2.62	2.31	9.33
D40	D-40	0.55	0.55	2.23
D45	D-45	2.04	0.61	2.03
D50	D-50	1.00	1.38	4.50
C10	C-10	1.11	1.19	4.47
C15	C-15	1.44	1.41	5.59
C25	C-25	2.15	2.53	8.45
C30	C-30	0.68	1.46	4.23
C35	C-35	0.64	1.36	3.93
C40	C-40	0.60	1.30	3.75
C45	C-45	2.00	2.05	8.30
C50	C-50	2.89	2.88	11.65
C55	C-55	2.14	2.19	8.57
B5	B-05	3.85	1.67	5.51
B10	B-10	0.89	1.53	4.46
B15	B-15	6.41	2.39	7.67
B20	B-20	18.17	6.08	19.47
B25	B-25	3.13	1.98	6.13
B30	B-30	2.45	2.18	6.67
B35	B-35	0.96	1.72	5.03
B36	B-36	0.18	0.36	1.04



PROJECT NAME: Harvest Crossing PA-5

DATE: 6/6/2022

PROJECT NUMBER: 196284001

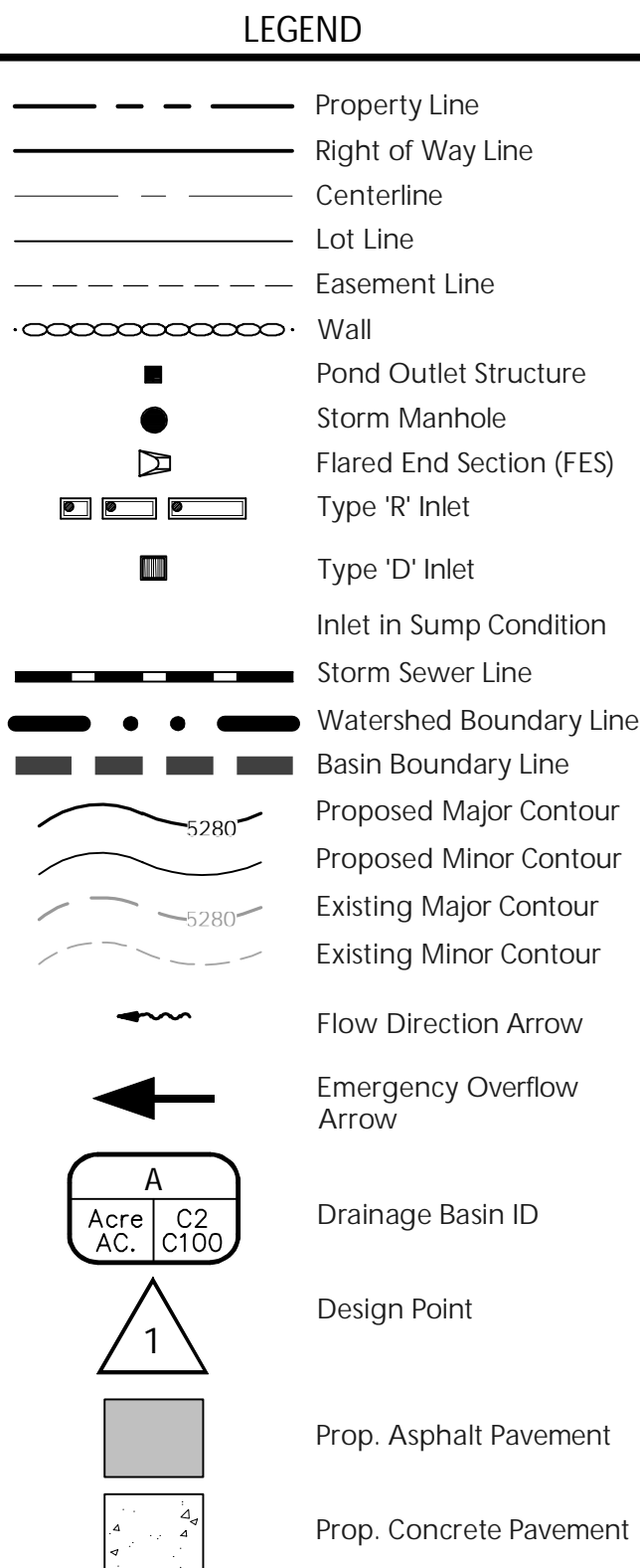
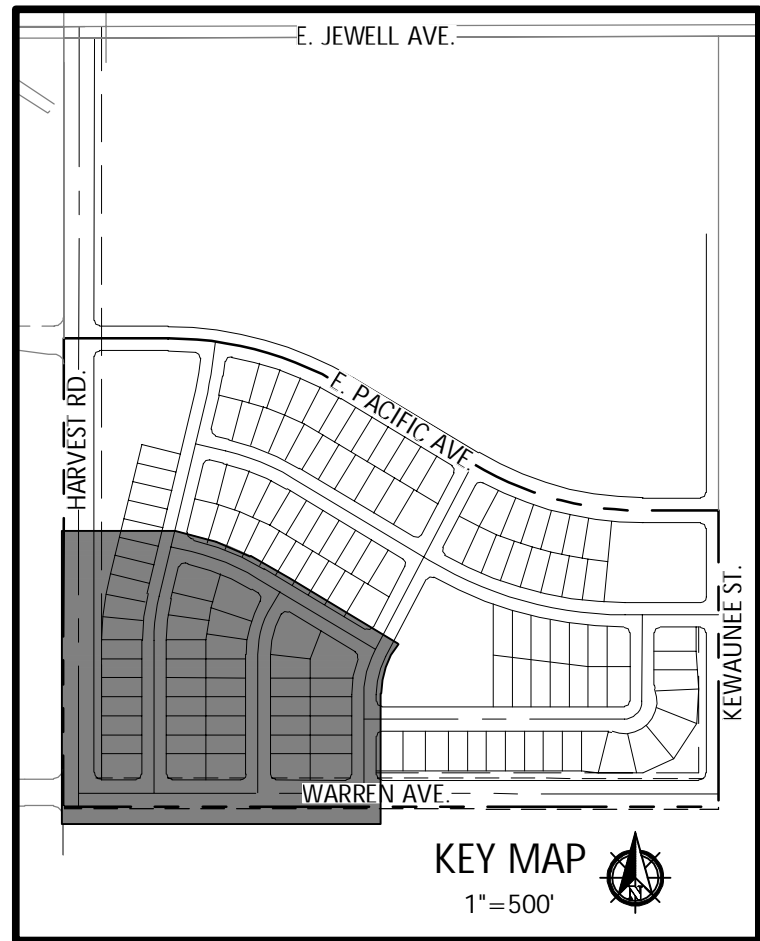
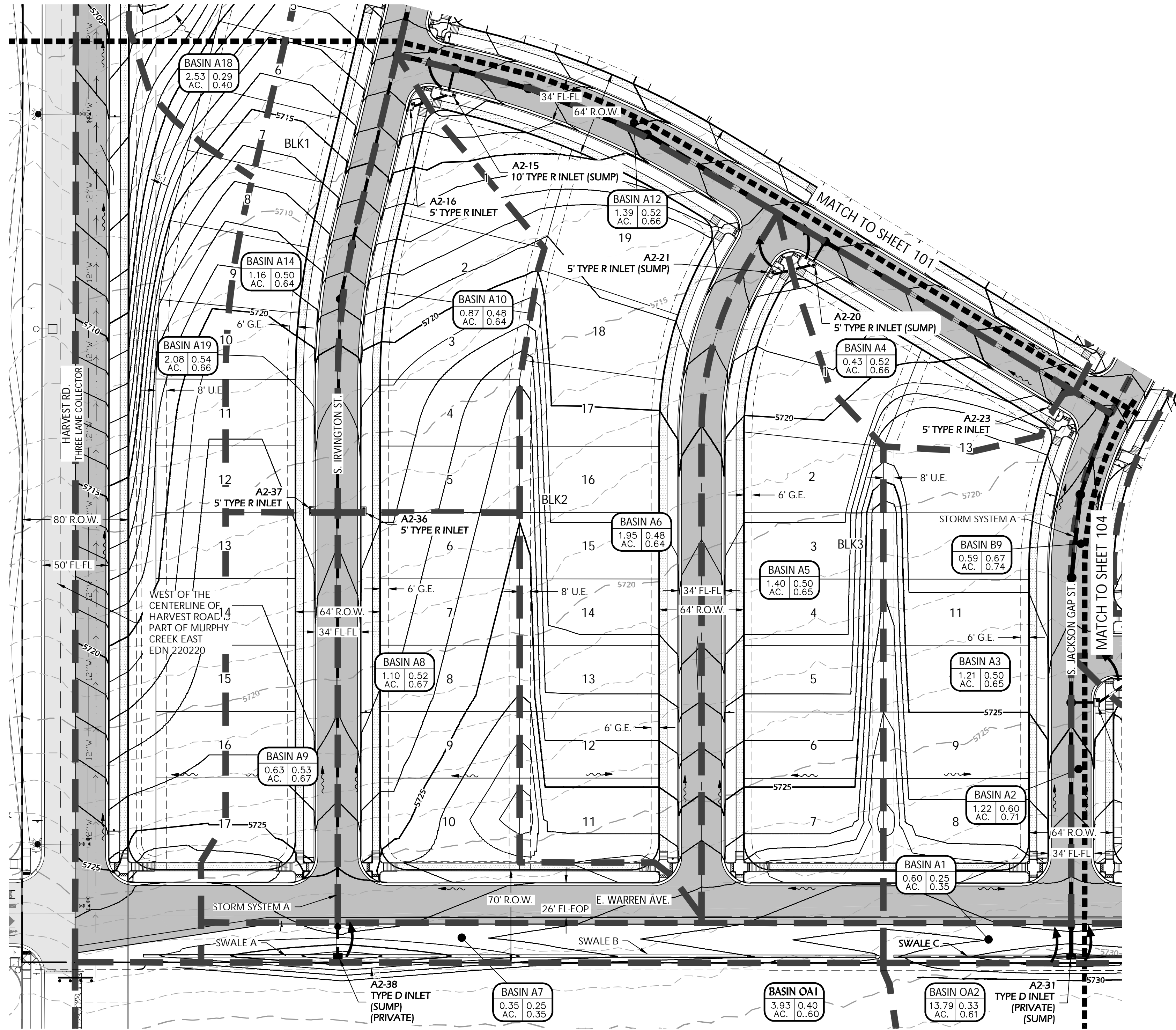
CALCULATED BY: JBP

