August 3, 2023

Cesarina Dancy
City of Aurora
Planning and Development Services Dept
15151 E. Alameda Parkway, Suite 2300
Aurora, CO 80012

RE: Initial Submission Review – Vistas At Kings Point South – Master Plan
Application Number: DA-1628-09
Case Numbers: 2023-7004-00

Dear Mrs. Dancy,

On behalf of Kings Point Investments LLC and Terracina Design, we have reviewed the comments from the Initial Submission Review for the Vista at Kings Point dated May 5, 2023. The following is a response to comments:

Initial Submission Review

SUMMARY OF KEY COMMENTS FROM ALL DEPARTMENTS

- It appears that the residential density proposed in the future R-2 region exceeds the maximum density of 5 DUs per acre (Planning) **RESPONSE: Density for this master plan was calculated based on the gross master plan area and not by individual zoning areas. Gross density is 3.6 DU/Ac.**

- Small Lots exceed maximum percentages. Multifamily dwelling units do not increase the number of lots used to determine the percentage of small lots. **RESPONSE: Small lot percentage will be tracked as development occurs and we will not exceed the 50% max restriction. Small lots also adjusted for R-2 vs R-1 areas.**

- Provide the section for Aurora Parkway and the south half as the obligation of this master plan. (Civil Engineering) **RESPONSE: Noted**

- Verify background traffic volumes with and without the Pine Dr extension. (Traffic Engineering) **RESPONSE: All volumes have been verified. They include background traffic from Kings Point MTS, Overlook at Kings Point, Longs and Cottonwood neighborhoods, and redistribution of traffic (as noted in the updated report) with and without the extension in place.**

- Site traffic assignments are not consistent with site trip generation table and distribution. (Traffic Engineering) **RESPONSE: All site generated trips have been reviewed and updated as needed. Distribution and trip generation tables have been reviewed and updated with**

consistent trip distribution percentages. School distribution percentages have been added to Table 6, Figure 6A, and Figure 6B. Site generated trips have been checked and updated in figures 7A and 7B as needed.

- Two points of access are needed for this site. As Aurora Parkway is currently not complete, provide information showing where these points will be provided. (Fire/Life Safety) **RESPONSE: We understand that this project will need 2 points of access and cannot move forward until those access points are provided via Aurora Parkway or surrounding sites. A connection for future Pine Drive is also now shown if ever needed for access.**

- Extensive coordination is required between this development, the Prusse Development and Kings Point South MUS team to ensure this MUS and others are in conformance with the Kings Point South MUS. (Aurora Water) **RESPONSE: Noted**

- A Tree Protection Plan (TPP) will be required for this site if there are Black Forest trees within its boundaries. (Forestry) **RESPONSE: Noted. A TPP will be submitted before the first Site Plan.**

- There are several comments related to park dedication requirements and park elements. (PROS) **RESPONSE: Park dedications updated per revised densities.**

- The current (2023) public art fee per residential acre is $381.13. (Public Art) **RESPONSE: Noted. This brings the total fee from $26,900 to $36,284**

- Please see the comment letters from outside agencies, Xcel Energy and MHFD **RESPONSE: Noted**

- Resubmit the Public Art Plan addressing Comments. **RESPONSE: Public Art plan resubmitted as part of submittal 2.**

Planning and Development Services Department Comments

1) **Community Questions, Comments, and Concerns**

1A. (Thomas Ludlow / 303-552-6620 / thludlow@gmail.com): Our property is immediately south of the project. We are concerned that the development will include substantial grading and earth moving that will result in a significant amount of dirt to be blown onto our property and home. The winds in this location are near constant and can be over 25 mph, and they blow predominately from north to south and we are directly in the path of any dust and dirt created during the development of this project. We are hopeful that substantial measures will be taken to minimize this potential problem. **RESPONSE: Measures will be taken to keep dust down. This is a standard procedure with new developments.**

1B. (Patrick Graham / bcocgraham@comcast.net): There is a large herd of approximately 20 antelope which roam this area. Have adequate protections been afforded these animals? **RESPONSE: Antelope will roam the vast amounts of open space in the surrounding area.**

1C. (Sierra Vista Douglas Homeowners Association / Thom Russell / thom@sierravistahoa.org):

- Not Extending Pine Drive to Aurora Parkway: Sierra Vista supports the position of not extending Pine Drive to Aurora Parkway for the reasons put forward by the Vistas at Kings Point South development group. Extending Pine Drive is viewed as a detriment to our community. **RESPONSE: We agree that Pine Drive extension is a detriment to the community. Pine Drive connection is required by the City and Douglas County 2040 Transportation Master Plan. Implementing Pine Drive thru this area will require collaboration between multiple entities and neighbors.**

- Vistas at Kings Point Planning Area PA-8: This open space buffer needs to be more fully defined regarding berms and landscaping. Sierra Vista's view is that the area should developed as a continuous natural passive buffer rather than an active buffer, with appropriate landscaping and berms. This comment also applies to the adjoining buffer open space associated with Kings Point South. **RESPONSE: Noted. This open space buffer area will be more defined with landscaping, trails and channels as necessary at the Site Plan stage.**

2) Completeness and Clarity of Application

(Tab 3 Page 3)
2A. This page should be 24"x36". **RESPONSE: PDF format revised**

(Tab 3 Page 4)
2B. This page should be 24"x36". **RESPONSE: PDF format revised**

(Tab 6 Page 7)
2C. As we move forward, you should be able to clarify your approach to prairie dogs on site, any required surveys related to other species, and your approach to relocation or extermination of prairie dogs. **RESPONSE: Prairie Dog removal methods will be determined with further studies into this issue.**

(Tab 3 Page 4)
2D. There appears to be a numbering typo. **RESPONSE: Revised**

3) Zoning and Land Use Comments

(Tab 6 Page 3)
3A. This language and expectation may need to be adjusted. Typically, we will not approve a Master Plan that is not supported by the underlying zoning. **RESPONSE: Per previous conversations with the City, it was agreed that the Rezone would occur at Site Plan so the zoning boundary follows the alignment of the Collector Road. This alignment has not been confirmed yet. Existing zoning is generally the same. Language will be adjusted accordingly.**

(Tab 8 Page 2)
3B. Since you are proposing small residential lots, the required amount and distribution of single-family housing types is determined by Section 146-4.2.3.A.3. In the R-1 zone district, no more than 25% of the residential lots may be small lots. In the R-2 zone, with fewer than 100 residential lots, no more than 35% of the lots may be small lots. If there are more than 100 lots in the R-2 zone district, 50% of the lots may be small, but they are subject to additional distribution standards described in the referenced code section. While it has been stated that the future proposed R-1 and R-2 zoning

boundaries are not known exactly at this time. We will still need this small lot distribution information for each zoning district in order to verify compliance with our small lot standards. In addition, multifamily dwelling units are not part of the "lot" calculation to determine the percentage of "small lots". **RESPONSE: Small lot percentage will be tracked as development occurs and we will not exceed the restrictions. It is understood that the number of small lots allowed within each zone district varies per the total number of lots. Site plans will be designed accordingly to meet these requirements.**

3C. Small Lot percentages and related requirements pertaining to product mix, proximity to open space and other requirements will be measured on a per-neighborhood basis, which also coincides with R-1 and R-2 zoning. **RESPONSE: Noted. This will be explored in more detail at the Site Plan stage.**

3D. Be aware that when proposing to use small lot standards, at least 50% of the standard size lots must use alternate-loaded or recessed garages, while at least 75% of the small lots must use the same. **RESPONSE: Noted**

(Tab 8 Page 3)

3E. These numbers (including the 3 park acres for PA-5) result in an average density for the R-2 region of about 8.8 DUs/acre. The maximum density for the R-2 district is 5 DUs/acre. **RESPONSE: The proposed R-2 zone district is 30.7 Acres at 5 DU/Ac equaling 153 DU's. The R-1 zone district is 64.5 Acres at 3 DU/Ac equals 194. Combining these areas equals 347 DU's. This is an average of 3.6 DU/Acres. This is reflected in Form D of Tab 8.**

(Tab 8 Page 4)
3F. 50% small lots are only allowed in R-2 districts with more than 100 residential lots. 25% small lots is the maximum permitted in the R-1 zone district. **RESPONSE: Noted**

4) <u>Streets and Pedestrian Issues</u>

(Tab 4 Page 5)
4A. The Kings Point North MP does show responsibility for the north half of Aurora Parkway. However, you will need to reach out to Oakwood Homes concerning the relocation of Aurora Parkway in this location. Both master plans should match. **RESPONSE: An Amendment to KP North has been discussed with the adjacent property owner.**

(Tab 6 Page 4)
4B. A separate meeting may be needed to discuss the future of Pine Drive depending on what comments are received on this application from Douglas County or the Town of Parker. A connection to a future Pine Drive may need to be planned for. **RESPONSE: A separate meeting was held with the City to discuss the overall comments. No additional meetings were held combining the City with Douglas County and Town of Parker since the City of Aurora felt it was unnecessary and not open for discussion. Pine Drive is required for 2 points of access and this connection point is now shown at the edge of the property leading south as necessary.**

5) <u>Parking Issues</u>

5A. There were no parking issues identified in this review. **RESPONSE: Noted**

6) Architectural and Urban Design Issues

(Tab 10 Page 6)

6A. Be aware that any front yard fencing, or corner lot side yard fencing less than 4 ft from the back of the sidewalk may only be 42 inches in height. If either of these fencing types is anticipated, a smaller 42-inch fence detail should also be shown here. **RESPONSE: Noted. Fence detail revised.**

(Tab 11 Page 11)

6B. Please include a statement similar to that on the Urban Design Standards: "The design standards listed in this matrix implement the design themes of the MP and are intended to complement and exceed the unified development ordinance (UDO). Unless a waiver has been specifically requested and granted, if a conflict should exist between any specific provisions of this matrix and any other ordinance standards, the higher standards shall govern.". **RESPONSE: Note added. Revised "higher standards" to "more restrictive" to stay consistent with comments on Tab 10.**

(Tab 12 Page 8)

6C. These examples do not meet the masonry requirement please replace them. **RESPONSE: Examples revised to show masonry as appropriate.**

(Tab 12 Page 10)

6D. Multifamily elevation designs should also be provided with their local site plan review. **RESPONSE: Text Revised.**

(Tab 12 Page 11)

6E. Multifamily elevation designs should also be provided with their local site plan review. **RESPONSE: Text Revised.**

7) Signage Issues

7A. There were no signage issues on this review. **RESPONSE: Noted**

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

(Tab 8 Page 7)

8A. Add a statement to clarify, similar to the Urban Design Tab, that these standards are intended to meet or exceed UDO requirements unless an adjustment has been approved by the planning commission. (See Redlines). **RESPONSE: Statement added.**

8B. Add "conflict". **RESPONSE: Revised**

8C. Add "the". **RESPONSE: Revised**

(Tab 10 Page 2)

8D. Replace with "more restrictive". **RESPONSE: Revised**

8E. Road missing. **RESPONSE: Revised**

(Tab 11 Page 2)

8F. Please note that crusher fines are not permitted as a mulch treatment. **RESPONSE: Noted**

(Tab 11 Page 4)
8G. Landscape Ordinance? Manual? **RESPONSE: Revised to "Manual"**

(Tab 11 Page 6)
8H. Add a note that sod will not be used. Prohibited by the Non-Functional Turf Ordinance passed in September 2022. **RESPONSE: Noted added**

9) Transportation Planning (Tom Worker-Braddock / 303-739-7340 / tworker@auroragov.org / Comments in light blue)
9A. There were no transportation planning comments on this review cycle. **RESPONSE: Noted**

Referral Comments from other Departments and Agencies

10) Civil Engineering (Julie Bingham / 303-739-7403 / jbingham@auroragov.org / Comments in green)
(Tab 10 Page 7)
10A. Remove this. Streetlights will be COA standard fixtures.. **RESPONSE: Text Revised**

10B. Local streets have a pole height of 20'. Collector streets have a pole height of 30'. **RESPONSE: Text Revised**

(Tab 10 Page 13)
10C. Where is this street shown? **RESPONSE: It is Road A, our 80' collector. Both Collector sections are currently shown since it was unclear which version was to be used. We're assuming a 2 lane collector since Kings Point South to the west is using that road section. Please confirm this assumption is correct and true.**

(PIP Page 5)
10D. Aurora Parkway is an obligation of this property. The PIP should identify the timing of the improvements to Aurora Parkway with regard to permitting. **RESPONSE: Conversations between land owners are still ongoing regarding who responsible for building what portion of Aurora Parkway. No additional obligation notes have been added at his time.**

10E. Add that offsite improvements may be required to meet traffic and life safety needs here and in each planning area. **RESPONSE: A statement about offsite improvements required to meet traffic and life safety needs has been added to the report.**

(PIP Page 6)
10F. Typical planning areas 1-4, include Aurora Parkway as a requirement for each planning area in the narrative and on the exhibits. **RESPONSE: A statement about Aurora Parkway being a requirement for each planning area has been added to planning area sections 1-4.**

(PIP Page 19)

10G. Provide the section for Aurora Parkway and the south half as the obligation of this master plan. Ensure there is no on-street bike lane for the Aurora Parkway section. Please provide a wider sidewalk/bike lane in lieu of the on-street bike lane. Please also ensure this matches all other tabs. **RESPONSE: A section for Aurora Parkway has been provided. Conversations between land owners are still ongoing regarding who responsible for building what portion of Aurora Parkway. No additional obligation notes have been added at this time.**

(PIP Page 20)
10H. Identify Aurora Parkway as an obligation of this property. Identify the extent required. **RESPONSE: Conversations between land owners are still ongoing regarding who responsible for building what portion of Aurora Parkway. No additional obligation notes have been added at his time.**

10I. The Overlook at King's Point is anticipating a second point of access through this property at this location including utility connections. Has this been coordinated with this master plan? **RESPONSE: Further coordination between Overlook, Vistas, and Kings Point South has taken place and will continue throughout Master Plan process. We have updated our utility layout to show the anticipated utility connection location.**

10J. Add this note: "The construction of E. Aurora Parkway and required offsite improvements must be completed prior to the issuance of any certification of occupancies for any planning areas. **RESPONSE: A note has been added to the plans**

(PIP Page 21)
10K. Typical all exhibits: Identify Aurora Parkway as an obligation of this property. Identify the extents required. **RESPONSE: Conversations between land owners are still ongoing regarding who responsible for building what portion of Aurora Parkway. No additional obligation notes have been added at his time.**

11) **Traffic Engineering (Steven Gomez / 303-739-7336 / segomez@auroragov.org / Comments in amber)**
(Tab 8 Page 5)
11A. Label access as full movement, typical. **RESPONSE: Labeled**

(Tab 8 Page 7)
11B. Should the language reference pro-rated/cost sharing to be provided with Contextual Site Plan. **RESPONSE: Note 1 revised. Owner and/or developers are responsible for 100 percent of the costs for any potential signals interior to the site. The cost of any potential signals along the perimeter of the site will be prorated and determined at Site Plan.**

(Tab 9 Page 6)
11C. Label access as full movement, typical. **RESPONSE: Labeled**

(TIS Page 1)

11D. Buildout year is 2027. Why not 2030, consistent with buildout for Prairie Point (Kings Point North) **RESPONSE: Buildout year has been changed to the 2030. Short-term background and project scenarios have been updated to reflect 2030 volumes.**

11E. Verify background traffic volumes with/without Pine Dr extension. Update as necessary. **RESPONSE: All volumes have been verified. They include background traffic from Kings Point MTS, Overlook at Kings Point, Longs and Cottonwood neighborhoods, and redistribution of traffic (as noted in the updated report) with and without the extension in place.**

11F. Provide justification for a higher overall % to the north and a lower % to the south without the Pine Drive extension compared to the Pine Drive extension. **RESPONSE: The overall distribution of traffic to the north should not be impacted by an extension of Pine Drive. Distribution percentages have been adjusted to be consistent with and without a Pine Drive extension.**

11G. Site traffic assignments are not consistent with the site trip generation table and distribution. **RESPONSE: All site generated trips have been reviewed and updated as needed. Distribution and trip generation tables have been reviewed and updated with consistent trip distribution percentages. School distribution percentages have been added to Table 6, Figure 6A, and Figure 6B. Site generated trips have been checked and updated in figures 7A and 7B as needed.**

11H. Add Traffic signal warrant evaluation section. **RESPONSE: Information on traffic signal warrants has been added to Section 5.2. Peak hour warrant worksheets have been included in the Appendix.**

11I. See comments throughout the report. **RESPONSE: Add report comments have been addressed.**

(TIS Page 6)
11J. Why not 2030? Consistent with the buildout for Prairie Point (Kings Point North). **RESPONSE: See response to 11D.**

(TIS Page 12)
11K. Add delay for the signalized results and unsignalized critical movements. overall unsignalized intersection results are not needed typical. **RESPONSE: Delays for individual movements are in Table 2. The overall LOS tables in the report are just for a summary to enhance the discussion.**

11L. By what year 2027, 2040?. **RESPONSE: Year 2030.**

(TIS Page 14)
11M. Verify, a portion of the WB traffic is destined to/from Parker Road north and wouldn't utilize the Pine Dr extension. In addition, a portion of the EB traffic is destined to/from E-470 north and wouldn't utilize the Pine Dr Extension. **RESPONSE: Agreed. This was included in the evaluation and impacted the percentages redirected.**

(TIS Page 19)
11N. This is not consistent with Table 5. **RESPONSE: Updated.**

11O. Provide a discussion on school trip distribution and assignments. **RESPONSE: School trip distribution percentages were added to Table 6 and Figures 6A & 6B. Note the school trip assignment included internal circulation on future local roads in both Vista and Overlook developments.**

(TIS Page 20)
11P. Provide justification for a higher overall % to the north and lower % to the south without the Pine Drive extension to the south compared to the Pine Drive extension. **RESPONSE: See response to 11F.**

(TIS Page 21)
11Q. Provide signal warrant and discussion evaluation. **RESPONSE: See response to 11H.**

(TIS Page 22)
11R. Add signal warrant evaluation and/or discussion for Pine Dr/Inspiration and Pine Dr/Aurora Parkway. **RESPONSE: See response to 11H.**

(TIS Page 27)
11S. Provide signal warrant evaluation and discussion. **RESPONSE: See response to 11H.**

(TIS Page 32)
11T. Highlighted is not consistent with Overlook at Kings Point TIS or Kings Point (Prairie Point)MTIS. **RESPONSE: Upon further review, it is clear the proposed future storage is dependent on whether Pine Drive is extended or remains in current geometry. Therefore, the updated Table 9 includes proposed storage lengths based on scenario type.**

Regarding discrepancies between the different TIS storage length recommendations, it is recommended that the Proposed Future Storage length be based on this TIS, as it is the most up to date. All storage lengths in the Vista TIS were determined to be equal to or longer than the Overlook TIS lengths with one exception: WB left at Parker Road and Aurora Parkway, which is currently calculated to be 10' longer in the Overlook TIS. The Kings Point TIS was completed without specific land use estimations of Vista and Overlook, making it more generalized and more conservative. Therefore, it is recommended that the proposed storage lengths of the Vista at King's Point TIS be utilized.

(TIS Page 41)
11U. Provide justification for a higher overall % to the north and lower % to the south without the Pine Drive extension to the south compared to the Pine Drive extension. **RESPONSE: See response to 11F.**

11V. Provide school trip distribution. **RESPONSE: See response to 11O.**

(TIS Page 42)
11W. Provide justification for a higher overall % to the north and lower % to the south without the Pine Drive extension to the south compared to the Pine Drive extension. **RESPONSE: See response to 11F.**

11X. Provide school trip distribution. **RESPONSE: See response to 11O.**

(TIS Page 43)
11Y. Site traffic assignment is not consistent with the trip generation table and distribution. **RESPONSE: See response to 11G.**

(TIS Page 44)
11Z. Site traffic assignment is not consistent with the trip generation table and distribution. **RESPONSE: See response to 11G.**

12) Civil Engineering (Steve Kirchner / 303-739-7489 / stkirchn@auroragov.org / Comments in blue)

(Tab 3 Page 1)
12A. Misspelling here. **RESPONSE: Revised**

(Tab 3 Page 4)
12B. These two locations are critical to providing two points of access to Vistas at Kings Point. Provide information showing these points will be provided. **RESPONSE: We understand that this site needs surrounding infrastructure to be constructed in order for access to be provided. Aurora Parkway crossing over E470 is the most critical for a connection off of Aurora Parkway. A secondary connection is provided to the west thru Kings Point South or to the South thru The Overlook at Kings Point. Pine Drive is also now shown as a potential second point of access.**

12C. Question; is the area to the south going to be annexed into the City of Aurora? If so, provide a note indicating future annexation of this area is intended. **RESPONSE: The area to the south is part of the Overlook at Kings Point Master Plan.**

(Tab 8 page 3)
12D. Where is item 1? **RESPONSE: Item 1 is for Floodway channels which this site does not have.**

12E. Please reflect a 3.5-acre land dedication for a permanent fire station. Any reference to temporary fire stations can be removed from any tab in the master plan submittal. **RESPONSE: Per discussion with Mike Dean, the requirement for a 3.5 Ac first station on this site has been removed. Correspondence attached at the rear of the response letter.**
There are 3 fire stations within the eight (8) minute response time therefore a fire station is not warranted in this location. This site is within 3 minutes of Aurora Fire Station 14 and less than 8 minutes from 2 South Metro fire stations, with which the City has an agreement. See attached exhibit. Please note that this property cannot be developed prior to the construction of Aurora Parkway which will provide direct access to the site from Aurora Fire Station 14. A note will be added to the Master Plan stating that development may not occur until the bridge over E470 and at least half of Aurora Parkway is constructed.

12F. 2 options for fire station location have been identified on tab 8.3. **RESPONSE: See response for 12E.**

12G. Show PA-3 with the fire station land dedication area in this section. See comments on tab 8.3 for further **RESPONSE: See response for 12E.**

(Tab 8 Page 5)
12H. Question; is the area to the south going to be annexed into the City of Aurora? If so, provide a note indicating future annexation of this area is intended. **RESPONSE: Area to the south is part of the Overlook at Kings Point MP.**

12I. If providing a 3.5-acre land dedication for a fire station is problematic, could we add the 3.5 acres in the property to the west? **RESPONSE: See response for 12E.**

12J. Option #1 for 3.5 acres for a permanent fire station here. **RESPONSE: See response for 12E.**

12K. Option #2 for 3.5 acres for a permanent fire station here. **RESPONSE: See response for 12E.**

(Tab 8 Page 6)
12L. Replace Fire Marshal with Office of Fire Chief Commander. **RESPONSE: Revised**

(Tab 8 Page 7)
12M. This project is contingent upon a connection of Aurora Parkway across E-470. Currently, Aurora Parkway is a dead-end street and secondary access will be required. **RESPONSE: We understand that 2 points of access will be required. A note will be added stating that development may not occur until the bridge over E470 and at least half of Aurora PArkway is constructed.**

(PIP Page 5)
12N. E Aurora Pkwy needs to cross E-470 and connect to Kings Point North for 2nd access point. **RESPONSE: Understood**

(PIP Page 20)
12O. All drawings need to reflect the 3.5-acre dedication for the fire station. **RESPONSE: See response for 12E.**

13) Aurora Water (Nina Khanzadeh / 720-859-4365 / rkhanzad@auroragov.org / Comments in red)
(MUR Page 1)
13A. Extensive coordination is required between this development, the Prusse Development and KP South MUS team to ensure this MUS and others are in conformance with the KP South MUS. **RESPONSE: Further coordination between Overlook, Vistas, and Kings Point South has taken place and will continue throughout Master Plan process.**

(MUR Page 4)
13B. Show and label limits of Antelope Creek, Prairie Point, King's Point South, and the Overlook at King's Point South.. **RESPONSE: Additional information has been added to this graphic. The extents of Prairie Point and Antelope Creek are not shown, but are shown on the Vicinity Map provided in Appendix A.**

(MUR Page 5)
13C. A looped water line is required at all times during development.. **RESPONSE: A statement regarding having a looped water line at all times during the phasing and construction of the Site has been added.**

13D. Only 292 units were accounted for in KP South MUS. **RESPONSE: Further coordination between Overlook, Vistas, and Kings Point South has taken place. We have reached out to HR Green regarding the increased number of units. The lift station design can accommodate the additional flow, but we are waiting on further conformation from their pump manufacturer if the selected pumps will be adequate.**

13E. Add: “South”. **RESPONSE: Comment has been addressed**

(MUR Page 8)
13F. Need coordination so that the Lift Station and Forcemains are sized accordingly in regards to this development and the offsite Overlook development. Coordinate with HR Green. **RESPONSE: Further coordination between Overlook, Vistas, and Kings Point South has taken place. We have reached out to HR Green regarding the increased number of units. The lift station design can accommodate the additional flow, but we are waiting on further conformation from their pump manufacturer if the selected pumps will be adequate.**

(MUR Page 9)
13G. Spelling error. **RESPONSE: Comment has been addressed**

13H. Include offsite basins. **RESPONSE: Offsite basin has been included**

13I. Need extensive coordination with KP South and Overlook at KP South to ensure all documents are in conformance with approved KPN and KPS MUS. **RESPONSE: Further coordination between Overlook, Vistas, and Kings Point South has taken place and will continue to take place as the project unfolds to ensure continuity between the projects.**

(MUR Page 10)
13J. Refer to the amendment approved in January 2023. **RESPONSE: Reference has been updated**

13K. Final version was approved in December 2022. **RESPONSE: Reference has been updated**

(MUR Page 12)
13L. Show the relationship and property boundaries between this development and Prairie Point, King's Point South, and others. **RESPONSE: The surrounding property boundaries have been added to the vicinity map.**

(MUR Page 14)
13M. Prusse MUS shows a sanitary main going to the eastern border- Clarify and adjust with them.. **RESPONSE: The offsite connection is now shown.**

13N. Show connection points and the design points to existing sanitary infrastructure. **RESPONSE: Our development is not connecting to existing infrastructure and is reliant on the Kings Point**

South development for all sanitary connections to existing infrastructure. We have shifted our map to show the Kings Point South sanitary alignment with the E-470 crossing for further clarification.

13O. Only 292 units accounted for in Kings Point South MUS- There are over 300 here. Need to have discussions with KP South to account for additional development- Please coordinate if needed. **RESPONSE: Further coordination between Overlook, Vistas, and Kings Point South has taken place. We have reached out to HR Green regarding the increased number of units. The lift station design can accommodate the additional flow, but we are waiting on further conformation from their pump manufacturer if the selected pumps will be adequate.**

13P. Need to account for offsite basins. **RESPONSE: Offisite basins have been accounted for.**

(MUR Page 15
13Q. The Overlook at KP South shows that your development will have the water main going south to connect- Please coordinate with them. **RESPONSE: The offsite water connection is now shown and accounted for in our model.**

13RNeed to account for offsite basins. **RESPONSE: Offisite basins have been accounted for.**

(MUR Page 17)
13S. Send live calcs to me via email. **RESPONSE: Calcs have been sent directly to you.**

(MUR Page 18)
13T. Ensure all offsite basins are accounted for coordinate with Prussee development to ensure all stubs and connections are provided. **RESPONSE: Connections to the surrounding developments have been accounted for and are now shown and modeled accordingly.**

(MUR Page 26)
13U. Send live calcs to me via email. **RESPONSE: Calcs have been sent directly to you.**

(MUR Page 27)
13V. Identify design point. **RESPONSE: Page has been removed**

(MUR Page 28)
13W. Identify design point.. **RESPONSE: Design point designation has been added.**

(MUR Page 30)
13X. Utilize the most recent version of the approved MUS for King's Point south. **RESPONSE: Approved MUS has been added.**

(MUR Page 35)
13Y. Show offsite Prusse property. **RESPONSE: The off site Prusse property has been shown.**

14) Forestry (Rebecca Lamphear / 303-739-7177 / rlamphea@auroragov.org / Comments in purple)
(Tab 8 Page 1)

14A. This site is subject to the Black Forest Ordinance. A Tree Protection Plan (TPP) will be required for this site if there are Black Forest trees within its boundaries. The TPP is required to be the first document that is approved, and the approval of the site plan and civil plan will follow. All documents must line up with the TPP. **RESPONSE: Noted. A TPP will be the first document approved before a Site Plan/Plat is approved.**

15) PROS (Curtis Bish / 303-739-7131 / cbish@auroragov.org / Comments in mauve)

(Tab 8 Page 3)

15A. Need clarification of the type of planned residential - multi-family versus SFA. If SFA, such as townhomes, still is considered a Single-Family unit for purposes of projecting population impact. Please specify as the answer has implications on PROS land dedication requirements. **RESPONSE: Revised to 2.65 to accommodate the higher population impact to open space.**

15B. 2.5 persons per unit is a valid multiplier only if the residential intended for PA-1 is multi-family. If single-family attached is being planned instead, the multiplier should be 2.65 persons per unit. Update population calculations if applicable. **RESPONSE: Revised to 2.65.**

(Tab 8 Page 4)

15C. PROS calculates land dedication requirements to the 100th rather than the 10th of an acre. Please update. Also, update accordingly if the numbers in Lines 11 and 12 fail to accurately represent the type of proposed
residential units for PA-1. **RESPONSE: Noted**

(Tab 8 Page 8)

15D. Numbers 13 and 14 are out of date and need not be included if no major arterial streets pass through or abut the development. **RESPONSE: Notes revised**

(Tab 9 Page 2)

15E. May or "will?" Proposed open space must provide recreational, conservation, and/or educational value and benefit. The provision of trails and trailside activity nodes with site furnishings are typically provided to satisfy land dedication criteria. **RESPONSE: Noted.**

15F. Include linework on the Open Space Plan map. **RESPONSE: Trails indicated on map as best possible. Grading and Black Forest Trees have significant impacts on this site and how its laid out. These details will not be known until site plans stage.**

15G. Sidewalks are not trails, generally speaking. Distinguishing between the two would be preferred in the narrative and mapping. **RESPONSE: Narrative revised. Trails shown on map as best possible.**

(Tab 9 Page 3)

15H. As noted in the Tab 8 redlines, PROS calculates land dedication requirements to the 100th rather than the 10th of an acre. Please update. **RESPONSE: Revised to the 100th**

15I. Change this to 146-4.3.18.B. **RESPONSE: Revised**

(Tab 9 Page 4)

15J. Applicable neighborhood park programmatic elements will be governed by the design criteria in effect at the time of Site Plan submittal. Language limiting that nothing more or different will be provided cannot be included in this Master Plan. **RESPONSE: Language revised**

15K. This could happen, but only with approval from PROS as well. **RESPONSE: Noted**

15L. Playgrounds must comply with the requirements of the PROS Dedication & Development Criteria Manual. Expand the narrative accordingly, such as describing the provision of inclusive play features, etc. **RESPONSE: Narrative revised**

15M. Only upon approval from PROS and if there is agreement from the school district for shared public use. **RESPONSE: Note revised**

(Tab 9 Page 5)
15N. This trigger. **RESPONSE: Trigger of neighborhood park revised to 206 units. This allows for PA-1, PA-2, or PA-3 to be constructed in their entirety before triggering the park.**

(Tab 9 Page 6)
15O. What is the 1/2 mile service radius for the park? Please show. **RESPONSE: ½ mile radius for the park is actually outside of the site and not within view which is why we dimensioned to a few of the property corners to show we met the ½ mile requirement. ¼ mile radius shown for reference as well.**

15P. A trail through this open space. Include symbology for trails in the legend. **RESPONSE: We will explore trails thru open space as much as possible. There is significant grade and black forest trees throughout the site which discourages trail connections in some areas.**

15Q. How will PA-8 provide open space value and benefit? Show on the map if it is to be interconnected to other spaces for pedestrian and bicycle mobility. **RESPONSE: PA-8 acts as a landscape buffer between our property and the large lots to the south of our property. This also serves as a conservational type open space. Final trail locations to be determined at site plan.**

15R. Has thought been given to the possibility of an open space corridor and trail being provided in conjunction with a maintenance path for what appears may become a drainage way leading to the detention pond? **RESPONSE: After further analysis of the site, an open space channel in this location creates a number of road/bridge crossings that are not conducive to the final site plan and how the grading needs to work. Roads want to be aligned in a north/south orientation with the grade of the site.**

16) Real Property (Roger Nelson / 720-587-2657 / ronelson@auroragov.org / Comments in magenta)

16A. There were no Real Property comments on this review. **RESPONSE: Noted**

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

17A. The current (2023) fee per residential acre is $381.13 (not $282.57). Please use that number to calculate the total public art requirement. Then use that new total to recalculate the line items in the

public art budget and resubmit. The current Public Art Guidelines for Metro Districts are attached to this letter. **RESPONSE: Noted**

(Tab 7 Page 2)
17B. With the current budget, staff recommends one public art location. **RESPONSE: Noted**

17C. Update this cost. **RESPONSE: Cost updated**

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

18A. To ensure that adequate utility easements are available within this development, PSCo requests that the following language or plat note be placed on the preliminary and final plats for the subdivision:
"Six-foot (6') wide utility easements are hereby dedicated on private property adjacent to the front lot lines and eight-foot (8') on the rear lot lines of each lot in the subdivision or platted area identified as single-family lots. Ten-foot (10') wide utility easements are hereby dedicated on private property adjacent to all public streets, and around the perimeter of each multi-family lot in the subdivision or platted area including tracts, parcels and/or open space areas. These easements are dedicated to the City of Aurora for the benefit of the applicable utility providers for the installation, maintenance, and replacement of electric, gas, television, cable, and telecommunications facilities. Utility easements shall also be granted within any access easements and private streets in the subdivision. Permanent structures, improvements, objects, buildings, wells, water meters and other objects that may interfere with the utility facilities or use thereof (Interfering Objects) shall not be permitted within said utility easements and the utility providers, as grantees, may remove any Interfering Objects at no cost to such grantees, including, without limitation, vegetation. Public Service Company of Colorado (PSCo) and its successors reserve the right to require additional easements and to require the property owner to grant PSCo an easement on its standard form.". **RESPONSE: Noted**

18B. PSCo also requests that all utility easements be depicted graphically on the preliminary and final plats. While these easements should accommodate the majority of utilities to be installed in the subdivision, some additional easements may be required as planning and building progresses. **RESPONSE: Noted**

18C. In addition, 31-23-214 (3), C.R.S., requires the subdivider, at the time of subdivision platting, to provide for major utility facilities such as electric substation sites, gas or electric transmission line easements and gas regulator/meter station sites as deemed necessary by PSCo. While this provision will not be required on every plat, when necessary, PSCo will work with the subdivider to identify appropriate locations. This statute also requires the subdivider to submit a letter of agreement to the municipal/county commission that adequate provision of electrical and/or gas service has been provided to the subdivisions. **RESPONSE: Noted**

18D. The property owner/developer/contractor must complete the application process for any new natural gas 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. 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. **RESPONSE: Noted**

19) Mile High Flood District (Laura Hinds / 303-455-6277 / submittals@mhfd.org)

19A. As noted in the drainage report, discharged flows from design point OS 5 will be conveyed through the site via an open channel. However, that area has a proposed residential land use and it appears flows are routed south along the parcel boundary. Please help us to understand the intended plan and if the existing tributary will remain open channel, in which case a tract will need to be dedicated. **RESPONSE: The existing swale bisects the site and is not conducive to development. We are proposing to redistribute the flows along the southern edge of the property either thru a combination of channels and pipes and then continue west along the southern property line. We already plan for open space along the southern boundary to assist with this.**

20) E-470 Public Highway Authority (Brandi Kemper / 303-537-3727 / bkemper@e-470.com)

20A. Outside the E-470 corridor, no comments. **RESPONSE: Noted**

MEMORANDUM

To: City of Aurora Engineering

From: Mandy Ricks, EIT
Cassie Slade, PE, PTOE

Date: August 1, 2023

Project: Vista at Kings Point

Subject: Response to Comments

Fox Tuttle Transportation Group received comments from City of Aurora staff in April 2023 in reference to the submittal of the Vista at Kings Point Traffic Impact Study (dated April 4, 2023). We appreciate your thorough review and feedback. The responses for the traffic related comments are listed below:

Comment 1. (S. Gomez) Buildout year is 2027. Why not 2030, consistent with buildout for Prairie Point (Kings Point North)?

Response: Buildout year has been changed to the 2030. Short-term background and project scenarios have been updated to reflect 2030 volumes.

Comment 2. Verify background traffic volumes with/without Pine Drive extension. Update as necessary.

Response: All volumes have been verified. They include background traffic from Kings Point MTS, Overlook at Kings Point, Longs and Cottonwood neighborhoods, and redistribution of traffic (as noted in the updated report) with and without the extension in place.

Comment 3. Provide justification for higher overall % to the north and lower % to the south without the Pine Drive extension compared to with the Pine Drive extension.

Response: The overall distribution of traffic to the north should not be impacted by an extension of Pine Drive. Distribution percentages have been adjusted to be consistent with and without a Pine Drive extension.

Comment 4. Site traffic assignments are not consistent with site trip generation table and distribution.

Response: All site generated trips have been reviewed and updated as needed. Distribution and trip generation tables have been reviewed and updated with

consistent trip distribution percentages. School distribution percentages have been added to Table 6, Figure 6A, and Figure 6B. Site generated trips have been checked and updated in figures 7A and 7B as needed.

Comment 5. Add traffic signal warrant evaluation section.

Response: Information on traffic signal warrants has been added to Section 5.2. Peak hour warrant worksheets have been included in the Appendix.

Comment 6. See comments throughout report.

Response: Responses to individual report comments below.

Comment 7. Page 8: Add delay for the signalized results and unsignalized critical movements. Overall unsignalized intersection results not needed typically.

Response: Delays for individual movements are in Table 2. The overall LOS tables in the report are just for a summary to enhance the discussion.

Comment 8. Page 10: Verify, a portion of the WB traffic is destined to/from Parker Road north and wouldn't utilize the Pine Dr extension. In addition, a portion of the EB traffic is destined to/from E-470 north and wouldn't utilize the Pine Dr extension.

Response: Agreed. This was included in the evaluation and impacted the percentages redirected.

Comment 9. Page 15: Not consistent with Table 5.

Response: Updated.

Comment 10. Page 15: Provide discussion on school trip distribution and assignment.

Response: School trip distribution percentages were added to Table 6 and Figures 6A & 6B. Note the school trip assignment included internal circulation on future local roads in both Vista and Overlook developments.

Comment 11. Table 9 (95th Percentile Queue Table): Highlight is not consistent with Overlook at Kings Point TIS or Kings Point (Prairie Point) MTIS.

Response: Upon further review, it is clear the proposed future storage is dependent on whether Pine Drive is extended or remains in current geometry. Therefore, the updated Table 9 includes proposed storage lengths based on scenario type.

Regarding discrepancies between the different TIS storage length recommendations, it is recommended that the Proposed Future Storage length be based on this TIS, as it is the most up to date. All storage lengths in the Vista TIS were determined to be equal to or longer than the Overlook TIS lengths with one exception: WB left at Parker Road and Aurora Parkway, which is currently calculated to be 10' longer in the Overlook TIS. The Kings Point TIS was completed without specific land use estimations of Vista and Overlook, making it more generalized and more conservative. Therefore, it is recommended that the proposed storage lengths of the Vista at King's Point TIS be utilized.

\MAR

Terracina Design 1st FDP Submittal Comment Response

1st Review

Advisory Comment:

The Review Fees paid at the time of Initial Submission cover three Master Drainage Report Reviews. If these comments are not addressed or design changes are made on the second submittal generating additional comments such that approval cannot be obtained within those three reviews, a new Review fee of $6,879 will be assessed upon receipt of the 4th Submittal covering up to three additional reviews. This fee will be assessed for each set of three additional reviews as required.

Understood. Thank you.

MASTER DRAI

FC

THE VISTAS AT
AURORA, C

Prepared for:

KINGS POINT INVESTMENTS, LLC
2707 E. Willamette Lane
Greenwood Village, CO 80121
Contact: Tim Sanford
Email: tim@sanford-elliott.com

Prepared by:

Terracina Design
10200 E. Girard Ave., Suite A-314
Denver, CO 80231
Contact: David Bacci, PE
Phone: 303-632-8867

March 2022

Approved for One Year From This Date

City engineer line has been removed.

Remove City Eng sig line - no longer required

City Engineer _____ Date _____

Water Department _____ Date _____

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Rainfall Depth-Duration-Frequency

Report Excerpts

I. INTRODUCTION

The Vistas at Kings Point development (Site) is a residential development containing single-family and multi-family units, a park, open space, and a school site. The purpose of this Master Drainage Report is to provide a conceptual drainage design for the necessary stormwater infrastructure to mitigate the impact to the existing hydrology. This Master Drainage Report replaces prior reports for the area and includes updated calculations with additional evaluations for the Site. The proposed improvements outlined in this report and related drainage plans are merely conceptual and may be altered in subsequent reports. The surrounding developments and individual filings will not be examined unless there is a direct impact to the Site.

A. Site Location

The Site is located in a portion of the northwest quarter of Section 2 and the northeast quarter of Section 3, Township 6 South, Range 66 West of the 6th Principal Meridian, City of Aurora, County of Douglas, State of Colorado. The Site is bound by highway E-470 to the north, Antelope Creek to the east, Sierra Vista No. 3 subdivision to the south, and vacant land to the west. Currently, there are several future developments adjacent to the site. To the north is Prairie Point South and Aurora Parkway (future), to the east is Overlook at Kings Point, and to the west is Kings Point South. A Vicinity Map can be found in Appendix A.

B. Proposed Development

Composite impervious value has been updated per the provided impervious values.

The Site is situate[d] [...]e-family and multi-family residential [...]Vistas at Kings Point South Master Plan [...]aster Drainage Report is to accompany the Vist[as] [...]lly developed, the Vistas at Kings Point is estimat[ed] [...]lti-family units. Terracina Design has estimated an overall composite imperviousness of 48% based on impervious values set forth by the City of Aurora's Storm Drainage Design and Technical Criteria Manual, existing site conditions, and the proposed Land Use Plan prepared by Terracina Design in March 2023. The impervious calculations are included in Appendix E of this report.

incorporation of the Turf Ordinance. This will impact the overall imperv value of your site.

II. HISTORIC DRAINAGE

A. Description of Property

The Site covers 95.18 acres of undeveloped land with native vegetation and has naturally occurring slopes ranging from 1 to 33 percent. The Site generally slopes from the east to the southwest towards an existing detention pond within the Crown Point development. Elevations range from 6190' to 5778' with a total relief of approximately 412'. The site primarily contains hydrologic soil group Type A & B soils consisting of Bresser-Truckton Sandy Loams (BtE), Renohill-Buick Complex (RmE) and Stapelton-Bresser (St) soils. A soils map has been provided and can be found in Appendix A.

The Cottonwood Area of Parker Outfall Systems Planning – Phase B, Preliminary Design Report (2001 OSP) notes that rural-residential development is present in most of the region, and there hasn't been any reported issues of ongoing erosion related to the drainageways. Existing

drainageways are natural, somewhat carved channels that appear to have developed some degree of stability.

B. Overall Basin Description

The Site is mostly located in the Cottonwood Middle Tributary with stormwater naturally flowing from the east to the southwest. The east portion of the site is located along a ridgeline, restricting offsite flow from the east from entering the property. The Site will receive offsite flows from the northeast that will have to be considered with Site and infrastructure designs in subsequent reports. The site has no existing development and imperviousness is estimated at 2 percent based on imperviousness set forth by the City of Aurora. The Cottonwood Middle Tributary is a naturally stable channel that exits the Site to the southwest. Flows from the Cottonwood Middle Tributary combine with Cottonwood South, east of E-470, and crosses the roadway via existing 60-inch RCP culverts. A small portion of the northwest corner of the Site lies within the Cottonwood North Tributary and crosses under E-470 via existing culverts. Cottonwood North Tributary converges with Cottonwood South Tributary and eventually with Cherry Creek. See MHFD map found in Appendix A.

Outfall Systems Plans:

- Cottonwood Area of Parker Outfall Systems Planning – Phase B, Preliminary Design Report by Farnsworth & Polk, April 2001.

Existing Major Drainage Plans:

- Kings Point North Master Drainage Plan and Report by Core Consultants Inc., August 2022 (EDN 222214).
- Flood Insurance Rate Map (FIRMS) covering the Vistas at Kings Point project include:
- FEMA Flood Insurance Rate Map 08005C0484L Effective Date February 17, 2017
- FEMA Flood Insurance Rate Map 08005C0500K Effective Date December 17, 2010

The Site is not located within a floodplain as depicted on the FIMA Flood Insurance Rates Map 08005C0484L Effective 2/17/2017 and the FIMA Flood Insurance Rates Map 08005C0500K Effective 12/17/2010 found in Appendix A. There are no irrigation facilities within or affected by the development of the Site.

III. DESIGN CRITERIA

A. List of References

Kings Point South Master Drainage Report by HR Green Development, LLC, January 25th, 2023

Cottonwood Area of Parker Outfall Systems Planning – Phase B, Preliminary Design Report by Farnsworth & Polk, April 2001

This Master Drainage Report is based on the City of Aurora's Storm Drainage Design and Technical Criteria (SDDTC) as well as the Mile High Flood District's Urban Storm Drainage Criteria Manual (USDCM).

There are no separate City master planning documents additional to the studies noted above.

B. Hydrologic Criteria

The one proposed drainage basin within the Site is greater than 90 acres; therefore, per Aurora standards, the Colorado Urban Hydrograph Procedure (CUHP) can be used in determining the stormwater runoff for the Site. The intensity-frequency curves used in the CUHP calculations were taken from NOAA ATLAS 14, Volume 8 Point Precipitation Frequency Estimates as shown in Appendix B. 1-hour point rainfall values of 0.84 for the 2-year minor event and 2.31 for the 100-year major event were utilized during modeling. Percent impervious values were taken from Table 1, City of Aurora Storm Drainage Design and Technical Criteria (SDDTC) and Table 6-3 of MHFD when not given in said Table 1. All drainage basins were analyzed and designed for both the minor (2-year) and major (100-year) storm events. These calculations also can be found in Appendix B. The sub-basins were delineated based on the existing topography and proposed planning documents developed for the project. Stormwater runoff for each basin can be found in Appendix B.

The detention pond was analyzed using the MHFD Detention Design spreadsheet for the anticipated pond release rate in conjunction with a SWMM model to incorporate routing for each basin. A separate CUHP calculation was run using the CUHP calculator built into the MHFD Detention Design. The Outlet Structure tab of said spreadsheet was then filled out to find an anticipated pond release rate and to gather pond stage outflow values from the Summary Stage-Area-Volume-Discharge Relationships table. These values were then imputed into the SWMM model to find the release rate. The two models were confirmed with each other. The pond release rates can be found in Appendix C & D.

The two variances have been added to Section D.

Please list these two items as requested variances under Section D on next page.

Per updated City of Aurora requirements, the detention pond was designed with water quality/EURV nested within the detention volume, not in addition to, and the initial pond design does not include an additional 1 foot of freeboard between the 100-year water surface elevation and the emergency overflow invert. The pond spillway will be set at the computed 100-year water surface elevation (WSEL) and 1-foot of freeboard will be provided between the WSEL of the emergency spillway conveying the maximum design emergency flow for storm event larger than the 100-year event and the top of embankment. These calculations will be included within subsequent reports.

How do allowable release rates compare to the OSP release rate for Pond CM3 and release rate assumed by Kings Point South MDP? Should likely use lesser of these.

Allowable release rates were determined using SDDTC Section 6.33 and the predominant soil t[illegible]ease rates from the S[illegible]rth in Section 6.33, F[illegible]st.

Additional statements have been added to the specific details portion of this report, comparing the release rate of the previously calculated Pond CM3 and the release rate calculated within this report.

C. Hydraulic Criteria

This report does not cover the hydraulic design for future stormwater conveyance systems and drainage facilities. The final design of the drainage improvements will include hydraulic analyses and will be described in subsequent reports.

D. Variances

No variances are being requested at this time.

IV. DRAINAGE PLAN

A. General Concepts

Comment has been addressed.

The Site generally follows historical flow patterns. Runoff a veloped within the Site will be collected in a subsurface storm system and conveyed to ~~and~~ full spectrum detention basin. The drainage analysis accounts for runoff from various minor off-site basins located within the Cottonwood Middle Tributary. The runoff generated from these basins have been will be conveyed through subsurface storm

We are coordinating with the property to the east and currently the plan is to capture and detain the adjacent backyards in this area. This basin has been included in all calculations.

See comment on plan for OS4. Does not appear to enter your site based on exis topo. Your site is only obligated to accept flows that are historically (exis cond) trib.

urrounding developments into account when ter infrastructure. The development to the east ns. At design point OS 5, discharged flows from the adjacent development's detention pond will be conveyed through the Site via an open channel as shown on the accompanying drainage map. At Design Point OS 4, flows from abutting residential unit backyards will flow onto the Site, then conveyed to an inlet via the open channel shown as shown on the accompanying drainage map, and eventually into the proposed detention pond.

The Kings Point South Master Drainage Report, dated November 2022, by HR Green includes a preliminary design for the proposed detention pond and flows discharged from the detention pond have been accounted for within their report. Existing stormwater conveyance infrastructure is in place downstream of the Site to convey flows to Cherry Creek during major storm events.

B. Specific Details

The location of the Vistas at Kings Point falls within the boundaries of the Cherry Creek Watershed. To ensure compliance, the project will adhere to the latest version of the "Cherry Creek Reservoir Watershed Stormwater Quality Regulation" that has been issued by the Cherry Creek Basin Water Quality Authority, as well as the requirements of the Cherry Creek Reservoir Control Regulation (5CCR 1002-72).

The Extended Detention Basin (EDB) that include Water Quality Capture Volumes will be the permanent Best Management Practice (BMP) implemented for the Site. Supplementary Low Impact Development (LID) measures will be integrated as deemed necessary and described in subsequent reports. It is worth noting that in all cases, the runoff leaving the site after development is equal to or less than the historic condition. These improvements are also highlighted in the related Public Improvements Plan (PIP), which specifies the construction of streets, drainage, and utilities. The PIP is designed to correspond to the development parcels and is not contingent on the order of development. This Master Drainage Plan contains approximate specifications for the storage requirements and release rates for Detention Pond A discussed below.

Additional statements have been added to the specific details portion of this report, comparing the release rate of the previously calculated Pond CM3 and the release rate calculated within this report.

Please discuss in text how your proposed Pond A release rate compares to 223021 and MHFD OSP. Appears your proposed rate is less than both.

See detailed comment on plan - proposed outfall location to adj property differs from historic and would change the location and alignment of a SMC.

Pond A's outfall location has been updated to the historic location.

Detention Pond A, referred to OSP Pond CM3 in the Kings Point South Master Drainage ...d the Cottonwood Area of Parker Outfall Systems ...eport by Farnsworth & Polk, April 2001, is located on the west side of the Site, and it is designed to manage the developed runoff from the improved Site and restore stormwater runoff to historical conditions. There are four basins, Basin OS1, OS2, OS3, OS4, and namely A1, which contribute developed stormwater to Pond A. Detention Pond A is planned to discharge into a proposed drainage swale, which will convey stormwater runoff from Basins OS5, OS6, and OS7 to the Kings Point South development located to the west of the Site. The stormwater will then flow through the Kings Pont South development and eventually make it to an existing detention pond located in the Crown Point development, described as Ex Detention Facility OS-1 (Crown Point) in the Kings Point South Master Drainage Report by HR Green dated 01/25/2023 and Final Drainage Report for Crown Point, JR Engineering, LTD. June 2000. Further details and calculations regarding Detention Pond A are provided in Appendix D.

For all new developments and redevelopments, drainage easements must be dedicated for their private detention ponds and Water Quality BMPs. As per SDDTC requirements, maintenance access will be provided to the top of the detention pond outlet structures and to any BMP control structures located within the detention ponds. The detention and water quality BMPs shall be adequately maintained to continue performing their intended function of stormwater management by ~~either the City of Aurora or~~ the metro district.

These fac will be private and not maintained by COA.

V. CONCLUSION

Comment has been addressed.

A. Compliance with Standards

The Master Drainage Report adheres to the drainage design standards of the City of Aurora and Mile High Flood District, as applicable. Moreover, the detention plan for the Site is in compliance with the Parker Outfall Systems Planning's Cottonwood Area, Phase B, Preliminary Design Report.

B. Summary of Concept

The construction of the Full Spectrum Detention facility for the Site will alleviate the impacts of the development on downstream properties and receiving waters, under both existing and future buildout conditions. For a comparison of existing and developed flows, refer to the table on the Master Drainage Plan.

VI. REFERENCES

City of Aurora's Storm Drainage Design and Technical Criteria.

Mile High Flood District's Urban Storm Drainage Criteria Manual (USDCM).

Final Drainage Report for Crown Point, JR Engineering, LTD. June 2000.

Cottonwood Area of Parker Outfall Systems Planning – Phase B, Preliminary Design Report by Farnsworth & Polk, April 2001.

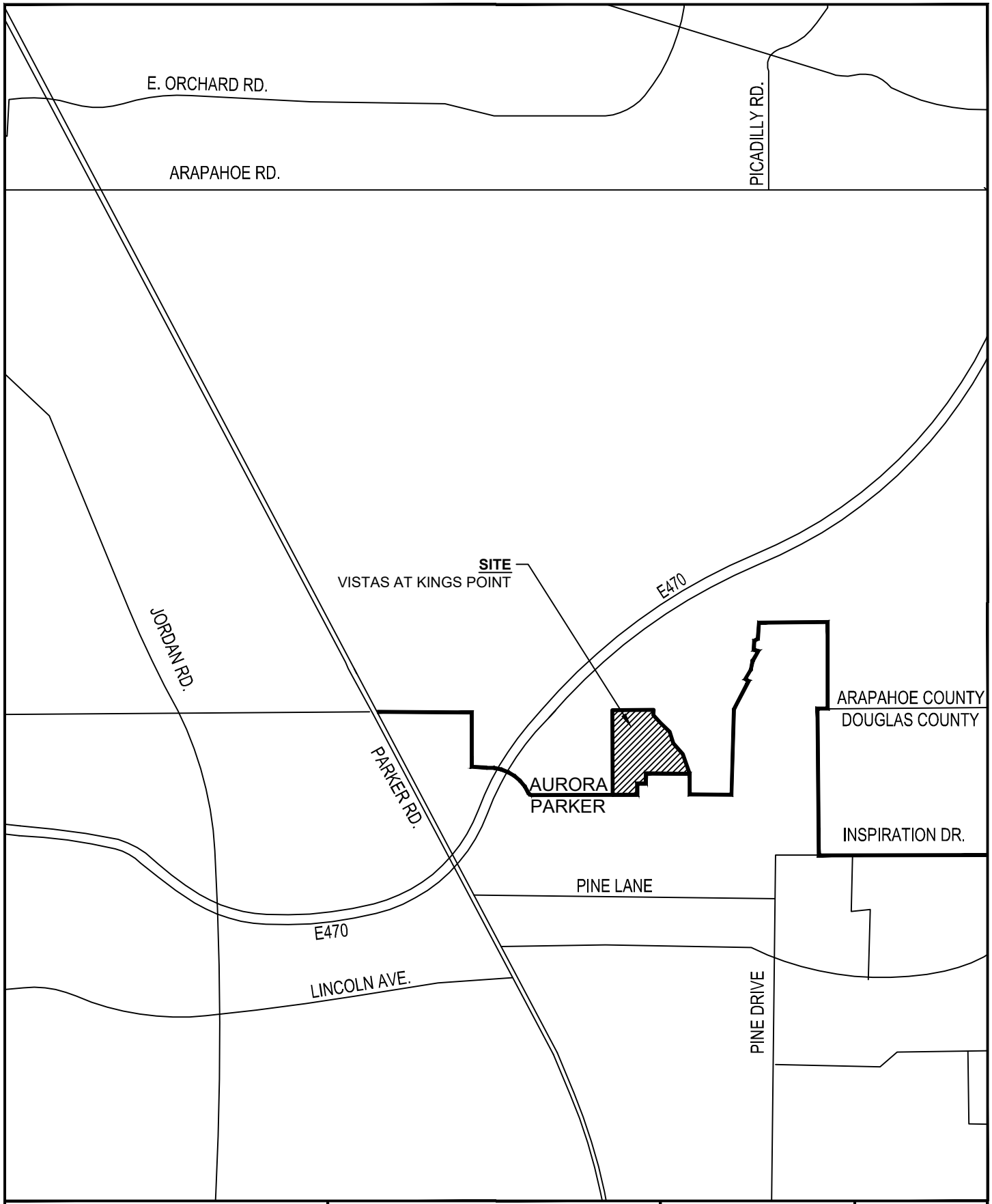
Kings Point North Master Drainage Plan and Report by Core Consultants Inc., August 2022 (EDN 222214).

Add ref for Kings Point South MDP (COA EDN 223021). This MDP area is immediately west of your site and your site discharges into it.

Kings Point South Master Drainage Plan and Report have been referenced.

APPENDIX A
MAPS AND EXHIBITS

Vicinity Map
Flood Insurance Rates Maps
Hydrologic Soils Map
Mile High Flood District Stream Corridor Map
Framework Development Plan



terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

KINGS POINT VISTAS
VICINITY MAP

AURORA, CO

DATE: 2023-02-08

0 4000'

1" = 4000'

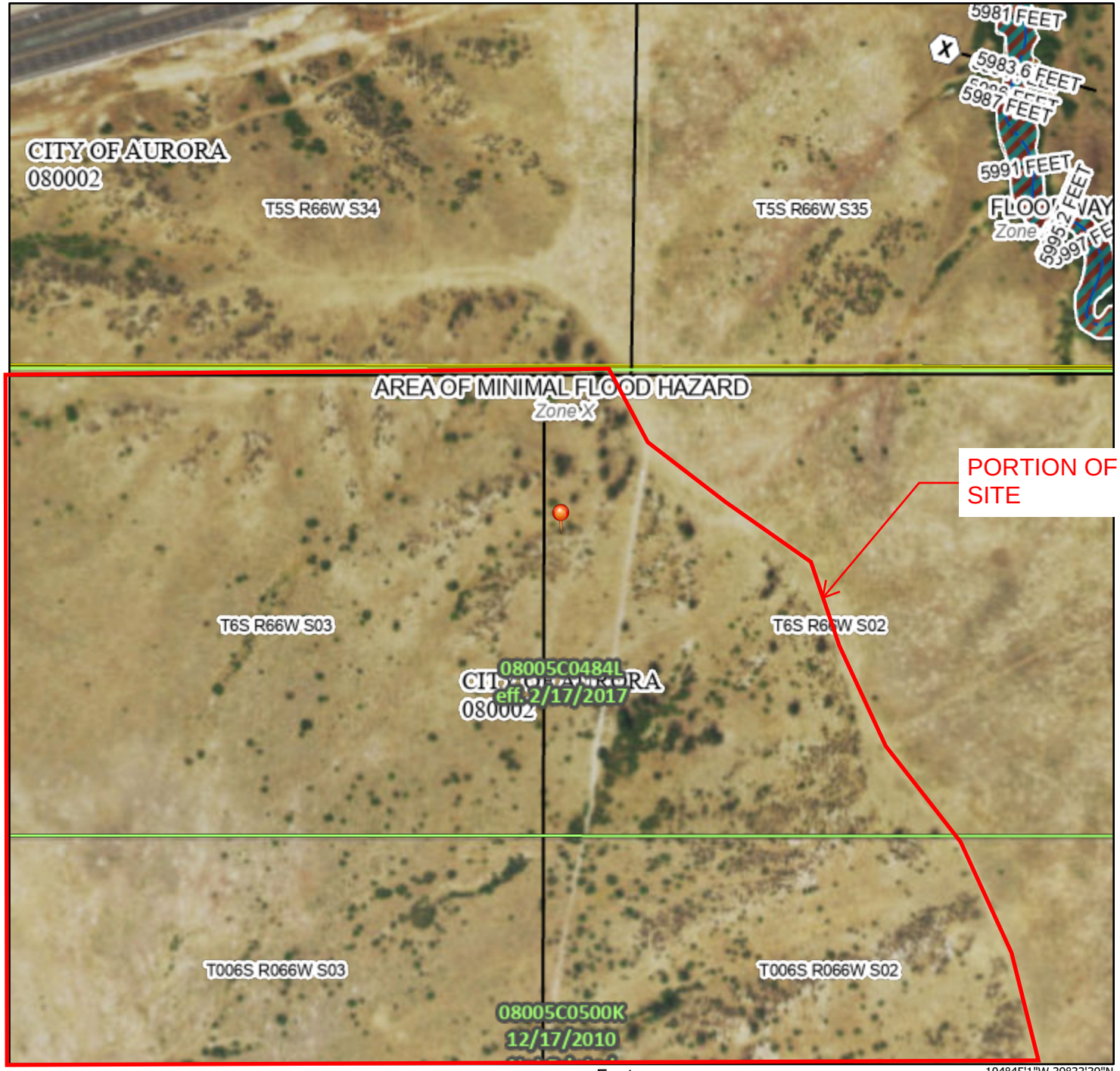
N

2/8/2023 10:17 AM ; X:\VISTAS AT KINGS POINT\CAD\PLANS\01 - VICINITY MAP\VICINITY MAP.DWG;

National Flood Hazard Layer FIRMette

FEMA

104°45'38"W 39°34'7"N



104°45'1"W 39°33'39"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

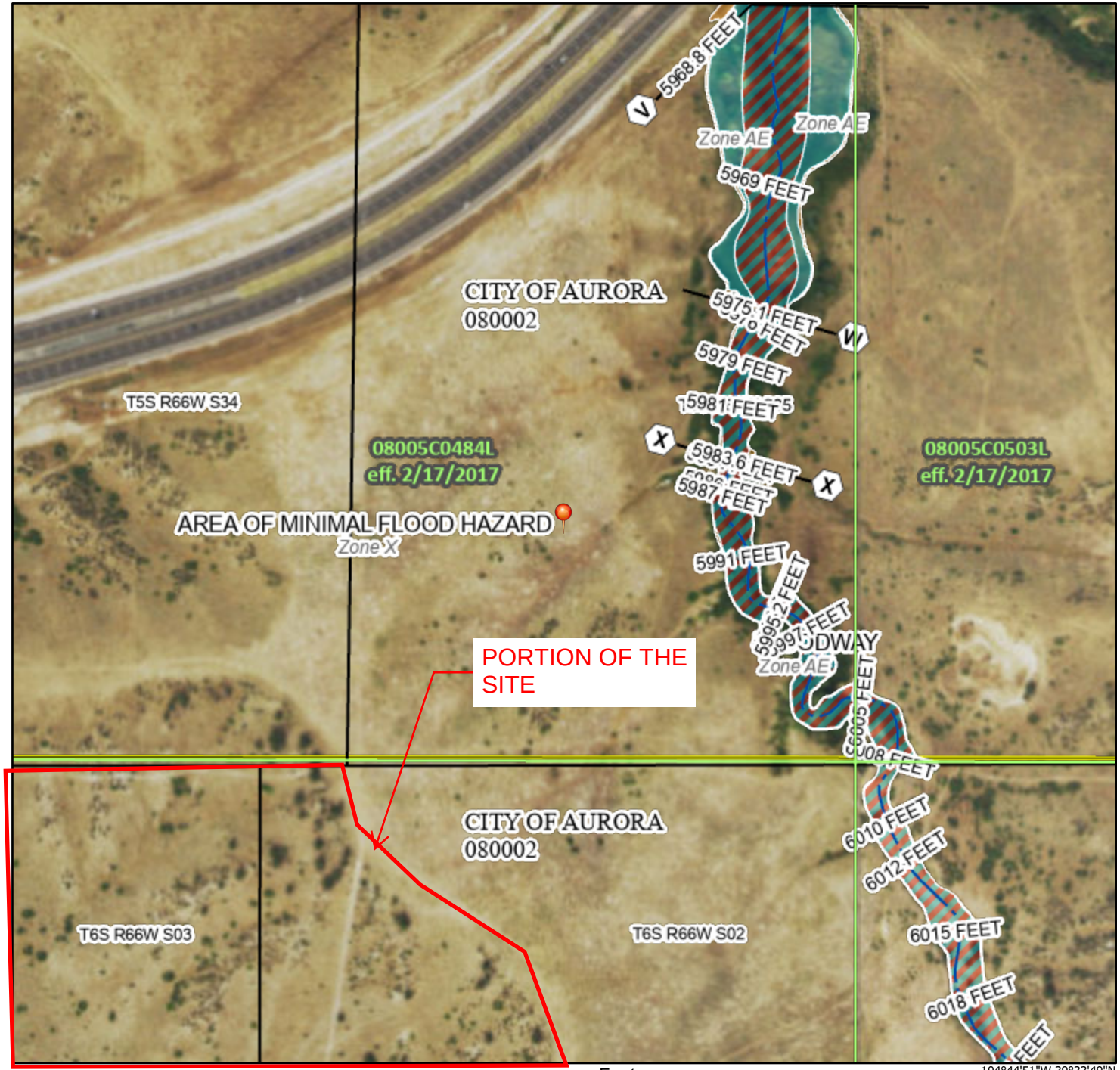
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/12/2023 at 5:16 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

104°45'29"W 39°34'17"N



104°44'51"W 39°33'49"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

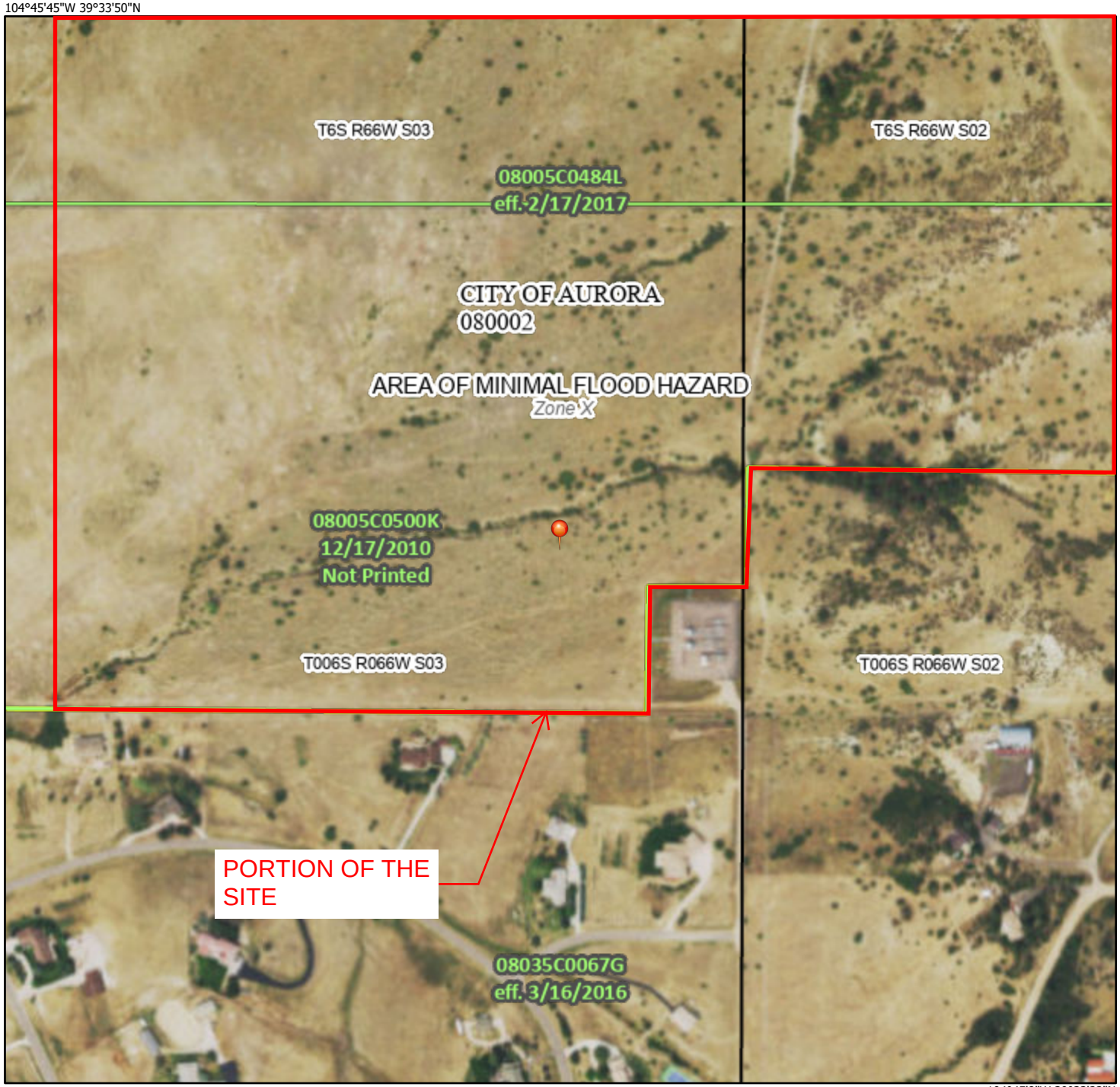
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/12/2023 at 5:19 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

104°45'45"W 39°33'50"N



104°45'8"W 39°33'22"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

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- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

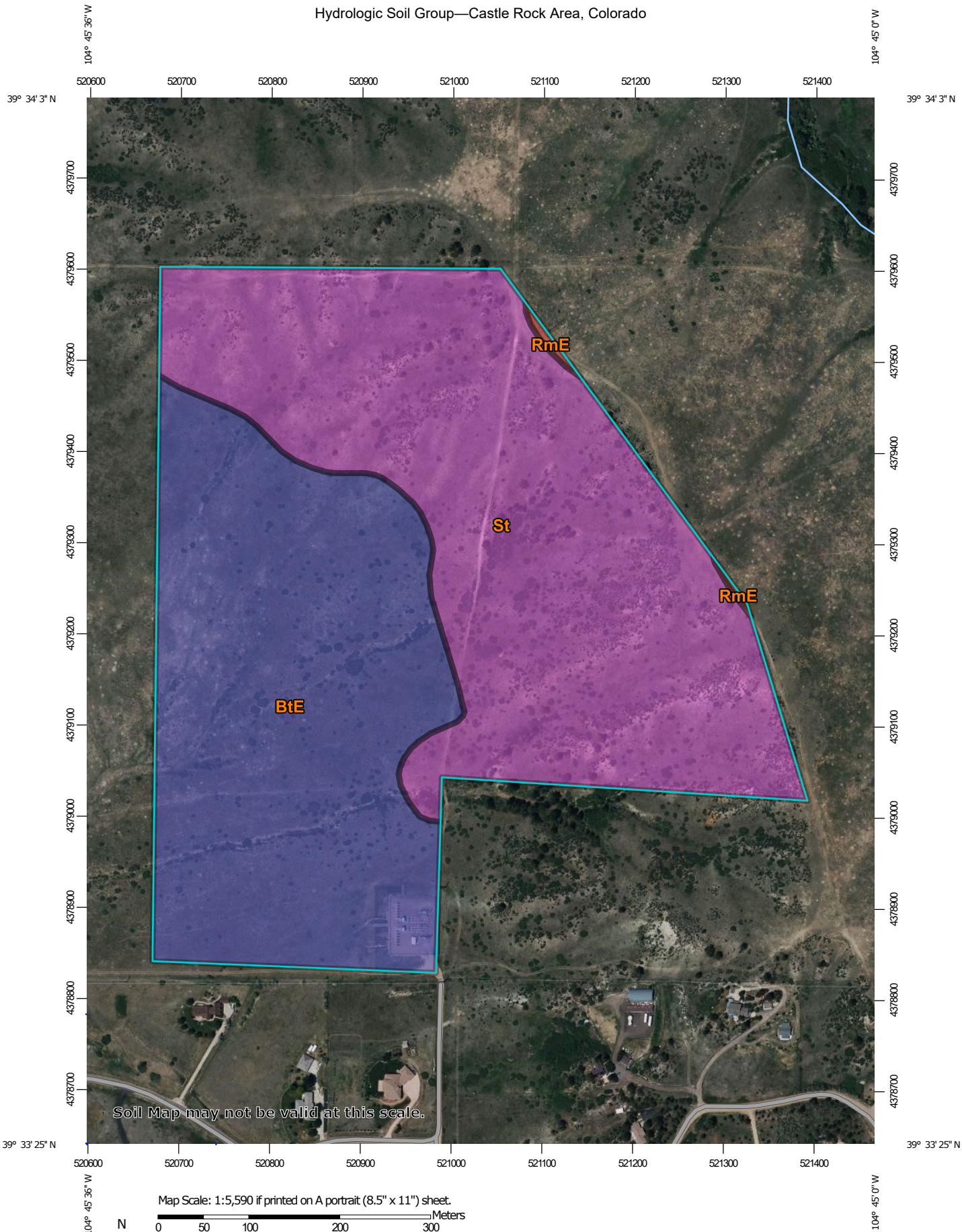
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/12/2023 at 5:17 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Hydrologic Soil Group—Castle Rock Area, Colorado



Map Scale: 1:5,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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: Castle Rock Area, Colorado
Survey Area Data: Version 15, Sep 1, 2022

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
BtE	Bresser-Truckton sandy loams, 5 to 25 percent slopes	B	43.5	45.0%
RmE	Renohill-Buick complex, 5 to 25 percent slopes	D	0.3	0.3%
St	Stapleton-Bresser association	A	52.8	54.7%
Totals for Area of Interest			**96.5**	**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.

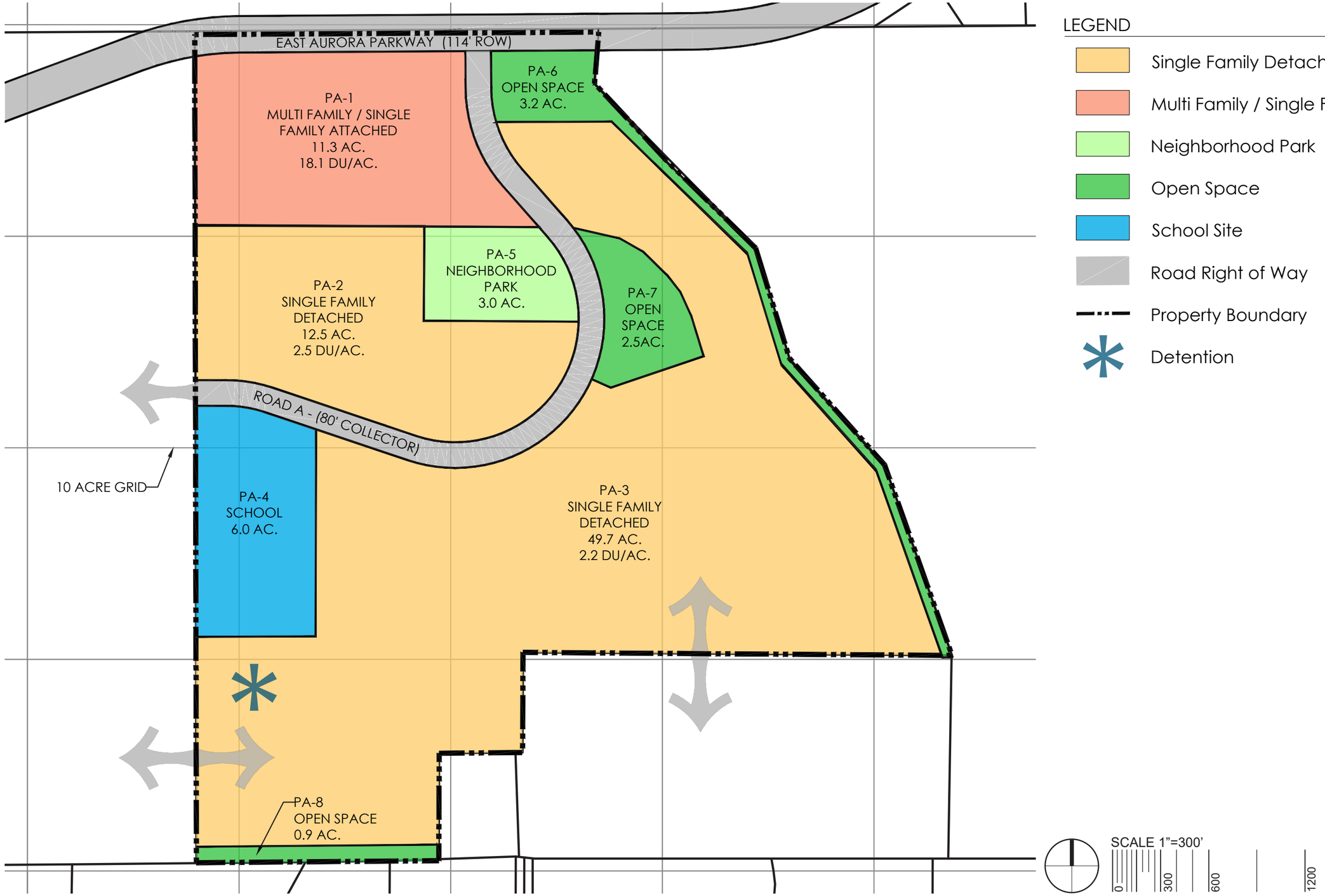
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

MHFD Stream Management Corridors
Legend
Layers
Basemap gallery
Measure
Print
Share
SITE
Cottonwood North Tributary
Cottonwood Middle Tributary
Cottonwood South Tributary
Antelope Creek
Antelope Tributary


EAST AURORA PARKWAY (114' ROW)
PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.
PA-6
OPEN SPACE
3.2 AC.
PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.
PA-5
NEIGHBORHOOD PARK
3.0 AC.
PA-7
OPEN SPACE
2.5AC.
ROAD A - (80' COLLECTOR)
10 ACRE GRID
PA-4
SCHOOL
6.0 AC.
PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.
PA-8
OPEN SPACE
0.9 AC.
LEGEND
Single Family Detached
Multi Family / Single Family Attached
Neighborhood Park
Open Space
School Site
Road Right of Way
Property Boundary
Detention
SCALE 1"=300'
0
300
600
1200

APPENDIX B
HYDRAULIC CALCULATIONS

Impervious Calculations
Colorado Urban Hydrograph Procedure (CUHP)

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph. 303.632.8867

Project Name: Vistas at Kings Point - Existing
Prepared By: MJG

Percent Impervious Calculations

Basin Id	Design Point	Total Basin	Historic Area	Paved Street Area	Single Family Lot Area	School Area	Multifamily Area	Parks Area	Gravel Area				Weighted % Impervious
			2%	100%	45%	50%	75%	5%	40%				
EX1	EX1	1.20	1.20										2.0%
EX2	EX2	4.04	4.04										2.0%
EX3	EX3	0.33	0.33										2.0%
EX4	EX4	0.39	0.39										2.0%
EX5	EX5	66.54	66.54										2.0%
EX6	EX6	17.65	17.65										2.0%
EX7	EX7	9.44	9.44										2.0%
EX8	EX8	10.55	10.55										2.0%
EX9	EX9	9.42	7.38						2.04				10.2%

Pond A total area and weighted impervious values have been added to this sheet.

Please include calcs here of the total area and weighted imperv to Pond A to support the values used in the MHFD spreadsheet on p 54.

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph. 303.632.8867

Prepared By: MJG

Percent Impervious Calculations

Basin Id	Design Point	Total Basin	Historic Area	Paved Street Area	Single Family Lot Area	School Area	Multifamily Area	Parks Area	Gravel Area				Weighted % Impervious
					45%	50%	75%	5%	40%				
					33.28	5.50	11.30	3.00					42.6%
													100.0%
					3.11								45.0%
													100.0%
					1.69								19.5%
													2.0%
													2.0%
									2.04				40.0%

Basins and impervious calculations have been updated accordingly. Each planning area has been broken out so that the impervious calculations relate back to the land plan documents. Due to this change, we have moved forward with CIA calculations for each individual basin and used the embedded CUHP calculator in the MHFD pond spreadsheet for the sizing of the detention pond.

A Turf Ordinance (2022-46) limiting the use of irrigated turf within the City of Aurora became effective on 10/15/22. Site plans submitted after this date are subject to the ordinance which impacts %imperv values and the resulting sizing of facilities within this site. Please use the attached draft COA criteria for % imperv to evaluate this site.

Based on landuse plan, appears that your proposed SF du/ac may be lower than what is represented in this table to right. If significantly lower, can discuss potentially using a unique value that you would calculate specifically for your site cond.

Based on our conversation, we are using the impervious values provided by Aurora and will adjust the pond size based on the site plan within subsequent reports.