CHECKED BY:

RATIONAL CALCULATIONS SUMMARY

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	PEAK FLOWS (CFS)	
			Q2	Q100
B40	B-40	1.81	2.19	6.81
B45	B-45	1.91	1.67	6.74
B50	B-50	1.15	1.21	4.69
B55	B-55	2.66	2.39	9.53
B60	B-60	2.30	2.57	9.93
B65	B-65	2.87	2.95	11.91
B70	B-70	0.22	0.49	1.46
B75	B-75	0.99	0.87	3.51
B80	B-80	1.65	2.19	7.45
B85	B-85	4.39	1.94	6.13
B90	B-90	1.25	1.84	6.23
B95	B-95	1.40	1.35	5.44
B100	B-100	1.80	1.64	6.59
B105	B-105	1.52	1.46	5.85
B110	B-110	2.17	2.00	8.09
B115	B-115	2.22	2.22	8.47
B120	B-120	6.07	5.30	20.53
B125	B-125	3.99	3.50	13.61
B130	B-130	0.94	0.94	3.80
B145	B-145	1.09	0.53	1.76
B146	B-146	0.14	0.31	0.90
B150	B-150	0.14	0.31	0.90
B155	B-155	0.89	1.40	4.94
B160	B-160	2.99	2.74	11.09
B165	B-165	0.81	0.79	3.19
B170	B-170	3.28	2.88	11.12
E5	E-05	1.69	1.69	6.84
E10	E-10	1.93	1.79	7.25
E15	E-15	1.42	2.25	7.18
OS1	OS-1	12.21	1.15	3.78
TOTAL		155.62	125.12	454.99
Drainage Basin Totals				
Basin A	Basin A	24.33	23.04	84.62
Basin B	Basin B	86.74	65.58	236.65
Basin C	Basin C	13.69	16.36	58.93
Basin D	Basin D	13.74	13.26	49.74
Basin E	Basin E	4.90	5.73	21.27
Basin OS-1	Basin OS-1	12.21	1.15	3.78
TOTAL		155.61	125.12	454.99

I:\JOB FOLDERS\1008 - SOUTH QUINCY RESIDENTIAL DEVELOPERS, INC\1008-18\PROD\DRAINAGE\FINAL\FINAL DRNG PRINTED ON: 2/28/2022 10:13 PM



NOTES:

- CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE CITY OF AURORA DESIGN CRITERIA AND THE CITY CODE. THE CITY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN. OF DIMENSIONS AND ELEVATIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETELY AND/OR ACCURACY OF THIS DOCUMENT.
- ALL STORM SEWER, INCLUDING ALL DETENTION POND FACILITIES, AND OTHER ASSOCIATED STORM STRUCTURES ARE PUBLIC UNLESS OTHERWISE NOTED.
- DETENTION PONDS ARE PRIVATE UNLESS OTHERWISE NOTED AND MAINTAINED BY THE HOA.
- THE STORM SEWER SYSTEM, IN COMBINATION WITH THE STREET, IS SIZED FOR THE 100 YEAR STORM EVENT.
- ROADWAY PAVING WILL NOT BE PERMITTED AND CERTIFICATES OF OCCUPANCY WILL NOT BE ISSUED UNTIL DOWNSTREAM PIPE AND OUTFALL HAVE BEEN CONSTRUCTED IN HARVEST ROAD AND INITIALLY ACCEPTED.
- FURTHER ADJACENT DOWNSTREAM DEVELOPMENT IS REQUIRED TO PROVIDE CONVEYANCE FOR EMERGENCY OVERFLOWS. CITY RECOMMENDS PRIVATE DRAINAGE EASEMENTS TO BE OBTAINED FOR ANY EMERGENCY FLOW PATHS NOT WITHIN ROW.