Table 5-4. Land Use Based Imperviousness Values for Master Planning

Land Use (Including Roadways)	Corresponding Zoning	Density	Imperviousness
Residential			
Low-Density Single-Family Home (SFH)*	R-1, PD, APZ^, MU-A^	3 du/acre	70%
Medium-Density SFH*	R-2, MU-A^	5 du/acre	75%
Rural	R-R	0-3 du/acre	30%
Trailer Parks	R-MH	Manufactured: 10 du/ac; cohousing/cottage: 12 du/ac; tiny houses: 15 du/ac	65%
Medium-Density MFH	R-3	N/A	75%
High-Density MFH	R-4, MU-TOD	Core: 60 du/ac, min.; Edge: 20 du/ac, min.	80%
Commercial			
Low-Density Commercial	MU-N	16 du/ac max	70%
Medium- to High-Density Commercial	MU-R, MU-FB, MU-C, AD^, MU-A^	25 du/ac min	80%
Urban Core Commercial	MU-OA	5 - 25 du/ac	90%
Industrial/Institutional			
Schools	MU-OI	N/A	55%
Office/Institutional	MU-OI (non-school)	N/A	75%
Industrial, Light Areas	I-1, AD^	N/A	80%
Industrial, Heavy Areas	I-2	N/A	90%
Solar Farm, Gravel Cover, Rows Parallel to Contours	N/A	N/A	460%
Solar Farm, Gravel Cover, Rows Diagonal to Contours	N/A	N/A	50%
Solar Farm, Gravel Cover, Rows Perpendicular to Contours	N/A	N/A	60%
Solar Farm, Grass Cover, Rows Parallel to Contours	N/A	N/A	~~40~~5%
Solar Farm, Grass Cover, Rows Diagonal to Contours	N/A	N/A	2033%
Solar Farm, Grass Cover, Rows Perpendicular to Contours	N/A	N/A	40%
Parks and Open Space			
Open Space	POS, APZ^	N/A	52%
Less Developed Parks	POS	N/A	10%
Cemeteries	POS	N/A	25%
Developed Parks	POS	N/A	30%

*If development was ~~compliant~~ approved before then turf ordinance limiting lawns to 500 sf was enacted, decrease imperviousness by 10%.
^Use corresponding value for appropriate land use; if land-use is unknown at time of master planning, use the highest imperviousness category. For example, if an area zoned as MU-A, the impervious value for master planning would be 80% (Medium- to High- Density Commercial).
du/ac = Dwelling per acre

CUHP SUBCATCHMENTS

CUHP SUBCATCHMENTS

Columns with this color heading are for required user-input
Columns with this color heading are for optional override values
Columns with this color heading are for program-calculated values

								Maximum Depression Storage (Watershed inches)		Horton's Infiltration Parameters			DCIA	
Subcatchment Name	EPA SWMM Target Node	Raingage	Area (mi^2)	Length to Centroid (mi)	Length (mi)	Slope (ft/ft)	Percent Imperviousness	Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)	Level 0, 1, or 2	Comment
EX1	EX1	100-Year	0.001881	0.017299242	0.043992	0.092	2	0.35	0.1	5	0.0007	1	0	Existing Condition
EX2	EX2	100-Year	0.00632	0.024780303	0.080871	0.115	2	0.35	0.1	5	0.0007	1	0	Existing Condition
EX3	EX3	100-Year	0.000521	0.007787879	0.023227	0.05	2	0.35	0.1	5	0.0007	1	0	Existing Condition
EX4	EX4	100-Year	0.000604	0.007787879	0.025227	0.118	2	0.35	0.1	5	0.0007	1	0	Existing Condition
EX5	EX5	100-Year	0.103963	0.170454545	0.377083	0.107	2	0.35	0.1	4.75	0.00125	0.8	0	Existing Condition
EX6	EX6	100-Year	0.027575	0.151234848	0.168636	0.157	2	0.35	0.1	4.75	0.00125	0.8	0	Existing Condition
EX7	EX7	100-Year	0.014756	0.104166667	0.210227	0.072	2	0.35	0.1	4.5	0.0018	0.6	0	Existing Condition
EX8	EX8	100-Year	0.016488	0.158143939	0.249318	0.153	2	0.35	0.1	4.5	0.0018	0.6	0	Existing Condition
EX9	EX9	100-Year	0.014712	0.084280303	0.205114	0.103	10.2	0.35	0.1	4.5	0.0018	0.6	0	Existing Condition

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)
2-Year Event

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
EX1	Existing Condition	0.158	0.028	14.9	1.82	7.8	1.29	3.0	4	4,369	0.38	1,645	35.0	1	1,535	0.87
EX2	Existing Condition	0.158	0.048	13.0	1.98	6.8	1.40	3.3	15	14,682	0.38	5,526	35.0	4	5,159	0.97
EX3	Existing Condition	0.158	0.016	15.4	1.69	8.0	1.19	2.8	1	1,211	0.38	456	35.0	0	424	0.85
EX4	Existing Condition	0.158	0.017	12.2	1.66	6.4	1.17	2.8	1	1,403	0.00	0	2.8	0	0	0.00
EX5	Existing Condition	0.158	0.171	19.9	4.11	10.3	2.91	6.9	157	241,528	0.00	887	35.0	0	880	0.01
EX6	Existing Condition	0.158	0.094	21.1	3.03	11.0	2.14	5.0	39	64,061	0.00	235	30.0	0	232	0.01
EX7	Existing Condition	0.158	0.071	31.4	3.21	16.3	2.27	5.4	14	34,280	0.01	266	35.0	0	264	0.01
EX8	Existing Condition	0.158	0.075	33.0	3.39	17.2	2.40	5.7	15	38,304	0.01	297	35.0	0	295	0.01
EX9	Existing Condition	0.137	0.062	25.4	2.71	13.2	1.91	4.5	17	34,179	0.05	1,573	35.0	1	1,544	0.06

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)
100-Year Event

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
EX1	Existing Condition	0.158	0.028	14.9	1.82	7.8	1.29	3.0	4	4,369	0.38	1,645	35.0	1	1,535	0.87
EX2	Existing Condition	0.158	0.048	13.0	1.98	6.8	1.40	3.3	15	14,682	0.38	5,526	35.0	4	5,159	0.97
EX3	Existing Condition	0.158	0.016	15.4	1.69	8.0	1.19	2.8	1	1,211	0.38	456	35.0	0	424	0.85
EX4	Existing Condition	0.158	0.017	12.2	1.66	6.4	1.17	2.8	1	1,403	0.38	528	35.0	0	485	1.00
EX5	Existing Condition	0.157	0.170	19.9	4.09	10.3	2.89	6.8	157	241,528	0.87	209,131	40.0	90	207,658	1.35
EX6	Existing Condition	0.157	0.093	21.1	3.01	11.0	2.13	5.0	39	64,061	0.87	55,469	40.0	22	54,693	1.27
EX7	Existing Condition	0.157	0.070	31.4	3.19	16.3	2.26	5.3	14	34,280	1.19	40,747	40.0	12	40,453	1.24
EX8	Existing Condition	0.157	0.074	33.0	3.37	17.2	2.38	5.6	15	38,304	1.19	45,530	45.0	13	45,251	1.19
EX9	Existing Condition	0.130	0.059	25.2	2.65	13.1	1.87	4.4	17	34,179	1.28	43,654	40.0	14	42,769	1.51

CUHP SUBCATCHMENTS

CUHP SUBCATCHMENTS

Columns with this color heading are for required user-input
Columns with this color heading are for optional override values
Columns with this color heading are for program-calculated values

								Maximum Depression Storage (Watershed inches)		Horton's Infiltration Parameters			DCIA	
Subcatchment Name	EPA SWMM Target Node	Raingage	Area (ft^2)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)	Level 0, 1, or 2	Comment
A1	A1	2-year	4073922.2	1436	2222.2665	0.07	43	0.35	0.05	4.75	0.00125	0.8	0	Future Condition
OS1	OS1	2-year	66171.334	150	264	0.07	100	0.35	0.05	5	0.0007	1	0	Future Condition
OS2	OS2	2-year	135685.57	134.96	433.76	0.07	45	0.35	0.05	5	0.0007	1	0	Future Condition
OS3	OS3	2-year	72197.315	521	760.2	0.04	100	0.35	0.05	5	0.0007	1	0	Future Condition
OS4	OS4	2-year	181327.06	134.48	429.84	0.07	19.5	0.35	0.05	5	0.0007	1	0	Future Condition
OS5	OS5	2-year	458888.42	733	1346.6	0.07	2	0.35	0.05	5	0.0007	1	0	Future Condition
OS6	OS6	2-year	321798.63	287	749	0.07	2	0.35	0.05	5	0.0007	1	0	Future Condition
OS7	OS7	2-year	88724.716	120	302.8	0.08	40	0.35	0.05	4.5	0.0018	0.6	0	Future Condition

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)
Proposed 2-Year

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A1	Future Condition	0.093	0.202	14.5	3.75	7.5	2.65	6.3	302	339,494	0.31	104,617	30.0	41	103,688	0.43
OS1	Future Condition	0.073	0.044	6.4	1.71	3.3	1.21	2.9	11	5,514	0.88	4,829	25.0	2	3,962	1.52
OS2	Future Condition	0.092	0.045	9.4	1.83	4.9	1.29	3.0	15	11,307	0.33	3,676	25.0	2	3,331	0.51
OS3	Future Condition	0.073	0.045	21.1	2.24	11.0	1.58	3.7	4	6,016	0.88	5,269	30.0	2	5,096	0.92
OS4	Future Condition	0.117	0.039	13.9	1.91	7.2	1.35	3.2	14	15,111	0.07	1,006	30.0	0	940	0.09
OS5	Future Condition	0.158	0.075	37.9	3.67	19.7	2.59	6.1	13	38,241	0.00	27	35.0	0	27	0.00
OS6	Future Condition	0.158	0.064	21.4	2.55	11.1	1.80	4.2	16	26,817	0.00	0	4.2	0	0	0.00
OS7	Future Condition	0.095	0.035	9.7	1.76	5.1	1.24	2.9	10	7,394	0.30	2,246	30.0	1	2,031	0.50

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)
Proposed 100-Year

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A1	Future Condition	0.093	0.208	14.0	3.73	7.3	2.64	6.2	314	339,494	1.52	515,668	35.0	231	511,200	2.47
OS1	Future Condition	0.073	0.044	6.4	1.71	3.3	1.21	2.9	11	5,514	2.50	13,787	30.0	6	11,312	4.12
OS2	Future Condition	0.092	0.046	9.2	1.82	4.8	1.29	3.0	16	11,307	1.26	14,273	35.0	7	12,878	2.31
OS3	Future Condition	0.073	0.045	21.1	2.24	11.0	1.58	3.7	4	6,016	2.50	15,043	35.0	4	14,549	2.61
OS4	Future Condition	0.115	0.038	13.8	1.91	7.2	1.35	3.2	14	15,111	0.70	10,516	35.0	6	9,816	1.34
OS5	Future Condition	0.158	0.074	37.9	3.66	19.7	2.59	6.1	13	38,241	0.38	14,408	40.0	5	14,358	0.43
OS6	Future Condition	0.158	0.063	21.4	2.54	11.1	1.79	4.2	16	26,817	0.38	10,093	35.0	5	9,843	0.68
OS7	Future Condition	0.094	0.036	9.3	1.76	4.8	1.24	2.9	10	7,394	1.67	12,376	35.0	6	11,124	3.00

APPENDIX C
HYDRAULIC CALCULATIONS

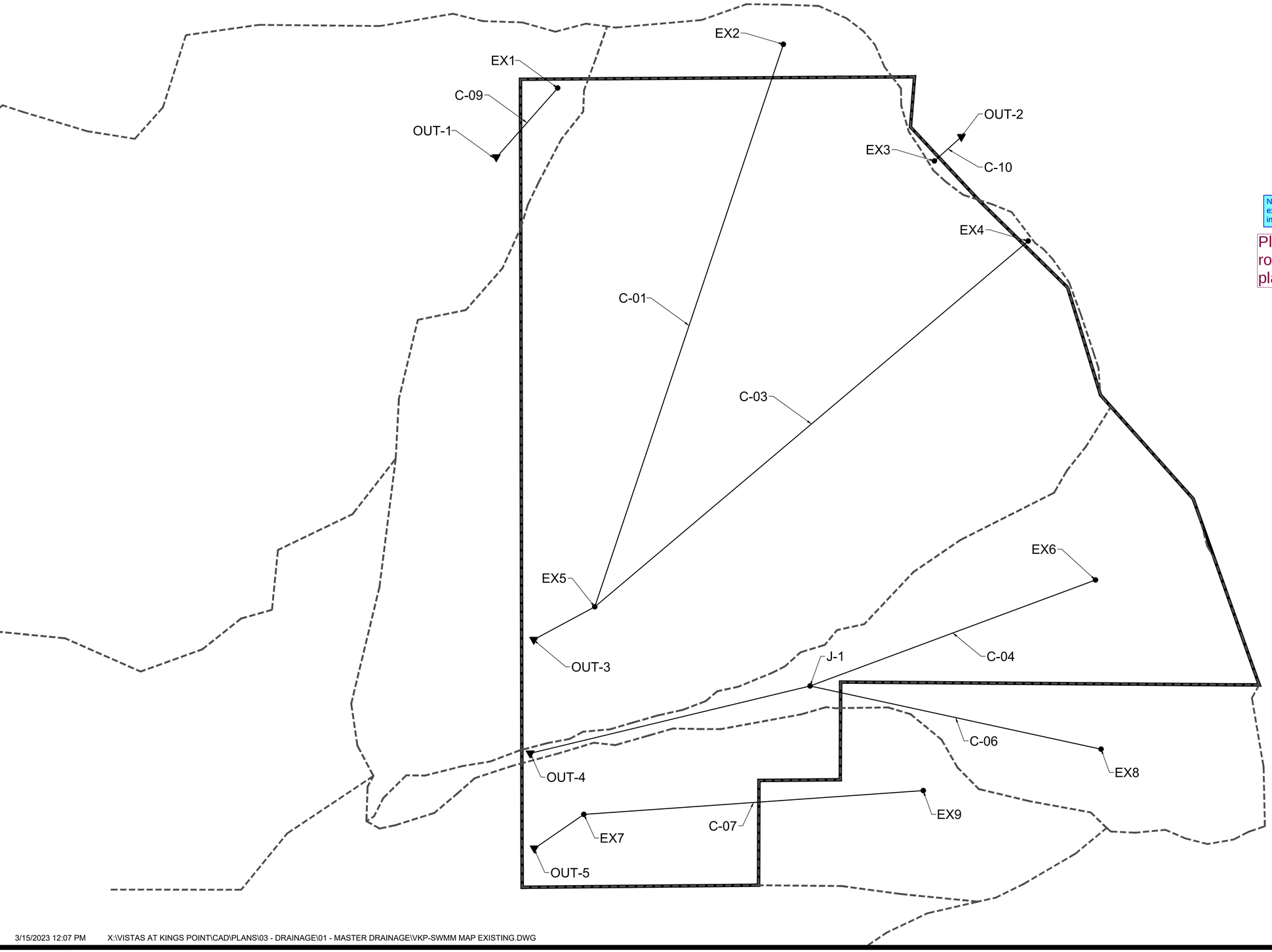
Stormwater Management Model (SWMM)

Sheet has been removed.

Max sheet size allowed in reports is 11x17. Please resize.

No routing is taking place on the updated existing basins. No routing has been included on the plan sheets.

Please also include routing diagram on plan sheet.



3/15/2023 12:07 PM X:\VISTAS AT KINGS POINT\CAD\PLANS\03 - DRAINAGE\01 - MASTER DRAINAGE\VKP-SWMM MAP EXISTING.DWG

March 15, 2023

VISTAS AT KINGS POINT

EXISTING SWMM MODEL MAP

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 150' 300'

1" = 150'

SWMM MO
Existing 2-

Each planning area has been broken out so that the impervious calculations relate back to the land plan documents. Due to this change, we have moved forward with CIA calculations for each individual basin and used the embedded CUHP calculator in the MHFD pond spreadsheet for the sizing of the detention pond. SWMM calculations have been removed from this report.

Please also include 1 copy of the SWMM input file for the exis system model showing, link-node connectivity, link characteristics, etc....

terracina design
Landscape Architecture, Planning & Engineering
10200 E. Girard Avenue, A-314. Denver, CO 80231 PH: 303.632.8867

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.2)
------------------------------------------------------------


***************
Analysis Options
***************
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... NO
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date ..... 01/01/2005 00:00:00
Ending Date ..... 01/01/2005 06:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:15:00
Routing Time Step ..... 20.00 sec
Variable Time Step ..... YES
Maximum Trials ..... 8
Number of Threads ..... 1
Head Tolerance ..... 0.005000 ft


*************************        Volume         Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------      ---------
Dry Weather Inflow .....          0.000          0.000
Wet Weather Inflow .....          0.000          0.000
Groundwater Inflow .....          0.000          0.000
RDII Inflow ............          0.000          0.000
External Inflow ........          0.237          0.077
External Outflow .......          0.198          0.065
Flooding Loss ..........          0.000          0.000
Evaporation Loss .......          0.000          0.000
Exfiltration Loss ......          0.000          0.000
Initial Stored Volume ....        0.000          0.000
Final Stored Volume ......        0.000          0.000
Continuity Error (%) .....       16.340


************************
Highest Continuity Errors
************************
Node EX7 (93.53%)


**************************
Time-Step Critical Elements
**************************
None


*******************************
Highest Flow Instability Indexes
*******************************
Link C-08 (10)


*******************************
Most Frequent Nonconverging Nodes
*******************************
Node EX7 (26.64%)
```

SWMM model has been removed from the report.

With ponding not allowed, any surcharge water would be lost from system. No surcharging for 2yr but what about 100yr and proposed?

Use of simpler kinematic wave is recommended by MHFD for planning studies partly because it has fewer stability problems - may resolve the issue below.

SWMM model has been removed from the report.

Significant continuity error - Problem/error at this node

SWMM model has been removed from the report.

Node OUT-1 (26.64%)
Node OUT-3 (26.64%)
Node OUT-4 (26.64%)
Node OUT-2 (26.64%)

****
Routing Time Step Summary
****
Minimum Time Step : 19.50 sec
Average Time Step : 19.98 sec
Maximum Time Step : 20.00 sec
% of Time in Steady State : 0.00
Average Iterations per Step : 3.60
% of Steps Not Converging : 26.64
Time Step Frequencies :
20.000 - 9.564 sec : 100.00 %
9.564 - 4.573 sec : 0.00 %
4.573 - 2.187 sec : 0.00 %
2.187 - 1.046 sec : 0.00 %
1.046 - 0.500 sec : 0.00 %

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
EX2	JUNCTION	0.00	0.00	6064.30	0 00:00	0.00
EX5	JUNCTION	0.01	0.11	5993.11	0 00:36	0.09
EX4	JUNCTION	0.00	0.00	6082.00	0 00:00	0.00
EX3	JUNCTION	0.00	0.00	6089.00	0 00:00	0.00
EX6	JUNCTION	0.00	0.00	6057.00	0 00:00	0.00
EX8	JUNCTION	0.00	0.00	6067.00	0 00:00	0.00
J-1	JUNCTION	0.00	0.02	5970.02	0 00:36	0.02
EX9	JUNCTION	0.00	0.00	6032.00	0 00:00	0.00
EX7	JUNCTION	0.01	0.05	5944.05	0 00:35	0.05
EX1	JUNCTION	0.00	0.00	6051.00	0 00:00	0.00
OUT-1	OUTFALL	0.00	0.00	6013.00	0 00:00	0.00
OUT-3	OUTFALL	0.01	0.11	5915.11	0 00:36	0.09
OUT-4	OUTFALL	0.00	0.02	5915.02	0 00:36	0.02
OUT-2	OUTFALL	0.00	0.00	6087.00	0 00:00	0.00
OUT-5	OUTFALL	0.00	0.02	5911.02	0 00:12	0.00

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
EX2	JUNCTION	3.94	3.94	0 00:35	0.0386	0.0386	0.000
EX5	JUNCTION	0.48	4.42	0 00:35	0.00658	0.0452	-0.020
EX4	JUNCTION	0.00	0.00	0 00:00	0	0	0.000 gal
EX3	JUNCTION	0.28	0.28	0 00:35	0.00317	0.00317	0.000
EX6	JUNCTION	0.12	0.12	0 00:30	0.00173	0.00173	0.000
EX8	JUNCTION	0.10	0.10	0 00:35	0.00221	0.00221	0.000
J-1	JUNCTION	0.00	0.22	0 00:35	0	0.00394	-0.174
EX9	JUNCTION	0.56	0.56	0 00:35	0.0115	0.0115	0.000
EX7	JUNCTION	0.09	0.65	0 00:35	0.00197	0.0135	1445.721
EX1	JUNCTION	1.05	1.05	0 00:35	0.0115	0.0115	0.000

OUT-1	OUTFALL	0.00	1.05	0	00:35	0	0.0115	0.000
OUT-3	OUTFALL	0.00	4.32	0	00:36	0	0.0452	0.000
OUT-4	OUTFALL	0.00	0.21	0	00:36	0	0.00395	0.000
OUT-2	OUTFALL	0.00	0.28	0	00:35	0	0.00317	0.000
OUT-5	OUTFALL	0.00	0.65	0	00:12	0	0.000875	0.000

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
EX2	JUNCTION	6.00	0.000	0.000
EX4	JUNCTION	6.00	0.000	0.000
EX3	JUNCTION	6.00	0.000	0.000
EX6	JUNCTION	6.00	0.000	0.000
EX8	JUNCTION	6.00	0.000	0.000
EX9	JUNCTION	6.00	0.000	0.000
EX1	JUNCTION	6.00	0.000	0.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OUT-1	23.03	0.31	1.05	0.011
OUT-3	43.66	0.64	4.32	0.045
OUT-4	43.48	0.06	0.21	0.004
OUT-2	20.35	0.10	0.28	0.003
OUT-5	3.70	0.15	0.65	0.001
System	26.85	1.25	5.84	0.065

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
C-01	DUMMY	3.94	0 00:35			
C-02	CONDUIT	4.32	0 00:36	8.76	0.00	0.04
C-03	DUMMY	0.00	0 00:00			
C-04	DUMMY	0.12	0 00:30			
C-05	CONDUIT	0.21	0 00:36	2.59	0.00	0.01
C-06	DUMMY	0.10	0 00:35			
C-07	DUMMY	0.56	0 00:35			
C-08	CONDUIT	0.65	0 00:12	0.00	0.00	0.02
C-09	DUMMY	1.05	0 00:35			

C-10 DUMMY 0.28 0 00:35

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C-02	1.00	0.22	0.00	0.00	0.04	0.73	0.00	0.00	0.46	0.00
C-05	1.00	0.17	0.00	0.00	0.07	0.76	0.00	0.00	0.31	0.00
C-08	1.00	0.47	0.49	0.00	0.04	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Wed Mar 15 10:48:33 2023
Analysis ended on: Wed Mar 15 10:48:33 2023
Total elapsed time: < 1 sec

SWMM MODEL OUTPUT
Existing 100-Year Event

terracina design
Landscape Architecture, Planning & Engineering
10200 E. Girard Avenue, A-314. Denver, CO 80231 PH: 303.632.8867

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.2)
-------------------------------------------------------------


***************
Analysis Options
***************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/01/2005 06:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Routing Time Step ........ 20.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.005000 ft


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         9.146         2.980
External Outflow .........         7.237         2.358
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        20.876


************************
Highest Continuity Errors
************************
Node EX7 (99.89%)


**************************
Time-Step Critical Elements
**************************
None


*******************************
Highest Flow Instability Indexes
*******************************
Link C-08 (10)


*******************************
Most Frequent Nonconverging Nodes
*******************************
Node EX7 (41.63%)
```

SWMM model has been removed from the report.

This is a significant continuity error. Please resolve.

Node OUT-1 (41.63%)
Node OUT-3 (41.63%)
Node OUT-4 (41.63%)
Node OUT-2 (41.63%)

****
Routing Time Step Summary
****
Minimum Time Step : 19.50 sec
Average Time Step : 19.98 sec
Maximum Time Step : 20.00 sec
% of Time in Steady State : 0.00
Average Iterations per Step : 4.50
% of Steps Not Converging : 41.63
Time Step Frequencies :
20.000 - 9.564 sec : 100.00 %
9.564 - 4.573 sec : 0.00 %
4.573 - 2.187 sec : 0.00 %
2.187 - 1.046 sec : 0.00 %
1.046 - 0.500 sec : 0.00 %

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
EX2	JUNCTION	0.00	0.00	6064.30	0 00:00	0.00
EX5	JUNCTION	0.09	0.62	5993.62	0 00:40	0.59
EX4	JUNCTION	0.00	0.00	6082.00	0 00:00	0.00
EX3	JUNCTION	0.00	0.00	6089.00	0 00:00	0.00
EX6	JUNCTION	0.00	0.00	6057.00	0 00:00	0.00
EX8	JUNCTION	0.00	0.00	6067.00	0 00:00	0.00
J-1	JUNCTION	0.07	0.39	5970.39	0 00:40	0.38
EX9	JUNCTION	0.00	0.00	6032.00	0 00:00	0.00
EX7	JUNCTION	0.23	1.45	5945.45	0 00:41	1.43
EX1	JUNCTION	0.00	0.00	6051.00	0 00:00	0.00
OUT-1	OUTFALL	0.00	0.00	6013.00	0 00:00	0.00
OUT-3	OUTFALL	0.09	0.61	5915.61	0 00:40	0.59
OUT-4	OUTFALL	0.07	0.39	5915.39	0 00:40	0.38
OUT-2	OUTFALL	0.00	0.00	6087.00	0 00:00	0.00
OUT-5	OUTFALL	0.00	0.02	5911.02	0 00:10	0.00

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
EX2	JUNCTION	3.94	3.94	0 00:35	0.0386	0.0386	0.000
EX5	JUNCTION	89.61	93.21	0 00:40	1.55	1.6	0.016
EX4	JUNCTION	0.39	0.39	0 00:35	0.00363	0.00363	0.000
EX3	JUNCTION	0.28	0.28	0 00:35	0.00317	0.00317	0.000
EX6	JUNCTION	22.33	22.33	0 00:40	0.409	0.409	0.000
EX8	JUNCTION	12.59	12.59	0 00:45	0.338	0.338	0.000
J-1	JUNCTION	0.00	34.92	0 00:40	0	0.748	0.010
EX9	JUNCTION	14.20	14.20	0 00:40	0.32	0.32	0.000
EX7	JUNCTION	11.73	25.93	0 00:40	0.303	0.623	91311.281
EX1	JUNCTION	1.05	1.05	0 00:35	0.0115	0.0115	0.000

OUT-1	OUTFALL	0.00	1.05	0	00:35	0	0.0115	0.000
OUT-3	OUTFALL	0.00	93.08	0	00:40	0	1.6	0.000
OUT-4	OUTFALL	0.00	34.86	0	00:40	0	0.748	0.000
OUT-2	OUTFALL	0.00	0.28	0	00:35	0	0.00317	0.000
OUT-5	OUTFALL	0.00	0.38	0	00:10	0	0.000681	0.000

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
EX2	JUNCTION	6.00	0.000	0.000
EX4	JUNCTION	6.00	0.000	0.000
EX3	JUNCTION	6.00	0.000	0.000
EX6	JUNCTION	6.00	0.000	0.000
EX8	JUNCTION	6.00	0.000	0.000
EX9	JUNCTION	6.00	0.000	0.000
EX1	JUNCTION	6.00	0.000	0.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OUT-1	23.03	0.31	1.05	0.011
OUT-3	47.64	20.71	93.08	1.595
OUT-4	56.80	8.14	34.86	0.748
OUT-2	20.35	0.10	0.28	0.003
OUT-5	3.70	0.11	0.38	0.001
System	30.31	29.36	129.05	2.358

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
C-01	DUMMY	3.94	0	00:35			
C-02	CONDUIT	93.08	0	00:40	23.42	0.03	0.21
C-03	DUMMY	0.39	0	00:35			
C-04	DUMMY	22.33	0	00:40			
C-05	CONDUIT	34.86	0	00:40	16.02	0.01	0.13
C-06	DUMMY	12.59	0	00:45			
C-07	DUMMY	14.20	0	00:40			
C-08	CONDUIT	0.38	0	00:10	0.00	0.00	0.16
C-09	DUMMY	1.05	0	00:35			

C-10 DUMMY 0.28 0 00:35

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C-02	1.00	0.19	0.00	0.00	0.04	0.76	0.00	0.00	0.55	0.00
C-05	1.00	0.07	0.00	0.00	0.06	0.86	0.00	0.00	0.41	0.00
C-08	1.00	0.43	0.53	0.00	0.04	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

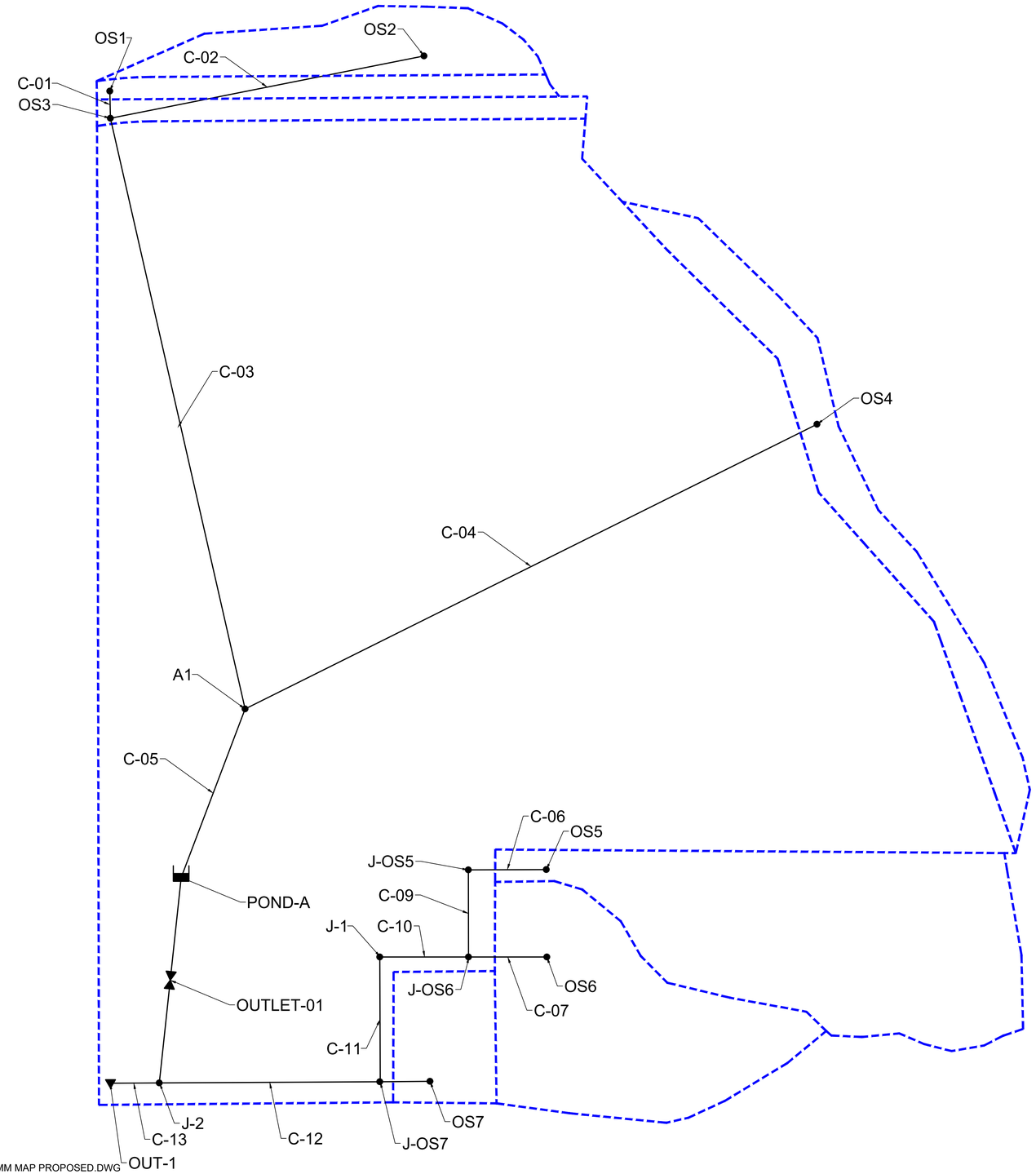
Analysis begun on: Wed Mar 15 10:49:21 2023
Analysis ended on: Wed Mar 15 10:49:21 2023
Total elapsed time: < 1 sec

Sheet has been removed.

Max sheet size allowed in reports is 11x17. Please resize.

Please also include routing diagram on plan sheet.

Routing diagram has been added to the plan sheet.



VISTAS AT KINGS POINT

PROPOSED SWMM MODEL MAP

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 150' 300'

1" = 150'

SWMM MODEL OUTPUT
Proposed 2-Ye

Each planning area has been broken out so that the impervious calculations relate back to the land plan documents. Due to this change, we have moved forward with CIA calculations for each individual basin and used the embedded CUHP calculator in the MHFD pond spreadsheet for the sizing of the detention pond. SWMM calculations have been removed from this report.

Please also include 1 copy of the SWMM input file for the prop system model showing, link-node connectivity, link characteristics, pond storage and outflow rating curves, etc.

terracina design
Landscape Architecture, Planning & Engineering
10200 E. Girard Avenue, A-314. Denver, CO 80231 PH: 303.632.8867

SWMM model has been removed from the report.

No nodes surcharged in any of the models as currently shown but not that entering NO for Ponding Allowed means that any surcharge water is lost from system.

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.2)
------------------------------------------------------------


***************
Analysis Options
***************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/01/2005 06:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Routing Time Step ........ 20.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.005000 ft


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         2.733         0.891
External Outflow .........         2.253         0.734
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.482         0.157
Continuity Error (%) .....        -0.064


************************
Highest Continuity Errors
************************
Node J-1 (3.88%)


*************************
Time-Step Critical Elements
*************************
Link C-13 (85.49%)
Link C-08 (13.66%)


*******************************
Highest Flow Instability Indexes
*******************************
All links are stable.


*******************************
Most Frequent Nonconverging Nodes
*******************************
```

Convergence obtained at all time steps.

****
Routing Time Step Summary
****
Minimum Time Step   :   1.77 sec
Average Time Step   :   5.87 sec
Maximum Time Step   :   20.00 sec
% of Time in Steady State   :   0.00
Average Iterations per Step :   2.00
% of Steps Not Converging   :   0.03
Time Step Frequencies   :
   20.000 - 9.564 sec   :   0.90 %
    9.564 - 4.573 sec   :   91.11 %
    4.573 - 2.187 sec   :   7.96 %
    2.187 - 1.046 sec   :   0.03 %
    1.046 - 0.500 sec   :   0.00 %

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
OS1	JUNCTION	0.01	0.10	6054.60	0 00:25	0.09
OS3	JUNCTION	0.18	0.64	6033.52	0 00:34	0.60
OS2	JUNCTION	0.02	0.10	6064.73	0 00:27	0.10
OS4	JUNCTION	0.04	0.16	6083.99	0 00:35	0.15
A1	JUNCTION	0.00	0.00	5984.50	0 00:34	0.00
OS5	JUNCTION	0.00	0.01	6013.01	0 00:31	0.01
J-OS5	JUNCTION	0.00	0.01	5982.83	0 00:51	0.01
OS6	JUNCTION	0.00	0.00	6038.38	0 00:00	0.00
J-OS6	JUNCTION	0.00	0.00	5980.00	0 01:05	0.00
J-1	JUNCTION	0.00	0.01	5962.01	0 01:36	0.01
OS7	JUNCTION	0.03	0.16	5981.16	0 00:30	0.16
J-OS7	JUNCTION	0.02	0.09	5958.09	0 00:31	0.09
15	JUNCTION	0.12	0.17	5917.17	0 01:34	0.17
OUT1	OUTFALL	0.12	0.17	5910.17	0 01:34	0.17
Pond-A	STORAGE	1.91	2.60	5921.60	0 01:35	2.60

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
OS1	JUNCTION	2.31	2.31	0 00:25	0.0296	0.0296	-0.395
OS3	JUNCTION	1.53	5.18	0 00:26	0.0381	0.093	0.404
OS2	JUNCTION	1.59	1.59	0 00:25	0.0249	0.0249	-1.068
OS4	JUNCTION	0.36	0.36	0 00:30	0.00703	0.00703	0.030
A1	JUNCTION	40.51	44.44	0 00:30	0.776	0.875	-0.001
OS5	JUNCTION	0.01	0.01	0 00:35	0.0002	0.0002	-0.103
J-OS5	JUNCTION	0.00	0.01	0 00:36	0	0.0002	0.033
OS6	JUNCTION	0.00	0.00	0 00:00	0	0	0.000 gal
J-OS6	JUNCTION	0.00	0.00	0 00:57	0	0.0002	0.451
J-1	JUNCTION	0.00	0.00	0 01:08	0	0.000199	4.033
OS7	JUNCTION	1.01	1.01	0 00:30	0.0152	0.0152	-0.041
J-OS7	JUNCTION	0.00	1.01	0 00:30	0	0.0154	-0.380
15	JUNCTION	0.00	7.74	0 01:33	0	0.735	0.149

OUT1	OUTFALL	0.00	7.74	0	01:34	0	0.734	0.000
Pond-A	STORAGE	0.00	44.44	0	00:30	0	0.875	-0.055

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
Pond-A	48.939	7.6	0.0	0.0	75.559	11.7	0 01:35	7.62

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OUT1	99.38	4.87	7.74	0.734
System	99.38	4.87	7.74	0.734

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
C-01	CONDUIT	2.30	0 00:25	3.44	0.00	0.01
C-02	CONDUIT	1.57	0 00:27	1.57	0.00	0.02
C-03	CONDUIT	4.12	0 00:35	12.72	0.14	0.16
C-04	CONDUIT	0.32	0 00:35	7.62	0.01	0.04
C-05	DUMMY	44.44	0 00:30			
C-06	CONDUIT	0.01	0 00:36	2.07	0.00	0.01
C-07	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C-08	CONDUIT	1.01	0 00:30	18.31	0.05	0.12
C-09	CONDUIT	0.00	0 00:57	0.00	0.00	0.00
C-10	CONDUIT	0.00	0 01:08	0.00	0.00	0.00
C-11	CONDUIT	0.00	0 01:36	0.07	0.00	0.02
C-12	CONDUIT	0.97	0 00:31	2.26	0.00	0.03
C-13	CONDUIT	7.74	0 01:34	5.34	0.00	0.06
OUTLET-01	DUMMY	7.62	0 01:35			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C-01	1.00	0.18	0.46	0.00	0.35	0.01	0.00	0.00	0.98	0.00
C-02	1.00	0.18	0.42	0.00	0.40	0.00	0.00	0.00	0.98	0.00
C-03	1.00	0.01	0.16	0.00	0.04	0.79	0.00	0.00	0.18	0.00
C-04	1.00	0.02	0.44	0.00	0.02	0.52	0.00	0.00	0.46	0.00
C-06	1.00	0.03	0.33	0.00	0.13	0.51	0.00	0.00	0.65	0.00
C-07	1.00	0.07	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-08	1.00	0.02	0.56	0.00	0.02	0.41	0.00	0.00	0.61	0.00
C-09	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.12	0.00
C-10	1.00	0.07	0.00	0.00	0.84	0.09	0.00	0.00	0.81	0.00
C-11	1.00	0.02	0.05	0.00	0.93	0.00	0.00	0.00	0.41	0.00
C-12	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.98	0.00
C-13	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Wed Mar 29 16:04:22 2023
Analysis ended on: Wed Mar 29 16:04:22 2023
Total elapsed time: < 1 sec

SWMM MODEL OUTPUT
Proposed 100-Year Event

terracina design
Landscape Architecture, Planning & Engineering
10200 E. Girard Avenue, A-314. Denver, CO 80231 PH: 303.632.8867

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.2)

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... NO
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date 01/01/2005 00:00:00
Ending Date 01/01/2005 06:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Routing Time Step ..... 20.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Number of Threads 1
Head Tolerance ..... 0.005000 ft

Flow Routing Continuity	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	13.656	4.450
External Outflow	12.624	4.114
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	1.033	0.337
Continuity Error (%)	-0.005	

****
Time-Step Critical Elements
****
Link C-13 (91.13%)
Link C-08 (8.53%)

****
Highest Flow Instability Indexes
****
All links are stable.

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****

```
Minimum Time Step           :     2.25 sec
Average Time Step           :     3.74 sec
Maximum Time Step           :    20.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.00
% of Steps Not Converging   :     0.02
Time Step Frequencies       :
   20.000 -  9.564 sec      :     0.35 %
    9.564 -  4.573 sec      :    26.92 %
    4.573 -  2.187 sec      :    72.73 %
    2.187 -  1.046 sec      :     0.00 %
    1.046 -  0.500 sec      :     0.00 %
```

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
OS1	JUNCTION	0.03	0.19	6054.69	0 00:30	0.19
OS3	JUNCTION	0.36	1.26	6034.14	0 00:39	1.21
OS2	JUNCTION	0.04	0.26	6064.89	0 00:35	0.23
OS4	JUNCTION	0.13	0.60	6084.43	0 00:37	0.55
A1	JUNCTION	0.00	0.00	5984.50	0 00:38	0.00
OS5	JUNCTION	0.11	0.34	6013.34	0 00:40	0.33
J-OS5	JUNCTION	0.12	0.38	5983.20	0 00:41	0.37
OS6	JUNCTION	0.06	0.31	6038.69	0 00:35	0.27
J-OS6	JUNCTION	0.09	0.32	5980.32	0 00:40	0.31
J-1	JUNCTION	0.15	0.54	5962.54	0 00:41	0.53
OS7	JUNCTION	0.07	0.37	5981.37	0 00:30	0.37
J-OS7	JUNCTION	0.11	0.43	5958.43	0 00:38	0.41
15	JUNCTION	0.35	0.70	5917.70	0 01:06	0.69
OUT1	OUTFALL	0.35	0.70	5910.70	0 01:06	0.69
Pond-A	STORAGE	3.89	6.32	5925.32	0 01:07	6.24

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
OS1	JUNCTION	6.26	6.26	0 00:30	0.0846	0.0846	-0.265
OS3	JUNCTION	4.33	16.99	0 00:35	0.109	0.29	0.296
OS2	JUNCTION	7.18	7.18	0 00:35	0.0963	0.0963	-0.662
OS4	JUNCTION	5.58	5.58	0 00:35	0.0734	0.0734	-0.007
A1	JUNCTION	230.71	248.28	0 00:35	3.82	4.19	0.000
OS5	JUNCTION	4.54	4.54	0 00:40	0.107	0.107	-0.022
J-OS5	JUNCTION	0.00	4.53	0 00:40	0	0.107	0.046
OS6	JUNCTION	5.03	5.03	0 00:35	0.0736	0.0736	-0.052
J-OS6	JUNCTION	0.00	9.30	0 00:40	0	0.181	-0.032
J-1	JUNCTION	0.00	9.28	0 00:40	0	0.181	0.123
OS7	JUNCTION	6.11	6.11	0 00:35	0.0832	0.0832	-0.024
J-OS7	JUNCTION	0.00	14.34	0 00:38	0	0.264	-0.333
15	JUNCTION	0.00	93.90	0 01:06	0	4.12	0.048
OUT1	OUTFALL	0.00	93.89	0 01:06	0	4.11	0.000
Pond-A	STORAGE	0.00	248.28	0 00:35	0	4.19	0.002

****
Node Surcharge Summary

****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
Pond-A	162.489	25.2	0.0	0.0	327.272	50.7	0 01:07	87.63

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OUT1	99.71	34.63	93.89	4.113
System	99.71	34.63	93.89	4.113

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
C-01	CONDUIT	6.23	0 00:30	3.33	0.00	0.03
C-02	CONDUIT	7.12	0 00:35	2.15	0.00	0.03
C-03	CONDUIT	14.29	0 00:40	16.73	0.47	0.32
C-04	CONDUIT	5.19	0 00:37	17.25	0.12	0.15
C-05	DUMMY	248.28	0 00:35			
C-06	CONDUIT	4.53	0 00:40	12.00	0.06	0.18
C-07	CONDUIT	5.04	0 00:35	16.63	0.05	0.16
C-08	CONDUIT	6.11	0 00:35	27.75	0.27	0.38
C-09	CONDUIT	4.49	0 00:41	2.38	0.01	0.12
C-10	CONDUIT	9.28	0 00:40	4.00	0.01	0.14
C-11	CONDUIT	9.22	0 00:41	3.21	0.02	0.16
C-12	CONDUIT	14.42	0 00:38	6.01	0.02	0.17
C-13	CONDUIT	93.89	0 01:06	12.44	0.06	0.23
OUTLET-01	DUMMY	87.63	0 01:07			

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class

Conduit	/Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C-01	1.00	0.15	0.48	0.00	0.37	0.00	0.00	0.00	0.99	0.00
C-02	1.00	0.15	0.45	0.00	0.40	0.00	0.00	0.00	0.99	0.00
C-03	1.00	0.01	0.13	0.00	0.05	0.80	0.00	0.00	0.17	0.00
C-04	1.00	0.01	0.41	0.00	0.02	0.55	0.00	0.00	0.44	0.00
C-06	1.00	0.02	0.31	0.00	0.14	0.54	0.00	0.00	0.91	0.00
C-07	1.00	0.06	0.60	0.00	0.09	0.26	0.00	0.00	0.90	0.00
C-08	1.00	0.01	0.56	0.00	0.04	0.38	0.00	0.00	0.91	0.00
C-09	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.30	0.00
C-10	1.00	0.06	0.00	0.00	0.80	0.15	0.00	0.00	0.92	0.00
C-11	1.00	0.01	0.05	0.00	0.94	0.00	0.00	0.00	0.15	0.00
C-12	1.00	0.01	0.00	0.00	0.89	0.09	0.00	0.00	0.94	0.00
C-13	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Wed Mar 29 16:01:14 2023
Analysis ended on: Wed Mar 29 16:01:14 2023
Total elapsed time: < 1 sec

APPENDIX D

DETENTION AND WATER QUALITY VOLUME REQUIRED CALCUALTIONS

Mile High Flood District Detention Worksheets

COA criteria allowable release rate calcs are required for Pond A. See section 6.33 of the COA SDDTC. Your release rate should be lesser of existing cond flow and COA allowable. Please also discuss in report.

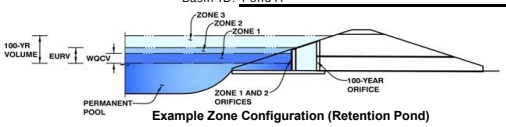
The calculated release rate has been added to the report. We used the release rates found in the Mile High spreadsheet until it reached the calculated value from section 6.33.

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: Vistas at Kings Point

Basin ID: Pond A



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	103.97	acres
Watershed Length =	3,538	ft
Watershed Length to Centroid =	1,778	ft
Watershed Slope =	0.060	ft/ft
Watershed Imperviousness =	47.00%	percent
Percentage Hydrologic Soil Group A =	55.0%	percent
Percentage Hydrologic Soil Group B =	45.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides
Water Quality Capture Volume (WQCV) =	1.717	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	5.385	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 0.84 in.) =	2.801	acre-feet	0.84 inches
5-yr Runoff Volume (P1 = 1.11 in.) =	4.011	acre-feet	1.11 inches
10-yr Runoff Volume (P1 = 1.35 in.) =	5.109	acre-feet	1.35 inches
25-yr Runoff Volume (P1 = 1.71 in.) =	8.002	acre-feet	1.71 inches
50-yr Runoff Volume (P1 = 2 in.) =	10.235	acre-feet	2.00 inches
100-yr Runoff Volume (P1 = 2.32 in.) =	13.312	acre-feet	2.32 inches
500-yr Runoff Volume (P1 = 3.14 in.) =	20.374	acre-feet	3.14 inches
Approximate 2-yr Detention Volume =	2.617	acre-feet	
Approximate 5-yr Detention Volume =	3.694	acre-feet	
Approximate 10-yr Detention Volume =	4.925	acre-feet	
Approximate 25-yr Detention Volume =	6.351	acre-feet	
Approximate 50-yr Detention Volume =	7.163	acre-feet	
Approximate 100-yr Detention Volume =	8.386	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.717	acre-feet
Zone 2 Volume (EURV - Zone 1) =	3.668	acre-feet
Zone 3 (100yr + 1 / 2 WQCV - Zones 1 & 2) =	3.860	acre-feet
Total Detention Basin Volume =	9.245	acre-feet
Initial Surcharge Volume (ISV) =	110	ft^3
Initial Surcharge Depth (ISD) =	0.33	ft
Total Available Detention Depth (H_{total}) =	10.00	ft
Depth of Trickle Channel (H_{TC}) =	0.50	ft
Slope of Trickle Channel (S_{TC}) =	0.005	ft/ft
Slopes of Main Basin Sides (S_{main}) =	4	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	2	

Initial Surcharge Area (A_{ISV}) =	333	ft^2
Surcharge Volume Length (L_{ISV}) =	18.3	ft
Surcharge Volume Width (W_{ISV}) =	18.3	ft
Depth of Basin Floor (H_{FLOOR}) =	1.17	ft
Length of Basin Floor (L_{FLOOR}) =	256.9	ft
Width of Basin Floor (W_{FLOOR}) =	135.3	ft
Area of Basin Floor (A_{FLOOR}) =	34,753	ft^2
Volume of Basin Floor (V_{FLOOR}) =	15,011	ft^3
Depth of Main Basin (H_{MAIN}) =	8.00	ft
Length of Main Basin (L_{MAIN}) =	320.9	ft
Width of Main Basin (W_{MAIN}) =	199.3	ft
Area of Main Basin (A_{MAIN}) =	63,949	ft^2
Volume of Main Basin (V_{MAIN}) =	388,918	ft^3
Calculated Total Basin Volume (V_{total}) =	9.279	acre-feet

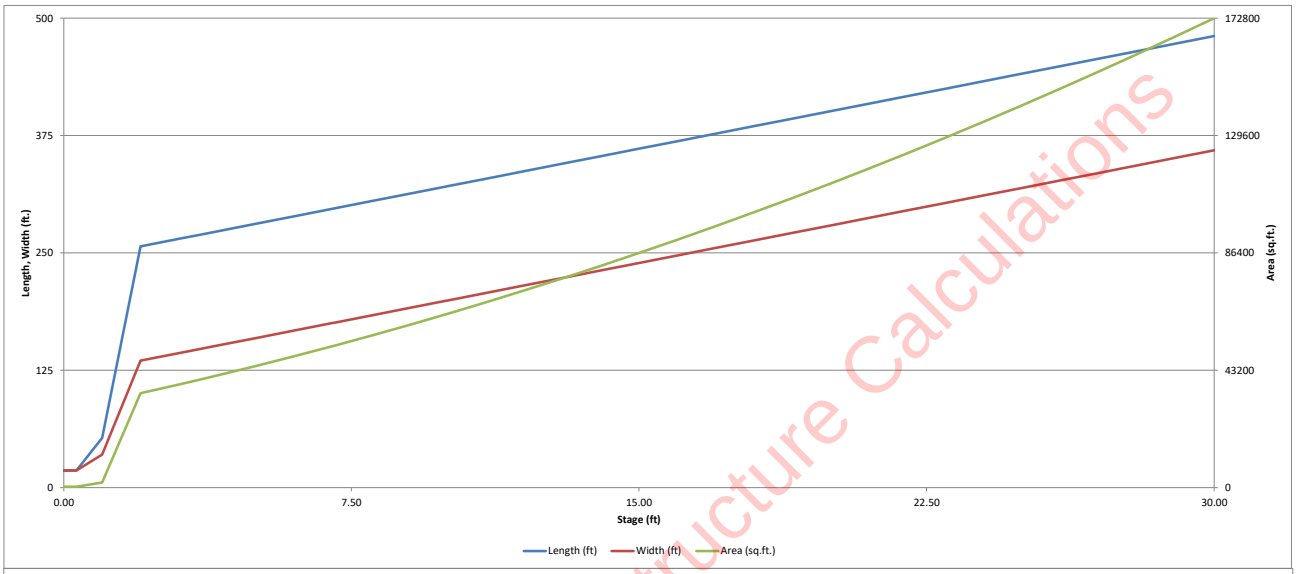
Depth Increment = 1.00 ft

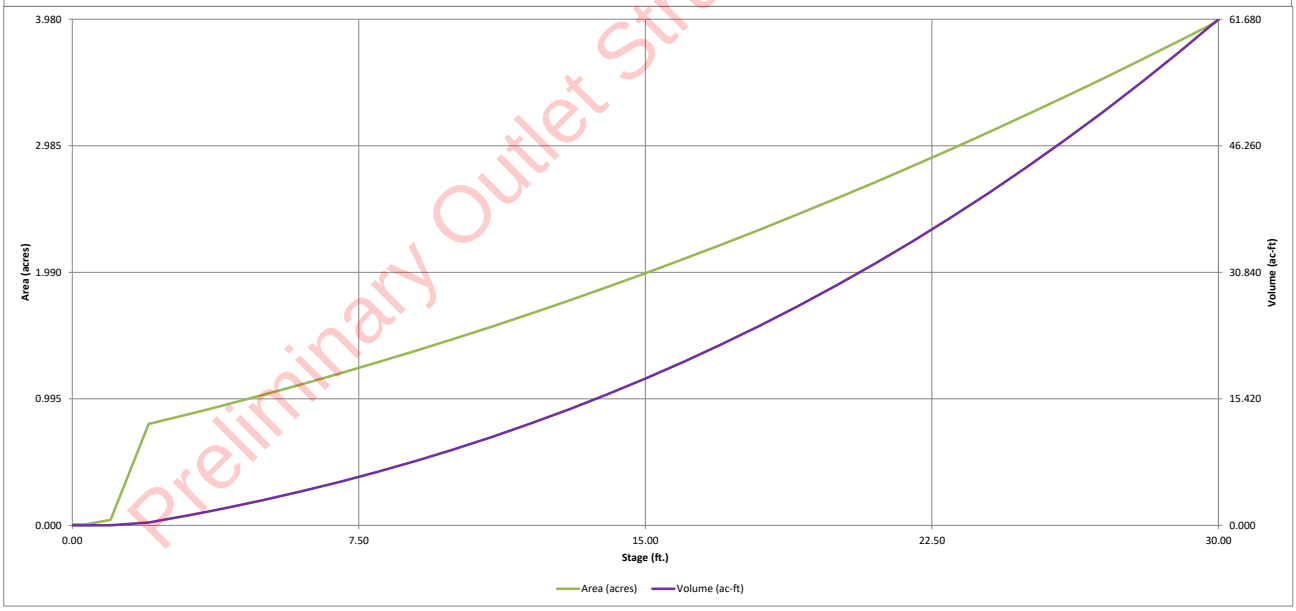
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	0.00		18.3	18.3	333		0.008		
ISV	0.33		18.3	18.3	333		0.008	110	0.003
	1.00		52.9	35.3	1,866		0.043	447	0.010
Floor	2.00		256.9	135.3	34,753		0.798	15,357	0.353
	3.00		264.9	143.3	37,954		0.871	51,699	1.187
Zone 1 (WQCV)	3.60		269.7	148.1	39,937		0.917	75,064	1.723
	4.00		272.9	151.3	41,284		0.948	91,308	2.096
	5.00		280.9	159.3	44,741		1.027	134,310	3.083
	6.00		288.9	167.3	48,327		1.109	180,833	4.151
	7.00		296.9	175.3	52,040		1.195	231,006	5.303
Zone 2 (EURV)	7.07		297.5	175.8	52,305		1.201	234,658	5.387
	8.00		304.9	183.3	55,882		1.283	284,957	6.542
	9.00		312.9	191.3	59,852		1.374	342,813	7.870
Z3 (100+1/2WQCV	9.97		320.7	199.0	63,824		1.465	402,786	9.247
	10.00		320.9	199.3	63,949		1.468	404,703	9.291
	11.00		328.9	207.3	68,175		1.565	470,754	10.807
	12.00		336.9	215.3	72,528		1.665	541,095	12.422
	13.00		344.9	223.3	77,010		1.768	615,853	14.138
	14.00		352.9	231.3	81,619		1.874	695,157	15.959
	15.00		360.9	239.3	86,357		1.982	779,135	17.886
	16.00		368.9	247.3	91,223		2.094	867,914	19.925
	17.00		376.9	255.3	96,216		2.209	961,622	22.076
	18.00		384.9	263.3	101,338		2.326	1,060,388	24.343
	19.00		392.9	271.3	106,587		2.447	1,164,340	26.730
	20.00		400.9	279.3	111,965		2.570	1,273,605	29.238
	21.00		408.9	287.3	117,470		2.697	1,388,312	31.871
	22.00		416.9	295.3	123,104		2.826	1,508,589	34.632
	23.00		424.9	303.3	128,865		2.958	1,634,563	37.524
	24.00		432.9	311.3	134,755		3.094	1,766,362	40.550
	25.00		440.9	319.3	140,773		3.232	1,904,115	43.712
	26.00		448.9	327.3	146,918		3.373	2,047,950	47.014
	27.00		456.9	335.3	153,192		3.517	2,197,994	50.459
	28.00		464.9	343.3	159,593		3.664	2,354,376	54.049
	29.00		472.9	351.3	166,123		3.814	2,517,223	57.787
	30.00		480.9	359.3	172,780		3.966	2,686,664	61.677

Preliminary Outlet Structure Calculations

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)





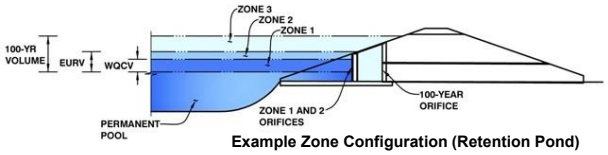
Preliminary Outlet Structure Calculations

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: Vistas at Kings Point

Basin ID: Pond A



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.60	1.717	Orifice Plate
Zone 2 (EURV)	7.07	3.668	Rectangular Orifice
Zone 3 (100+1/2WQCV)	9.97	3.860	Weir&Pipe (Restrict)
Total (all zones)		9.245	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	3.681E-02	ft^2
Depth at top of Zone using Orifice Plate =	3.60	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	14.40	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	5.30	sq. inches (use rectangular openings)	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.20	2.40					
Orifice Area (sq. inches)	5.30	5.30	5.30					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Rectangular	Not Selected			Zone 2 Rectangular	Not Selected	
Invert of Vertical Orifice =	3.60	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	0.02	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	7.11	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	0.08	N/A	feet
Vertical Orifice Height =	2.00	N/A	inches				
Vertical Orifice Width =	1.20		inches				

Calculated Parameters for Vertical Orifice

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	7.11	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	12.11	N/A	feet
Overflow Weir Front Edge Length =	4.00	N/A	feet	Overflow Weir Slope Length =	20.62	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	8.12	N/A	
Horiz. Length of Weir Sides =	20.00	N/A	feet	Overflow Grate Open Area w/o Debris =	57.39	N/A	ft^2
Overflow Grate Type =	Type C Grate	N/A		Overflow Grate Open Area w/ Debris =	28.70	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	7.07	N/A	ft^2
Outlet Pipe Diameter =	36.00	N/A	inches	Outlet Orifice Centroid =	1.50	N/A	feet
Restrictor Plate Height Above Pipe Invert =	36.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	3.14	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=		ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	feet
Spillway Crest Length =		feet	Stage at Top of Freeboard =	feet
Spillway End Slopes =		H:V	Basin Area at Top of Freeboard =	acres
Freeboard above Max Water Surface =		feet	Basin Volume at Top of Freeboard =	acre-ft

Calculated Parameters for Spillway

Routed Hydrograph Results

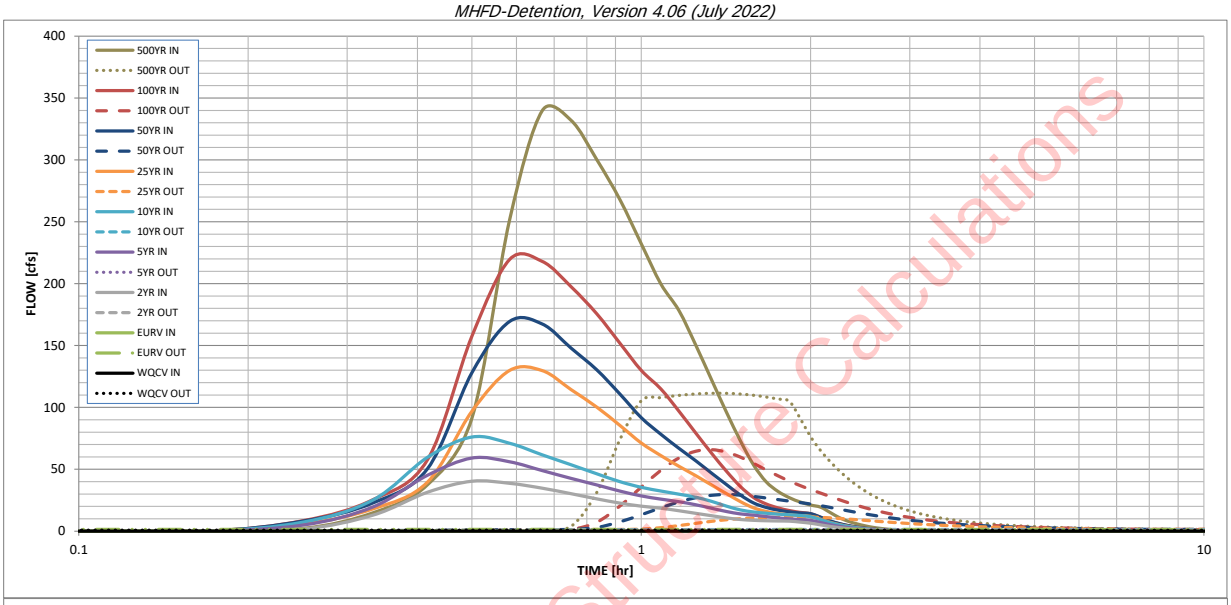
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

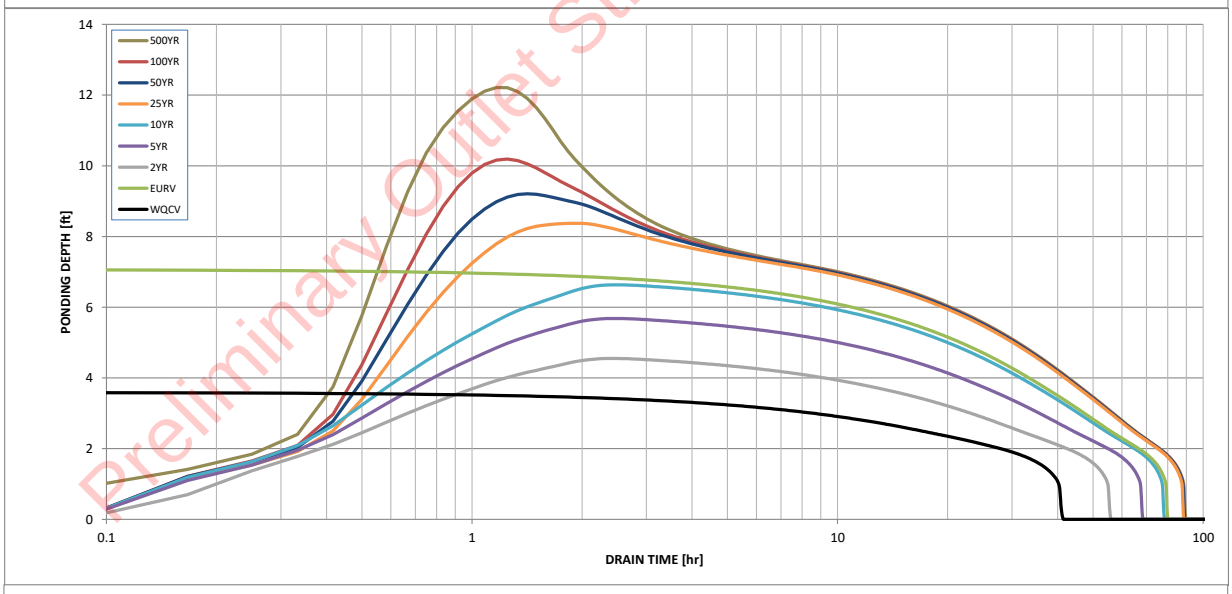
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	0.84	1.11	1.35	1.71	2.00	2.32	3.14
CUHP Runoff Volume (acre-ft) =	1.717	5.385	2.801	4.011	5.109	8.002	10.235	13.312	20.374
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	2.801	4.011	5.109	8.002	10.235	13.312	20.374
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.4	1.1	1.8	34.1	58.1	93.1	170.5
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.00	0.01	0.02	0.33	0.56	0.90	1.64
Peak Inflow Q (cfs) =	N/A	N/A	40.4	59.1	76.1	129.9	169.5	219.5	339.8
Peak Outflow Q (cfs) =	0.8	1.4	1.0	1.2	1.4	11.4	29.6	65.8	111.4
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.1	0.8	0.3	0.5	0.7	0.7
Structure Controlling Flow =	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.2	0.5	1.1	1.9
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	38	73	51	63	71	79	77	74	69
Time to Drain 99% of Inflow Volume (hours) =	40	77	54	66	75	84	84	83	81
Maximum Ponding Depth (ft) =	3.60	7.07	4.55	5.68	6.63	8.38	9.21	10.19	12.22
Area at Maximum Ponding Depth (acres) =	0.92	1.20	0.99	1.08	1.16	1.32	1.39	1.49	1.69
Maximum Volume Stored (acre-ft) =	1.723	5.387	2.629	3.801	4.867	7.023	8.147	9.556	12.774

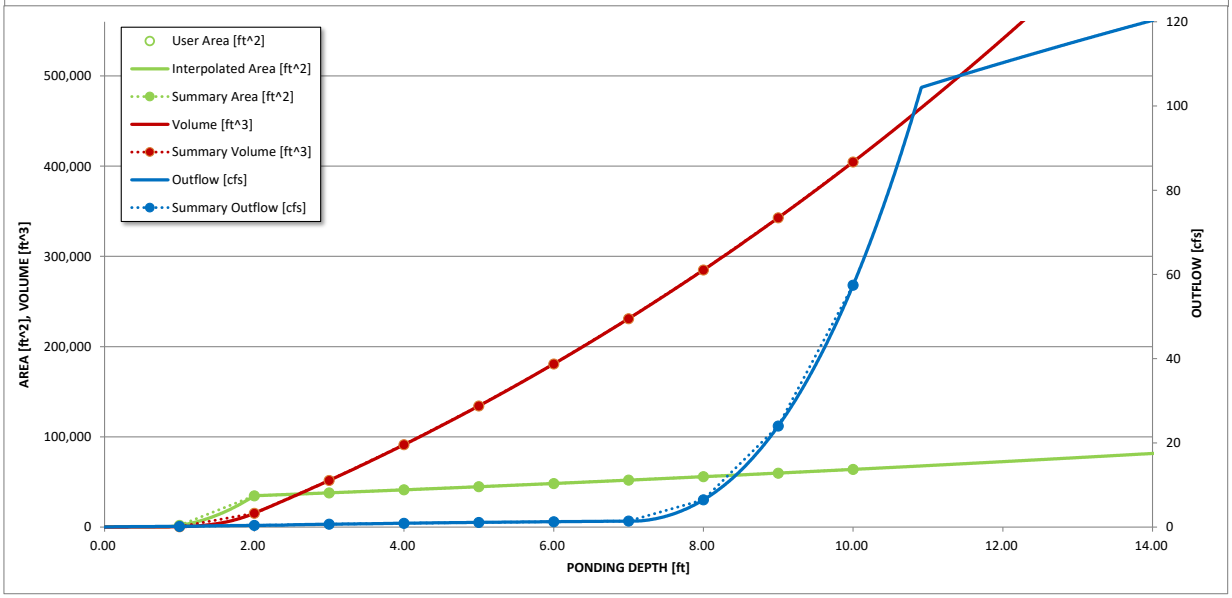
Preliminary Outlet Structure Calculations

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Preliminary Outlet Structure Calculations

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

Time Interval	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.18
	0:15:00	0.00	0.00	1.71	4.87	7.23	5.64	8.06	8.39	14.80
	0:20:00	0.00	0.00	12.94	19.56	25.18	18.00	22.82	25.42	37.46
	0:25:00	0.00	0.00	31.44	45.14	59.66	39.58	50.38	57.61	91.45
	0:30:00	0.00	0.00	40.35	59.10	76.08	96.92	128.13	157.65	251.61
	0:35:00	0.00	0.00	38.67	56.05	71.01	129.87	169.46	219.55	339.79
	0:40:00	0.00	0.00	34.72	48.93	61.65	129.72	167.39	217.96	332.00
	0:45:00	0.00	0.00	30.27	42.65	53.66	114.39	147.92	197.56	300.23
	0:50:00	0.00	0.00	26.10	37.35	46.35	100.24	130.37	175.64	267.70
	0:55:00	0.00	0.00	22.66	32.36	39.96	85.34	110.68	151.70	232.17
	1:00:00	0.00	0.00	20.19	28.46	35.43	71.20	91.67	129.89	199.78
	1:05:00	0.00	0.00	18.54	25.88	32.43	61.08	78.32	114.95	178.26
	1:10:00	0.00	0.00	16.50	23.80	29.88	52.40	66.91	96.91	150.25
	1:15:00	0.00	0.00	14.40	21.32	27.36	44.79	56.86	79.24	122.25
	1:20:00	0.00	0.00	12.48	18.48	24.07	37.28	46.85	62.94	96.22
	1:25:00	0.00	0.00	10.73	15.89	20.23	30.37	37.70	48.46	73.03
	1:30:00	0.00	0.00	9.43	13.95	17.19	23.87	29.20	36.09	53.46
	1:35:00	0.00	0.00	8.75	12.93	15.50	18.84	22.81	27.15	39.93
	1:40:00	0.00	0.00	8.41	11.79	14.49	15.95	19.18	22.00	32.11
	1:45:00	0.00	0.00	8.21	10.71	13.76	14.26	17.00	18.79	27.03
	1:50:00	0.00	0.00	8.09	9.94	13.25	13.20	15.61	16.63	23.55
	1:55:00	0.00	0.00	7.30	9.36	12.66	12.47	14.68	15.15	21.11
	2:00:00	0.00	0.00	6.42	8.72	11.66	12.00	14.09	14.12	19.39
	2:05:00	0.00	0.00	5.09	6.99	9.27	9.66	11.31	11.09	15.07
	2:10:00	0.00	0.00	3.81	5.19	6.86	7.10	8.29	8.04	10.87
	2:15:00	0.00	0.00	2.85	3.87	5.08	5.25	6.11	5.94	7.99
	2:20:00	0.00	0.00	2.11	2.87	3.73	3.88	4.50	4.40	5.90
	2:25:00	0.00	0.00	1.55	2.08	2.71	2.81	3.26	3.21	4.28
	2:30:00	0.00	0.00	1.11	1.47	1.95	2.01	2.32	2.29	3.05
	2:35:00	0.00	0.00	0.78	1.03	1.39	1.44	1.67	1.64	2.18
	2:40:00	0.00	0.00	0.52	0.71	0.96	1.01	1.16	1.14	1.50
	2:45:00	0.00	0.00	0.32	0.47	0.61	0.65	0.75	0.73	0.95
	2:50:00	0.00	0.00	0.17	0.27	0.34	0.37	0.42	0.41	0.53
	2:55:00	0.00	0.00	0.07	0.13	0.15	0.17	0.19	0.18	0.23
	3:00:00	0.00	0.00	0.02	0.04	0.04	0.05	0.05	0.04	0.05
	3:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Preliminary Outlet Structure Calculations

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]
	1.00	1,866	0.043	447	0.010	0.18
	2.00	34,753	0.798	15,357	0.353	0.41
	3.00	37,954	0.871	51,699	1.187	0.68
	4.00	41,284	0.948	91,308	2.096	0.92
	5.00	44,741	1.027	134,310	3.083	1.12
	6.00	48,327	1.109	180,833	4.151	1.28
	7.00	52,040	1.195	231,006	5.303	1.42
	8.00	55,882	1.283	284,957	6.542	6.47
	9.00	59,852	1.374	342,813	7.870	24.01
	10.00	63,949	1.468	404,703	9.291	57.47

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

Preliminary Outlet Structure Calculations

APPENDIX E

COPIES OF REFERENCES REPORTS, GRAPHS, TABLES AND FIGURES USED

Runoff Coefficients and Percent Impervious
Rainfall Depth-Duration-Frequency
Report Excerpts

223021MD1
2021-3001
29N-P

HRGREEN.COM

HRGreen

EXCERPTS FROM

Kings Point South

Master Drainage Report

November 2022

HR Green Project No: 212000.01

Prepared For:

Lennar Corporation
9193 S Jamaica Street
Englewood, CO 80112
Contact: Joseph Huey, PE

Prepared By:

HR Green Development, LLC
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FACSIMILE
This electronic plan is a facsimile of the Signed and sealed pdf set.

Kristine L. House — 11-28-22
Kristine L. House — Date

Approved For One Year From This Date

01.25.2023

City Engineer — 01/23/2023 **Date**

Water Department — 01/23/2023 **Date**

emergency spillway conveying the maximum design (emergency) flow and the top of embankment. At the time of pond certification, the 100-year WSEL shall not exceed the spillway crest. If the 100-year WSEL exceeds the pond spillway, then pond modifications and certification will be required prior to issuance of TCO and COs.

Justification: This variance request is consistent with expected future revisions to the City of Aurora's Storm Drainage Design and Technical Criteria.

Location(s): This variance request is for all on-site detention ponds.

2. City of Aurora's Storm Drainage Design and Technical Criteria, Section 6.31 Design Frequency "Up to one half of the Full Spectrum Detention may be included within the 100-year detention volume flood pool."

   Variance Request: It is requested that the detention pond use nested detention volumes, i.e., the 100-year volume is inclusive of the entire Water Quality Capture volume (WQCV) and Excess Urban Runoff Volume (EURV).

   Justification: This variance request is consistent with expected future revisions to the City of Aurora's Storm Drainage Design and Technical Criteria.

   Location(s): This variance request is for all on-site detention ponds.

D. Drainage Plan

1. General Concept

a) *Discuss drainage concept and typical drainage pattern.* The development of Kings Point South will require public improvements for the safe collection and conveyance of stormwater runoff. Runoff within the proposed development will initially be carried in the streets. The street conveyance will be supplemented with storm sewer systems where street flow capacities are exceeded or at specific locations requested by the City. Storm sewer networks along with open channel drainageways will convey runoff to detention and water quality facilities. Historic flow patterns will be followed whenever possible.

b) *Discuss impacts from offsite basins to the property including conveyance concepts through the property.* Minor off-site basins are expected to contribute runoff to the Kings Point South site at several different locations. Runoff generated by these basins has been included in this analysis and, whenever possible, will be conveyed via the street and storm system designed for the induvial planning areas.

Runoff from major off-site basins will be conveyed through the property following historic drainageways whenever possible. Specifically in the Cottonwood North Tributary conveying runoff from the E-470 crossing to the southwest and the Cottonwood Middle Tributary conveying runoff from tributary areas east of the site to the southwest. This area east of the site is expected to detain developed runoff to historic conditions. This is shown on the Master Drainage Plan with OSP Pond CM3. The outfall noted in the 2001 OSP matches historic conditions modeled with this analysis.

c) *Coordination requirements with surrounding developments.* The Master Drainage Plan for Kings Point South is being coordinated with all surrounding developments.

The Crown Point development just to the south of the Kings Point South property boundary (east of E-470) accepts runoff from the site in multiple locations. The primary location is along the

potentially adverse effects to the water quality of the drainageway. In addition, by maintaining a healthy open channel and promoting the preservation of the existing low flow channels where possible, the water quality of the watershed will benefit by maintaining a high-water table, hydraulically connecting surface flows to ground water, and promoting vegetation growth.

c) *Detention Ponding Plan.* OSP Pond CN2 (renamed Detention Pond B with this Report) is provided at the general location shown in the 2001 OSP. Additional smaller detention ponds will be provided to treat and detain runoff from the site to acceptable levels to releasing off-site. Detention Pond B is shown as a recommended improvement on the 2001 OSP and has a regional impact on the downstream drainageways, therefore it may be considered regional and will qualify for MHFD's Maintenance Eligibility Program (MEP).

OSP Pond CM3 has been located east of the Kings Point South site. This area east of the site is expected to detain developed runoff to historic conditions. See additional discussion regarding this pond in Section 2.g.

There are two on-site basins which do not currently show detention and/or water quality in the developed condition due to their isolated nature and/or existing slopes prohibiting development. These are Basin D2 and E3. Notes have been included on the plan that state if development occurs within these basins, water quality and detention is required prior to releasing runoff to downstream properties.

Estimated detention pond locations and preliminary sizing results are shown on the Master Drainage Plan.

d) *Water quality BMP plan including whether the BMP's provided are regional water quality BMPs identified in an Outfall Systems Plan.* The predominant water quality Best Management Practices (BMPs) provided for the Kings Point South site will be Extended Detention Basins (EDBs) incorporating Water Quality Capture Volumes. Additional Low Impact Development (LID) measures will be incorporated whenever appropriate. As noted previously, OSP Pond CN2 (renamed Detention Pond B with this Report) is provided at the general location shown in the 2001 OSP.

e) *Identify onsite/offsite right-of-way/easement requirements for drainage facilities.* Easements are required for all public storm sewers outside of dedicated right-of-way. Open channels, creeks, and streams, including major drainageways and emergency overflow tracts, shall be dedicated to the City as right-of-way when requested by the City and no later than the first plat adjacent to the drainage facility. The right-of-way width will be determined based on the proposed design and maintenance access requirements.

Where there is not a 100-year capacity storm sewer underneath, emergency overflow tracts must be concrete lined as shown in the latest version of the "Roadway Design and Construction Specifications" and the tract dedicated to the City, otherwise, overflow tracts may be designed as grass-lined swales. The tracts are normally required where sump streets are drained between residential lots to a drainageway, or when there are back draining cul-de-sacs. All emergency overflow tracts shall be designed for a 100-year storm, assuming the minor storm sewer inlets are plugged.

All new developments and redevelopments must dedicate drainage easements for their private detention ponds and Water Quality BMP's. This easement is required to allow City personnel emergency access to the facilities.

f) *Discuss maintenance responsibilities and maintenance access to drainageways, detention ponds and Water Quality BMP's.* A note must be added to the site plans or contextual site plans indicating who will be responsible for the maintenance of these facilities, i.e., the property owner, home-owner's association, or metro district. It is the underlying responsibility of the property owner to ensure the private detention and water quality BMPs are maintained, and they continue to serve the intended stormwater management function

Maintenance access will be provided to the top of the detention pond outlet structures and to BMP control structures that may be located within the detention ponds in accordance with SDDTC requirements.

g) *Identify drainageway public improvements required with the development and their funding source, i.e., channels, grade control structures, revetments, regional drainage facilities, bridges, culverts crossing arterial roadways or collectors, including preliminary culvert sizes, etc.* Drainageway improvements for the Cottonwood North and Cottonwood Middle Tributaries are noted in two separate sources.

The first is the *Cottonwood Area of Parker Outfall Systems Planning – Phase B, Preliminary Design Report (2001 OSP).* This planning document identifies channel improvements and detention facilities along both tributaries. Cottonwood System Reach I (along the Cottonwood North Tributary) is proposed to run through the project site, flowing west from the E-470 crossing outfall. Improvements noted in the 2001 OSP include both check and drop structures and an improved channel section. Upstream of the on-site portion of Reach I, east of E-470, is proposed detention facility CN2. This pond has been renamed "Pond B" with this Report. Detention Pond B is shown as a recommended improvement on the 2001 OSP and has a regional impact on the downstream drainageways, therefore it may be considered a regional facility. Reach I may design for the detained release from Pond B.

Cottonwood System Reach H (Cottonwood Middle Tributary) also shows check and drop structures within the limits of the Kings Point South property. The detention element along this reach is noted in the 2001 OSP as CM3. Pond CM3 is shown to the east (outside) of the Kings Point South boundary on the Master Drainage Plan included with this Report, this is slightly farther east than illustrated on the 2001 OSP Plan. It makes sense for this detention to be provided off-site for several reasons. The OSP narrative for the Preliminary Design includes the following statement, "During development of the subject areas, alternate detention sites may be considered as determined to be most compatible with development objectives." Pond CM3 serves primarily the future development east of the Kings Point South site within Basin CM3 and should be the responsibility of the future developer. Out of the 120 acres tributary to this pond, only 10 acres (or 8% of the tributary area) is within the Kings Point South site. Locating it entirely on the Kings Point South site puts a disproportionate amount of regional requirements onto a single developer, especially considering they must provide additional detention for their site elsewhere.

In addition to the 2001 OSP recommendations, current online MHFD mapping (included in Appendix E) shows master planned components for Kings Point South including the detention facilities noted above and two Stream Management Corridors (SMC) on the property. The first is on the west parcel along what is noted as the Cottonwood North Tributary, the SMC for this reach is noted as 184 feet wide. The second SMC is on the east parcel along what is noted as the Cottonwood Middle Tributary with a SMC width of 61.4 feet. Both corridors are depicted in orange, indicating they were developed using a very high level GIS desktop analysis based on auto-generated flow rates and slopes. These are intended to be a starting point for planning purposes only, with refinement occurring through

APPENDIX B
HYDROLOGIC CALCULATIONS

CUHP SUBCATCHMENTS - EXISTING CONDITIONS

CUHP SUBCATCHMENTS

Columns with this color heading are for required user-input
Columns with this color heading are for optional override values
Columns with this color heading are for program-calculated values

Subcatchment Name	EPA SWMM Target Node	Raingage	Area (mi^2)	Length to Centroid (mi)	Length (mi)	Slope (ft/ft)	Percent Imperviousness	Maximum Depression Storage (Watershed inches)		Horton's Infiltration Parameters			DCIA	Comment
								Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)	Level 0, 1, or 2	
A	B-A	100-Year	0.0565	0.226	0.5189	0.04927	2.0	0.35	0.1	4.43	0.0018	0.595	0	Historic Conditions
B	B-B	100-Year	0.1791	0.2862	0.7104	0.05998	6.1	0.35	0.1	3.83	0.0017	0.577	0	Historic Conditions
C1	B-C1	100-Year	0.0333	0.0982	0.3186	0.0594	2.0	0.35	0.1	3.11	0.0018	0.507	0	Historic Conditions
C2	B-C2	100-Year	0.0122	0.0417	0.1559	0.085	2.0	0.35	0.1	3	0.0018	0.5	0	Historic Conditions
D	B-D	100-Year	0.0365	0.2275	0.4122	0.0551	2.0	0.35	0.1	4.46	0.0018	0.599	0	Historic Conditions
E1	B-E1	100-Year	0.0465	0.1907	0.437	0.0563	14.7	0.35	0.1	4.26	0.0018	0.584	0	Historic Conditions
E2	B-E2	100-Year	0.0018	0.0173	0.043	0.0866	2.0	0.35	0.1	4.5	0.0018	0.6	0	Historic Conditions
E3	B-E3	100-Year	0.0030	0.0394	0.0614	0.1962	2.0	0.35	0.1	3	0.0018	0.5	0	Historic Conditions
OS1	B-OS1	100-Year	0.0050	0.0366	0.0771	0.0614	5.0	0.35	0.1	4.5	0.0018	0.6	0	Historic Conditions
OS4	B-OS4	100-Year	0.1079	0.2513	0.4161	0.07965	2.0	0.35	0.1	4.75	0.00125	0.8	0	Historic Conditions
OS5	B-OS5	100-Year	0.0640	0.3191	0.4287	0.0751	2.0	0.35	0.1	4.75	0.00125	0.8	0	Historic Conditions
OS6	B-OS6	100-Year	0.1647	0.6108	0.8324	0.058	2.0	0.35	0.1	4.75	0.00125	0.8	0	Historic Conditions

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)
2-Year Event

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A	Historic Conditions	0.158	0.130	42.0	5.69	21.9	4.02	9.5	40	131,191	0.01	999	40.0	0	999	0.01
B	Historic Conditions	0.147	0.204	30.9	6.35	16.1	4.49	10.6	174	416,039	0.03	10,706	40.0	4	10,711	0.03
C1	Historic Conditions	0.158	0.102	27.1	3.62	14.1	2.56	6.0	37	77,293	0.01	736	35.0	0	733	0.01
C2	Historic Conditions	0.158	0.065	18.3	2.41	9.5	1.71	4.0	20	28,343	0.01	271	30.0	0	262	0.02
D	Historic Conditions	0.158	0.107	44.7	5.17	23.3	3.65	8.6	24	84,797	0.01	642	40.0	0	641	0.01
E1	Historic Conditions	0.124	0.096	36.6	4.20	19.0	2.97	7.0	38	107,913	0.08	8,154	40.0	2	8,135	0.07
E2	Historic Conditions	0.158	0.027	15.5	1.82	8.0	1.29	3.0	3	4,066	0.01	30	30.0	0	28	0.02
E3	Historic Conditions	0.158	0.035	17.5	1.97	9.1	1.39	3.3	5	6,970	0.01	67	30.0	0	63	0.02
~~OS1~~	~~Historic Conditions~~	~~0.151~~	~~0.042~~	~~20.2~~	~~2.15~~	~~10.5~~	~~1.52~~	~~3.6~~	~~7~~	~~11,709~~	~~0.02~~	~~234~~	~~30.0~~	~~0~~	~~225~~	~~0.03~~
OS4	Historic Conditions	0.158	0.174	26.5	5.04	13.8	3.56	8.4	122	250,580	0.00	872	35.0	0	869	0.01
OS5	Historic Conditions	0.158	0.137	38.7	5.59	20.1	3.95	9.3	50	148,592	0.00	517	35.0	0	516	0.00
~~OS6~~	~~Historic Conditions~~	~~0.158~~	~~0.210~~	~~50.5~~	~~9.66~~	~~26.3~~	~~6.83~~	~~16.1~~	~~98~~	~~382,608~~	~~0.00~~	~~1,331~~	~~45.0~~	~~0~~	~~1,330~~	~~0.00~~

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)
100-Year Event

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A	Historic Conditions	0.156	0.128	42.0	5.65	21.9	3.99	9.4	40	131,191	1.19	155,603	50.0	37	155,494	1.02
B	Historic Conditions	0.143	0.199	30.9	6.22	16.0	4.39	10.4	174	416,039	1.25	518,827	45.0	155	518,930	1.35
C1	Historic Conditions	0.156	0.101	27.0	3.60	14.1	2.55	6.0	37	77,293	1.31	101,263	40.0	32	100,820	1.51
C2	Historic Conditions	0.156	0.064	18.3	2.41	9.5	1.70	4.0	20	28,343	1.32	37,500	35.0	15	36,236	1.92
D	Historic Conditions	0.157	0.106	44.7	5.13	23.3	3.63	8.6	24	84,797	1.18	100,179	50.0	23	100,023	0.96
E1	Historic Conditions	0.120	0.095	36.1	4.12	18.8	2.91	6.9	39	107,913	1.34	144,936	45.0	37	144,615	1.24
E2	Historic Conditions	0.157	0.027	15.4	1.82	8.0	1.29	3.0	3	4,066	1.18	4,795	35.0	2	4,487	1.90
E3	Historic Conditions	0.156	0.034	17.5	1.96	9.1	1.39	3.3	5	6,970	1.32	9,221	35.0	4	8,763	1.94
OS1	Historic Conditions	0.147	0.041	20.2	2.13	10.5	1.51	3.6	7	11,709	1.21	14,181	40.0	5	13,648	1.65
OS4	Historic Conditions	0.157	0.172	26.5	5.01	13.8	3.54	8.3	122	250,580	0.86	214,651	40.0	76	213,914	1.10
OS5	Historic Conditions	0.157	0.136	38.7	5.55	20.1	3.92	9.2	50	148,592	0.86	127,286	45.0	34	127,126	0.83
OS6	Historic Conditions	0.157	0.209	50.5	9.59	26.3	6.78	16.0	98	382,608	0.86	327,748	55.0	71	327,578	0.68

CUHP SUBCATCHMENTS - FUTURE DEVELOPED CONDITIONS

CUHP SUBCATCHMENTS

Columns with this color heading are for required user-input
Columns with this color heading are for optional override values
Columns with this color heading are for program-calculated values

								Maximum Depression Storage (Watershed inches)		Horton's Infiltration Parameters			DCIA	
Subcatchment Name	EPA SWMM Target Node	Raingage	Area (mi^2)	Length to Centroid (mi)	Length (mi)	Slope (ft/ft)	Percent Imperviousness	Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)	Level 0, 1, or 2	Comment
A1	B-A1	100-Year	0.042364	0.1583	0.3962	0.043	44	0.35	0.05	4.43	0.0018	0.595	0	Future Developed Conditions
A2	B-A2	100-Year	0.0367808	0.2685	0.4412	0.045	38.2	0.35	0.05	4.5	0.0018	0.6	0	Future Developed Conditions
B1	B-B1	100-Year	0.0268977	0.1527	0.2936	0.061282099	56.16	0.35	0.05	3.75	0.0018	0.55	0	Future Developed Conditions
B2	B-B2	100-Year	0.0107017	0.0301	0.1556	0.085202929	48.41	0.35	0.05	4.5	0.0018	0.6	0	Future Developed Conditions
B3	B-B3	100-Year	0.0236509	0.0857	0.2192	0.095042579	47.45	0.35	0.05	4.6	0.00158	0.68	0	Future Developed Conditions
B4	B-B4	100-Year	0.0126004	0.0764	0.1373	0.1	57.34	0.35	0.05	3.6	0.0018	0.54	0	Future Developed Conditions
B5	B-B5	100-Year	0.0327	0.246	0.448	0.042	45.0	0.35	0.05	3.08	0.0018	0.505	0	Future Developed Conditions
B6	B-B6	100-Year	0.0295	0.135	0.378	0.040	25.8	0.35	0.05	3.08	0.0018	0.505	0	Future Developed Conditions
B7	B-B7	100-Year	0.0031	0.043	0.067	0.085	34.4	0.35	0.05	4.5	0.0018	0.6	0	Future Developed Conditions
C1	B-C1	100-Year	0.0475	0.175	0.359	0.055	40.5	0.35	0.05	3.15	0.0018	0.51	0	Future Developed Conditions
D1	B-D1	100-Year	0.0275	0.228	0.412	0.057	45.2	0.35	0.05	4.5	0.0018	0.6	0	Future Developed Conditions
D2	B-D2	100-Year	0.0090	0.127	0.173	0.046	2.0	0.35	0.05	4.5	0.0018	0.6	0	Future Developed Conditions
E1	B-E1	100-Year	0.0243	0.079	0.437	0.056	13.1	0.35	0.05	3.75	0.0018	0.55	0	Historic Conditions
E2	B-E2	100-Year	0.0273	0.221	0.342	0.061	30.0	0.35	0.05	3.75	0.0018	0.55	0	Future Developed Conditions
E3	B-E3	100-Year	0.0030	0.022	0.067	0.233	2.0	0.35	0.05	3	0.0018	0.5	0	Future Developed Conditions
E5	B-E5	100-Year	0.0017	0.017	0.043	0.087	33.1	0.35	0.05	4.5	0.0018	0.6	0	Future Developed Conditions
OS1	B-OS1	100-Year	0.0050	0.039	0.077	0.061	5.0	0.35	0.05	4.5	0.0018	0.6	0	Historic (off-site) Conditions
OS2	B-OS2	100-Year	0.0079	0.022	0.112	0.084	75.4	0.35	0.05	4.75	0.00125	0.8	0	Future Developed Conditions
OS3	B-OS3	100-Year	0.0020	0.038	0.068	0.083	95.0	0.35	0.05	5	0.0007	1	0	Future Developed Conditions
OS4	B-OS4	100-Year	0.1079	0.251	0.416	0.080	2.0	0.35	0.05	4.75	0.00125	0.8	0	Historic (off-site) Conditions
OS5	B-OS5	100-Year	0.0640	0.319	0.429	0.075	2.0	0.35	0.05	4.75	0.00125	0.8	0	Historic (off-site) Conditions
OS6	B-OS6	100-Year	0.1047	0.611	0.832	0.058	2.0	0.35	0.1	4.75	0.00125	0.8	0	Historic Conditions

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)
2-Year

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A1	Future Developed Conditions	0.093	0.118	20.8	3.38	10.8	2.39	5.6	61	98,420	0.34	33,230	30.0	10	32,958	0.39
A2	Future Developed Conditions	0.096	0.100	33.9	4.11	17.6	2.91	6.9	33	85,449	0.28	24,148	35.0	5	24,091	0.23
B1	Future Developed Conditions	0.087	0.110	16.2	2.87	8.4	2.03	4.8	50	62,489	0.45	28,313	30.0	10	27,720	0.60
B2	Future Developed Conditions	0.091	0.067	8.7	1.95	4.5	1.38	3.2	37	24,862	0.38	9,372	30.0	4	8,503	0.63
B3	Future Developed Conditions	0.091	0.095	11.8	2.36	6.1	1.67	3.9	60	54,946	0.36	19,762	30.0	8	18,723	0.55
B4	Future Developed Conditions	0.086	0.079	9.9	2.10	5.1	1.49	3.5	38	29,273	0.47	13,614	30.0	6	12,619	0.75
B5	Future Developed Conditions	0.092	0.107	29.7	3.95	15.5	2.79	6.6	33	75,872	0.36	27,096	35.0	7	26,996	0.32
B6	Future Developed Conditions	0.108	0.074	35.1	3.51	18.3	2.48	5.8	25	68,469	0.18	12,447	35.0	3	12,400	0.16
B7	Future Developed Conditions	0.099	0.030	16.7	1.89	8.7	1.33	3.1	6	7,158	0.24	1,741	30.0	1	1,646	0.32
C1	Future Developed Conditions	0.094	0.119	19.7	3.30	10.3	2.33	5.5	72	110,326	0.32	34,909	30.0	12	34,569	0.38
D1	Future Developed Conditions	0.092	0.099	27.9	3.62	14.5	2.56	6.0	30	63,835	0.35	22,197	35.0	6	22,091	0.32
D2	Future Developed Conditions	0.158	0.057	43.7	3.41	22.7	2.41	5.7	6	20,963	0.01	156	40.0	0	155	0.01
E1	Historic Conditions	0.126	0.073	32.2	3.30	16.8	2.33	5.5	23	56,377	0.07	4,093	35.0	1	4,066	0.08
E2	Future Developed Conditions	0.103	0.074	37.1	3.61	19.3	2.55	6.0	22	63,349	0.21	13,252	35.0	3	13,209	0.17
E3	Future Developed Conditions	0.158	0.034	13.5	1.86	7.0	1.31	3.1	7	6,919	0.01	73	30.0	0	67	0.02
E5	Future Developed Conditions	0.100	0.023	11.7	1.70	6.1	1.20	2.8	4	4,054	0.23	935	30.0	0	860	0.38
OS1	Historic (off-site) Conditions	0.151	0.042	20.2	2.15	10.5	1.52	3.6	7	11,710	0.02	240	30.0	0	231	0.03
OS2	Future Developed Conditions	0.079	0.071	5.3	1.79	2.8	1.26	3.0	45	18,321	0.61	11,216	25.0	6	8,721	1.10
~~OS3~~	~~Future Developed Conditions~~	~~0.074~~	~~0.040~~	~~9.0~~	~~1.78~~	~~4.7~~	~~1.26~~	~~3.0~~	~~7~~	~~4,614~~	~~0.81~~	~~3,743~~	~~25.0~~	~~2~~	~~3,358~~	~~1.39~~
OS4	Historic (off-site) Conditions	0.158	0.174	26.5	5.04	13.8	3.56	8.4	122	250,570	0.00	905	35.0	0	902	0.01
OS5	Historic (off-site) Conditions	0.158	0.137	38.7	5.59	20.1	3.95	9.3	50	148,598	0.00	537	35.0	0	536	0.00
~~OS6~~	~~Historic (off-site) Conditions~~	~~0.158~~	~~0.210~~	~~50.5~~	~~9.66~~	~~26.3~~	~~6.83~~	~~16.1~~	~~98~~	~~382,608~~	~~0.00~~	~~1,368~~	~~45.0~~	~~0~~	~~1,367~~	~~0.00~~

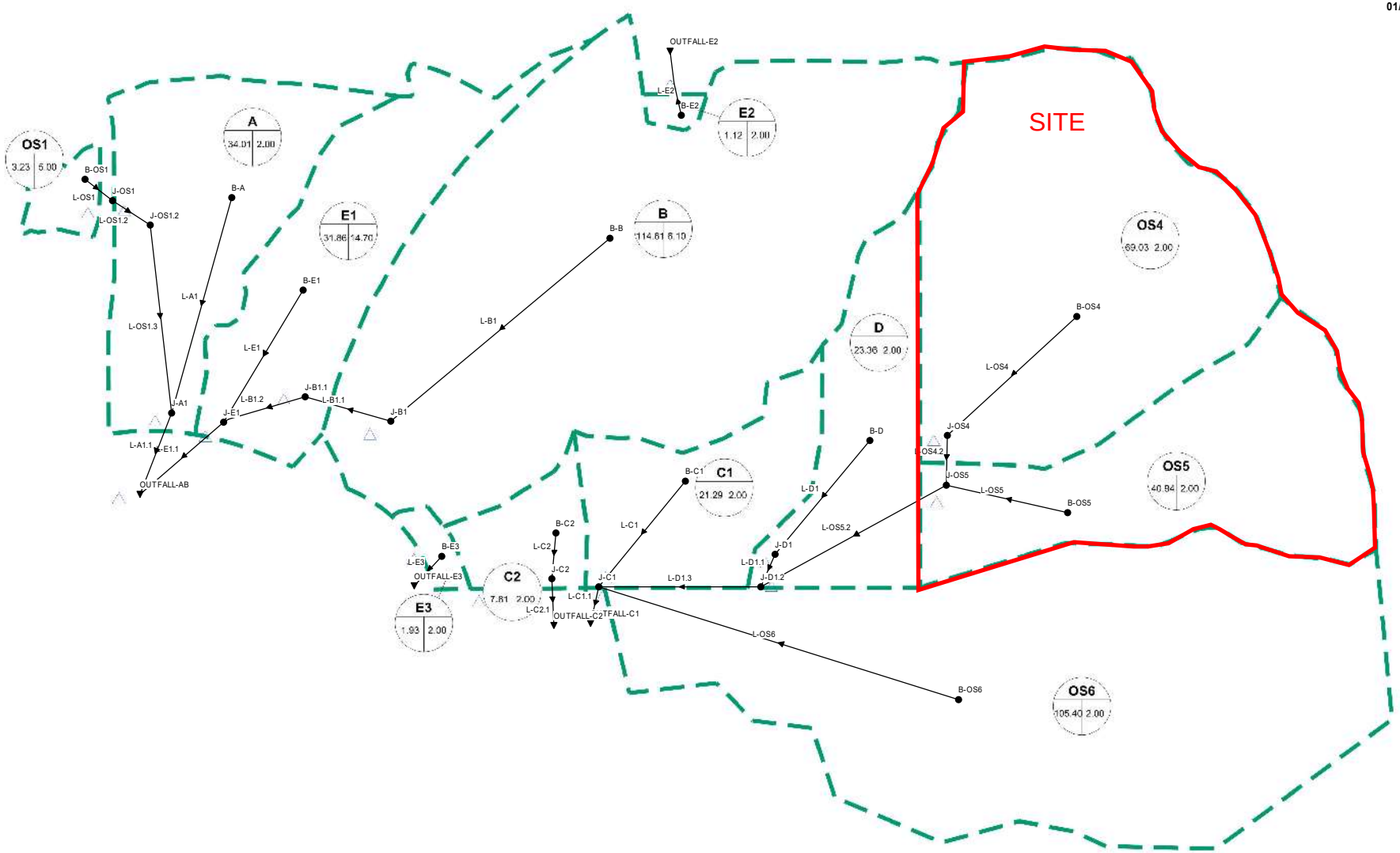
Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)
100-Year

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A1	Future Developed Conditions	0.092	0.121	20.0	3.36	10.4	2.38	5.6	64	98,420	1.72	169,400	35.0	59	167,848	2.16
A2	Future Developed Conditions	0.095	0.104	32.3	4.08	16.8	2.88	6.8	34	85,449	1.64	139,890	40.0	36	139,381	1.51
B1	Future Developed Conditions	0.086	0.112	15.9	2.86	8.2	2.02	4.8	51	62,489	1.91	119,606	35.0	46	116,872	2.68
B2	Future Developed Conditions	0.090	0.069	8.4	1.94	4.4	1.37	3.2	38	24,862	1.78	44,179	30.0	22	39,983	3.25
B3	Future Developed Conditions	0.090	0.097	11.4	2.35	5.9	1.66	3.9	62	54,946	1.70	93,426	35.0	43	88,671	2.87
B4	Future Developed Conditions	0.085	0.080	9.7	2.10	5.1	1.48	3.5	39	29,273	1.94	56,677	35.0	26	52,494	3.28
B5	Future Developed Conditions	0.091	0.109	28.9	3.93	15.0	2.78	6.6	34	75,872	1.81	137,561	40.0	37	137,076	1.77
B6	Future Developed Conditions	0.105	0.074	34.4	3.46	17.9	2.45	5.8	26	68,469	1.58	108,296	45.0	27	107,843	1.42
B7	Future Developed Conditions	0.097	0.032	15.6	1.88	8.1	1.33	3.1	6	7,158	1.58	11,328	35.0	4	10,631	2.27
C1	Future Developed Conditions	0.093	0.122	19.1	3.28	9.9	2.32	5.5	75	110,326	1.75	193,386	35.0	70	191,698	2.29
D1	Future Developed Conditions	0.091	0.101	26.9	3.59	14.0	2.54	6.0	31	63,835	1.73	110,644	40.0	31	110,167	1.79
D2	Future Developed Conditions	0.157	0.056	43.7	3.39	22.7	2.40	5.7	6	20,963	1.18	24,726	45.0	6	24,631	0.97
E1	Historic Conditions	0.123	0.071	31.9	3.25	16.6	2.30	5.4	23	56,377	1.37	77,113	40.0	21	76,580	1.36
E2	Future Developed Conditions	0.101	0.078	34.4	3.56	17.9	2.52	5.9	24	63,349	1.58	99,858	45.0	25	99,497	1.41
E3	Future Developed Conditions	0.156	0.034	13.5	1.85	7.0	1.31	3.1	7	6,919	1.32	9,156	35.0	4	8,519	2.28
E5	Future Developed Conditions	0.098	0.024	10.9	1.70	5.7	1.20	2.8	5	4,054	1.57	6,348	35.0	3	5,807	2.75
OS1	Historic (off-site) Conditions	0.147	0.041	20.2	2.13	10.5	1.51	3.6	7	11,710	1.21	14,189	40.0	5	13,656	1.65
OS2	Future Developed Conditions	0.079	0.071	5.3	1.79	2.7	1.26	3.0	45	18,321	2.06	37,710	30.0	19	29,216	3.74
~~OS3~~	~~Future Developed Conditions~~	~~0.074~~	~~0.040~~	~~9.0~~	~~1.78~~	~~4.7~~	~~1.26~~	~~3.0~~	~~7~~	~~4,614~~	~~2.37~~	~~10,936~~	~~30.0~~	~~5~~	~~9,889~~	~~3.69~~
OS4	Historic (off-site) Conditions	0.157	0.172	26.5	5.01	13.8	3.54	8.3	122	250,570	0.86	214,687	40.0	76	213,949	1.10
OS5	Historic (off-site) Conditions	0.157	0.136	38.7	5.55	20.1	3.92	9.2	50	148,598	0.86	127,317	45.0	34	127,157	0.83
~~OS6~~	~~Historic (off-site) Conditions~~	~~0.157~~	~~0.209~~	~~50.5~~	~~9.59~~	~~26.3~~	~~6.78~~	~~16.0~~	~~98~~	~~382,668~~	~~0.86~~	~~327,748~~	~~55.0~~	~~71~~	~~327,578~~	~~0.68~~

APPENDIX C
HYDRAULIC CALCULATIONS

Kings Point South

01/01/2005 00:05:00