Calculated Proposed Runoff Rates						
Basin ID	Design Point	Total Area (Ac.)	Tc (min)	Runoff Coefficients		Peak Flow (cfs)
				C ₂	C ₁₀₀	Q ₂ Q ₁₀₀
A1	A2-31 (Int.)	0.60	11.7	0.25	0.35	0.37 1.41
A2	A2-29	1.05	8.7	0.61	0.71	1.82 5.70
A2-a	A2-30	0.17	6.9	0.55	0.69	0.28 0.94
A3	A2-23	1.21	11.0	0.50	0.65	1.55 5.50
A4	A2-20	0.43	8.2	0.52	0.66	0.64 2.20
A5	A2-21	1.40	11.3	0.50	0.65	1.78 6.28
A6	A2-15	1.95	13.4	0.48	0.64	2.23 8.01
A7	A2-38 (Int.)	0.35	10.7	0.25	0.35	0.23 0.87
A8	A2-36	1.10	8.3	0.52	0.67	1.63 5.67
A9	A2-37	0.63	7.7	0.53	0.67	0.99 3.35
A10	A2-16	0.87	10.7	0.48	0.64	1.08 3.91
A11	A2-12	2.67	12.9	0.47	0.63	3.00 11.00
A12	A2-11	1.39	10.2	0.52	0.66	1.91 6.57
A14	A2-2	1.16	9.6	0.50	0.64	1.58 5.51
A15	A3-5	0.33	9.9	0.67	0.74	0.72 2.14

(Int.) Indicates Interim Condition (D.B.O.) Indicates Designed by Others

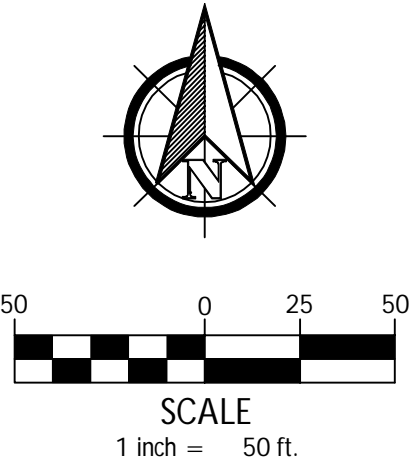
Calculated Proposed Runoff Rates						
Basin ID	Design Point	Total Area (Ac.)	Tc (min)	Runoff Coefficients		Peak Flow (cfs)
				C ₂	C ₁₀₀	Q ₂ Q ₁₀₀
A16	A3-4	3.06	11.9	0.49	0.64	3.71 13.25
A17	A3-2	0.21	5.0	0.67	0.74	0.46 1.37
A18	A1-6	2.53	8.4	0.47	0.57	3.40 11.10
A19	A4-2	2.08	11.7	0.54	0.66	2.80 9.27
B1	B3-11	0.50	11.3	0.67	0.74	0.86 2.57
B1-a	B3-14 (Int.)	0.14	8.1	0.25	0.35	0.10 0.39
B2	B3-7	3.67	14.2	0.42	0.58	3.58 13.25
B2-a	B3-8	0.20	5.3	0.60	0.70	0.39 1.24
B3	B3-5	1.02	8.1	0.56	0.68	1.66 5.43
B4	B3-6	3.76	13.9	0.35	0.65	3.08 15.26
B5	B3-2	1.08	10.8	0.54	0.67	1.50 5.06
B6	B4-2	0.19	5.0	0.67	0.74	0.43 1.28
B7	B2-14	0.31	6.2	0.56	0.68	0.55 1.81
B8	B2-13	1.16	12.3	0.45	0.63	1.29 4.82
B9	B2-9	0.62	6.2	0.67	0.74	1.31 3.88

(Int.) Indicates Interim Condition (D.B.O.) Indicates Designed by Others

Calculated Proposed Runoff Rates						
Basin ID	Design Point	Total Area (Ac.)	Tc (min)	Runoff Coefficients		Peak Flow (cfs)
				C ₂	C ₁₀₀	Q ₂ Q ₁₀₀
B10	B2-4	0.55	9.1	0.67	0.74	1.03 3.05
B11	B2-2	1.70	13.0	0.45	0.62	1.83 6.88
B12	B1-1	1.35	5.0	0.49	0.58	2.23 7.13
C1	B1-4	0.24	5.0	0.67	0.74	0.54 1.60
C2	B1-2B	0.15	5.0	0.67	0.74	0.35 1.02
D1	C1-4	0.11	5.0	0.71	0.79	0.27 0.80
D2	C1-2	0.44	5.0	0.67	0.74	1.00 2.95
OA1	A2-38 (Int.)	4.74	15.0	0.25	0.35	2.66 10.05
OA2	A2-31 (Int.)	17.46	18.6	0.25	0.35	8.84 33.37
OB	B3-14 (Int.)	0.47	6.7	0.25	0.35	0.29 1.10
OC	B4-4	0.54	5.3	0.67	0.74	1.21 3.59
OD	Pond T	1.39	13.4	0.25	0.35	0.82 3.11
OE	C2-2	0.81	6.2	0.71	0.79	1.82 5.46
OF	C2-5	1.00	9.4	0.57	0.66	1.56 4.90
OG	Pond T	10.96	15.2	0.26	0.36	6.42 23.85

(Int.) Indicates Interim Condition (D.B.O.) Indicates Designed by Others

PROJECT BENCHMARK:
CITY OF AURORA BENCHMARK #456529NE002 BEING A 3" BRASS CAP STAMPED "CITY OF AURORA, BM, 23-70, 0-110" ATOP A 30" LONG STEEL PIPE IN CONC. ON THE SOUTH SIDE OF E. JEWELL AVE. APPROX. 300 FT. WEST OF THE CENTERLINE OF A BRIDGE CROSSING COAL CREEK & AT THE SOUTHEAST CORNER OF INTERSECTION OF ROAD GOING SOUTHEAST FROM E. JEWELL AVE. EL. NAVD88 = 5623.18'



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Westminster, CO 80234
303.421.4224
www.innovativelandinc.com

Revision Type:

No.	Rev.	Date:
1		
2		
3		
4		
5		
6		

Date: February 28, 2022
Horiz. Scale: 1" = 50'
Vert. Scale: N/A

Sheet: 102 of 113
Job No.: 1002 84

Designed By: XWL
Prepared By: AA
Approved By: XWL

Harvest Crossing Filing No. 1
Aurora, Colorado
Construction Documents
Final Drainage Plan

Client: Richmond American Homes
Address: Greenwood Village, CO 80111
4350 South Monaco Street
Denver, Colorado 80237
Contact: Eric Kuby
Phone: 720-977-3827

NOT FOR CONSTRUCTION

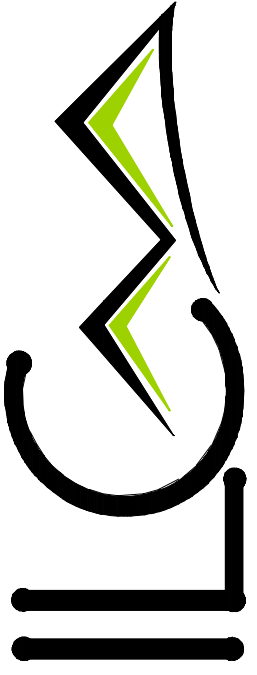
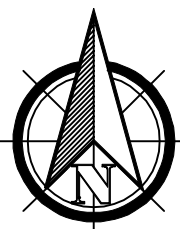
Know what's below.
Call before you dig.