```
[TITLE]
;;Project Title/Notes
Kings Point South
Master Drainage Report
Existing Condition Modeling

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           01/01/2005
START_TIME           00:00:00
REPORT_START_DATE    01/01/2005
REPORT_START_TIME    00:00:00
END_DATE             01/01/2005
END_TIME             06:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:05:00
WET_STEP             00:05:00
DRY_STEP             01:00:00
ROUTING_STEP         0:00:30

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[FILES]
;;Interfacing Files
USE INFLOWS "KPS_MDR_interface_EX2.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
B-A              5880       0          0          0          0
B-B              5900       0          0          0          0
B-C1             5900       0          0          0          0
B-D              5925       0          0          0          0
B-E1             5875       0          0          0          0
B-E3             5875       0          0          0          0
B-E2             5965       0          0          0          0
B-OS1            5865       0          0          0          0
B-OS4            5995       0          0          0          0
B-OS5            6000       0          0          0          0
J-A1             5821       0          0          0          0
J-B1             5835       0          0          0          0
J-B1.1           5823       0          0          0          0
J-C1             5866       0          0          0          0
```

```
J-D1             5880       0          0          0          0
J-D1.2           5874       0          0          0          0
J-E1             5807       0          0          0          0
J-OS1            5851.1     0          0          0          0
J-OS1.2          5848.7     0          0          0          0
J-OS4            5930       0          0          0          0
J-OS5            5925       0          0          0          0
B-C2             5875       0          0          0          0
J-C2             5844       0          0          0          0
B-OS6            6000       0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
OUTFALL-AB       5795       FREE                        NO
OUTFALL-C1       5844       FREE                        NO
OUTFALL-E3       5846       FREE                        NO
OUTFALL-E2       5962       FREE                        NO
OUTFALL-C2       5842       FREE                        NO

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow
MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ---
-------
L-OS1            B-OS1            J-OS1            400        0.01       0          0          0          0
L-OS1.2          J-OS1            J-OS1.2          120        0.013      0          0          0          0
L-OS1.3          J-OS1.2          J-A1             985        0.013      0          0          0          0
L-A1             B-A              J-A1             400        0.01       0          0          0          0
L-E1             B-E1             J-E1             400        0.01       0          0          0          0
L-C1             B-C1             J-C1             400        0.01       0          0          0          0
L-D1             B-D              J-D1             400        0.01       0          0          0          0
L-E2             B-E2             OUTFALL-E2       400        0.01       0          0          0          0
L-OS4            B-OS4            J-OS4            400        0.01       0          0          0          0
L-OS5            B-OS5            J-OS5            400        0.01       0          0          0          0
L-OS4.2          J-OS4            J-OS5            400        0.01       0          0          0          0
L-OS5.2          J-OS5            J-D1.2           971        .030       0          0          0          0
L-D1.3           J-D1.2           J-C1             903        0.01       0          0          0          0
L-E3             B-E3             OUTFALL-E3       400        0.01       0          0          0          0
L-E1.1           J-E1             OUTFALL-AB       400        .035       0          0          0          0
L-B1.1           J-B1             J-B1.1           360        .013       0          0          0          0
L-B1.2           J-B1.1           J-E1             620        .035       0          0          0          0
L-D1.1           J-D1             J-D1.2           400        0.01       0          0          0          0
L-C1.1           J-C1             OUTFALL-C1       400        0.01       0          0          0          0
L-C2             B-C2             J-C2             400        0.01       0          0          0          0
L-C2.1           J-C2             OUTFALL-C2       400        0.01       0          0          0          0
L-B1             B-B              J-B1             400        0.01       0          0          0          0
L-A1.1           J-A1             OUTFALL-AB       400        .035       0          0          0          0
L-OS6            B-OS6            J-C1             100        0.01       0          0          0          0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
L-OS1            DUMMY        0                0          0          0          1
L-OS1.2          CIRCULAR     2                0          0          0          1
L-OS1.3          CIRCULAR     2                0          0          0          1
L-A1             DUMMY        0                0          0          0          1
L-E1             DUMMY        0                0          0          0          1
L-C1             DUMMY        0                0          0          0          1
L-D1             DUMMY        0                0          0          0          1
L-E2             DUMMY        0                0          0          0          1
L-OS4            DUMMY        0                0          0          0          1
L-OS5            DUMMY        0                0          0          0          1
L-OS4.2          DUMMY        0                0          0          0          1
L-OS5.2          TRAPEZOIDAL  5                4          2.5        2.5        1
L-D1.3           IRREGULAR    L-D1.3           0          0          0          1
L-E3             DUMMY        0                0          0          0          1
L-E1.1           TRAPEZOIDAL  4                14         4          4          1
L-B1.1           CIRCULAR     5                0          0          0          2
L-B1.2           TRAPEZOIDAL  4                14         4          4          1
```

```
L-D1.1           DUMMY        0               0          0          0          1
L-C1.1           DUMMY        0               0          0          0          1
L-C2             DUMMY        0               0          0          0          1
L-C2.1           DUMMY        0               0          0          0          1
L-B1             DUMMY        0               0          0          0          1
L-A1.1           TRAPEZOIDAL  3               10         4          4          1
L-OS6            DUMMY        0               0          0          0          1

[TRANSECTS]
;;Transect Data in HEC-2 format
;
;existing swale
NC .040     .040     .035
X1 L-D1.3           7        167.18   193.38   0.0      0.0      0.0      0.0      0.0
GR 5866.00  132.06   5857.00  167.18   5856.83  181.37   5857.00  193.38   5864.18  214.79
GR 5865.49  240.55   5868.54  254.44

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS -2500.000 0.000 12500.000 10000.000
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
B-A              398.602            6305.134
B-B              4213.731           5901.290
B-C1             4983.052           3435.117
B-D              6840.429           3850.708
B-E1             1118.475           5376.878
B-E3             2521.215           2671.875
B-E2             4935.718           7145.415
B-OS1            -1088.489          6496.936
B-OS4            8933.103           5109.573
B-OS5            8840.830           3114.187
J-A1             -209.668           4124.119
J-B1             2006.914           4041.119
J-B1.1           1132.975           4295.001
J-C1             4100.577           2370.365
J-D1             5887.841           2693.055
J-D1.2           5735.568           2370.365
J-E1             312.742            4031.355
J-OS1            -805.313           6282.113
J-OS1.2          -429.373           6033.113
J-OS4            7623.106           3898.042
J-OS5            7616.747           3392.281
B-C2             3675.915           2914.157
J-C2             3631.113           2444.547
B-OS6            7733.564           1222.607
OUTFALL-AB       -527.020           3299.004
OUTFALL-C1       4018.158           1998.799
OUTFALL-E3       2240.398           2372.336
OUTFALL-E2       4826.990           7797.001
OUTFALL-C2       3655.183           1976.517

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
L-E2             4865.104           7458.044
L-B1.2           365.003            4063.760
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

Kings Point South
Master Drainage Report
Existing Condition Modeling

WARNING 08: elevation drop exceeds length for Conduit L-OS6

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/01/2005 06:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Routing Time Step ........ 30.00 sec


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.563         0.183
External Outflow .........         0.569         0.186
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -1.201


*******************************
Highest Flow Instability Indexes
*******************************
All links are stable.


************************
Routing Time Step Summary
************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00
Percent Not Converging      :     0.00
```

```
******************
Node Depth Summary
******************

-------------------------------------------------------------------------------
                           Average  Maximum  Maximum  Time of Max    Reported
                             Depth    Depth      HGL   Occurrence   Max Depth
Node                 Type     Feet     Feet     Feet  days hr:min        Feet
-------------------------------------------------------------------------------
B-A                  JUNCTION 0.00     0.00  5880.00     0  00:00        0.00
B-B                  JUNCTION 0.00     0.00  5900.00     0  00:00        0.00
B-C1                 JUNCTION 0.00     0.00  5900.00     0  00:00        0.00
B-D                  JUNCTION 0.00     0.00  5925.00     0  00:00        0.00
B-E1                 JUNCTION 0.00     0.00  5875.00     0  00:00        0.00
B-E3                 JUNCTION 0.00     0.00  5875.00     0  00:00        0.00
B-E2                 JUNCTION 0.00     0.00  5965.00     0  00:00        0.00
B-OS1                JUNCTION 0.00     0.00  5965.00     0  00:00        0.00
B-OS4                JUNCTION 0.00     0.00  5995.00     0  00:00        0.00
B-OS5                JUNCTION 0.00     0.00  6000.00     0  00:00        0.00
J-A1                 JUNCTION 0.01     0.08  5821.08     0  00:39        0.08
J-B1                 JUNCTION 0.05     0.22  5835.22     0  00:40        0.22
J-B1.1               JUNCTION 0.05     0.22  5823.22     0  00:41        0.22
J-C1                 JUNCTION 0.02     0.06  5866.06     0  01:08        0.06
J-D1                 JUNCTION 0.00     0.00  5880.00     0  00:00        0.00
J-D1.2               JUNCTION 0.02     0.08  5874.08     0  00:43        0.08
J-E1                 JUNCTION 0.04     0.17  5807.17     0  00:42        0.17
J-OS1                JUNCTION 0.01     0.08  5851.18     0  00:30        0.08
J-OS1.2              JUNCTION 0.01     0.08  5848.78     0  00:32        0.08
J-OS4                JUNCTION 0.00     0.00  5930.00     0  00:00        0.00
J-OS5                JUNCTION 0.01     0.07  5925.07     0  00:35        0.07
B-C2                 JUNCTION 0.00     0.00  5875.00     0  00:00        0.00
J-C2                 JUNCTION 0.00     0.00  5844.00     0  00:00        0.00
B-OS6                JUNCTION 0.00     0.00  6000.00     0  00:00        0.00
OUTFALL-AB           OUTFALL  0.04     0.17  5795.17     0  00:44        0.17
OUTFALL-C1           OUTFALL  0.00     0.00  5844.00     0  00:00        0.00
OUTFALL-E3           OUTFALL  0.00     0.00  5846.00     0  00:00        0.00
OUTFALL-E2           OUTFALL  0.00     0.00  5962.00     0  00:00        0.00
OUTFALL-C2           OUTFALL  0.00     0.00  5842.00     0  00:00        0.00


******************
Node Inflow Summary
******************

-------------------------------------------------------------------------------------------------
                           Maximum  Maximum                  Lateral       Total        Flow
                           Lateral    Total  Time of Max      Inflow      Inflow     Balance
                            Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type      CFS      CFS  days hr:min    10^6 gal    10^6 gal     Percent
-------------------------------------------------------------------------------------------------
B-A                  JUNCTION 0.28     0.28     0  00:40     0.00747     0.00747       0.000
B-B                  JUNCTION 3.63     3.63     0  00:40      0.0801      0.0801       0.000
B-C1                 JUNCTION 0.27     0.27     0  00:35     0.00548     0.00548       0.000
B-D                  JUNCTION 0.17     0.17     0  00:40     0.00479     0.00479       0.000
B-E1                 JUNCTION 2.12     2.12     0  00:40      0.0608      0.0608       0.000
B-E3                 JUNCTION 0.03     0.03     0  00:30    0.000474    0.000474       0.000
B-E2                 JUNCTION 0.02     0.02     0  00:30    0.000208    0.000208       0.000
B-OS1                JUNCTION 0.10     0.10     0  00:30     0.00168     0.00168       0.000
B-OS4                JUNCTION 0.38     0.38     0  00:35      0.0065      0.0065       0.000
B-OS5                JUNCTION 0.16     0.16     0  00:35     0.00386     0.00386       0.000
J-A1                 JUNCTION 0.00     0.38     0  00:40           0     0.00918       0.000
J-B1                 JUNCTION 0.00     3.63     0  00:40           0      0.0801       0.000
J-B1.1               JUNCTION 0.00     3.63     0  00:41           0      0.0801       0.000
J-C1                 JUNCTION 0.00     0.82     0  01:01           0      0.0318       0.000
J-D1                 JUNCTION 0.00     0.17     0  00:40           0     0.00479       0.000
J-D1.2               JUNCTION 0.00     0.65     0  00:43           0      0.0153       0.000
J-E1                 JUNCTION 0.00     5.61     0  00:42           0       0.142       0.000
J-OS1                JUNCTION 0.00     0.10     0  00:30           0     0.00168       0.000
J-OS1.2              JUNCTION 0.00     0.10     0  00:32           0     0.00169       0.000
J-OS4                JUNCTION 0.00     0.38     0  00:35           0      0.0065       0.000
```

J-OS5	JUNCTION	0.00	0.53	0	00:35	0	0.0104	0.000
B-C2	JUNCTION	0.13	0.13	0	00:30	0.00196	0.00196	0.000
J-C2	JUNCTION	0.00	0.13	0	00:30	0	0.00196	0.000
B-OS6	JUNCTION	0.31	0.31	0	00:45	0.00995	0.00995	0.000
OUTFALL-AB	OUTFALL	0.00	5.96	0	00:44	0	0.151	0.000
OUTFALL-C1	OUTFALL	0.00	0.82	0	01:01	0	0.0318	0.000
OUTFALL-E3	OUTFALL	0.00	0.03	0	00:30	0	0.000474	0.000
OUTFALL-E2	OUTFALL	0.00	0.02	0	00:30	0	0.000208	0.000
OUTFALL-C2	OUTFALL	0.00	0.13	0	00:30	0	0.00196	0.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OUTFALL-AB	85.56	1.09	5.96	0.151
OUTFALL-C1	70.97	0.28	0.82	0.032
OUTFALL-E3	20.00	0.01	0.03	0.000
OUTFALL-E2	15.83	0.01	0.02	0.000
OUTFALL-C2	24.17	0.05	0.13	0.002
System	43.31	1.44	6.72	0.186

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
L-OS1	DUMMY	0.10	0	00:30			
L-OS1.2	CONDUIT	0.10	0	00:32	2.32	0.00	0.04
L-OS1.3	CONDUIT	0.10	0	00:39	2.67	0.00	0.04
L-A1	DUMMY	0.28	0	00:40			
L-E1	DUMMY	2.12	0	00:40			
L-C1	DUMMY	0.27	0	00:35			
L-D1	DUMMY	0.17	0	00:40			
L-E2	DUMMY	0.02	0	00:30			
L-OS4	DUMMY	0.38	0	00:35			
L-OS5	DUMMY	0.16	0	00:35			
L-OS4.2	DUMMY	0.38	0	00:35			
L-OS5.2	CONDUIT	0.48	0	00:43	1.84	0.00	0.01
L-B1.3	CHANNEL	0.45	0	01:08	0.59	0.00	0.01
L-E3	DUMMY	0.03	0	00:30			
L-E1.1	CONDUIT	5.59	0	00:44	2.21	0.00	0.04
L-B1.1	CONDUIT	3.63	0	00:41	5.75	0.00	0.04
L-B1.2	CONDUIT	3.57	0	00:43	1.80	0.00	0.03
L-D1.1	DUMMY	0.17	0	00:40			
L-C1.1	DUMMY	0.82	0	01:01			
L-C2	DUMMY	0.13	0	00:30			
L-C2.1	DUMMY	0.13	0	00:30			
L-B1	DUMMY	3.63	0	00:40			
L-A1.1	CONDUIT	0.37	0	00:44	1.12	0.00	0.01
L-OS6	DUMMY	0.31	0	00:45			

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

Kings Point South
Master Drainage Report
Existing Condition Modeling

WARNING 08: elevation drop exceeds length for Conduit L-OS6

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/01/2005 06:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Routing Time Step ........ 30.00 sec


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........        40.211        13.103
External Outflow .........        40.255        13.118
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.110


*******************************
Highest Flow Instability Indexes
*******************************
Link L-E1.1 (1)
Link L-OS1.2 (1)
Link L-B1.1 (1)
Link L-B1.2 (1)


************************
Routing Time Step Summary
************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.08
```

```
  Percent Not Converging      :     0.00


  ******************
  Node Depth Summary
  ******************

  ---------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
  Node                 Type        Feet     Feet     Feet  days hr:min        Feet
  ---------------------------------------------------------------------------
  B-A                  JUNCTION    0.00     0.00  5880.00     0  00:00        0.00
  B-B                  JUNCTION    0.00     0.00  5900.00     0  00:00        0.00
  B-C1                 JUNCTION    0.00     0.00  5900.00     0  00:00        0.00
  B-D                  JUNCTION    0.00     0.00  5925.00     0  00:00        0.00
  B-E1                 JUNCTION    0.00     0.00  5875.00     0  00:00        0.00
  B-E3                 JUNCTION    0.00     0.00  5875.00     0  00:00        0.00
  B-E2                 JUNCTION    0.00     0.00  5965.00     0  00:00        0.00
  B-OS1                JUNCTION    0.00     0.00  5965.00     0  00:00        0.00
  B-OS4                JUNCTION    0.00     0.00  5995.00     0  00:00        0.00
  B-OS5                JUNCTION    0.00     0.00  6000.00     0  00:00        0.00
  J-A1                 JUNCTION    0.14     0.54  5821.54     0  00:45        0.54
  J-B1                 JUNCTION    0.31     1.36  5836.36     0  00:45        1.36
  J-B1.1               JUNCTION    0.31     1.36  5824.36     0  00:45        1.36
  J-C1                 JUNCTION    0.29     1.18  5867.18     0  00:48        1.18
  J-D1                 JUNCTION    0.00     0.00  5880.00     0  00:00        0.00
  J-D1.2               JUNCTION    0.31     1.38  5875.38     0  00:46        1.37
  J-E1                 JUNCTION    0.29     1.32  5808.32     0  00:46        1.32
  J-OS1                JUNCTION    0.09     0.55  5851.65     0  00:40        0.55
  J-OS1.2              JUNCTION    0.09     0.55  5849.25     0  00:36        0.55
  J-OS4                JUNCTION    0.00     0.00  5930.00     0  00:00        0.00
  J-OS5                JUNCTION    0.29     1.38  5926.38     0  00:45        1.37
  B-C2                 JUNCTION    0.00     0.00  5875.00     0  00:00        0.00
  J-C2                 JUNCTION    0.00     0.00  5844.00     0  00:00        0.00
  B-OS6                JUNCTION    0.00     0.00  6000.00     0  00:00        0.00
  OUTFALL-AB           OUTFALL     0.29     1.32  5796.32     0  00:47        1.32
  OUTFALL-C1           OUTFALL     0.00     0.00  5844.00     0  00:00        0.00
  OUTFALL-E3           OUTFALL     0.00     0.00  5846.00     0  00:00        0.00
  OUTFALL-E2           OUTFALL     0.00     0.00  5962.00     0  00:00        0.00
  OUTFALL-C2           OUTFALL     0.00     0.00  5842.00     0  00:00        0.00


  ********************
  Node Inflow Summary
  ********************

  ---------------------------------------------------------------------------------------------
                                Maximum  Maximum                  Lateral       Total        Flow
                                Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                 Inflow   Inflow   Occurrence      Volume      Volume       Error
  Node                 Type       CFS      CFS  days hr:min    10^6 gal    10^6 gal     Percent
  ---------------------------------------------------------------------------------------------
  B-A                  JUNCTION  36.74    36.74     0  00:50        1.16        1.16       0.000
  B-B                  JUNCTION 154.84   154.84     0  00:45        3.88        3.88       0.000
  B-C1                 JUNCTION  32.13    32.13     0  00:40       0.754       0.754       0.000
  B-D                  JUNCTION  22.53    22.53     0  00:50       0.748       0.748       0.000
  B-E1                 JUNCTION  36.80    36.80     0  00:45        1.08        1.08       0.000
  B-E3                 JUNCTION   3.72     3.72     0  00:35      0.0655      0.0655       0.000
  B-E2                 JUNCTION   2.13     2.13     0  00:35      0.0336      0.0336       0.000
  B-OS1                JUNCTION   5.33     5.33     0  00:40       0.102       0.102       0.000
  B-OS4                JUNCTION  75.83    75.83     0  00:40         1.6         1.6       0.000
  B-OS5                JUNCTION  33.82    33.82     0  00:45       0.951       0.951       0.000
  J-A1                 JUNCTION   0.00    41.76     0  00:45           0        1.26       0.000
  J-B1                 JUNCTION   0.00   154.84     0  00:45           0        3.88       0.000
  J-B1.1               JUNCTION   0.00   154.61     0  00:45           0        3.88       0.000
  J-C1                 JUNCTION   0.00   229.68     0  00:49           0        6.52       0.000
  J-D1                 JUNCTION   0.00    22.53     0  00:50           0       0.748       0.000
  J-D1.2               JUNCTION   0.00   130.49     0  00:46           0         3.3       0.000
  J-E1                 JUNCTION   0.00   191.06     0  00:46           0        4.96       0.000
```

J-OS1	JUNCTION	0.00	5.33	0	00:40	0	0.102	0.000
J-OS1.2	JUNCTION	0.00	5.33	0	00:36	0	0.102	0.000
J-OS4	JUNCTION	0.00	75.83	0	00:40	0	1.6	0.000
J-OS5	JUNCTION	0.00	108.05	0	00:45	0	2.55	0.000
B-C2	JUNCTION	14.99	14.99	0	00:35	0.271	0.271	0.000
J-C2	JUNCTION	0.00	14.99	0	00:35	0	0.271	0.000
B-OS6	JUNCTION	71.17	71.17	0	00:55	2.45	2.45	0.000
OUTFALL-AB	OUTFALL	0.00	232.66	0	00:47	0	6.23	0.000
OUTFALL-C1	OUTFALL	0.00	229.68	0	00:49	0	6.52	0.000
OUTFALL-E3	OUTFALL	0.00	3.72	0	00:35	0	0.0655	0.000
OUTFALL-E2	OUTFALL	0.00	2.13	0	00:35	0	0.0336	0.000
OUTFALL-C2	OUTFALL	0.00	14.99	0	00:35	0	0.271	0.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OUTFALL-AB	90.97	42.35	232.66	6.225
OUTFALL-C1	95.69	42.18	229.68	6.521
OUTFALL-E3	36.94	1.10	3.72	0.066
OUTFALL-E2	28.75	0.72	2.13	0.034
OUTFALL-C2	42.64	3.93	14.99	0.271
System	59.00	90.29	479.73	13.117

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
L-OS1	DUMMY	5.33	0	00:40			
L-OS1.2	CONDUIT	5.33	0	00:36	7.55	0.17	0.28
L-OS1.3	CONDUIT	5.33	0	00:41	8.56	0.14	0.25
L-A1	DUMMY	36.74	0	00:50			
L-E1	DUMMY	36.80	0	00:45			
L-C1	DUMMY	32.13	0	00:40			
L-D1	DUMMY	22.53	0	00:50			
L-E2	DUMMY	2.13	0	00:35			
L-OS4	DUMMY	75.83	0	00:40			
L-OS5	DUMMY	33.82	0	00:45			
L-OS4.2	DUMMY	75.83	0	00:40			
L-OS5.2	CONDUIT	108.11	0	00:46	10.60	0.06	0.27
L-B1.3	CHANNEL	130.00	0	00:48	4.03	0.01	0.10
L-E3	DUMMY	3.72	0	00:35			
L-E1.1	CONDUIT	190.94	0	00:47	7.48	0.12	0.33
L-B1.1	CONDUIT	154.61	0	00:45	17.83	0.16	0.27
L-B1.2	CONDUIT	154.47	0	00:46	6.66	0.10	0.31
L-D1.1	DUMMY	22.53	0	00:50			
L-C1.1	DUMMY	229.68	0	00:49			
L-C2	DUMMY	14.99	0	00:35			
L-C2.1	DUMMY	14.99	0	00:35			
L-B1	DUMMY	154.84	0	00:45			

L-A1.1	CONDUIT	41.72	0	00:47	6.39	0.04	0.18
L-OS6	DUMMY	71.17	0	00:55			

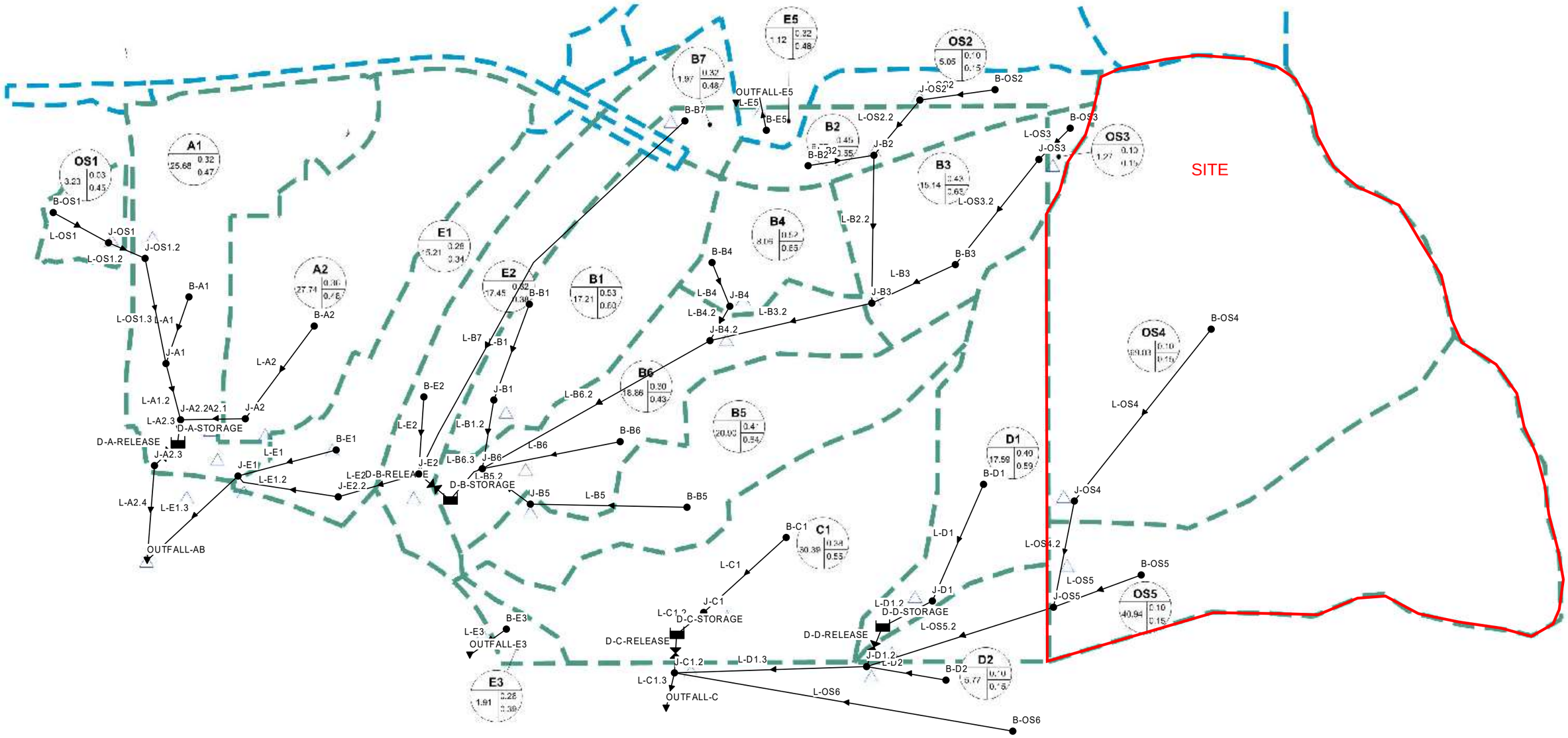
****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Tue Sep 20 11:18:59 2022
Analysis ended on: Tue Sep 20 11:18:59 2022
Total elapsed time: < 1 sec

Kings Point South

01/01/2005 00:05:00



```
[TITLE]
;;Project Title/Notes
Kings Point South
Master Drainage Report
Proposed Condition Modeling

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           01/01/2005
START_TIME           00:00:00
REPORT_START_DATE    01/01/2005
REPORT_START_TIME    00:00:00
END_DATE             01/01/2005
END_TIME             06:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:05:00
WET_STEP             00:05:00
DRY_STEP             01:00:00
ROUTING_STEP         0:00:30

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[FILES]
;;Interfacing Files
USE INFLOWS "KPS_MDR_interface_100.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
B-A1             5880       0          0          0          0
B-A2             5850       0          0          0          0
B-B1             5900       0          0          0          0
B-B2             5960       0          0          0          0
B-B3             5975       0          0          0          0
B-B4             5925       0          0          0          0
B-B5             5900       0          0          0          0
B-B6             5875       0          0          0          0
B-C1             5900       0          0          0          0
B-D1             5925       0          0          0          0
B-E1             5875       0          0          0          0
B-E2             5875       0          0          0          0
B-E3             5875       0          0          0          0
B-B7             5965       0          0          0          0
```

```
B-E5            5965       0          0          0          0
B-OS1           5865       0          0          0          0
B-OS2           6000       0          0          0          0
B-OS3           6040       0          0          0          0
B-OS4           5995       0          0          0          0
B-OS5           6000       0          0          0          0
J-A2            5818       0          0          0          0
J-A1            5821       0          0          0          0
J-A2.2          5815       0          0          0          0
J-A2.3          5813       0          0          0          0
J-B1            5855       0          0          0          0
J-B2            5955       0          0          0          0
J-B3            5923       0          0          0          0
J-B4            5890       0          0          0          0
J-B5            5856       0          0          0          0
J-B6            5850       0          0          0          0
J-C1            5866       0          0          0          0
J-D1            5880       0          0          0          0
J-D1.2          5873       0          0          0          0
J-E1            5807       0          0          0          0
J-OS1           5851.1     0          0          0          0
J-OS1.2         5848.7     0          0          0          0
J-OS2           5985       0          0          0          0
J-OS3           6020       0          0          0          0
J-OS4           5930       0          0          0          0
J-OS5           5925       0          0          0          0
J-E2            5835       0          0          0          0
J-E2.2          5823       0          0          0          0
J-B4.2          5876       0          0          0          0
B-D2            5901       0          0          0          0
J-C1.2          5850       0          0          0          0
B-OS6           6000       0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
OUTFALL-AB      5795       FREE                        NO
OUTFALL-C       5844       FREE                        NO
OUTFALL-E3      5846       FREE                        NO
OUTFALL-E5      5962       FREE                        NO

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi
Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- --------
-------- --------
D-A-STORAGE     5814     10         0          TABULAR    POND-A-STORAGE-CURVE         0        0
D-B-STORAGE     5848     10         0          TABULAR    POND-B-STORAGE-CURVE         0        0
D-C-STORAGE     5864     10         0          TABULAR    POND-C-STORAGE-CURVE         0        0
D-D-STORAGE     5875     9          0          TABULAR    POND-D-STORAGE-CURVE         0        0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow
MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ----------
-------
L-A2.3          J-A2.2           D-A-STORAGE      400        0.01       0          0          0          0
L-A1            B-A1             J-A1             400        0.01       0          0          0          0
L-A1.2          J-A1             J-A2.2           50         .013       0          0          0          0
L-A2            B-A2             J-A2             400        0.01       0          0          0          0
L-A2.1          J-A2             J-A2.2           430        .013       0          0          0          0
L-A2.4          J-A2.3           OUTFALL-AB       400        .035       0          0          0          0
L-B1            B-B1             J-B1             400        0.01       0          0          0          0
L-B1.2          J-B1             J-B6             95         .013       0          0          0          0
L-B2            B-B2             J-B2             400        0.01       0          0          0          0
L-B2.2          J-B2             J-B3             800        0.013      0          0          0          0
L-B3            B-B3             J-B3             400        0.01       0          0          0          0
L-B3.2          J-B3             J-B4.2           850        .035       0          0          0          0
L-B4            B-B4             J-B4             400        0.01       0          0          0          0
L-B4.2          J-B4             J-B4.2           225        .035       0          0          0          0
```

```
L-B5            B-B5            J-B5            400        0.01       0          0          0          0
L-B5.2          J-B5            J-B6            240        .013       0          0          0          0
L-B6            B-B6            J-B6            400        0.01       0          0          0          0
L-B6.2          J-B4.2          J-B6            1140       .035       0          0          0          0
L-B6.3          J-B6            D-B-STORAGE     400        0.01       0          0          0          0
L-B7            B-B7            J-E2            2035       .030       0          0          0          0
L-C1            B-C1            J-C1            400        0.01       0          0          0          0
L-C1.2          J-C1            D-C-STORAGE     400        0.01       0          0          0          0
L-D1            B-D1            J-D1            400        0.01       0          0          0          0
L-D1.2          J-D1            D-D-STORAGE     400        0.01       0          0          0          0
L-D1.3          J-D1.2          J-C1.2          903        0.01       0          0          0          0
L-D2            B-D2            J-D1.2          400        0.01       0          0          0          0
L-E1            B-E1            J-E1            400        0.01       0          0          0          0
L-E1.2          J-E2.2          J-E1            620        .035       0          0          0          0
L-E1.3          J-E1            OUTFALL-AB      400        .035       0          0          0          0
L-E2            B-E2            J-E2            400        0.01       0          0          0          0
L-E2.2          J-E2            J-E2.2          360        .013       0          0          0          0
L-E3            B-E3            OUTFALL-E3      400        0.01       0          0          0          0
L-E5            B-E5            OUTFALL-E5      400        0.01       0          0          0          0
L-OS1           B-OS1           J-OS1           400        0.01       0          0          0          0
L-OS1.2         J-OS1           J-OS1.2         120        0.013      0          0          0          0
L-OS1.3         J-OS1.2         J-A1            985        0.013      0          0          0          0
L-OS2           B-OS2           J-OS2           400        0.01       0          0          0          0
L-OS2.2         J-OS2           J-B2            400        0.01       0          0          0          0
L-OS3           B-OS3           J-OS3           400        0.01       0          0          0          0
L-OS3.2         J-OS3           B-B3            400        0.01       0          0          0          0
L-OS4           B-OS4           J-OS4           400        0.01       0          0          0          0
L-OS4.2         J-OS4           J-OS5           400        0.01       0          0          0          0
L-OS5           B-OS5           J-OS5           400        0.01       0          0          0          0
L-OS5.2         J-OS5           J-D1.2          971        .030       0          0          0          0
L-OS6           B-OS6           J-C1.2          100        0.01       0          0          0          0
L-C1.3          J-C1.2          OUTFALL-C       100        0.01       0          0          0          0

[OUTLETS]
;;Name           From Node       To Node         Offset     Type            QTable/Qcoeff    Qexpon
Gated
;;-------------- --------------- --------------- ---------- --------------- ---------------- ---------- ---
-----
D-C-RELEASE     D-C-STORAGE     J-C1.2          0          TABULAR/DEPTH   POND-C-RELEASE-CURVE
NO
D-A-RELEASE     D-A-STORAGE     J-A2.3          0          TABULAR/DEPTH   POND-A-RELEASE-CURVE
NO
D-B-RELEASE     D-B-STORAGE     J-E2            0          TABULAR/DEPTH   POND-B-RELEASE-CURVE
NO
D-D-RELEASE     D-D-STORAGE     J-D1.2          0          TABULAR/DEPTH   POND-D-RELEASE-CURVE
NO

[XSECTIONS]
;;Link           Shape        Geom1           Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ --------------- ---------- ---------- ---------- ---------- ----------
L-A2.3          DUMMY        0               0          0          0          1
L-A1            DUMMY        0               0          0          0          1
L-A1.2          CIRCULAR     3               0          0          0          1
L-A2            DUMMY        0               0          0          0          1
L-A2.1          CIRCULAR     4               0          0          0          1
L-A2.4          TRAPEZOIDAL  3               10         4          4          1
L-B1            DUMMY        0               0          0          0          1
L-B1.2          CIRCULAR     3               0          0          0          1
L-B2            DUMMY        0               0          0          0          1
L-B2.2          CIRCULAR     3               0          0          0          1
L-B3            DUMMY        0               0          0          0          1
L-B3.2          TRAPEZOIDAL  4               12         2          2          1
L-B4            DUMMY        0               0          0          0          1
L-B4.2          TRAPEZOIDAL  4               17         3          3          1
L-B5            DUMMY        0               0          0          0          1
L-B5.2          CIRCULAR     3               0          0          0          1
L-B6            DUMMY        0               0          0          0          1
L-B6.2          TRAPEZOIDAL  4               13         3          3          1
L-B6.3          DUMMY        0               0          0          0          1
L-B7            TRAPEZOIDAL  5               3          4          4          1
```

```
L-C1             DUMMY        0               0          0          0          1
L-C1.2           DUMMY        0               0          0          0          1
L-D1             DUMMY        0               0          0          0          1
L-D1.2           DUMMY        0               0          0          0          1
L-D1.3           IRREGULAR    L-D1.3          0          0          0          1
L-D2             DUMMY        0               0          0          0          1
L-E1             DUMMY        0               0          0          0          1
L-E1.2           TRAPEZOIDAL  4               14         4          4          1
L-E1.3           TRAPEZOIDAL  4               14         4          4          1
L-E2             DUMMY        0               0          0          0          1
L-E2.2           CIRCULAR     5               0          0          0          2
L-E3             DUMMY        0               0          0          0          1
L-E5             DUMMY        0               0          0          0          1
L-OS1            DUMMY        0               0          0          0          1
L-OS1.2          CIRCULAR     2               0          0          0          1
L-OS1.3          CIRCULAR     2               0          0          0          1
L-OS2            DUMMY        0               0          0          0          1
L-OS2.2          DUMMY        0               0          0          0          1
L-OS3            DUMMY        0               0          0          0          1
L-OS3.2          DUMMY        0               0          0          0          1
L-OS4            DUMMY        0               0          0          0          1
L-OS4.2          DUMMY        0               0          0          0          1
L-OS5            DUMMY        0               0          0          0          1
L-OS5.2          TRAPEZOIDAL  5               4          2.5        2.5        1
L-OS6            DUMMY        0               0          0          0          1
L-C1.3           DUMMY        0               0          0          0          1

[TRANSECTS]
;;Transect Data in HEC-2 format
;
;existing swale
NC .04      .04      .035
X1 L-D1.3           7        167.18   193.38   0.0      0.0      0.0      0.0      0.0
GR 5866.00  132.06   5857.00  167.18   5856.83  181.37   5857.00  193.38   5864.18  214.79
GR 5865.49  240.55   5868.54  254.44

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
;POND A RELEASE CURVE
POND-A-RELEASE-CURVE Rating     0          0
POND-A-RELEASE-CURVE            0.5        0.07
POND-A-RELEASE-CURVE            1          0.13
POND-A-RELEASE-CURVE            1.5        0.2
POND-A-RELEASE-CURVE            2          0.29
POND-A-RELEASE-CURVE            2.5        0.36
POND-A-RELEASE-CURVE            2.8        0.4
POND-A-RELEASE-CURVE            3          0.52
POND-A-RELEASE-CURVE            3.5        1.29
POND-A-RELEASE-CURVE            4          1.74
POND-A-RELEASE-CURVE            4.5        2.08
POND-A-RELEASE-CURVE            4.89       2.3
POND-A-RELEASE-CURVE            5          3.42
POND-A-RELEASE-CURVE            5.5        16.43
POND-A-RELEASE-CURVE            6          34.62
POND-A-RELEASE-CURVE            6.5        39.11
POND-A-RELEASE-CURVE            7          40.68
POND-A-RELEASE-CURVE            7.38       41.83
POND-A-RELEASE-CURVE            8          43.65
POND-A-RELEASE-CURVE            8.25       44.36
POND-A-RELEASE-CURVE            8.5        45.06
POND-A-RELEASE-CURVE            9          102.22
POND-A-RELEASE-CURVE            9.5        210.36
POND-A-RELEASE-CURVE            10         356.59
POND-A-RELEASE-CURVE            10.5       537.37
;
;POND-B-RELEASE-CURVE
POND-B-RELEASE-CURVE Rating     0          0
POND-B-RELEASE-CURVE            0.5        0.09
POND-B-RELEASE-CURVE            1          0.13
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

Kings Point South
Master Drainage Report
Proposed Condition Modeling

WARNING 08: elevation drop exceeds length for Conduit L-OS6

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/01/2005 06:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Routing Time Step ........ 30.00 sec


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         5.872         1.913
External Outflow .........         2.247         0.732
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         3.648         1.189
Continuity Error (%) .....        -0.392


*******************************
Highest Flow Instability Indexes
*******************************
Link L-E1.3 (1)


************************
Routing Time Step Summary
************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00
Percent Not Converging      :     0.00
```

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
B-A1	JUNCTION	0.00	0.00	5880.00	0 00:00	0.00
B-A2	JUNCTION	0.00	0.00	5850.00	0 00:00	0.00
B-B1	JUNCTION	0.00	0.00	5900.00	0 00:00	0.00
B-B2	JUNCTION	0.00	0.00	5960.00	0 00:00	0.00
B-B3	JUNCTION	0.00	0.00	5975.00	0 00:00	0.00
B-B4	JUNCTION	0.00	0.00	5925.00	0 00:00	0.00
B-B5	JUNCTION	0.00	0.00	5900.00	0 00:00	0.00
B-B6	JUNCTION	0.00	0.00	5875.00	0 00:00	0.00
B-C1	JUNCTION	0.00	0.00	5900.00	0 00:00	0.00
B-D1	JUNCTION	0.00	0.00	5925.00	0 00:00	0.00
B-E1	JUNCTION	0.00	0.00	5875.00	0 00:00	0.00
B-E2	JUNCTION	0.00	0.00	5875.00	0 00:00	0.00
B-E3	JUNCTION	0.00	0.00	5875.00	0 00:00	0.00
B-B7	JUNCTION	0.02	0.08	5965.08	0 00:30	0.08
B-E5	JUNCTION	0.00	0.00	5965.00	0 00:00	0.00
B-OS1	JUNCTION	0.00	0.00	5865.00	0 00:00	0.00
B-OS2	JUNCTION	0.00	0.00	6000.00	0 00:00	0.00
B-OS3	JUNCTION	0.00	0.00	6040.00	0 00:00	0.00
B-OS4	JUNCTION	0.00	0.00	5995.00	0 00:00	0.00
B-OS5	JUNCTION	0.00	0.00	6000.00	0 00:00	0.00
J-A2	JUNCTION	0.18	0.58	5818.58	0 00:35	0.58
J-A1	JUNCTION	0.10	0.43	5821.43	0 00:30	0.43
J-A2.2	JUNCTION	0.18	0.58	5815.58	0 00:37	0.57
J-A2.3	JUNCTION	0.06	0.08	5813.08	0 02:23	0.08
J-B1	JUNCTION	0.11	0.53	5855.53	0 00:30	0.52
J-B2	JUNCTION	0.09	0.55	5955.55	0 00:25	0.54
J-B3	JUNCTION	0.09	0.54	5923.54	0 00:27	0.53
J-B4	JUNCTION	0.02	0.13	5890.13	0 00:30	0.13
J-B5	JUNCTION	0.15	0.51	5856.51	0 00:35	0.51
J-B6	JUNCTION	0.15	0.53	5850.53	0 00:30	0.52
J-C1	JUNCTION	0.00	0.00	5866.00	0 00:00	0.00
J-D1	JUNCTION	0.00	0.00	5880.00	0 00:00	0.00
J-D1.2	JUNCTION	0.05	0.07	5873.07	0 00:43	0.07
J-E1	JUNCTION	0.11	0.16	5807.16	0 00:43	0.16
J-OS1	JUNCTION	0.01	0.08	5851.18	0 00:30	0.08
J-OS1.2	JUNCTION	0.01	0.08	5848.78	0 00:32	0.08
J-OS2	JUNCTION	0.00	0.00	5985.00	0 00:00	0.00
J-OS3	JUNCTION	0.00	0.00	6020.00	0 00:00	0.00
J-OS4	JUNCTION	0.00	0.00	5930.00	0 00:00	0.00
J-OS5	JUNCTION	0.01	0.07	5925.07	0 00:35	0.07
J-E2	JUNCTION	0.18	0.24	5835.24	0 01:58	0.24
J-E2.2	JUNCTION	0.18	0.24	5823.24	0 01:59	0.24
J-B4.2	JUNCTION	0.07	0.48	5876.48	0 00:31	0.47
B-D2	JUNCTION	0.00	0.00	5901.00	0 00:00	0.00
J-C1.2	JUNCTION	0.04	0.06	5850.06	0 02:09	0.06
B-OS6	JUNCTION	0.00	0.00	6000.00	0 00:00	0.00
OUTFALL-AB	OUTFALL	0.11	0.16	5795.16	0 00:45	0.16
OUTFALL-C	OUTFALL	0.00	0.00	5844.00	0 00:00	0.00
OUTFALL-E3	OUTFALL	0.00	0.00	5846.00	0 00:00	0.00
OUTFALL-E5	OUTFALL	0.00	0.00	5962.00	0 00:00	0.00
D-A-STORAGE	STORAGE	3.12	3.67	5817.67	0 02:23	3.66
D-B-STORAGE	STORAGE	3.86	4.56	5852.56	0 02:18	4.56
D-C-STORAGE	STORAGE	3.29	3.76	5867.76	0 02:25	3.76
D-D-STORAGE	STORAGE	3.84	4.59	5879.59	0 02:21	4.59

```
******************
Node Inflow Summary
******************
```

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	Time of Max Occurrence hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
B-A1	JUNCTION	10.50	10.50	0	00:30	0.247	0.247	0.000
B-A2	JUNCTION	5.44	5.44	0	00:35	0.18	0.18	0.000
B-B1	JUNCTION	10.33	10.33	0	00:30	0.207	0.207	0.000
B-B2	JUNCTION	4.33	4.33	0	00:30	0.0636	0.0636	0.000
B-B3	JUNCTION	8.36	9.94	0	00:30	0.14	0.165	0.000
B-B4	JUNCTION	6.06	6.06	0	00:30	0.0944	0.0944	0.000
B-B5	JUNCTION	6.69	6.69	0	00:35	0.202	0.202	0.000
B-B6	JUNCTION	2.99	2.99	0	00:35	0.0928	0.0928	0.000
B-C1	JUNCTION	11.67	11.67	0	00:30	0.259	0.259	0.000
B-D1	JUNCTION	5.63	5.63	0	00:35	0.165	0.165	0.000
B-E1	JUNCTION	1.19	1.19	0	00:35	0.0304	0.0304	0.000
B-E2	JUNCTION	2.97	2.97	0	00:35	0.0988	0.0988	0.000
B-E3	JUNCTION	0.04	0.04	0	00:30	0.000505	0.000505	0.000
B-B7	JUNCTION	0.64	0.64	0	00:30	0.0123	0.0123	0.000
B-E5	JUNCTION	0.42	0.42	0	00:30	0.00643	0.00643	0.000
B-OS1	JUNCTION	0.11	0.11	0	00:30	0.00173	0.00173	0.000
B-OS2	JUNCTION	5.55	5.55	0	00:25	0.0652	0.0652	0.000
B-OS3	JUNCTION	1.65	1.65	0	00:25	0.0251	0.0251	0.000
B-OS4	JUNCTION	0.39	0.39	0	00:35	0.00675	0.00675	0.000
B-OS5	JUNCTION	0.16	0.16	0	00:35	0.00401	0.00401	0.000
J-A2	JUNCTION	0.00	5.44	0	00:35	0	0.18	0.000
J-A1	JUNCTION	0.00	10.54	0	00:30	0	0.248	0.000
J-A2.2	JUNCTION	0.00	15.57	0	00:33	0	0.428	0.000
J-A2.3	JUNCTION	0.00	1.44	0	02:23	0	0.159	0.000
J-B1	JUNCTION	0.00	10.33	0	00:30	0	0.207	0.000
J-B2	JUNCTION	0.00	9.68	0	00:25	0	0.129	0.000
J-B3	JUNCTION	0.00	18.93	0	00:30	0	0.294	0.000
J-B4	JUNCTION	0.00	6.06	0	00:30	0	0.0944	0.000
J-B5	JUNCTION	0.00	6.69	0	00:35	0	0.202	0.000
J-B6	JUNCTION	0.00	43.55	0	00:34	0	0.896	0.000
J-C1	JUNCTION	0.00	11.67	0	00:30	0	0.259	0.000
J-D1	JUNCTION	0.00	5.63	0	00:35	0	0.165	0.000
J-D1.2	JUNCTION	0.00	0.64	0	01:55	0	0.0723	-0.000
J-E1	JUNCTION	0.00	5.03	0	00:43	0	0.443	0.000
J-OS1	JUNCTION	0.00	0.11	0	00:30	0	0.00173	0.000
J-OS1.2	JUNCTION	0.00	0.11	0	00:32	0	0.00173	0.000
J-OS2	JUNCTION	0.00	5.55	0	00:25	0	0.0652	0.000
J-OS3	JUNCTION	0.00	1.65	0	00:25	0	0.0251	0.000
J-OS4	JUNCTION	0.00	0.39	0	00:35	0	0.00675	0.000
J-OS5	JUNCTION	0.00	0.55	0	00:35	0	0.0108	0.000
J-E2	JUNCTION	0.00	4.14	0	01:58	0	0.418	0.000
J-E2.2	JUNCTION	0.00	4.14	0	01:59	0	0.417	0.000
J-B4.2	JUNCTION	0.00	24.97	0	00:31	0	0.39	0.000
B-D2	JUNCTION	0.04	0.04	0	00:40	0.00116	0.00116	0.000
J-C1.2	JUNCTION	0.00	1.13	0	02:09	0	0.128	0.000
B-OS6	JUNCTION	0.32	0.32	0	00:45	0.0102	0.0102	0.000
OUTFALL-AB	OUTFALL	0.00	5.74	0	02:03	0	0.597	0.000
OUTFALL-C	OUTFALL	0.00	1.13	0	02:09	0	0.128	0.000
OUTFALL-E3	OUTFALL	0.00	0.04	0	00:30	0	0.000505	0.000
OUTFALL-E5	OUTFALL	0.00	0.42	0	00:30	0	0.00643	0.000
D-A-STORAGE	STORAGE	0.00	15.57	0	00:33	0	0.428	0.001
D-B-STORAGE	STORAGE	0.00	43.55	0	00:34	0	0.896	0.004
D-C-STORAGE	STORAGE	0.00	11.67	0	00:30	0	0.259	-0.003
D-D-STORAGE	STORAGE	0.00	5.63	0	00:35	0	0.165	0.005

****
Node Flooding Summary
****

No nodes were flooded.

****

Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
D-A-STORAGE	37.240	14	0	0	48.904	18	0 02:22	1.44
D-B-STORAGE	79.992	21	0	0	103.613	27	0 02:18	3.17
D-C-STORAGE	26.179	15	0	0	32.205	18	0 02:25	0.42
D-D-STORAGE	14.415	21	0	0	19.005	27	0 02:20	0.58

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OUTFALL-AB	95.69	3.87	5.74	0.597
OUTFALL-C	97.08	0.81	1.13	0.128
OUTFALL-E3	17.22	0.02	0.04	0.001
OUTFALL-E5	38.89	0.10	0.42	0.006
System	62.22	4.80	6.88	0.732

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
L-A2.3	DUMMY	15.57	0 00:33			
L-A1	DUMMY	10.50	0 00:30			
L-A1.2	CONDUIT	10.52	0 00:30	16.68	0.05	0.14
L-A2	DUMMY	5.44	0 00:35			
L-A2.1	CONDUIT	5.42	0 00:37	4.85	0.05	0.14
L-A2.4	CONDUIT	1.44	0 02:25	1.68	0.00	0.03
L-B1	DUMMY	10.33	0 00:30			
L-B1.2	CONDUIT	10.34	0 00:30	12.36	0.07	0.18
L-B2	DUMMY	4.33	0 00:30			
L-B2.2	CONDUIT	9.48	0 00:27	10.97	0.07	0.18
L-B3	DUMMY	9.94	0 00:30			
L-B3.2	CONDUIT	18.97	0 00:31	4.64	0.01	0.08
L-B4	DUMMY	6.06	0 00:30			
L-B4.2	CONDUIT	6.04	0 00:31	2.69	0.00	0.03
L-B5	DUMMY	6.69	0 00:35			
L-B5.2	CONDUIT	6.68	0 00:36	8.37	0.06	0.17
L-B6	DUMMY	2.99	0 00:35			
L-B6.2	CONDUIT	24.33	0 00:34	3.72	0.02	0.12
L-B6.3	DUMMY	43.55	0 00:34			
L-B7	CONDUIT	0.53	0 00:44	2.26	0.00	0.01
L-C1	DUMMY	11.67	0 00:30			
L-C1.2	DUMMY	11.67	0 00:30			
L-D1	DUMMY	5.63	0 00:35			
L-D1.2	DUMMY	5.63	0 00:35			
L-D1.3	CHANNEL	0.64	0 02:09	0.86	0.00	0.00
L-D2	DUMMY	0.04	0 00:40			
L-E1	DUMMY	1.19	0 00:35			
L-E1.2	CONDUIT	4.13	0 02:02	1.88	0.00	0.04
L-E1.3	CONDUIT	5.02	0 00:45	2.12	0.00	0.04
L-E2	DUMMY	2.97	0 00:35			

L-E2.2	CONDUIT	4.14	0	01:59	5.96	0.00	0.05
L-E3	DUMMY	0.04	0	00:30			
L-E5	DUMMY	0.42	0	00:30			
L-OS1	DUMMY	0.11	0	00:30			
L-OS1.2	CONDUIT	0.11	0	00:32	2.33	0.00	0.04
L-OS1.3	CONDUIT	0.10	0	00:39	2.68	0.00	0.04
L-OS2	DUMMY	5.55	0	00:25			
L-OS2.2	DUMMY	5.55	0	00:25			
L-OS3	DUMMY	1.65	0	00:25			
L-OS3.2	DUMMY	1.65	0	00:25			
L-OS4	DUMMY	0.39	0	00:35			
L-OS4.2	DUMMY	0.39	0	00:35			
L-OS5	DUMMY	0.16	0	00:35			
L-OS5.2	CONDUIT	0.50	0	00:43	1.88	0.00	0.01
L-OS6	DUMMY	0.32	0	00:45			
L-C1.3	DUMMY	1.13	0	02:09			
D-C-RELEASE	DUMMY	0.42	0	02:25			
D-A-RELEASE	DUMMY	1.44	0	02:23			
D-B-RELEASE	DUMMY	3.17	0	02:18			
D-D-RELEASE	DUMMY	0.58	0	02:21			

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Tue Sep 27 16:21:41 2022
Analysis ended on: Tue Sep 27 16:21:41 2022
Total elapsed time: < 1 sec

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

Kings Point South
Master Drainage Report
Proposed Condition Modeling

WARNING 08: elevation drop exceeds length for Conduit L-OS6

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/01/2005 06:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Routing Time Step ........ 30.00 sec


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........        48.186        15.702
External Outflow .........        42.154        13.737
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         6.037         1.967
Continuity Error (%) .....        -0.011


*******************************
Highest Flow Instability Indexes
*******************************
Link L-OS1.2 (1)
Link L-B7 (1)
Link L-A1.2 (1)


************************
Routing Time Step Summary
************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.12
Percent Not Converging      :     0.00
```

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
B-A1	JUNCTION	0.00	0.00	5880.00	0 00:00	0.00
B-A2	JUNCTION	0.00	0.00	5850.00	0 00:00	0.00
B-B1	JUNCTION	0.00	0.00	5900.00	0 00:00	0.00
B-B2	JUNCTION	0.00	0.00	5960.00	0 00:00	0.00
B-B3	JUNCTION	0.00	0.00	5975.00	0 00:00	0.00
B-B4	JUNCTION	0.00	0.00	5925.00	0 00:00	0.00
B-B5	JUNCTION	0.00	0.00	5900.00	0 00:00	0.00
B-B6	JUNCTION	0.00	0.00	5875.00	0 00:00	0.00
B-C1	JUNCTION	0.00	0.00	5900.00	0 00:00	0.00
B-D1	JUNCTION	0.00	0.00	5925.00	0 00:00	0.00
B-E1	JUNCTION	0.00	0.00	5875.00	0 00:00	0.00
B-E2	JUNCTION	0.00	0.00	5875.00	0 00:00	0.00
B-E3	JUNCTION	0.00	0.00	5875.00	0 00:00	0.00
B-B7	JUNCTION	0.04	0.26	5965.26	0 00:35	0.25
B-E5	JUNCTION	0.00	0.00	5965.00	0 00:00	0.00
B-OS1	JUNCTION	0.00	0.00	5865.00	0 00:00	0.00
B-OS2	JUNCTION	0.00	0.00	6000.00	0 00:00	0.00
B-OS3	JUNCTION	0.00	0.00	6040.00	0 00:00	0.00
B-OS4	JUNCTION	0.00	0.00	5995.00	0 00:00	0.00
B-OS5	JUNCTION	0.00	0.00	6000.00	0 00:00	0.00
J-A2	JUNCTION	0.40	1.49	5819.49	0 00:40	1.49
J-A1	JUNCTION	0.22	1.07	5822.07	0 00:36	1.07
J-A2.2	JUNCTION	0.40	1.49	5816.49	0 00:42	1.49
J-A2.3	JUNCTION	0.23	0.60	5813.60	0 01:22	0.60
J-B1	JUNCTION	0.21	1.13	5856.13	0 00:35	1.12
J-B2	JUNCTION	0.16	1.14	5956.14	0 00:30	1.11
J-B3	JUNCTION	0.16	1.14	5924.14	0 00:31	1.10
J-B4	JUNCTION	0.04	0.31	5890.31	0 00:35	0.31
J-B5	JUNCTION	0.31	1.23	5857.23	0 00:40	1.22
J-B6	JUNCTION	0.31	1.23	5851.23	0 00:41	1.22
J-C1	JUNCTION	0.00	0.00	5866.00	0 00:00	0.00
J-D1	JUNCTION	0.00	0.00	5880.00	0 00:00	0.00
J-D1.2	JUNCTION	0.32	1.37	5874.37	0 00:46	1.37
J-E1	JUNCTION	0.37	1.11	5808.11	0 00:53	1.10
J-OS1	JUNCTION	0.09	0.55	5851.65	0 00:40	0.55
J-OS1.2	JUNCTION	0.09	0.55	5849.25	0 00:36	0.55
J-OS2	JUNCTION	0.00	0.00	5985.00	0 00:00	0.00
J-OS3	JUNCTION	0.00	0.00	6020.00	0 00:00	0.00
J-OS4	JUNCTION	0.00	0.00	5930.00	0 00:00	0.00
J-OS5	JUNCTION	0.29	1.37	5926.37	0 00:45	1.37
J-E2	JUNCTION	0.46	1.19	5836.19	0 00:54	1.19
J-E2.2	JUNCTION	0.46	1.19	5824.19	0 00:54	1.19
J-B4.2	JUNCTION	0.16	1.13	5877.13	0 00:36	1.13
B-D2	JUNCTION	0.00	0.00	5901.00	0 00:00	0.00
J-C1.2	JUNCTION	0.24	0.85	5850.85	0 00:53	0.85
B-OS6	JUNCTION	0.00	0.00	6000.00	0 00:00	0.00
OUTFALL-AB	OUTFALL	0.36	1.11	5796.11	0 00:54	1.10
OUTFALL-C	OUTFALL	0.00	0.00	5844.00	0 00:00	0.00
OUTFALL-E3	OUTFALL	0.00	0.00	5846.00	0 00:00	0.00
OUTFALL-E5	OUTFALL	0.00	0.00	5962.00	0 00:00	0.00
D-A-STORAGE	STORAGE	4.88	7.39	5821.39	0 01:22	7.39
D-B-STORAGE	STORAGE	5.62	8.26	5856.26	0 01:11	8.26
D-C-STORAGE	STORAGE	5.26	7.35	5871.35	0 01:14	7.35
D-D-STORAGE	STORAGE	5.92	8.01	5883.01	0 01:21	8.01

```
******************
Node Inflow Summary
******************
```

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
B-A1	JUNCTION	58.64	58.64	0	00:35	1.26	1.26	0.000
B-A2	JUNCTION	35.58	35.58	0	00:40	1.04	1.04	0.000
B-B1	JUNCTION	46.14	46.14	0	00:35	0.874	0.874	0.000
B-B2	JUNCTION	22.27	22.27	0	00:30	0.299	0.299	0.000
B-B3	JUNCTION	43.37	47.87	0	00:35	0.663	0.737	0.000
B-B4	JUNCTION	26.48	26.48	0	00:35	0.393	0.393	0.000
B-B5	JUNCTION	37.03	37.03	0	00:40	1.03	1.03	0.000
B-B6	JUNCTION	26.80	26.80	0	00:45	0.807	0.807	0.000
B-C1	JUNCTION	69.52	69.52	0	00:35	1.43	1.43	0.000
B-D1	JUNCTION	31.46	31.46	0	00:40	0.824	0.824	0.000
B-E1	JUNCTION	21.09	21.09	0	00:40	0.573	0.573	0.000
B-E2	JUNCTION	24.67	24.67	0	00:45	0.744	0.744	0.000
B-E3	JUNCTION	4.35	4.35	0	00:35	0.0637	0.0637	0.000
B-B7	JUNCTION	4.48	4.48	0	00:35	0.0795	0.0795	0.000
B-E5	JUNCTION	3.07	3.07	0	00:35	0.0434	0.0434	0.000
B-OS1	JUNCTION	5.33	5.33	0	00:40	0.102	0.102	0.000
B-OS2	JUNCTION	18.88	18.88	0	00:30	0.219	0.219	0.000
B-OS3	JUNCTION	4.69	4.69	0	00:30	0.0734	0.0734	0.000
B-OS4	JUNCTION	75.84	75.84	0	00:40	1.6	1.6	0.000
B-OS5	JUNCTION	33.83	33.83	0	00:45	0.951	0.951	0.000
J-A2	JUNCTION	0.00	35.58	0	00:40	0	1.04	0.000
J-A1	JUNCTION	0.00	63.59	0	00:36	0	1.36	0.000
J-A2.2	JUNCTION	0.00	98.24	0	00:40	0	2.4	0.000
J-A2.3	JUNCTION	0.00	41.87	0	01:22	0	1.93	0.000
J-B1	JUNCTION	0.00	46.14	0	00:35	0	0.874	0.000
J-B2	JUNCTION	0.00	41.15	0	00:30	0	0.518	-0.000
J-B3	JUNCTION	0.00	86.08	0	00:34	0	1.25	0.000
J-B4	JUNCTION	0.00	26.48	0	00:35	0	0.393	0.000
J-B5	JUNCTION	0.00	37.03	0	00:40	0	1.03	0.000
J-B6	JUNCTION	0.00	217.88	0	00:37	0	4.36	0.000
J-C1	JUNCTION	0.00	69.52	0	00:35	0	1.43	0.000
J-D1	JUNCTION	0.00	31.46	0	00:40	0	0.824	0.000
J-D1.2	JUNCTION	0.00	119.32	0	00:52	0	3.36	0.000
J-E1	JUNCTION	0.00	137.63	0	00:53	0	4.87	0.000
J-OS1	JUNCTION	0.00	5.33	0	00:40	0	0.102	0.000
J-OS1.2	JUNCTION	0.00	5.33	0	00:36	0	0.102	0.000
J-OS2	JUNCTION	0.00	18.88	0	00:30	0	0.219	0.000
J-OS3	JUNCTION	0.00	4.69	0	00:30	0	0.0734	0.000
J-OS4	JUNCTION	0.00	75.84	0	00:40	0	1.6	0.000
J-OS5	JUNCTION	0.00	108.06	0	00:45	0	2.55	0.000
J-E2	JUNCTION	0.00	118.37	0	00:54	0	4.31	0.000
J-E2.2	JUNCTION	0.00	118.37	0	00:54	0	4.3	0.000
J-B4.2	JUNCTION	0.00	112.57	0	00:36	0	1.65	0.000
B-D2	JUNCTION	5.60	5.60	0	00:45	0.184	0.184	0.000
J-C1.2	JUNCTION	0.00	218.92	0	00:53	0	6.84	0.000
B-OS6	JUNCTION	71.17	71.17	0	00:55	2.45	2.45	0.000
OUTFALL-AB	OUTFALL	0.00	176.31	0	00:57	0	6.78	0.000
OUTFALL-C	OUTFALL	0.00	218.92	0	00:53	0	6.84	0.000
OUTFALL-E3	OUTFALL	0.00	4.35	0	00:35	0	0.0637	0.000
OUTFALL-E5	OUTFALL	0.00	3.07	0	00:35	0	0.0434	0.000
D-A-STORAGE	STORAGE	0.00	98.24	0	00:40	0	2.4	0.051
D-B-STORAGE	STORAGE	0.00	217.88	0	00:37	0	4.36	0.076
D-C-STORAGE	STORAGE	0.00	69.52	0	00:35	0	1.43	0.070
D-D-STORAGE	STORAGE	0.00	31.46	0	00:40	0	0.824	0.070

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
D-A-STORAGE	86.605	32	0	0	165.264	61	0 01:21	41.87
D-B-STORAGE	155.374	41	0	0	279.014	74	0 01:10	94.21
D-C-STORAGE	61.711	34	0	0	105.253	58	0 01:14	29.62
D-D-STORAGE	33.000	47	0	0	55.138	79	0 01:20	15.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
OUTFALL-AB	96.81	43.38	176.31	6.784
OUTFALL-C	98.33	43.08	218.92	6.844
OUTFALL-E3	35.14	1.12	4.35	0.064
OUTFALL-E5	41.11	0.65	3.07	0.043
System	67.85	88.24	397.95	13.736

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
L-A2.3	DUMMY	98.24	0 00:40			
L-A1	DUMMY	58.64	0 00:35			
L-A1.2	CONDUIT	63.59	0 00:37	27.97	0.27	0.36
L-A2	DUMMY	35.58	0 00:40			
L-A2.1	CONDUIT	35.54	0 00:42	8.32	0.30	0.37
L-A2.4	CONDUIT	41.86	0 01:22	5.65	0.05	0.20
L-B1	DUMMY	46.14	0 00:35			
L-B1.2	CONDUIT	46.02	0 00:35	18.95	0.30	0.38
L-B2	DUMMY	22.27	0 00:30			
L-B2.2	CONDUIT	40.59	0 00:31	16.60	0.30	0.38
L-B3	DUMMY	47.87	0 00:35			
L-B3.2	CONDUIT	86.17	0 00:36	7.95	0.06	0.20
L-B4	DUMMY	26.48	0 00:35			
L-B4.2	CONDUIT	26.43	0 00:35	4.72	0.01	0.08
L-B5	DUMMY	37.03	0 00:40			
L-B5.2	CONDUIT	37.00	0 00:41	13.61	0.35	0.41
L-B6	DUMMY	26.80	0 00:45			
L-B6.2	CONDUIT	112.06	0 00:37	6.15	0.09	0.28
L-B6.3	DUMMY	217.88	0 00:37			
L-B7	CONDUIT	4.19	0 00:43	4.34	0.00	0.05
L-C1	DUMMY	69.52	0 00:35			
L-C1.2	DUMMY	69.52	0 00:35			
L-D1	DUMMY	31.46	0 00:40			
L-D1.2	DUMMY	31.46	0 00:40			
L-D1.3	CHANNEL	119.15	0 00:53	5.49	0.01	0.07
L-D2	DUMMY	5.60	0 00:45			
L-E1	DUMMY	21.09	0 00:40			
L-E1.2	CONDUIT	118.35	0 00:55	6.12	0.08	0.26
L-E1.3	CONDUIT	137.59	0 00:54	6.76	0.08	0.28

L-E2	DUMMY	24.67	0	00:45			
L-E2.2	CONDUIT	118.37	0	00:54	16.52	0.12	0.24
L-E3	DUMMY	4.35	0	00:35			
L-E5	DUMMY	3.07	0	00:35			
L-OS1	DUMMY	5.33	0	00:40			
L-OS1.2	CONDUIT	5.33	0	00:36	7.55	0.17	0.28
L-OS1.3	CONDUIT	5.33	0	00:41	8.58	0.14	0.25
L-OS2	DUMMY	18.88	0	00:30			
L-OS2.2	DUMMY	18.88	0	00:30			
L-OS3	DUMMY	4.69	0	00:30			
L-OS3.2	DUMMY	4.69	0	00:30			
L-OS4	DUMMY	75.84	0	00:40			
L-OS4.2	DUMMY	75.84	0	00:40			
L-OS5	DUMMY	33.83	0	00:45			
L-OS5.2	CONDUIT	108.12	0	00:46	10.67	0.06	0.27
L-OS6	DUMMY	71.17	0	00:55			
L-C1.3	DUMMY	218.92	0	00:53			
D-C-RELEASE	DUMMY	29.62	0	01:14			
D-A-RELEASE	DUMMY	41.87	0	01:22			
D-B-RELEASE	DUMMY	94.21	0	01:11			
D-D-RELEASE	DUMMY	15.00	0	01:21			

****
Conduit Surcharge Summary
****

No conduits were surcharged.

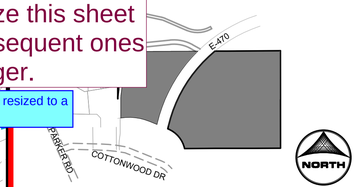
Analysis begun on: Tue Sep 27 16:21:11 2022
Analysis ended on: Tue Sep 27 16:21:11 2022
Total elapsed time: < 1 sec

1

223021

Max sheet size allowed in reports is 11x17 please resize this sheet and all subsequent ones that are larger.

All sheets have been resized to a maximum of 11x17.



KEYMAP: 1" = 2000'

NOTES:

1. CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH 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 SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
2. ENSURE THAT THE PROVISIONS OF CRS 37-92-602, AS AMENDED BY SENATE BILL 15-212, REGARDING NOTIFICATION OF DOWNSTREAM WATER RIGHTS HOLDERS ARE UPHELD.
3. FLOOD INSURANCE RATE MAP (FIRMS) COVERING KINGS POINT SOUTH INCLUDE:
   FIRM 08005C0484L, FEBRUARY 17, 2017
   FIRM 08005C0500K, DECEMBER 17, 2010
4. ALL STORM INFRASTRUCTURE SHOWN IS PUBLIC AND SIZED FOR THE 100-YEAR EVENT UNLESS OTHERWISE NOTED.
5. STORM INFRASTRUCTURE SHOWN MAY NOT BE IN ITS FINAL LOCATION. ADDITIONAL STORM SEWER MAY BE REQUIRED WITH PRELIMINARY AND FINAL DRAINAGE REPORTS.
6. DETENTION PONDS SHALL BE PRIVATE AND MAINTAINED BY THE HOA OR METRO DISTRICT. PONDS SHOWN ARE CONCEPTUAL IN NATURE ONLY, ACTUAL SIZE, SHAPE AND LOCATION MAY VARY.
7. CULVERTS SHALL BE PROVIDED WITH AN EMERGENCY OVERFLOW PATH THAT DOES NOT ENCROACH INTO ANY RESIDENTIAL LOTS.
8. AT ALL CULVERTS, THE ADJACENT FINISHED FLOOR ELEVATIONS SHALL BE AT LEAST 1' ABOVE THE EMERGENCY WATER SURFACE ELEVATION OVER THE ROADWAY.

LEGEND:

- EXISTING MAJOR CONTOUR (25')
- EXISTING MINOR CONTOUR (5')
- PLANNING AREA BOUNDARY
- PROPERTY BOUNDARY
- STORM LINE
- PROPOSED BASIN LINE
- OFFSITE BASIN LINE (BY OTHERS)
- LIMITS OF MASTER PLAN ANALYSIS
- OVERLAND FLOW ARROW
- EMERGENCY OVERFLOW ARROW
- PROPOSED BASIN LABEL
- C-6 BASIN DESIGNATION
- AREA (AC.) 1.00 2.0 PERCENT IMPERVIOUSNESS
- PROPOSED DETENTION LOCATION D
- SWMM CONVEYANCE ELEMENT L-D1
- SWMM JUNCTION ELEMENT A-1

APPROVED ONE YEAR FROM THIS DATE
01.25.2023

CITY ENGINEER — 01/23/2023 DATE

WATER DEPARTMENT — 01/23/2023 DATE

BENCHMARK

NORTHWEST CORNER SECTION 3, T6S, R66W, 6TH PM

FOUND 3" DIA BRASS CAP SET IN 5" X 5" GRANITE STONE, .3" ABOVE SURFACE "PLS 13155 1993"

ELEVATION = 5874.00' (NAVD88), MONUMENT INDEX NO = 13Z6S66

SITE OUTFALL FLOW COMPARISON		
LOCATION / BASIN	HISTORIC Q_{100} (CFS)	DEVELOPED Q_{100} (CFS)
Outfall AB	232	176
Outfall C1	245	219
Outfall E3	4	4
Outfall E5	2	5
E-470 Crossing	155	118

FACSIMILE
This electronic plan is a facsimile of the Signed and sealed pdf set.
Kristine L. House — 11-28-22 Date

DRAWN BY:	KLH	JOB DATE:	11/9/2022
APPROVED:	AZ	JOB NUMBER:	212000.02
CAD DATE:	11/22/2022		
CAD FILE:	J:\2021\212000.01\CAD\Dwgs\C\MDR\KPS_MasterDrainagePlan		

BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 — 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

HRGreen

HR GREEN - DENVER
5619 DTC PARKWAY SUITE 1150
DENVER CO 80111
PHONE: 720.602.4999 | TOLL FREE: 800.728.7805
FAX: 844.273.1057 | HRGreen.com

KINGS POINT SOUTH SUBDIVISION - FILING NO. 1
LENNAR CORPORATION
CITY OF AURORA, COLORADO

KINGS POINT SOUTH MASTER DRAINAGE REPORT
MASTER DRAINAGE PLAN

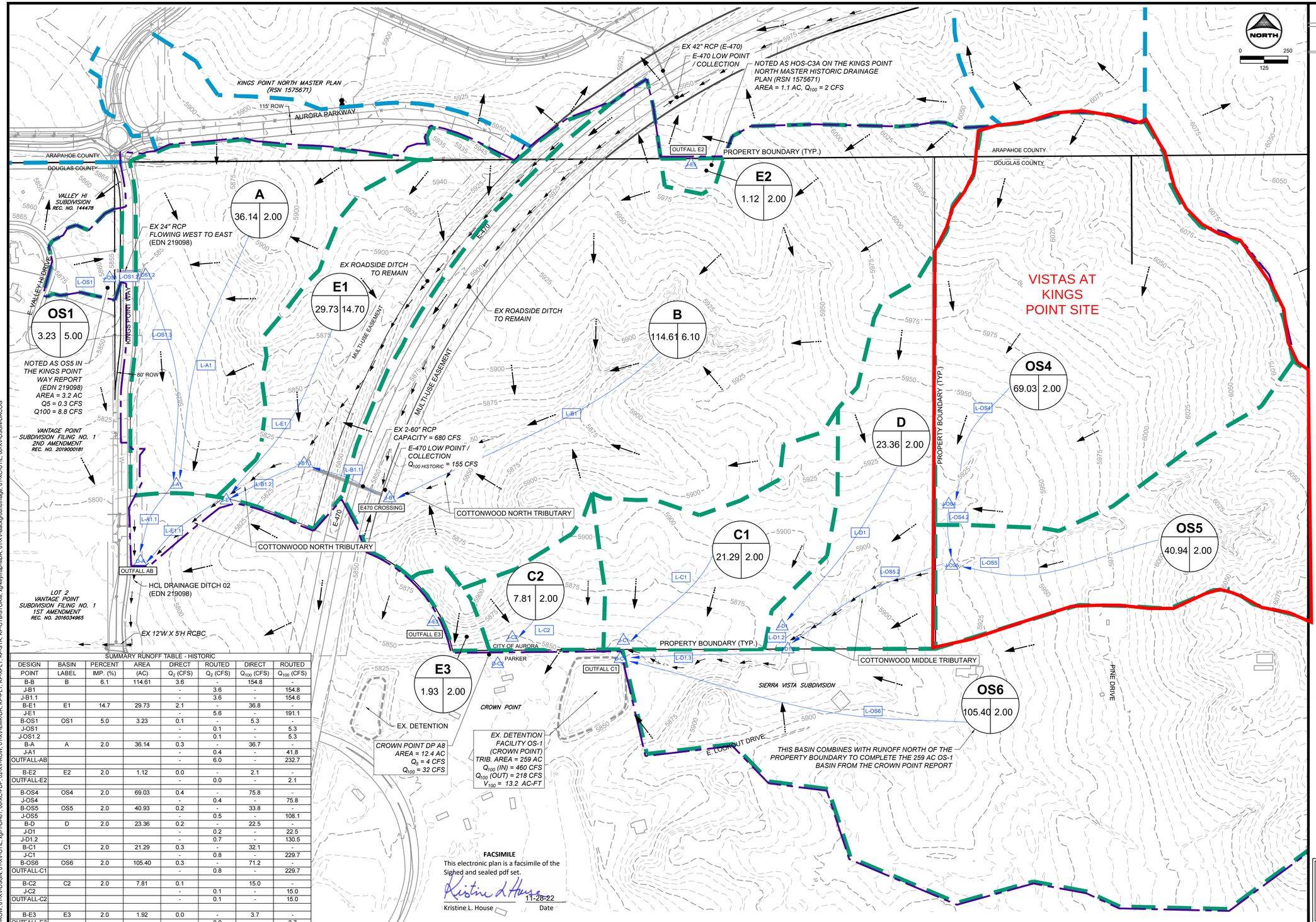
SHEET DR1 — 1

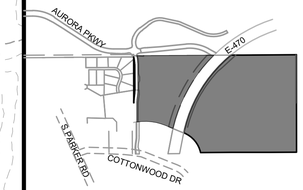
HR GREEN Xrefs: 01-XV-ROW; 01-XV-DSGN; 01-XV-UTIL; xgl-1-DH01; 00-XC-FDP; 02-XV-ROW; 01-XV-EMK-DR; KP-PLT; KP-XP-LT; KP-STR; KP-UTB-STORM; 00-XC-BASINS; xg-keymap-MDR; 01-XC-UTIL; 00-XV-DSGN-DRCOG

APPROVED ON 01.25.2023

2

223021





KEYMAP: 1" = 2000'

NOTES:

1. CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH 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 SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
2. ENSURE THAT THE PROVISIONS OF CRS 37-92-602, AS AMENDED BY SENATE BILL 15-212, REGARDING NOTIFICATION OF DOWNSTREAM WATER RIGHTS HOLDERS ARE UPHELD.
3. FLOOD INSURANCE RATE MAP (FIRMS) COVERING KINGS POINT SOUTH INCLUDE:
   FIRM 08005C0484L, FEBRUARY 17, 2017
   FIRM 08005C0500K, DECEMBER 17, 2010
4. ALL STORM INFRASTRUCTURE SHOWN IS PUBLIC AND SIZED FOR THE 100-YEAR EVENT UNLESS OTHERWISE NOTED.
5. STORM INFRASTRUCTURE SHOWN MAY NOT BE IN ITS FINAL LOCATION. ADDITIONAL STORM SEWER MAY BE REQUIRED WITH PRELIMINARY AND FINAL DRAINAGE REPORTS.
6. DETENTION PONDS SHALL BE PRIVATE AND MAINTAINED BY THE HOA OR METRO DISTRICT. PONDS SHOWN ARE CONCEPTUAL IN NATURE ONLY, ACTUAL SIZE, SHAPE AND LOCATION MAY VARY.
7. CULVERTS SHALL BE PROVIDED WITH AN EMERGENCY OVERFLOW PATH THAT DOES NOT ENCROACH INTO ANY RESIDENTIAL LOTS.
8. AT ALL CULVERTS, THE ADJACENT FINISHED FLOOR ELEVATIONS SHALL BE AT LEAST 1' ABOVE THE EMERGENCY WATER SURFACE ELEVATION OVER THE ROADWAY.

LEGEND:

- EXISTING MAJOR CONTOUR (25') — 5050
- EXISTING MINOR CONTOUR (5') — 5045
- PLANNING AREA BOUNDARY
- PROPERTY BOUNDARY
- STORM LINE
- PROPOSED BASIN LINE
- OFFSITE BASIN LINE (BY OTHERS)
- LIMITS OF MASTER PLAN ANALYSIS
- OVERLAND FLOW ARROW
- EMERGENCY OVERFLOW ARROW
- PROPOSED BASIN LABEL
  - C-6 — BASIN DESIGNATION
  - AREA (AC.) 1.00 2.0 — PERCENT IMPERVIOUSNESS
- PROPOSED DETENTION LOCATION — D
- SWMM CONVEYANCE ELEMENT — L-D1
- SWMM JUNCTION ELEMENT — A-A1

SUMMARY RUNOFF TABLE - HISTORIC

DESIGN POINT	BASIN LABEL	PERCENT IMP. (%)	AREA (AC)	DIRECT Q_2 (CFS)	ROUTED Q_2 (CFS)	DIRECT Q_{100} (CFS)	ROUTED Q_{100} (CFS)
B-B	B	6.1	114.61	3.6	-	154.8	-
J-B1				-	3.6	-	154.8
J-B1.1				-	3.6	-	154.6
B-E1	E1	14.7	29.73	2.1	-	36.8	-
J-E1				-	5.6	-	191.1
B-OS1	OS1	5.0	3.23	0.1	-	5.3	-
J-OS1				-	0.1	-	5.3
J-OS1.2				-	0.1	-	5.3
B-A	A	2.0	36.14	0.3	-	36.7	-
J-A1				-	0.4	-	41.8
OUTFALL-AB				-	6.0	-	232.7
B-E2	E2	2.0	1.12	0.0	-	2.1	-
OUTFALL-E2				-	0.0	-	2.1
B-OS4	OS4	2.0	69.03	0.4	-	75.8	-
J-OS4				-	0.4	-	75.8
B-OS5	OS5	2.0	40.93	0.2	-	33.8	-
J-OS5				-	0.5	-	108.1
B-D	D	2.0	23.36	0.2	-	22.5	-
J-D1				-	0.2	-	22.5
J-D1.2				-	0.7	-	130.5
B-C1	C1	2.0	21.29	0.3	-	32.1	-
J-C1				-	0.8	-	229.7
B-OS6	OS6	2.0	105.40	0.3	-	71.2	-
OUTFALL-C1				-	0.8	-	229.7
B-C2	C2	2.0	7.81	0.1		15.0	-
J-C2				-	0.1	-	15.0
OUTFALL-C2				-	0.1	-	15.0
B-E3	E3	2.0	1.92	0.0	-	3.7	-
OUTFALL-E3				-	0.0	-	3.7

FACSIMILE
This electronic plan is a facsimile of the Signed and sealed pdf set.
Kristine L House 11-28-22
Kristine L. House Date

BENCHMARK
NORTHWEST CORNER SECTION 3, T6S, R66W, 6TH PM

FOUND 3" DIA BRASS CAP SET IN 5" X 5" GRANITE STONE, .3" ABOVE SURFACE "PLS 13155 1993"

ELEVATION = 5874.00' (NAVD88), MONUMENT INDEX NO = 13Z6S66

DRAWN BY: KLH | JOB DATE: 11/9/2022 | APPROVED: AZ | JOB NUMBER: 212000.02 | CAD DATE: 11/22/2022 | CAD FILE: J:\2021\212000.01\CAD\Dwgs\C\MDR\KPS_HistoricDrainagePlan

BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

HR GREEN - DENVER
5619 DTC PARKWAY SUITE 1150
DENVER CO 80111
PHONE: 720.602.4999 | TOLL FREE: 800.728.7805
FAX: 844.273.1057 | HRGreen.com

KINGS POINT SOUTH SUBDIVISION - FILING NO. 1
LENNAR CORPORATION
CITY OF AURORA, COLORADO

KINGS POINT SOUTH MASTER DRAINAGE REPORT
HISTORIC DRAINAGE PLAN

SHEET DR2 | 2

APPROVED ON 01.25.2023

HR GREEN Xrefs: 01-XV-ROW; 01-XV-DSGN; 01-XV-UTIL; xg/I-DH01; 00-XC-FDP; 02-XV-ROW; 01-XV-EMK-DR; KP-PLT; KP-XP-LT; KP-STR; KP-UTB-STORM; xg-keymap-MDR; 01-XV-Background/image; 01-XC-UTIL; 00-XV-DSGN-DRCOS

3

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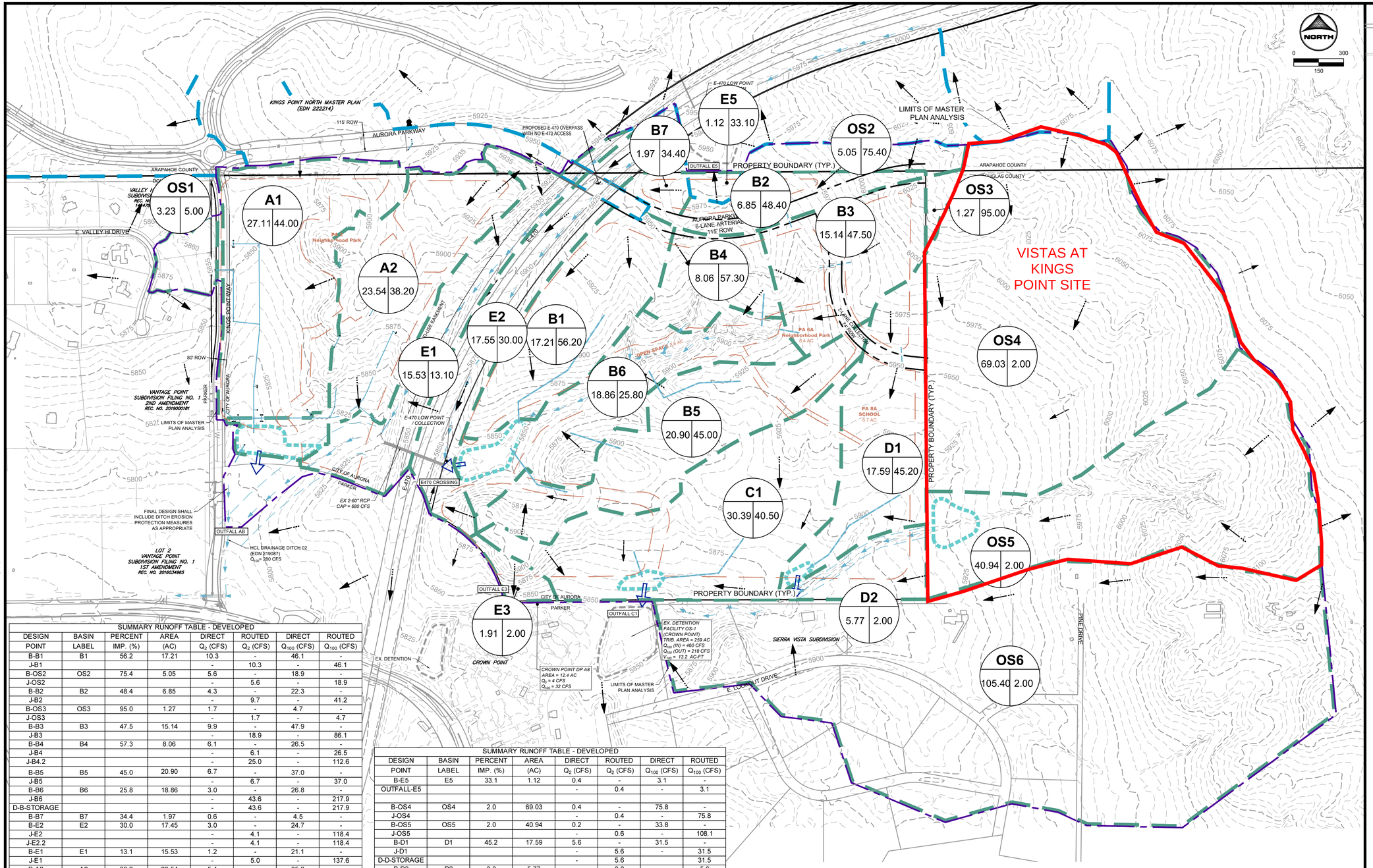

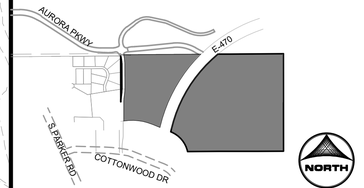

KEYMAP: 1" = 2000'

NOTES:

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- PROPOSED BASIN LABEL (C-6 = BASIN DESIGNATION; AREA (AC.) 1.00 | 2.0 = PERCENT IMPERVIOUSNESS)
- PROPOSED DETENTION LOCATION (D)
- SWMM CONVEYANCE ELEMENT (L-D1)
- SWMM JUNCTION ELEMENT (J-A1)

SUMMARY RUNOFF TABLE - DEVELOPED

DESIGN POINT	BASIN LABEL	PERCENT IMP. (%)	AREA (AC)	DIRECT Q_2 (CFS)	ROUTED Q_2 (CFS)	DIRECT Q_{100} (CFS)	ROUTED Q_{100} (CFS)
B-B1	B1	56.2	17.21	10.3	-	46.1	-
J-B1				-	10.3	-	46.1
B-OS2	OS2	75.4	5.05	5.6	-	18.9	-
J-OS2				-	5.6	-	18.9
B-B2	B2	48.4	6.85	4.3	-	22.3	-
J-B2				-	9.7	-	41.2
B-OS3	OS3	95.0	1.27	1.7	-	4.7	-
J-OS3				-	1.7	-	4.7
B-B3	B3	47.5	15.14	9.9	-	47.9	-
J-B3				-	18.9	-	86.1
B-B4	B4	57.3	8.06	6.1	-	26.5	-
J-B4				-	6.1	-	26.5
J-B4.2				-	25.0	-	112.6
B-B5	B5	45.0	20.90	6.7	-	37.0	-
J-B5				-	6.7	-	37.0
B-B6	B6	25.8	18.86	3.0	-	26.8	-
J-B6				-	43.6	-	217.9
D-B-STORAGE				-	43.6	-	217.9
B-B7	B7	34.4	1.97	0.6	-	4.5	-
B-E2	E2	30.0	17.45	3.0	-	24.7	-
J-E2				-	4.1	-	118.4
J-E2.2				-	4.1	-	118.4
B-E1	E1	13.1	15.53	1.2	-	21.1	-
J-E1				-	5.0	-	137.6
B-A2	A2	38.2	23.54	5.4	-	35.6	-
J-A2				-	5.4	-	35.6
B-OS1	OS1	5.0	3.23	0.1	-	5.3	-
J-OS1				-	0.1	-	5.3
J-OS1.2				-	0.1	-	5.3
B-A1	A1	44.0	27.11	10.5	-	58.6	-
J-A1				-	10.5	-	63.6
J-A2.2				-	15.6	-	98.2
D-A-STORAGE				-	15.6	-	98.2
J-A2.3				-	1.4	-	41.9
OUTFALL-AB				-	5.7	-	176.3

SUMMARY RUNOFF TABLE - DEVELOPED

DESIGN POINT	BASIN LABEL	PERCENT IMP. (%)	AREA (AC)	DIRECT Q_2 (CFS)	ROUTED Q_2 (CFS)	DIRECT Q_{100} (CFS)	ROUTED Q_{100} (CFS)
B-E5	E5	33.1	1.12	0.4		3.1	
OUTFALL-E5				-	0.4	-	3.1
B-OS4	OS4	2.0	69.03	0.4	-	75.8	-
J-OS4				-	0.4	-	75.8
B-OS5	OS5	2.0	40.94	0.2	-	33.8	-
J-OS5				-	0.6	-	108.1
B-D1	D1	45.2	17.59	5.6	-	31.5	-
J-D1				-	5.6	-	31.5
D-D-STORAGE				-	5.6		31.5
B-D2	D2	2.0	5.77	-	0.0		5.6
J-D1.2				-	0.6		119.3
B-C1	C1	40.5	30.39	11.7	-	69.5	-
J-C1				-	11.7	-	69.5
D-C-STORAGE				-	11.7	-	69.5
B-OS6	OS6	2.0	105.40	-	0.3	-	71.2
J-C1.2				-	1.1	-	218.9
OUTFALL-C				-	1.1	-	218.9
B-E3	E3	2.0	1.91	0.0	-	4.4	-
OUTFALL-E3				-	0.0	-	4.4

SITE OUTFALL FLOW COMPARISON

LOCATION / BASIN	HISTORIC Q_{100} (CFS)	DEVELOPED Q_{100} (CFS)
Outfall AB	232	176
Outfall C1	245	219
Outfall E3	4	4
Outfall E5	2	5
E-470 Crossing	155	118

FACSIMILE
This electronic plan is a facsimile of the Signed and sealed pdf set.

Kristine L. House — 11-28-22 Date

BENCHMARK
NORTHWEST CORNER SECTION 3, T6S, R66W, 6TH PM

FOUND 3" DIA BRASS CAP SET IN 5" X 5" GRANITE STONE, .3" ABOVE SURFACE "PLS 13155 1993"

ELEVATION = 5874.00' (NAVD88), MONUMENT INDEX NO = 13Z6S66

DRAWN BY: XXX | JOB DATE: 11/28/2022
APPROVED: XXX | JOB NUMBER: 212000.02
CAD DATE: 12/12/2019
CAD FILE: J:\2021\212000.01\CAD\Dwgs\C\MDR\KPS_MasterDrainagePlan

BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

HR GREEN - DENVER
5619 DTC PARKWAY SUITE 1150
DENVER CO 80111
PHONE: 720.602.4999 | TOLL FREE: 800.728.7805
FAX: 844.273.1057 | HRGreen.com

KINGS POINT SOUTH SUBDIVISION - FILING NO. 1
LENNAR CORPORATION
CITY OF AURORA, COLORADO

KINGS POINT SOUTH MASTER DRAINAGE REPORT
MASTER DRAINAGE PLAN - OFFSITE BASINS

SHEET DR3 | 3

APPROVED ON 01.25.2023

HR GREEN Xrefs: 01-XV-ROW; 01-XV-DSGN; 01-XV-UTIL; xgf-1-DH01; 00-XC-FDP; 02-XV-ROW; 01-XV-EMK-DR; KP-PLT; KP-XPLT; KP-STR; KP-UTB-STORM; 00-XC-BASINS; xg-keymap-MDR; 01-XC-UTIL; 00-XV-DSGN-DRCOG

222214MD1
1900-ARAP-S
28M

EXCERPTS FROM

MASTER DRAINAGE REPORT

FOR

KINGS POINT NORTH
AURORA, COLORADO
CASE NO. 1575671

Prepared for:

Clayton Properties Group II, Inc.
4908 Tower Road
Denver, CO 80249
Contact: Randy Bauer
Phone: 303-486-8500

Prepared by:

CORE Consultants, Inc.
3473 South Broadway
Englewood, CO 80113
Contact: Manuel H. Nuno, PE
Phone: 303-730-5985
CORE Project Number: 19-032

FACSIMILE
THIS ELECTRONIC PLAN IS A FACSIMILE OF THE SIGNED AND SEALED PDF SET.
08/05/22
MANNY NUNO, PE, CFM DATE

August 5, 2022

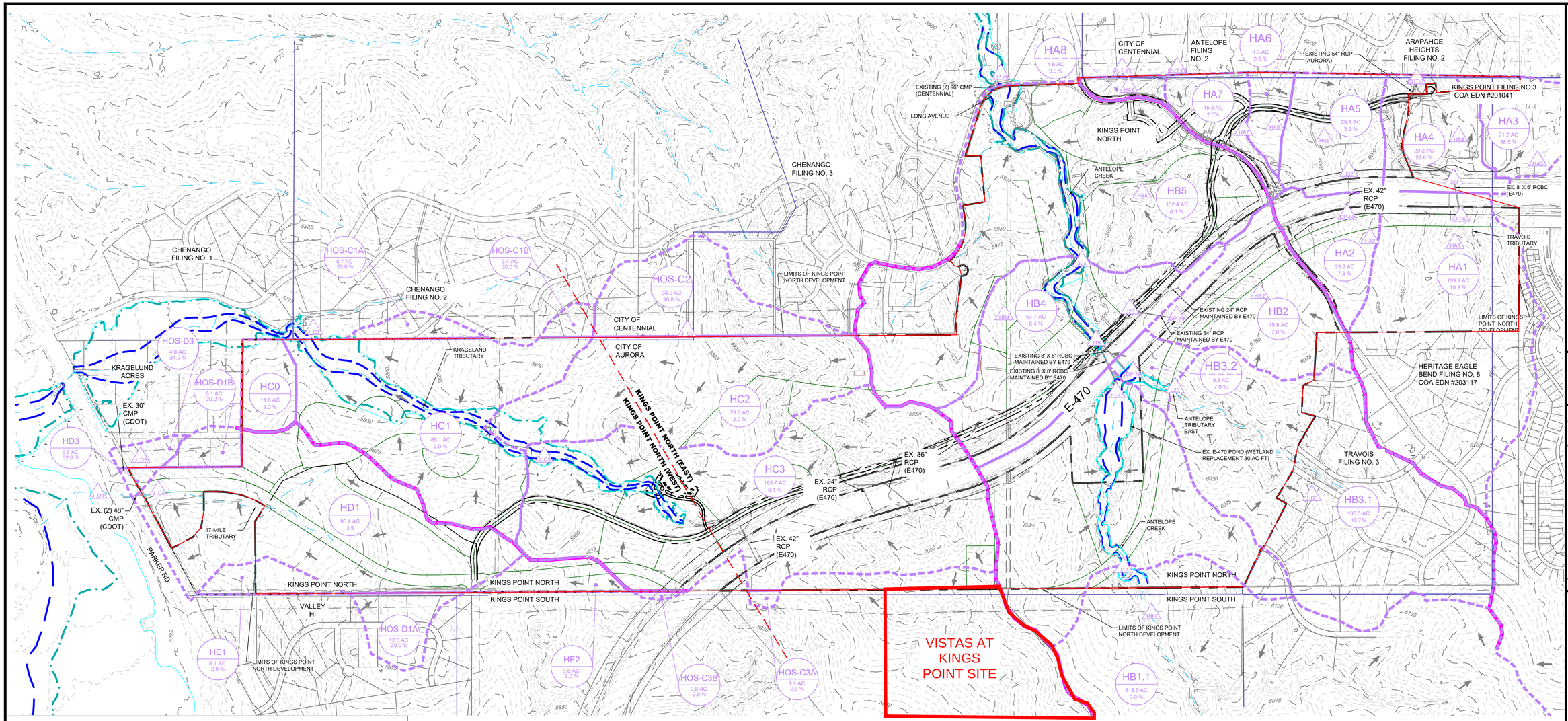
Approved For One Year From This Date
08/22/2022

City Engineer — Date 08/19/2022

Water Department — Date 08/22/2022

1

222214



LEGEND

EXISTING	PROPOSED	
X	X	BASIN DESIGNATION
XX.X AC XX.X %	XX.X AC XX.X %	AREA % IMPERVIOUS
X	X	DESIGN POINT

- DIRECTIONAL FLOW ARROW
- EMERGENCY OVERFLOW ROUTE
- PROPOSED DRAINAGE SUB-BASIN
- EXISTING DRAINAGE MAJOR-BASIN
- EASEMENT
- EXISTING DRAINAGE BASIN
- EXISTING MAJOR CONTOUR (5280)
- EXISTING MINOR CONTOUR (5279)
- RIGHT OF WAY (R.O.W.)
- CENTERLINE
- PLANNING AREAS
- PROJECT BOUNDARY
- FLOOD WAY
- 100 YEAR FLOODPLAIN
- 500 YEAR FLOODPLAIN
- MAPPED STREAMLINES
- DRAINAGE SWALE

NOTES:

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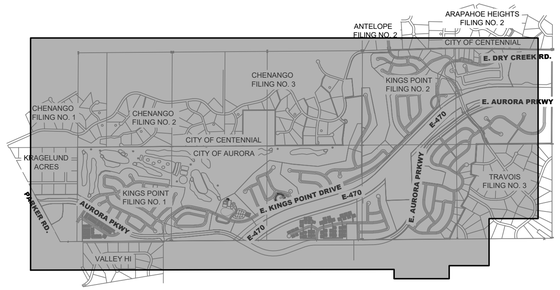
2. STORM SEWER SYSTEM IN COMBINATION WITH THE STREETS WILL BE SIZED FOR THE 100 YEAR STORM EVENT.
3. PONDS SHOWN HEREIN ARE SCHEMATIC ONLY. ACTUAL SIZE, SHAPE, AND LOCATION WILL VARY AS SITE DESIGN PROGRESSES.
4. THIS MASTER DRAINAGE PLAN HAS BEEN PREPARED BASED UPON THE BEST AVAILABLE INFORMATION AT THIS TIME. CONCEPTS, DRAINAGE PATTERNS, AND OFFSITE FACILITIES SHALL BE CONFIRMED IN THE SUBSEQUENT PRELIMINARY AND FINAL DRAINAGE PLANS FOR THE PROPERTY.
5. ALL STORM INFRASTRUCTURE IS PRIVATE EXCEPT AS NOTED AND SIZED FOR THE 100 YEAR EVENT. ALL STORM INFRASTRUCTURE WILL BE MAINTAINED BY THE METRO DISTRICT EXCEPT AS NOTED.
6. THE STORM SEWER MAY NOT BE IN ITS FINAL LOCATION. ADDITIONAL STORM SEWER MAY BE REQUIRED AND WILL BE REFINED WITH THE PRELIMINARY DRAINAGE REPORT. DRAINAGE EASEMENTS WILL BE PROVIDED AS NEEDED.
7. THE BASIS OF THE KRAGELUND TRIBUTARY FLOOD HAZARD AREAS IS THE CHERRY CREEK TRIBUTARY MINOR TRIBUTARY FHAD PREPARED BY DEWBERRY, AND APPROVED IN 2021.
8. WORK IN THE FLOODPLAIN REQUIRES A FLOODPLAIN DEVELOPMENT PERMIT.
9. WORK IN FLOODWAY REQUIRES CLOMR OR NO RISE CERTIFICATION LETTER.

BENCHMARK

10. CITY OF AURORA BENCHMARK NUMBER SS6635NE001 BEING A 2" DIAMETER BRASS CAP SET IN THE NORTHWEST CORNER OF THE BRIDGE ABUTMENT OF SOUTH IRELAND WAY AND E-4470.

PROJECT BENCHMARK ELEVATION = 6057.71 FEET
(NAVD 88 DATUM)



KEY MAP
SCALE: 1" = 4000

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

MJN 08/03/22
MANNY NUNO, PE, CFM DATE

MANUEL H NUNO DATE
STATE OF COLORADO P.E. 52773
FOR AND ON BEHALF OF CORE CONSULTANTS LLC

0 500' 1,000'
1 inch = 500 ft.

APPROVED FOR ONE YEAR FROM THIS DATE
08/22/2022

CITY ENGINEER 08/19/2022 DATE

WATER DEPARTMENT 08/22/2022 DATE

APPROVED ON 08/22/2022

LAND DEVELOPMENT | ENERGY | PUBLIC INFRASTUCTURE

CORE CONSULTANTS. INC.
3473 S. BROADWAY
ENGLEWOOD, CO 80113
303.703.4444
LIVEYOURCORE.COM

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

#	REVISION DESCRIPTION	DATE	BY

KINGS POINT NORTH
AURORA, CO

MASTER PLAN DRAINAGE MAPS
EXISTING CONDITIONS

NOT FOR CONSTRUCTION

DESIGNED BY: CS
DRAWN BY: SO
CHECKED BY: MN

JOB NO.
19-032

SHEET
1

8/8/2022 4:53 AM X:\19-032 KINGS POINT\CIVIL\CADD\PLANS\FILING 1\DRAINAGE\MASTER DRAINAGE MAPS EXISTING.DWG

3

222214

POND B7
TRIB AREA: 25.8 AC
PEAK 100-YEAR DISCHARGE: 24 CFS
100-YR EMERGENCY FLOW: 50 CFS
100-YR+ EURV VOLUME: 2.50 AC-FT
TYPE: FULL SPECTRUM DETENTION
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

EXISTING (2) 96" CMP (CENTENNIAL)

POND B6
TRIB AREA: 19.4 AC
PEAK 100-YEAR DISCHARGE: 18 CFS
100-YR EMERGENCY FLOW: 37 CFS
100-YR + 1/2 EURV VOLUME: 1.82 AC-FT
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

POND B5
TRIB AREA: 59.1 AC
PEAK 100-YEAR DISCHARGE: 59 CFS
100-YR EMERGENCY FLOW: 111 CFS
100-YR+ 1/2 EURV VOLUME: 5.00 AC-FT
TYPE: FULL SPECTRUM DETENTION
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

POND B4
TRIB AREA: 23.4 AC
PEAK 100-YEAR DISCHARGE: 19 CFS
100-YR EMERGENCY FLOW: 40 CFS
100-YR+ 1/2 EURV VOLUME: 2.20 AC-FT
TYPE: FULL SPECTRUM DETENTION
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

POND B1
TRIB AREA: 25.1 AC
PEAK 100-YEAR DISCHARGE: 21 CFS
100-YR EMERGENCY FLOW: 82 CFS
100-YR + 1/2 EURV VOLUME: 3.47 AC-FT
TYPE: FULL SPECTRUM DETENTION
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

POND C6
TRIB AREA: 18.9 AC
PEAK 100-YEAR DISCHARGE: 16 CFS
100-YR EMERGENCY FLOW: 91 CFS
100-YR + 1/2 EURV VOLUME: 3.07 AC-FT
TYPE: FULL SPECTRUM DETENTION
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

C5
AREA: 15.1 AC
100-YEAR DISCHARGE: 13 CFS
R EMERGENCY FLOW: 52 CFS
R + 1/2 EURV VOLUME: 2.43 AC-FT
FULL SPECTRUM DETENTION
SEE SUMMARY TABLE ON SHEET 4
ADDITIONAL DETAILS

POND B3
TRIB AREA: 167.7 AC
PEAK 100-YEAR DISCHARGE: 139 CFS
100-YR EMERGENCY FLOW: 316 CFS
100-YR + 1/2 EURV VOLUME: 13.98 AC-FT
TYPE: FULL SPECTRUM DETENTION
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

POND B2
TRIB AREA: 59.5 AC
PEAK 100-YEAR DISCHARGE: 29 CFS
100-YR EMERGENCY FLOW: 123 CFS
100-YR+ 1/2 EURV VOLUME: 7.98 AC-FT
TYPE: FULL SPECTRUM DETENTION
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

POND A2
IMMEDIATE TRIB AREA: 77 AC
TOTAL UPSTREAM DRAINAGE AREA: 201 AC
PEAK 100-YEAR DISCHARGE: 171 CFS
100-YR EMERGENCY FLOW: 209 CFS
100-YR + 1/2 EURV VOLUME: 12.69 AC-FT
TYPE: FULL SPECTRUM DETENTION + A1 WATER QUALITY
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

POND A1
TRIB AREA: 102.6 AC
PEAK 100-YEAR DISCHARGE: 98 CFS
100-YR EMERGENCY FLOW: 182 CFS
100-YR VOLUME: 7.54 AC-FT
TYPE: FLOOD CONTROL ONLY
NOTE: SEE SUMMARY TABLE ON SHEET 4
FOR ADDITIONAL DETAILS

VISTAS AT KINGS POINT SITE

FUTURE KINGS POINT REGIONAL POND 112
36.2 AC-FT
997CFS INFLOW
389CFS OUTFLOW

THE REGIONAL POND 112 OUTFLOW CURVE IS NOT AVAILABLE AT THIS TIME. OS5 WAS MODELED AS UNDETAINED HISTORIC FLOWS.

MATCH LINE SHEET 1

X:\19-032 KINGS POINT\CIVIL\CADD\PLANS\FILING 1\DRAINAGE\MASTER DRAINAGE MAPS PROPOSED-R.DWG

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LEGEND

EXISTING	PROPOSED	
X	X	BASIN DESIGNATION
XX.X AC XX.X %	XX.X AC XX.X %	AREA % IMPERVIOUS
X	X	DESIGN POINT
		PROPOSED DRAINAGEWAY CORRIDOR
		DIRECTIONAL FLOW ARROW
		EMERGENCY OVERFLOW ROUTE
		PROPOSED DRAINAGE SUB-BASIN
		PROPOSED DRAINAGE MAJOR-BASIN
		EASEMENT
		EXISTING DRAINAGE BASIN
5280	5280	EXISTING MAJOR CONTOUR
5279	5279	EXISTING MINOR CONTOUR
		RIGHT OF WAY (R.O.W.)
		CENTERLINE
		PROJECT BOUNDARY
		FLOOD WAY
		100 YEAR FLOODPLAIN
		500 YEAR FLOODPLAIN
		MAPPED STREAMLINES
5279		BASE FLOOD ELEVATIONS
<	<	DRAINAGE SWALE
		PROJECT BOUNDARY
		PLANNING AREAS
		PROPOSED STORM PIPES

NOTES:

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, 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 COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
2. STORM SEWER SYSTEM IN COMBINATION WITH THE STREETS WILL BE SIZED FOR THE 100 YEAR STORM EVENT.
3. PONDS SHOWN HEREIN ARE SCHEMATIC ONLY. ACTUAL SIZE, SHAPE, AND LOCATION WILL VARY AS SITE DESIGN PROGRESSES.
4. THIS MASTER DRAINAGE PLAN HAS BEEN PREPARED BASED UPON THE BEST AVAILABLE INFORMATION AT THIS TIME. CONCEPTS, DRAINAGE PATTERNS, AND OFFSITE FACILITIES SHALL BE CONFIRMED IN THE SUBSEQUENT PRELIMINARY AND FINAL DRAINAGE PLANS FOR THE PROPERTY.
5. ALL STORM INFRASTRUCTURE IS PRIVATE EXCEPT AS NOTED AND SIZED FOR THE 100 YEAR EVENT. ALL STORM INFRASTRUCTURE WILL BE MAINTAINED BY THE METRO DISTRICT EXCEPT AS NOTED.
6. THE STORM SEWER MAY NOT BE IN ITS FINAL LOCATION. ADDITIONAL STORM SEWER MAY BE REQUIRED AND WILL BE REFINED WITH THE PRELIMINARY DRAINAGE REPORT. DRAINAGE EASEMENTS WILL BE PROVIDED AS NEEDED.
7. THE BASIS OF THE KRAGELUND TRIBUTARY FLOOD HAZARD AREAS IS THE CHERRY CREEK TRIBUTARY MINOR TRIBUTARY FHAD PREPARED BY DEWBERRY, AND APPROVED IN 2021.
8. WORK IN THE FLOODPLAIN REQUIRES A FLOODPLAIN DEVELOPMENT PERMIT.
9. WORK IN FLOODWAY REQUIRES CLOMR OR NO RISE CERTIFICATION LETTER.

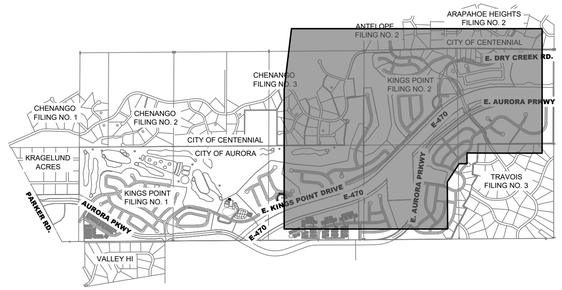
BENCHMARK

10. CITY OF AURORA BENCHMARK NUMBER SS6635NE001 BEING A 2" DIAMETER BRASS CAP SET IN THE NORTHWEST CORNER OF THE BRIDGE ABUTMENT OF SOUTH IRELAND WAY AND E-4470.

PROJECT BENCHMARK ELEVATION = 6057.71 FEET
(NAVD 88 DATUM)

FACSIMILE
THIS ELECTRONIC PLAN IS A FACSIMILE OF THE SIGNED AND SEALED PDF SET.
08/03/22
MANNY NUNO, PE, CFM DATE

KEY MAP
SCALE: 1" = 4000



APPROVED ON 08/22/2022

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ENGLEWOOD, CO 80113
303.703.4444
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#	REVISION DESCRIPTION	DATE	BY

KINGS POINT NORTH
AURORA, CO
MASTER PLAN DRAINAGE MAPS

NOT FOR CONSTRUCTION

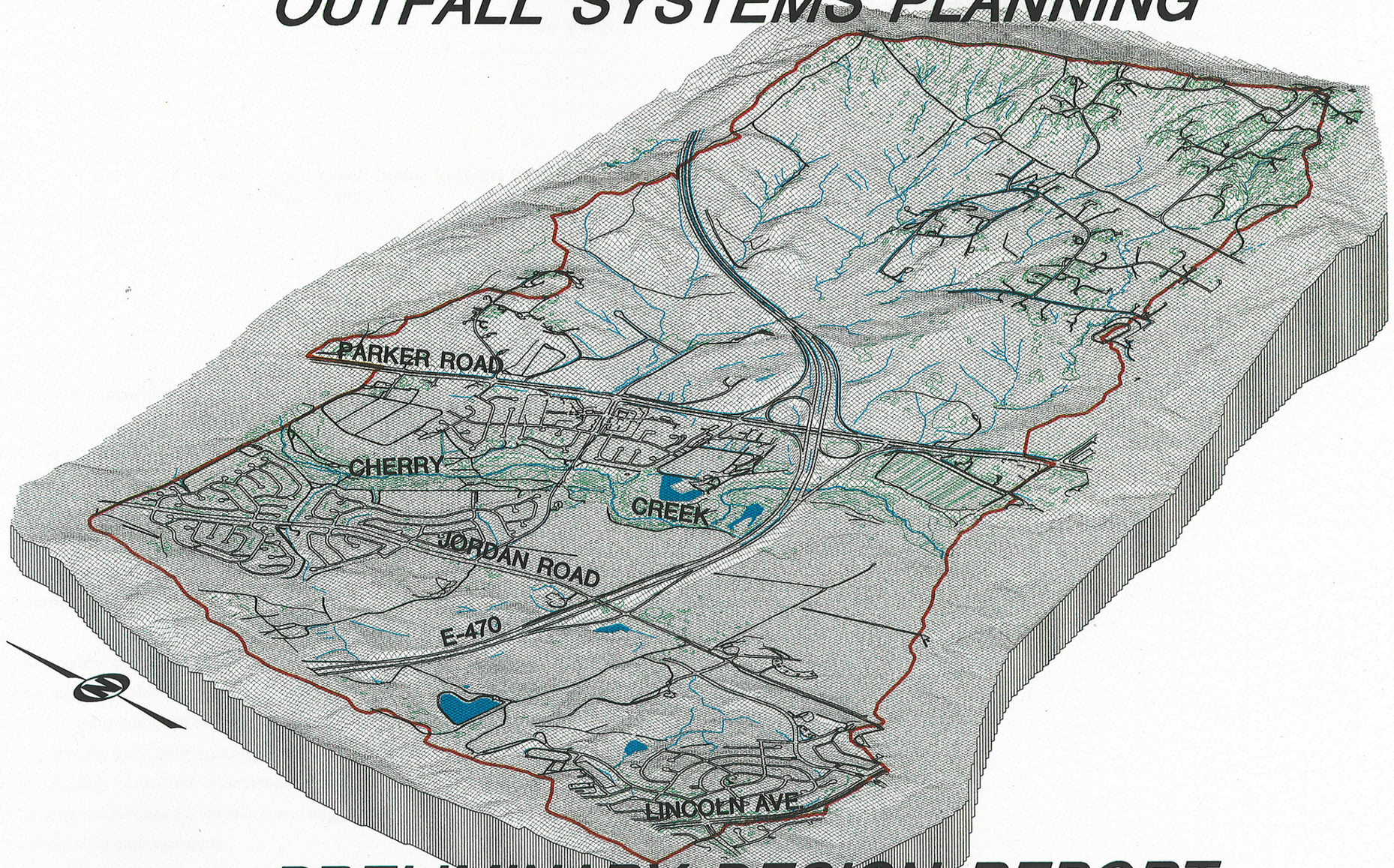
DESIGNED BY: CS
DRAWN BY: SO
CHECKED BY: MN

JOB NO.
19-032

SHEET
3

EXCERPTS FROM

COTTONWOOD AREA OF PARKER OUTFALL SYSTEMS PLANNING



PRELIMINARY DESIGN REPORT

TOWN OF PARKER **DOUGLAS COUNTY**

URBAN DRAINAGE & FLOOD CONTROL DISTRICT

APRIL 2001

FARNSWORTH & POLK
a member of the Farnsworth Wylie Group

EXECUTIVE SUMMARY

General

This report presents the final results of a project entitled "Planning of Cottonwood Area of Parker Outfall Systems" that was authorized by the Urban Drainage and Flood Control District (District). The local project sponsors were the Town of Parker (Parker) and Douglas County (County). The purpose of the project is to develop an Outfall Systems Plan, at the preliminary design level, which defines recommended drainage improvements for the conveyance of storm runoff from drainage areas in excess of 130 acres within the watershed study area.

Project Approach

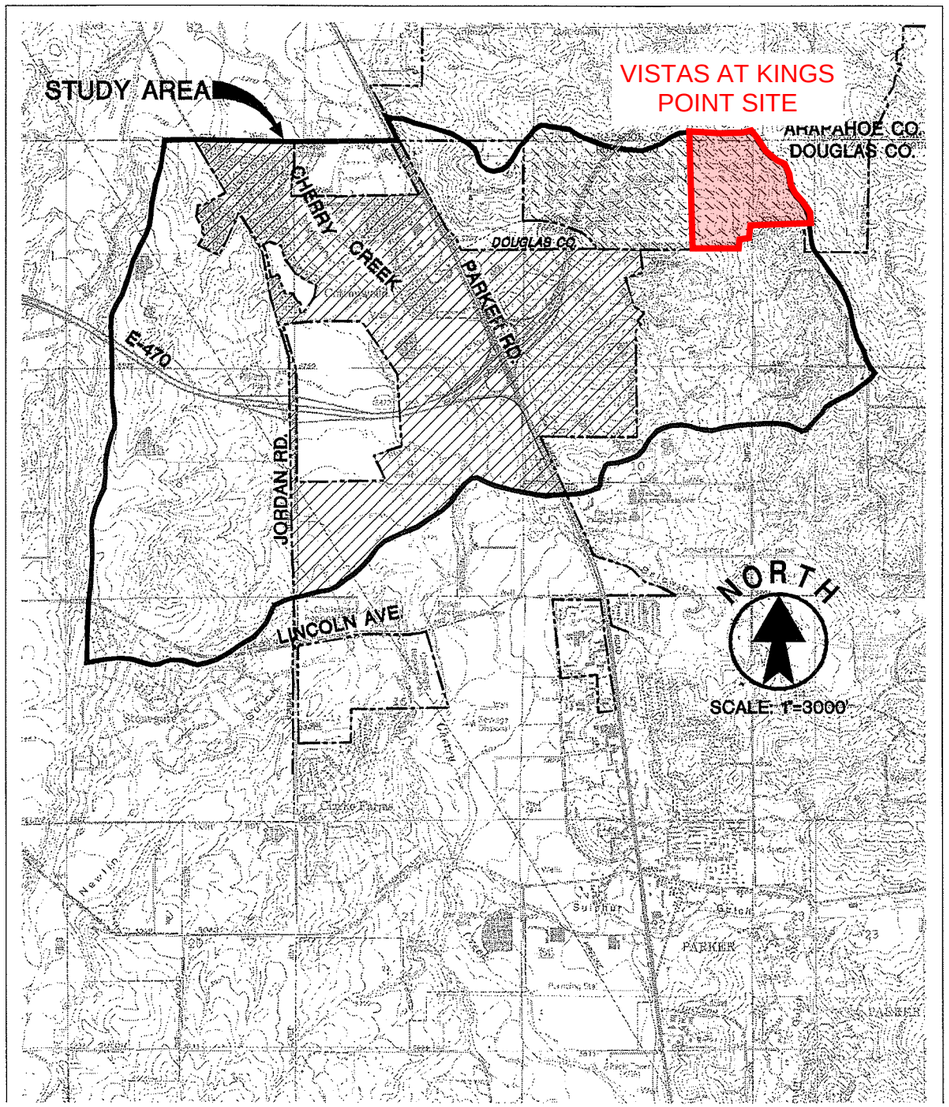
The project planning process was divided into two parts: an Alternatives Evaluation phase and a Preliminary Design phase. The Alternatives Evaluation phase included gathering data from project sponsors, performing field investigations of existing structures and drainage conditions, developing baseline hydrologic models, defining alternative drainage improvement designs and costs, and selecting a preferred outfall systems plan. This first phase was begun on July 30, 1999, and the final Alternatives Evaluation Report was submitted to the District on April 6, 2000. The process included five progress meetings and one public meeting for gathering and dissemination of data.

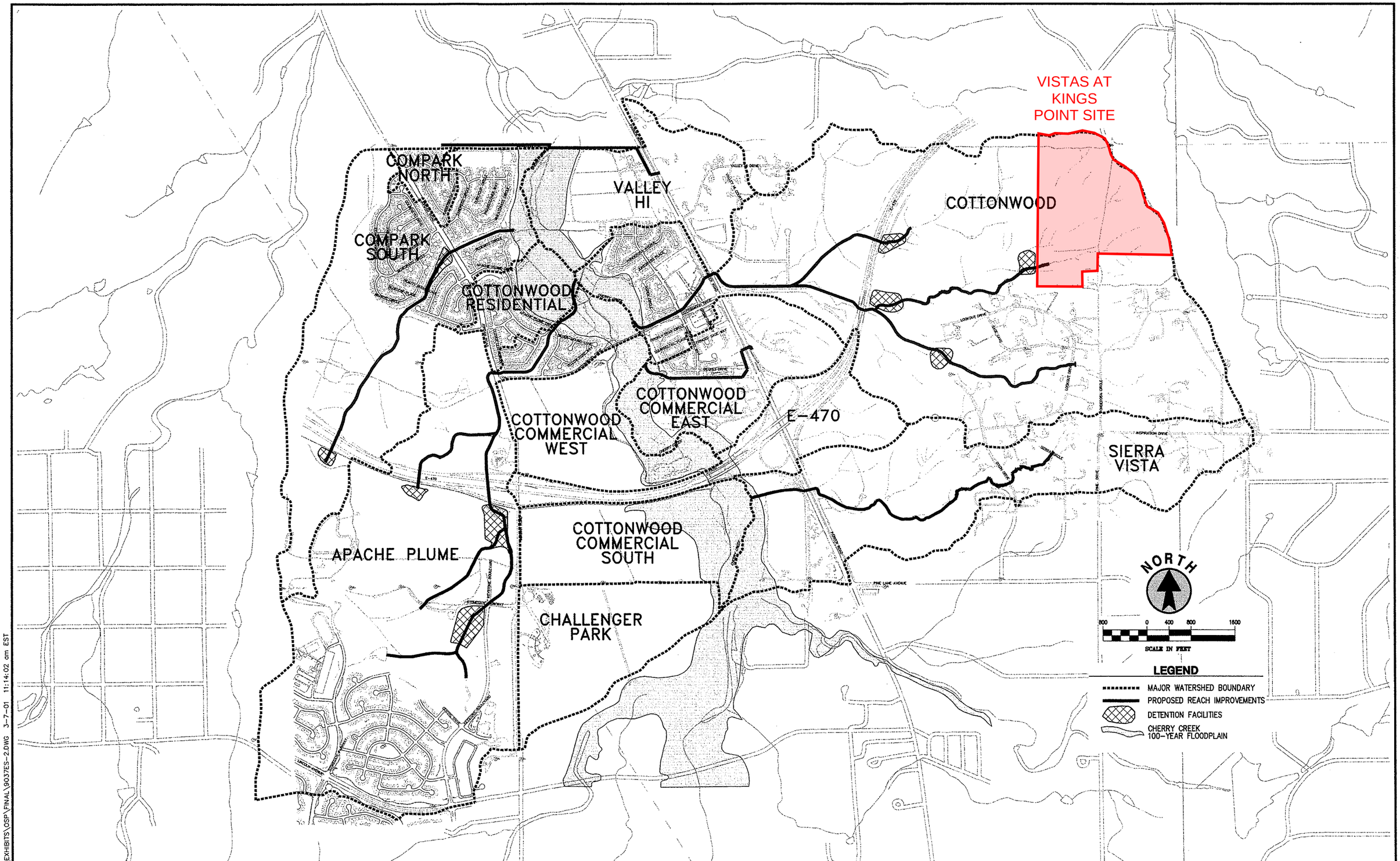
The Preliminary Design phase was begun on August 24, 2000 after design selection was completed by the District and the local sponsors. This phase included refining of cost estimates from the Alternatives Evaluation, and the preparation of preliminary designs. During this phase, three progress meetings and one public meeting were held.

Study Area Description

The project study area is comprised of the local watersheds that drain to Cherry Creek between the Arapahoe-Douglas County Line on the north and Baldwin and Newlin Gulches on the south (see Figure ES-1, Vicinity Map). The study area covers approximately 3,350 acres and is roughly divided in half by Cherry Creek which flows from south to north through the area. At the present time the study area is approximately 45 percent in the County, 45 percent within the Parker corporate limits, and 10 percent within the City of Aurora as delineated in Figure ES-1.

Under existing development conditions, approximately 45 percent of the study area is fully developed. Rapid development is presently occurring in various locations throughout the study area. Much of the area bordering the major roads through the study area is expected to develop into commercial and industrial areas with relatively





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GROUND CONTROL SURVEY BY:
AERIAL PHOTOGRAPHY BY: *LANDMARK MAPPING, LTD.*
TOPOGRAPHIC MAPPING BY:
CONTOUR INTERVAL: 2 FOOT DATE FLOWN: 1/19/99

FARNSWORTH & POLK
a member of the Farnsworth Wyle Group
2996 S. Colorado Blvd. Ste. 250
Denver, Colorado 80222
(303) 692-5535 * phone
(303) 692-0470 * fax

DESIGNED	MJN/CJC	DATE 02-23-01
DRAWN	EJM	DATE 02-23-01
CHECKED	BSK/MJN	DATE 02-23-01
REVISED		DATE
REVISED		DATE

TOWN OF PARKER • DOUGLAS COUNTY
URBAN DRAINAGE & FLOOD CONTROL DISTRICT

COTTONWOOD AREA OF PARKER
OUTFALL SYSTEMS PLANNING

OUTFALL SYSTEMS PLAN

FIGURE ES-2

II. STUDY AREA DESCRIPTION

A. General

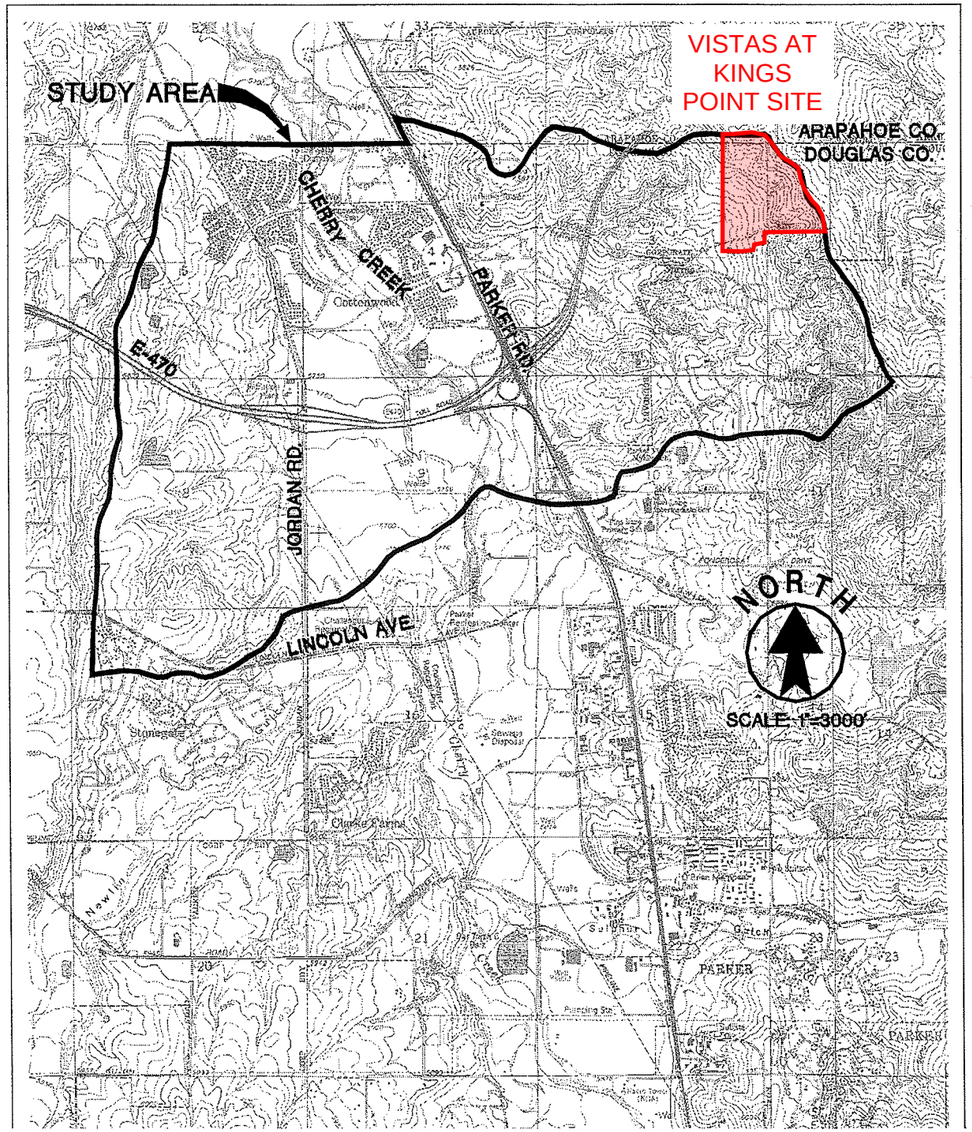
The project study area is comprised of the local watersheds that drain to Cherry Creek between the Arapahoe-Douglas County Line on the north and Baldwin and Newlin Gulches on the south (see Figure 2, Project Boundary Map). The south boundary of the study area is approximately one-half mile north of Lincoln Avenue. The study area covers approximately 3,330 acres and is roughly divided in half by Cherry Creek, which flows from south to north through the area. Near the center of the study area is the "Cottonwood Area" which is north of Cottonwood Drive and adjacent to Cherry Creek. The Cottonwood Area is currently comprised of a commercial area and established residential development.

At the present time the study area is approximately 45 percent in the County, 45 percent within the Parker corporate limits, and 10 percent within the City of Aurora, as delineated in Figure 1. It is anticipated that in the foreseeable future much of the study area could be annexed into the Town of Parker. Those areas that are presently expected to remain in the County include the existing residential developments in the east portion of the study area and various areas west of Cherry Creek. Approximately one-half square mile at the north-central portion of the study area is within the City of Aurora. The extent of areas potentially subject to annexation into Aurora is presently unknown. The potential jurisdiction limits are of interest to this study, particularly with respect to future land use projections, and indirectly with respect to the funding and phasing of outfall drainage system improvements.

The major arterial roads through the study area are Parker Road (State Highway 83), Jordan Road and E-470. Several major collectors are located within the area, including Cottonwood Drive, Stonegate Parkway and Pine Lane.

B. Topography

Maximum surface slopes within the study area occur along the southwestern, northeastern, and eastern sub-watersheds where slopes of 1 to 7.5 percent are observed. In the northeastern and eastern sub-watersheds, existing drainageways are typically natural, somewhat incised channels that appear to have developed some degree of stability. Rural-residential development exists in much of this area and continuing erosion problems associated with these drainageways have not been reported.



COTTONWOOD AREA OF PARKER
OUTFALL SYSTEMS PLANNING

FIGURE NO: 2

PROJECT BOUNDARY MAP

Also on the south side of E-470, but further west, is sub-watershed AP3. This area drains to an existing detention basin adjacent to south side of E-470, through a 48-inch reinforced concrete pipe (RCP) culvert under E-470, and then through a poorly defined channel to the Apache Plume main channel. South and upgradient of AP3 is sub-watershed AP4. Flows from this sub-watershed are contained in a land application wet basin.

From the Stonegate Fountain Detention basin, the main channel crosses under E-470 through a 10' x 5' box culvert west of Jordan Road. This culvert discharges to an area, west of the water treatment plant, that is partially developed. The drainageway continues through a poorly defined channel to an existing 154"x 96" arch corrugated metal pipe (CMP) culvert under Jordan Road. This culvert discharges to a constructed channel, located in an existing residential area, between Jordan Road and the Cherry Creek floodplain. This drainageway is known as Apache Plume. Apache Plume drains through a 154"x 96" arch CMP culvert under Apache Plume Drive and discharges to a park just downstream of this culvert. No outfall channel presently exists to convey flow through the park to the Cherry Creek channel.

Cottonwood Watershed

The Cottonwood Watershed is comprised of three areas: South, Middle, and North (which are designated as CS, CM, and CN, respectively). These areas are each tributary to the main Cottonwood channel. The main Cottonwood channel extends from E-470 to Cherry Creek through sub-watersheds CS3, CS2 and CS1, respectively. West of Parker Road the main Cottonwood channel is piped through a 162"x96" metal arch pipe to Cherry Creek (Figure A-6). This pipe is located under parking lots in the commercial area north of Cottonwood Drive and then under Cottonwood Drive.

The Cottonwood South area includes six sub-watersheds, CS1, CS2, CS3, CS4, CS5, and CS6, and extends from the east study area boundary, within the Sierra Vista Estates subdivision, to Cherry Creek. The South area includes a portion of the proposed commercial and multifamily development of Crown Point located just east of E-470 in Sub-watershed CS4.

The Middle Cottonwood area is comprised of three sub-watersheds, CM1, CM2, and CM3, on the east side of E-470. This area includes existing development in the northern portion of Sierra Vista Estates, and undeveloped land in the City of Aurora within Sub-watershed CM3. The Cottonwood North area is comprised of two sub-watersheds, CN1 and CN2, that straddle E-470. Sub-watershed CN2, east of E-470, is comprised of undeveloped land largely within the Aurora city limits.

Runoff from sub-watersheds CM1, CM2, CM3, CS4, CS5, and CS6 concentrates at an existing bridge crossing of E-470. The E-470 bridge was constructed for the future extension of Cottonwood Drive. The bridge appears to have been sized to accommodate only the future roadway, and once the road is in place, flows will have to be conveyed underground through a culvert or storm sewer. At the present time the area under the bridge is lined with riprap.

Cottonwood Commercial West Watershed

This watershed is comprised of three sub-watersheds, CCW1, CCW2, and CCW3. The watershed is between Cherry Creek and Jordan Road, on the north side of E-470. The entire watershed is currently undeveloped with the exception of a corridor trail and park adjacent to Cherry Creek. Sub-watershed CCW3 is projected to be commercial development. An existing culvert under Cottonwood Drive conveys some runoff from Sub-watershed CCW3 to Apache Plume; however, based on review of topographic mapping there appears to be little tributary area to this culvert. The entire CCW watershed typically drains northward and then east to Cherry Creek along the Cottonwood Drive embankment.

Cottonwood Commercial East Watershed

The Cottonwood Commercial East Watershed, designated CCE, is comprised of two sub-watersheds, CCE1 and CCE2, that straddle Parker Road between E-470 and Cottonwood Drive. The upper sub-watershed, CCE2, is located entirely within the commercial use area of the proposed Crown Point development. Runoff from this sub-watershed crosses Parker Road through an existing double-42" CMP culvert. Culvert discharges flow overland along generally undefined flow paths toward an existing storm sewer system located under Becket Drive. Residents have reported flooding of townhomes in this area. Review of drainage plans for The Glenns of Cottonwood (1998) and Park Meadows Subdivision Filing No. 1 (1984) suggests that this area has not been adequately master-planned with respect to storm drainage. Local runoff appears to be adequately managed, however flows from the culverts under Parker Road do not appear to be adequately controlled in downstream facilities.

Sub-watershed CCE1, located west of Parker Road, is nearly fully developed with a mix of commercial, single-family and multi-family residential development. This area drains through local storm sewers and overland to Cherry Creek.

D. Detention and Water Quality Facilities

For proposed regional detention facilities, storage volumes and discharge rates were typically based upon the peak flow attenuation needed to meet flow capacities in existing downstream structures. For the AP3, Stonegate Fountain and Keystone Detention Basins, storage-discharge relationships were obtained from the Stonegate Drainage Report (Reference 8).

Regional detention facilities included in the outfall systems plan are those that are: (1) within or are proposed to be located within public property, rights-of-way or easements, (2) will be maintained by a public agency if not adequately maintained by a private owner, and (3) are or will be recognized by the local jurisdiction as "regional" detention facilities. Regional detention facilities serve an area of approximately 130 acres or larger. Within the study area there are on-site detention facilities that meet the first two of these requirements. However, only those on-site detention basins that are recognized by the local drainage jurisdiction as regional facilities are considered to be part of the outfall systems.

It was determined early in the project that water quality enhancement features would be an important part of the outfall systems plan. In the alternatives report, water quality features were recommended for all regional detention basins. Dry extended-detention basins designed in accordance with District guidelines were proposed. Wet water-quality basins would be preferred over the dry design for areas with adequate base flow to support the wet basins, because wet basins, as compared to dry basins, are more efficient at removing some pollutants.

In addition to the regional facilities, it was recommended in the alternatives report that on-site BMPs be incorporated, to the extent practicable, into all site and drainage designs for areas subject to future development. These BMPs include use of grass swales and buffer strips, water quality detention facilities, minimizing directly-connected-impervious-areas, street sweeping for litter control, porous pavement, strict control of construction site runoff, and other measures as discussed in Volume 3 of the Manual (Reference 1).

Water quality facilities included in the selected outfall systems plan are further discussed in the Preliminary Design chapter of this report.

E. Opinion of Probable Costs for Alternatives Evaluation

Opinions of probable costs for the various alternatives were prepared based upon unit costs presented in the Alternatives Evaluation Report. These unit costs were determined through analysis of cost data from the District, recently constructed projects in the area, other recent drainage master plans and local experience. The objective of the cost estimating was to provide a basis for a relative comparison of alternate improvement costs, and to develop an order-of-magnitude cost estimate for the proposed systems. The cost estimates for the selected outfall system plan, as presented in the Preliminary Design chapter of this report, are based upon updated unit costs and present a more detailed cost evaluation as compared to the alternative cost estimates.

One of the largest cost elements of the proposed systems is land acquisition for both conveyance structures and detention basins. Land values were included in the alternative costs for facilities proposed at locations, in areas subject to future development, where no formal facilities or public land dedications presently exist. Land costs were not included for existing drainageways in areas that were currently at full development, as it was assumed that public easements or rights-of-way currently exist, or that existing drainage channels or other structures represent established uses that do not need to be secured through land acquisition. In cases where major drainage facilities are constructed in conjunction with development along a drainageway, developers may dedicate land with no actual land purchase costs incurred by the respective drainage jurisdiction.

For purposes of this study, land values were assumed to be $87,000 per acre regardless of proposed use and location within the study area. This value is based upon information, from the E-470 Authority, recently compiled for right-of-way acquisition purposes. Actual land values within the study area are expected to vary greatly, depending upon location. In some cases, the multi-use aspect of a drainage facility could be considered to reduce the cost of land used for stormwater management. For example, land acquired primarily for a detention basin could also be used as a park, and the land cost could be considered to be divided between both recreational and drainage uses.

Costs for wetlands restoration was included in improvement alternatives that would disturb existing wetlands in the Cottonwood, Apache Plume, and Sierra Vista Watersheds. No disturbance of wetlands was proposed for alternative improvements in the other watersheds of the study area. It was assumed that the cost of wetland restoration was only comprised of revegetation, and land values and other

TABLE A-1

CUHP SUB-WATERSHED PARAMETERS (EXISTING IMPERVIOUSNESS CONDITIONS)

BASIN ID	AREA sq mi	LENGTH mi	CENTROID mi	SLOPE ft/ft	Tc min	% IMPERV. %	Perv. Dep Storage	Imp Dep Storage	INITIAL RATE	DECAY COEFF.	FINAL RATE	HYDROLOGIC SOIL GROUP
AP1	0.081	0.451	0.256	0.0115	24.8	30.0	0.35	0.1	3.89	0.0018	0.56	B/C
AP2	0.161	0.669	0.294	0.0137		7.7	0.35	0.1	4.44	0.0018	0.60	B/C
AP3	0.065	0.348	0.140	0.0330	22.7	4.0	0.35	0.1	4.50	0.0018	0.60	B
AP4	0.025	0.142	0.066	0.0199	12.5	51.0	0.35	0.1	4.50	0.0018	0.60	B
AP5	0.155	0.767	0.297	0.0269		4.9	0.35	0.1	4.49	0.0018	0.60	B/C
AP6	0.078	0.619	0.341	0.0262	41.9	14.0	0.35	0.1	4.50	0.0018	0.60	B
AP7	0.071	0.871	0.453	0.0169	59.0	3.0	0.35	0.1	3.59	0.0018	0.54	B/C
AP8	0.075	0.415	0.195	0.0181	38.4	2.0	0.35	0.1	4.08	0.0018	0.57	B/C
AP9	0.197	0.811	0.417	0.0220		37.4	0.35	0.1	3.00	0.0018	0.50	C
AP10	0.185	0.741	0.341	0.0277		42.2	0.35	0.1	3.63	0.0018	0.54	B/C
CS1	0.144	0.496	0.333	0.0119		58.9	0.35	0.1	3.66	0.0018	0.54	B/C
CS2	0.073	0.564	0.284	0.0376	35.0	5.6	0.35	0.1	4.50	0.0018	0.60	B
CS3	0.047	0.362	0.197	0.0306	24.5	4.2	0.35	0.1	3.38	0.0018	0.53	B/C
CS4	0.084	0.485	0.225	0.0421	27.5	4.2	0.35	0.1	4.17	0.0018	0.58	B/C
CS5	0.119	0.479	0.237	0.0299	32.4	20.0	0.35	0.1	3.00	0.0018	0.50	C
CS6	0.151	0.741	0.337	0.0549		20.0	0.35	0.1	4.17	0.0018	0.58	B/C
CN1	0.154	0.697	0.402	0.0372		6.2	0.35	0.1	4.50	0.0018	0.60	B
CN2	0.178	0.752	0.316	0.0529		6.3	0.35	0.1	3.75	0.0018	0.55	B/C
CM1	0.162	0.765	0.384	0.0323		9.4	0.35	0.1	3.00	0.0018	0.50	C
CM2	0.155	0.744	0.316	0.0580		16.4	0.35	0.1	4.13	0.0018	0.58	B/C
CM3	0.188	0.598	0.347	0.0696		2.0	0.35	0.1	4.35	0.0018	0.59	B/C
CCW1	0.076	0.277	0.027	0.0180	25.6	2.0	0.35	0.1	3.77	0.0018	0.55	B/C
CCW2	0.076	0.578	0.313	0.0097	72.6	2.0	0.35	0.1	4.14	0.0018	0.58	B/C
CCW3	0.059	0.371	0.218	0.0161	23.1	2.0	0.35	0.1	4.40	0.0018	0.59	B/C
CCE1	0.156	0.462	0.292	0.0107		51.6	0.35	0.1	3.53	0.0018	0.54	B/C
CCE2	0.086	0.439	0.233	0.0303	29.7	14.3	0.35	0.1	4.50	0.0018	0.60	B
CCS1	0.121	0.600	0.367	0.0069	89.5	2.0	0.35	0.1	3.50	0.0018	0.53	B/C
CCS2	0.109	0.665	0.328	0.0275	48.8	2.0	0.35	0.1	4.02	0.0018	0.57	B/C
CP1	0.103	0.739	0.330	0.0101	37.1	46.0	0.35	0.1	4.41	0.0018	0.59	B/C
CP2	0.130	0.794	0.402	0.0107	39.9	46.0	0.35	0.1	4.20	0.0018	0.58	B/C
EPN1	0.047	0.741	0.398	0.0255	27.2	46.0	0.35	0.1	4.07	0.0018	0.57	B/C
EPN2	0.024	0.278	0.123	0.0574	14.4	4.2	0.35	0.1	3.15	0.0018	0.51	B/C
EPS1	0.034	0.440	0.189	0.0193	40.8	46.0	0.35	0.1	4.46	0.0018	0.60	B/C
EPS2	0.036	0.392	0.176	0.0559	20.3	4.2	0.35	0.1	3.66	0.0018	0.54	B/C
E4-1	0.044	0.693	0.455	0.0152	33.5	46.0	0.35	0.1	3.62	0.0018	0.54	B/C
CPN1	0.037	0.227	0.189	0.0157	16.7	42.0	0.35	0.1	4.26	0.0018	0.58	B/C
CPS1	0.121	0.407	0.214	0.0100	22.4	35.0	0.35	0.1	3.63	0.0018	0.54	B/C
CPS2	0.082	0.350	0.170	0.0251	9.9	42.0	0.35	0.1	4.49	0.0018	0.60	B/C
CPS3	0.087	0.547	0.256	0.0339	34.4	2.0	0.35	0.1	3.00	0.0018	0.50	C
CPS4	0.135	0.413	0.235	0.0304	21.4	6.3	0.35	0.1	4.50	0.0018	0.60	B
CPS5	0.087	0.530	0.239	0.0254	40.6	4.2	0.35	0.1	4.50	0.0018	0.60	B
CPS6	0.071	0.568	0.214	0.0263	26.1	2.0	0.35	0.1	4.50	0.0018	0.60	B
CPS7	0.052	0.398	0.223	0.0232	9.9	42.0	0.35	0.1	4.26	0.0018	0.58	B/C
VH1	0.148	0.574	0.282	0.0122		7.0	0.35	0.1	3.74	0.0018	0.55	B/C
VH2	0.119	0.343	0.133	0.0643	16.6	20.0	0.35	0.1	4.50	0.0018	0.60	B
CR1	0.094	0.551	0.242	0.0127	22.0	28.0	0.35	0.1	3.00	0.0018	0.50	C
SV1	0.117	0.411	0.144	0.0289	21.3	62.1	0.35	0.1	3.96	0.0018	0.56	B/C
SV2	0.201	0.752	0.398	0.0264		4.6	0.35	0.1	4.17	0.0018	0.58	B/C
SV3	0.098	0.847	0.373	0.0421	48.1	24.7	0.35	0.1	4.17	0.0018	0.58	B/C
SV4	0.137	0.847	0.388	0.0553	43.8	20.0	0.35	0.1	4.13	0.0018	0.58	B/C

TABLE A-2

CUHP SUB-WATERSHED PARAMETERS (FUTURE IMPERVIOUSNESS CONDITIONS)

BASIN ID	AREA sq mi	LENGTH mi	CENTROID mi	SLOPE ft/ft	Tc min	% IMPERV. %	Perv. Dep Storage	Imp Dep Storage	INITIAL RATE	DECAY COEFF.	FINAL RATE	HYDROLOGIC SOIL GROUP
AP1	0.081	0.451	0.256	0.0115	24.8	30.0	0.35	0.1	3.89	0.0018	0.56	B/C
AP2	0.161	0.669	0.294	0.0137		76.6	0.35	0.1	4.44	0.0018	0.60	B/C
AP3	0.065	0.348	0.140	0.0330	8.3	70.5	0.35	0.1	4.50	0.0018	0.60	B
AP4	0.025	0.142	0.066	0.0199	6.0	73.0	0.35	0.1	4.50	0.0018	0.60	B
AP5	0.155	0.767	0.297	0.0269		75.4	0.35	0.1	4.49	0.0018	0.60	B/C
AP6	0.078	0.619	0.341	0.0262	17.6	47.0	0.35	0.1	4.50	0.0018	0.60	B
AP7	0.071	0.871	0.453	0.0169	27.4	95.0	0.35	0.1	3.59	0.0018	0.54	B/C
AP8	0.075	0.415	0.195	0.0181	13.5	46.0	0.35	0.1	4.08	0.0018	0.57	B/C
AP9	0.197	0.811	0.417	0.0220		37.4	0.35	0.1	3.00	0.0018	0.50	C
AP10	0.185	0.741	0.341	0.0277		42.2	0.35	0.1	3.63	0.0018	0.54	B/C
CS1	0.144	0.496	0.333	0.0119		58.9	0.35	0.1	3.66	0.0018	0.54	B/C
CS2	0.073	0.564	0.284	0.0376	13.1	40.4	0.35	0.1	4.50	0.0018	0.60	B
CS3	0.047	0.362	0.197	0.0306	9.1	63.2	0.35	0.1	3.38	0.0018	0.53	B/C
CS4	0.084	0.485	0.225	0.0421	10.2	68.1	0.35	0.1	4.17	0.0018	0.58	B/C
CS5	0.119	0.479	0.237	0.0299	32.4	20.0	0.35	0.1	3.00	0.0018	0.50	C
CS6	0.151	0.741	0.337	0.0549		20.0	0.35	0.1	4.17	0.0018	0.58	B/C
CN1	0.154	0.697	0.402	0.0372		60.3	0.35	0.1	4.50	0.0018	0.60	B
CN2	0.178	0.752	0.316	0.0529		64.7	0.35	0.1	3.75	0.0018	0.55	B/C
CM1	0.162	0.765	0.384	0.0323		42.3	0.35	0.1	3.00	0.0018	0.50	C
CM2	0.155	0.744	0.316	0.0580		23.7	0.35	0.1	4.13	0.0018	0.58	B/C
CM3	0.188	0.598	0.347	0.0696		58.6	0.35	0.1	4.35	0.0018	0.59	B/C
CCW1	0.076	0.277	0.027	0.0180	25.6	27.0	0.35	0.1	3.77	0.0018	0.55	B/C
CCW2	0.076	0.578	0.313	0.0097	72.6	30.4	0.35	0.1	4.14	0.0018	0.58	B/C
CCW3	0.059	0.371	0.218	0.0161	13.1	90.0	0.35	0.1	4.40	0.0018	0.59	B/C
CCE1	0.156	0.462	0.292	0.0107		51.6	0.35	0.1	3.53	0.0018	0.54	B/C
CCE2	0.086	0.439	0.233	0.0303	11.0	92.8	0.35	0.1	4.50	0.0018	0.60	B
CCS1	0.121	0.600	0.367	0.0069	82.5	7.0	0.35	0.1	3.50	0.0018	0.53	B/C
CCS2	0.109	0.665	0.328	0.0275	18.3	70.0	0.35	0.1	4.02	0.0018	0.57	B/C
CP1	0.103	0.739	0.330	0.0101	37.1	46.0	0.35	0.1	4.41	0.0018	0.59	B/C
CP2	0.130	0.794	0.402	0.0107	39.9	46.0	0.35	0.1	4.20	0.0018	0.58	B/C
EPN1	0.047	0.741	0.398	0.0255	27.2	46.0	0.35	0.1	4.07	0.0018	0.57	B/C
EPN2	0.024	0.278	0.123	0.0574	5.2	92.6	0.35	0.1	3.15	0.0018	0.51	B/C
EPS1	0.034	0.440	0.189	0.0193	40.8	46.0	0.35	0.1	4.46	0.0018	0.60	B/C
EPS2	0.036	0.392	0.176	0.0559	7.3	92.6	0.35	0.1	3.66	0.0018	0.54	B/C
E4-1	0.044	0.693	0.455	0.0152	33.5	46.0	0.35	0.1	3.62	0.0018	0.54	B/C
CPN1	0.037	0.227	0.189	0.0157	16.7	42.0	0.35	0.1	4.26	0.0018	0.58	B/C
CPS1	0.121	0.407	0.214	0.0100	22.4	35.0	0.35	0.1	3.63	0.0018	0.54	B/C
CPS2	0.082	0.350	0.170	0.0251	9.9	42.0	0.35	0.1	4.49	0.0018	0.60	B/C
CPS3	0.087	0.547	0.256	0.0339	13.0	80.0	0.35	0.1	3.00	0.0018	0.50	C
CPS4	0.135	0.413	0.235	0.0304	10.4	77.0	0.35	0.1	4.50	0.0018	0.60	B
CPS5	0.087	0.530	0.239	0.0254	15.1	77.0	0.35	0.1	4.50	0.0018	0.60	B
CPS6	0.071	0.568	0.214	0.0263	16.7	42.0	0.35	0.1	4.50	0.0018	0.60	B
CPS7	0.052	0.398	0.223	0.0232	9.9	42.0	0.35	0.1	4.26	0.0018	0.58	B/C
VH1	0.148	0.574	0.282	0.0122		7.0	0.35	0.1	3.74	0.0018	0.55	B/C
VH2	0.119	0.343	0.133	0.0643	16.6	43.0	0.35	0.1	4.50	0.0018	0.60	B
CR1	0.094	0.551	0.242	0.0127	22.0	28.0	0.35	0.1	3.00	0.0018	0.50	C
SV1	0.117	0.411	0.144	0.0289	12.1	62.1	0.35	0.1	3.96	0.0018	0.56	B/C
SV2	0.201	0.752	0.398	0.0264		82.3	0.35	0.1	4.17	0.0018	0.58	B/C
SV3	0.098	0.847	0.373	0.0421	48.1	24.7	0.35	0.1	4.17	0.0018	0.58	B/C
SV4	0.137	0.847	0.388	0.0553	43.8	20.0	0.35	0.1	4.13	0.0018	0.58	B/C

TABLE A-4 (CONTINUED)

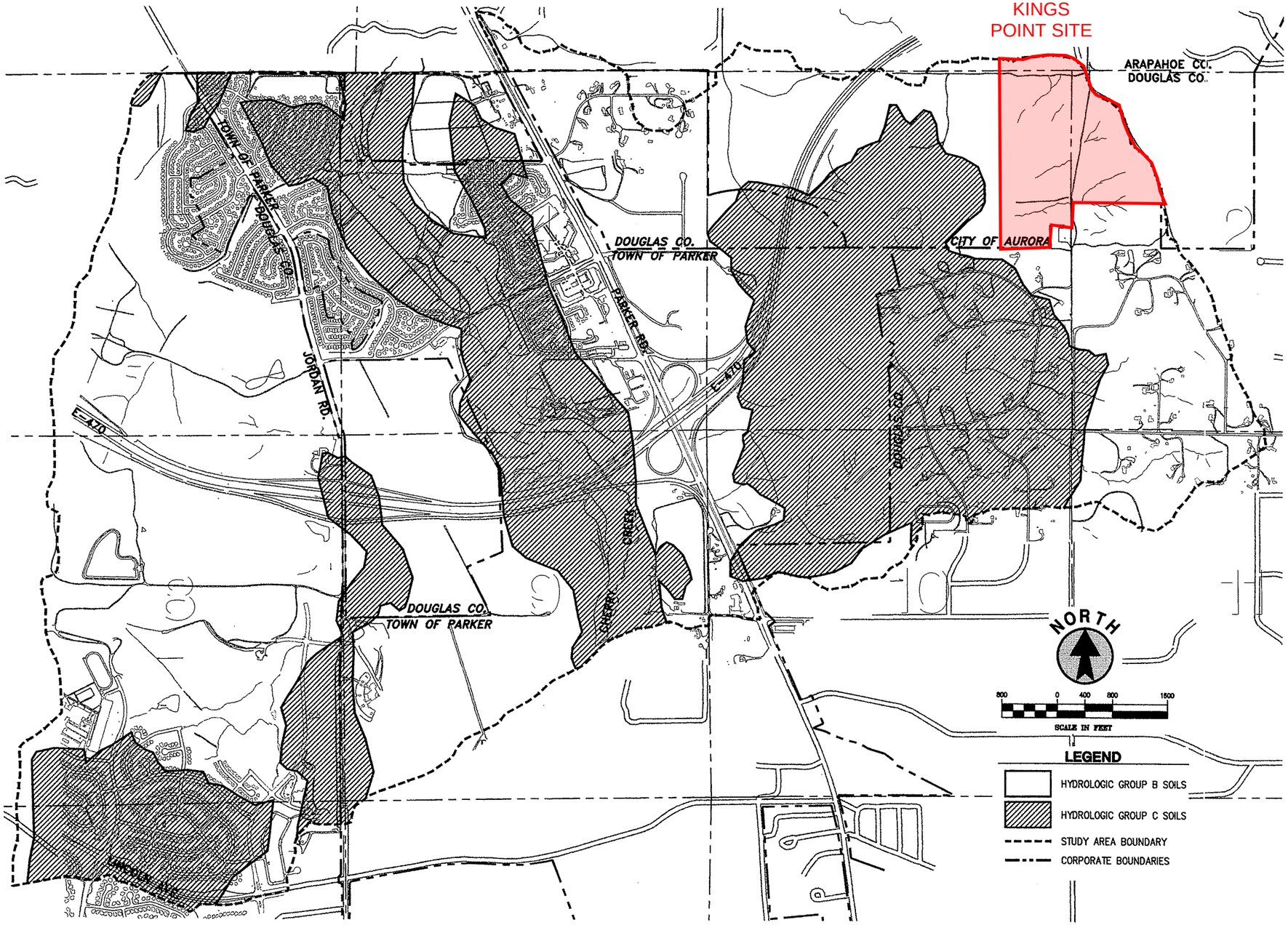
SWMM ROUTING PARAMETERS
PROPOSED OUTFALL SYSTEMS

GUTTER NUMBER	GUTTER CONNECTION	CONVEYANCE TYPE	WIDTH OR DIAMETER (ft)	LENGTH (ft)	INVERT SLOPE (ft/ft)	SIDE SLOPES HORIZ./VERT. L	R	MANNING'S N	OVERBANK SURCHARGE DEPTH (ft)
SIERRA VISTA WATERSHED									
107	204		0	1	0.001	0	0	0.001	10
204	105	CHANNEL	10	2500	0.042	5	5	0.04	3
106	105		0	1	0.001	0	0	0.001	10
105	203		0	1	0.001	0	0	0.001	10
203	103	CHANNEL	10	2930	0.023	10	10	0.04	4
104	103		0	1	0.001	0	0	0.001	10
103	202		0	1	0.001	0	0	0.001	10
202	201	PIPE	8.7	183	0.017	0	0	0.016	15
201	101	CHANNEL	10	1100	0.018	10	10	0.04	5
102	101		0	1	0.001	0	0	0.001	10

TABLE A-5

SUB-BASIN PEAK DISCHARGE SUMMARY(CUHP)

Sub-Basin Designation	EXISTING CONDITIONS Q(.4") (cfs)	Q 2year (cfs)	Q 5year (cfs)	Q 10year (cfs)	Q 50year (cfs)	Q 100year (cfs)	FUTURE CONDITIONS Q(.4") (cfs)	Q 2year (cfs)	Q 5year (cfs)	Q 10year (cfs)	Q 50year (cfs)	Q 100year (cfs)
AP1	4	20	45	63	123	152	4	20	45	63	123	152
AP2	0	5	27	44	113	147	51	146	220	274	431	507
AP3	0	2	17	28	74	95	18	52	81	101	161	194
AP4	4	13	23	30	52	64	7	20	31	38	60	72
AP5	0	3	25	42	113	148	47	135	205	254	401	475
AP6	1	6	20	30	70	109	11	38	69	91	165	200
AP7	0	1	12	19	47	61	22	64	91	107	160	189
AP8	0	1	16	27	69	89	11	36	68	90	160	196
AP9	15	60	131	171	310	381	15	60	131	171	310	381
AP10	21	74	145	198	359	433	21	74	145	198	359	433
CS1	30	94	161	209	348	414	30	94	161	209	348	414
CS2	0	2	17	27	69	90	8	29	57	77	144	178
CS3	0	1	15	24	55	70	11	33	56	70	112	135
CS4	0	2	24	40	99	128	22	65	104	130	209	300
CS5	2	19	57	79	157	196	2	19	57	79	157	196
CS6	3	19	55	79	170	215	3	19	55	79	170	215
CN1	0	4	26	42	111	146	33	103	170	221	374	445
CN2	0	6	42	67	156	201	45	135	222	282	452	542
CM1	0	9	40	59	128	165	17	64	131	173	308	370
CM2	2	15	50	73	162	206	4	26	68	95	206	251
CM3	0	2	38	66	175	226	43	132	223	285	473	576
CCW1	0	1	24	38	93	119	3	16	40	57	111	138
CCW2	0	0	9	16	42	55	2	8	17	24	50	63