Sheet: 102

Calculated Proposed Runoff Rates							
Basin ID	Design Point	Total Area [Ac.]	1c [in]	Runoff Coefficients		Peak Flow [cfs]	
				C ₂	C ₁₀₀	Q ₂	Q ₁₀₀
B10	B2-4	0.55	9.1	0.67	0.74	1.03	3.05
B11	B2-2	1.70	13.0	0.45	0.62	1.83	6.88
B12	B1-1	1.35	5.0	0.49	0.58	2.23	7.13
C1	B1-4	0.24	5.0	0.67	0.74	0.54	1.60
C2	B1-2B	0.15	5.0	0.67	0.74	0.35	1.02
D1	C1-4	0.11	5.0	0.71	0.79	0.27	0.80
D2	C1-2	0.44	5.0	0.67	0.74	1.00	2.95
OA1	A2-38 [Int.]	4.74	15.0	0.25	0.35	2.66	10.05
OA2	A2-31 [Int.]	17.46	18.6	0.25	0.35	8.84	33.37
OB	B3-14 [Int.]	0.47	6.7	0.25	0.35	0.29	1.10
OC	B4-4	0.54	5.3	0.67	0.74	1.21	3.59
OD	Pond T	1.39	13.4	0.25	0.35	0.82	3.11
OE	C2-2	0.81	6.2	0.71	0.79	1.82	5.46
OF	C2-5	1.00	9.4	0.57	0.66	1.56	4.90
OG	Pond T	10.96	15.2	0.26	0.36	6.42	23.85
(Int.) indicates Interim Condition				(D,B,O.) indicates Designed by Others			

	Property Line
	Right of Way Line
	Centerline
	Lot Line
	Easement Line
	Wall
	Pond Outlet Structure
	Storm Manhole
	Flared End Section (FES)
	Type 'R' Inlet
	Type 'D' Inlet
	Inlet in Sump Condition
	Storm Sewer Line
	Watershed Boundary Line
	Basin Boundary Line
	Proposed Major Contour
	Proposed Minor Contour
	Existing Major Contour
	Existing Minor Contour
	Flow Direction Arrow
	Emergency Overflow Arrow
	Drainage Basin ID
	Design Point
	Prop. Asphalt Pavement
	Prop. Concrete Pavement

1. CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE CITY OF AURORA DESIGN CRITERIA AND THE CITY CODE. THE CITY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS AND ELEVATIONS, WHICH SHOULD BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETELY AND/OR ACCURACY OF THIS DOCUMENT.
2. ALL STORM SEWER, INCLUDING ALL DETENTION POND FACILITIES, AND OTHER ASSOCIATED STORM STRUCTURES ARE TO BE UNLINED AND NOT TO BE NOTED.
3. DETENTION PONDS ARE PRIVATE UNLESS OTHERWISE NOTED AND MAINTAINED BY THE HOA.
4. THE STORM SEWER SYSTEM, IN COMBINATION WITH THE STREET, IS SIZED FOR THE 100 YEAR STORM EVENT.
5. ROADWAY PAVING WILL NOT BE PERMITTED AND CERTAIN TYPES OF CITY MAINTENANCE ARE PROHIBITED UNTIL DOWNSTREAM PIPE AND OUTFALL HAVE BEEN CONSTRUCTED IN HARVEST ROAD AND INITIALLY ACCEPTED.
6. FURTHER ADJACENT DOWNSTREAM DEVELOPMENT IS REQUIRED TO PROVIDE CONVEYANCE FOR EMERGENCY OVERFLOWS. EASEMENTS FOR EMERGENCY DRAINAGE EASEMENTS TO BE OBTAINED FOR ANY EMERGENCY FLOW PATHS NOT WITHIN ROW.



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No.	Rev. Date:	Revision Type:	Date: February 28, 2022	Sheet: 104 of 113
1			Designed By: XWL	
2			Prepared By: AA	
3			Approved By: XWL	
4				Job No.: 1002 84
5				Vert. Scale: N/A
6				Horiz. Scale: 1" = 50'

Harvest Crossing Filing No. 1

Aurora, Colorado

Final Drainage Plan

Client:	Richmond American Homes	Proj. Name:	
Address:	Greenwood Village, CO 80111 4350 South Monaco Street Denver, Colorado 80237	Location:	
Contact:	Eric Kubly Phone: 720-977-3827	Plan Set:	
		Sheet Name:	
NOT FOR CONSTRUCTION			



Know what's below.
Call before you dig.