CCW3	0	1	15	26	68	88	22	62	89	107	158	187
CCE1	26	88	160	210	359	431	26	88	160	210	359	431
CCE2	1	8	29	43	101	129	34	95	135	161	235	278
CCS1	0	1	16	26	64	83	0	3	18	29	67	86
CCS2	0	1	20	34	87	114	29	87	138	174	278	329
CP1		30	55	72	134	166		30	55	72	134	166
CP2		38	69	90	167	206		38	69	90	167	206
EPN1	5	16	30	40	72	88	5	16	30	40	72	88
EPN2	0	1	8	11	26	33	9	25	37	43	64	75
EPS1	2	8	15	20	37	45	2	8	15	20	37	45
EPS2	0	1	11	17	40	51	14	39	56	66	97	114
E4-1	4	13	25	32	58	70	4	13	25	32	58	70
CPN1	4	15	29	39	72	88	4	15	29	39	72	88
CPS1	9	39	84	115	215	263	9	39	84	115	215	263
CPS2	10	35	67	90	167	205	10	35	67	90	167	205
CPS3	0	3	28	42	95	122	29	82	125	152	230	273
CPS4	0	6	40	63	162	209	44	122	184	226	353	421
CPS5	0	2	17	29	76	99	28	77	117	144	224	267
CPS6	0	1	18	31	83	107	9	30	58	77	143	176
CPS7	6	22	42	57	103	127	6	22	42	57	103	127
VH1	0	5	30	47	111	145	0	5	30	47	111	145
VH2	2	18	49	73	159	201	16	54	102	136	250	307
CR1	4	24	61	84	156	193	4	24	61	84	156	193
SV1	23	74	122	159	264	312	27	83	138	176	287	346
SV2	0	4	33	54	139	181	71	203	298	367	563	657
SV3	2	12	30	43	90	114	2	12	30	43	90	114
SV4	2	16	45	65	140	176	2	16	45	65	140	176



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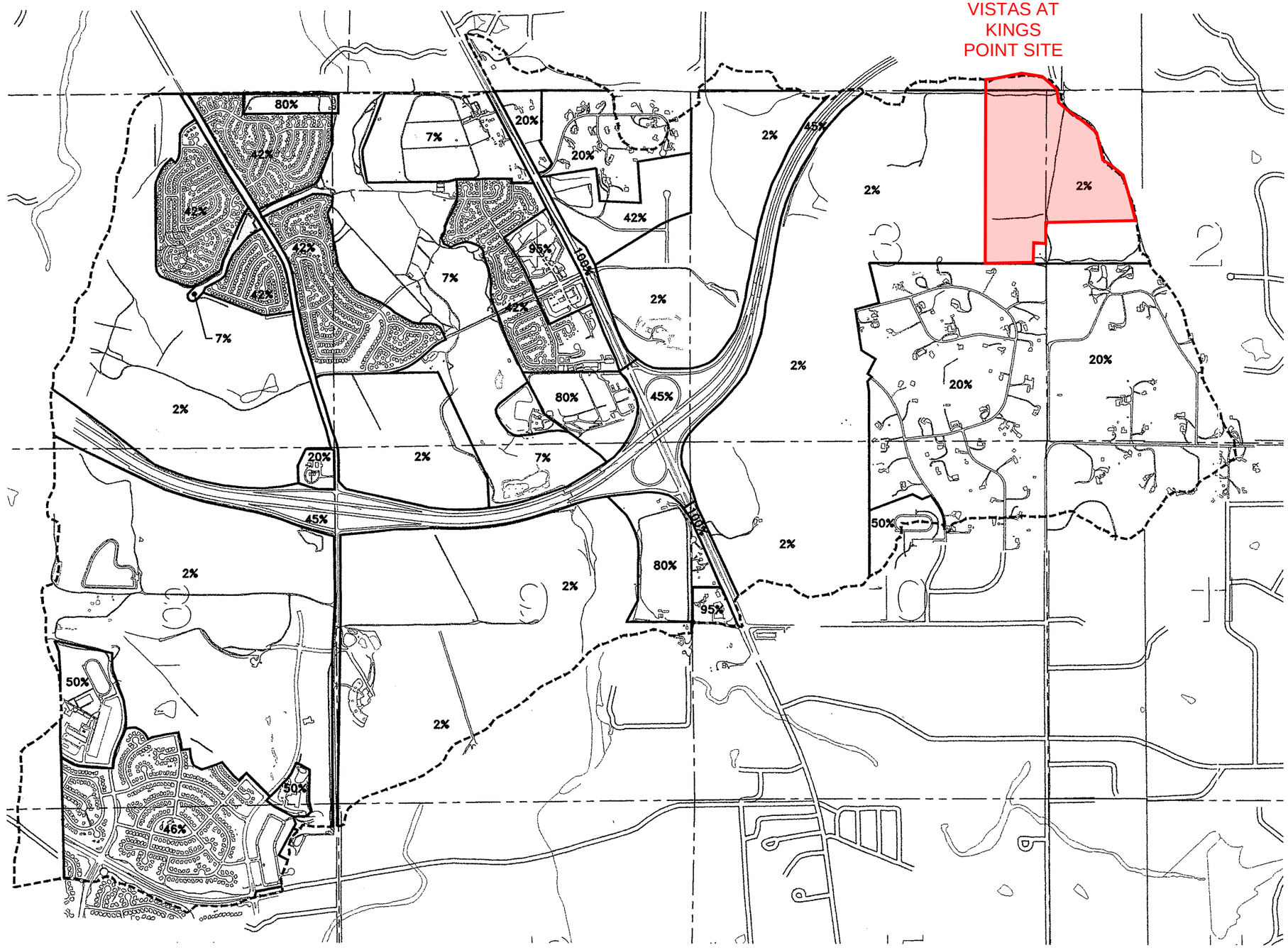
GROUND CONTROL SURVEY BY:		FARNSWORTH & POLK — a member of the Farnsworth Wyke Group, 2996 S. Colorado Blvd. Ste. 250, Denver, Colorado 80222, (303) 692-8558 phone, (303) 692-0470 fax	DESIGNED MJN DATE 02-23-01 DRAWN EJM DATE 02-23-01 CHECKED RJU DATE 02-23-01 REVISED ____ DATE ____ REVISED ____ DATE ____	TOWN OF PARKER • DOUGLAS COUNTY URBAN DRAINAGE & FLOOD CONTROL DISTRICT	COTTONWOOD AREA OF PARKER OUTFALL SYSTEMS PLANNING	HYDROLOGIC SOILS GROUP MAP	FIGURE A-2
AERIAL PHOTOGRAPHY BY:	LANDMARK MAPPING, LTD.						
TOPOGRAPHIC MAPPING BY:							
CONTOUR INTERVAL: 2 FOOT	DATE FLOWN: 1/19/99						



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GROUND CONTROL SURVEY BY:			DESIGNED MJN DATE 02-23-01	TOWN OF PARKER • DOUGLAS COUNTY URBAN DRAINAGE & FLOOD CONTROL DISTRICT	COTTONWOOD AREA OF PARKER OUTFALL SYSTEMS PLANNING	EXISTING WATERSHED IMPERVIOUSNESS MAP	FIGURE A-3
AERIAL PHOTOGRAPHY BY:	LANDMARK MAPPING, LTD.		DRAWN EJM DATE 02-23-01				
TOPOGRAPHIC MAPPING BY:			CHECKED RJU DATE 02-23-01				
CONTOUR INTERVAL: 2 FOOT	DATE FLOWN: 1/19/99	FARNSWORTH & POLK	REVISED ____ DATE ____				
		a member of the Farnsworth Kyle Group 2996 S. Colorado Blvd. Ste. 250 Denver, Colorado 80222 (303) 692-8888 • phone (303) 692-0470 • fax	REVISED ____ DATE ____				

VISTAS AT KINGS POINT SITE

NORTH

800 0 400 800 1600

SCALE IN FEET

LEGEND

- STUDY AREA BOUNDARY
- IMPERVIOUSNESS LIMITS
- 20% PERCENT IMPERVIOUSNESS

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GROUND CONTROL SURVEY BY:
AERIAL PHOTOGRAPHY BY: *LANDMARK MAPPING, LTD.*
TOPOGRAPHIC MAPPING BY:
CONTOUR INTERVAL: 2 FOOT DATE FLOWN: 1/19/99

FARNSWORTH & POLK
a member of the Farnsworth Fyfe Group
2996 S. Colorado Blvd. Ste. 250
Denver, Colorado 80222
(303) 692-9888 * phone
(303) 692-0470 * fax

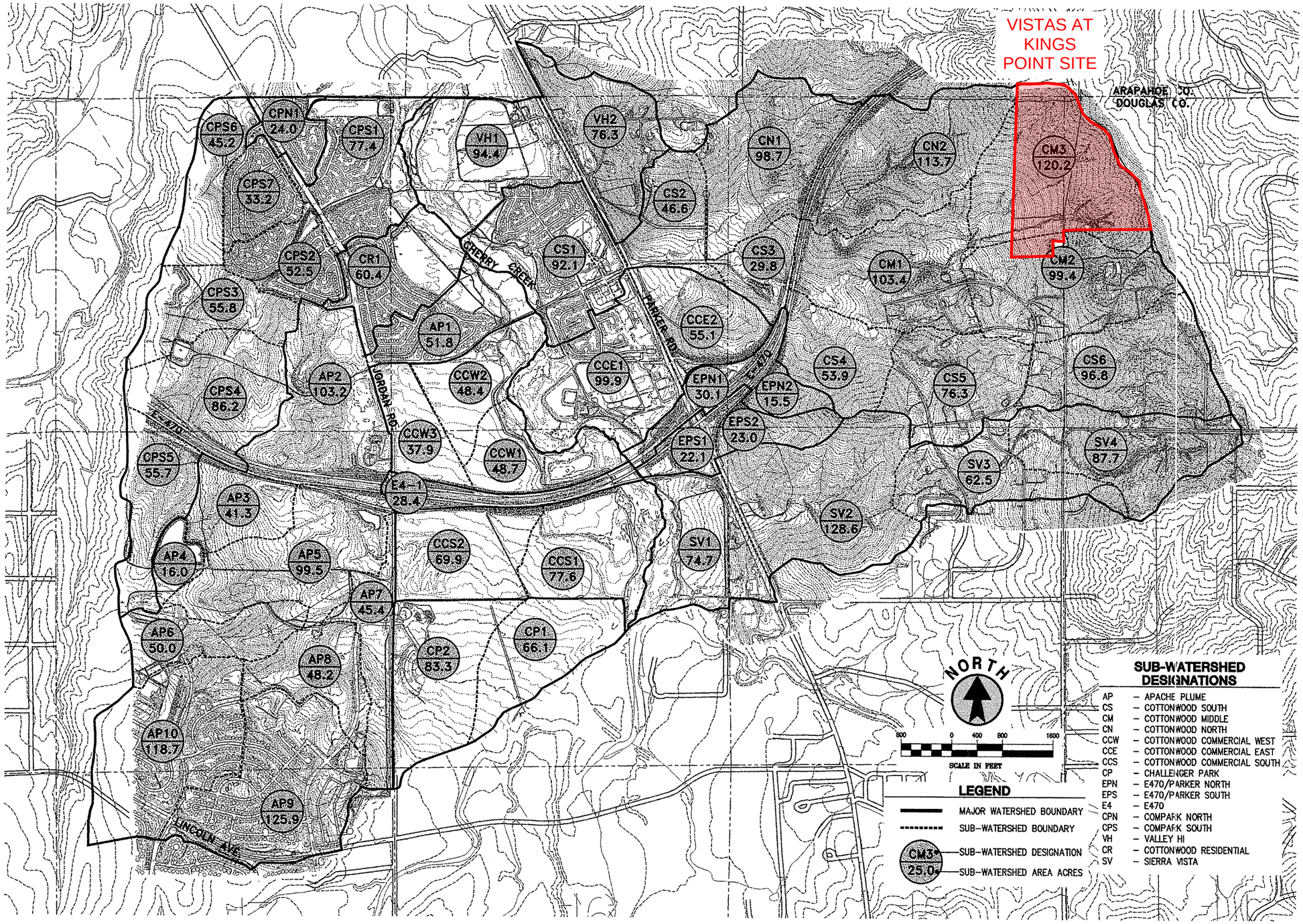
DESIGNED	MJN	DATE 02-23-01
DRAWN	EJM	DATE 02-23-01
CHECKED	RJU	DATE 02-23-01
REVISED		DATE
REVISED		DATE

TOWN OF PARKER • DOUGLAS COUNTY
URBAN DRAINAGE & FLOOD CONTROL DISTRICT

COTTONWOOD AREA OF PARKER
OUTFALL SYSTEMS PLANNING

FUTURE WATERSHED IMPERVIOUSNESS MAP

FIGURE A-4



GROUND CONTROL SURVEY BY:
AERIAL PHOTOGRAPHY BY: *LANDMARK MAPPING, LTD.*
TOPOGRAPHIC MAPPING BY:
CONTOUR INTERVAL: 2 FOOT DATE FLOWN: 1/19/99

FARNSWORTH & POLK
a member of the Farnsworth Kyle Group
2996 S. Colorado Blvd. Ste. 250
Denver, Colorado 80222
(303) 692-8338 * phone
(303) 692-0479 * fax

DESIGNED	MJN	DATE	02-23-01
DRAWN	EJM	DATE	02-23-01
CHECKED	RJU	DATE	02-23-01
REVISED		DATE	
REVISED		DATE	

TOWN OF PARKER • DOUGLAS COUNTY
URBAN DRAINAGE & FLOOD CONTROL DISTRICT

COTTONWOOD AREA OF PARKER
OUTFALL SYSTEMS PLANNING

SUB-WATERSHED MAP

FIGURE A-5

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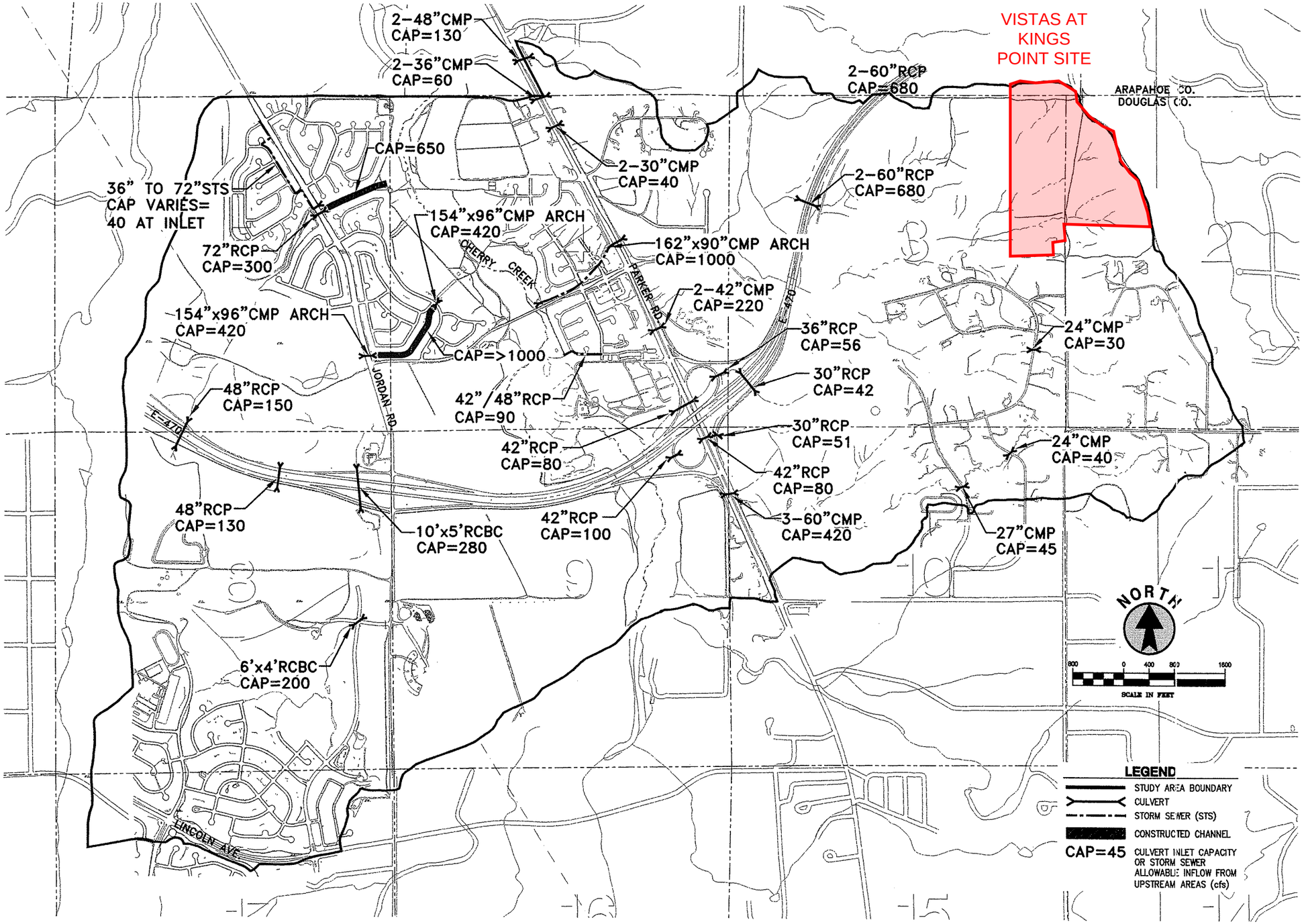

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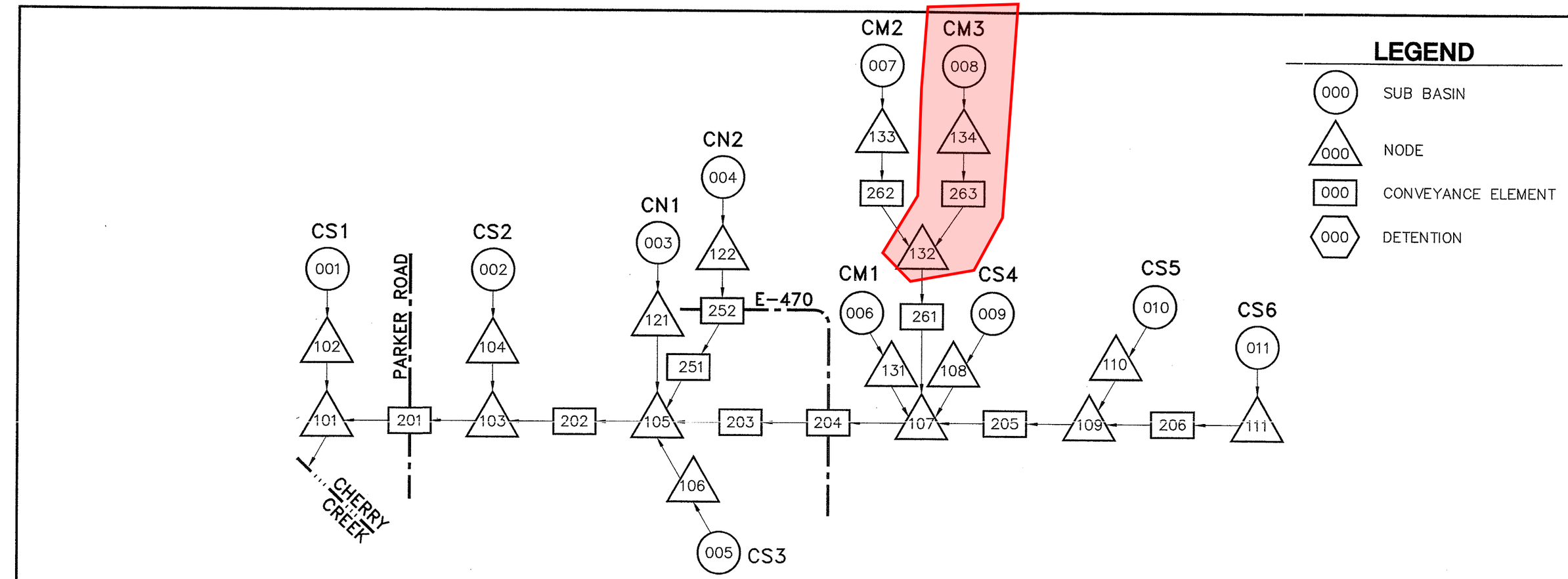
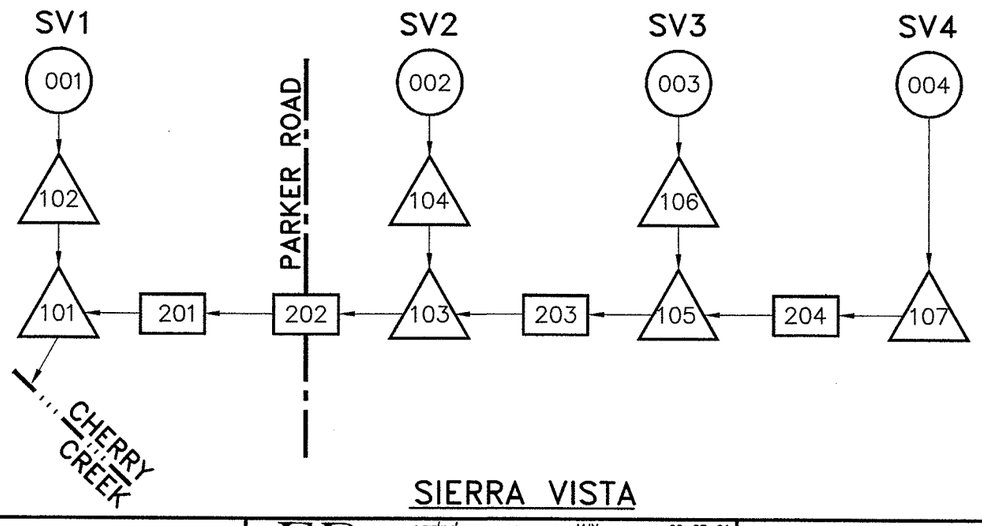
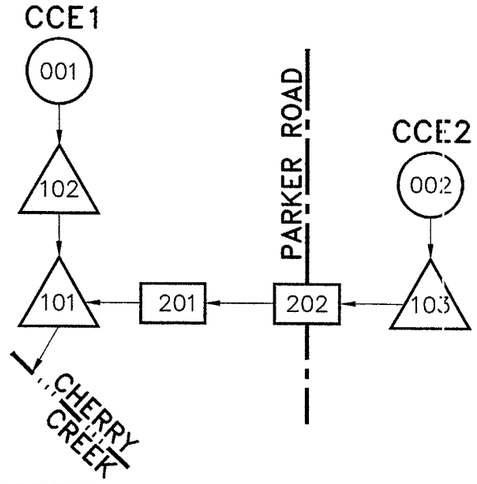
GROUND CONTROL SURVEY BY:	LANDMARK MAPPING, LTD.	Farnsworth & Polk — a member of the Farnsworth Wylie Group, 2996 S. Colorado Blvd. Ste. 250, Denver, Colorado 80222, (303) 692-8888 * phone, (303) 692-0470 * fax	DESIGNED MJN DATE 02-23-01 DRAWN EJM DATE 02-23-01 CHECKED RJU DATE 02-23-01 REVISED ____ DATE ____ REVISED ____ DATE ____	TOWN OF PARKER • DOUGLAS COUNTY URBAN DRAINAGE & FLOOD CONTROL DISTRICT	COTTONWOOD AREA OF PARKER OUTFALL SYSTEMS PLANNING	EXISTING OUTFALL STRUCTURES MAP	FIGURE A-6
AERIAL PHOTOGRAPHY BY:							
TOPOGRAPHIC MAPPING BY:							
CONTOUR INTERVAL: 2 FOOT	DATE FLOWN: 1/19/99						



COTTONWOOD SOUTH, MIDDLE AND NORTH



SIERRA VISTA



COTTONWOOD COMMERCIAL EAST

FARNSWORTH & POLK
a member of the Farnsworth Wylie Group
2996 S. Colorado Blvd. Ste. 250
Denver, Colorado 80222
(303) 692-8888 * phone
(303) 692-0470 * fax

DESIGNED	MJN	DATE	02-23-01
DRAWN	EJM	DATE	02-23-01
CHECKED	RJU	DATE	02-23-01
REVISED		DATE	
REVISED		DATE	

TOWN OF PARKER • DOUGLAS COUNTY
URBAN DRAINAGE & FLOOD CONTROL DISTRICT

COTTONWOOD AREA OF PARKER
OUTFALL SYSTEMS PLANNING

SWMM ROUTING
SCHEMATICS

FIGURE
A-8

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CS2

CN1

CN2

CM1

CM2

CM3

CS3

CS4

CS5

CS6

CCE2

EPN1

EPN2

EPS1

NORTH

200 0 100 200 400

SCALE IN F

VISTAS AT KINGS POINT SITE

MATCHLINE SEE DRAWING 4

COTTONWOOD SYSTEM
REACH I
G.L.C.
STA. 1+40 TO 17+50
53.5' R.O.W.

G.S.B. DROP STRUCTURE (TYP.)

EXISTING (2) 60" RCP's
NO IMPROVEMENTS

COTTONWOOD SYSTEM
PROFILE #3, SEE
DRAWING 11

CN2 DETENTION FACILITY
Q_{100} (IN) = 542 cfs
Q_{100} (OUT) = 115 cfs
V_{100} = 14.0 Ac. ft.
WQCV = 1.3 Ac. ft.

G.S.B. DROP STRUCTURE

COTTONWOOD SYSTEM
REACH B
G.L.C.
STA. 19+50 TO 27+80
90' R.O.W.

COTTONWOOD SYSTEM
REACH I
G.L.C.
STA. 0+00 TO 1+40
57.5' R.O.W.

COTTONWOOD SYSTEM
REACH D
G.L.C.
STA. 34+35 TO 45+00
71' R.O.W.

COTTONWOOD SYSTEM
REACH H
STA. 14+00 TO 28+40
65'L x 63'W R.O.W. AT
EACH CHECK STRUCTURE

CM1 DETENTION FACILITY
Q_{100} (IN) = 720 cfs
Q_{100} (OUT) = 325 cfs
V_{100} = 16.4 Ac. ft.
WQCV = 1.5 Ac. ft.

GROUTED BOULDER ENERGY DISSIPATION BASIN

COTTONWOOD SYSTEM
REACH G
G.L.C.
STA. 5+60 TO 14+00
66' R.O.W.

CM3 DETENTION FACILITY
Q_{100} (IN) = 576 cfs
Q_{100} (OUT) = 145 cfs
V_{100} = 14.8 Ac. ft.
WQCV = 1.3 Ac. ft.

FUTURE COTTONWOOD DRIVE (BY OTHERS)

DOUBLE 8'Wx6'H RCBC
STA. 45+00 TO 52+00

G.S.B. DROP STRUCTURE

COTTONWOOD SYSTEM
PROFILE #2, SEE
DRAWING 12

COTTONWOOD SYSTEM
REACH H
G.L.C.
STA. 28+40 TO 30+40
48' R.O.W.

COTTONWOOD SYSTEM
REACH C
G.L.C.
STA. 27+80 TO 34+35
88.5' R.O.W.

COTTONWOOD SYSTEM
REACH E
G.L.C.
STA. 52+00 TO 63+80
50' R.O.W.

TYPE M RIPRAP TRANSITION (TYP.)

COTTONWOOD COMMERCIAL EAST, SEE DRAWING 5

REPLACE EXISTING 24" CMP WITH 60" RCP
STA. 93+25 TO 93+90

G.S.B. DROP STRUCTURE (TYP.)

G.S.B. DROP STRUCTURE

COTTONWOOD SYSTEM
REACH F
STA. 68+15 TO 82+30
65'L x 60'W R.O.W. AT
EACH CHECK STRUCTURE

CS5 DETENTION FACILITY
Q_{100} (IN) = 377 cfs
Q_{100} (OUT) = 150 cfs
V_{100} = 17.5 Ac. ft.
WQCV = 1.6 Ac. ft.

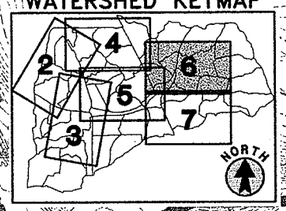
CHECK STRUCTURE (TYP.)

COTTONWOOD SYSTEM
PROFILE #1, SEE
DRAWING 11

COTTONWOOD SYSTEM
REACH F
G.L.C.
STA. 82+30 TO 93+25
57' R.O.W.

LOOKOUT DRIVE

WATERSHED KEYMAP



NOTES:

1. THIS DRAWING IS FOR MASTER PLANNING PURPOSES AND REPRESENTS PRELIMINARY AND CONCEPTUAL ENGINEERING. ALTERNATIVES TO THIS OUTFALL SYSTEM WILL BE CONSIDERED BY LOCAL REVIEWING AGENCIES AND THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT PROVIDED THE ALTERNATIVE OFFERS EQUAL HYDRAULIC CAPACITY AND STREAM STABILITY. THE ALTERNATIVE MUST COMPLY WITH ALL REQUIREMENTS OF THE LOCAL JURISDICTION AND THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.

2. THE TOWN OF PARKER AND DOUGLAS COUNTY MANAGE AND REGULATE ALL LAND DEVELOPMENT AND REDEVELOPMENT WITHIN THE 100-YEAR FLOODPLAINS OF THIS WATERSHED SO AS TO PREVENT FUTURE FLOOD DAMAGES BY FOLLOWING THE RECOMMENDATIONS OF THIS PLAN.

W:\FP\99037\EXHIBITS\OSP\FINAL\99037OW-5.DWG 3-7-01 12:09:58 pm EST

GROUND CONTROL SURVEY BY:
AERIAL PHOTOGRAPHY BY: LANDMARK MAPPING, LTD.
TOPOGRAPHIC MAPPING BY:
CONTOUR INTERVAL: 2 FOOT DATE FLOWN: 1/19/99

FARNSWORTH & POLK
a member of the Farnsworth Ryhn Group
2996 S. Colorado Blvd. Ste. 250
Denver, Colorado 80222
(303) 692-8555 • phone
(303) 692-0470 • fax

DESIGNED	MJN/CJC	DATE	02-23-01
DRAWN	CJM	DATE	02-23-01
CHECKED	SSK/MJN	DATE	02-23-01
REVISED		DATE	
REVISED		DATE	

TOWN OF PARKER • DOUGLAS COUNTY
URBAN DRAINAGE & FLOOD CONTROL DISTRICT

COTTONWOOD AREA OF PARKER
OUTFALL SYSTEMS PLANNING

COTTONWOOD PLAN

DRAWING
6

EXCERPTS FROM

FINAL DRAINAGE REPORT
FOR
CROWN POINT

Prepared for:

CCG, Inc.
6350 LBJ Freeway, Suite 264
Dallas, Tx 75240
(972) 385-2244
Contact: Jay Chiles

Prepared by:

JR ENGINEERING, LTD.
6020 Greenwood Plaza Blvd.
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(303) 740-9393
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TOWN OF PARKER
JUN 0 1 2000
PLANNING DEPT.

June 21, 1999
Revised November 15, 1999
Job Number 4187.00

The 81.9 acres of the project site east of E-470 together with the offsite flows drain through the Cottonwood Drive underpass.

Sub-Basin Description

Three offsite basins drain onto the site. From north to south they have been named OS-1, OS-2, and OS-3. These correspond to basins 1A5, 1A2, and 3A in the Holland report. Resepectively, the 100-year flowrates onto the project site at these locations are 450 cfs, 294 cfs, and 230 cfs.

The site has been divided into three major basins for analysis: Major Basin A contain the 81.9 acres of land draining to the Cottonwood Drive underpass. Major Basin B contains the 63.6 acres encompassing the west parcel of the site. Major Basin C contains the 131.7 acres that drain to the southwest corner of the site.

The three major basins have been divided further into sub-basins as shown on the Final Drainage Plan in order to aid in the sizing of onsite storm sewer. Basins A-1 through A-7 drain to a detention facility adjacent to the east end of the Cottonwood Drive underpass. Basins B-1 through B-4 drain to a water quality facility to be located immediately southeast of the intersection of Parker Road and Cottonwood Drive. Basins C-1 through C-8 drain to a water quality facility to be located adjacent to the southerly intersection of Parker Road and Crown Point Drive. Various basins above were joined together to perform the CUHP\SWMM analysis (See Appendix A: CUHP\SWMM software output).

DRAINAGE DESIGN CRITERIA

Development Criteria Reference and Constraints

The Town of Parker's Storm Drainage and Environmental Criteria Manual (SDECM) as well as the Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual (USDCM) were used in the preparation of this report.

The proposed drainage system will include five facilities to provide only detention, and three

the curb and gutter. As each site develops, the particular drainage system for that site will be designed. As a rule, run-off will be collected within each site rather than being allowed to drain to the collector roadways. Storm sewer has been designed at this time to provide the method of conveyance from the retail sites to the detention and water quality facilities. Runoff in the collector roadways will be conveyed in the curb and gutter to storm sewer inlets, which will convey flows to the detention and water quality facilities.

All runoff from Major Basin A and Major basin B, plus offsite basins OS-1 and OS-2 will release (below historic rates) into an existing 8' x 12' CMP arch pipe storm sewer beneath Parker Road located immediately northwest of the project site. This storm sewer drains through Cottonwood Filing No. 2, then releases into Cherry Creek approximately one-third mile west of the project site.

All runoff from the south basin plus offsite basin OS-3 will release into three existing 60" CMPs beneath Parker Road located approximately 500 feet south of the eastbound E-470 off ramp. This storm sewer conveys flows to a plant nursery on the west side of Parker Road where flows are allowed to spread into a sheet flow condition toward Cherry Creek approximately one-quarter mile to the west.

Specific Details

During the 100-year storm event, a total of 974 cfs enter the project from three offsite drainage basins. Town criteria allows the 272.8-acre project site to release at a rate of 0.85 cfs/acre or at the historic rate (whichever is less) At 0.85 cfs/acre the project site is allowed to release at a rate of 1246.8 cfs. The historic release from the site according to the Holland Report is 942 cfs. Therefore, the site has been designed to release at or below the historic rates. The allowable release rate is divided between the northwest corner of the site (615 cfs) and the southwest corner of the site (327 cfs).

In order to reduce flows through the site, separate detention facilities will be located in the open space area where each of the three offsite drainage basins enter the site. This will reduce the OS-1 peak flow from 460 cfs to 217.8 cfs. The OS-2 peak flow will be reduced from 281 cfs to 132 cfs,

and the OS-3 peak flow will be reduced from 235 cfs to 88 cfs. This will enable smaller detention facilities to be used within the site. By reducing the offsite flows being conveyed through the site this will enable there to be no detention of runoff from Major Basin B and the lower portion of Major Basin C. Runoff from these basins will receive only water quality treatment, but flows will still be released from the site below the allowable regulated rates.

Runoff generated within Major Basin A (81.9 acres) will drain to a detention and water quality facility on the west side of the basin. The peak inflow rate to this facility will be 328 cfs and the peak release rate will be 180 cfs. The water quality facilities are sized to provide treatment for all onsite lands.

Runoff generated within Major Basin B (65.6 acres) will drain to the aforementioned water quality facility in the northwest corner of the site, and will then be released with flows from Major Basin A and offsite basins OS-1 and OS-2 to an existing 8' x 12' CMP arch culvert beneath Parker Road located immediately northwest of the project site. This flow will continue within storm sewer until it releases into Cherry Creek approximately one-half mile west of the project site. The allowable release rate from the northwest corner of the site is 615 cfs. Only 583 cfs will be released during the 100-year storm event. Therefore, the release rate from this location will be 32 cfs below that which is allowed by Town criteria.

Run-off generated within Major Basin C will drain to one of four water quality facilities to be located onsite. All flows will exit the site through three existing 60" CMPs adjacent to the southerly intersection of Cottonwood Drive and Parker Road. At this location this flow will combine with the flow released from Detention Facility OS-3. The allowable release rate at this location is 327 cfs. The proposed 100-year release rate is 304 cfs. Therefore, the release rate from this location will be 23 cfs less than that allowed by Town criteria. The land between the outlet of these culverts and Cherry Creek is a plant nursery. The nursery should suffer no adverse effects from Crown Point drainage as the release rate from the site is not increasing.

To summarize the concept set forth regarding the release of flows from the project site:

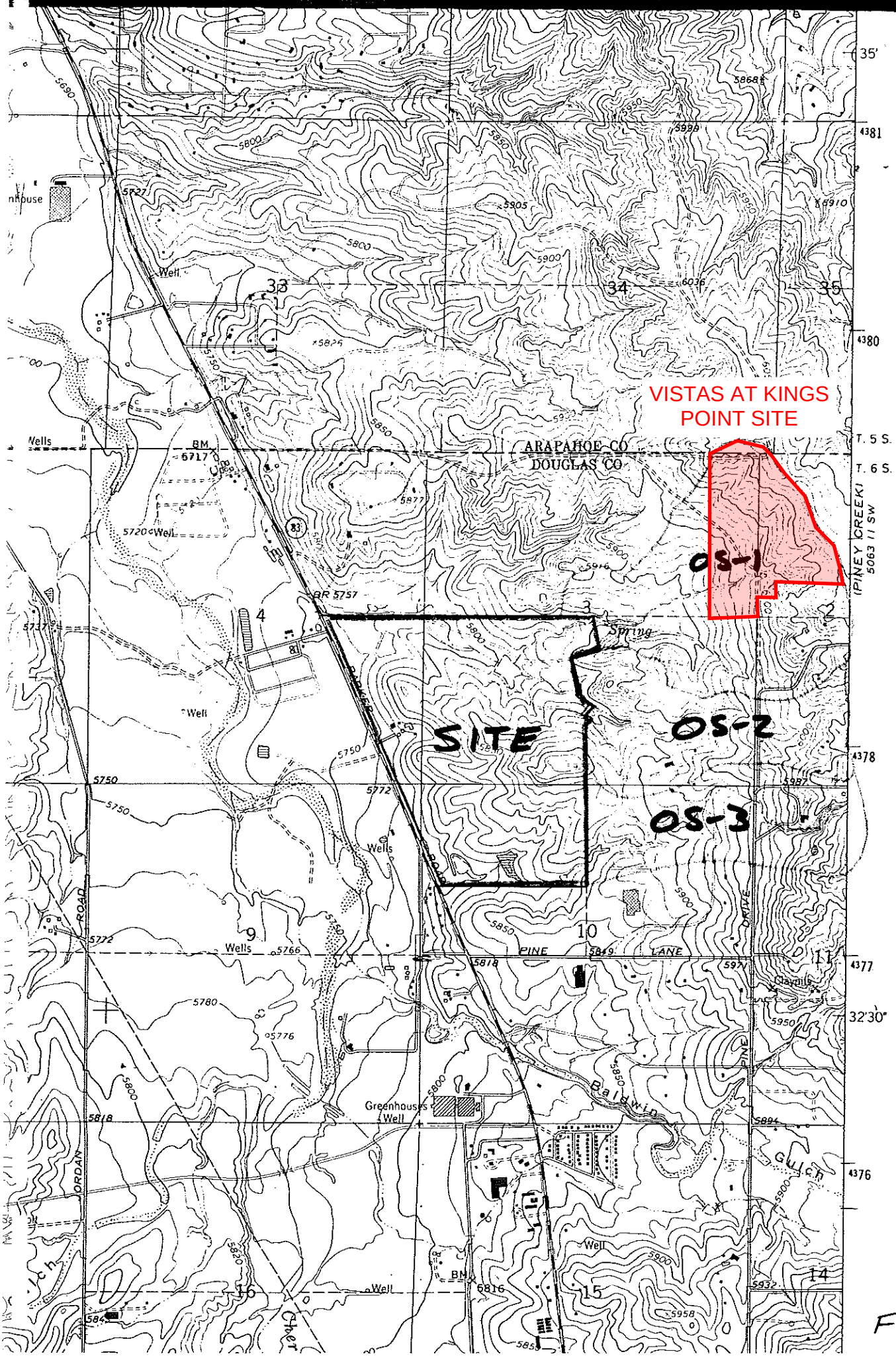

VISTAS AT KINGS POINT SITE
OS-1
OS-2
OS-3
SITE
ARAPAHOE CO
DOUGLAS CO
T. 5 S.
T. 6 S.
PINEY CREEK
Spring
Well
Wells
Greenhouses
Baldwin
PINE
LANE
DRIVE
ROAD
Claymills
Gulch
BM 5717
BM 5816
BR 5757
4381
4380
4379
4378
4377
4376
32'30"

Figure 1

OS-1 = SWMM element # 300

100 yr. outlet dia =	5.0 ft	
Q100 =	217.6 cfs	
C =	0.6	
g =	32.2 ft/s^2	
100 yr. W.S.E. =	43.99 ft	
invert =	35.00 ft	
h =	6.49 ft	(h = 100 yr W.S.E. - (dia/2+invert))
A =	17.7 ft^2	
100 yr.orifice dia =	4.8 ft	

Set orifice dia. and area constant then solve for Q by changing the head value.
This calculates outflow that corresponds to pond elevations and storage values.

Constants:

A =	17.7 ft^2
dia =	4.8 ft

* Storage values were calculated from the pond volume sheets.

Q = A*c*(2*g*h)^.5

elev	h	Qout	Storage
44	6.5	217.8	13.11
43	5.5	200.3	10.95
42	4.5	181.2	8.87
41	3.5	159.8	6.94
40	2.5	135.1	5.15
39	1.5	104.6	3.52
38	0.5	60.4	1.95
37	-	-	0.72
36	-	-	0.11
35	-	-	0.00

OS-2 = SWMM element # 301

100 yr. outlet dia =	4.0 ft	
Q100 =	132.0 cfs	
C =	0.6	
g =	32.2 ft/s^2	
100 yr. W.S.E. =	42.95 ft	
invert =	35.00 ft	
h =	5.95 ft	(h = 100 yr W.S.E. - (dia/2+invert))
A =	11.2 ft^2	
100 yr.orifice dia =	3.8 ft	

Set orifice dia. and area constant then solve for Q by changing the head value.
This calculates outflow that corresponds to pond elevations and storage values.

Constants:

A =	11.2 ft^2
dia =	3.8 ft

* Storage values were calculated from the pond volume sheets.

Q = A*c*(2*g*h)^.5

elev	h	Qout	Storage
43	6.0	132.6	8.51
42	5.0	121.0	6.24
41	4.0	108.2	4.16
40	3.0	93.7	3.22
39	2.0	76.5	1.85
38	1.0	54.1	0.93
37	0.0	-	0.36
36	-	-	0.06
35	-	-	0.00

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENSION DAMS ***

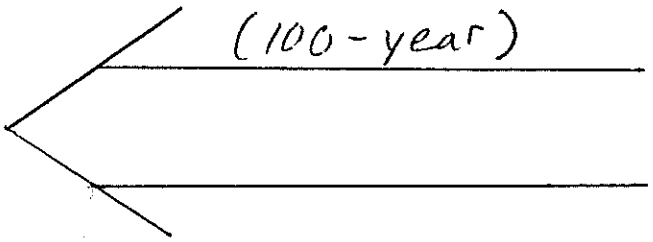
CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
102	281.	(DIRECT FLOW)	0	45.
101	460.	(DIRECT FLOW)	0	45.
104	348.	(DIRECT FLOW)	0	35.
301	132.	.1	8.4	1 25.
300	218.	.1	13.1	1 20.
107	257.	(DIRECT FLOW)	0	30.
106	235.	(DIRECT FLOW)	0	45.
302	180.	.1	5.7	0 50.
241	132.	2.2		1 25.
240	218.	2.7		1 20.
108	218.	(DIRECT FLOW)	0	30.
110	257.	(DIRECT FLOW)	0	30.
304	62.	.1	5.1	0 50.
303	88.	.1	9.6	1 40.
105	335.	(DIRECT FLOW)	0	35.
242	184.	2.6		0 50.
202	350.	3.5		1 20.
305	25.	.1	3.8	0 55.
306	33.	.1	4.2	0 55.
244	63.	1.8		0 55.
243	88.	1.8		1 40.
250	338.	2.6		0 35.
248	506.	3.1		1 10.
245	25.	1.1		0 35.
246	34.	1.6		0 40.
109	170.	(DIRECT FLOW)	0	35.
247	143.	2.9		1 20.
251	583.	(DIRECT FLOW)	0	40.
213	304.	(DIRECT FLOW)	0	35.

1

Runoff into Pond OS-1

Release from Pond OS-1

SWMM Results (100-year)



ENDPROGRAM PROGRAM CALLED

0.

250	338.	2.6	0	35.
248	506.	3.1	1	10.
245	25.	1.1	0	35.
246	34.	1.6	0	40.
109	170.	(DIRECT FLOW)	0	35.
247	143.	2.9	1	20.
251	583.	(DIRECT FLOW)	0	40.
213	304.	(DIRECT		

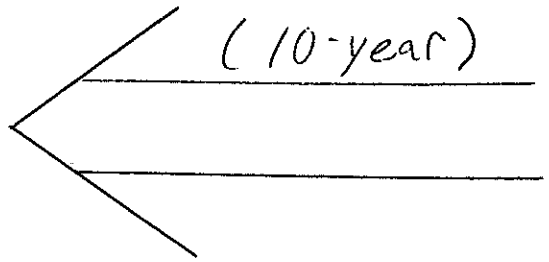
CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
102	105.	(DIRECT FLOW)		0 40.
101	191.	(DIRECT FLOW)		0 40.
104	191.	(DIRECT FLOW)		0 30.
301	74.	.1	1.7 1 0.	
300	113.	.1	4.0 1 0.	
107	131.	(DIRECT FLOW)		0 25.
106	96.	(DIRECT FLOW)		0 40.
302	110.	.1	3.7 0 45.	
241	74.	1.6	1 5.	
240	113.	1.8	1 0.	
108	127.	(DIRECT FLOW)		0 25.
110	158.	(DIRECT FLOW)		0 25.
304	36.	.1	2.9 0 45.	
303	47.	.1	2.6 1 20.	
105	195.	(DIRECT FLOW)		0 30.
242	108.	1.9	0 45.	
202	187.	2.4	1 5.	
305	16.	.1	2.1 0 45.	
306	24.	.1	2.5 0 40.	
244	36.	1.3	0 45.	
243	47.	1.2	1 20.	
250	196.	2.0	0 30.	
248	278.	2.3	0 55.	
245	17.	.8	0 45.	
246	24.	1.2	0 45.	
109	103.	(DIRECT FLOW)		0 30.
247	78.	1.8	0 50.	
251	319.	(DIRECT FLOW)		0 50.
213	151.	(DIRECT FLOW)		0 35.

1

Runoff into Pond OS-1

Release from Pond OS-1

SWMM Results (10-year)



ENDPROGRAM PROGRAM CALLED

0.

250	196.	2.0	0 30.	
248	278.	2.3	0 55.	
245	17.	.8	0 45.	
246	24.	1.2	0 45.	
109	103.	(DIRECT FLOW)		0 30.
247	78.	1.8	0 50.	
251	319.	(DIRECT FLOW)		0 50.
213	151.	(DIRECT FLOW)		0 35.

1

ENDPROGRAM PROGRAM C

Pond Volume

100-year release rate = 217.6 cfs
10-year release rate = 113 cfs

Volume=1/3 x Depth x (A+B+(A*B)^0.5)
A - Upper Surface
B - Lower Surface

Project Name: Crown Point
Project No. 4187.00
By: BK
Checked By:
Date: 9/14/99

Pond OS-1 = # 300

Elevation	Surface Area (square feet)	A+B+(A*B)^0.5	1/3	Depth (feet)	Volume (cubic feet)	CumulativeVolume (cubic feet)
5835.00	0	0.00	0.00	0.00	0	0
5836.00	13995	13995.00	4665.00	1.00	4665	4665
5837.00	41752	79919.70	26639.90	1.00	26640	31305
5838.00	66252	160598.23	53532.74	1.00	53533	84838
5839.00	71069	205939.24	68646.41	1.00	68646	153484
5840.00	75551	212551.89	70850.63	1.00	70851	224335
5841.00	80113	233462.57	77820.86	1.00	77821	302156
5842.00	88009	252090.24	84030.08	1.00	84030	386186
5843.00	94010	272979.02	90993.01	1.00	90993	477179
5844.00	100241	282176.09	94058.70	1.00	94059	571237

100-yr WS = 5843.99
Storage = 570,636 cf = 13.1 ac-ft

10-yr WS = 5839.72
Storage = 204,732 cf = 4.7 ac-ft

FINAL DRAINAGE PLAN
CROWN POINT

LEGEND

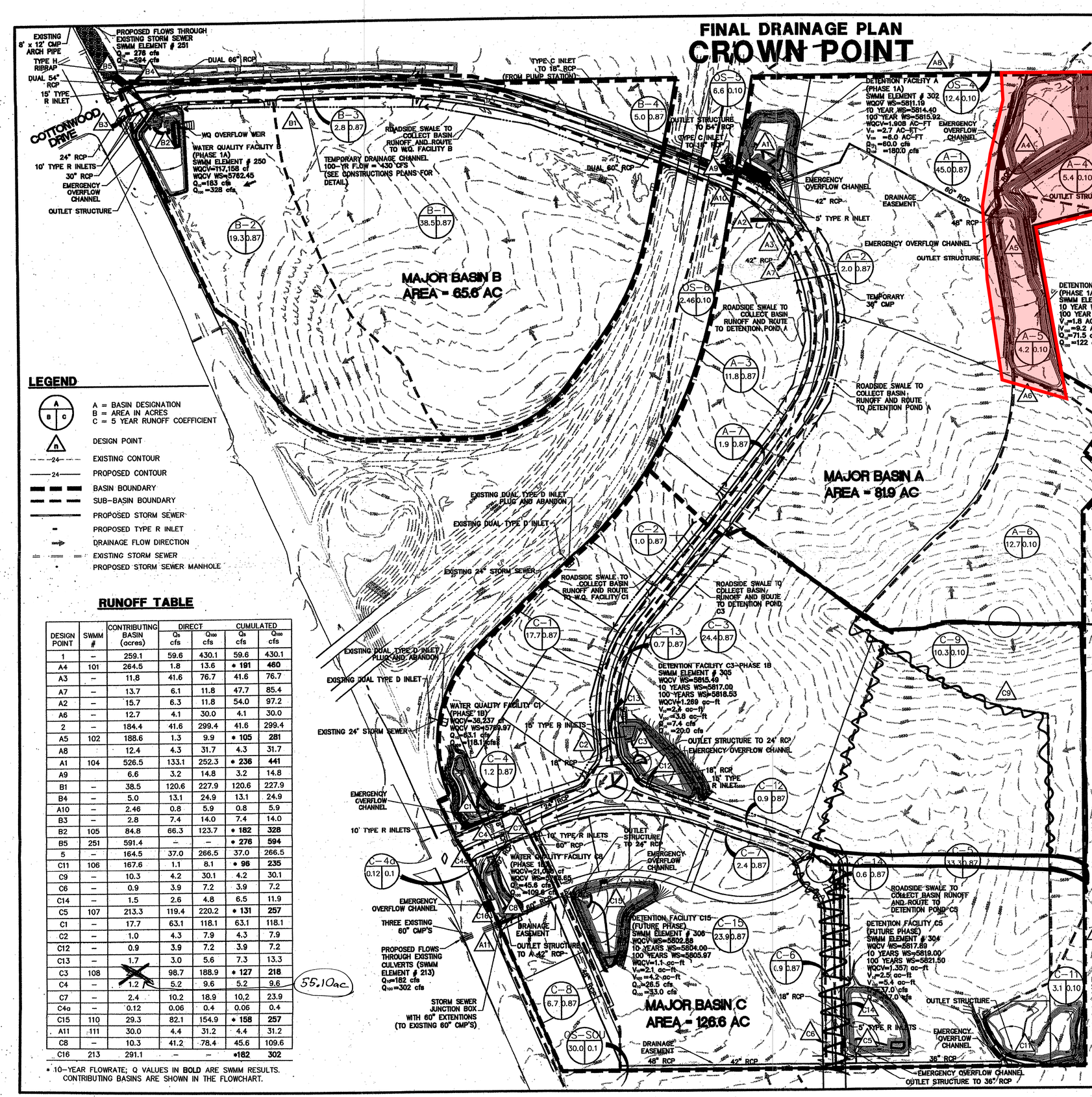
- A = BASIN DESIGNATION
- B = AREA IN ACRES
- C = 5 YEAR RUNOFF COEFFICIENT
- DESIGN POINT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- PROPOSED STORM SEWER
- PROPOSED TYPE R INLET
- DRAINAGE FLOW DIRECTION
- EXISTING STORM SEWER
- PROPOSED STORM SEWER MANHOLE

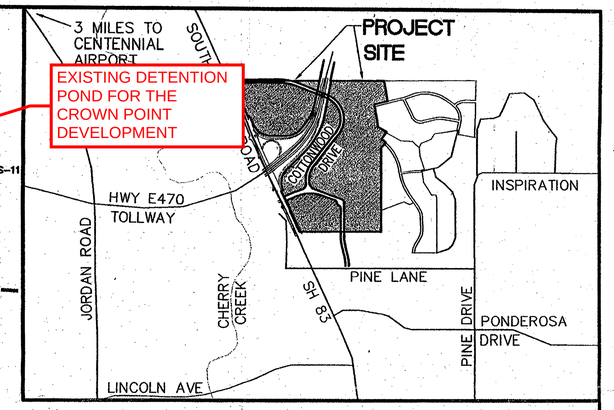
RUNOFF TABLE

DESIGN POINT	SWMM #	CONTRIBUTING BASIN (acres)	DIRECT Q_5 cfs	DIRECT Q_{100} cfs	CUMULATED Q_5 cfs	CUMULATED Q_{100} cfs
1	–	259.1	59.6	430.1	59.6	430.1
A4	101	264.5	1.8	13.6	• 191	460
A3	–	11.8	41.6	76.7	41.6	76.7
A7	–	13.7	6.1	11.8	47.7	85.4
A2	–	15.7	6.3	11.8	54.0	97.2
A6	–	12.7	4.1	30.0	4.1	30.0
2	–	184.4	41.6	299.4	41.6	299.4
A5	102	188.6	1.3	9.9	• 105	281
A8		12.4	4.3	31.7	4.3	31.7
A1	104	526.5	133.1	252.3	• 236	441
A9		6.6	3.2	14.8	3.2	14.8
B1	–	38.5	120.6	227.9	120.6	227.9
B4	–	5.0	13.1	24.9	13.1	24.9
A10	–	2.46	0.8	5.9	0.8	5.9
B3	–	2.8	7.4	14.0	7.4	14.0
B2	105	84.8	66.3	123.7	• 182	328
B5	251	591.4	–	–	• 276	594
5	–	164.5	37.0	266.5	37.0	266.5
C11	106	167.6	1.1	8.1	• 96	235
C9	–	10.3	4.2	30.1	4.2	30.1
C6	–	0.9	3.9	7.2	3.9	7.2
C14	–	1.5	2.6	4.8	6.5	11.9
C5	107	213.3	119.4	220.2	• 131	257
C1	–	17.7	63.1	118.1	63.1	118.1
C2	–	1.0	4.3	7.9	4.3	7.9
C12	–	0.9	3.9	7.2	3.9	7.2
C13	–	1.7	3.0	5.6	7.3	13.3
C3	108	98.7	188.9	• 127	218
C4	–	1.2	5.2	9.6	5.2	9.6
C7	–	2.4	10.2	18.9	10.2	23.9
C4a	–	0.12	0.06	0.4	0.06	0.4
C15	110	29.3	82.1	154.9	• 158	257
A11	111	30.0	4.4	31.2	4.4	31.2
C8	–	10.3	41.2	78.4	45.6	109.6
C16	213	291.1	–	–	•182	302

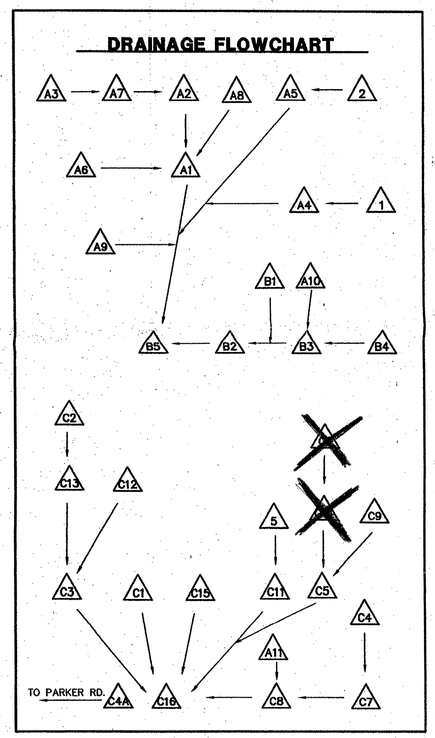
55.10ac

• 10-YEAR FLOWRATE; Q VALUES IN **BOLD** ARE SWMM RESULTS. CONTRIBUTING BASINS ARE SHOWN IN THE FLOWCHART.





VICINITY MAP
SCALE 1" = 2000'



ENGINEER'S CERTIFICATION

PREPARED UNDER MY SUPERVISION.

JAMES T. JONES, P.E. — DATE

COLORADO NO. 19606

FOR AND ON BEHALF OF JR ENGINEERING, LTD.

FINAL DRAINAGE PLAN
CROWN POINT
JOB NO. 4187.00
DATE: SEPTEMBER 7, 2000
DR1 OF 1

JR Engineering, Ltd.
6020 Greenwood Plaza Blvd.
Englewood, Colorado 80111
Tel. (303) 740-9393
FAX (303) 721-9019

ENGINEERING/PLANNING/SURVEYING

REV. 9/27/99, 10/27/99, 11/11/99

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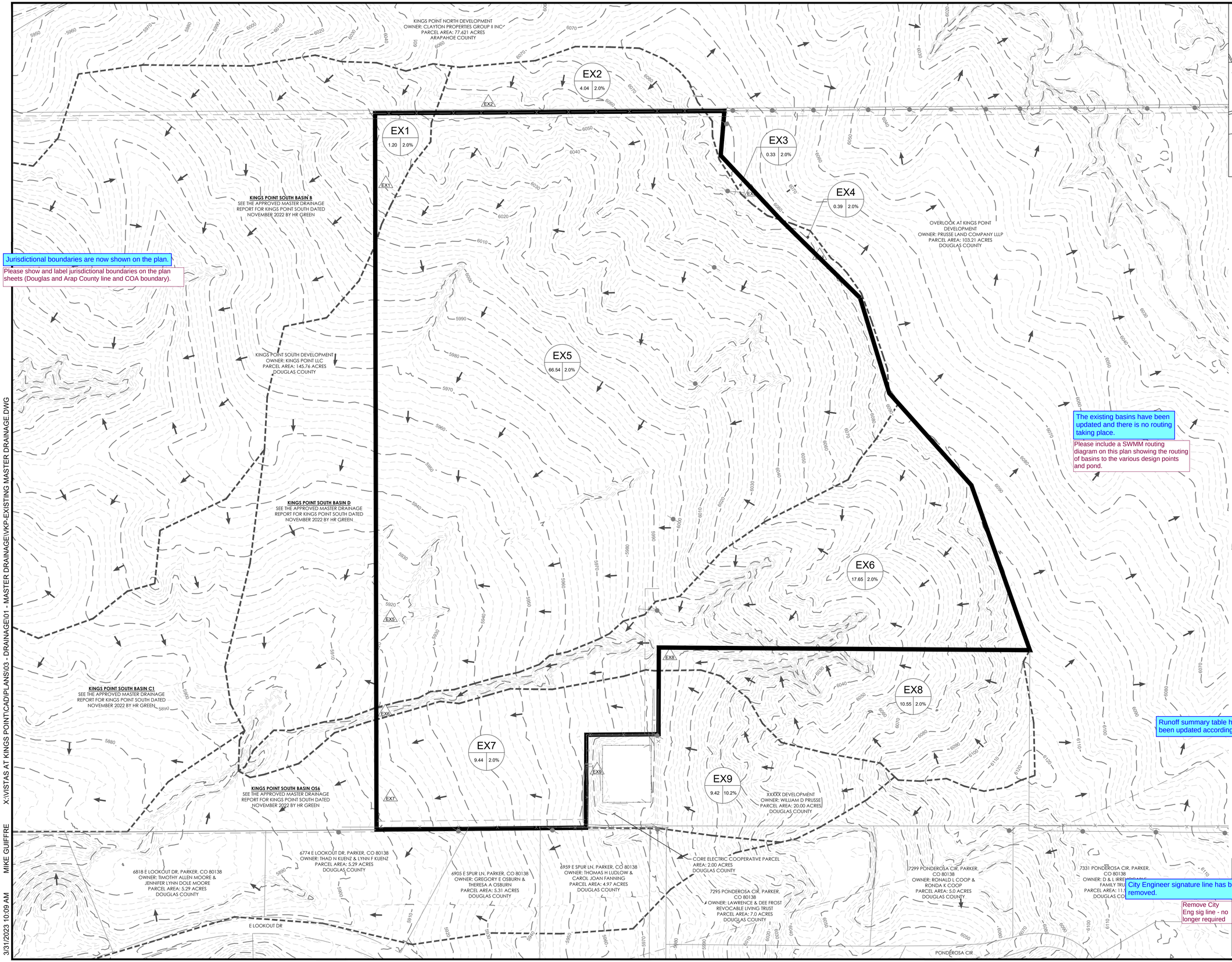
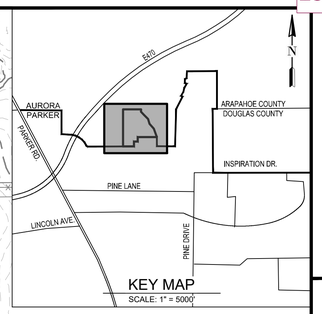
1st Review



Jurisdictional boundaries are now shown on the plan.

Please show and label jurisdictional boundaries on the plan sheets (Douglas and Arap County line and COA boundary).



LEGEND

- PROJECT BOUNDARY
- 4880 PROPOSED MAJOR CONTOUR
- 4878 PROPOSED MINOR CONTOUR
- PROPOSED DRAINAGE BASIN MAJOR
- PROPOSED DRAINAGE BASIN MINOR
- EXISTING DRAINAGE BASIN MAJOR
- EXISTING DRAINAGE BASIN MINOR
- DRAINAGE SWALE

EXISTING	PROPOSED	
EX-1	PR-1	BASIN DESIGNATION
AREA X.XX (AC) / 0.XX / 0.XX	AREA X.XX (AC) / 0.XX / 0.XX	MINOR RUNOFF COEFFICIENT / MAJOR RUNOFF COEFFICIENT

DIRECTIONAL FLOW ARROW

EX-1 / PR-1 DESIGN POINT

EMERGENCY OVERFLOW ROUTE

The existing basins have been updated and there is no routing taking place.

Please include a SWMM routing diagram on this plan showing the routing of basins to the various design points and pond.

NOTES:

1. CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH 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 SHALL BE CONFORMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
2. ENSURE THAT THE PROVISIONS OF CRS 37-92-602, AS AMENDED BY SENATE BILL 15-212, REGARDING NOTIFICATION OF DOWNSTREAM WATER RIGHTS HOLDERS ARE UPHELD
3. FLOOD INSURANCE RATE MAP XXXXXXXXXXXXXX
4. ALL STORM INFRASTRUCTURE SHOWN IS PUBLIC AND SIZED FOR THE 100-YEAR EVENT UNLESS OTHERWISE NOTED.
5. STORM INFRASTRUCTURE SHOWN MY NOT BE IN ITS FINAL LOCATION. ADDITIONAL STORM SEWER MY BE REQUIRED WITH PRELIMINARY AND FINAL DRAINAGE REPORTS.
6. DETENTION PONDS SHALL BE PRIVATE AND MAINTAINED BY THE HOA OR METRO DISTRICT. PONDS SHOWN ARE CONCEPTUAL IN NATURE ONLY, ACTUAL SIZE, SHAPE AND LOCATION MAY VARY.
7. CULVERTS SHALL BE PROVIDED WITH AN EMERGENCY OVERFLOW PATH THAT DOES NOT ENCROACH INTO ANY RESIDENTIAL LOTS.
8. AT ALL CULVERTS, THE ADJACENT FINISHED FLOOR ELEVATIONS SHALL BE AT LEAST 1' ABOVE THE EMERGENCY WATER SURFACE ELEVATION OVER THE ROADWAY.

Runoff summary table has been updated accordingly.

Table below must also show:
- areas, % imperv for basins.
-Routed/accumulated flows at DP's

RUNOFF SUMMARY TABLE		
BASIN ID	2-YEAR EVENT (CFS)	100-YEAR EVENT (CFS)
EX1	1	1
EX2	4	4
EX3	0	0
EX4	0	0
EX5	0	90
EX6	0	22
EX7	0	12
EX8	0	13
EX9	1	14

APPROVED ONE YEAR FROM THIS DATE

City Engineer signature line has been removed.

Remove City Eng sig line - no longer required

CITY ENGINEER _____ DATE _____

WATER DEPARTMENT _____ DATE _____

terracina design
10200 E. Grand Ave, A-314
Denver, CO 80231
ph. 303.632.8867

EXISTING MASTER DRAINAGE MAP

VISTAS AT KINGS POINT

N

0 150'

1" = 150'

3/31/2023

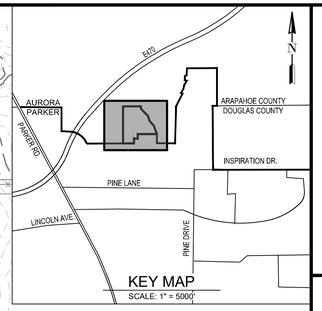
1 OF 2

3/31/2023 10:09 AM MIKE GUIFFRE X:\VISTAS AT KINGS POINT\CAD\PLANS\03 - DRAINAGE\E01 - MASTER DRAINAGE\VKP-EXISTING MASTER DRAINAGE.DWG

PROPOSED MASTER DRAINAGE MAP

VISTAS AT KINGS POINT

terracina design
10200 E. Grand Ave, A-314
Denver, CO 80231
ph. 303.632.8867



KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

OS1 — 1.52 — 100.0%
OS2 — 3.11 — 45.0%
OS3 — 1.66 — 100.0%

AURORA PARKWAY
6-LANE ARTERIAL
(144' ROW)

PA-1
MULTI FAMILY / TOWNHOUSE
9.6 AC.
20.0 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

PA-5
NEIGHBORHOOD
PARK
3.0 AC.

PA-2
RESIDENTIAL
12.5 AC.
2.4 DU/AC.

PA-7
OPEN SPACE
2.5 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

A1 — 93.52 — 42.6%

2-LANE COLLECTOR
(80' ROW)

OVERLOOK AT KINGS POINT
DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

OS4 — 4.16 — 19.5%

Basin OS4 appears to flow away from your site based on topo shwon here rather than into it. If flows away then does not need to be evaluated.

We are coordinating with the property to the east and currently the plan is to capture and detain the adjacent backyards in this area. This basin has been included in all calculations.

We do not foresee the use of culverts under the collector at this time. We will add culvert calculations if that changes.

Prelim sizing is required for any culverts under collector or arterial roadways. Additional sub-basin delineation may be needed if there will be any culverts.

PA-4
SCHOOL
6.0 AC.

PA-3
RESIDENTIAL
49.2 AC.
2.5 DU/AC.

We are now showing Pond A discharging at its historic location. We have maintained the outfall location for DP2 and we will work with the adjacent property owner to coordinate this discharge point.

Appears all outflows from your site and offsite trib areas are being directed to DP2. This though is not the historic outfall location for most of these areas and also differs from where the approved 223021 Kings Point South MDP assumed flows would be entering their site. Written acceptance from the adjacent property owner may be needed since this is a change from historic conditions and approved MDP. Also this would remove flow from Cottonwood Middle Trib Stream Management Corridor (SCM). SMC are generally required to be maintained with development and follow historic alignments. Input from MHFD also needed.

DETENTION POND A
TRIB. AREA =103.97 ACRES
Q100 (IN) = 218.5 CFS
Q100 (OUT) = 83.79
WQCV = 1.72 AC-FT
EURV = 5.39 AC-FT

Values have been updated per the MHFD pond spreadsheet.

SWMM modeling results differ from values here

Also list 100yr storage volume for Pond A

100 year volume has been added.

Callouts have been added.

Swale callouts would help - pretty difficult to see these lines.

Both of these "swales" would have significant flows and should be designed as channels.

This is now designed as a channel.

DETENTION
POND A

PA-8
OPEN SPACE
0.9 AC.

OS7 — 2.04 — 40.0%

OS6 — 7.39 — 2.0%

OS5 — 10.53 — 2.0%

XXXXX DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

Comment has been addressed.

"EMERGENCY OVERFLOW LOCATIONS" since applies to sump inlets, pond overflow, etc....

Comment has been addressed.

Comment has been addressed.

PRIVATE

Comment has been addressed.

AND GARAGES SHALL NOT BE INUNDATED

LEGEND

- PROJECT BOUNDARY
- 4880 — PROPOSED MAJOR CONTOUR
- 4878 — PROPOSED MINOR CONTOUR
- PROPOSED DRAINAGE BASIN MAJOR
- PROPOSED DRAINAGE BASIN MINOR
- EXISTING DRAINAGE BASIN MAJOR
- EXISTING DRAINAGE BASIN MINOR
- DRAINAGE SWALE

EXISTING / PROPOSED

EX-1 (AREA X.XX (AC), 0.XX, 0.XX) / PR-1 (AREA X.XX (AC), 0.XX, 0.XX) — BASIN DESIGNATION; MINOR RUNOFF COEFFICIENT; MAJOR RUNOFF COEFFICIENT

DIRECTIONAL FLOW ARROW

EX-1 / PR-1 — DESIGN POINT; EMERGENCY OVERFLOW ROUTE

NOTES:

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2. ENSURE THAT THE PROVISIONS OF CRS 37-92-602, AS AMENDED BY [illegible] TION OF DOWNSTREAM
3. FLOOD INSURANCE RATE MAP XXXXXXXXXXXXXX
4. ALL STORM INFRASTRUCTURE SHOWN IS PUBLIC AND SIZE [illegible] WISE NOTED.
5. [illegible] NOT BE IN ITS FINAL LOCATION. ADDITIONAL STORM SEWER MAY BE REQUIRED WITH PRELIMINARY AND FINAL DRAINAGE REPORTS.
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7. CULVERTS SHALL BE PROVIDED WITH AN EMERGENCY OVERFLOW PATH THAT DOES NOT ENCROACH INTO ANY RESIDENTIAL LOTS.
8. AT ~~ALL CULVERTS~~, THE ADJACENT FINISHED FLOOR ELEVATIONS SHALL BE AT LEAST 1' ABOVE THE EMERGENCY WATER SURFACE ELEVATION ~~OVER THE ROADWAY~~.

RUNOFF SUMMARY TABLE

BASIN ID	2-YEAR EVENT (CFS)	100-YEAR EVENT (CFS)
A1	41	229
OS1	0	1
OS2	2	10
OS3	4	11
OS4	0	6
OS5	0	5
OS6	0	5
OS7	1	6

Runoff summary table has been updated accordingly.

Table above must also show:
- areas, % imperv for basins.
-Routed/accumulated flows at DP's

Please include a SWMM routing diagram on this plan showing the routing of basins to the various design points and pond.

Routing diagram has been added to this plan.

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE & JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSBURN
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

7295 PONDEROSA CIR, PARKER, CO 80138
OWNER: LAWRENCE & DEE FROST REVOCABLE LIVING TRUST
PARCEL AREA: 7.0 ACRES
DOUGLAS COUNTY

7299 PONDEROSA CIR, PARKER, CO 80138
OWNER: RONALD L COOP & RONDA K COOP
PARCEL AREA: 5.0 ACRES
DOUGLAS COUNTY

7331 PONDEROSA CIR, PARKER, CO 80138
OWNER: D & L IRREVOCABLE FAMILY TRUST
PARCEL AREA: 11.95 ACRES
DOUGLAS COUNTY

E LOOKOUT DR

PONDEROSA CIR

N

0 150'

1" = 150'

3/31/2023

1 OF 2

3/31/2023 11:37 AM MIKE GUIFFRE X:\VISTAS AT KINGS POINT\CAD\PLANS\03 - DRAINAGE\01 - MASTER DRAINAGE\VKP-PROPOSED MASTER DRAINAGE.DWG

Extensive coordination is required between this development, the Prusse Development and KP South MUS team to ensure this MUS and others are in conformance with the KP South MUS

Terracina Design 1st FDP Submittal Comment Response

Further coordination between Overlook, Vistas, and Kings Point South has taken place and will continue throughout Master Plan process.

MA

THE VISTAS AT KINGS POINT
AURORA, COLORADO

Prepared for:

KINGS POINT INVESTMENTS, LLC
2707 E. Willamette Lane
Greenwood Village, CO 80121
Contact: Tim Sanford
Email: Tim@sanford-elliott.com

Prepared by:

Terracina Design
10200 E. Girard Ave., Suite A-314
Denver, CO 80231
Contact: David Bacci, PE
Phone: 303-632-8867

March 2022

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Appendices

Appendix A - Maps

Vicinity Map
Vistas at Kings Point Land Use Plan
Sanitary Map
Water Map

Appendix B - Water Demand Calculations and WaterCAD Model

Water Demand Calculations
WaterCAD Map
WaterCAD Output Tables

Appendix C – Sanitary Sewer Calculations

Sanitary Sewer Calculations
HydraFlow Pipe Capacities

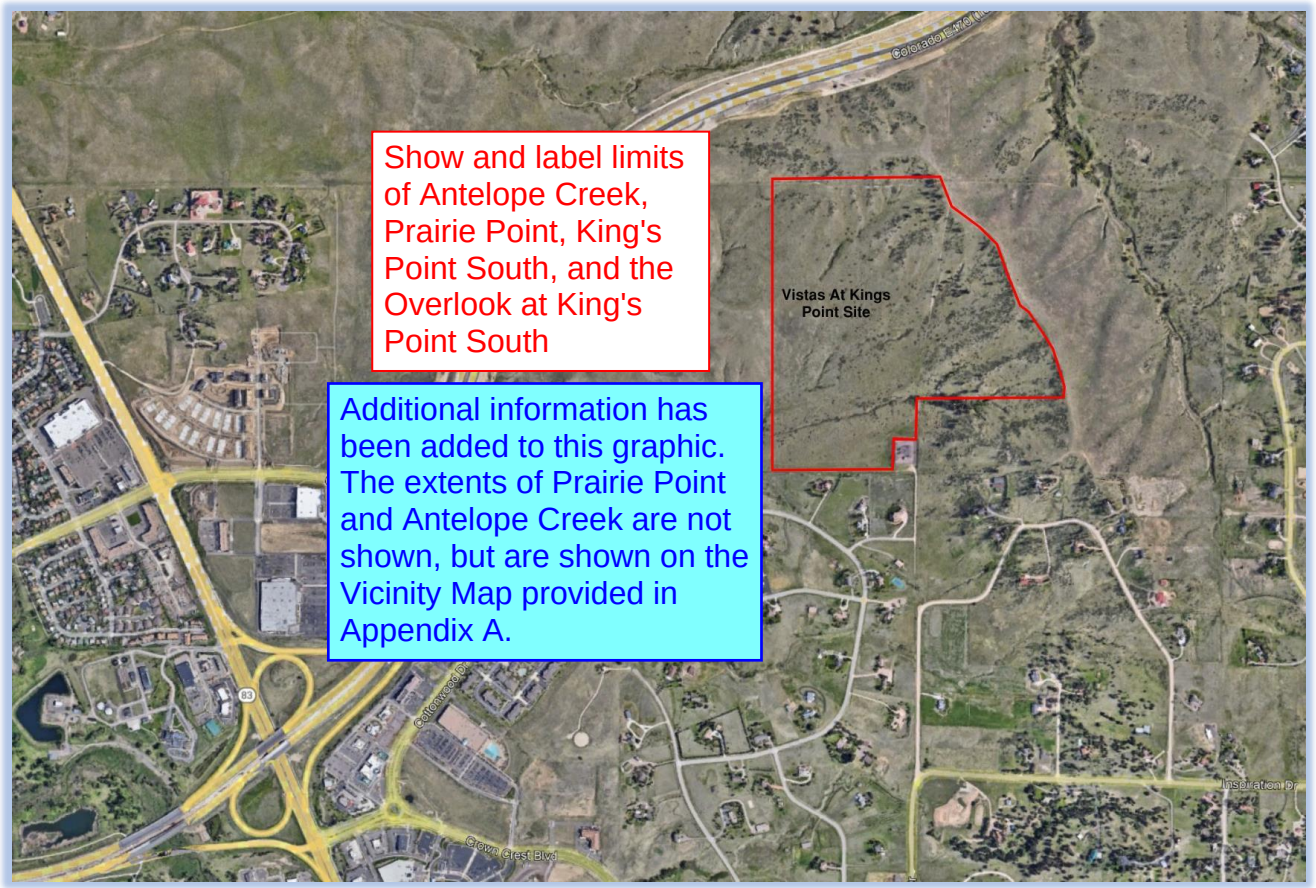
Appendix D – References

I. INTRODUCTION

The Vistas at Kings Point development (Site) is a residential development containing single-family and multi-family units, a park, open space, and a school site. The purpose of this Master Utility Report is to provide a conceptual utility design for water and sanitary infrastructure to serve the development. This Master Utility Report replaces prior reports for the area and includes updated calculations with additional evaluations for the Site. The proposed improvements outlined in this report and related utility plans are merely conceptual and may be altered in subsequent reports. The surrounding developments and individual filings will not be examined unless there is direct impact to the Site.

A. Site Location

The Site is located in a portion of the northwest quarter of Section 2 and the northeast quarter of Section 3, Township 6 South, Range 66 West of the 6th Principal Meridian, City of Aurora, County of Douglas, State of Colorado. The Site is bound by Highway E-470 to the north, Antelope Creek to the east, Sierra Vista No. 3 subdivision to the south, and vacant land to the west. Currently, there are several future developments adjacent to the site. To the north is Prairie Point South and Aurora Parkway (future), to the east is Overlook at Kings Point, and to the west is Kings Point South.



Only 292 units were accounted for in KP South MUS

A looped water line is required at all times during development

A statement regarding having a looped water line at all times during the phasing and construction of the Site has been added.

Further coordination between Overlook, Vistas, and Kings Point South has taken place. We have reached out to HR Green regarding the increased number of units. The lift station design can accommodate the additional flow, but we are waiting on further conformation from their pump manufacturer if the selected pumps will be adequate.

evelopm

95.18 acres of undeveloped land th
ark, open space, and a school site as outlined in the Vistas at Kings Point
epared by Terracina Design. Once fully developed, the Vistas at Kings
ave 140 single-family homes and 205 multi-family units. For the purpose
lling units per acre gathered from the Vistas at Kings Point South Master
me the maximum buildout of the Site. No phasing has been anticipated
ng areas being proposed within the Site. The purpose of this Master Utility
ny the Vistas at Kings Point Master Plan submittal.

previous reports that investigated the Site in its entirety. The Master Utility
South by HR Green, dated December 2022 calculated an anticipated
harging the Site as well as two internal water main connections between
s. The Site will utilize existing E-470 utility crossings the Master Utility Report
for Kings Point South prepared by HR Green. Further details are presented within this report.

See the Vistas at Kings Point South Master Plan prepared by Terracina Design located in Appendix A and the Public Improvement Plans (PIP) for additional details on the activation infrastructure requirements for the individual planning areas.

II. DOMESTIC WATER

A. System Layout

The City of Aurora (COA) water system will provide service to the Site. The planned development falls primarily within Pressure Zone 7 with portions of Pressure Zone 6 encroaching the property at the southwest and portions of Pressure Zone 8 encroaching the property to the southeast, as indicated on the City of Aurora's Capital Improvement Plan for Aurora Water, dated April 2018. The current ground elevations on the site range from roughly 6190' to 5778'. Pressure zones and Hydraulic Grade Lines (HGLs) are defined below:

Table 1 – Water Pressure Zones

Pressure Zone	HGL (ft)	Top Elevation (ft)	Bottom Elevation (psi)	Minimum Static Pressure (ft)	Maximum Static Pressure (psi)
6	6050	5930	5810	52	104
7	6190	6090	5930	43	113
8	6300	6185	6023	50	120

The domestic water supplied to the Site is dependent on the construction of Aurora Parkway and the 12 inch water line that will be located within Aurora Parkway. A minimum of two connections to the surrounding future domestic water infrastructure will need to be established to maintain a looped system during construction of the individual planning areas. At least one connection will be made to the future 12 inch water line located in Aurora Parkway, while two internal connections will be made to the future Kings Point South development situated west of the property, and one connection will be made to

Comment has been addressed.

South

located to the south of the Site. The suggested water system has currently been modeled with 8-inch and 12-inch PVC water lines interior to the Site. The majority of the Site is located within Pressure Zone 7. A visual representation of these lines can be found in the accompanying Water Demand Map.

B. Water System Design Criteria

The proposed water system to serve the Site conforms to the guidelines outlined in Section 5.00 of the City of Aurora Water, Sanitary Sewer, and Storm Drainage Infrastructure Standards and Specifications (COA Standards and Specifications) dated September 2019. Below are the relevant criteria used in the preliminary design of the water infrastructure:

- The water distribution system shall be analyzed to meet the Maximum Day demand plus Fire Flow Demand with a residual pressure of no less than 20 psi at any point within the water distribution system. Fire flow demand for residential use is 1,500 gpm for 2 hours and for industrial/school is 3,500 gpm.

- The minimum diameter for water mains in a single family detached residential area shall be 8-inch.

- 4-inch, 10-inch and 18-inch water mains are not ideal for the water infrastructure.

- The maximum velocity in waterlines 6-inch or smaller during the Maximum Hour Demand shall not exceed 2.5 fps.

- The maximum velocity in 8-inch to 12-inch mains during the Maximum Hour Demand shall not exceed 3.0 foot per second (fps)

- The design of the water distribution system should hold to the ratios of 4.5:1 for Maximum Hour Demand to Average Day Demand, and 2.8:1 for Max Day Demand to Average Day Demand.

- Water pipe mater shall be DIP or PVC pipe exclusively.

C. Water Demand Calculations

The water demand calculations have been completed and applied to the proposed water model in accordance with the COA Standards and Specifications. For the purpose of this report, the dwelling units per acre gathered from the Vistas at Kings Point South Master Plan created by Terracina Design was used to assume the maximum unit count of the Site.

The calculation of domestic water demand for residential development assumes an average of 101 gallons per capita per day (gpc/day) and assumes an occupancy of 2.77 people per unit. Industrial and school water usage is estimated at 1,200 gallons per day per acre (gpd/acre), while parks require 1,800 gpd/acre. A summary of system-wide water demands is provided in the table below, with detailed calculations included in Appendix B.

Table 2 – Water Demands Based on Capita

Planning Area	Zoning	Dwellings	Equivalent Capita	Avg Day (GPM)	Max Day (GPM)	Peak Hour (GPM)
PA-1	Multi-Family	204.5	566.5	39.74	111.26	178.82
PA-2	Single Family	31.3	86.6	6.07	17.00	27.32
PA-3	Single Family	109.3	302.9	21.24	59.48	95.59

Table 3 – Water Demands Based on Acreage

Planning Area	Zoning	Acres	GPD/AC	Avg Day (GPM)	Max Day (GPM)	Peak Hour (GPM)
PA-4	School	6.0	1200	5	14	22.50
PA-5	Park	3.0	1800	3.75	10.5	16.88

D. Hydraulic Modeling

Bentley WaterCAD was used to create a model of the internal water distribution system for the Site. By imputing the calculated water demands, various scenarios were simulated in the model to ensure that the water system would function as intended under proposed operating conditions. Below is a list of the different scenarios run in WaterCAD and the WaterCAD output tables can be found in Appendix B

- Average Day Demand
- Max Day Demand
- Peak Hour Demand
- Max Day Demand + Fire Flow of 2500 gpm @ J-7
- Max Day Demand + Fire Flow of 1500 gpm @ J-9
- Max Day Demand + Fire Flow of 1500 gpm @ J-10

The reservoir elevations of the water system are determined by the typical zone pressures (HGLs) as indicated in Table 1 above. In addition, the elevations of the water system junctions were assigned based on their existing elevations. A Hazen-Williams factor of 150 was applied to all pipe in the water model.

E. Hydraulic Modeling Results

All WaterCAD output tables are located in Appendix B. The pressure and max velocity results at nodes with the maximum demands applied for the Average Day, Max Day Demand, and Peak Hour Demand scenarios are shown below in Table 4. All results from the WaterCAD model fall within the acceptable ranges set forth by the City of Aurora.

Table 4 – Hydraulic Modeling Results

		Average Day			Max Day Demand			Peak Hour Demand		
Node	Elevation (ft)	Demand (gpm)	Pressure (psi)	Max Velocity (ft/s)	Demand (gpm)	Pressure (psi)	Max Velocity (ft/s)	Demand (gpm)	Pressure (psi)	Max Velocity (ft/s)
J-1	6048	19.87	61.44	1.5	55.63	61.43	1.5	89.41	61.42	1.5
J-7	6022	19.87	72.68	1.5	55.63	72.68	1.5	89.41	72.66	1.5
J-9	6056	10.62	57.97	1.5	29.74	57.97	1.5	47.80	57.95	1.5
J-10	5951	10.62	103.40	1.5	29.74	103.4	1.5	47.80	103.38	1.5

To ensure that the water system meets the necessary requirements for fire saf
Day Demand Fire Flow Scenario was modeled in accordance with COA Star
Specifications. This analysis applied fire flow to junctions in the system located
locations throughout the site.

The model utilized a residential fire flow requirement of 1,500 gallons per minu
townhome fire flow requirement of 2,500 gallons per minute. All junctions exa
model have a minimum residual pressure of 20 psi during the fire flow scenari

Need coordination that the Lift Station and Forcemains are sized accordingly in regards to this development and the offsite Overlook development. Coordinate with HR Green

III. SANITARY SEWER

A. System Layout

Sanitary sewer will be provided via 8-inch mains located in the pro
streets. The Site consists of four basins and all wastewater flow from
the southwest portion of the site towards the future Kings Point Sout
Point 1. Once the flows exits the Site, it will be conveyed through K
and under Highway E-470 to a lift station, eventually being lifted to Ki
No. 1 by dual force mains as shown on the Kings Point South Master
dated December 2022.

Further coordination between Overlook, Vistas, and Kings Point South has taken place. We have reached out to HR Green regarding the increased number of units. The lift station design can accommodate the additional flow, but we are waiting on further conformation from their pump manufacturer if the selected pumps will be adequate.

The lift station (west of E-470), force mains (west of E-470), extension o
adjacent developments sanitary infrastructure must be in place befo
No lift stations, force mains, etc. are being proposed as part o
proposed gravity system and proposed connection will sufficiently s
sewer not located within a public right-of way will be within a dedi
access and maintenance. Any future development of the existing
needed to serve this site is the responsibility of the developer.

B. Sanitary Sewer Design Criteria

Wastewater demands were calculated based on standards set by the City of Aurora's Design Criteria and Construction Plans of the City of Aurora Water, Sanitary Sewer and Storm Drainage Infrastructure Standards and Specifications (COA Standards and Specifications) Section 5.03, dated September 2019. Section 5.03 relevant criteria is below:

- "Residential" use has a typical equivalent of 2.77 people per unit and a loading 68 gallons per capita per day
- Industrial use (including schools) a typical equivalent of 18 people per acre or a loading of 1,200 gallons per day per acre
- Peaking factor is based on Curve "A" where Curve "A" = 5 / population^0.167 or a maximum peaking factor of 4 and a minimum peaking factor of 1.7
- Infiltration is 10% of average flow a
- Assume a Manning's value of 0.01
- Minimum pipe slope of 0.4% for all
- Pipes 12-inches or smaller should n
- All pipes must have a minimum velocity of 2 feet per second

Further coordination between Overlook, Vistas, and Kings Point South has taken place and will continue to take place as the project unfolds to ensure continuity between the projects.

Need extensive coordination with KP South and Overlook at KP South to ensure all documents are in conformance with approved KPN and KPS MUS

C. Sanitary Sewer Demand Calculations

Spelling

Comment has been addressed.

Sanitary sewer demand calculations have been completed (posed sanitary system in accordance with COA Standards and Speci dresses only the portion of the sanitary sewer system that services the site. Wastewater flows for the Site are projected to be higher than what was anticipated in the Kings Point South Master Utility Report prepared by HR Green, dated December 2022. Discrepancies in the sanitary flows between the Master Plan and this report can be attributed to the assumption of unit densities for the Site. The current equivalent unit projection for the Site is 383 units compared to 292 units assumed in the Kings Point South Master Utility Report. The Kings Point South Master Utility Report assumed off site demand from the Site at Design Point 1. It was calculated that a Total Peak Flow of 0.46 cfs would flow from the Site at Design Point 1, an increase of 0.111 cfs form Kings Point Souths report. All sanitary sewer calculations can be found in Appendix C. A brief summary of the sanitary flows for the site are below:

Include offsite basins

Offsite basin has been included.

Table 5 – Sanitary Demand Per Planning Area

Parcel	Use	Equivalent Capita	Average D (GPM)	
Planning Area 1	Multi-Family	566.5	26.75	107.01
Planning Area 2	Single Family	86.6	4.09	16.35
Planning Area 3	Single Family	302.9	14.30	57.21
Planning Area 4	School	108.0	5.00	20.00

D. Sanitary Sewer Sizing

A Manning's equation analysis using HydroFlow Express was run for an 8" PVC pipe flowing 75% full, with a Mannings Coefficient of 0.011 at a minimum grade of 0.4% to demonstrate that an

8" pipe could adequately handle flows from this development. This analysis is included in Appendix C. Additional flow analysis will be conducted in subsequent reports.

E. Variances

No variances are being requested at this time.

IV. CONCLUSION

A. Domestic Water

This Master Utility Report Vistas at Kings Point is in compliance with the water design standards established by the City of Aurora. The reservoir elevations for the water system connections have been determined based on the typical zone pressures (HGLs) of the surrounding areas.

The proposed domestic water system, which includes 8-inch and 12-inch lines, is designed to connect to future surrounding networks and meets the criteria for Average Day, Maximum Hour, and Maximum Day Demand + Fire Flow scenarios.

B. Sanitary Sewer

This Master Utility Report Vistas at Kings Point is in compliance with the sanitary sewer design standards established by the City of Aurora. The proposed sanitary sewer system will utilize an 8-inch pipe to convey all wastewater throughout the system. The Site will utilize a future lift station described in the Kings Point South Master Utility Report and other future infrastructure put in place by others.

Reference has been updated

V. REFERENCES

Final version was approved in December 2022

Water, Sanitary Sewer and Storm Drai ards and Specifications, 2020 Edition, City of Aurora, Colorado.

Kings Point South Master Utility Report by HR Green, Dated December 2022 (Ongoing)

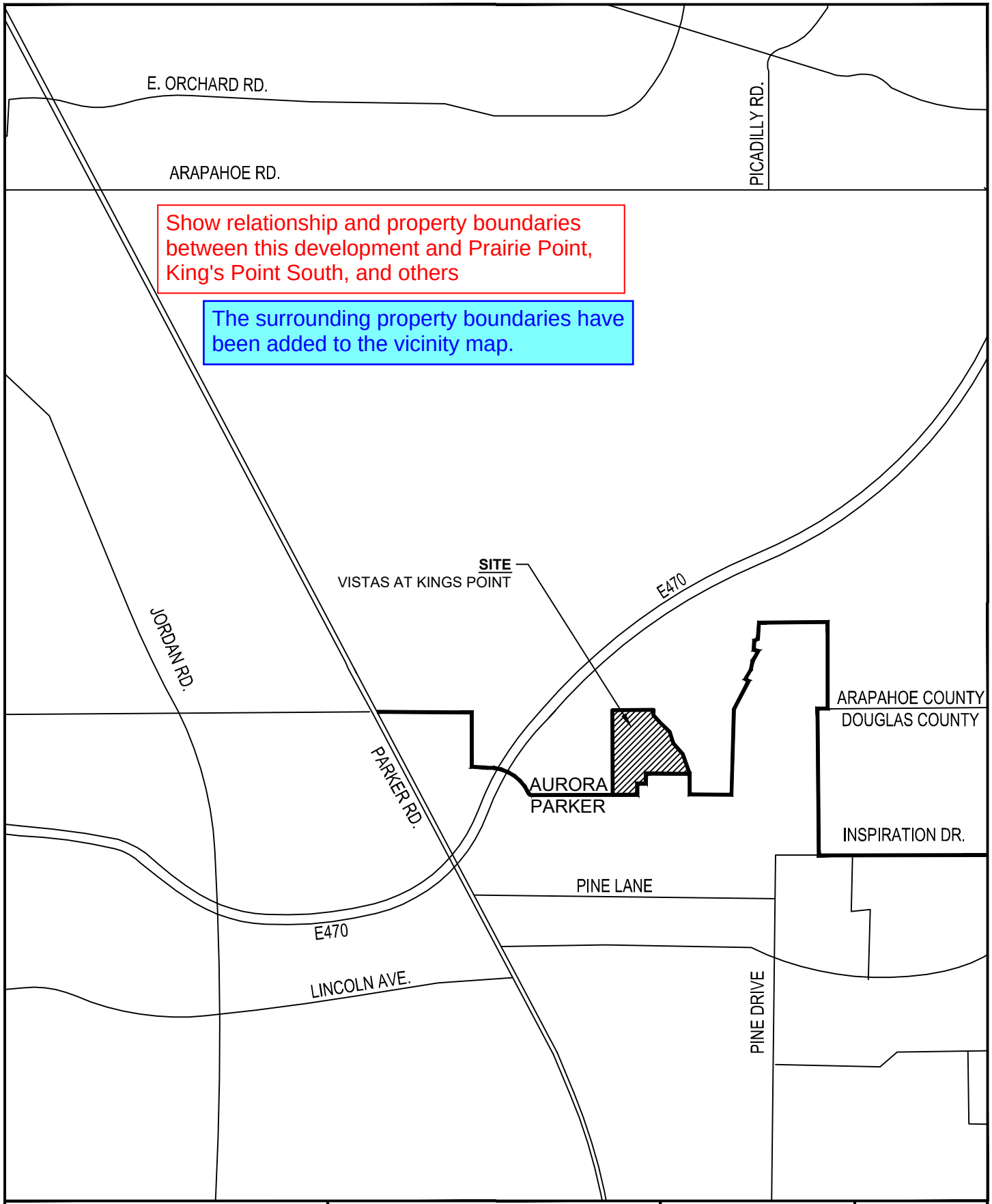
Kings Point North Master Utility Report and Plan by Core Consultants, Inc., June 2022 (EDN 222157 MU1)

Reference has been updated

Refer to amendment approved in January 2023

APPENDIX A
GENERAL MAPS

Vicinity Map
Vistas at Kings Point Land Use Plan
Sanitary System Map
Water System Map



terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

KINGS POINT VISTAS
VICINITY MAP

AURORA, CO DATE: 2023-02-08

0 4000'

1" = 4000'

N

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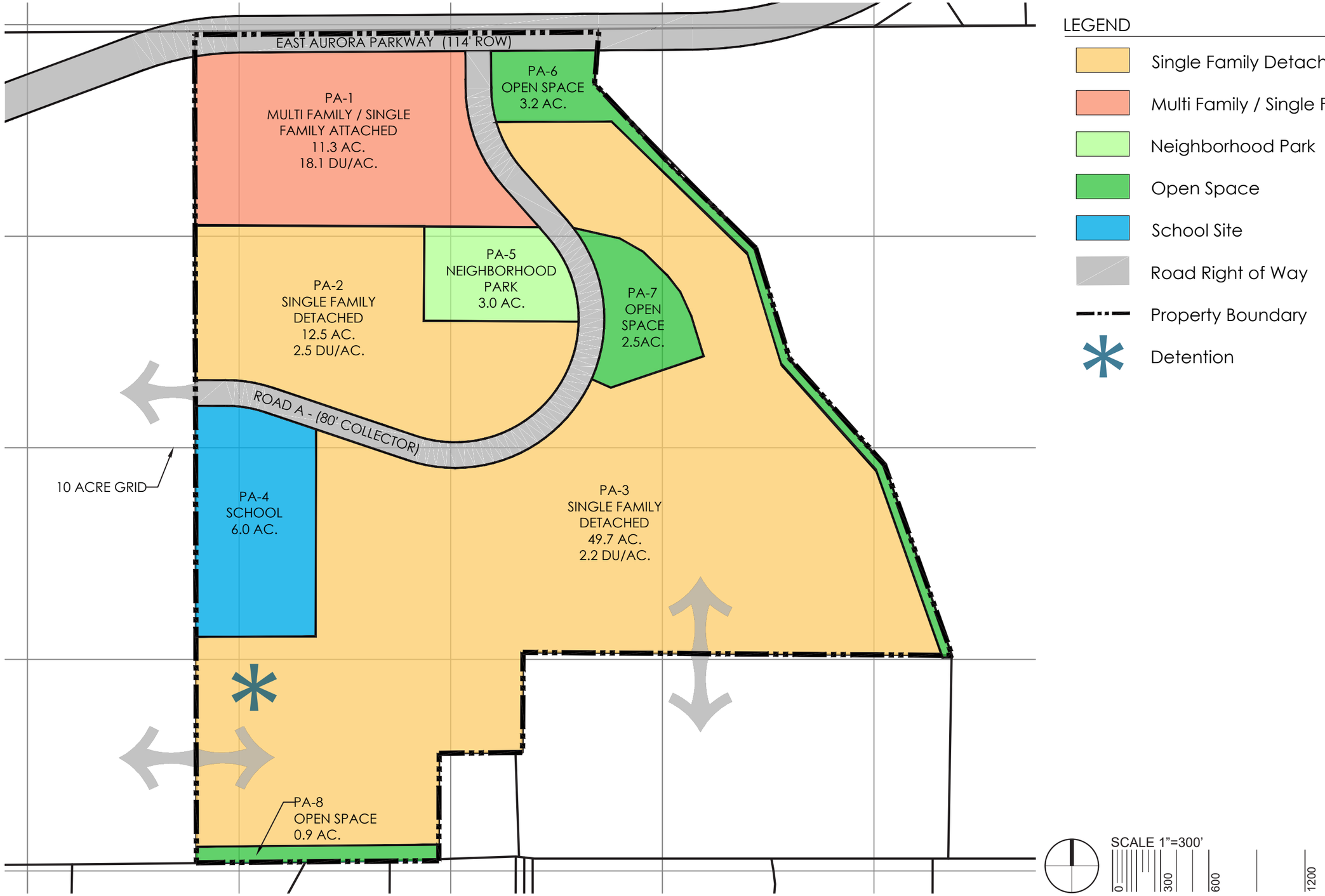
EAST AURORA PARKWAY (114' ROW)
PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.
PA-6
OPEN SPACE
3.2 AC.
PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.
PA-5
NEIGHBORHOOD PARK
3.0 AC.
PA-7
OPEN SPACE
2.5AC.
ROAD A - (80' COLLECTOR)
10 ACRE GRID
PA-4
SCHOOL
6.0 AC.
PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.
PA-8
OPEN SPACE
0.9 AC.
LEGEND
Single Family Detached
Multi Family / Single Family Attached
Neighborhood Park
Open Space
School Site
Road Right of Way
Property Boundary
Detention
SCALE 1"=300'
0
300
600
1200

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

Show connection point and the design points to existing sanitary infastructure

Our development is not connecting to existing infrastructure and is reliant on the Kings Point South development for all sanitary connections to existing infrastructure. We have shifted our map to show the Kings Point South sanitary alignment with the E-470 crossing for further clarification.

AURORA PARKWAY
6-LANE ARTERIAL
(114' ROW)

PA1
204 DU | MF

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

PA-2
SINGLE FAMILY
12.5 AC.
2.5 DU/AC.

PA-5
NEIGHBORHOOD PARK
3.0 AC.

PA-7
OPEN SPACE
2.5 AC.

PA2
31 DU | SF

2-LANE COLLECTOR
(80' ROW)

PA4
39 DU | IND

PA-4
SCHOOL
6.0 AC.

8" SANITARY
(TYPICAL)

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

Need to account for offsite basins

Offsite basins have been accounted for.

Further coordination between Overlook, Vistas, and Kings Point South has taken place. We have reached out to HR Green regarding the increased number of units. The lift station design can accommodate the additional flow, but we are waiting on further conformation from their pump manufacturer if the selected pumps will be adequate.