Sheet: 104

Basin Runoff Calculations - Direct Runoff

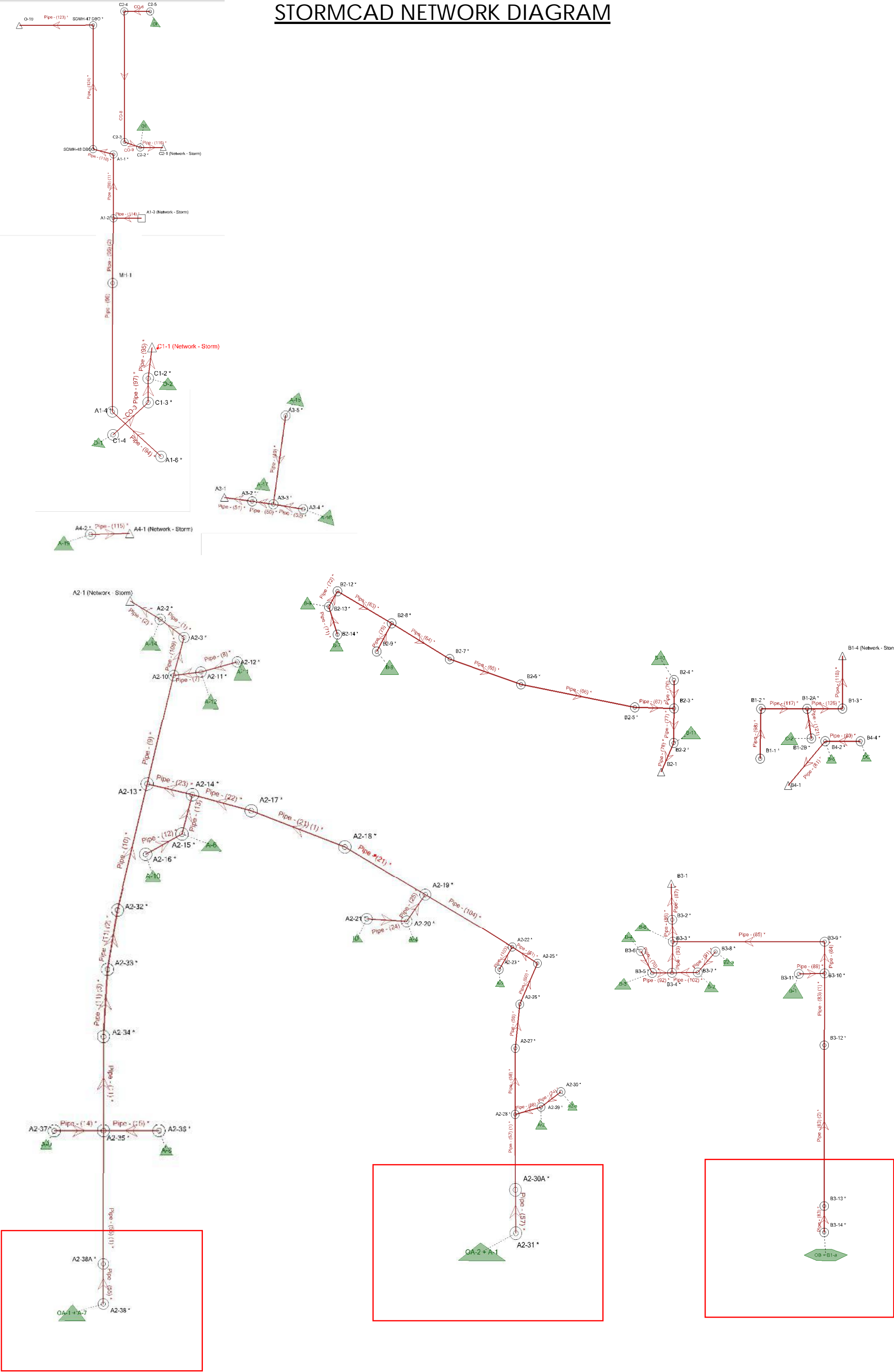
Project No.: 1008-18

22-Feb-22

Basin ID	Design Point	Total Area (Ac.)	Imp (%)	Tc (min)	Runoff Coeff.							
					C ₂	C ₅	C ₁₀₀	I ₂	I ₅	I ₁₀₀	Q ₂	Q ₁₀₀
Developed												
A1	A2-31 (Int.)	0.60	5%	11.7	0.25	0.27	0.35	2.51	3.50	6.77	0.37	1.41
A2	A2-29	1.05	65%	8.7	0.61	0.63	0.71	2.82	3.93	7.60	1.82	5.70
A2-a	A2-30	0.17	62%	6.9	0.55	0.58	0.69	3.05	4.26	8.24	0.28	0.94
A3	A2-23	1.21	55%	11.0	0.50	0.53	0.65	2.58	3.60	6.96	1.55	5.50
A4	A2-20	0.43	57%	8.2	0.52	0.55	0.66	2.88	4.01	7.76	0.64	2.20
A5	A2-21	1.40	55%	11.3	0.50	0.53	0.65	2.54	3.55	6.86	1.78	6.28
A6	A2-15	1.95	54%	13.4	0.48	0.52	0.64	2.37	3.31	6.39	2.23	8.01
A7	A2-38 (Int.)	0.35	5%	10.7	0.25	0.27	0.35	2.61	3.64	7.04	0.23	0.87
A8	A2-36	1.10	58%	8.3	0.52	0.55	0.67	2.87	4.00	7.73	1.63	5.67
A9	A2-37	0.63	59%	7.7	0.53	0.56	0.67	2.95	4.11	7.95	0.99	3.35
A10	A2-16	0.87	53%	10.7	0.48	0.51	0.64	2.60	3.63	7.02	1.08	3.91
A11	A2-12	2.67	52%	12.9	0.47	0.51	0.63	2.40	3.35	6.49	3.00	11.00
A12	A2-11	1.39	58%	10.2	0.52	0.55	0.66	2.65	3.70	7.16	1.91	6.57
A14	A2-2	1.16	55%	9.6	0.50	0.53	0.64	2.72	3.80	7.35	1.58	5.51
A15	A3-5	0.33	74%	5.9	0.67	0.68	0.74	3.21	4.47	8.66	0.72	2.14
A16	A3-4	3.06	54%	11.9	0.49	0.52	0.64	2.49	3.48	6.72	3.71	13.25
A17	A3-2	0.21	74%	5.0	0.67	0.68	0.74	3.36	4.68	9.06	0.46	1.37
A18	A1-6	2.53	41%	8.4	0.47	0.49	0.57	2.86	3.99	7.72	3.40	11.10
A19	A4-2	2.08	56%	11.7	0.54	0.56	0.66	2.51	3.50	6.78	2.80	9.27
B1	B3-11	0.50	73%	11.3	0.67	0.68	0.74	2.55	3.56	6.88	0.86	2.57
B1-a	B3-14 (Int.)	0.14	5%	8.1	0.25	0.27	0.35	2.89	4.03	7.80	0.10	0.39
B2	B3-7	3.67	43%	14.2	0.42	0.46	0.58	2.31	3.22	6.22	3.58	13.25
B2-a	B3-8	0.20	66%	5.3	0.60	0.62	0.70	3.31	4.61	8.92	0.39	1.24
B3	B3-5	1.02	62%	8.1	0.56	0.59	0.68	2.90	4.04	7.81	1.66	5.43
B4	B3-6	3.76	36%	13.9	0.35	0.41	0.65	2.33	3.25	6.29	3.08	15.26
B5	B3-2	1.08	59%	10.8	0.54	0.57	0.67	2.59	3.61	6.99	1.50	5.06
B6	B4-2	0.19	74%	5.0	0.67	0.68	0.74	3.36	4.68	9.06	0.43	1.28
B7	B2-14	0.31	62%	6.2	0.56	0.59	0.68	3.16	4.41	8.53	0.55	1.81
B8	B2-13	1.16	50%	12.3	0.45	0.49	0.63	2.46	3.43	6.63	1.29	4.82
B9	B2-9	0.62	74%	6.2	0.67	0.68	0.74	3.16	4.40	8.51	1.31	3.88
B10	B2-4	0.55	74%	9.1	0.67	0.68	0.74	2.78	3.87	7.49	1.03	3.05
B11	B2-2	1.70	50%	13.0	0.45	0.49	0.62	2.40	3.35	6.47	1.83	6.88
B12	B1-1	1.35	43%	5.0	0.49	0.51	0.58	3.36	4.68	9.06	2.23	7.13
C1	B1-4	0.24	74%	5.0	0.67	0.68	0.74	3.36	4.68	9.06	0.54	1.60
C2	B1-2B	0.15	74%	5.0	0.67	0.68	0.74	3.36	4.68	9.06	0.35	1.02
D1	C1-4	0.11	79%	5.0	0.71	0.72	0.79	3.36	4.68	9.06	0.27	0.80
D2	C1-2	0.44	74%	5.0	0.67	0.68	0.74	3.36	4.68	9.06	1.00	2.95
Off-site Interim Condition												
OA1	A2-38 (Int.)	4.74	5%	15.0	0.25	0.27	0.35	2.25	3.13	6.06	2.66	10.05
OA1 + A7	A2-38 (Int.)	5.09	5%	15.0	0.25	0.27	0.35	2.25	3.13	6.06	2.86	10.80
OA2	A2-31 (Int.)	17.46	5%	18.6	0.25	0.27	0.35	2.02	2.82	5.46	8.84	33.37
OA2 + A1	A2-31 (Int.)	18.06	5%	18.6	0.25	0.27	0.35	2.02	2.82	5.46	9.14	34.51
OB	B3-14 (Int.)	0.47	5%	12.2	0.25	0.27	0.35	2.47	3.44	6.65	0.29	1.10
OB + B1-a	B3-14 (Int.)	0.62	5%	12.4	0.25	0.27	0.35	2.45	3.42	6.62	0.38	1.43
OC	B4-4	0.54	74%	5.3	0.67	0.68	0.74	3.30	4.60	8.90	1.21	3.59
OD	Pond T	1.39	5%	13.4	0.25	0.27	0.35	2.37	3.30	6.38	0.82	3.11

Basin ID	Design Point	Total Area (Ac.)	Imp (%)	Tc (min)	Runoff Coeff.							
					C ₂	C ₅	C ₁₀₀	I ₂	I ₅	I ₁₀₀	Q ₂	Q ₁₀₀
OE	C2-2	0.81	79%	6.2	0.71	0.72	0.79	3.16	4.41	8.53	1.82	5.46
OF	C2-5	1.00	55%	9.4	0.57	0.58	0.66	2.74	3.83	7.40	1.56	4.90
OG	Pond T	10.96	7%	15.2	0.26	0.28	0.36	2.23	3.11	6.02	6.42	23.85
Off-site Developed Condition												
OA1	PA	3.93	50%	15.2	0.40	0.45	0.60	2.23	3.11	6.02	3.51	14.19
OA1 + A7	PA	4.28	52%	15.2	0.43	0.47	0.62	2.23	3.11	6.02	4.07	15.87
OA2	PA	13.80	39%	11.8	0.33	0.40	0.61	2.50	3.49	6.74	11.47	57.10
OA2 + A1	PA	14.40	41%	11.6	0.35	0.41	0.62	2.52	3.51	6.79	12.62	60.71
OB	PA	14.10	49%	13.3	0.39	0.44	0.60	2.37	3.31	6.40	13.13	54.30
OB + B1-a	PA	14.24	49%	13.3	0.40	0.45	0.60	2.38	3.31	6.41	13.38	55.08
OC	B1-4	0.54	74%	5.1	0.67	0.68	0.74	3.34	4.66	9.01	1.21	3.60
OD	PT	1.39	5%	13.4	0.25	0.27	0.35	2.37	3.30	6.38	0.82	3.11
OE	C2-2	0.81	79%	6.2	0.71	0.72	0.79	3.17	4.41	8.54	1.83	5.48
OF	C2-5	1.00	55%	7.5	0.57	0.58	0.66	2.98	4.15	8.03	1.70	5.32
OG	PT	10.96	7%	15.2	0.26	0.28	0.36	2.23	3.11	6.02	6.42	23.86
Existing												
OC		0.60	5%	8.3	0.25	0.27	0.35	2.87	4.00	7.74	0.43	1.63
OD		1.39	5%	11.4	0.25	0.27	0.35	2.54	3.54	6.85	0.88	3.33
OE		0.81	5%	7.0	0.25	0.27	0.35	3.04	4.24	8.20	0.62	2.32
OF		0.97	21%	8.9	0.36	0.37	0.45	2.81	3.91	7.57	0.97	3.32
Emergency Overflow Contributing Flows (Developed Condition)												
Pond A inflow		40.91	48%	26.2	0.43	0.47	0.62	1.68	2.34	4.53	29.59	115.61
Pond B inflow		30.89	49%	20.1	0.44	0.48	0.62	1.94	2.71	5.24	26.13	100.69
Pond T inflow		14.71	17%	15.2	0.32	0.34	0.42	2.23	3.11	6.02	10.60	37.13
Pond T + Pond A		55.62	39%	26.2	0.40	0.44	0.57	1.68	2.34	4.53	37.57	143.57
Intensity $\frac{28.5 * P_1}{(10 + T_c)^{0.786}}$											2 Year P ₁ =	0.99 inches
											5 Year P ₁ =	1.38 inches
											100 Year P ₁ =	2.67 inches

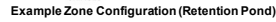
STORMCAD NETWORK DIAGRAM



Appendix D- Detention Computations

MHFD-Detention, Version 4.05 (January 2022)

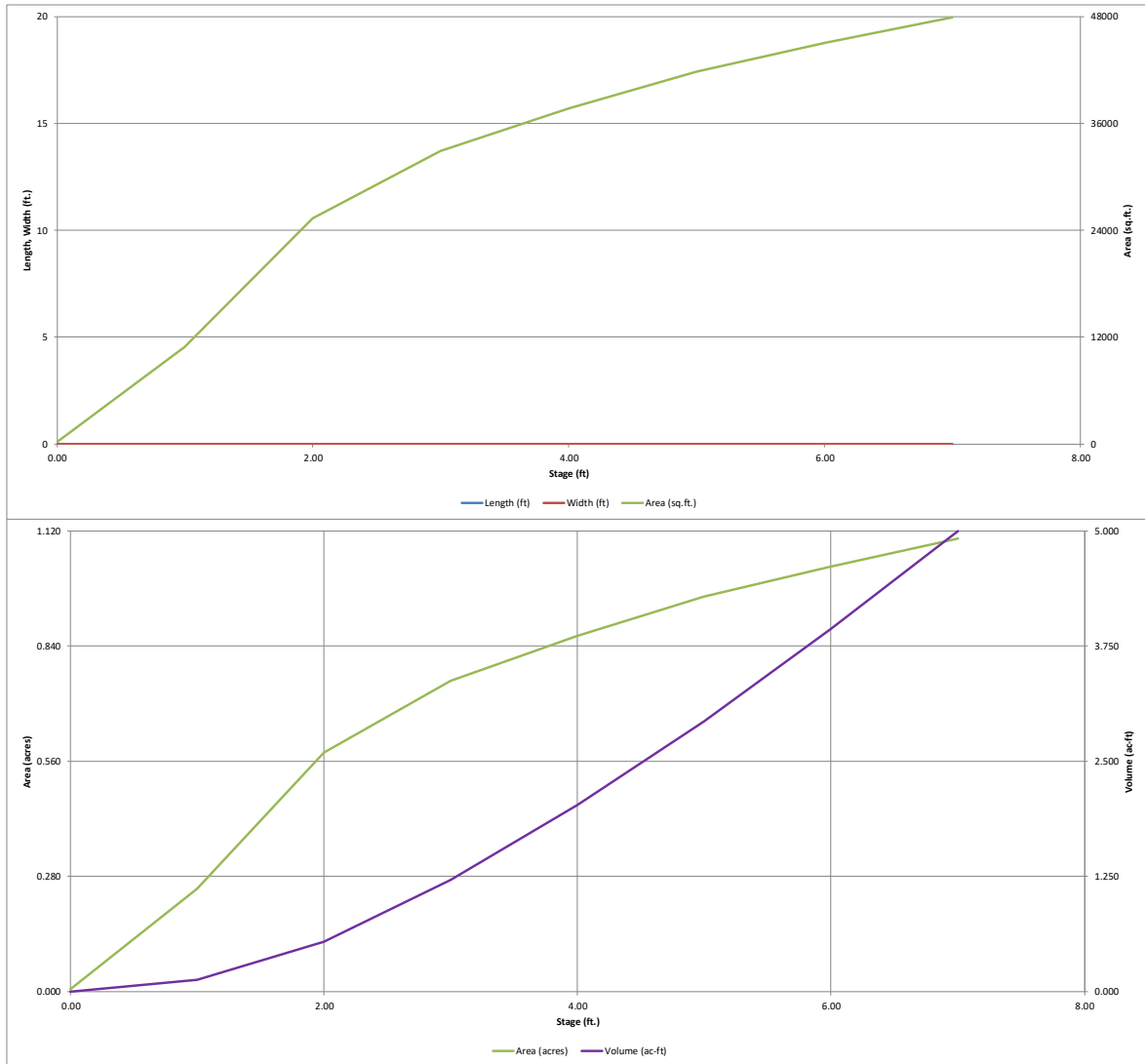
Basin ID: Pond A



Optional User Overrides	
	acre-feet
	acre-feet
0.99	inches
1.39	inches
1.62	inches
2.00	inches
2.34	inches
2.67	inches
3.39	inches

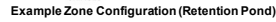
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.05 (January 2022)



MHFD-Detention, Version 4.05 (January 2022)