Only 292 units accounted for in Kings Point South MUS- There are over 300 here. Need to have discussions with KP South to account for additional development- Please coordinate if needed

Prusee MUS shows a sanitary main going to the eastern border- Clarify and adjust with them

The offsite connection is now shown.

FUTURE 8" SANITARY TIE IN

DETENTION POND A1

PA3
109 DU | SF

PA-8
OPEN SPACE
0.9 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

LEGEND

- 8" SS — 8" SANITARY PROPOSED
- INTERNAL ROAD CONNECTION
- PA1 — PLANNING AREA
- X.XX DU | SF/MF
  - LAND USE: SINGLE FAMILY, MULTIFAMILY, INDUSTRIAL
  - MAX ALLOWABLE DWELLING UNITS

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March 31, 2023

VISTAS AT KINGS POINT

SANITARY DEMAND MAP

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Denver, CO 80231
ph: 303.632.8867

N

0 150' 300'
1" = 150'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FUTURE 12" WATER

FUTURE 12" WATER TIE IN

Need to account for offsite basins

Offsite basins have been accounted for.

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

AURORA PARKWAY
6-LANE ARTERIAL
(144' ROW)

FUTURE PRESSURE REDUCING VALVE

PA-2
RESIDENTIAL
12.5 AC.
2.5 DU/AC.

PA-5
NEIGHBORHOOD PARK
3.0 AC.

PA-7
OPEN SPACE
2.5 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

FUTURE 12" WATER TIE IN

2-LANE COLLECTOR
(80' ROW)

FUTURE PRESSURE REDUCING VALVE

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-4
SCHOOL
6.0 AC.

8" WATER (TYPICAL)

PA-3
RESIDENTIAL
49.7 AC.
2.2 DU/AC.

The Overlook at KP South shown that your development will have the water main going south to connect- Please coordinate with them

The offsite water connection is now shown and accounted for in our model.

ZONE 6
5810-5930
HGL 6050

ZONE 7
5930-6090
HGL 6190

ZONE 8
6090-X

PRESSURE REDUCING VALVE

FUTURE 8" WATER TIE IN

DETENTION POND A1

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

LEGEND

- ZONE 6
- ZONE 8
- XX — UNITS OR ACRES
- 8" W — PROPOSED 8" WATER
- 12" W — PROPOSED 12" WATER

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March 31, 2023

VISTAS AT KINGS POINT

WATER DEMAND MAP

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10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 150' 300'

1" = 150'

APPENDIX B
WATER

Water Demand Calculations
WaterCAD Map
WaterCAD Output Tables

Send live calcs to me via email

Calcs have been sent to you directly.

terracina design

Vistas at King Point

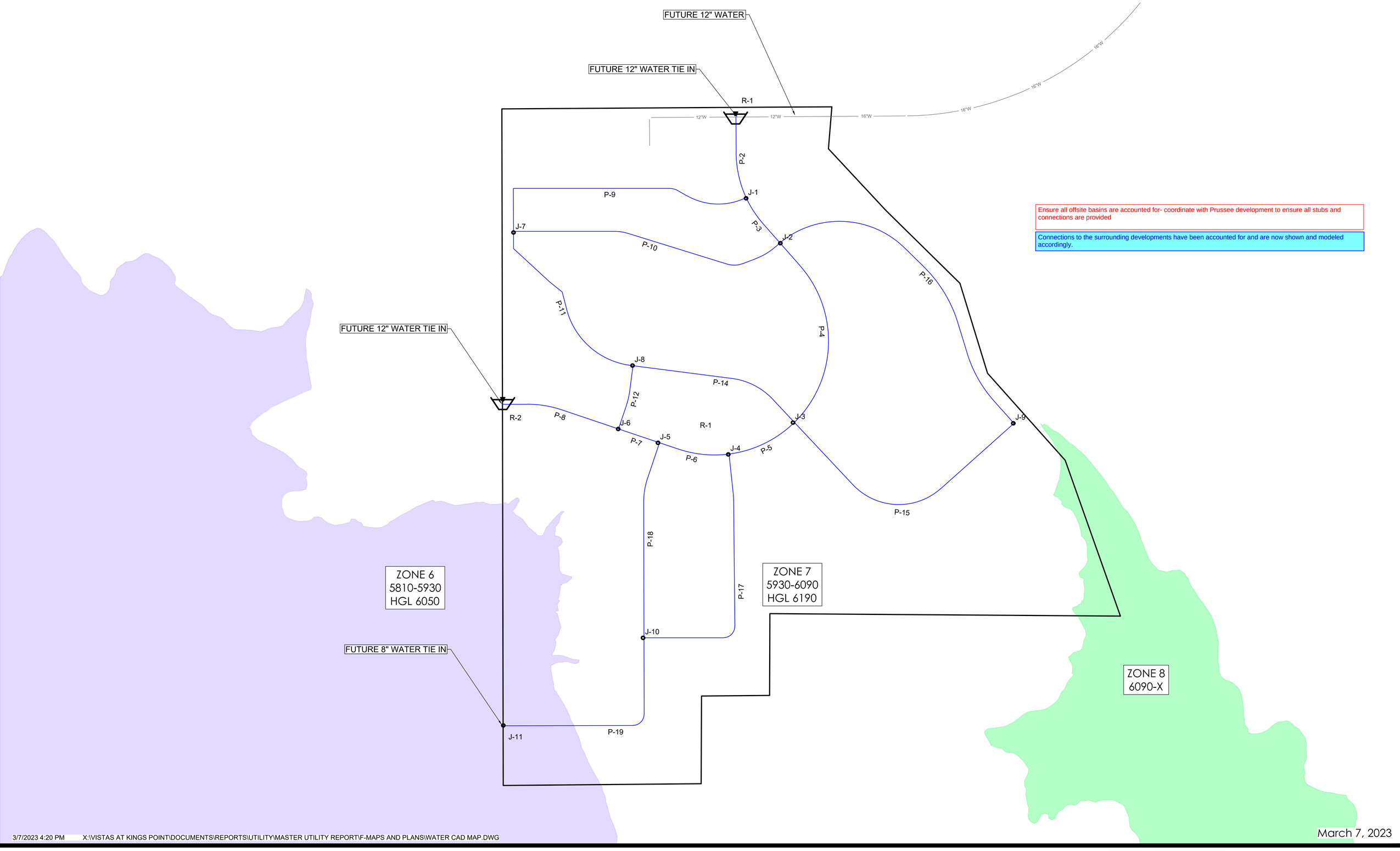
Potable Water Demand Calcualtion

TD # 14-003
3/30/2023
MJG

PLANNING AREA	*JUNCTION*	*USE*	*ACRES*	*DENSITY*	*DWELLINGS*	*PEOPLE PER UNIT*	*AVG DAY PER CAPITA FLOW*	**DEMAND**			
				(DU/AC)	*UNITS (DU)*		**(GPD)**	*AVG DAY* **(GPD)**	*AVG DAY* **(GPM)**	*MAX DAY (MDD)* **(GPM)**	*PEAK HOUR (PHD)* **(GPM)**
			a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**
								c x d x e	f/24/60	g x 2.8	g x 4.5
PA-1	J-1	Multi-Family	5.65	18.1	102.265	2.77	101	28,611	19.87	55.63	89.41
PA-1	J-7	Multi-Family	5.65	18.1	102.265	2.77	101	28,611	19.87	55.63	89.41
PA-2	J-8	Single-Family	12.50	2.5	31.25	2.77	101	8,743	6.07	17.00	27.32
PA-3	J-9	Single-Family	24.85	2.2	54.67	2.77	101	15,295	10.62	29.74	47.80
PA-3	J-10	Single-Family	24.85	2.2	54.67	2.77	101	15,295	10.62	29.74	47.80
				AVG DAY (GPD/AC)				a x b	f/24/60	g x 2.8	g x 4.5
PA-4	J-6	School	6.0	1200				7,200	5.00	14.00	22.50
PA-5	J-2	Park	3.0	1800				5,400	3.75	10.50	16.88
				TOTAL	**290**			**109,154**	**75.80**	**212.24**	**341.11**

PEAKING FACTOR

MAX DAY (MDD)	**2.8**
PEAK HOUR (PHD)	**4.5**



Ensure all offsite basins are accounted for- coordinate with Prussee development to ensure all stubs and connections are provided

Connections to the surrounding developments have been accounted for and are now shown and modeled accordingly.

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March 7, 2023

VISTAS AT KINGS POINT

WATER CAD MAP

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 150' 300'

1" = 150'

Vistas at Kings Point

Average Day

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	42.92	6,190.00
1269	R-2	6,190.00	32.88	6,190.00

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
1272	P-2	312	R-1	J-1	12.0	PVC	150	42.92	0.12	0.000	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	16.28	0.05	0.000	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	1.23	0.00	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-7.62	0.02	0.000	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-12.17	0.03	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-18.25	0.05	0.000	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-32.88	0.09	0.000	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	6.77	0.04	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-6.28	0.04	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-6.82	0.04	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-9.64	0.06	0.000	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	-3.26	0.02	0.000	Open
1294	P-15	1,076	J-3	J-9	8.0	PVC	150	5.60	0.04	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-5.02	0.03	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	4.55	0.03	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-6.08	0.04	0.000	Open
1300	P-19	855	J-10	J-11	8.0	PVC	150	0.00	0.00	0.000	Open

Junction Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	19.87	6,190.00	61.44
1273	J-2	6,035.00	3.75	6,190.00	67.06
1275	J-3	6,006.00	0.00	6,190.00	79.61
1277	J-4	5,993.00	0.00	6,190.00	85.23
1279	J-5	5,986.00	0.00	6,190.00	88.26
1281	J-6	5,982.00	5.00	6,190.00	89.99
1284	J-7	6,022.00	19.87	6,190.00	72.68
1287	J-8	5,986.00	6.07	6,190.00	88.26
1293	J-9	6,056.00	10.62	6,190.00	57.97
1296	J-10	5,951.00	10.62	6,190.00	103.40
1299	J-11	5,928.00	0.00	6,190.00	113.35

Vistas at Kings Point

Max Daily Demand (MDD)

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	120.17	6,190.00
1269	R-2	6,190.00	92.07	6,190.00

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
1272	P-2	312	R-1	J-1	12.0	PVC	150	120.17	0.34	0.000	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	45.59	0.13	0.000	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	3.45	0.01	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-21.34	0.06	0.000	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-34.08	0.10	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-51.09	0.14	0.000	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-92.07	0.26	0.000	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	18.96	0.12	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-17.57	0.11	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-19.10	0.12	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-26.98	0.17	0.000	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	-9.12	0.06	0.000	Open
1294	P-15	1,076	J-3	J-9	8.0	PVC	150	15.67	0.10	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-14.07	0.09	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	12.73	0.08	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-17.01	0.11	0.000	Open
1300	P-19	855	J-10	J-11	8.0	PVC	150	0.00	0.00	0.000	Open

Junction Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	55.63	6,189.99	61.43
1273	J-2	6,035.00	10.50	6,189.99	67.06
1275	J-3	6,006.00	0.00	6,189.99	79.60
1277	J-4	5,993.00	0.00	6,189.99	85.23
1279	J-5	5,986.00	0.00	6,189.99	88.26
1281	J-6	5,982.00	14.00	6,189.99	89.99
1284	J-7	6,022.00	55.63	6,189.98	72.68
1287	J-8	5,986.00	17.00	6,189.98	88.25
1293	J-9	6,056.00	29.74	6,189.98	57.97
1296	J-10	5,951.00	29.74	6,189.98	103.40
1299	J-11	5,928.00	0.00	6,189.98	113.35

Vistas at Kings Point

Peak Hour Demand (PHD)

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	191.70	6,190.00
1269	R-2	6,190.00	146.43	6,190.00

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
1272	P-2	312	R-1	J-1	12.0	PVC	150	191.70	0.54	0.000	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	72.05	0.20	0.000	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	4.50	0.01	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-34.14	0.10	0.000	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-54.61	0.15	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-81.94	0.23	0.000	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-146.43	0.42	0.000	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	30.24	0.19	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-28.08	0.18	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-31.09	0.20	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-41.98	0.27	0.000	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	-13.43	0.09	0.000	Open
1294	P-15	1,076	J-3	J-9	8.0	PVC	150	25.21	0.16	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-22.59	0.14	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	20.47	0.13	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-27.34	0.17	0.000	Open
1300	P-19	855	J-10	J-11	8.0	PVC	150	0.00	0.00	0.000	Open

Junction Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	89.41	6,189.97	61.42
1273	J-2	6,035.00	16.88	6,189.97	67.05
1275	J-3	6,006.00	0.00	6,189.97	79.59
1277	J-4	5,993.00	0.00	6,189.97	85.22
1279	J-5	5,986.00	0.00	6,189.97	88.25
1281	J-6	5,982.00	22.50	6,189.97	89.98
1284	J-7	6,022.00	89.41	6,189.95	72.66
1287	J-8	5,986.00	24.32	6,189.96	88.25
1293	J-9	6,056.00	47.80	6,189.95	57.95
1296	J-10	5,951.00	47.80	6,189.96	103.39
1299	J-11	5,928.00	0.00	6,189.96	113.34

Vistas at Kings Point

MDD + Fire Demand @ J-7

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	1,545.94	6,190.00
1269	R-2	6,190.00	1,162.89	6,190.00

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
1272	P-2	312	R-1	J-1	12.0	PVC	150	1,545.94	4.39	0.004	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	677.53	1.92	0.001	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	-134.60	0.38	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-487.67	1.38	0.001	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-446.18	1.27	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-517.41	1.47	0.001	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-1,162.89	3.30	0.003	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	812.78	5.19	0.010	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-809.47	5.17	0.009	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-929.97	5.94	0.012	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-631.48	4.03	0.006	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	-315.49	2.01	0.002	Open
1294	P-15	1,076	J-3	J-9	8.0	PVC	150	37.58	0.24	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	7.84	0.05	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	-41.49	0.26	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-71.23	0.45	0.000	Open
1300	P-19	855	J-10	J-11	8.0	PVC	150	0.00	0.00	0.000	Open

Junction Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	55.63	6,188.64	60.85
1273	J-2	6,035.00	10.50	6,188.44	66.38
1275	J-3	6,006.00	0.00	6,188.47	78.95
1277	J-4	5,993.00	0.00	6,188.62	84.63
1279	J-5	5,986.00	0.00	6,188.74	87.71
1281	J-6	5,982.00	14.00	6,188.83	89.48
1284	J-7	6,022.00	2,552.22	6,178.37	67.65
1287	J-8	5,986.00	17.00	6,187.34	87.11
1293	J-9	6,056.00	29.74	6,188.44	57.30
1296	J-10	5,951.00	29.74	6,188.66	102.82
1299	J-11	5,928.00	0.00	6,188.66	112.77

Vistas at Kings Point

MDD + Fire Demand @ J-9

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	963.70	6,190.00
1269	R-2	6,190.00	752.12	6,190.00

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
1272	P-2	312	R-1	J-1	12.0	PVC	150	963.70	2.73	0.002	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	821.84	2.33	0.001	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	164.31	0.47	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	-512.99	1.46	0.001	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-468.63	1.33	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-542.74	1.54	0.001	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-752.12	2.13	0.001	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	86.23	0.55	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	77.96	0.50	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	-47.35	0.30	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	-195.39	1.25	0.001	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	131.03	0.84	0.000	Open
1294	P-15	1,076	J-3	J-9	8.0	PVC	150	808.33	5.16	0.009	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-724.99	4.63	0.008	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	-44.37	0.28	0.000	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-74.11	0.47	0.000	Open
1300	P-19	855	J-10	J-11	8.0	PVC	150	0.00	0.00	0.000	Open

Junction Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	55.63	6,189.43	61.19
1273	J-2	6,035.00	10.50	6,189.14	66.69
1275	J-3	6,006.00	0.00	6,189.09	79.21
1277	J-4	5,993.00	0.00	6,189.25	84.91
1279	J-5	5,986.00	0.00	6,189.38	87.99
1281	J-6	5,982.00	14.00	6,189.48	89.77
1284	J-7	6,022.00	55.63	6,189.27	72.37
1287	J-8	5,986.00	17.00	6,189.31	87.96
1293	J-9	6,056.00	1,533.32	6,178.92	53.18
1296	J-10	5,951.00	29.74	6,189.29	103.10
1299	J-11	5,928.00	0.00	6,189.29	113.05

Vistas at Kings Point

MDD + Fire Demand @ J-10

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
1268	R-1	6,190.00	772.04	6,190.00
1269	R-2	6,190.00	943.78	6,190.00

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Dia. (in)	Material	Hazen Williams C	Flow (gpm)	Vel. (ft/s)	Headloss Gradient (ft/ft)	Status (Initial)
1272	P-2	312	R-1	J-1	12.0	PVC	150	772.04	2.19	0.001	Open
1274	P-3	217	J-1	J-2	12.0	PVC	150	608.37	1.73	0.001	Open
1276	P-4	780	J-2	J-3	12.0	PVC	150	444.18	1.26	0.000	Open
1278	P-5	281	J-3	J-4	12.0	PVC	150	589.02	1.67	0.001	Open
1280	P-6	274	J-4	J-5	12.0	PVC	150	-108.35	0.31	0.000	Open
1282	P-7	161	J-5	J-6	12.0	PVC	150	-944.31	2.68	0.002	Open
1283	P-8	455	J-6	R-2	12.0	PVC	150	-943.78	2.68	0.002	Open
1285	P-9	1,076	J-1	J-7	8.0	PVC	150	108.04	0.69	0.000	Open
1286	P-10	1,062	J-7	J-2	8.0	PVC	150	-58.15	0.37	0.000	Open
1288	P-11	733	J-7	J-8	8.0	PVC	150	110.55	0.71	0.000	Open
1289	P-12	248	J-8	J-6	8.0	PVC	150	14.52	0.09	0.000	Open
1292	P-14	682	J-8	J-3	8.0	PVC	150	79.03	0.50	0.000	Open
1294	P-15	1,076	J-3	J-9	8.0	PVC	150	-65.80	0.42	0.000	Open
1295	P-16	1,324	J-9	J-2	8.0	PVC	150	-95.54	0.61	0.000	Open
1297	P-17	1,051	J-4	J-10	8.0	PVC	150	697.37	4.45	0.007	Open
1298	P-18	752	J-10	J-5	8.0	PVC	150	-835.96	5.34	0.010	Open
1300	P-19	855	J-10	J-11	8.0	PVC	150	0.00	0.00	0.000	Open

Junction Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
1271	J-1	6,048.00	55.63	6,189.62	61.27
1273	J-2	6,035.00	10.50	6,189.46	66.83
1275	J-3	6,006.00	0.00	6,189.12	79.23
1277	J-4	5,993.00	0.00	6,188.91	84.76
1279	J-5	5,986.00	0.00	6,188.92	87.80
1281	J-6	5,982.00	14.00	6,189.20	89.65
1284	J-7	6,022.00	55.63	6,189.38	72.42
1287	J-8	5,986.00	17.00	6,189.21	87.92
1293	J-9	6,056.00	29.74	6,189.22	57.64
1296	J-10	5,951.00	1,533.32	6,181.36	99.66
1299	J-11	5,928.00	0.00	6,181.36	109.62

APPENDIX C

Wastewater

Sanitary Sewer Calculations
8" PVC Max Flow @ 75% Full
8" PVC @ Peak Design Flow

terracina design

Vistas at Kings Point Preliminary
Water and Sanitary Sewer Utlity Report
Potable Water Demand Calcualtion

Send live calcs to me via email

Calcs have been sent to you directly.

TD # 14-003
3/30/2023
MJG

PARCEL	*USE*	*ACRES*	*DENSITY* (DU/AC)	*Max Units* (DU)	*EQUIVALENT* (PEOPLE/DU)	*EQUIVALENT CAPITA* (C)	**DEMAND** *AVG DAY* (GPC/DAY)	*AVG DAY* (GPD)	*AVG DAY* (GPM)	*PEAK DESIGN* (GPM)
		a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**
						a x b x d		e x f	g/24*60	h x 4
Planning Area 1	Multi-Family	11.3	18.1	204.5	2.77	566.5	68	38525	26.75	107.01
Planning Area 2	Single Family	12.5	2.5	31.3	2.77	86.6	68	5886	4.09	16.35
Planning Area 3	Single Family	49.7	2.2	109.3	2.77	302.9	68	20595	14.30	57.21
				345.1	**TOTAL CAPITA**	**956**	**SUB-TOTAL**	**65006.80**	**45.14**	**180.57**

PARCEL	*USE*	*ACRES*	*EQUIVALENT* (PEOPLE/DU)	*AVERAGE DAY* (GPD/ACRE)			
						a x e	g/24*60	h x 4
Planning Area 4	School	6.0	18.00	1200.0		7200	5.00	20.00
					SUB-TOTAL	**7200.00**	**5.00**	**20.00**
					TOTAL	**72206.80**	**50.14**	**200.57**

INFILTRATION (10% OF THE AVERAGE DAILY FLOW) =	**5.01**	
TOTALS WITH INFILTRATION (GPM) =	**55.16**	**205.59**
TOTALS WITH INFILTRATION (CFS) =	**0.12**	**0.46**

PEAKING FACTOR* **4.0**

Channel Report

Identify design point

Page has been removed.

8in PVC @ 75% Full - 0.835 CFS

Circular

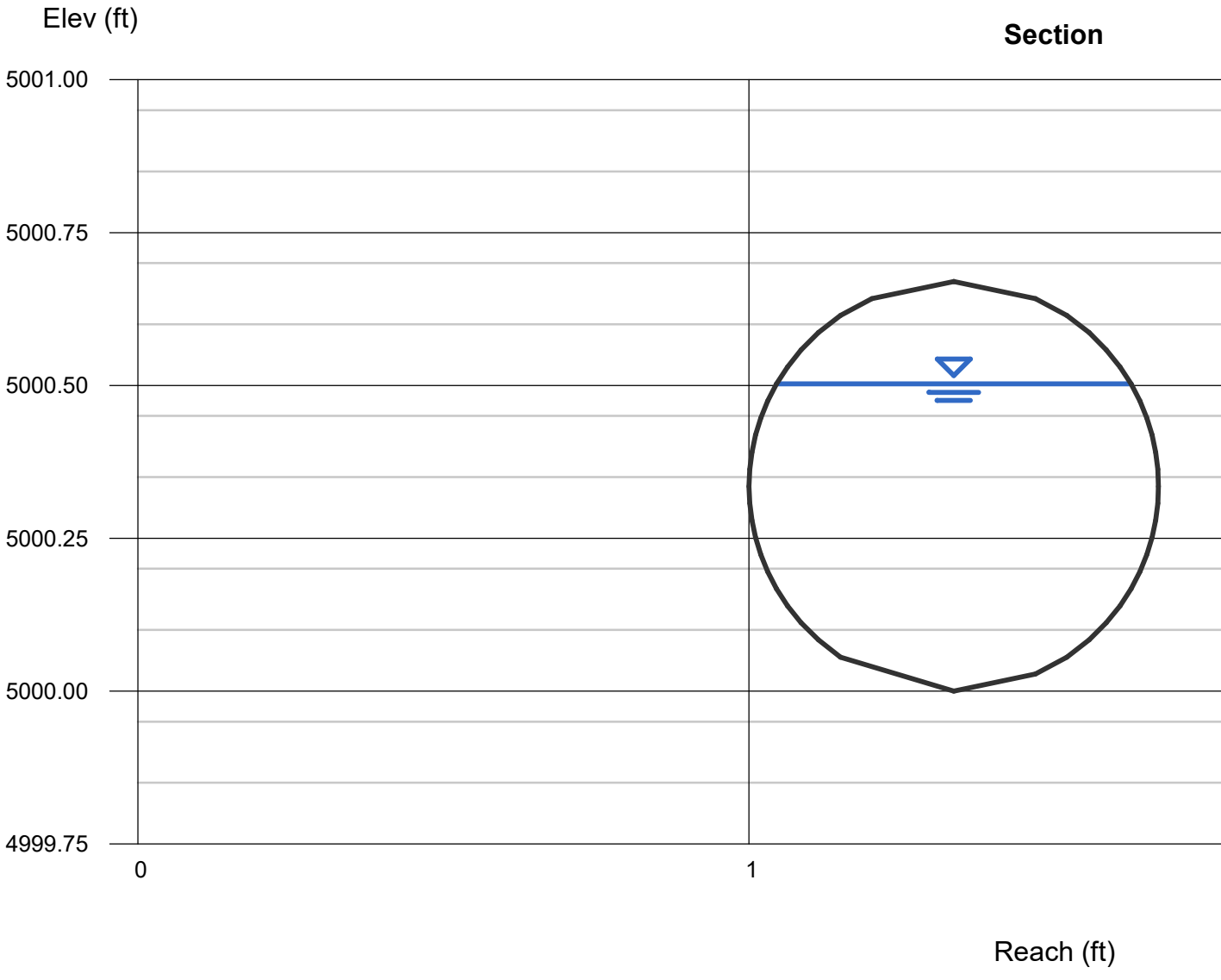
Diameter (ft)	= 0.67
Invert Elev (ft)	= 5000.00
Slope (%)	= 0.40
N-Value	= 0.011

Calculations

Compute by:	Q vs Depth
No. Increments	= 4

Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 0.835
Area (sqft)	= 0.28
Velocity (ft/s)	= 2.94
Wetted Perim (ft)	= 1.40
Crit Depth, Yc (ft)	= 0.44
Top Width (ft)	= 0.58
EGL (ft)	= 0.64



Channel Report

Identify design point

Design point designation has been added.

8 in PVC @ Peak Desing Flow

Circular

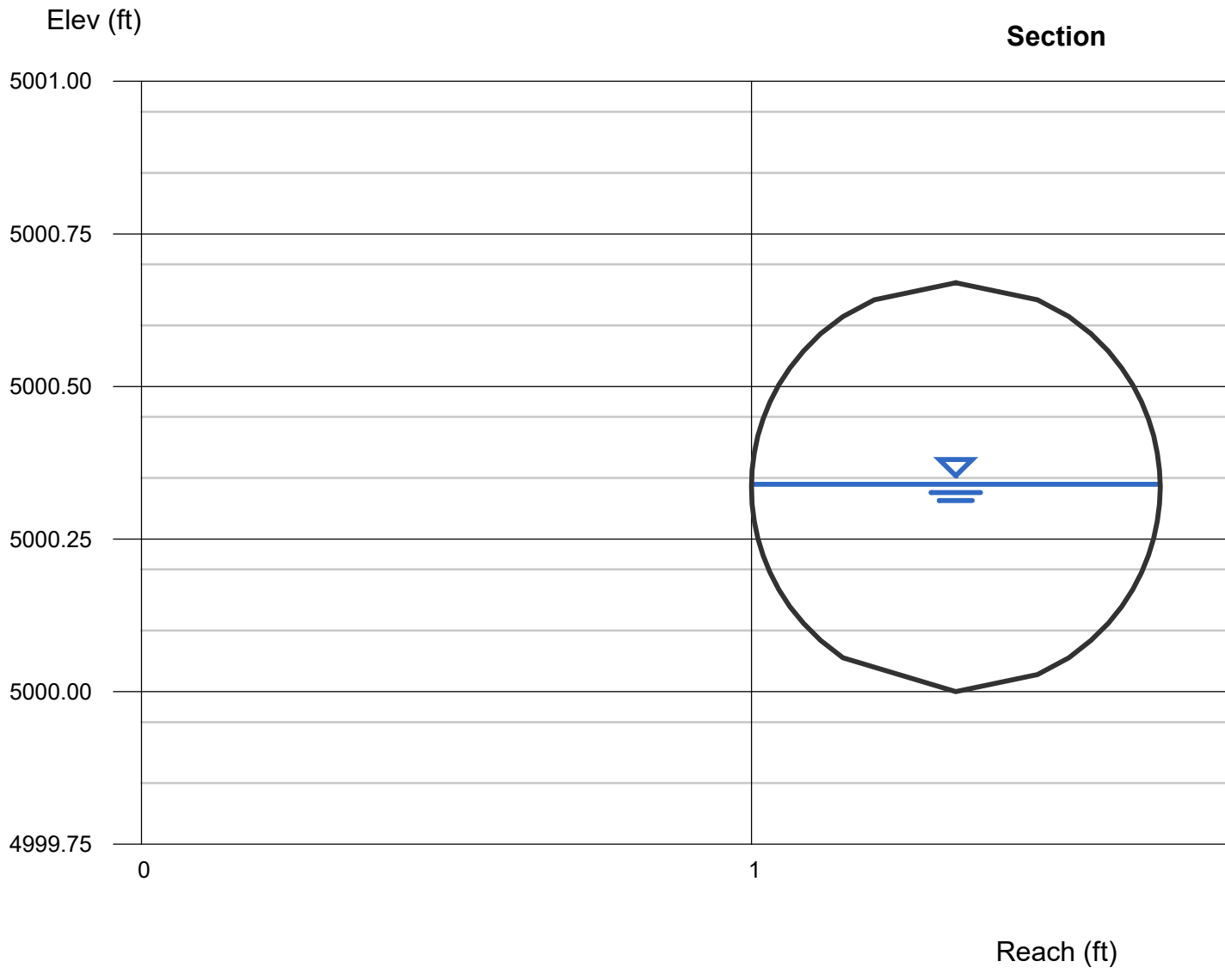
Diameter (ft)	= 0.67
Invert Elev (ft)	= 5000.00
Slope (%)	= 0.40
N-Value	= 0.011

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.46

Highlighted

Depth (ft)	= 0.34
Q (cfs)	= 0.460
Area (sqft)	= 0.18
Velocity (ft/s)	= 2.55
Wetted Perim (ft)	= 1.07
Crit Depth, Yc (ft)	= 0.32
Top Width (ft)	= 0.67
EGL (ft)	= 0.44



APPENDIX D

References

Kings Point South Master Utility Report (West of Site)
Kings Point North Master Utility Report(North of Site)

Utilize the most recent version of the approved MUS for King's Point south

HRGREEN.COM

Approved MUS has been added.

EXCERPTS FROM

Kings Point South

Master Utility Report

December 2022
HR Green Project No: 212000.01

Prepared For:
Lennar Corporation
c/o Joseph Huey, PE
9193 S Jamaica Street
Englewood, CO 80112

Prepared By:
HR Green Development, LLC
Contact: Kristine House, PE
khouse@hrgreen.com
720-602-4938

Approved For One Year From This Date	
City Engineer	**Date**
Water Department	**Date**
Fire Department	**Date**

- Minimum velocity of 2 fps at least once per day. Minimum slope of 0.4% will be analyzed for pipes to meet the 2 fps requirement.

The *Master Utility Report for Kings Point North* (EDN 222157 MU1) assumed two off-site demand locations for Kings Point South, noted with Design Point 32 and Basin FUT-2. Design Point 32 references a cumulative Total Peak Flow of 645 gallons-per-minute (gpm), whereas this report calculates a lesser demand of 502 gpm or 0.723 million gallons-per-day (mgd) at the same location. The Kings Point North Report calculated a cumulative Total Peak Flow of 15.3 gpm for Basin FUT-2, whereas this report calculates a greater demand of 20.4 gpm or 0.029 million mgd at the same location. It appears the Kings Point North Report was utilizing out of date calculations, the design teams will continue to coordinate these demands to ensure adequate infrastructure sizing as both projects move forward with design.

3. Sanitary Sewer Flow Generations

a) Sanitary sewer loading calculations have been completed and applied to the proposed sanitary system in accordance with COA Standards and Specifications. Unit counts used in this analysis are based on current development projections and are within parameters set forth with the FDP. Additional criteria used to determine sanitary sewer generations include:

- Average flow generation of 68 gallons per capita per day (gpc/day).
- Residential population density of (2.77 people/unit).

b) Sanitary basin boundaries were estimated based on the existing grades and natural flow direction of the site. One off-site basin and thirteen major on-site sanitary basins were identified. The off-site basin includes approximately 115 acres and is inclusive of the Prusse property (including unannexed portions). Sanitary sewer generation calculations are included in Appendix C and summarized below (including off-site).

TABLE 4: SANITARY SEWER DEMAND SUMMARY

Location (see sheet SS1)	Average Day Flow (mgd)	Peak Flow + Infiltration (mgd)
Filing No. 1 (west)	0.034	0.141
Filing No. 2 (east)	0.094	0.387
Off-site	0.055	0.226
Kings Point South Total	0.184	0.753

4. Sanitary Sewer Sizing

a) Preliminary sanitary sewer system sizing was determined in accordance with the COA Standards and Specifications for maximum depth of flow of 75% capacity for all pipe sizes 12-inches and smaller and 80% for pipe sizes larger than 12-inches.

b) Pipe capacities and velocity requirements were verified in Bentley FlowMaster. Calculations indicate that all planned development can be serviced by 8-inch and 10-inch mains. The City of Aurora has requested that where this report calculates a 10-inch line is adequate, those lines be upsized to 12-inch mains. This provides for a measure of flexibility in the future land use densities.

5. Sanitary Sewer Lift Station

a) A lift station will be required for the City of Aurora to provide wastewater service to the proposed development. Most of the flow will gravity flow to the southwest corner of the site, where the lift station is located, and be lifted via 8-inch force main along Kings Point Way. The proposed lift station will be designed to accommodate the peak flow (0.724 mgd) from the Kings Point South development.

The lift station, force main, and connection point to Filing No. 2 will be constructed during Filing No. 1. There will be a 12-inch line under E-470 that will connect service from Filing No. 2 to the lift station. The City of Aurora has an intergovernmental agreement (IGA) with Metro Wastewater, where flows will eventually be conveyed via a series of lift stations. Neighboring sanitation districts include Cottonwood Sanitation and Water District and Parker Sanitation District. See separate *Conceptual Design Report, Kings Point South Lift Station* for additional details.

D. Conclusions

1. Domestic Water

a) This Master Utility Report for Kings Point South is in compliance with the City of Aurora domestic water design criteria. Reservoir elevations of the connections to the water system are consistent with surrounding developments and are based on typical Zone pressures (HGLs) noted above.

b) The domestic water system is comprised of 8-inch and 12-inch lines, is proposed to tie into the existing network and satisfies the requirements for the Average Day, Maximum Hour, and Maximum Day Demand + Fire Flow scenarios.

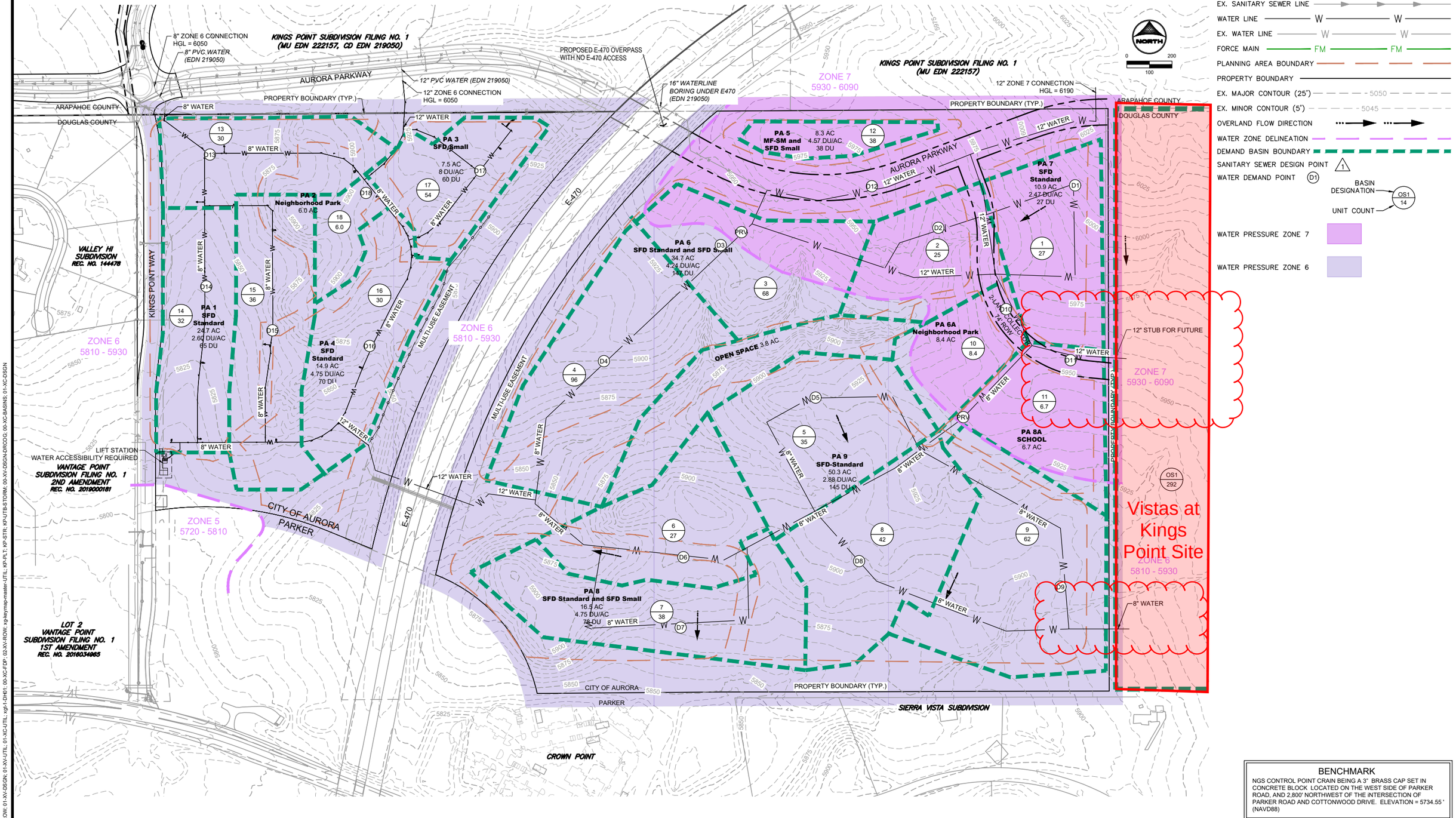
c) No water system variances are requested at this time.

2. Sanitary Sewer

a) This Master Utility Report for Kings Point South is in compliance with the City of Aurora sanitary sewer design criteria.

b) The following conclusions are drawn based on this study:

- Proposed 8-inch local sanitary sewer lines will tie into larger 12-inch sanitary mains conveying effluent to a lift station near the southwest corner of the site.
- A lift station will be required for the City of Aurora to provide wastewater service to the proposed development.
- The sanitary alignment can maintain minimum slopes and acceptable design depths for the proposed development within the project area.
- Total average flow rates calculated with this Report (0.18 mgd) are less than those estimated with *The Master Utility Report for Kings Point North* (0.50 mgd). The existing sanitary sewer infrastructure is adequately sized to convey lifted effluent from Kings Point South.



BENCHMARK

NGS CONTROL POINT CRAIN BEING A 3" BRASS CAP SET IN CONCRETE BLOCK LOCATED ON THE WEST SIDE OF PARKER ROAD, AND 2,800' NORTHWEST OF THE INTERSECTION OF PARKER ROAD AND COTTONWOOD DRIVE. ELEVATION = 5734.55 ' (NAVD88)

DRAWN BY:	KLH	JOB DATE:	9/21/2022
APPROVED:	RWL	JOB NUMBER:	212000.01
CAD DATE:	11/30/2022		
CAD FILE:	J:\2021\212000.01\CAD\Dwgs\C\MUR\KPS_MasterUtilityPlan		

BAR IS ONE INCH ON OFFICIAL DRAWINGS. IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

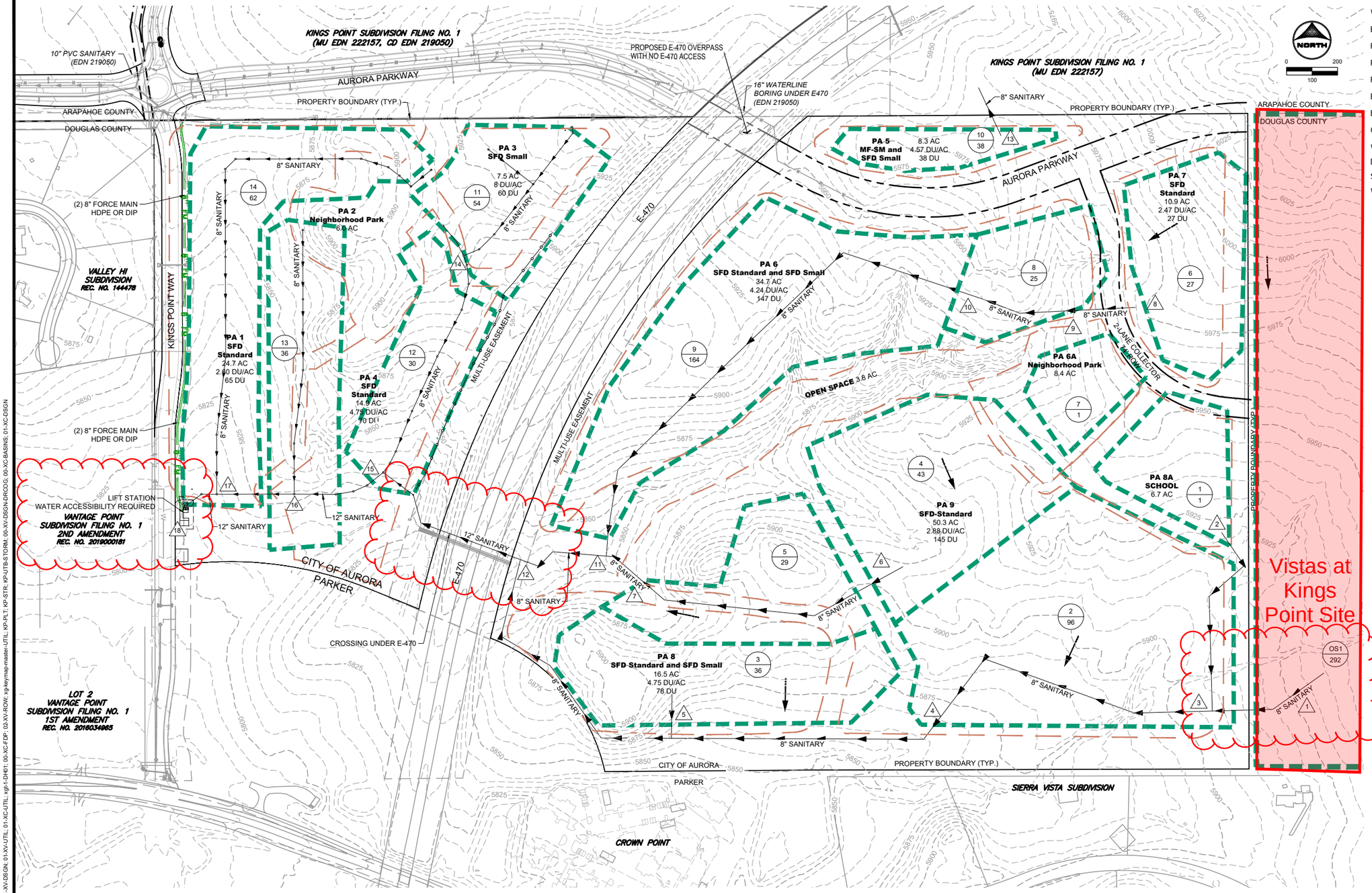
HR GREEN - DENVER
5619 DTC PARKWAY SUITE 1150
DENVER CO 80111
PHONE: 720.602.4999 | TOLL FREE: 800.728.7805
FAX: 844.273.1057 | HRGreen.com

KINGS POINT SOUTH SUBDIVISION - FILING NO. 1
LENNAR CORPORATION
CITY OF AURORA, COLORADO

MASTER UTILITY REPORT
MASTER WATER PLAN

SHEET WT1 | 1

HR GREEN Xrefs: 01-XV-ROW; 01-XV-DSGN; 01-XV-UTIL; 01-XC-UTIL; xg-1-DH01; 00-XC-FDP; 02-XV-RDW; xg-keymap-master-UTIL; KP-PLT; KP-STR; KP-UTB-STORM; 00-XV-DSGN-DRCGS; 00-XC-BASINS; 01-XC-DSGN



LEGEND

- SANITARY SEWER LINE — 12"
- EX. SANITARY SEWER LINE
- WATER LINE — W — W
- EX. WATER LINE — W — W
- FORCE MAIN — FM — FM
- PLANNING AREA BOUNDARY
- PROPERTY BOUNDARY
- EX. MAJOR CONTOUR (25') — 5050
- EX. MINOR CONTOUR (5') — 5045
- OVERLAND FLOW DIRECTION
- WATER ZONE DELINEATION
- DEMAND BASIN BOUNDARY
- SANITARY SEWER DESIGN POINT (1)
- WATER DEMAND POINT (D1)
- BASIN DESIGNATION — OS1
- UNIT COUNT — 14

BENCHMARK

NGS CONTROL POINT CRAIN BEING A 3" BRASS CAP SET IN CONCRETE BLOCK LOCATED ON THE WEST SIDE OF PARKER ROAD, AND 2,800' NORTHWEST OF THE INTERSECTION OF PARKER ROAD AND COTTONWOOD DRIVE. ELEVATION = 5734.55 ' (NAVD88)

DRAWN BY: KLH | JOB DATE: 9/21/2022
APPROVED: RWL | JOB NUMBER: 212000.01
CAD DATE: 11/30/2022
CAD FILE: J:\2021\212000.01\CAD\Dwgs\C\MUR\KPS_MasterUtilityPlan

BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

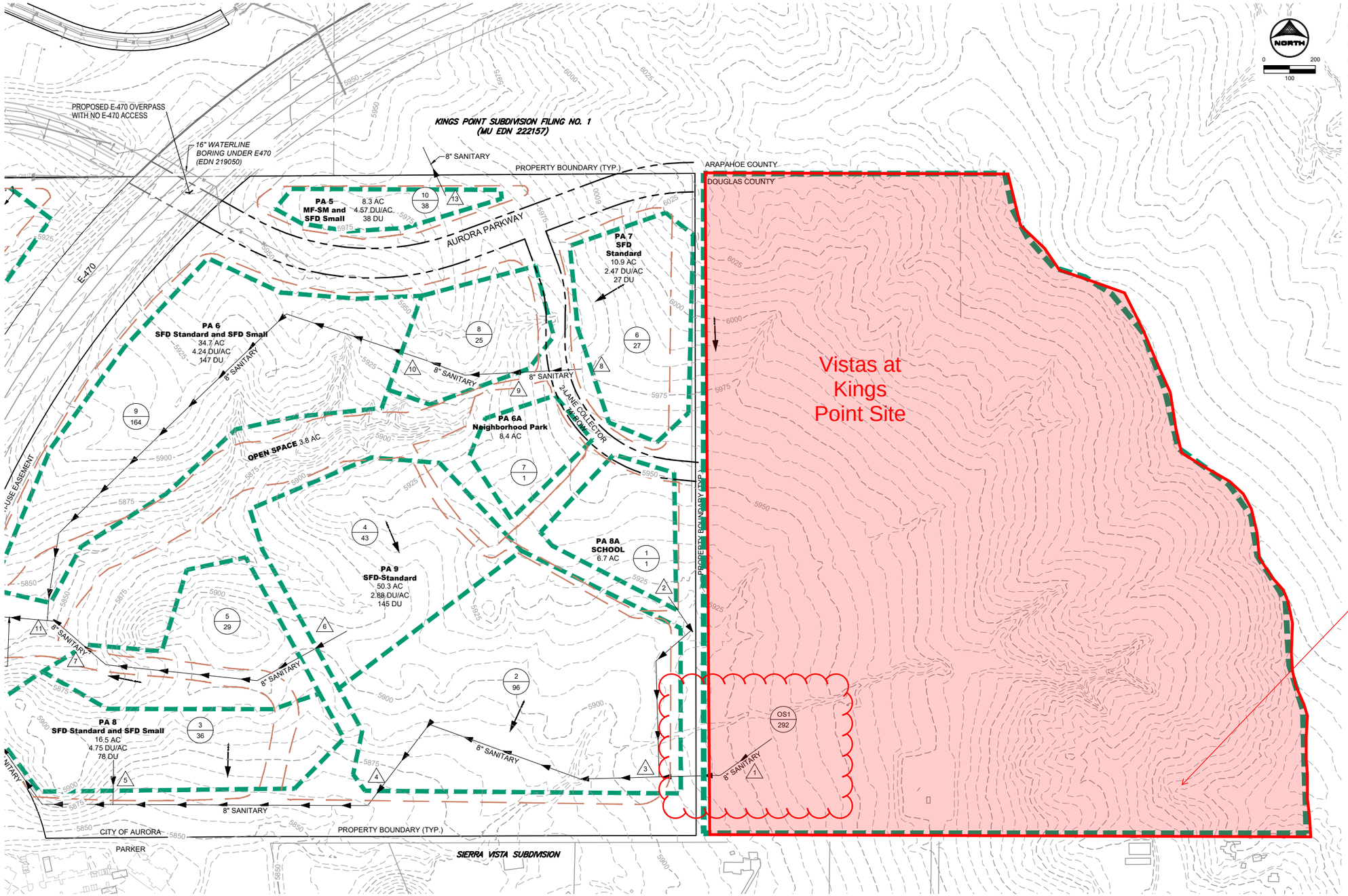
HR GREEN - DENVER
5619 DTC PARKWAY SUITE 1150
DENVER CO 80111
PHONE: 720.602.4999 | TOLL FREE: 800.728.7805
FAX: 844.273.1057 | HRGreen.com

KINGS POINT SOUTH SUBDIVISION - FILING NO. 1
LENNAR CORPORATION
CITY OF AURORA, COLORADO

MASTER UTILITY REPORT
MASTER SANITARY SEWER PLAN

SHEET SS1 | 2

HR GREEN Xrefs: 01-XV-ROW; 01-XV-DSGN; 01-XV-UTIL; 01-XC-UTIL; xg/-I-DH01; 00-XC-FDP; 02-XV-ROW; xg-keymap=master-UTIL; KP-PLT; KP-STR; KP-UTB-STORM; 00-XV-DSGN-DRCOG; 00-XC-BASINS; 01-XC-DSGN



LEGEND

- SANITARY SEWER LINE — S — 12"
- EX. SANITARY SEWER LINE
- WATER LINE — W — W
- EX. WATER LINE — W — W
- FORCE MAIN — FM — FM
- PLANNING AREA BOUNDARY
- PROPERTY BOUNDARY
- EX. MAJOR CONTOUR (25') — 5050
- EX. MINOR CONTOUR (5') — 5045
- OVERLAND FLOW DIRECTION
- WATER ZONE DELINEATION
- DEMAND BASIN BOUNDARY
- SANITARY SEWER DESIGN POINT (1)
- WATER DEMAND POINT (D1)
- BASIN DESIGNATION — OS1 / UNIT COUNT — 14

Show offsite Prusse property

The offsite Prusse property is now shown.

BENCHMARK

NGS CONTROL POINT CRAIN BEING A 3" BRASS CAP SET IN CONCRETE BLOCK LOCATED ON THE WEST SIDE OF PARKER ROAD, AND 2,800' NORTHWEST OF THE INTERSECTION OF PARKER ROAD AND COTTONWOOD DRIVE. ELEVATION = 5734.55 ' (NAVD88)

DRAWN BY: KLH | JOB DATE: 9/21/2022 | APPROVED: RWL | JOB NUMBER: 212000.01 | CAD DATE: 11/9/2022 | CAD FILE: J:\2021\212000.01\CAD\Dwgs\C\MUR\KPS_MasterUtilityPlan

BAR IS ONE INCH ON OFFICIAL DRAWINGS. IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

HR GREEN - DENVER
5619 DTC PARKWAY SUITE 1150
DENVER CO 80111
PHONE: 720.602.4999 | TOLL FREE: 800.728.7805
FAX: 844.273.1057 | HRGreen.com

KINGS POINT SOUTH SUBDIVISION - FILING NO. 1
LENNAR CORPORATION
CITY OF AURORA, COLORADO

MASTER UTILITY REPORT
OFFSITE SANITARY SEWER BAINS

SHEET SS2 | 3

HR GREEN Xrefs: 01-XV-ROW; 01-XV-DSGN; 01-XV-UTIL; 01-XC-UTIL; xg=1-DH01; 00-XC-FDP; 02-XV-ROW; xg-keymap-master-UTIL; KP-PLT; KP-STR; KP-UTB-STORM; 00-XV-DSGN-DRCOG; 00-XC-BASINS; 01-XC-BASINS

SANITARY SEWER DEMAND CALCULATIONS

HRGreen

Project #: 212000.01 Location: Aurora, CO By: K House Date: 9/21/2022
Project: Kings Point South Plan Date: Checked: R Littleton Date: 9/22/2022

LOADING RATES		
Zoning	Average Day (gpcd)	People per Unit
Residential	68	2.77

PEAKING FACTOR			
PF = 5/(p^0.167)	Where p = Population in thousands		
Min. PF =	1.7	Max. PF =	4.0

PIPE CAPACITY (mgd) (n=.011)				
75 % FULL	PIPE SIZE (IN)	0.4% SLOPE	1.0% SLOPE	2.5% SLOPE
	8	0.53	0.84	1.33
	10	0.97	1.53	2.41
	12	1.57	2.48	3.92

Zoning	Average Day (gpd/acre)	Equivalent Population
Schools / Industrial	1,200	18

Design Point	Basin	Planning Area	Development Type	No. of Units	No. of Acres	Population Density (people/unit)	Equivalent Population	Average Flow Generation (gpcpd)	Average Day Flow (mgd)	Infil. @ 10% (mgd)	Cummulative Population	Peak Factor	Peak Flow (mgd)	Peak Flow + Infil. (mgd)	Peak Flow + Infil. (cfs)	Estimated Pipe Slope (%)	Estimated Size at Given Slope	Pipe Velocity (ft/sec)	Percent Full at Given Slope
Kings Point South - Filing 2																			
1	OS-1	Offsite / 2.5 du-ac		292	117	2.77	809	68	0.055	0.006	809	4.0	0.220	***0.226***	*0.349*	0.4%	8		
2	1	School		1	6.7	18.00	121	67	0.008	0.001	121	4.0	0.032	***0.033***	*0.051*	0.4%	8		
3	Total at Design Point								0.063	0.006	929	4.0	0.252	***0.258***	*0.400*	0.4%	8		
4	2	PA-9	SFD - Standard	96	N/A	2.77	266	68	0.018	0.002	266	4.0	0.072	***0.074***	*0.115*	0.4%	8		
	Total at Design Point								0.081	0.008	1,195	4.0	0.324	***0.333***	*0.515*	0.4%	8		
5	3	PA-8	SFD - Standard	36		2.77	100	68	0.007	0.001	100	4.0	0.027	***0.028***	*0.043*	0.4%	8		
	Total at Design Point								0.088	0.009	1,295	4.0	0.352	***0.360***	*0.558*	0.4%	8	2.7	56.8%
6	4	PA-9	SFD - Standard	43		2.77	119	68	0.008	0.001	119	4.0	0.032	***0.033***	*0.051*	0.4%	8		
7	5	PA-8	SFD - Standard	29		2.77	80	68	0.005	0.001	80	4.0	0.022	***0.022***	*0.035*	0.4%	8		
	Total at Design Point								0.014	0.001	199	4.0	0.054	***0.056***	*0.086*	0.4%	8		
8	6	PA-7	SFD - Standard	27		2.77	75	68	0.005	0.001	75	4.0	0.020	***0.021***	*0.032*	0.4%	8		
9	7	PA-6A	Park	1												0.4%	8		
	Total at Design Point								0.005	0.001	75	4.0	0.020	***0.021***	*0.032*	0.4%	8		
10	8	PA-6	SFD - Standard	25		2.77	69	68	0.005	0.000	69	4.0	0.019	***0.019***	*0.030*	0.4%	8		
	Total at Design Point								0.010	0.001	144	4.0	0.039	***0.040***	*0.062*	0.4%	8		
11	9	PA-6	SFD - Standard	164		2.77	454	68	0.031	0.003	454	4.0	0.124	***0.127***	*0.196*	0.4%	8		
	Total at Design Point								0.054	0.005	798	4.0	0.217	***0.222***	*0.344*	0.4%	8	2.4	42.7%
12	Total at Design Point			420					0.142	0.014	2,093	4.0	0.569	***0.583***	*0.902*	0.4%	10	3.1	53.0%

222157MU1
1900-ARAP-SE
28M, 28N, 28P,
27P, 28Q, 28R,
27R

MASTER UTILITY REPORT

FOR

KINGS POINT NORTH
AURORA, CO
PROJECT NO. 1571466

In light of groundwater limitations, Aurora is providing the tertiary water alternative at the Binney Water Treatment Facility (PBPF) site. It shall be Oakwood's sole obligation to fund the infrastructure required to convey the tertiary water from the BWPF to the Kings Point Golf Course by 2035. In addition, Oakwood shall be responsible for all fees and rates associated with the tertiary system. A connection to the potable water system for golf course irrigation will not be allowed since Aurora Water is providing a tertiary water alternative.

Prepared for:

Clayton Properties Group II, Inc.
4908 Tower Road
Denver, CO 80249
Contact: Randy Bauer
Phone: 303-486-8500

Prepared by:

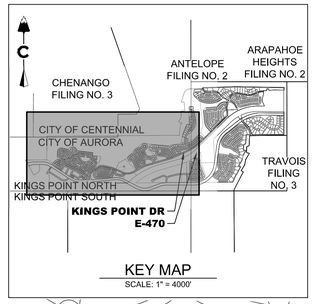
CORE Consultants, Inc.
3473 South Broadway
Englewood, CO 80113
Contact: Rob Hansen, PE, CFM
Phone: 303-703-4444
CORE Project Number: 19-032

June 1, 2022

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

ROBERT D. HANSEN, PE, CFM — 06/01/22 DATE

APPROVED ON THIS DATE 06/15/2022	
	06/14/2022
City Engineer	Date
	06/13/2022
Water Department	Date
	06/07/2022
Fire Department	Date



KEY MAP
SCALE: 1" = 4000'

FACSIMILE
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ROBERT D. HANSEN, PE, CFM — 06/01/22 DATE

LEGEND

X / X / X / XX
PLANNING AREA (DEMAND AREA)
-LOT COUNT
-ACRES
LAND USE
-SINGLE FAMILY (SF)
-MULTI-FAMILY (MF)
-COMMERCIAL (COM)
-PARK (PAR)

- 8-INCH WATER
- 12-INCH WATER
- 16-INCH WATER
- 24-INCH WATER
- 30-INCH WATER
- PLANNING AREA BOUNDARY
- PRESSURE ZONE BOUNDARY

NOTES:

1. WATER NODE MAP DOES NOT DEPICT ALL REQUIRED WATERLINES. MAP ONLY SHOWS THE MODELING OF THE PRIMARY WATER LINES.

APPROVED FOR ONE YEAR FROM THIS DATE
06/15/2022

CITY ENGINEER	Vernon D. Adam	06/14/2022 DATE
WATER DEPARTMENT		06/13/2022 DATE
FIRE DEPARTMENT		06/07/2022 DATE

CORE CONSULTANTS, INC.
3473 S. BROADWAY
ENGLEWOOD, CO 80113
303.703.4444
LIVEYOURCORE.COM

LAND DEVELOPMENT | ENERGY | PUBLIC INFRASTUCTURE

CORE

C
0 300'
1 inch = 300 ft.

MASTER UTILITY WATER NODE MAP

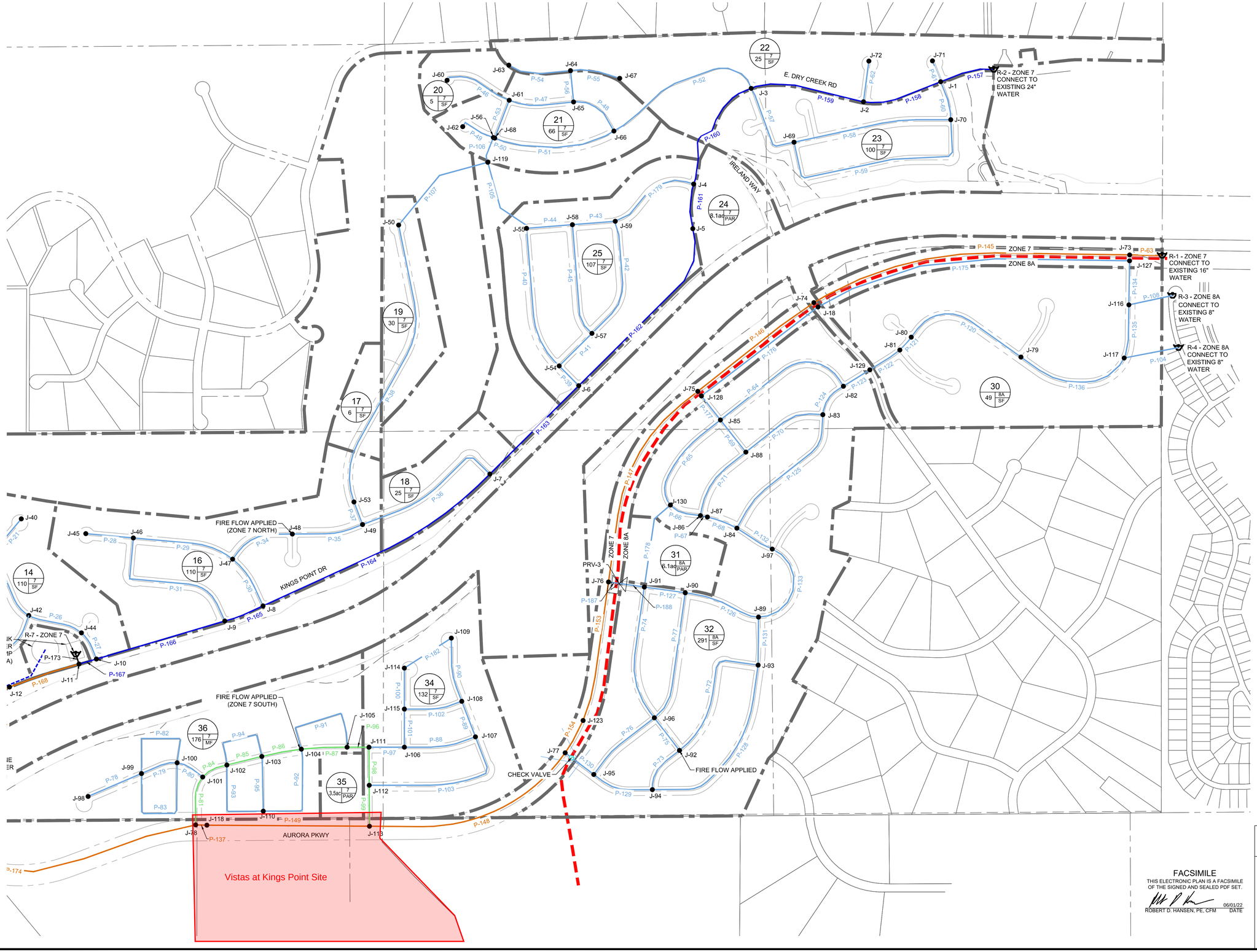
KINGS POINT NORTH

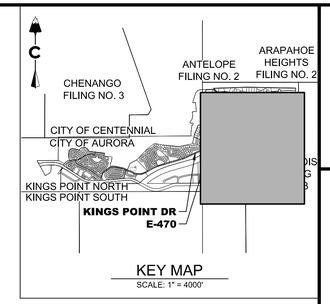
DATE: 05/27/22
CREATED BY: AR
JOB NO. 19-032
SHEET 1

5/27/2022 12:00 PM - X:\19-032 KINGS POINT\CIVIL\CAD\PLAN\UTILITY REPORTS\MASTER UTILITY REPORT\WATER CAD\KP MASTER WATERCAD MODEL.DWG

APPROVED ON 06/15/2022

222157





C

0 300'

1 inch = 300 ft.

LEGEND

X — PLANNING AREA (DEMAND AREA)

X — LOT COUNT / ACRES

XX — LAND USE
-SINGLE FAMILY (SF)
-MULTI-FAMILY (MF)
-COMMERCIAL (COM)
-PARK (PAR)

- 8-INCH WATER
- 12-INCH WATER
- 16-INCH WATER
- 24-INCH WATER
- 30-INCH WATER
- PLANNING AREA BOUNDARY
- PRESSURE ZONE BOUNDARY

NOTES:

1. WATER NODE MAP DOES NOT DEPICT ALL REQUIRED WATERLINES, MAP ONLY SHOWS THE MODELING OF THE PRIMARY WATER LINES.

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APPROVED FOR ONE YEAR FROM THIS DATE
06/15/2022

CITY ENGINEER	06/14/2022 DATE
WATER DEPARTMENT	06/13/2022 DATE
FIRE DEPARTMENT	06/07/2022 DATE

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MASTER UTILITY WATER NODE MAP

KINGS POINT NORTH

DATE: 05/27/22

CREATED BY: AR

JOB NO. 19-032

SHEET 2

5/27/2022 11:58 AM - X:\19-032 KINGS POINT\CIVIL\CAD\PLAN\UTILITY REPORT\MASTER UTILITY REPORT\MASTER WATER CAD\KP MASTER WATERCAD MODEL.DWG;

APPROVED ON 06/15/2022

3

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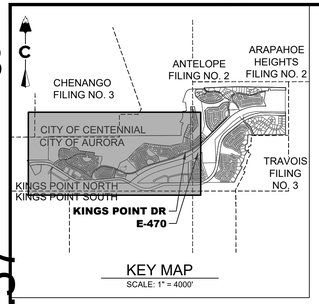

KEY MAP
SCALE: 1" = 4000'

SEE REPORT TEXT

CONNECT TO EX. 8" ECCV LINE

LONG AVE

PROPERTY BOUNDARY, TYP

CONNECT TO EX. 15" SS

S. PARKER ROAD

AURORA PARKWAY

NEIGHBORHOOD PARK (NAC #1) 3.1 AC

E. KINGS POINT DR.

PROPOSED GOLF CLUB HOUSE

5 MG WATER TANK

E-470

MATCH LINE SEE NEXT SHEET

NEIGHBORHOOD PARK (NAC #4) 3.5 AC

Vistas at Kings Point Site

A	31	SF	
B	85	SF	
C	176	MF	
D	17	SF	
E	12.3	COMM	
F	68	SF	
G	208	SF	
H	81	SF	
I	116	MF	
J	37	SF	
K	16	COMM	
L	62	SF	
N	33	SF	
Q	34	SF	
Q-1	38	SF	
T	4.8	SF	
U	12	SF	
FUT-2	38	SF	
FUT	400	SF	

Demands at DP-32 from the Master Utility Report for Kings Point South-West Parcel dated June 9, 2021. See appendix E for sanitary map and peak flow for main B.

NOTES:

1. INTERNAL ROADWAY NETWORK SHOWN IS PRELIMINARY AND SUBJECT TO CHANGE.
2. SEE DEMAND CALCS FOR APPROXIMATE PIPE SIZING AT CORRESPONDING DESIGN POINTS.
3. PIPE SIZES SHOWN HERE ON ARE BASED ON MIN SLOPE VALUES AND ARE NOT REFLECTIVE OF A FINAL DESIGN. THE PROPOSED PIPES SIZES ARE SUBJECT TO CHANGE BASED ON FURTHER INVESTIGATION WITHIN SUBSEQUENT UTILITY REPORTS.

X — BASIN DESIGNATION
00.0 — DENSITY / LOT COUNT
SF/MF — LAND USE -SINGLE FAMILY -MULTI-FAMILY -COMMERCIAL
X — DESIGN POINT

LEGEND

- BASIN BOUNDARY
- EXISTING SANITARY SEWER (SIZE PER PLAN)
- PROPOSED 8" SANITARY SEWER
- PROPOSED 10" SANITARY SEWER
- PROPOSED 12" SANITARY SEWER
- PROPOSED 15" SANITARY SEWER

FACSIMILE

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06/15/2022

CITY ENGINEER — 06/14/2022 DATE

WATER DEPARTMENT — 06/13/2022 DATE

N
0 300'
1 inch = 300 ft.

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SANITARY SEWER BASIN MAP

KINGS POINT NORTH

DATE: 06/01/22
CREATED BY: AR
JOB NO. 19-032
SHEET 1 OF 2

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APPROVED ON 06/15/2022

4

222157

CONNECT TO EX. 8" ECCV LINE
MAX CAPACITY - 249 GMP/272 SFRE'S
CREEKSIDE SCHOOL DEMAND - 43 SFRE'S
REMAINING CAPACITY - 229 SFRE'S
(FUTURE UPSIZING REQUIRED.
SEE REPORT TEXT FOR ADDITIONAL INFORMATION)

CONNECT TO EX. 8" ECCV LINE

LONG AVE

CONNECT TO EX. 10" SS

E. DRY CREEK RD.

EX. LIFT STATION

NEIGHBORHOOD PARK
(NAC #2) 8.1 AC

CONNECT TO EX. 8" SS

E-470

AURORA PARKWAY

S. IRELAND WAY

E. KINGS POINT DR.

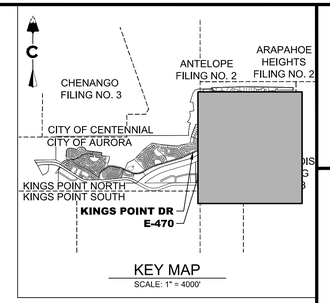
NEIGHBORHOOD PARK
(NAC #3) 6.1 AC

NEIGHBORHOOD PARK
(NAC #4) 3.5 AC

Vistas at Kings Point Site

A	31	SF
C	176	MF
FUT	400	SF
L	62	SF
M	291	SF
N	33	SF
O	111	SF
P	84	SF
Q	34	SF
Q-1	38	SF
R	112	SF
S	49	SF

MATCH LINE SEE PREVIOUS SHEET



KEY MAP
SCALE: 1" = 4000'

0 300'
1 inch = 300 ft.

LEGEND

X — BASIN DESIGNATION
00.0 — DENSITY / LOT COUNT
SF/MF — LAND USE (-SINGLE FAMILY, -MULTI-FAMILY, -COMMERCIAL)
X — DESIGN POINT

- BASIN BOUNDARY
- EXISTING SANITARY SEWER (SIZE PER PLAN)
- PROPOSED 8" SANITARY SEWER
- PROPOSED 10" SANITARY SEWER
- PROPOSED 12" SANITARY SEWER
- PROPOSED 15" SANITARY SEWER

NOTES:

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ROBERT D. HANSEN, PE, CFM — 06/01/22 DATE

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06/15/2022

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WATER DEPARTMENT — 06/13/2022 DATE

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SANITARY SEWER BASIN MAP

KINGS POINT NORTH

DATE: 05/27/22
CREATED BY: AR
JOB NO. 19-032
SHEET 2 OF 2

5/27/2022 8:52 AM - \\CORE-2012-FILE\PROJECTS\19-032 KINGS POINT\CIVIL\CADD\PLANS\UTILITY REPORTS\MASTER UTILITY REPORTS\SANITARY BASIN MAP\SANITARY SEWER BASIN MAP.DWG;

APPROVED ON 06/15/2022

Terracina Design 1st FDP
Submittal Comment Response

PUBLIC IMPROVEMENT PLAN

FOR

THE VISTAS AT KINGS POINT
AURORA, COLORADO

Prepared for:

KINGS POINT INVESTMENTS, LLC
2707 E. Willamette Lane
Greenwood Village, CO 80121
Contact: Tim Sanford
Email: tim@sanford-elliott.com

Prepared by:

Terracina Design
10200 E. Girard Ave., Suite A-314
Denver, CO 80231
Contact: David Bacci, PE
Phone: (303) 632-8867

March 2022

Table of Contents

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B. Scope of Work 4
C. Site Location 4
D. Filings 4

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C. Water Distribution System 5
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E. Storm Drainage System 6

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V. CONCLUSION 13

Appendices

Appendix A - Vicinity Map
Firm Map

Appendix B - Road Sections
Public Improvement Plan Exhibits

I. INTRODUCTION

A. General Description

The Vistas at Kings Point (Site) is a residential development and is situated on a total of 95.2 acres. The Site will consist of single family, multifamily, a park, open space, and a school site. The remaining improved areas will be for roadways, a detention pond, and open space located throughout the development.

B. Scope of Work

The purpose of this Public Improvement Plan (PIP) is to define the infrastructure requirements for the Vistas at Kings Point master planned community. The surrounding developments and filings will not be defined within this report.

C. Site Location

The Site is located in a portion of the northwest quarter of Section 2 and in a portion of the northeast quarter of Section 3, Township 6 South, Range 66 West of the 6th Principal Meridian, City of Aurora, County of Douglas, State of Colorado. The Site is bound by Highway E-470 to the north, Antelope Creek to the east, Sierra Vista No. 3 subdivision to the south, and vacant land to the west. Currently, there are several future developments adjacent to the site. To the north is Prairie Point South and Aurora Parkway (future), to the east is Overlook at Kings Point, and to the west is Kings Point South.

D. Filings

The Site has been divided into eight planning areas. These planning areas include single family, multi-family, a park, a school, and open space. A brief description of each planning area is below:

- Planning Area 1 located in the northwest portion of the development will consist of Multifamily/Townhouses at 18.1 dwelling units per acre with a maximum of 204 dwelling units.

- Planning Area 2 located in the central west portion of the development will consist of residential units at a density of 2.5 dwelling units per acre with a maximum of 31 dwelling units and public local roads.

- Planning area 3 located in the south and east portion of the development will consist of will consist of residential units at a density of 2.2 dwelling units per acre with a maximum of 109 dwelling units, public local roads, and a detention pond.

- Planning Area 4 located in the central west portion of the development will consist of a school.

- Planning Area 5 located in the central portion of the development will consist of a neighborhood park.

- Planning Area 6 located in the east portion of the development will consist of open space.
- Planning area 7 located in the middle portion of the development and will consist of open space.
- Planning area 8 located in the south portion of the development will consist of open space.

All parks and open space areas will be constructed with the last adjacent planning area as described in Form J of the Master Plan.

II. Public Improvements

A. General

The Public Improvement Plan Exhibits loc planning areas for the project and the r planning area. Proposed roadway section in Appendix B. Public Improvement Plan E all required improvements. All other P improvements for each individual planning

Conversations between land owners are still ongoing regarding who is responsible for building what portion of Aurora Parkway. No additional obligation notes have been added at his time.

The utility alignments shown and discussed within subject to change during the final design of the Site. Final r and storm sewer alignments will be determined in future site submittals. The Site will have two points of access with each fi quirements. The waterline layout has been designed to provide ed services for each filing. All utility and road design will comply rds and will be subject to review and comment at the time of f

Aurora Parkway is an obligation of this property.

The PIP should identify the timing of the improvements to Aurora parkway with regards to permitting.

B. Roadway System

The Vistas at Kings Point development is predicated on the construction of Aurora Parkway. The initial access to the Site will be from Aurora Parkway via the proposed collector. The collector road will continue through the site, connecting to Kings Point South to the west. The collector will then continue through Kings Point South and connect back to Aurora Parkway. It's anticipated that the colle ucted with the full roadway secti rea to maintain two points of acce ement Exhibits located within the A

A statement about offsite improvements required to meet traffic and life safety needs has been added to the report.

C. Water Distribution

Add that offsite improvements may be required to meet traffic and life safety needs here and to each planning area.

Water will be supplied to the Site by a future 12 inch and 8-inch stub from the west through the Kings Point South development. Additional interior waterline construction will be completed incrementally as development progresses throughout the Site in a manner to ensure a looped system will provide adequate pressure and water supply to the planning areas.

E Aurora Pkwy needs to cross E-470, and connect to Kings Point North for 2nd access point.

A statement about the E-470 bridge needed to be established for a second point of access has been added to the report.

D. Sanitary Distribution System

The Project will contain one sanitary sewer basin that will flow generally from northeast to southwest and connect to a future 8 inch stub in Kings Point South to the west. Flows will then continue through the Kings Point South development, cross Highway E-470, and enter a lift station located on the east side of Kings Point Way. Additional interior sanitary construction will be completed incrementally as development progresses throughout the Site in a manner to ensure sanitary connections to each planning areas and dwelling units.

E. Storm Drainage System

The Site is located in the Cottonwood Middle Tributary and will require public and private drainage improvements for the conveyance of developed stormwater to the proposed detention pond. Stormwater runoff will be routed to a detention pond located at the southwest corner of the Project through an underground piped system as shown on the Public Improvement Plan Exhibits. Flows from the detention pond will then outfall to Kings Point South and eventually make it into an existing pond within the Crown Point development located southwest of the Site. The drainage facilities will be designed to the 2-year and 100-year storm events using Aurora's Stormwater Design and Technical Criteria Manual and Mile High Flood District's Criteria Manual.

III. Specific Planning Area Improvements

Preliminary improvements for each individual planning area are outlined below. Changes in the filing sequencing may be approved by the City of Aurora's Public Works Department. Any designated filing can be constructed at any time as long as two points of access are provided for life safety, a looped water system capable of providing adequate fire flow and domestic service is provided, sanitary sewer is provided for each dwelling unit, and storm drainage is adequately served with water quality, detention storage, and conveyance to downstream facilities. Planning areas dedicated to detention ponds or parks and open space are not part of individual filings, but are included with proposed construction as the other individual filings require the detention or park to be constructed. Additional offsite improvements may be required based on traffic and life safety requirements. Final improvements for each individual planning area will be determined in future site plan and construction drawing submittals.

A. Planning Area 1

A statement about Aurora Parkway being a requirement for each planning area has been added to planning area sections 1-4.

1. General

Proposed roadways and wet [illegible] Public Improvement Plan Exhibit 2 locate[illegible] Area 1, in the northwest portion of [illegible] posed multifamily/ townhomes. Infrastructure necessary for the completion of this phase includes the construction of the collector roadway, waterlines, sanitary sewer mains, storm sewers, and a[illegible]

Typical planning areas 1-4, include Aurora Parkway as a requirement for each planning area in the narrative and on the exhibits.

2. Roadway System

The roadway infrastructure necessary for the completion of this phase includes the construction of the collector road that bisects the Site. Internal streets shall

be defined and constructed during the Site Plan and Construction Document process. Proposed roadway sections shall be designed and constructed per City of Aurora specifications and standards. Exhibits showing the proposed road cross-sections have been provided in Appendix B of this report.

3. Water Distribution System

Water will be provided to Planning Area 1 by making two connections to the proposed 12 inch waterline located in the proposed collector that is bisecting the Project. An interior 8 inch water line will be used to supply the dwelling units with potable water. The conceptual waterline layout is shown on Public Improvement Plan Exhibit 2 located in Appendix B of this report.

4. Sanitary Sewer System

Sanitary flows will be collected and conveyed through a sanitary sewer system in the local and collector roads within the Site. Sanitary flows will eventually flow to the southwest portion of the Site. Flows will then continue through Kings Point South, cross Highway E-470, and enter a lift station located on the east side of Kings Point Way.

5. Parks and Open Space

Planning Area 1 is bordered by Planning Area 5 to the south. Planning Area 5 is a neighborhood park and will be constructed with the last remaining adjacent planning area as described in Form J of the Master Plan.

B. Planning Area 2

1. General

Proposed roadways and wet utility alignments are shown on Public Improvement Plan Exhibit 3 located in Appendix B of this report. Planning Area 2 located in the central west portion of the Site contains 12.5 acres of proposed residential dwelling units. Infrastructure necessary for the completion of this phase includes the construction of the collector roadway, waterlines, sanitary sewer mains, storm sewers, and associated drainage facilities.

2. Roadway System

The roadway infrastructure necessary for the completion of this phase includes the construction of the collector road that bisects the Site. Internal streets shall be defined and constructed during the Site Plan and Construction Document process. Proposed roadway sections shall be designed and constructed per City of Aurora specifications and standards. Exhibits showing the proposed road cross-sections have been provided in Appendix B of this report.

3. Water Distribution System

Water will be provided to Planning Area 2 by making two connections to the proposed 12 inch waterline located in the proposed collector that is bisecting the Project and one connection to the waterline located in Planning Area 1. An interior 8 inch water line will be used to supply the dwelling units with potable water. The conceptual waterline layout is shown on Public Improvement Plan Exhibit 3 located in Appendix B of this report.

4. Sanitary Sewer System

Sanitary flows will be collected and conveyed through a sanitary sewer system in the local and collector roads within the Site. Sanitary flows will eventually flow to the southwest portion of the Site. Flows will then continue through Kings Point South, cross Highway E-470, and enter a lift station located on the east side of Kings Point Way.

5. Parks and Open Space

Planning Area 2 is bordered by Planning Area 5 to the northeast. Planning Area 5 is a neighborhood park and will be constructed with the last remaining adjacent planning area as described in Form J of the Master Plan.

C. Planning Area 3

1. General

Proposed roadways and wet utility alignments are shown on Public Improvement Plan Exhibit 4 located in the Appendix B of this report. Planning Area 2 contains 49.7 acres of proposed residential dwelling units in the southeast portion of the Site. Infrastructure necessary for the completion of this phase includes the construction of the collector roadway, waterlines, sanitary sewer mains, storm sewers, and associated drainage facilities.

2. Roadway System