Basin ID: Pond B

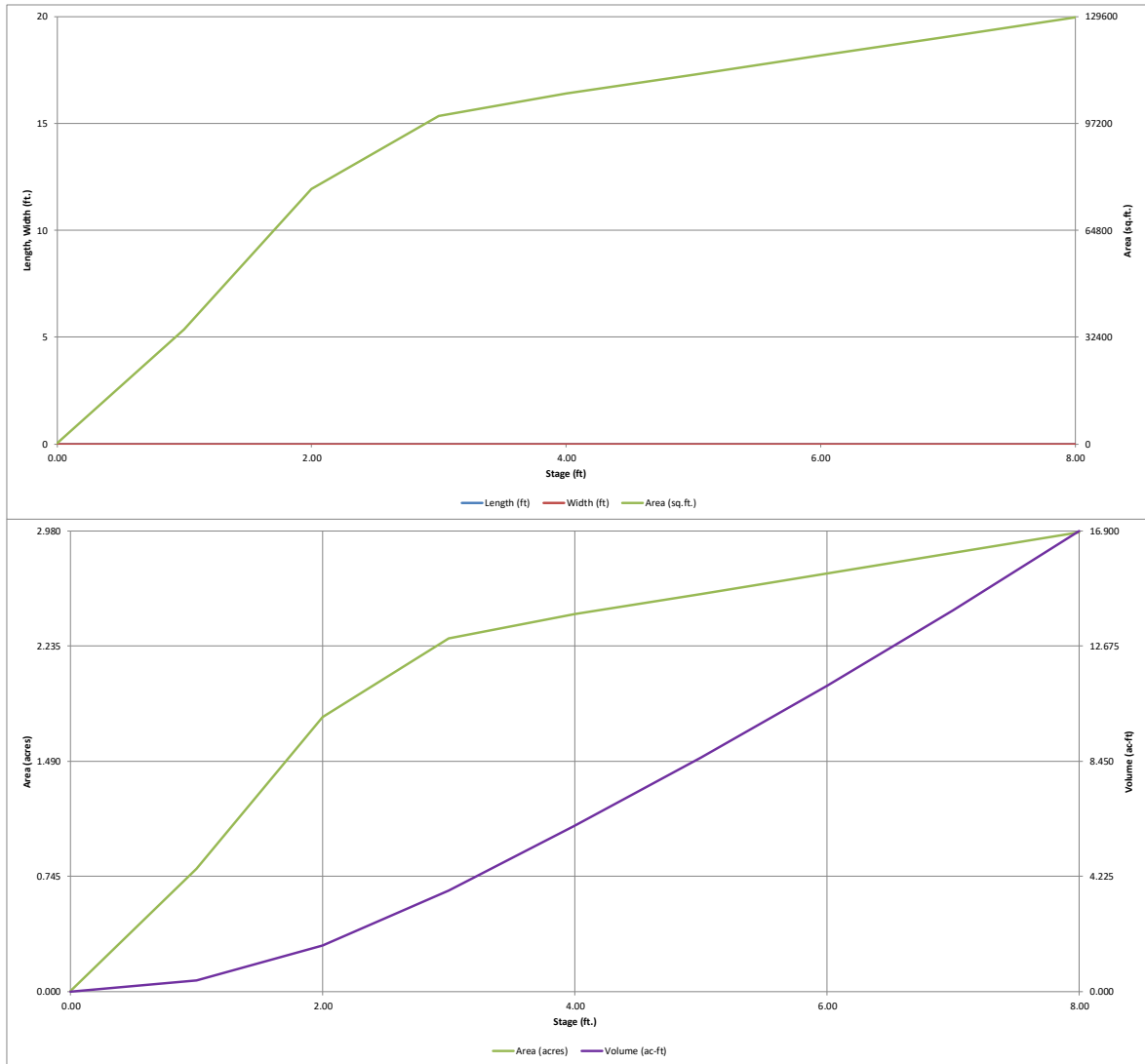


	acre-feet
	acre-feet
0.99	inches
1.39	inches
1.62	inches
2.00	inches
2.34	inches
2.67	inches
3.39	inches

6/3/2022, 11:24 AM

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.05 (January 2022)



Pond A Detention Calcs

k	0.076012		
v	1.85 (100-yr)	(From CoA Equation)	v 2.09 (100-yr)
a	24.33		
i	42.46		

This sheet needs to be better organized or removed if repetitive - same with next sheet

Addressed - sheets removed

2.17 aurora 100-yr (100-yr plus 0.2*WQCV)
2.65 (TOTAL STORAGE, NOT INCLUDING 2' FREEBOARD)

WQCV	0.186 in	(from MHFD Equation & UD Detention)
	0.378 acre-ft	
EURV	0.965 acre-ft	(from UD Detention)

Inputs for Outlet Structure Tab MHFD

0.453 Zone 1 (WQCV * 1.2)
0.512 Zone 2 (EURV - Zone 1)
1.68 Zone 3 (Total Volume - (Zone 1 + Zone 2))

$$V = KA$$

For the 100-year, $K_{100} = (1.78 - 0.002I^2 - 3.56)/900$ (6.1)

Where V=required volume for the 100

I= Developed basin imperviousness (%)

A= Tributary Area (acres)

Pond B Detention Calcs

k	0.057			
v	4.91 (100-yr)	(From CoA Equation)	v	6.21 (100-yr) (From UD Detention)
a	86.74			
i	31.73			

6.43 aurora 100-yr (100-yr plus 0.2*WQCV)

7.69 (TOTAL STORAGE, NOT INCLUDING 2' FREEBOARD)

WQCV	0.156758 in	(from MHFD Equation & UD Detention)
	1.13 acre-ft	
EURV	2.511 acre-ft	(from UD Detention)

Inputs for Outlet Struture Tab MHFD

1.36 Zone 1 (WQCV * 1.2)

1.15 Zone 2 (EURV - Zone 1)

5.18 Zone 3 (Total Volume - (Zone 1 + Zone 2))

$$V = KA$$

For the 100-year, $K_{100} = (1.78 - 0.002I^2 - 3.56)/900$ (6.1)

Where V=required volume for the 100

I= Developed basin imperviousness (%)

A= Tributary Area (acres)

Appendix E- Hydraulic Computations

Worksheet for A-A

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	91.60 cfs
Crest Elevation	5,701.15 ft
Tailwater Elevation	5,701.15 ft
Coefficient of Discharge	0.580
Angle	177.60 degrees
Results	
Headwater Elevation	5,702.05 ft
Headwater Height Above Crest	0.90 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	38.9 ft ²
Velocity	2.36 ft/s
Wetted Perimeter	86.2 ft
Top Width	86.15 ft

Worksheet for B-B

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	11.91 cfs
Crest Elevation	5,730.69 ft
Tailwater Elevation	5,730.69 ft
Coefficient of Discharge	0.580
Angle	176.20 degrees
Results	
Headwater Elevation	5,731.17 ft
Headwater Height Above Crest	0.48 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	6.9 ft ²
Velocity	1.72 ft/s
Wetted Perimeter	28.9 ft
Top Width	28.91 ft

Worksheet for C-C

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	22.35 cfs
Crest Elevation	5,729.04 ft
Tailwater Elevation	5,729.04 ft
Coefficient of Discharge	0.580
Angle	177.70 degrees
Results	
Headwater Elevation	5,729.54 ft
Headwater Height Above Crest	0.50 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	12.7 ft ²
Velocity	1.76 ft/s
Wetted Perimeter	50.3 ft
Top Width	50.27 ft

Worksheet for D-D

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	6.74 cfs
Crest Elevation	5,715.57 ft
Tailwater Elevation	5,715.57 ft
Coefficient of Discharge	0.580
Angle	177.60 degrees
Results	
Headwater Elevation	5,715.89 ft
Headwater Height Above Crest	0.32 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	4.8 ft ²
Velocity	1.40 ft/s
Wetted Perimeter	30.3 ft
Top Width	30.33 ft

Worksheet for E-E

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	16.03 cfs
Crest Elevation	5,712.21 ft
Tailwater Elevation	5,712.21 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	68.0 ft
Results	
Headwater Elevation	5,712.40 ft
Headwater Height Above Crest	0.19 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$2.95 \text{ ft}^{(1/2)}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$2.95 \text{ ft}^{(1/2)}/\text{s}$
Flow Area	12.6 ft ²
Velocity	1.27 ft/s
Wetted Perimeter	68.4 ft
Top Width	68.00 ft

Worksheet for F-F

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	60.97 cfs
Crest Elevation	5,725.05 ft
Tailwater Elevation	5,725.05 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	80.0 ft
Results	
Headwater Elevation	5,725.45 ft
Headwater Height Above Crest	0.40 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$3.06 \text{ ft}^{(1/2)}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$3.06 \text{ ft}^{(1/2)}/\text{s}$
Flow Area	31.6 ft ²
Velocity	1.93 ft/s
Wetted Perimeter	80.8 ft
Top Width	80.00 ft

Worksheet for G-G

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	39.72 cfs
Crest Elevation	5,722.48 ft
Tailwater Elevation	5,722.48 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	80.0 ft
Results	
Headwater Elevation	5,722.78 ft
Headwater Height Above Crest	0.30 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$3.05 \text{ ft}^{(1/2)}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$3.05 \text{ ft}^{(1/2)}/\text{s}$
Flow Area	24.0 ft ²
Velocity	1.65 ft/s
Wetted Perimeter	80.6 ft
Top Width	80.00 ft

Worksheet for H-H

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	7.38 cfs
Crest Elevation	5,735.11 ft
Tailwater Elevation	5,735.11 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	106.7 ft
Results	
Headwater Elevation	5,735.19 ft
Headwater Height Above Crest	0.08 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$2.93 \text{ ft}^{(1/2)}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$2.93 \text{ ft}^{(1/2)}/\text{s}$
Flow Area	8.8 ft ²
Velocity	0.84 ft/s
Wetted Perimeter	106.9 ft
Top Width	106.70 ft

Worksheet for I-I

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	22.31 cfs
Crest Elevation	5,721.50 ft
Tailwater Elevation	5,721.50 ft
Coefficient of Discharge	0.580
Angle	179.70 degrees
Results	
Headwater Elevation	5,721.72 ft
Headwater Height Above Crest	0.22 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	19.0 ft ²
Velocity	1.17 ft/s
Wetted Perimeter	170.5 ft
Top Width	170.52 ft

Worksheet for J-J

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	12.84 cfs
Crest Elevation	5,723.22 ft
Tailwater Elevation	5,723.22 ft
Coefficient of Discharge	0.580
Angle	178.90 degrees
Results	
Headwater Elevation	5,723.52 ft
Headwater Height Above Crest	0.30 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	9.4 ft ²
Velocity	1.36 ft/s
Wetted Perimeter	62.7 ft
Top Width	62.69 ft

K-K

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	12.03 cfs
Crest Elevation	5,735.15 ft
Tailwater Elevation	5,735.15 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	64.0 ft
Results	
Headwater Elevation	5,735.31 ft
Headwater Height Above Crest	0.16 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$2.95 \text{ ft}^{(1/2)}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$2.95 \text{ ft}^{(1/2)}/\text{s}$
Flow Area	10.2 ft ²
Velocity	1.18 ft/s
Wetted Perimeter	64.3 ft
Top Width	64.00 ft

Worksheet for L-L

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	13.94 cfs
Crest Elevation	5,739.26 ft
Tailwater Elevation	5,739.26 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	64.0 ft
Results	
Headwater Elevation	5,739.44 ft
Headwater Height Above Crest	0.18 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$2.95 \text{ ft}^{(1/2)}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$2.95 \text{ ft}^{(1/2)}/\text{s}$
Flow Area	11.3 ft ²
Velocity	1.24 ft/s
Wetted Perimeter	64.4 ft
Top Width	64.00 ft

Worksheet for M-M

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	11.65 cfs
Crest Elevation	5,750.45 ft
Tailwater Elevation	5,750.45 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	34.3 ft
Results	
Headwater Elevation	5,750.69 ft
Headwater Height Above Crest	0.24 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$2.97 \text{ ft}^{(1/2)}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$2.97 \text{ ft}^{(1/2)}/\text{s}$
Flow Area	8.1 ft ²
Velocity	1.44 ft/s
Wetted Perimeter	34.7 ft
Top Width	34.25 ft

Worksheet for N-N

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	6.53 cfs
Crest Elevation	5,739.00 ft
Tailwater Elevation	5,739.00 ft
Coefficient of Discharge	0.580
Angle	177.20 degrees
Results	
Headwater Elevation	5,739.33 ft
Headwater Height Above Crest	0.33 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	4.6 ft ²
Velocity	1.43 ft/s
Wetted Perimeter	27.3 ft
Top Width	27.31 ft

Worksheet for O-O

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	21.27 cfs
Crest Elevation	5,725.70 ft
Tailwater Elevation	5,725.70 ft
Coefficient of Discharge	0.580
Angle	179.40 degrees
Results	
Headwater Elevation	5,725.99 ft
Headwater Height Above Crest	0.29 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	15.9 ft ²
Velocity	1.33 ft/s
Wetted Perimeter	110.4 ft
Top Width	110.37 ft

Worksheet for P-P

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	23.29 cfs
Crest Elevation	5,727.61 ft
Tailwater Elevation	5,727.61 ft
Coefficient of Discharge	0.580
Angle	179.10 degrees
Results	
Headwater Elevation	5,727.96 ft
Headwater Height Above Crest	0.35 ft
Tailwater Height Above Crest	0.00 ft
Flow Area	15.8 ft ²
Velocity	1.47 ft/s
Wetted Perimeter	89.7 ft
Top Width	89.73 ft

Worksheet for Q-Q

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	19.82 cfs
Crest Elevation	5,729.69 ft
Tailwater Elevation	5,729.69 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	265.8 ft
Results	
Headwater Elevation	5,729.78 ft
Headwater Height Above Crest	0.09 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$2.93 \text{ ft}^{(1/2)}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$2.93 \text{ ft}^{(1/2)}/\text{s}$
Flow Area	23.0 ft ²
Velocity	0.86 ft/s
Wetted Perimeter	266.0 ft
Top Width	265.79 ft

Worksheet for R-R

Project Description	
Solve For	Headwater Elevation
Input Data	
Discharge	47.29 cfs
Crest Elevation	5,731.76 ft
Tailwater Elevation	5,731.76 ft
Crest Surface Type	Paved
Crest Breadth	2.00 ft
Crest Length	210.2 ft
Results	
Headwater Elevation	5,731.94 ft
Headwater Height Above Crest	0.18 ft
Tailwater Height Above Crest	0.00 ft
Weir Coefficient	$2.95 \text{ ft}^{1/2}/\text{s}$
Submergence Factor	1.000
Adjusted Weir Coefficient	$2.95 \text{ ft}^{1/2}/\text{s}$
Flow Area	37.8 ft ²
Velocity	1.25 ft/s
Wetted Perimeter	210.6 ft
Top Width	210.24 ft