The roadway infrastructure necessary for the completion of this phase includes the construction of the collector road that bisects the Site. Internal streets shall be defined and constructed during the Site Plan and Construction Document process. Proposed roadway sections shall be designed and constructed per City of Aurora specifications and standards. Exhibits showing the proposed road cross-sections have been provided in Appendix B of this report.

3. Water Distribution System

Water will be provided to Planning Area 3 by making multiple connection to the proposed 12 inch waterline located in the proposed collector that is bisecting the Site. An interior 8 inch water line will be used to supply the dwelling

units with potable water. The conceptual waterline layout is shown on Public Improvement Plan 4 located in Appendix B of this report.

4. Sanitary Sewer System

Sanitary flows will be collected and conveyed through a sanitary sewer system in the local and collector roads within the Site, to the southwest portion of the site. Flows will then continue through Kings Point South, cross Highway E-470, and enter a lift station located on the east side of Kings Point Way.

5. Parks and Open Space

Planning Area 3 is bordered by Planning Area 7 to the northeast. Planning Area 7 is open space and will be constructed with the last remaining adjacent planning area as described in Form J of the Master Plan.

D. Planning Area 4

1. General

Proposed roadways and wet utility alignments are shown on Public Improvement Plan 5 located in Appendix B of this report. Planning Area 4 contains 6.0 acres of proposed school zoning in the central west portion of the Site. Infrastructure necessary for the completion of this phase includes the construction of the collector roadway, waterlines, sanitary sewer mains, storm sewers, and associated drainage facilities.

2. Roadway System

The roadway infrastructure necessary for the completion of this phase includes the construction of the collector road that bisects the Project. Internal streets shall be defined and constructed during the Site Plan and Construction Document process.

3. Water Distribution System

Water will be provided to Planning Area 4 by making one connection to the proposed 12 inch waterline located in the proposed collector that is bisecting the Site. The conceptual waterline layout is shown on Public Improvement Plan Exhibit 5 located in Appendix B of this report.

4. Sanitary Sewer System

Sanitary flows will be collected and conveyed through a sanitary sewer system in the local road to the southwest portion of the site. Flows will then continue through Kings Point South, cross Highway E-470, and enter a lift station located on the east side of Kings Point Way.

5. Parks and Open Space

Planning Area 4 is not bordered by a park or open space.

E. Planning Area 5

1. General

Proposed roadways and wet utility alignments are shown on Public Improvement Plan 6 located in Appendix B of this report. Planning Area 5 contains 3.0 acres of a proposed neighborhood park in the central of the Site. Infrastructure necessary for the completion of this phase includes the construction of the collector roadway, waterlines, sanitary sewer mains, storm sewers, and associated drainage facilities.

2. Roadway System

The roadway infrastructure necessary for the completion of this phase includes the construction of the collector road that bisects the Project. Internal streets shall be defined and constructed during the Site Plan and Construction Document process.

3. Water Distribution System

Water will be provided to Planning Area 5 by making one connection to the proposed 12 inch waterline located in the proposed collector that is bisecting the Site. The conceptual waterline layout is shown on Public Improvement Plan Exhibit 6 located in Appendix B of this report.

4. Sanitary Sewer System

Sanitary flows will be collected and conveyed through a sanitary sewer system in the collector road to the southwest portion of the site. Flows will then continue through the Kings Point South development, cross Highway E-470, and enter a lift station located on the east side of Kings Point Way.

5. Parks and Open Space

Planning Area 5 is not bordered by a park or open space.

F. Planning Area 6

1. General

Proposed roadways and wet utility alignments are shown on Public Improvement Plan 7 located in Appendix B of this report. Planning Area 6 contains 3.2 acres of a proposed open space in the northeast and east portion of the Site. Infrastructure necessary for the completion of this phase includes

the construction of the collector roadway, waterlines, sanitary sewer mains, storm sewers, and associated drainage facilities.

2. Roadway System

The roadway infrastructure necessary for the completion of this phase includes the construction of the collector road that bisects the Project.

3. Water Distribution System

Water will be provided to Planning Area 6 by making one connection to the proposed 12 inch waterline located in the proposed collector that is bisecting the Site. The conceptual waterline layout is shown on Public Improvement Plan Exhibit 7 located in Appendix B of this report.

4. Sanitary Sewer System

No sanitary infrastructure will be supplied to Planning area 6

5. Parks and Open Space

Planning Area 6 is not bordered by any other parks or open space.

G. Planning Area 7

1. General

Proposed roadways and wet utility alignments are shown on Public Improvement Plan 8 located in Appendix B of this report. Planning Area 7 contains 2.5 acres of a proposed open space in the central portion of the Site. Infrastructure necessary for the completion of this phase includes the construction of the collector roadway, waterlines, sanitary sewer mains, storm sewers, and associated drainage facilities.

2. Roadway System

The roadway infrastructure necessary for the completion of this phase includes the construction of the collector road that bisects the Project.

3. Water Distribution System

Water will be provided to Planning Area 7 by making one connection to the proposed 12 inch waterline located in the proposed collector that is bisecting the Site. The conceptual waterline layout is shown on Public Improvement Plan Exhibit 8 located in Appendix B of this report.

4. Sanitary Sewer System

No sanitary infrastructure will be supplied to Planning area 7

5. Parks and Open Space

Planning Area 7 is not bordered by a park or open space.

H. Planning Area 8

1. General

Proposed roadways and wet utility alignments are shown on Public Improvement Plan 9 located in Appendix B of this report. Planning Area 8 contains 0.9 acres of a proposed open space in the central portion of the Site. Infrastructure necessary for the completion of this phase includes the construction of the collector roadway, waterlines, sanitary sewer mains, storm sewers, and associated drainage facilities.

2. Roadway System

The roadway infrastructure necessary for the completion of this phase includes the construction of the collector road that bisects the Project.

3. Water Distribution System

Water will be provided to Planning Area 8 by making one connection to the proposed 8 inch waterline located in Planning Area 8. The conceptual waterline layout is shown on Public Improvement Plan Exhibit 9 located in Appendix B of this report.

4. Sanitary Sewer System

No sanitary infrastructure will be supplied to Planning area 8

5. Parks and Open Space

Planning Area 7 is not bordered by a park or open space.

IV. Fire Life Safety

The developer is responsible for building all necessary infrastructure, both on and off the site, to establish two emergency access points for the entire site and each phase of interior construction. This includes constructing any necessary emergency crossing improvements, fire hydrants, and looped water supplies as mandated by the fire code and city regulations. For any phase with 30 or more residential units, a looped water system and two access points to the site must be provided at the time of the site plan.

A phasing plan must be provided if the interior of the site will be developed in multiple phases.The phasing plan must show two access points and a looped water supply for each phase. In the absence of a permanent fire station, the Aurora Fire Department may require a temporary fire station if its risk analysis shows that it's necessary based on the following criteria:

- a yearly rate of over 100 alarms in the first DUE area.
- a response time for the first DUE of over 8 minutes 90% of the time.
- over 100 family dwelling units.
- commercial/industrial square footage exceeding 2 million square feet.

If a temporary fire station is needed, the developer must provide a 1 ¾ acre site within close proximity to the development for the station, separate from the permanent station's site. The temporary station will be available for use by the Aurora Fire Department for 10 years or as specified by an agreement between the department and the developer.

A Whelen Warning System may be required for the site, the location of which can be determined using different methods. In the past, the population density of the city center determined the location of sirens to ensure coverage. In newly annexed or developing areas of the city, sirens should be placed every ½ section of ground (320 acres) or 6000 feet apart for edge-on-edge coverage. Contact the Office of Emergency Management at 303- 739-7636 (phone), 303-326-8986 (fax), or email to afd_oem@aurora.gov with any questions.

V. Conclusion

The purpose of this Public Improvement Plan report is to identify and outline the infrastructure improvements required for the Vistas at Kings Point development. As stated above, the Site is anticipated to have seven planning areas. Utility and drainage improvements will be outlined in the accompanying Master Utility Report and Master Drainage Report respectively.

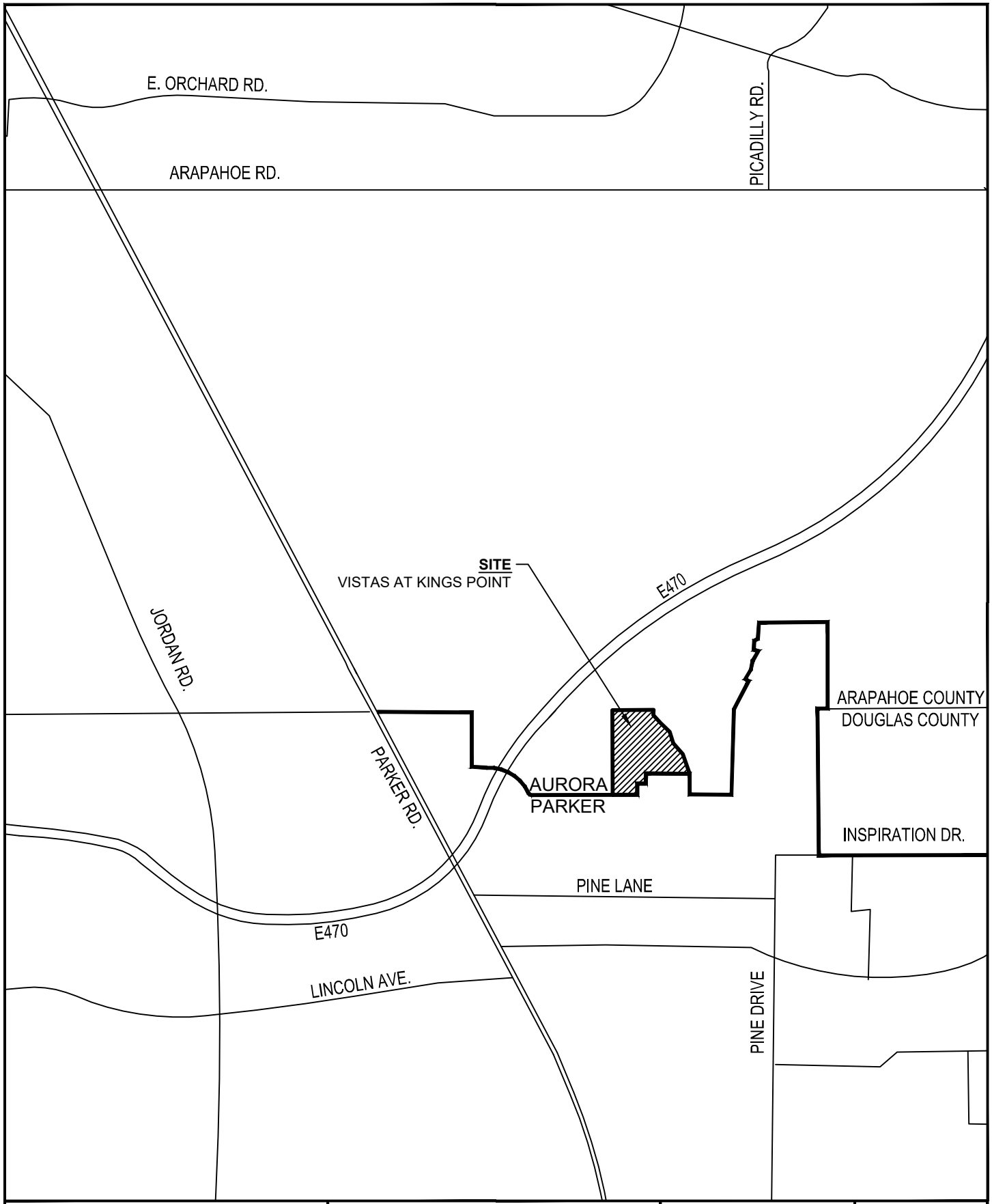
APPENDIX A
GENERAL MAPS

VICINITY MAP

FIRM MAP

terracina design

Landscape Architecture, Planning & Engineering
10200 E. Girard Avenue, A-314. Denver, CO 80231 PH: 303.632.8867



terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

KINGS POINT VISTAS
VICINITY MAP

AURORA, CO

DATE: 2023-02-08

0 4000'

1" = 4000'

N

2/8/2023 10:17 AM ; X:\VISTAS AT KINGS POINT\CAD\PLANS\01 - VICINITY MAP\VICINITY MAP.DWG;

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 shown on 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 Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

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 Floodway Data table shown on this FIRM.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD 83, GRS 1980 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, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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 Douglas County GIS Department and the Town of Castle Rock GIS Department. Additional input was provided by the City of Lone Tree and Town of Parker. These data are current as of 2010.

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 **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

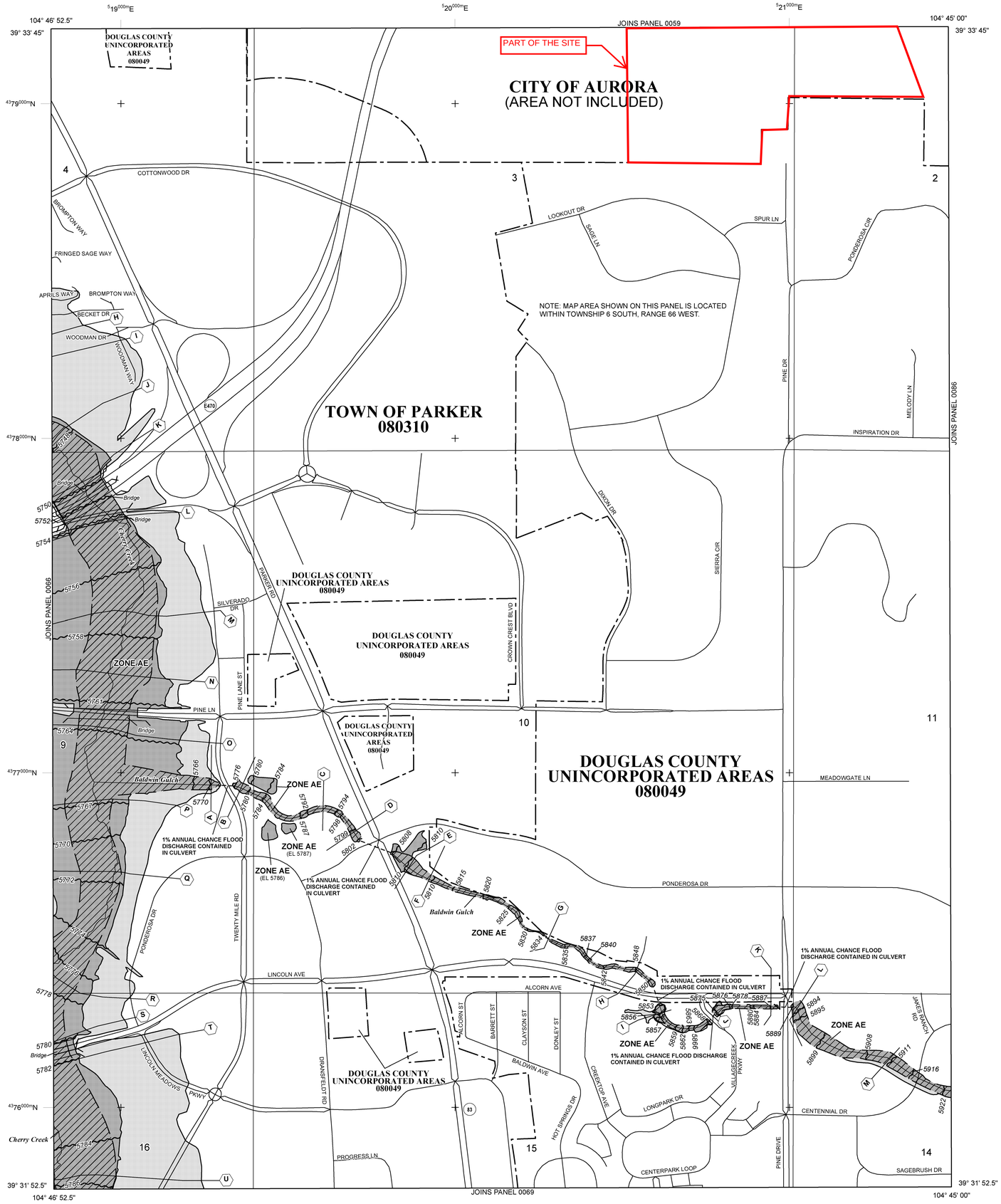
Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

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.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



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 Areas 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.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4988000mN — 1000-meter Universal Transverse Mercator grid values, zone 13
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

SEPTEMBER 30, 2005

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

MARCH 16, 2016: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to update map format, to add roads and road names, to reflect updated topographic information, to incorporate previously issued letters of map revision.

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.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0067G

FIRM

FLOOD INSURANCE RATE MAP

DOUGLAS COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 67 OF 495
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

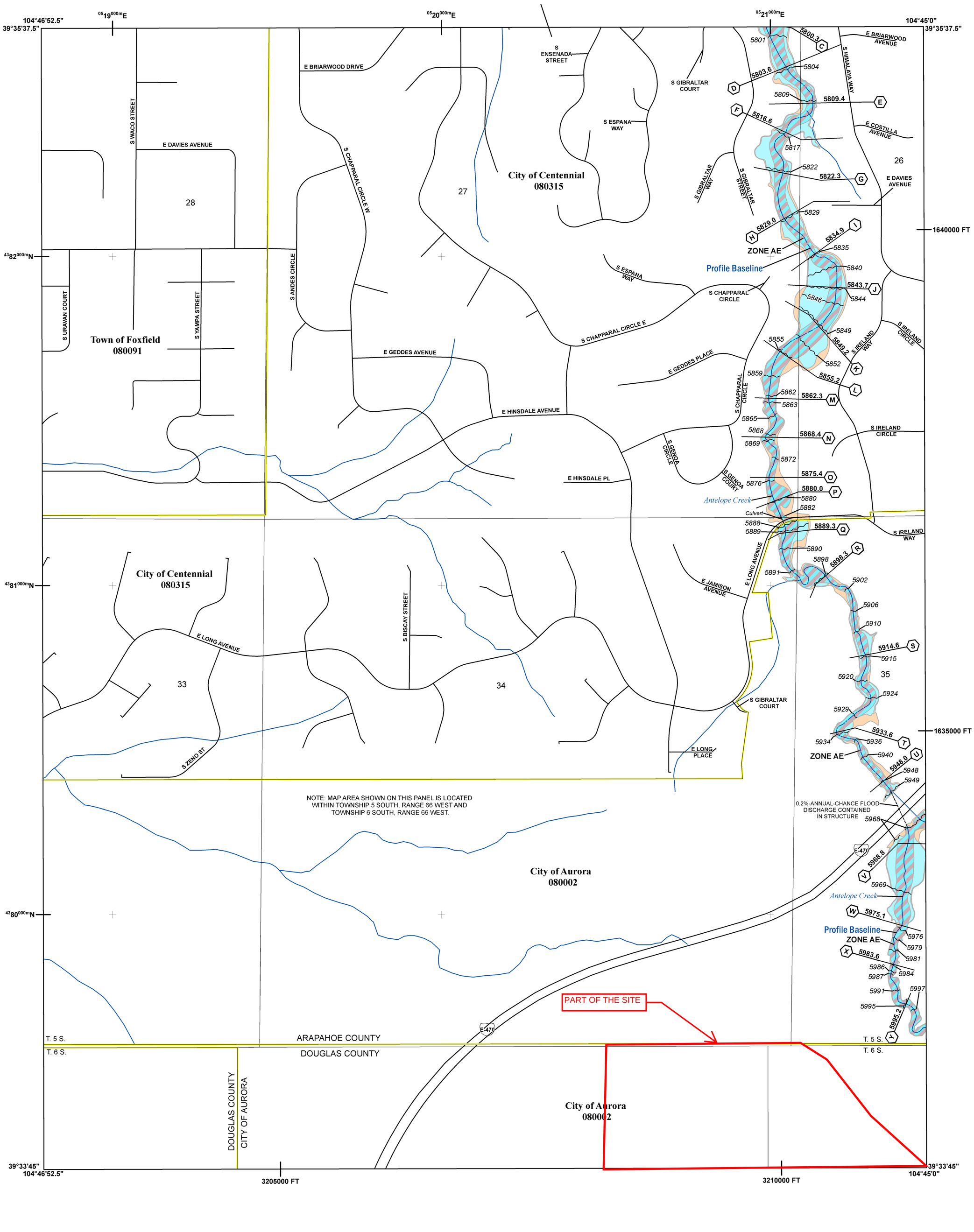
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DOUGLAS COUNTY	080049	0067	G
PARKER, TOWN OF	080310	0067	G

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
08035C0067G
MAP REVISED
MARCH 16, 2016

Federal Emergency Management Agency



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 5 SOUTH, RANGE 66 WEST AND TOWNSHIP 6 SOUTH, RANGE 66 WEST.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A,V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*

OTHER AREAS
- NO SCREEN Areas of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike, or Floodwall
- Non-accredited Levee, Dike, or Floodwall

OTHER FEATURES
- E 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction. To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

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 1980 spheroid, Western Hemisphere.

SCALE

Map Projection:

NAD83 UTM Zone 13N
Western Hemisphere; Vertical Datum: NAVD88

1 inch = 500 feet 1:6,000

0 1,000 2,000 Feet

0 250 500 Meters

PANEL LOCATOR

* PANEL NOT PRINTED

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

ARAPAHOE COUNTY, COLORADO
And Incorporated Areas

PANEL 484 OF 725

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
AURORA, CITY OF	080002	0484	L
CENTENNIAL, CITY OF	080315	0484	L
FOXFIELD, TOWN OF	080091	0484	L

VERSION NUMBER
2.3.3.2

MAP NUMBER
08005C0484L

MAP REVISED
FEBRUARY 17, 2017

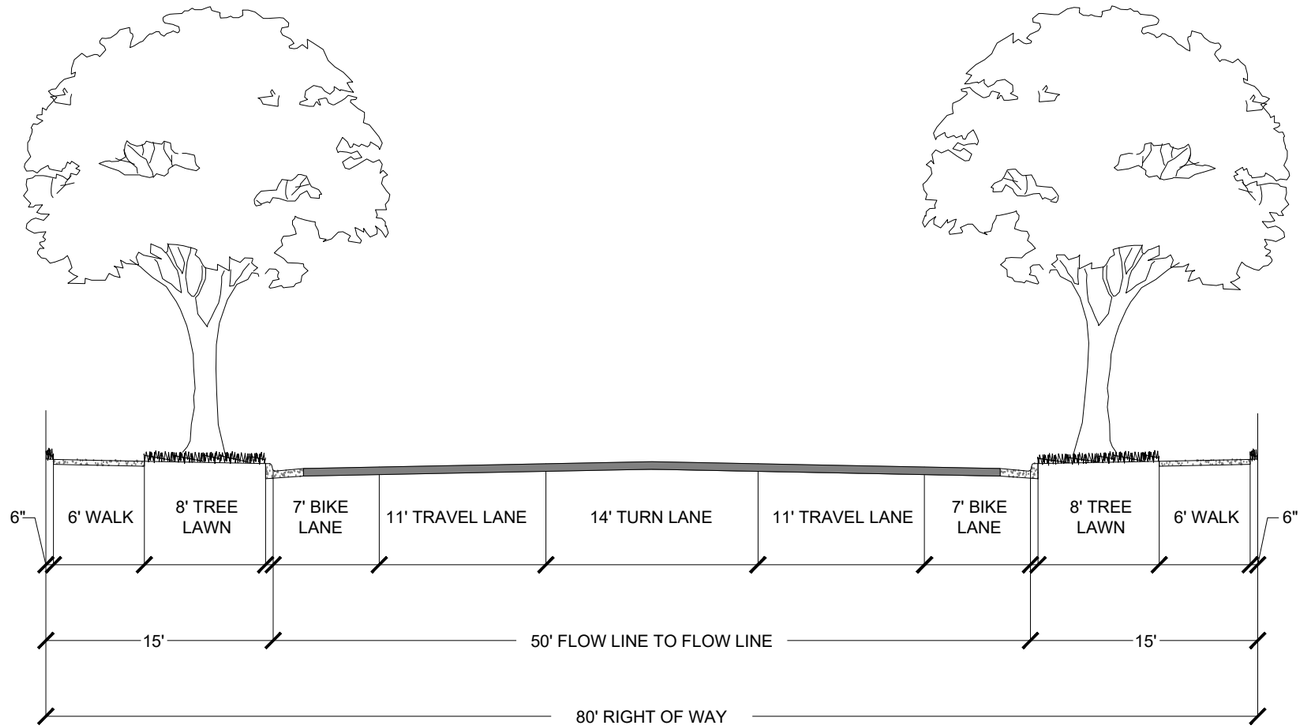
APPENDIX B
HYDROLOGIC CALCULATIONS

ROAD SECTIONS

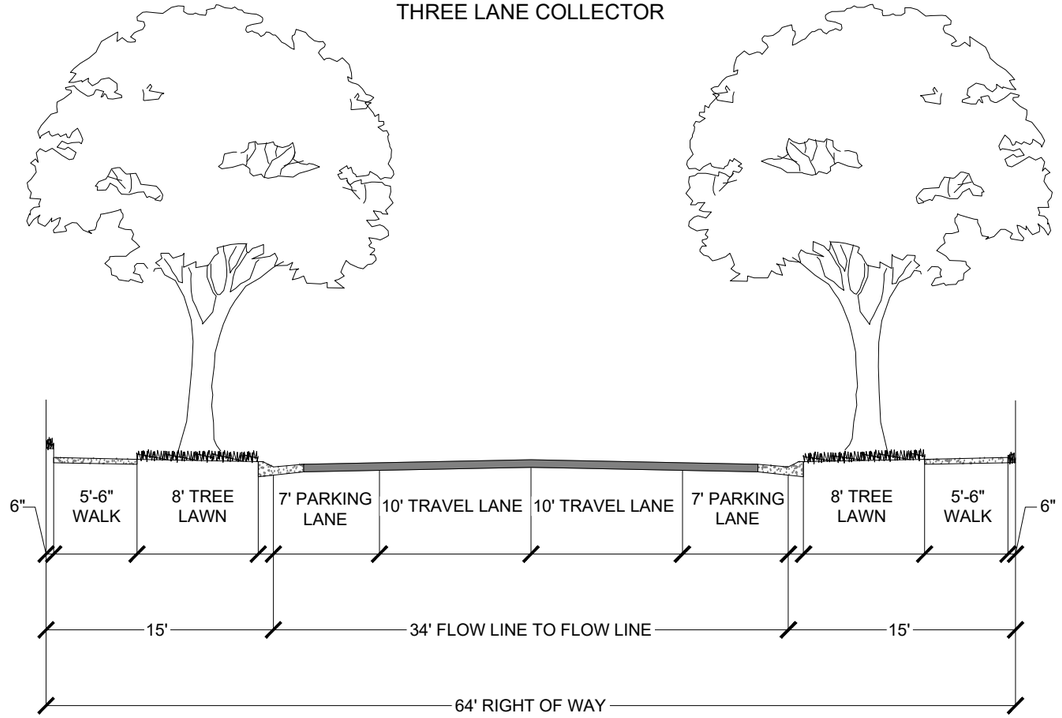
PUBLIC IMPROVEMENT PLAN EXHIBITS

terracina design

Landscape Architecture, Planning & Engineering
10200 E. Girard Avenue, A-314. Denver, CO 80231 PH: 303.632.8867



THREE LANE COLLECTOR



LOCAL STREET

A section for Aurora Parkway has been provided. Conversations between land owners are still ongoing regarding who responsible for building what portion of Aurora Parkway. No additional obligation notes have been added at this time.

Provide the section for Aurora Parkway and the south half as the obligation of this master plan.

Ensure there is no on-street bike lane for the Aurora Parkway section. Please provide a wider sidewalk/bike lane in lieu of the on-street bike lane. Please also ensure this matches all other tabs.

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'

1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

Per conversations with Life Safety, a 3.5 acre dedication for a fire station is not needed for this project.

Conversations between land owners are still ongoing regarding who responsible for building what portion of Aurora Parkway. No additional obligation notes have been added at his time.

All drawings need to reflect the 3.5 acre dedication for fire station.

Identify Aurora Parkway as an obligation of this property. Identify the extents required.

Note has been added to the plans.

Add this note:
THE CONSTRUCTION OF E. AURORA PARKWAY AND REQUIRED OFFSITE IMPROVEMENTS MUST BE COMPLETED PRIOR TO THE ISSUANCE OF ANY CERTIFICATION OF OCCUPANCIES FOR ANY PLANNING AREAS.

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

PA-5
NEIGHBORHOOD PARK
3.0 AC.

PA-7
OPEN SPACE
2.5AC.

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

DETENTION
3.0 AC.

PA-8
OPEN SPACE
0.9 AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

TIE INTO FUTURE 8"
SANITARY STUB

TIE INTO FUTURE
8" WATER STUB

50' UTILITY EASEMENT
BK 367 PG 95

30' IREA EASEMENT
REC NO. 2003123719

NORTH PINE DRIVE
(60' ROW)

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT SOUTH LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSB
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN F
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

The Overlook at King's Point is anticipating a second point of access through this property at this location including utility connections. Has this been coordinated with this master plan?

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES

Further coordination between Overlook, Vistas, and Kings Point South has taken place and will continue throughout Master Plan process. We have updated our utility layout to show the anticipated utility connection location.

LEGEND

- PROJECT BOUNDARY
- PLANNING AREA (PA) BOUNDARY
- EAST AURORA PKWY RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING SECTION LINE
- ADJCENT PROPERTY LINE
- 8" W — 8" WATER PROPOSED WITHIN PA
- 12" W — 12" WATER PROPOSED WITHIN PA
- 8" W — 8" WATER PROPOSED OUSTIDE PA
- 12" W — 12" WATER PROPOSED OUSTIDE PA
- 8" SS — 8" SANITARY PROPOSED OUSTIDE PA
- 8" SS — 8" WATER PROPOSED OUSTIDE PA
- COLLECTOR ROAD
- PLANNING AREA (PA)
- DETENTION POND
- INTERNAL ROAD CONNECTION

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March 28, 2023

VISTAS AT KINGS POINT

EXHIBIT 1 - OVERALL

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

Conversations between land owners are still ongoing regarding who responsible for building what portion of Aurora Parkway. No additional obligation notes have been added at his time.

Typical all exhibits: Identify Aurora Parkway as an obligation of this property. Identify the extents required.

(114' ROW)

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

PA-5
NEIGHBORHOOD PARK
3.0 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-7
OPEN SPACE
2.5AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

50' UTILITY EASEMENT
BK 367 PG 95

DETENTION
3.0 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

TIE INTO FUTURE 8" SANITARY STUB

TIE INTO FUTURE 8" WATER STUB

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSBURN
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

30' IREA EASEMENT
REC NO. 2003123719

NORTH PINE DRIVE
(60' ROW)

LEGEND

- PROJECT BOUNDARY
- PLANNING AREA (PA) BOUNDARY
- EAST AURORA PKWY RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING SECTION LINE
- ADJCENT PROPERTY LINE
- 8" W — 8" WATER PROPOSED WITHIN PA
- 12" W — 12" WATER PROPOSED WITHIN PA
- 8" W — 8" WATER PROPOSED OUSTIDE PA
- 12" W — 12" WATER PROPOSED OUSTIDE PA
- 8" SS — 8" SANITARY PROPOSED OUSTIDE PA
- 8" SS — 8" WATER PROPOSED OUSTIDE PA
- COLLECTOR ROAD
- PLANNING AREA (PA)
- DETENTION POND
- INTERNAL ROAD CONNECTION

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VISTAS AT KINGS POINT

EXHIBIT 2 - PLANNING AREA 1

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

FUTURE EAST AURORA PARKWAY
(114' ROW)

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

PA-5
NEIGHBORHOOD PARK
3.0 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-7
OPEN SPACE
2.5AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

50' UTILITY EASEMENT
BK 367 PG 95

DETENTION
3.0 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

TIE INTO FUTURE 8"
SANITARY STUB

TIE INTO FUTURE
8" WATER STUB

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSBURN
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

30' IREA EASEMENT
REC NO. 2003123719

NORTH PINE DRIVE
(60' ROW)

LEGEND

- PROJECT BOUNDARY
- PLANNING AREA (PA) BOUNDARY
- EAST AURORA PKWY RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING SECTION LINE
- ADJCENT PROPERTY LINE
- 8" W — 8" WATER PROPOSED WITHIN PA
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- 8" W — 8" WATER PROPOSED OUSTIDE PA
- 12" W — 12" WATER PROPOSED OUSTIDE PA
- 8" SS — 8" SANITARY PROPOSED OUSTIDE PA
- 8" SS — 8" WATER PROPOSED OUSTIDE PA
- COLLECTOR ROAD
- PLANNING AREA (PA)
- DETENTION POND
- INTERNAL ROAD CONNECTION

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VISTAS AT KINGS POINT

EXHIBIT 3 - PLANNING AREA 2

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

FUTURE EAST AURORA PARKWAY
(114' ROW)

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

PA-5
NEIGHBORHOOD PARK
3.0 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-7
OPEN SPACE
2.5AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

50' UTILITY EASEMENT
BK 367 PG 95

DETENTION
3.0 AC.

TIE INTO FUTURE 8"
SANITARY STUB

TIE INTO FUTURE
8" WATER STUB

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSBURN
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

NORTH PINE DRIVE
(60' ROW)

30' IREA EASEMENT
REC NO. 2003123719

LEGEND

- PROJECT BOUNDARY
- PLANNING AREA (PA) BOUNDARY
- EAST AURORA PKWY RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING SECTION LINE
- ADJCENT PROPERTY LINE
- 8" W — 8" WATER PROPOSED WITHIN PA
- 12" W — 12" WATER PROPOSED WITHIN PA
- 8" W — 8" WATER PROPOSED OUSTIDE PA
- 12" W — 12" WATER PROPOSED OUSTIDE PA
- 8" SS — 8" SANITARY PROPOSED OUSTIDE PA
- 8" SS — 8" WATER PROPOSED OUSTIDE PA
- COLLECTOR ROAD
- PLANNING AREA (PA)
- DETENTION POND
- INTERNAL ROAD CONNECTION

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EXHIBIT 4 - PLANNING AREA 3

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

FUTURE EAST AURORA PARKWAY
(114' ROW)

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

PA-5
NEIGHBORHOOD PARK
3.0 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-7
OPEN SPACE
2.5AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

50' UTILITY EASEMENT
BK 367 PG 95

DETENTION
3.0 AC.

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

TIE INTO FUTURE 8"
SANITARY STUB

TIE INTO FUTURE
8" WATER STUB

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSBURN
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

NORTH PINE DRIVE
(60' ROW)

30' IREA EASEMENT
REC NO. 2003123719

LEGEND

- PROJECT BOUNDARY
- PLANNING AREA (PA) BOUNDARY
- EAST AURORA PKWY RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING SECTION LINE
- ADJCENT PROPERTY LINE
- 8" W — 8" WATER PROPOSED WITHIN PA
- 12" W — 12" WATER PROPOSED WITHIN PA
- 8" W — 8" WATER PROPOSED OUSTIDE PA
- 12" W — 12" WATER PROPOSED OUSTIDE PA
- 8" SS — 8" SANITARY PROPOSED OUSTIDE PA
- 8" SS — 8" WATER PROPOSED OUSTIDE PA
- COLLECTOR ROAD
- PLANNING AREA (PA)
- DETENTION POND
- INTERNAL ROAD CONNECTION

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VISTAS AT KINGS POINT

EXHIBIT 5 - PLANNING AREA 4

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

FUTURE EAST AURORA PARKWAY
(114' ROW)

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

PA-5
NEIGHBORHOOD PARK
3.0 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-7
OPEN SPACE
2.5AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

50' UTILITY EASEMENT
BK 367 PG 95

DETENTION
3.0 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

TIE INTO FUTURE 8"
SANITARY STUB

TIE INTO FUTURE
8" WATER STUB

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSBURN
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

NORTH PINE DRIVE
(60' ROW)

30' IREA EASEMENT
REC NO. 2003123719

LEGEND

- PROJECT BOUNDARY
- PLANNING AREA (PA) BOUNDARY
- EAST AURORA PKWY RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING SECTION LINE
- ADJCENT PROPERTY LINE
- 8" W — 8" WATER PROPOSED WITHIN PA
- 12" W — 12" WATER PROPOSED WITHIN PA
- 8" W — 8" WATER PROPOSED OUSTIDE PA
- 12" W — 12" WATER PROPOSED OUSTIDE PA
- 8" SS — 8" SANITARY PROPOSED OUSTIDE PA
- 8" SS — 8" WATER PROPOSED OUSTIDE PA
- COLLECTOR ROAD
- PLANNING AREA (PA)
- DETENTION POND
- INTERNAL ROAD CONNECTION

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VISTAS AT KINGS POINT

EXHIBIT 6 - PLANNING AREA 5

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

FUTURE EAST AURORA PARKWAY
(114' ROW)

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

PA-5
NEIGHBORHOOD PARK
3.0 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-7
OPEN SPACE
2.5AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

50' UTILITY EASEMENT
BK 367 PG 95

DETENTION
3.0 AC.

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

TIE INTO FUTURE 8"
SANITARY STUB

TIE INTO FUTURE
8" WATER STUB

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSBURN
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

NORTH PINE DRIVE
(60' ROW)

30' IREA EASEMENT
REC NO. 2003123719

LEGEND

- PROJECT BOUNDARY
- PLANNING AREA (PA) BOUNDARY
- EAST AURORA PKWY RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING SECTION LINE
- ADJCENT PROPERTY LINE
- 8" W — 8" WATER PROPOSED WITHIN PA
- 12" W — 12" WATER PROPOSED WITHIN PA
- 8" W — 8" WATER PROPOSED OUSTIDE PA
- 12" W — 12" WATER PROPOSED OUSTIDE PA
- 8" SS — 8" SANITARY PROPOSED OUSTIDE PA
- 8" SS — 8" WATER PROPOSED OUSTIDE PA
- COLLECTOR ROAD
- PLANNING AREA (PA)
- DETENTION POND
- INTERNAL ROAD CONNECTION

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March 28, 2023

VISTAS AT KINGS POINT

EXHIBIT 7 - PLANNING AREA 6

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

FUTURE EAST AURORA PARKWAY
(114' ROW)

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

PA-5
NEIGHBORHOOD PARK
3.0 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-7
OPEN SPACE
2.5AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

50' UTILITY EASEMENT
BK 367 PG 95

DETENTION
3.0 AC.

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

TIE INTO FUTURE 8"
SANITARY STUB

TIE INTO FUTURE
8" WATER STUB

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

6905 E SPUR LN, PARKER, CO 80138
OWNER: GREGORY E OSBURN & THERESA A OSBURN
PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

NORTH PINE DRIVE
(60' ROW)

30' IREA EASEMENT
REC NO. 2003123719

LEGEND

- PROJECT BOUNDARY
- PLANNING AREA (PA) BOUNDARY
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- COLLECTOR ROAD
- PLANNING AREA (PA)
- DETENTION POND
- INTERNAL ROAD CONNECTION

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March 28, 2023

VISTAS AT KINGS POINT

EXHIBIT 8 - PLANNING AREA 7

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

KINGS POINT NORTH DEVELOPMENT
OWNER: CLAYTON PROPERTIES GROUP II INC
PARCEL AREA: 77.621 ACRES
ARAPAHOE COUNTY

FULL MOVEMENT INTERSECTION

TIE INTO FUTURE 16" WATER LINE

10' POWER LINE EASEMENT
BK 1242 PG 87

20' INGRESS & EGRESS EASEMENT
BK 336 PG 80
BK 420 PG 48

FUTURE EAST AURORA PARKWAY
(114' ROW)

PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.

PA-6
OPEN SPACE
3.2 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: PRUSSE LAND COMPANY LLLP
PARCEL AREA: 103.21 ACRES
DOUGLAS COUNTY

PA-5
NEIGHBORHOOD PARK
3.0 AC.

KINGS POINT SOUTH DEVELOPMENT
OWNER: KINGS POINT LLC
PARCEL AREA: 145.76 ACRES
DOUGLAS COUNTY

PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.

PA-7
OPEN SPACE
2.5AC.

COLLECTOR
(80' ROW)

TIE INTO FUTURE
12" WATER STUB

PA-4
SCHOOL
6.0 AC.

PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.

50' UTILITY EASEMENT
BK 367 PG 95

DETENTION
3.0 AC.

OVERLOOK AT KINGS POINT DEVELOPMENT
OWNER: WILLIAM D PRUSSE
PARCEL AREA: 20.00 ACRES
DOUGLAS COUNTY

CORE ELECTRIC COOPERATIVE PARCEL
AREA: 2.00 ACRES
DOUGLAS COUNTY

TIE INTO FUTURE 8"
SANITARY STUB

TIE INTO FUTURE
8" WATER STUB

6818 E LOOKOUT DR, PARKER, CO 80138
OWNER: TIMOTHY ALLEN MOORE &
JENNIFER LYNN DOLE MOORE
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DOUGLAS COUNTY

6905 E SPUR LN, PARKER, CO 80138
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PARCEL AREA: 5.31 ACRES
DOUGLAS COUNTY

6774 E LOOKOUT DR, PARKER, CO 80138
OWNER: THAD N KUENZ & LYNN F KUENZ
PARCEL AREA: 5.29 ACRES
DOUGLAS COUNTY

PA-8
OPEN SPACE
0.9 AC.

6959 E SPUR LN, PARKER, CO 80138
OWNER: THOMAS H LUDLOW & CAROL JOAN FANNING
PARCEL AREA: 4.97 ACRES
DOUGLAS COUNTY

NORTH PINE DRIVE
(60' ROW)

30' IREA EASEMENT
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LEGEND

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March 28, 2023

VISTAS AT KINGS POINT

EXHIBIT 9 - PLANNING AREA 8

terracina design
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

N

0 300' 600'
1" = 300'

TAB 3

MP CONTEXT MAP

- Context Map Narrative 3.1
- Reginal Location Map 3.2
- Context Map 3.3

Misspell

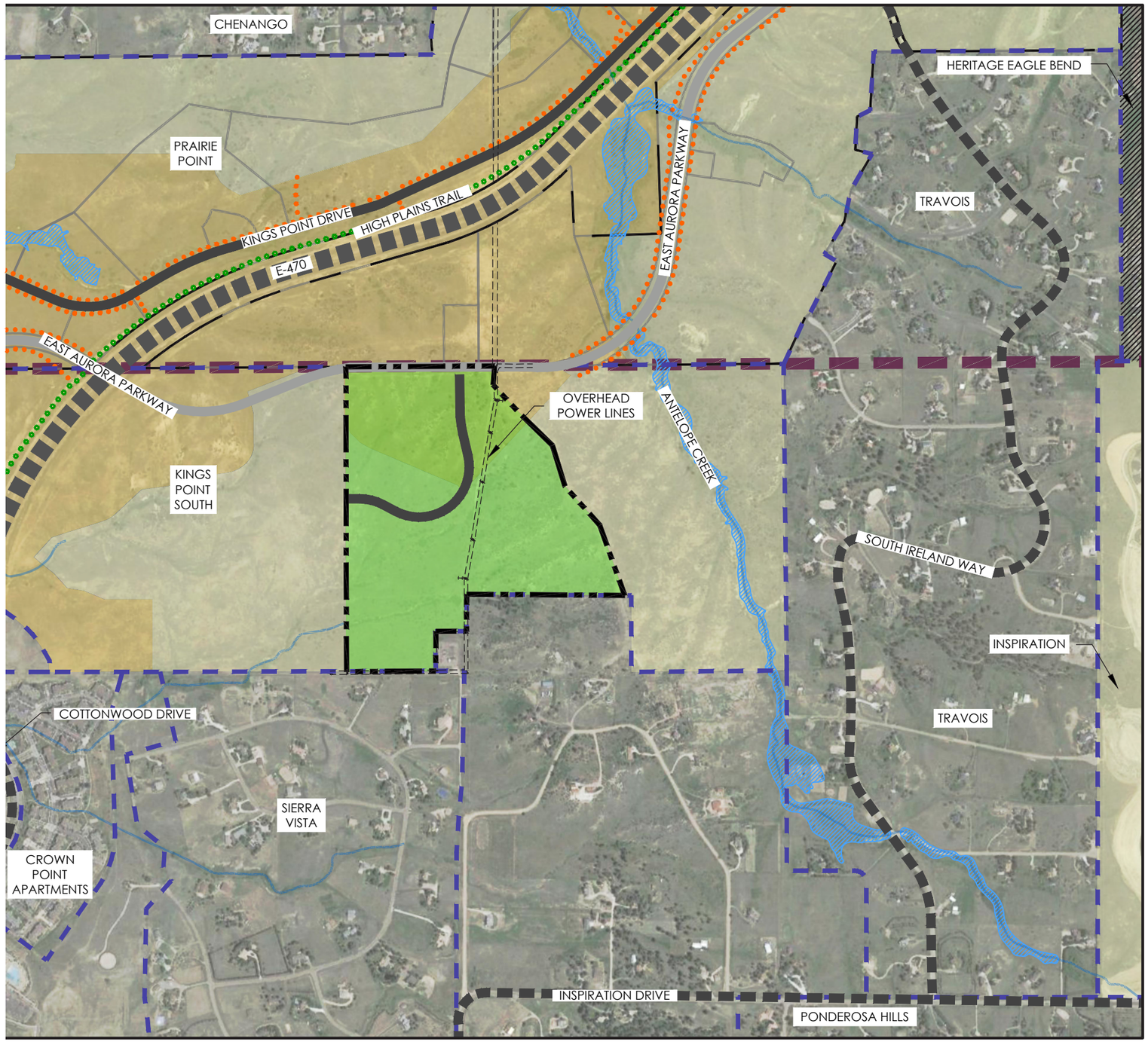
Revised

1. Context Map Narratve

The Vistas at Kings Point MP (Master Plan) consists of 95.2 acres. The Vistas MP is located between Aurora Parkway to the north and Sierra Vista neighborhood to the south, Kings Point South to the West and Overlook and Kings Point to the East. The location of the proposed MP can be found in Tabs 3.3, as well as Tab 4 - Site Analysis.

The terrain has a prominent ridge on the eastern edge of the property offering exspansive views to the west all the way from Pikes Peak to the south to Longs Peak to the north. An average slope of 8%-10% runs consistently from east to west. The regional location of the site is shown on Tab 3.2.

The site has been farmed for a number of years and contains little vegetation. The Cottonwood Middle Tributary barely emerges into the site from the Southwest running Northeast. A more detailed description of the site's characteristics may be found in Tab 4 – Site Analysis. The Context Map, Tab 3.3, shows existing uses, structures, streets, and parks and open space within ½ mile of the site's boundary.



LEGEND

ZONING

- R-1 (LOW - DENSITY SINGLE FAMILY RESIDENTIAL)
- R-2 (MEDIUM - DENSITY RESIDENTIAL)
- PD (PLANNED DEVELOPMENT)

ROADS

- EXISTING HIGHWAY
- EXISTING COLLECTOR
- PROPOSED COLLECTOR
- PROPOSED ARTERIAL

TRAILS

- EXISTING HIGH PLAINS TRAIL
- PROPOSED TRAIL/WALK

WATER

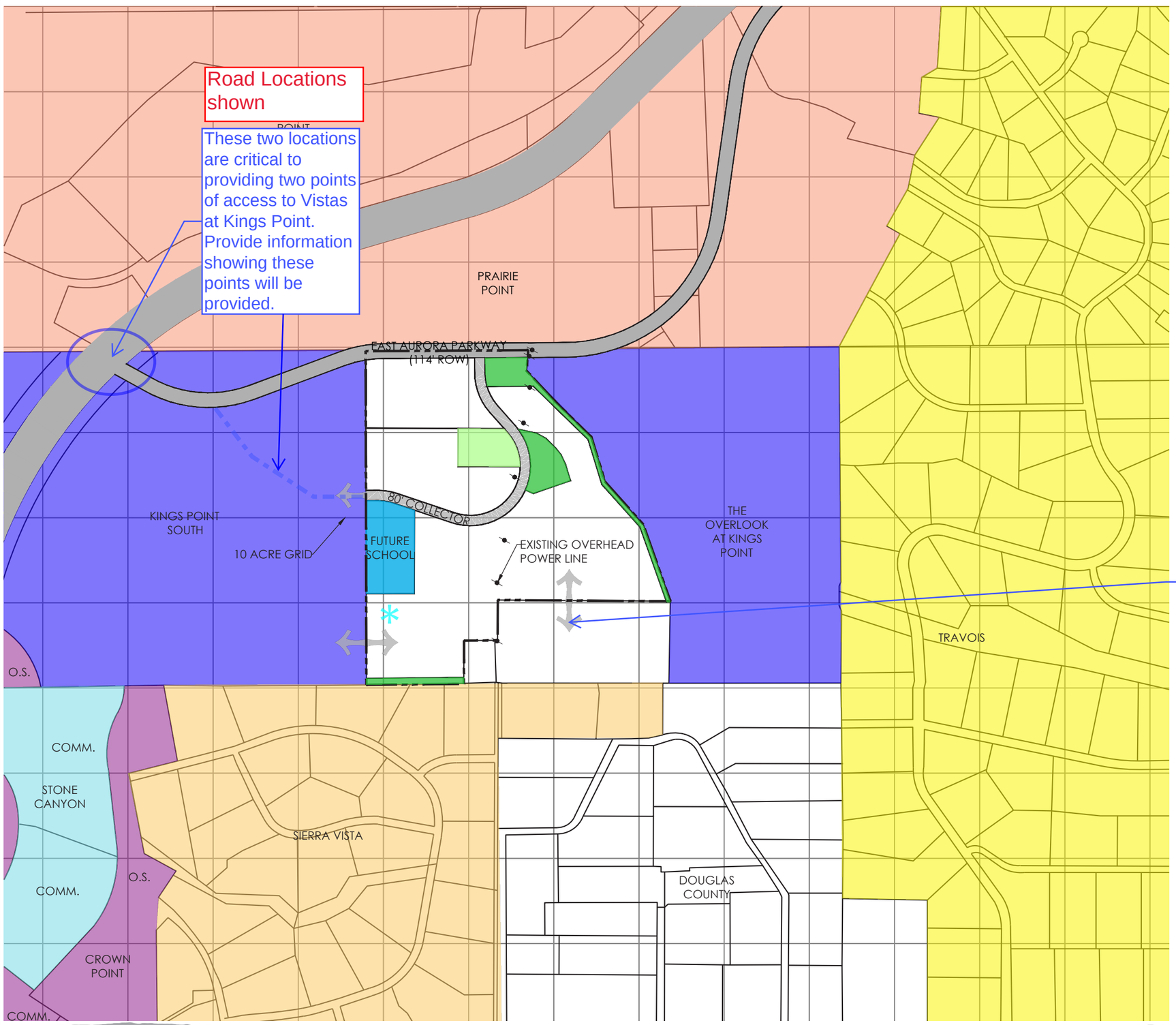
- STREAMS
- 100 YEAR FLOOD AREAS

BOUNDARIES

- COUNTY
- NEIGHBORHOOD
- PRAIRIE POINT PLANNING AREA
- VISTAS AT KINGS POINT PROPERT`

Revised

This page should be 24"x36"



LEGEND

- Neighborhood Park
- Open Space
- School Site
- Road Right of Way
- Property Boundary
- Detention

Question; is the area to the south going to be annexed into the City of Aurora? If so, provide a note indicating future annexation of this area is intended.

PROPERTY IS A PART OF THE OVERLOOK AT KINGS POINT. HATCH REVISED.

SCALE 1"=800'

0 800 1600 3200

Revised

This page should be 24"x36"

TAB 4

MP SITE ANALYSIS

- Form A - Site Analysis 4.1
- Existing Plans Map 4.2
- Natural Features Map 4.3

1. General Site Character

Briefly describe the existing location and physical character of your site. What are its most important and distinguishing features?

The Site

The Vistas Master Plan (MP) is made up of 95.2 acres in the City of Aurora and Douglas County. The site is located south of E-470 between Aurora Parkway to the north and Sierra Vista neighborhood to the south, Kings Point South to the West and Overlook at KP to the East. The location of the proposed MP can be found in Tabs 3.3, as well as Tab 4 - Site Analysis.

Existing Land Use

The site is currently zoned R-1 and R-2 and is currently an undeveloped site.

Surrounding Land Uses

The majority of land uses surrounding our site is Low-Medium Density residential homes ranging in lot sizes. Following E-470 a little further southwest will lead to commercial use near the Crown Pointe Apartments as seen on the Regional Location Map – Tab 3.2 and the Context Map – Tab 3.3.

Topography and Landform

The landform and topography consist of a prominent ridge on the east side of the property at an elevation around 6090, and with an average 8-10% slope from east to west, the site dramatically drops to an elevation of 5910 on the west side of the property.

Ten-foot contours are shown on Tab 4.3, Natural Features Map

A. Water Features

There are no water features identified on the property.

B. Floodplains

There are no floodplains identified on the property.

C. Springs

No springs have been identified on the property.

D. Riparian Areas

There are no riparian areas identified on the property.

E. Water Table

The water table will be determined during further site analysis and assessment.

Natural or Geologic Hazard Areas

The following generalized soil and geologic information was obtained from the Colorado Geological Survey and is shown on Tab 4.3 entitled Natural Feature

A. Soils

The Natural Resource Conservation Service identifies the following on the site:

1. BtE – Bresser – Truckton sandy loams, 5 - 25% slopes. Group B filtration.

2. St – Stapleton-Bresser association. Group A Filtration.

B. Geology

The Geologic Map of Colorado identifies the following on the site:

1. Tkdi - Denver Formation or lower part of Dawson Arkose along the western portion of the site which includes Arkasis sandstone, shale, mudstone, conglomerate, and local coal beds.

2. Tdu – Upper Part of Dawson Arkose which makes up a majority of the site includes arkosic sandstone, conglomerate, and shale. Included green mountain conglomerates south of golden.

(Source: "Geologic Map of Colorado," Colorado Geological Survey, 1979).

No geologic hazards have been identified on the site to date.

Existing Vegetation and Black Forest Trees

There are a few stands of Black Forest Pines located on the Natural Features Map Tab 4.3. In all probability, most of the site will need to be graded in order to meet City requirements. If they cannot be saved, we will provide mitigation in conformance with the Black Forest Ordinance.

Existing Utilities

An Alta Survey has been prepared and is included in Tab 14 which identifies existing easements on the site. Also See Tab 4.2 for more information.

There is an Existing power line that runs from the South from Pine Dr. through our site to the North.

The entire site is outside of Airport Influence District and Noise Impact Boundary Area.

Significant Views

The backdrop of the prominent ridge on the east boundary of site offers exceptional views from Pikes Peak to the south, west to Mount Evans and further north to Longs Peak.

Vegetation / Drainage

A natural channelized area known as Cottonwood Middle Tributary that exists in the southwest.

Existing Structures:

There is an existing power line that runs from the south from existing Pine Dr through our site to the north across Aurora Parkway.

Wildlife:

The site was historically farmed and grazed so there is limited habitat for wildlife; however, the following generalized wildlife habitat information was obtained from the Colorado Division of Wildlife:

The entire site is the overall range for goose, jackrabbit, jumping mouse, and pocket mouse. This information is shown on Tab 4.3 entitled Natural Features Map.

(Source: "Natural Diversity Information Source - Significant Wildlife Habitat Maps - Adams, Arapahoe, and Denver Counties, Colorado." Colorado Division of Wildlife, September 1998).

Proposed Land Uses

The proposed MP area is within the R-2 (Medium Density Residential) and R-1 (Low-Density Residential) zone district. A mix of Single-Family Attached/Detached and Multi-Family will be majority of the proposed Land Uses.

2. Site Assets

Based on your site analysis, what are your site's most important physical assets and potential amenities? Consider location, relationship to existing and proposed transportation networks, scenic beauty, recreation potential, special natural resources, etc.

The greatest natural physical feature of our site is the existing slope gradient of the land which provides the spectacular daytime views of the front range mountains

and evening views of the lights of southeast metropolitan Denver. These views will be protected by the careful grading and subdivision design layout of the streets and lot arrangements in the plan. Because of the steep slope of the site, the majority of the site will have to be graded in order to meet all engineering criteria and requirements of the city. There are a few stands of Black Forest Pines on the site. An effort will be made to save a few of these pines, but they may be lost to the necessary grading that has to take place on the land. If they cannot be saved, we will provide mitigation in conformance with the Black Forest Ordinance.

Historical/Archeological

The Colorado Historical Society Office of Archaeology and Historic Preservation conducted a search of the Colorado Inventory of Cultural Resources; several items have been inventoried on the site, but none were found to have significant historic or archaeological value. The Colorado Historical Society search of the "Inventory of Cultural Resources" indicated this property was not eligible for designation as a historic site because of the severely dilapidated condition of the buildings and lack of unique architectural qualities.

3. Site Restrictions

Based on your site analysis, what are the physical restrictions and site characteristics that may pose a challenge to development? Consider location, nature of surrounding conditions, environmental pollution, lack of existing infrastructure, steep slopes, etc.

This site is limited by the steep slopes found throughout the property which determine the tion of roads, lots, and other infrastructure. Black Forest areas will be much as possible and steer design at the site plan level. An existing above r line also bisects the site running north to south which we will try to avoid e plan process.

Oakwood homes has been contacted and coordination in progress

Existing/Planned Streets

There are no roads currently constructed within or adjacent to this MP. In the Prairie Point MP, Aurora Parkway along the northern edge of our MP has been shown completely on our property for reasons unknown. We propose that Aurora Parkway be centered on the section line in this location so each property owner is responsible for half of the roadway. Additional cost sharing would need to occur for the remainder of Aurora Parkway to the west and east.

The Kings Point North MP does show responsibility for the north half of Aurora Parkway. However you will need to reach out to Oakwood Homes concerning the relocating of Aurora Parkway in this location. Both master plans should match.

A collector road is proposed to intersect our site and connecting future Aurora Parkway to the development to west, as well as providing access through our site and to the school site.

esign Response to Site Assets

How does your proposed development plan take advantage of all the site assets identified by your analysis?

The careful subdivision layout of the minor streets and lots should create a strong "sense of place" in a community where all have spectacular views of the foreground and mountains to the west in the daytime, and views at night to the lights serving the foreground of this urban area.

5. Design Response to Site Challenges

How does your development plan deal with the site's development constraints as identified above? Have you considered alternate strategies to deal with these problems? If so, why did you select the particular approach shown on your development plan?

Our land use plan deals with the site's constraint's identified above by using the natural slopes of the site to plan and design the ultimate road and lot layouts. Open spaces were specifically selected to preserve as many Black forest trees as possible while designing the site appropriately. Power lines are also being avoided as much as possible with the concept designs.

Highway and Airport Noise

The entire site is outside of Airport Influence District and Noise Impact Boundary Area.

Grading

Grading will follow the natural contours as much as possible and will be limited around power lines poles as any kind of grading would trigger burial relocation of power line.

6. Development Impacts on Existing Site Conditions

What are the impacts of your project on the existing character of the site and its immediate surroundings? What improvements will your development make? How have any impacts been mitigated? Consider impacts on environmental quality, aesthetic appearance, existing open space and natural features, physical infrastructure, etc.

The proposed plan offers to take advantage of the amazing views that this site has to offer. Not everyone has the opportunity to view the front range and the city of Denver, and we aim to take advantage of that by offering each owner, a unique place to live.

The construction of the Vistas MP will change the existing rural/agricultural character of the land to that of a planned community. The impacts of this change will be mitigated by the preservation of a generous amount of open space, parks, and trails, and the design of the community as a pedestrian-friendly development that has a combination of housing, parks, and recreational uses.

CHERRY CREEK SCHOOL DISTRICT 5

AURORA FIRE DISTRICT

PRAIRIE POINT

ARAPAHOE COUNTY

DOUGLAS COUNTY

DOUGLAS COUNTY SCHOOL DISTRICT RE-1

AURORA/SOUTH METRO FIRE DISTRICT

20' INGRESS & EGRESS EASEMENT BK. 336 PG. 80 & 87 AND BK. 420 PG. 48

CENTER LINE OF POWER LINE EASEMENT BK 122 PG 5

KINGS POINT SOUTH

THE OVERLOOK AT KINGS POINT

OVERHEAD POWER LINE
POSSIBLE IREA UTILITY EASEMENT BK 113 PG 29

BK. 367 PG. 95 PARCEL "2" (EASEMENT & ROW)

BK. 367 PG. 95 PARCEL "1" (SUBSTATION SITE)

THE OVERLOOK AT KINGS POINT

30' IREA EASEMENT REC #2003123719

AURORA/SOUTH METRO FIRE DISTRICT

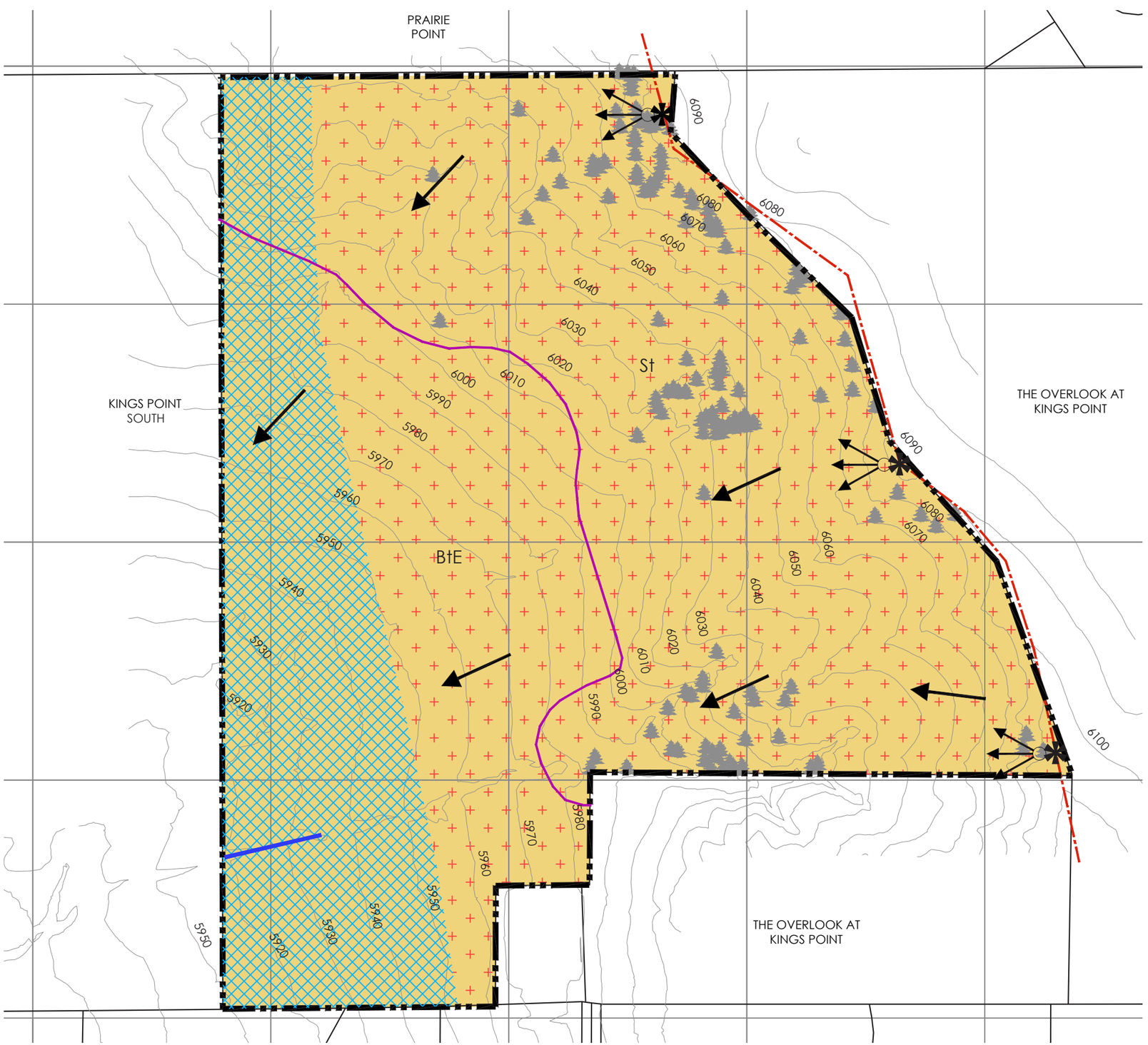
SOUTH METRO FIRE DISTRICT

LEGEND

- Aurora Water
- Sierra Vista Douglas Mutual Water
- Douglas County Water
- Fire District Jurisdictions
- School District Boundary
- Property Boundary
- Ridge Line
- Existing Utility Pole
- High Point
- Slope Direction
- Significant Views of Front Range

SCALE 1"=300'

0 300 600 1200



LEGEND

TKdl - DENVER FORMATION OR LOWER PART OF DAWSON ARKOSE -
ARKOSIC SANDSTONE, SHALE, MUDSTONE, CONGLOMERATE, AND LOCAL COAL BEDS.

Tdu - UPPER PART OF DAWSON ARKOSE -
ARKOSIC SANDSTONE, CONGLOMERATE, AND SHALE. INCLUDED GREEN MOUNTAIN CONGLOMERATES SOUTH OF GOLDEN

OVERALL RANGE -
WHITE-TAILED JACKARABBIT, PREBLE'S MEADOW JUMPING MOUSE AND OLIVE-BACKED POCKET MOUSE DISTRIBUTION

Property Boundary

Ridge Line

Cottonwood Middle Tributary

Soil Boundary

- BtE - Bresser - Truckston sandy loams, 5 to 25% slopes

- St - Stapleton-Bresser Association

High Point

Slope Direction

Significant Views of Front Range

Existing Black Forest Tree

SCALE 1"=300'

0 300 600 1200

TAB 6

MP NARRATIVE

- MP Narrative 6.1

1. General Description of the MP

Briefly describe the general character of your proposed MP. What will be the predominant land uses? What market segment is the proposed development designed to serve?

The Vistas at King's Point Master Plan (MP) is made up of 95.2 acres of Low Density – Medium Density Residential land uses. This is a new Master Plan bordered by Kings point South to the west and The overlook at KP to the east. To the south is Sierra Vista, an existing community.

Vistas is envisioned as a comprehensive planned community integrated with places to live in, locations for recreation, and places to learn. The residential uses are complimented with centrally located neighborhood parks, schools and open space that brings it all together.

2. Defining Character of the MP

Describe how your proposed MP will create a unique community with a definable character and special "sense of place". What facilities, amenities and special design features will set it apart in the marketplace from similar developments in your area?

The physical characteristics of this property that give this project uniqueness is the prominent ridge on the east boundary of site which creates exceptional views to the southwest, west, and to the northwest. The site has phenomenal unobstructed views from Pikes Peak to the south, west to Mount Evans and further north to Longs Peak.

The average slope gradient of the site from east to west range from 8 - 10%. The careful subdivision layout of the minor streets and lots should create a strong "sense of place" in a community where everyone will have spectacular views of the mountains to the west in the daytime, and views at night to the lights of the urban Denver area.

This MP provides additional land to the proposed school site on the common boundary between our development and the development to the west. Pedestrian corridors will be placed that serve the visual scenic beauty of the site and ease of access to the proposed school site. The ridge adjacent to the eastern boundary has the best and most spectacular views of the project.

All physical requirements for vehicular access and utilities, especially drainage and detention, will be provided for; the conceptual drainage and detention sites are located on the plan.

We view our MP not as an isolated neighborhood, but as part of a larger community that joins King Point South from the west to our site which then connects further east to The Overlook at Kings Point. These neighborhoods come together thru the shared use of roads, schools and open space. With the superior views to the west amongst these neighborhoods, we anticipate increased home values which in turn benefit the City of Aurora with higher tax income. In addition to Neighborhood Park and open space, this

plan will provide cash-in-lieu contribution for the community park.

3. Zoning Conformance

Does the MP accurately reflect adopted zone district boundaries?

The Vistas Master Plan (MP) is currently zone R-1 and R-2. Once the MP is approved and the first site plan establishes the alignment of the Collector Road, we will then proceed with a rezone that uses this road alignment as the zoning boundary. We will be rezoning approximately 1.2 acres of R-2 to R-1.

4. Potential Regulatory Conflicts

Are there any existing or potential conflicts between MP design ordinance requirements and the terms of any existing annexation agreements or agreements with other jurisdictions or interest groups? If so what are they and how you propose to resolve them?

At this time we do not see any specific regulatory conflicts.

This language and expectation may need to be adjusted. Typically we will not approve a Master Plan that is not supported by the underlying zoning.

5. Adjustments

Does your current design require any ordinance waivers in order
so, list each proposed waiver, and answer the following questio

- *What are the specific site-related characteristics of your site t*
  waiver request? (Do not include self-imposed hardships or co
  justification. Financial constraints may be considered, but
  unusual site conditions. Do not simply respond that meetin
  standards would be too costly.)
- *What design alternatives have you considered to avoid th*
  weren't these alternatives chosen?
- *What measures have been taken to reduce the severity o*
  waiver?
- *What compensating increases in design standards have y*
  mitigate the waiver's impact?

Per previous conversations with the City, it was agreed that the Rezone would occur at Site Plan so the zoning boundary follows the alignment of the Collector Road. This alignment has not been confirmed yet. Existing zoning is generally the same. Language will be adjusted accordingly.

There are no adjustments being requested in the MP.

6. Required City Facilities

What additional city facilities or services will the City of Aurora have to provide in order for your MP to be implemented? What police, fire, and recreation facilities are required and where are they located (inside or outside your MP boundary.) To what extent will your development plan help to fun or construct these facilities?

As far as we can analyze, this development will pay for required City Facilities and services

thru the dedication of lands, and cash-in-lieu payments to the City, School District, or other districts, as may be required for public services. Other City services will be paid for thru property taxes and sales taxes on purchases within the City. This development has annexed to one of the adjacent Metropolitan Districts, Known as Kings Point South Metro District, to extend required infrastructure to this property.

7. Vehicular Circulation

Do your proposed arterial and collector roadways align with the arterials and collectors of adjacent properties? Do your roadway cross-sections match adjacent cross-sections? If not, explain why.

There are no roads currently constructed within or adjacent to this MP. In the King's Point North MP, Aurora Parkway along the northern edge of our MP has been shown completely on our property for reasons unknown. We propose that Aurora Parkway be centered on the section line in this location so each property owner is responsible for half of the roadway. Negotiations between the two land owners are ongoing. Additional cost sharing would need to occur for the remainder of Aurora Parkway to the west and east.

A collector road is proposed to bisect our site and connect future Aurora Parkway to the development to the west, as well as provide access through our site to the school site. This roadway cross section will match that what is proposed to the west of our site.

One roadway that we do not plan on extending thru our site and up to Aurora Parkway is Pine Drive. Pine Drive currently travels north-south between Main Street, near downtown Parker, to Inspiration Drive where the roadways create a 90-degree bend for continued travel. Currently, the roadway provides access to several existing suburban and rural residential communities and is within four municipal boundaries (City of Aurora, Town of Parker, Douglas County, and Arapahoe County). Based on several municipal documents, the future plan for Pine Drive is to widen the two-lane section to four-lanes and to extend from Inspiration Drive to Aurora Parkway. While Other documents we've found do not include the extension of Pine Drive.

Per the separate meeting with the city, Pine Dr is being required for access. This connection point is now being shown in the master plan and various reports. See the TIS for more detail on this.

Although Pine Drive being extended to the north from Inspirat has been shown in several planning documents within the City and Douglas County, it will be a difficult roadway to accomm properties and the vision of proposed developments. It is our County and Parker have plans to soften the transition at the i Inspiration Dr. with a larger continuous radius furthering our p extension. The list of challenges are as follows:

A separate meeting may be needed to discuss the future of Pine Drive depending on what comments are received on this application from Douglas County or the Town of Parker.

- Limited available right-of-way due to large overhead elec property boundaries, especially for a four-lane roadway.
- Limited alignment options due to large overhead electric
- Challenging topography and drainage.
- Existing substation along the west side of the alignment may impact the ability to extend Pine Drive.
- Several property owners that do not want Pine Drive extended north due to

the right-of- way dedication needed and impact to the existing and future residents.

- Volume forecasts on the extension do not warrant the need for a four-lane roadway.

It is the desire of the property owners to not extend Pine Drive due to the barrier it may create in the future neighborhoods. Maintaining Pine Drive as it exists today will have the following positive impacts compared to extending north to Aurora Parkway:

- Maintains similar traffic flow to existing conditions on Inspiration Drive.
- Reduced growth in traffic through the existing rural residential neighborhood.
- Minimized right-of-way impact to existing residential properties and substation.
- Minimized interaction with overhead electric lines and poles.
- Improved atmosphere for community and neighborhood interaction of proposed developments.
- Reduced impervious surface.
- Reduced maintenance time and money.
- Refer to the Master Traffic Impact Study for further analysis on Pine Dr.

8. Pedestrian Circulation

Do off-street trails on your site connect with those on adjacent properties? Do your cross sections match adjacent cross sections? If not, explain why.

Pedestrian circulation connections are planned in several locations around the property providing access to the centrally located school site on both our property and King's Point South to the west of our property. The central school location provides pedestrian access connections to both developments and thru the neighborhood. Additional pedestrian connections may be provided as we progress thru the site planning phase.

9. Protection of Natural Features, Resources and Sensitive Areas.

Describe how the development will be designed to protect, use or enhance natural resources and features. In particular, describe how the design of the development will respond to:

The greatest natural physical feature of our site is the existing slope gradient of the land which provides the spectacular daytime views of the front range mountains and evening views of the lights of southeast metropolitan Denver. These views will be protected by the careful grading and subdivision design layout of the streets and lot arrangements in the plan. Because of the steep slope of the site, the majority of the site will have to be graded in order to meet all engineering criteria

and requirements of the city. Black Forest Pines also exist in the property running north to south. An effort will be made to save many of these trees thru proper land planning and the use of retaining walls as necessary. Some pines may even be transplanted if they meet Black Forest criteria outlined by the City. If they cannot be saved, we will provide mitigation in conformance with the Black Forest Ordinance.

10. Neighborhood Concept

Briefly describe the location of your individual neighborhoods. How have you defined the boundaries for each neighborhood? How are the architectural styles and other design features distributed among the neighborhoods? Are there any styles or other design standards that are restricted to specific areas?

This Master Plan will primarily be made up of two neighborhoods with Road A (Collector Road) acting as the division point. To the north of the collector road is neighborhood 'A', which will be zoned R-2 and allow for more residential density. Neighborhood 'A' will have a multi-family/single family attached land use along Aurora Parkway to provide more affordable housing options in the community. Neighborhood 'A' will also include a neighborhood park adjacent to the multi-family land use since those types of products typically lack open space and other outdoor activity areas. Single family detached homes are also provided in this neighborhood west of the park. To the south of the collector road is neighborhood 'B' which will be zoned R-1 and have less residential density. This neighborhood will be made up of single family homes and will take advantage of the western views more than neighborhood 'A'. The architectural styles amongst both neighborhoods will be relatively the same and follow those styles outlined in Tab 12.

11. Black Forest Ordinance

Is the Black Forest Ordinance applicable to your site? If so where do the impacted areas show on your exhibits, and how will the requirements of the ordinance be carried out?

There are a few stands of Black Forest Pines located on the Natural Features Map Tab 4.3. You will find when reading Section 12 on Steep Slopes that, in all probability, most of the site will need to be graded in order to meet City requirements. An effort will be made to save many of these trees thru proper land planning and the use of retaining walls where necessary. Some pines will be transplanted if they meet Black Forest criteria outlined by the City. If they cannot be saved, we will provide mitigation in conformance with the Black Forest Ordinance.

12. Steep Slope Standards

Does your development plan include building on areas with an existing slope of 6% or greater? If so, what standards and design strategies have you adopted to deal with drainage and aesthetic issues? Have you reviewed and considered our recommended steep slope design guidelines? If not, why?

Logical and sensible engineering solutions for steep slope lands will be followed. Consideration will be given to the use of any and all recommendations of the City's steep slope standards. Some of our considerations are as follows:

a) Street Grades that comply with the City's Subdivision Regulations.
b) Streets that run more parallel to slopes, with all street grades complying with City standards.
c) The possibility of using single loaded lots with the emphasis on preserving down hill views with up hill streets with no lots on the up hill side.
d) Walkout basements to assist in taking up grade.
e) Use of retaining walls where need to take up grade.
f) Housing design and lot improvements that protect grades, and retain views.
g) Careful street and lot design to protect drainage, and the use of drainage improvements required to meet all drainage regulations and subdivision regulations.
h) The use of storm sewers and open drainage channels where appropriate to control all runoff to either a storm sewer or open channel.
i) Structural and / or home foundation design to assist and reduce unnecessary grading, and protect drainage and enhance the livability on all lots.

13. Consultations with Outside Jurisdictions and Agencies

Have you consulted with representatives of your local school district, the Colorado Division of Wildlife, the Colorado Department of Public Health and Environment, or other applicable local, state or federal agencies? If so, list the dates, contact person, and results of your discussions. Include any letters you've received from these agencies as an appendix to your application.

No discussions have occurred with outside agencies.

As we move forward, you should be able to clarify your approach to prairie dogs on site, any required surveys related to other species and your approach to relocation or extermination of prairie dogs.

No discussions have occurred with outside agencies to date. This section will be updated as more studies are done for wildlife.

A TPP will be submitted before the first site plan

This site is subject to the Black Forest Ordinance. A Tree Protection Plan (TPP) will be required for this site if there are Black Forest trees within its boundaries. The TPP is required to be the first document that is approved, and the approval of the site plan and civil plan will follow. All documents must line up with the TPP.

TAB 8

MP LAND USE

- Land Use Plan and Summary 8.1
- Land Use Matrix 8.2
- Land Use Plan 8.3
- Fire and Safety Exhibit 8.4
- Standard Master Plan Notes 8.5

The Master Plan for Vistas at Kings Point consists of 95.2 acres. Proposed land use is Residential Low Density and Residential Medium Density.

A total of approximately 345 dwelling units are planned, ranging in density from 2.2 to 18.1 dwellings per acre. The housing types that will be offered are single-family detached, single family attached and multi-family homesites.

A total of 1 Neighborhood Parks on 3.0 acres, along with 6.6 acres of open space make up the parks and open space system that are interconnected by a network of trails. The public dedications and open space areas expressly provided for in this MP will satisfy all dedication and open space requirements applicable to the MP site.

With respect to school dedications, the total acreage allocated under this MP for that purpose equals approximately 6.0 acres. This school dedication plan has been designed with input from Aurora Public Schools (APS). One P-8 school is proposed to serve this development.

The Land Use Plan (Tab 8.3) shows the configuration of these land uses. Acres, density, and total number of dwelling units are detailed in Tab 8.2, below. All lots size standards and setbacks will follow code unless specified during the site plan process.

TOTAL PROJECT

LAND USE	ACRES	DENSITY	DU	% OF RES DU
Multi-Family Residential	11.3	18.1	205	59.4%
Single Family Residential	62.2	2.3	140	40.6%
Sub Total	73.5		345	100.0%
P-8 School	6.0			
Neighborhood Parks	3.0			
Credited Open Space	6.6			
Right of Way	6.1			
Sub Total	21.7			
TOTAL	95.2			

Noted

Single Family Residential will contain a mix of standard and small front loaded homes

Since you are proposing small residential lots, the required amount and distribution of single-family housing types is determined by Section 146-4.2.3.A.3. In the R-1 zone district, no more than 25% of the residential lots may be small lots. In the R-2 zone, with fewer than 100 residential lots, no more than 35% of the lots may be small lots. If there are more than 100 lots in the R-2 zone district, 50% of the lots may be small, but they are subject to additional distribution standards described in the referenced code section. While it has been stated that the future proposed R-1 and R-2 zoning boundaries are not known exactly at this time. We will still need this small lot distribution information for each zone district in order to verify compliance with our small lot standards.

Be aware that when proposing to use small lot standards, at least 50% of the standard size lots must use alternate-loaded or recessed garages, while at least 75% of the small lots must use the same.

Revised

Per Email from Mike Dean dated 06/28/2023 our request to remove the 3.5 Acre land dedication for a fire station is approved.

FORM D: MP Land Use Matrix

	B. PLANNING AREA MAP NUMBER	C. MAP AREA CODE	D. GROSS LAND AREA IN ACRES	E. LAND USE FORMULA	F. MAX POTENTIAL DENSITY BY CODE (in DU's)	G. ACTUAL PROPOSED MAXIMUM DENSITY (in DU's)	H. LAND USE DETAILS AND COMMENTS
	PA-4	SCHOOL SITE	6.0				Public School P-8
	PA-5	NEIGHBORHOOD PARK	3.0	3.0 ACRES PER 1,000 RESIDENTS			3.0 AC net Credited toward neighborhood park requirement.
	PA-6						3.2 AC net Credited toward open space requirement
and Dedication Areas for Park, Schools, & Fire Stations	PA-7						2.5 AC net Cr requireme
	PA-8						0.9 AC net Cr requireme
Subtotal			15.6				
3a. Development Areas Subzone: R-1 / R-2 Subarea-C	PA-1	MULTI FAMILY, SFA	11.3	18.1 DU/AC		**205**	
	PA-2	SFD	12.5	2.5 DU/AC		**31**	
	PA-3	SFD	49.7	2.2 DU/AC		**109**	
		RIGHT-OF-WAY	6.1				
Subtotal			79.6				
SUB AREA TOTAL			**95.2**		**345**	**345**	**Gross Max**
4. Total Map Acreage (Sub-Area Total Above)			95.2				
5. Less 1/2 of Perimeter Streets Not Owned by Applicant							
6. Applicant's Acreage Listed in Application (Line 4 minus Line 5)							
7. Total Floodplain Acreage			0.0				
8. Total Adjusted Gross MP Acreage (Line 4 minus Line 7)			95.2				
9. Total Active Adult Planning Areas			0.0	1.58 PERSONS PER UNIT			
10. Total Single Family Planning Areas			62.2	2.65 PERSONS PER UNIT		141	373 Estimated Residents
12. Total Single Family attached / Multi-Family Planning Areas			11.3	2.5 PERSONS PER UNIT		205	512 Estimated Residents
12. Total Residential			**73.5**		**345**	**345**	**885 Estimated Residents**

Show PA-3 with fire station land dedication area in this section. See comments on tab 8.3 for further ion.

Where is item 1?

Item 1 was floodplain areas so removed from matrix since we did not have any

Please reflect a 3.5 acre land dedication for a permanent fire station. Any reference to temporary fire stations can be removed from any tab in the master plan submittal.

Revised our person per unit number to encompass the requirements for SFA and Multi Family units.

Need clarification of the type of planned residential - multi-family versus SFA. If SFA, such as townhomes, those still are considered a Single Family unit for purposes of projecting population impact. Please specify as the answer has implications on PROS land dedication requirements.

Density for this master plan was calculated based on the gross master plan area and not by individual zoning areas. Gross density is 3.6 DU/Ac.

These numbers (including the 3 park acres for PA-5) result in an average density for the R-2 region of about 8.8 DUs/acre. The maximum density for the R-2 district is 5 DUs/acre.

2 options for fire station location have been identified on tab 8.3.

Per Email from Mike Dean dated 06/28/2023 our request to remove the 3.5 Acre land dedication for a fire station is approved.

Revised to 2.65 person per unit

2.5 persons per unit is a valid multiplier only if the residential intended for PA-1 is multi-family. If single family attached is being planned instead, the multiplier should be 2.65 persons per unit. Update population calculations if applicable.

This appears to be a numbering typo.

Revised

FORM D: MP Land Use Matrix							
A. LAND USE ITEM	**B. PLANNING AREA MAP NUMBER**	**C. MAP AREA CODE**	**D. GROSS LAND AREA IN ACRES**	**E. LAND USE FORMULA**	**F. MAX POTENTIAL DENSITY BY CODE (in DU's)**	**G. ACTUAL PROPOSED MAXIMUM DENSITY (in DU's)**	**H. LAND USE DETAILS AND COMMENTS**
13. Check for avg. residential density in subzone				5 DU's/AC TIMES LINE 8	476	345	
14. Small Lot Total				50% of TOTAL UNITS			
15. Check for maximum allowable number of multi-family units							
16. Total Retail Planning Areas			0.0				
17. Total Office Planning Areas			0.0				
18. Total Industrial Planning Areas			0.0				
19. Total Mixed Commercial Planning Areas			0.0				
20. Total Commercial			**0.0**				
21. Total Neighborhood Parks			3.0	3.0 AC / 1000 RESIDENTS			Required Land Dedication = 2.7 AC. Provided Land Dedication = 3.0 AC.
22. Total Community Parks			0.0	1.1 AC / 1000 RESIDENTS			Requirement of 1.0 AC will be met by applicant cash-in-lieu payment
23. Total other Credited Open Space including trail corridors, greenbelts, and special rec. sites			6.6	7.8 AC / 1000 RESIDENTS			Required Land Dedication = 6.9 AC. Provided Land Dedication = 6.6 AC.
24. Total Open Space			**9.6**				**Required Land Dedication = 10.6 AC.** **Provided Land Dedication = 9.6 AC.** **Provided Cash-In-Lieu Payment = 1.0 AC.**

Noted

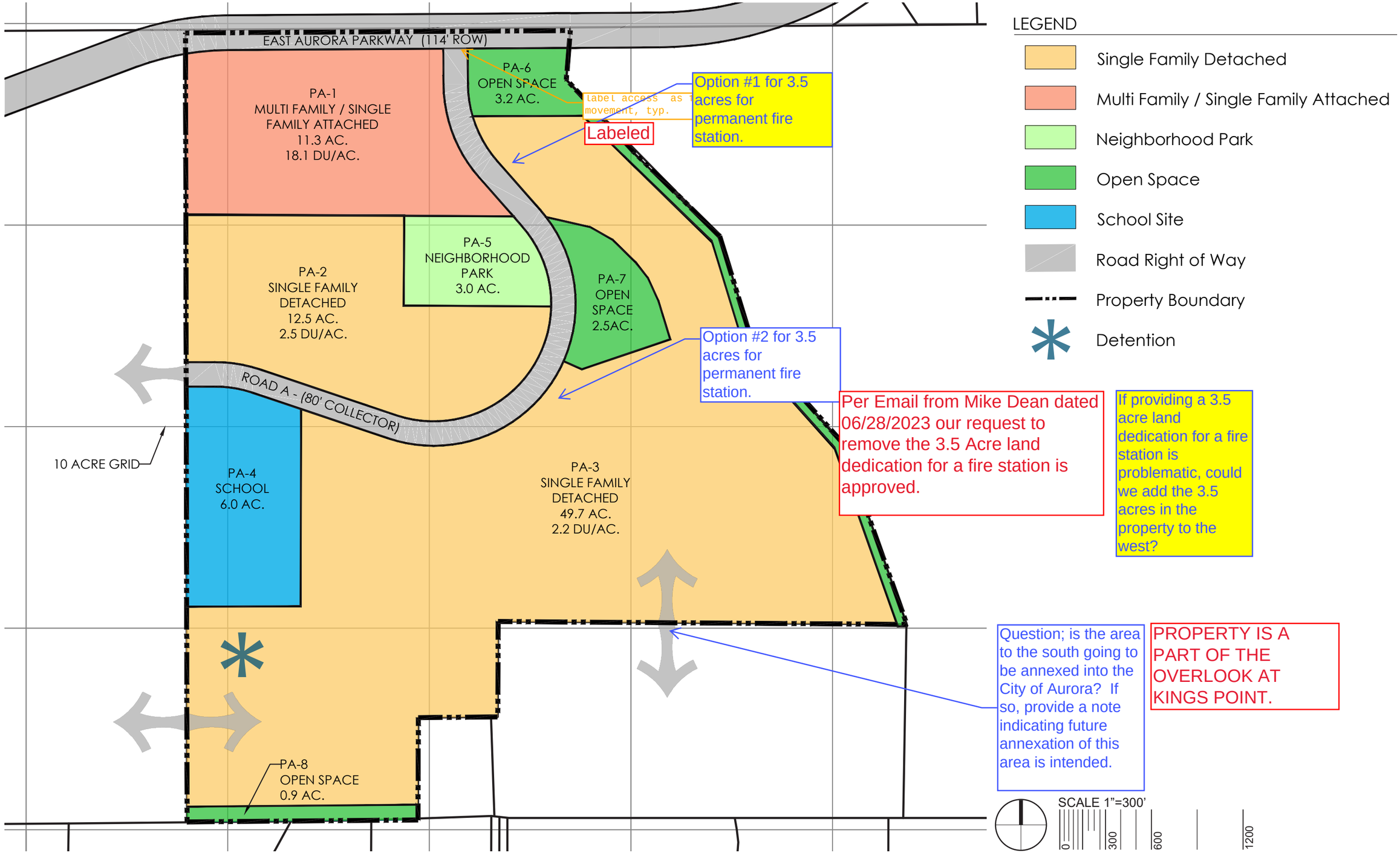
50% small lots is only allowed in R-2 districts with more than 100 residential lots. 25% small lots is the maximum permitted in the R-1 zone district.

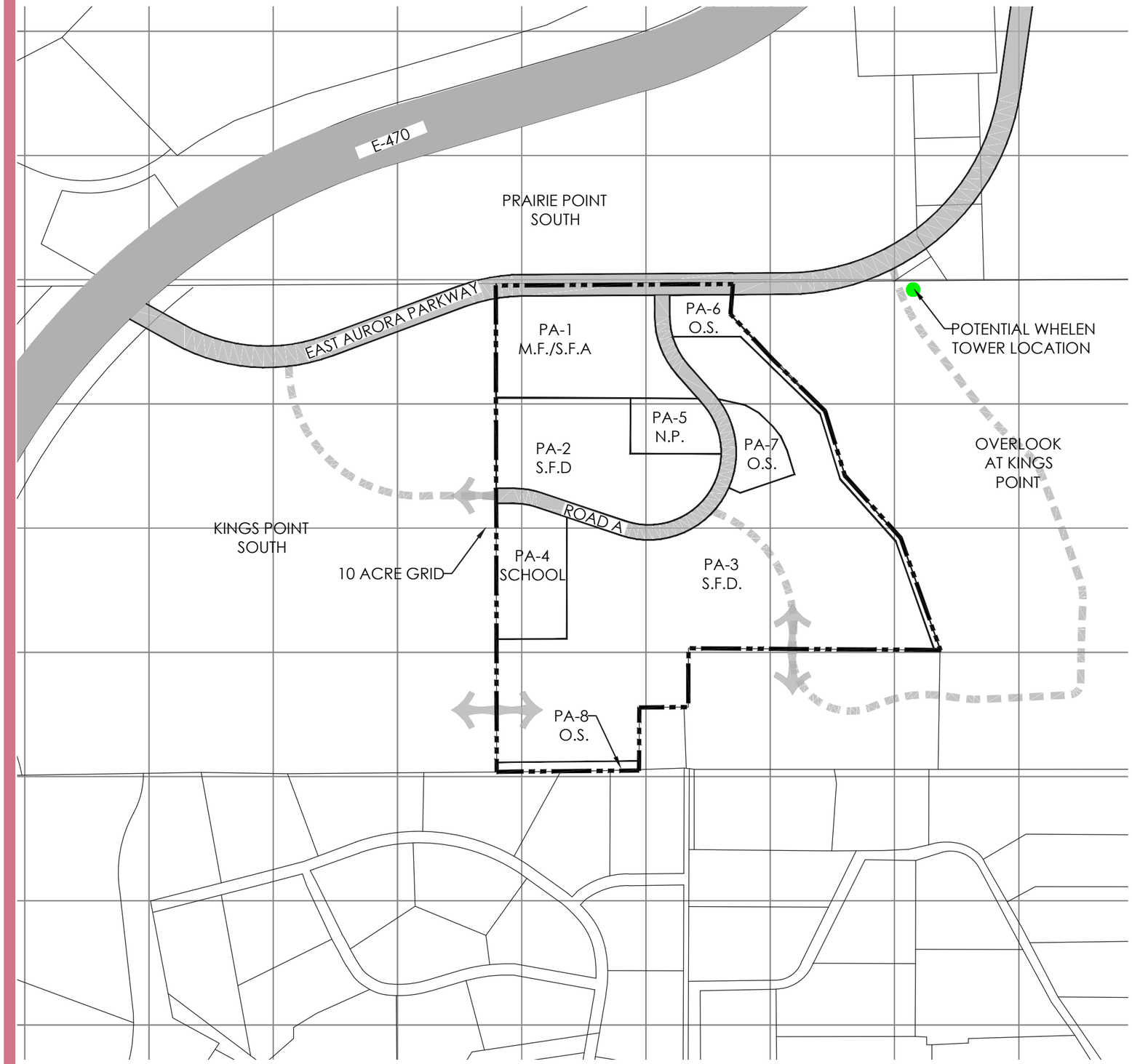
Small lot percentage will be tracked throughout development and will not exceed small lot restrictions

This is a percentage of lots (ie all single family lots) not a percent of units. Multi family units do not increase the lot count. A quantity may not be identifiable at this point and will have tracked as development occurs.

PROS calculates land dedication requirements to the 100th rather than the 10th of an acre. Please update. Also, update accordingly if the numbers in Lines 11 and 12 fail to accurately represent the type of proposed residential units for PA-1.

Revised


EAST AURORA PARKWAY (114' ROW)
PA-1
MULTI FAMILY / SINGLE FAMILY ATTACHED
11.3 AC.
18.1 DU/AC.
PA-6
OPEN SPACE
3.2 AC.
label access as t
movement, typ.
Labeled
Option #1 for 3.5 acres for permanent fire station.
PA-2
SINGLE FAMILY DETACHED
12.5 AC.
2.5 DU/AC.
PA-5
NEIGHBORHOOD PARK
3.0 AC.
PA-7
OPEN SPACE
2.5AC.
Option #2 for 3.5 acres for permanent fire station.
ROAD A - (80' COLLECTOR)
10 ACRE GRID
PA-4
SCHOOL
6.0 AC.
PA-3
SINGLE FAMILY DETACHED
49.7 AC.
2.2 DU/AC.
Per Email from Mike Dean dated 06/28/2023 our request to remove the 3.5 Acre land dedication for a fire station is approved.
If providing a 3.5 acre land dedication for a fire station is problematic, could we add the 3.5 acres in the property to the west?
PA-8
OPEN SPACE
0.9 AC.
Question; is the area to the south going to be annexed into the City of Aurora? If so, provide a note indicating future annexation of this area is intended.
PROPERTY IS A PART OF THE OVERLOOK AT KINGS POINT.
LEGEND
Single Family Detached
Multi Family / Single Family Attached
Neighborhood Park
Open Space
School Site
Road Right of Way
Property Boundary
Detention
SCALE 1"=300'
0
300
600
1200



LEGEND

- Road Right of Way
- Potential Future Access Roads
- Property Boundary
- Potential Whelen Tower Location

Revised

Replace Fire Marshal with Office of Fire Chief Commander

STANDARD FIRE NOTES

- Permanent or temporary fire stations: the exact placement of permanent or temporary fire stations will be determined and approved by the city of aurora's ~~fire marshal~~ to insure that coordinated coverage is provided within the city. For specific questions, the ~~fire marshal~~ can be reached through the fire department main switchboard, 303-326-8999, or 303-326-8986 (fax).
- The FEMA requirement for outdoor emergency warning systems is a 60-70 foot monopole tower using an alert siren. The City of Aurora uses the Whelen Siren System. The land requirement for the tower is a 10' x 10' easement. Each siren covers approximately 3,000 radial feet at 70 db and is typically spaced one siren per square mile.
- In newly annexed/developing areas of the city, sirens should be sited on every ½ section of ground (320 acres) or 6000 feet apart to provide edge to edge coverage.
- The exact placement of sirens will be determined by the City of Aurora's Office of Emergency Management to insure that coordinated coverage is provided on a system wide basis. For specific questions, the Office of Emergency Management can be reached at 303-739-7636 (phone), 303-326-8986 (fax), or afd_oem@auroragov.org.

SCALE 1"=600'

0 600 1200 2400

should the language reference pro-rated/cost sharing to be provided with COntextual Site Plan

Revised

1. Traffic Signal Costs. Owner and/or developers are responsible for 100 percent of signal costs for interior intersections. Public Improvement Funding Agreement (PIFA) will dictate the payment and timing of signals at perimeter intersections.

2. Street Lights. Streetlights must be constructed along all public streets as required by City Code Section 126-236.

3. Archeological finds. The owner, developer and/or contractors will notify the City if archeological artifacts are uncovered during construction.

4. Parks. Neighborhood park sites shall not exceed 4:1 slopes.

5. Residential Density Reductions. The developer has the right to build at a lower residential density in any map area provided the City has determined that the use is permitted and compatible with surrounding land uses. A finding of compatibility will be determined at the time of Site Plan review. This reduction shall be considered an administrative MP amendment.

Development may not occur until the bridge over E-470 and atleast half of Aurora parkway is constructed

6. Master Drainage Plan. No subdivision shall be approved prior to the City's approval of the Master Drainage Plan. In the event of any plan conflicts with the Master Plan, including but not limited to, the size, location and regional detention ponds and drainage way locations, cross sections and widths, the Master Drainage Plan, as approved by the City, shall govern. Drainage pond drop structures and other facilities are subject to or site plan review.

This project is contingent upon a connection of Aurora Parkway across E-470. Currently Aurora Parkway is currently a dead-end street and secondary access will be required.

404 Permit. The developer is responsible to comply with any requirements of the Army Corps of Engineers (if any) with regards to 404 permitting and wetlands mitigation.

8. Emergency Access. The developer shall provide two separate and approved points of paved emergency access and a looped water supply to each phase of the development as approved by the City. The developer shall provide emergency crossings that meet all city standards. The developer/applicant is required to provide all offsite roadways necessary to provide the two distinct points of access to the overall site.

Revised

9. The Master Utility Study, Master Drainage Study and Master Transportation Study are incorporated into the MP. Final approval of these documents is required before acceptance of an application for the first within the project.

Add "conflict"

10. Landscaping Standards. Unless otherwise noted herein in an adjustment, the landscaping standards outlined in the UDO apply to this MP. Where the standards outlined in the UDO with standards within this MP, the more restrictive shall apply.

11. Future Amendments. Any future amendments to architecture, landscape architecture and other urban design standards and related drawings must demonstrate an equal or better quality than the approved MP standards.

Add "the"

Revised

12. MP Adjustments. Except for any adjustments listed below, this MP will be interpreted to mean that all standards contained in the MP will meet or exceed all city code requirements.

13. Major arterial medians to be publicly maintained shall be designed and constructed in accordance with P&OSD Public Median Standards. (These policies are pending completion.)

14. Major arterial medians to be privately maintained shall be designed and constructed in accordance with P&OSD Private Median Standards. (These policies are pending completion.)

Numbers 13 and 14 are out of date and need not be included if no major arterial streets pass through or abut the development.

Removed

TAB 9

MP OPEN SPACE

- Open Space Narrative 9.1
- Form J 9.2
- Open Space Plan 9.3
- Neighborhood Plan 9.4

1. **Open Space**

The parks and open space system Vistas includes 3.0 acres in Neighborhood Parks and 6.6 acres of open space. The open space includes a conservation area for a massing of black forest trees thru the use of retaining walls and preservation methods during construction. A landscape buffer along the southern edge of the property also helps to separate our proposed community from the already existing large lots to the south.

2. **Connectivity**

In concert with the Zone District requirements, all subdivisions and developments within Vistas will be designed to create an integrated system of lots, streets, sidewalks, trails, and bikeways that provides for optimal movement of people, bicycles and automobiles within the Vistas community to and fr ent streets, developments and uses.

Added

Include linework on the Open Space Plan map.

3. **Pedestrian and Bicycle Circulation System**

The pedestrian circulation system at Vistas consists of detached pedestrian trails along the to walks along local streets. All con d schools are connected to the trail Open Space, Circulation, and N

Sidewalks are not trails, generally speaking. Distinguishing between the two would be preferred in the narrative and mapping.

Potential open space and park trail connections shown

The Vistas MP encourages vity throughout the community

- 8-foot community detached trails along Minor Arterials.
- Landscaped tree lawns adjacent to a majority of the local streets will be provided.
- 6-foot neighborhood trails may b d in an open space depending on site constraints.

Text revised

May or "will?" Proposed open space must provide recreational, conservation, and/or educational value and benefit. The provision of trails and trailside activity nodes with site furnishings are typically provided to satisfy land dedication criteria.

4. **Primary Access**

One principal Arterial, Future Aurora Parkw direction along the northern boundary; th lanes. Connecting to Future Aurora Parkw runs through the site connecting to the de

In addition to these roadways, local roadways will serve the individual neighborhoods, designed to meet the City of Aurora Subdivision Ordinance.

Sidewalks are planned along all streets, and pedestrian/bicycle trails are planned in

open spac

As noted in the Tab 8 redlines, PROS calculates land dedication requirements to the 100th rather than the 10th of an acre. Please update.

Tab 10.14- ons for these streets.

Text revised

5. Public Land Dedication Requirements

The City's parks/open space dedication requirements under the current City Code, when applied to the MP site, would require approximately 2.7 acres of neighborhood parks, 1.0 acres of community parks, and 6.9 acres of further open space/parks, resulting in an aggregate public land dedication requirement of approximately 10.6 acres. Any PLD shortfalls for community park requirement will be provided with a cash in-lieu payment to the City accordance with City Code Section 147-48(b)(4).

Change to 146-4.3.18.B

Text revised

Under this MP Amendment, the will dedicate 3.0 acres for neighborhood parks, 1.0 acres Cash-In-Lieu payments for Community Parks, and another 6.6 acres to credited open space. 0.3 Acres of the dedicated open space are coming from the extra 0.3 Acres of Neighborhood Park.

6. Park and Recreational Improvement Requirements

The Kings Point South Metro D
improvement of parks within
The District will be responsible
dedication by the applicant / land owners. The program elements for
the parks to be improved by t South Metropolitan
District(s) and shall be limited to the list shown below. No further improvements will be required by the City. Refer to the Development Agreement for details on funding of the park improvements.

Applicant will construct pedestrian/bicycle/recre
in the Open Space/Circulation/Neighborhood Mo
MP. The 8-foot and 6-foot community and neighb
dedicated to and maintained by one or more of t

Neighborhood Parks and the improvements therein (including irrigation) will be constructed and maintained by the Kings Point South Metro District. The following is a list of program elements that may be provided within a Metropolitan District park in Vistas. Additional items may be provided at the discretion of the Kings Point South Metropolitan District(s).

Play Features may include:

- Hillside Slide
- Log/Mushroom Steppers
- Slop
- Nat
- Climbing Boulders/Walls

Informal multi-purpose field

Loop trail system

Picnic pavilion with seating for 15 people

Picnic Tables

Grills

Benches (as needed)

Trash receptacle

On street parkin

Landscaping w

Park sign

At the SP stage, the program elements shown above may be reduced in parks located adjacent to school sites in order to avoid duplication with equipment located on the school site.

Applicable neighborhood park programmatic elements will be governed by the design criteria in effect at the time of Site Plan submittal. Language limiting that nothing more or different will be provided cannot be included in this Master Plan.

Text revised

Text revised

May or "will?" There are specific programmatic elements which must be provided in a neighborhood park. Refer to Section 6.10 of the PROS Dedication & Development Criteria

This could happen but only with approval from PROS as well.

Playgrounds must comply with the requirements outlined in Section 6.22.B of the PROS Dedication & Development Criteria Manual. Expand the narrative accordingly, such as describing the provision of inclusive play features, etc.

Revised

Text revised

Only upon approval from PROS and if there is agreement from the school district for shared public use.

Form J: Parks and Open Space Inventory and Phasing Approval					
A.	**B.**	**C.**	**D.**	**E.**	**F.**
Planning Area Designation (Or feature in an area)	**Description and Inventory of Facilities**	**Total Acreage**	**Parks Dept. Credited Acreage**	**Final Ownership & Facility Funding**	**Phasing Plan and Trigger for Each Phase**
PA-5	Neighborhood Park - Program elements that may be provided within a neighborhood park: Play features may include: Slope and Nature Play Equipment, Climbing Boulders/Walls, Loop trail system, Picnic pavilion, Picnic Tables, Grills, Benches (as needed), Trash receptacles (as needed), Landscaping with automatic irrigation system, and park sign. Additional items may be provided at the discretion of the Kings Point South Metropolitan District. Service area to include Planning Areas 1, 2, and 3 which totals 73.1 acres and 345 dwelling units. Conceptual design determined at SP. Other improvements may include features that are supportive of a theme for the neighborhood or the development, such as public art at an appropriate scale. The neighborhood park will benefit recreation by providing including facilities for contemplative recreation as well as open areas that offer scenic vistas to the west, benefit conservation by preserving land to establish an interconnected park and open space system, and benefit education thru the implementation of land management practices that support interpretation goals. Trail connections to the nearby school and open space will be provided.	3.0	3.0	Kings Point South Metro District / Developer to construct, own and maintain.	Revised This trigger .... Dedication concurrent with adjacent planning area final plats. Construction shall be complete by the issuance of the 300th C.O. within planning areas 1, 2, and 3 combined or within 6 months of completion of infrastructure including adjacent roads and water service extension to the site, whichever is later. Park plan submittal will be included in the Filing that contains the trigger certificate of occupancy stated above.
PA 6, 7	Open Space in minimum 30' wide Corridors with 6' minimum trails and vista points. Site furnishins, shade structures, and outdoor art may be provided as necessary. These open spaces provide conservation benefits by preserving land to establish an interconnected park and open space system throughout the development and recreational benefits with the provision of trails and paths. Conceptual design determined at SP. Black forest trees will be preserved as much as possible thru the use of retaining walls and approriate design.	5.7	5.7	Kings Point South Metro District to construct, own, and maintain.	Dedication concurrent with final plats adjacent to the site dedication. Improvements and landscaping to be completed with construction of associated drainage improvements.
PA 8	Open Space buffer with trails, street furniture, and vista points. These open spaces provide conservation benefits by preserving land to establish an interconnected park and open space system throughout the development and recreational benefits with the provision of trails and paths. Conceptual design determined at SP.	0.9	0.9	Kings Point South Metro District to construct, own, and maintain.	Dedication concurrent with final plats adjacent to the site dedication. Improvements and landscaping to be completed with construction of associated drainage improvements.
TOTAL		**9.6**	**9.6**		9.6 acres of neighborhood park and open space provided.
Director of Parks, Recreation, and Open Space Date:_____ Signature:					

*1.0 Ac. Community parks deficit will be made up with cash in lieu unless otherwise specified.

EAST AURORA PARKWAY (114' ROW)

PA-1
MF / SFA
11.3AC.
18.1 DU/AC.

PA-5
NEIGHBORHOOD
PARK
3.0 AC.

PA-7
OPEN
SPACE
2.5AC.

ROAD A - (80' COLLECTOR)

PA-4
SCHOOL
6.0 AC.

PA-3
SFD
49.7 AC.
2.2 DU/AC.

PA-8
OPEN SPACE
0.9 AC.

10 ACRE GRID

2,067 LF / 0.39 MI.

1,836 LF / 0.35 MI.

Labeled

label access as full movement, typ.

A trail through this open space. Include symbology for trails in the legend.

Added

1/4 mile radius shown. Half mile falls outside our viewport

What is the 1/2 mile service radius for the park? Please show.

A connectiion here would be beneficial.

Added

Per the master drainage report for kings point south, historic drainage flows will be maintained near the proposed detention pond shown along the western edge of the property. The remaining drainage to the east of this area has no documented floodplains or wetlands of note and mostly consists of washout areas. Drainage basin flows are mostly directed along the southern boundary as well and continue west. A mid site open space corridor and channel is both unnecessary and a hinderance to the site in terms of grading and future homesites.

Has thought been given to the possibility of an open space corridor and trail being provided in conjunction with a maintenance path for what appears may become a drainageway leading to the detention pond?

Acts a landscape buffer to the larger lots below. and a potential trail connection.

How will PA-8 provide open space value and benefit? Show on map if it is to be interconnected to other spaces for pedestrian and bicycle mobility. The drainageway noted above would be a substitute open space area than this.

LEGEND

- Neighborhood Park
- Open Space
- School Site
- Road Right of Way
- Property Boundary
- Neighborhood Boundary
- Primary Entry Point
- Detention
- 2' Existing Contour intervals

SCALE 1"=300'

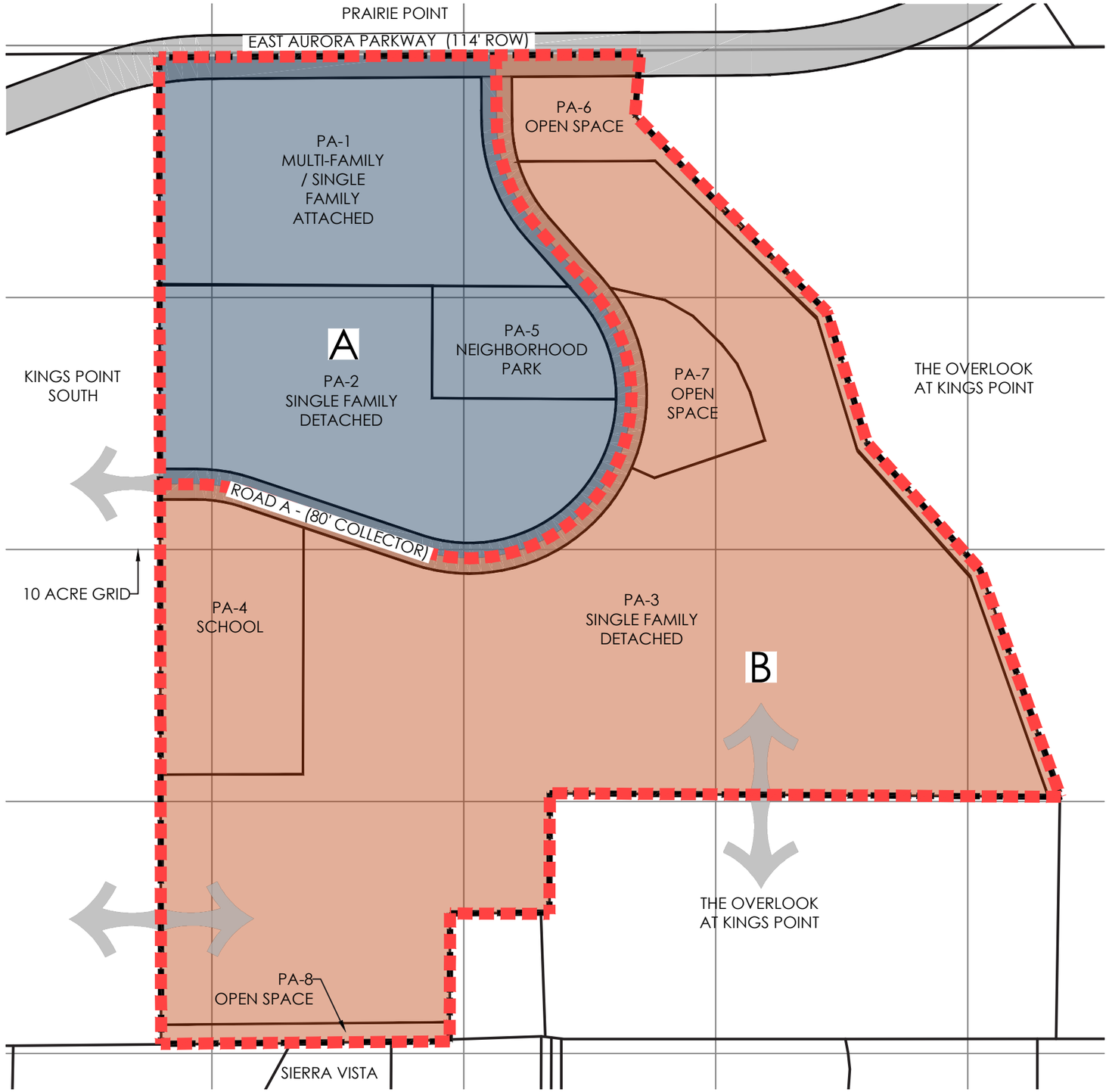
0 300 600 1200

VISTAS AT KINGS POINT MASTER PLAN

AURORA, CO MARCH 29, 2023

OPEN SPACE PLAN

TAB 9.3



LEGEND

NEIGHBORHOOD BOUNDARY

Neighborhood	Size (AC)	North Boundary	East Boundary	South Boundary	West Boundary
A	30.1	East Aurora Parkway	Road A	Road A	Kings Point South
B	65.1	East Aurora Parkway / Road A	Overlook	Sierra Vista / Overlook	Road A / Kings Point South
Total	95.2				

SCALE 1"=300'

0 300 600 1200

TAB 10

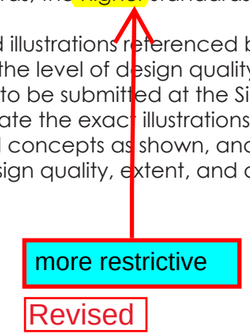
MP URBAN DESIGN STANDARDS

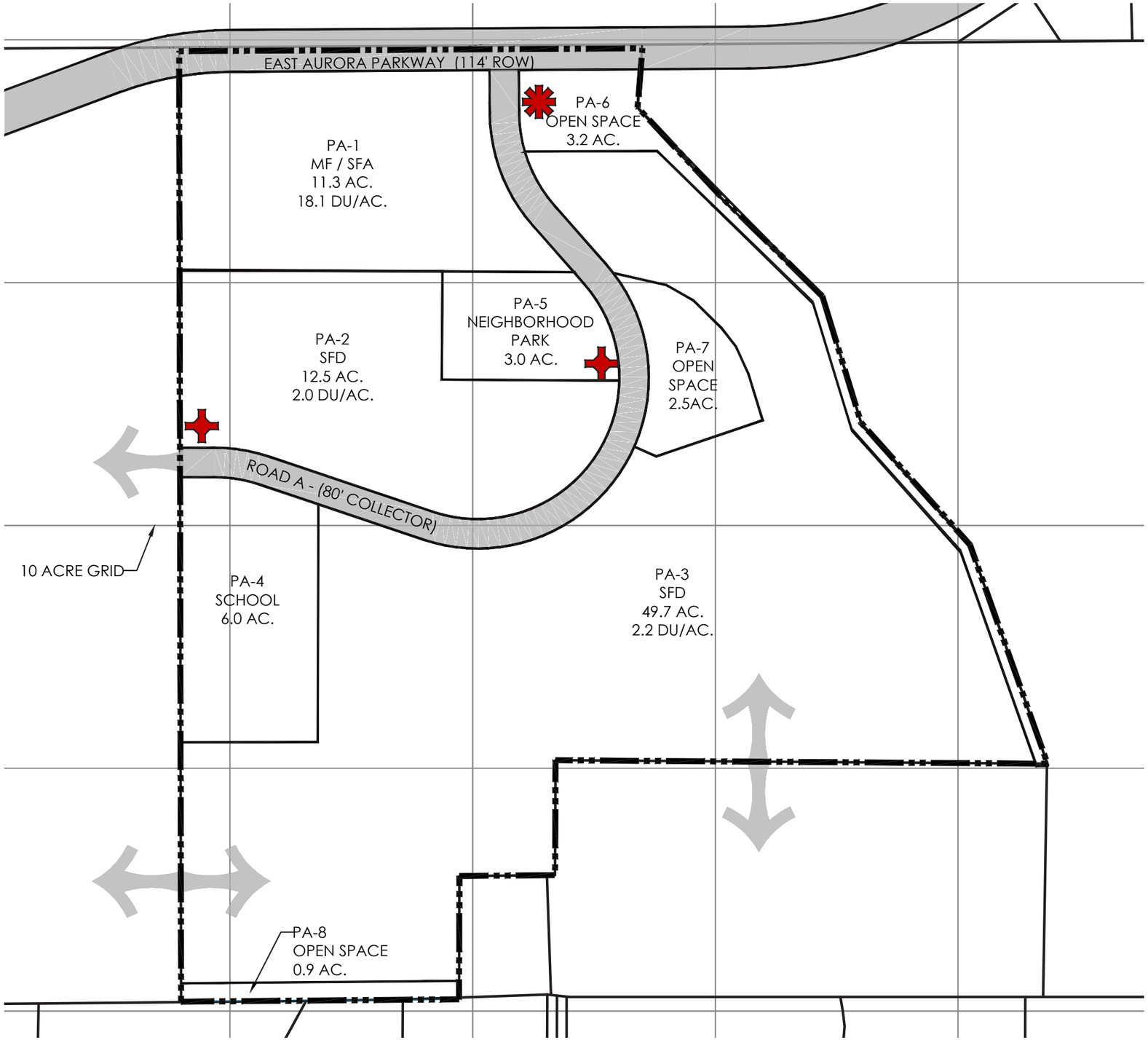
- Form F1 - Urban Design Standards 10.1
- Overall Monument Plan 10.2
- Primary Entry Monument 10.3
- Secondary and Tertiary Monument 10.4
- Walls and Fencing 10.5
- Lighting 10.6
- Residential Paving 10.7
- Residential Site Furnishings 10.8
- Residential Specialty Structure 10.9
- Residential Signage 10.10
- Multi-Family Signage 10.11
- Street Standards 10.12

SPECIAL URBAN DESIGN FEATURE	BRIEF DESCRIPTION OF THE FEATURE	LOCATION IN APPLICATION PACKAGE
	RESIDENTIAL	
1. ENTRY MONUMENTATION	THE PRIMARY FEATURES OF THE ENTRY MONUMENTATION WILL HELP TO PROVIDE COMMUNITY IDENTIFICATION, INCLUDING A TRAPEZOIDAL SHAPED COLUMN THAT WILL BE REPEATED THROUGHOUT THE PROJECT. WOODEN BEAMS AND PANELS IN THE MONUMENTATION WILL ALSO BE ESTABLISHED AS A RECURRING THEME. ALL ENTRY MONUMENTS WILL BE CONSTRUCTED OF STONE OR NATURAL LOOKING STONE VENEER; PRE-CAST CONCRETE OR LIMESTONE WILL BE USED FOR THE CAP AND TRIM PIECES; METAL ROOFS WILL CAP COLUMN AND TOWERS. PANELS WITHIN PARTS OF THE ENTRY FEATURES WILL BE MADE OF ACRYLIC PANELS TRIMMED IN METAL TO SUGGEST THE APPEARANCE OF LIGHTED GLASS PANES. SIGN LETTERING SHALL FOLLOW THE STANDARD LOGO STYLE SHOWN IN THE SIGNAGE STANDARDS.	10.3 & 10.4
2. RETAINING WALLS	RETAINING WALLS SHALL BE SPLIT FACE MASONRY BLOCK IN A VARIETY OF EARTH TONED COLORS THAT INTEGRATE RANDOM SIZES AND PATTERNS FOR INTEREST. RAILING OR BARRIER IS REQUIRED ON ALL WALLS GREATER THAN 30".	10.5
3. FENCE AND PRIVACY WALLS	FENCING ALONG LOTS ADJACENT TO OPEN SPACE AND DETENTION FACILITIES WILL BE THREE-RAIL OR OPEN RAIL WOOD FENCE. INTERNAL FENCING ALONG LOTS ADJACENT TO OTHER LOTS OR NEARBY ROADS WILL BE PRIVACY FENCING CONSISTING OF COMPOSITE WOOD WITH MASONRY COLUMNS, OR COMPOSITE WOOD WITHOUT COLUMNS. COLUMNS SHOULD BE PLACED AT LOT CORNERS AND USED IN HIGH VISIBILITY AREAS. ALONG ARTERIAL AND COLLECTOR ROADS COLUMNS SHOULD BE PLACED EVERY 60 FEET MIN.	10.5
4. LIGHTING STANDARDS	LIGHT FIXTURES INDICATIVE OF THE ARTS AND CRAFTS AND CRAFTSMAN STYLES FOUND WITHIN THE MONUMENTATION. STREET LIGHTS IN PUBLIC RIGHT OF WAY WILL BE OWNED AND MAINTAINED BY THE CITY OF AURORA AND MUST MEET COA STANDARDS.	10.6
5. RESIDENTIAL PAVING STANDARDS	SCORED AND COLORED CONCRETE PAVING AREAS MAY BE USED AT THE PLAZA AREAS WITHIN THE PARK.	10.7
6. STREET FURNITURE STANDARDS	BENCHES AND TRASH RECEPTACLES WILL BE MADE OF WROUGHT IRON/METAL TO MATCH THE METAL DETAILING ON THE MONUMENTATION. BOLLARDS, WHERE NEEDED, ARE TO BE METAL. VARIATIONS IN COLOR MAY OCCUR PER AMENITY SPACE.	10.8
7. SIGNAGE STANDARDS	STANDARDIZED TYPE FACE, LOGO, AND A SERIES OF THEMATIC COLORS SHALL BE USED THROUGHOUT THE COMMUNITY'S SIGNAGE. WITHIN COMMERCIAL DEVELOPMENTS, SIGNAGE STANDARDS SHOULD HAVE A HIERARCHY OF COLORS AND FONT TYPES, FROM THE MAIN MONUMENT TO THE BUILDING SIGNS.	10.10 &10.11
8. SPECIAL NEIGHBORHOOD CONCEPTS	THIS DEVELOPMENT IS FOCUSED ON THE SPECTACULAR VIEWS THE SITE HAS TO OFFER. A SERIES OF OPEN SPACES AND TRAILS WILL ALLOW RESIDENTS ACCESS TO THE ENTIRE DEVELOPMENT WITHOUT THE USE OF AUTOMOBILES. ALONG THIS CORRIDOR WILL BE NEIGHBORHOOD PARKS, SCHOOLS, AND OPEN SPACE.	
9. SPECIAL FACILITIES AND STRUCTURES SUCH AS CLUBHOUSES AND RECREATIONAL FACILITIES	VARIOUS POTENTIAL PLAYGROUND COMPONENTS CONSITING CLIMBING BOULDERS, NATURE PLAY, AND LOG STEPPERS. A SHADE STRUCTURE ALONG WITH VARIOUS OTHER FURNISHINGS TO BE PLACED THROUGHOUT THE NEIGHBORHOOD PARK	10.9
10. STREET STANDARDS	60' LOCAL, 64' LOCAL, 80' COLLECTOR, AND 144' ROW SIX LANE ARTERIAL PER CITY OF AURORA STANDARDS.	10.12
11. COMMERCIAL STANDARDS	NOT APPLICABLE	N/A

The design standards listed in this matrix implement the design themes of the MP and are intended to complement and exceed the unified development ordinance (UDO). Unless a waiver has been specifically requested and granted, if a conflict should exist between any specific provisions of this matrix and any other ordinance standards, the higher standards shall govern.

All the photos and illustrations referenced by this matrix are representative of the level of design quality required by this MP. Final designs to be submitted at the Site Plan level will not necessarily duplicate the exact illustrations, but will contain the same themes and concepts as shown, and will be at the same or higher level of design quality, extent, and detail.





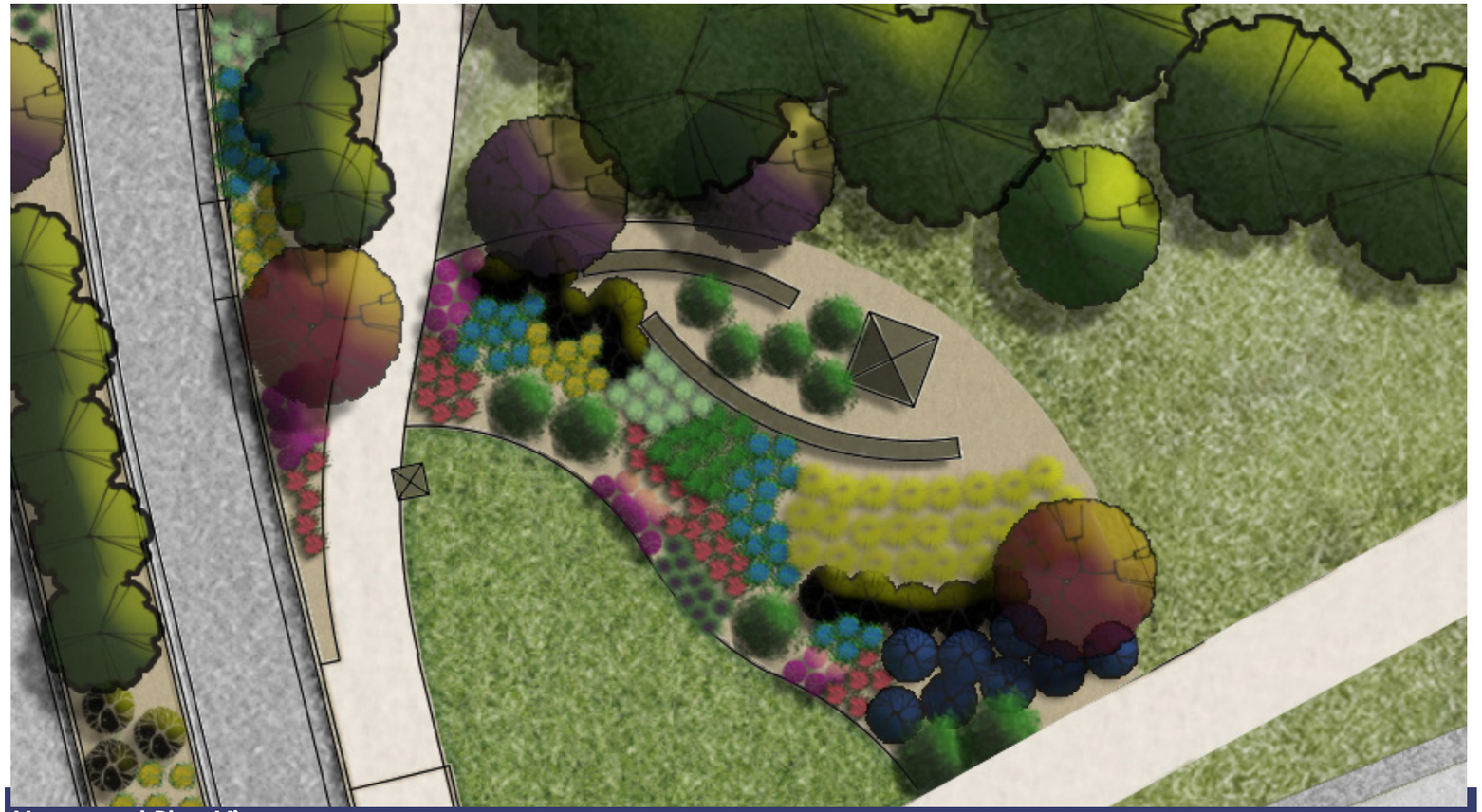
LEGEND

- Primary Entry Monument
- Secondary Entry Monument
- R.O.W.
- Property Boundary

GENERAL NOTES

Primary residential entry monuments will be located where the collector (Road A) intersects with Aurora Parkway to distinguish primary points of interest within the development.

Secondary entry monuments will be located at entry points into the community along local streets and collector roads. Parks may utilize secondary monuments as indentification signs. Final locations of monuments will be determined at Site Plan. Locations of tertiary monuments will be determined at Site Plan level.

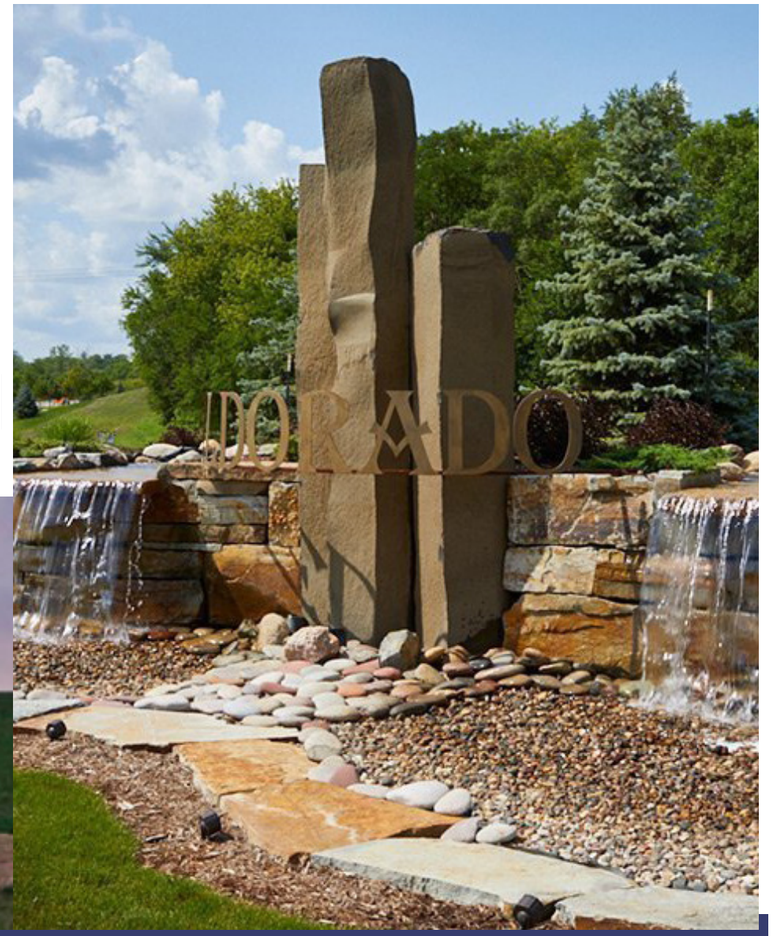


Monument Plan View

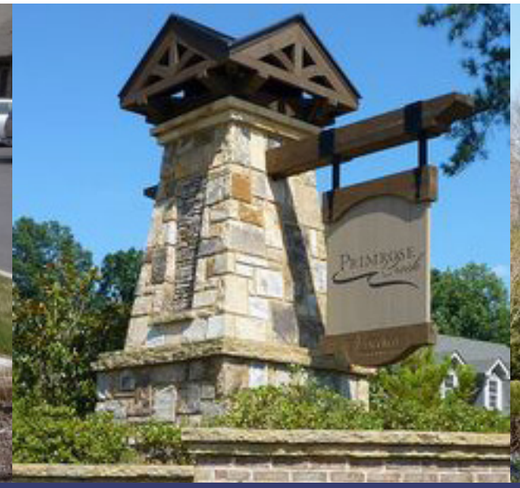
GENERAL NOTES

The primary residential entry monument will consist of a series of stone walls with a sign face and a separate vertical stone elements. Both the wall, sign face, and vertical monument should utilize similar stone, metal, and barn wood materials.

The sign face shall be a maximum of 96 square feet. Sign dimensions to be specified in corresponding Site Plan, not to exceed city code.



Entry Monuments



Secondary Monument

Neighborhood Column

GENERAL NOTES

The secondary and tertiary residential entry monuments should resemble the Colorado theme by utilizing similar forms and materials to the primary entry monument. Secondary or tertiary entry monuments should be placed based upon hierarchy of points of interest.

Secondary and tertiary entry monument shall not exceed 8' in height.

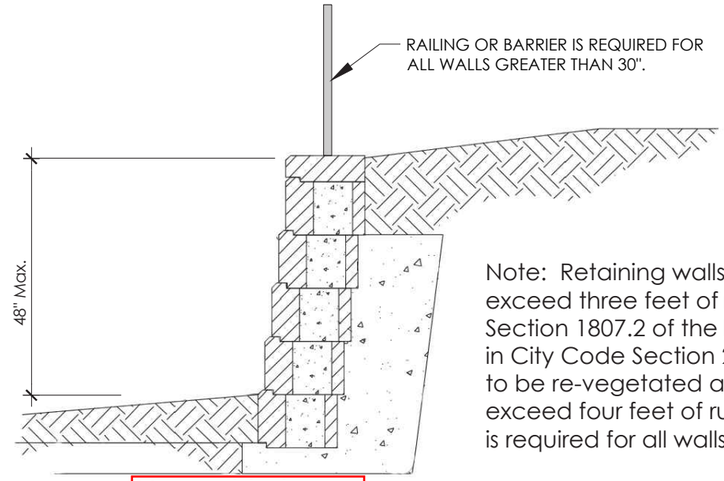
Sign area and dimensions to be specified in corresponding Site Plan, not to exceed city code.

GENERAL NOTES

Walls and fencing throughout the development will further embrace the Colorado theme and accent other built structures on the site.

Fencing will have a sense of openness where desirable landscape features and beneficial views will enhance the quality of the development. Privacy fencing, in contrast, will provide the opportunity for privacy while framing vistas to the landscape. Fencing along local roads and interior lots should be made of composite material or wood and utilize earth tone colors. Fencing along arterial and collector roads should be made of composite material and utilize earth tone colors. Along arterial and collector roads columns should be placed every 60 feet. Open rail fencing will be used along open space areas.

Walls will utilize local and on-site materials when possible to create parallels between the built and native environment. Where retention on site is necessary, modular block walls will be utilized. On-site boulders will also be used throughout planting beds and for soil retention.

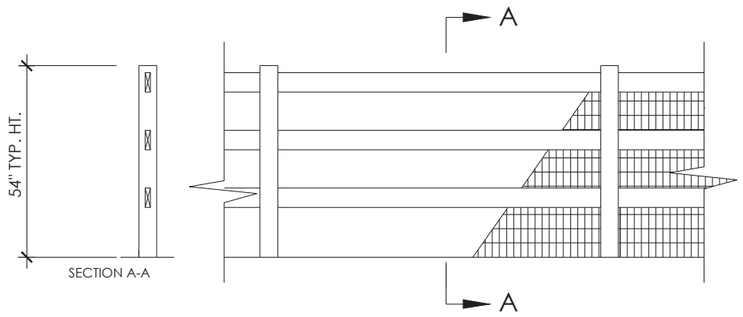


Note: Retaining walls shall be required whenever slopes exceed three feet of run to one foot in rise (3:1). Refer to Section 1807.2 of the International Building Code, as adopted in City Code Section 22-131, for additional design criteria. Slopes to be re-vegetated and to be maintained by Aurora shall not exceed four feet of run to one foot of rise (4:1). Railing or barrier is required for all walls greater than 30".

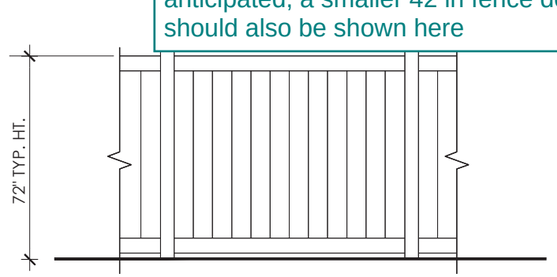
Modular [illegible]all

Note added to Open Rail fence detail

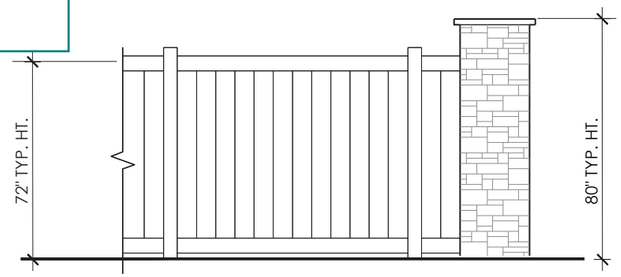
Be aware that any front yard fencing, or corner lot side yard fencing less than 4 ft from the back of sidewalk may only be 42 in in height. If either of these fencing types are anticipated, a smaller 42 in fence detail should also be shown here



Open Rail Fence



Typical Privacy Fence



Privacy Fence with Stone Column

Accent Lighting

Landscape Lighting

Monument Lighting

GENERAL NOTES

Lighting will occur within right-of-ways, near shared sidewalks, trails, and at entry monuments located throughout the development. The goal of lighting is to assure safety and encourage circulation between amenities within the area. Lighting shall also accent other built and natural structures within the site to embrace the Colorado theme.
Lighting will include a mixture of street pole lighting, bollard lighting, and accent lighting for entry features, landscape, and other important elements.

Sidewalks, internal pedestrian paths, and bicycle paths shall be lit with full cutoff fixtures no more than 16 feet tall and providing consistent illumination of at least one foot-candle on the walking surface. On- site streets and parking areas shall be lit with full cutoff type fixtures no more than 25 feet tall. Fixtures should be of the downcast type. Street lights in public right of way will be owned and maintained by the City of Aurora and must meet COA standards.

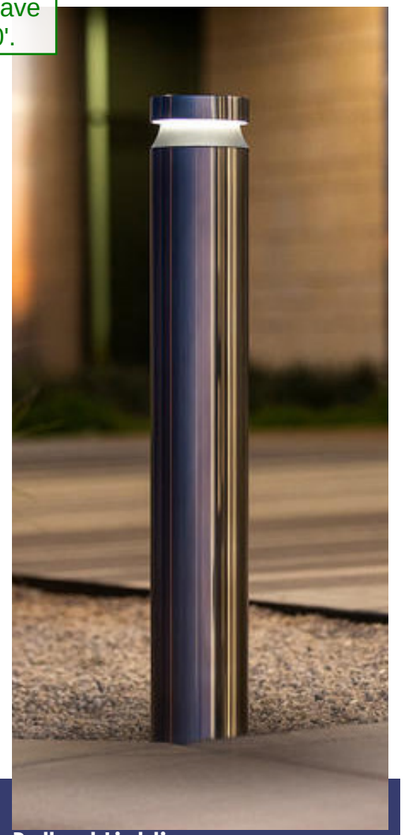
Revised

Local streets have a pole height of 20'. Collector streets have a pole height of 30'.

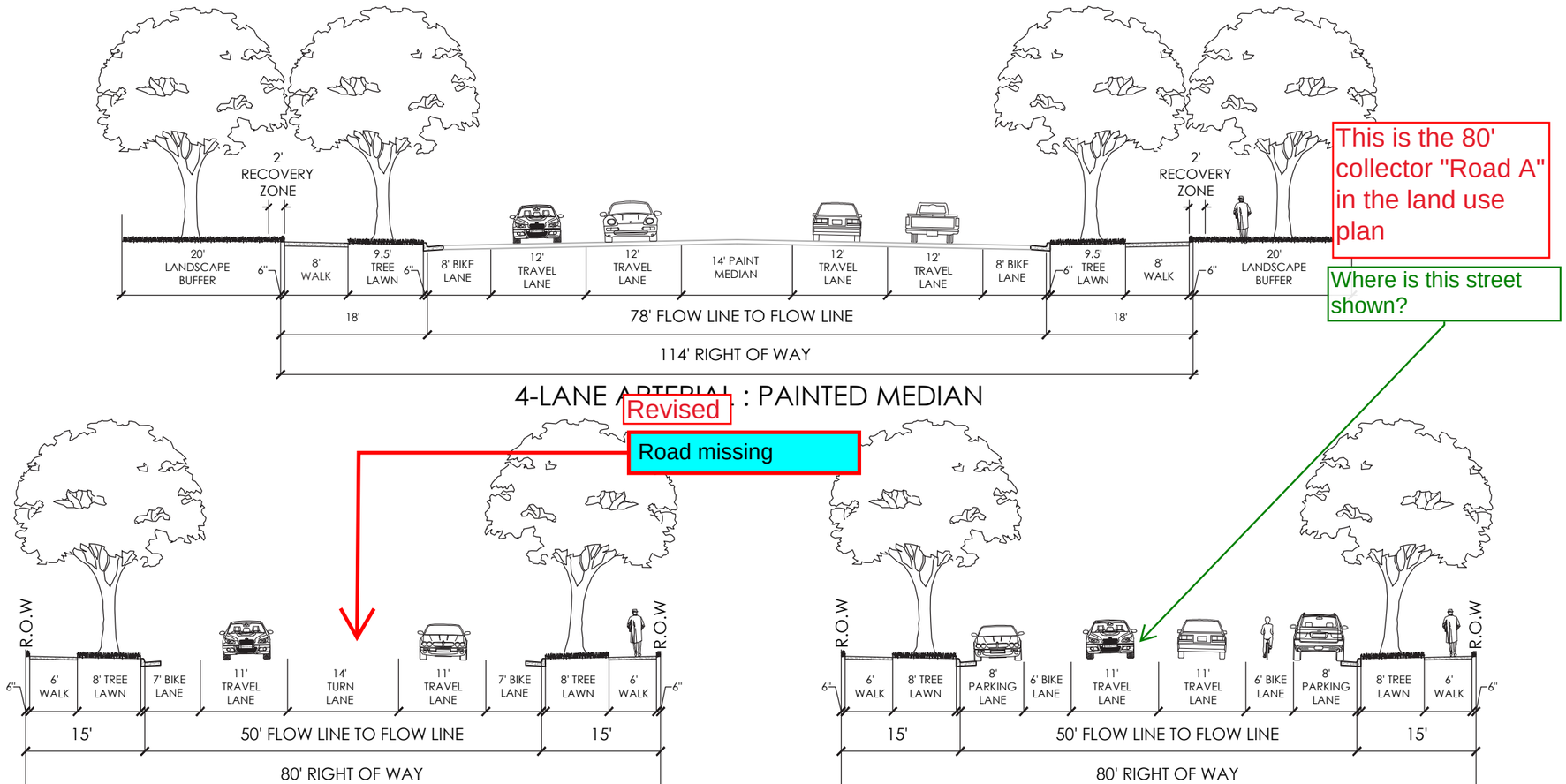
Revised

Remove this. Streetlights will be COA standard fixtures.

Street Lighting (or XCEL equal)



Bollard Lighting



This is the 80' collector "Road A" in the land use plan

Where is this street shown?

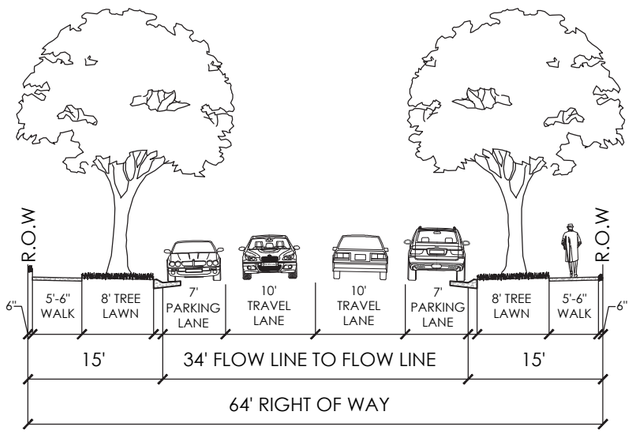
4-LANE ARTERIAL : PAINTED MEDIAN

Revised

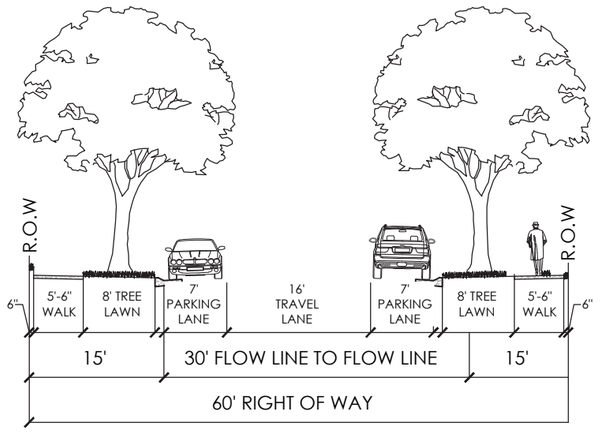
Road missing

THREE LANE COLLECTOR

TWO LANE COLLECTOR



LOCAL STREET #1



LOCAL STREET #2

Note Added

Please include a statement similar to that on the Urban design Standards

The design standards listed in this matrix implement the design themes of the MP and are intended to complement and exceed the unified development ordinance (UDO). Unless a waiver has been specifically requested and granted, if a conflict should exist between any specific provisions of this matrix and any other ordinance standards, the higher standards shall govern.

TAB 11

MP LANDSCAPE STANDARDS

- Form G - Landscape Matrix 11.1
- Plant Material 11.2
- Entry Monument Landscape 11.3
- Streetscape Standards 11.4
- Neighborhood Parks 11.5
- Detention and Dranage 11.6
- Open Space 11.7

SPECIAL LANDSCAPE FEATURE	BRIEF DESCRIPTION OF THE FEATURE	LOCATION IN APPLICATION PACKAGE
1. OVERALL LANDSCAPE CONCEPT AND PALETTE OF PLANT MATERIALS USED TO CARRY IT OUT	THE LANDSCAPE CHARACTER OF VISTAS IS INSPIRED BY THE COLORADO AND MOUNTAIN THEME. THE NATURAL COLORADO FOREST WILL INFLUENCE THE COMMUNITY OPEN SPACE CORRIDORS AND BUFFER ZONES WITH NATURAL LOOKING PLANTINGS OF NATIVE GRASSES AND WATER-WISE PLANTS WITH CROPPINGS OF BOULDERS. THE PARKS WILL HAVE PROGRAMMED ELEMENTS THAT WILL BE INCORPORATED INTO THE SURROUNDING LANDSCAPES. THE LANDSCAPE CHARACTER WILL ALSO REFLECT THE CHARACTER OF THE SITE. USING THE EXISTING SLOPE TO OUR ADVANTAGE TO MIMICK THE FEEL OF THE MOUNTAINS ALL LANDSCAPE WILL CONFORM TO THE UDO AND LANDSCAPE REFERENCE MANUAL. LANDSCAPING FOR ALL DEVELOPMENT SHALL INCLUDE A VARIETY OF WATER-WISE PLANT MATERIALS AND MULCHES THAT PROVIDE VISUAL INTEREST. REFER TO THE APPROVED XERISCAPE PLANT LIST.	11.2 and 11.6-11.7
2. LANDSCAPE DESIGN AT ENTRY MONUMENTATION AND KEY ENTRY POINTS	DISTINCTIVE LANDSCAPED AREAS SHALL BE PROVIDED AT ENTRY MONUMENTS THAT VISUALLY FRAME AND ENHANCE THE ENTRY EXPERIENCE. LANDSCAPING IN THESE AREAS SHALL CONSIST OF PLANT SPECIMENS HAVING A HIGH DEGREE OF VISUAL INTEREST DURING ALL SEASONS. A MIXTURE OF BOULDERS, SHRUBS, ORNAMENTAL GRASSES, ORNAMENTAL TREES, FLOWERS, AND/OR GROUND COVER SHALL BE PLANTED AROUND SIGN BASES AND AT CURB RETURNS NEAR SITE ENTRANCES.	11.3
3. LANDSCAPE STANDARDS ALONG E-470 OR I-70 (IF APPLICABLE)	NOT APPLICABLE	N/A
4. LANDSCAPE STANDARDS ALONG ARTERIAL AND COLLECTOR ROADS	ALONG ART[illegible]R ROADS LANDSCAPE DESIGN AND PATTERNS SHOULD BE CONSISTENT THROUGHOUT THE COMMUNITY WITHIN THE CURBSIDE LANDSCAPE[illegible]GHBORHOODS, LANDSCAPE WILL REMAIN CONSISTENT THROUGHOUT THE NEIGHBORHOODS TO CREATE A SYNONYMOUS FEEL. IT IS ALSO ENCOURAGED TO CONTINUE THE PLANTING DESIGN FROM THE CURBSIDE LANDSCAPE INTO ADJACENT TRACT LANDSCAPE AREAS, OUTSIDE OF THE RIGH[illegible] PER THE [illegible]PE REQUIREMENTS ARE 1 SHRUB PER 40 SF, WITH NO MORE THAN 40% OF SHRUB COUNT AS ORNAMENTAL GRASSES AND NO MORE TH[illegible]N BE PROVIDED AS SHRUB REQUIREMENT REPLACEMENTS. STREET TREES ARE REQUIRED 1 TREE EVER 40 LF.	11.4
5. LANDSCAPE STANDARDS ALONG LOCAL ROADWAYS	CURBSIDE LANDSCAPE SHALL BE DESIGNED TO MEET ALL REQUIREMENTS WITHIN CITY OF AURORA UDO LANDSCAPE STANDARDS. THIS COULD INCLUDE TREATMENTS CONSISTING OF WATER CONSERVING SHRUBS, NATIVE SEED AND ORNAMENTAL GRASSES. NON-LIVING LANDSCAPE MATERIAL IS ALSO A DESIGN OPTION USING ~~CRUSHER FINES~~, ROCK MULCH AND BOULDERS. ALL CURBSIDE LANDSCAPE WILL HAVE TREES SPACED EQUALLY TO CREATE A CONTINUOUS STREET EDGE OR GROUPINGS OF TREE FOR AN ORGANIC NATURAL CHARACTERISTIC. TREE SPECIES DIVERSITY IS STRONGLY ENCOURAGED. *PER THE UDO, CURBSIDE LANDSCAPE REQUIREMENTS ARE 1 SHRUB PER 40 SF, WITH NO MORE THAN 40% OF SHRUB COUNT AS ORNAMENTAL GRASSES AND NO MORE THAN 5% OF PERENNIALS CAN BE PROVIDED AS SHRUB REQUIREMENT REPLACEMENTS. STREET TREES ARE REQUIRED 1 TREE EVER 40 LF.*	11.4
6. LANDSCAPE STANDARDS IN COMMERCIAL AND PUBLIC GATHERING AREAS. (TREE GRATES & PROTECTORS, PLANTERS, FLOWER BEDS, SCREENING AT PARKING LOTS, ETC.)	NOT APPLICABLE	N/A

Note added to end.

Please note that crusher fines are not permitted as a mulch treatment.

PLANT MATERIALS

THE FOLLOWING LIST IS PROVIDED AS A GUIDE TO VEGETATION. WATER USE GROUPS HAVE BEEN DELINEATED TO ENCOURAGE XERICSCAPING PRINCIPLES OF DESIGN, WHICH RECOMMENDS PLANTING VEGETATION OF SIMILAR WATER REQUIREMENTS TOGETHER. BECAUSE OF AVAILABILITY UNCERTAINTY AT THE TIME OF CONSTRUCTION, ALTERNATE SPECIES MAY BE INCLUDED WITH INSTALLATION OF THE LANDSCAPE. ANY OF THE FOLLOWING SPECIES ARE APPROPRIATE THROUGHOUT VISTAS AT KINGS POINT MASTER PLAN. ALL LANDSCAPE DESIGN AND MATERIALS SHALL COMPLY WITH THE CITY OF AURORA LANDSCAPE.

Landscape Ordinance? Manual?

Revised to Manual

DECIDOUS CANOPY TREES

- FALL FIESTA SUGAR MAPLE
- WESTERN CATALPA
- WESTERN HACKBERRY
- SEEDLESS KENTUCKY COFFEETREE
- IMPERIAL HONEYLOCUST
- SKYLINE HONEYLOCUST
- SIOUXLAND PLAINS COTTONWOOD
- SWAMP WHITE OAK
- BUR OAK
- CHINKAPIN OAK
- TEXAS RED OAK
- ENGLISH OAK
- SCHUMMARD ELM
- PRINCETON ELM
- TRIUMPH ELM

DECIDUOUS ORNAMENTAL TREES

- BIGTOOTH MAPLE
- FLAME AMUR MAPLE
- HOT WINGS MAPLE
- PATTERN PERFECT MAPLE
- COCKSPUR THORNLESS HAWTHORN
- GOLDENRAIN TREE
- PRAIRIE FIRE CRABAPPLE
- ROYAL RAINDROPS CRABAPPLE
- SRING SNOW CRABAPPLE
- SUCKER PUNCH CHOKECHERRY
- SCHUBERT/CANADA RED CHOKECHERRY
- JAPANESE TREE LILAC

EVERGREEN TREES

- PINON PINE
- BOSNIAN PINE
- AUSTRIAN PINE
- PONDEROSA PINE

DECIDOUS SHRUBS

- BAGATELLE JAPANESE
- ROSE GLOW JAPANESE
- BURGUNDY CAROUSEL JAPANESE BARBERRY
- PURPLE BUTTERFLY BUSH
- BLUE MIST SPIREA
- DARK KNIGHT BLUE MIST SPIREA
- TALL BLUE RABBITBRUSH
- RUSSIAN SAGE
- RUSSIAN 'LITTLE SPIRE' SAGE
- CREEPING WESTERN SAND CHERRY
- PURPLE LEAF PLUM
- CHEYENNE MOCKORANGE
- GOLD DROP POTENTILLA
- MCKAY'S WHITE POTENTILLA
- PINK BEAUTY POTENTILLA
- MANGO TANGO POTENTILLA
- DWARF FRAGRANT SUMAC
- SMOOTH SUMAC
- THREE LEAF SUMAC
- CREEPING THREE LEAF SUMAC
- RED LAKE CURRANT
- DOUBLE KNOCK OUT ROSE
- SUNNY KNOCK OUT ROSE
- FIRE MEIDILAND ROSE
- CORAL MEIDILAND ROSE
- FUCHSIA MEIDILAND ROSE
- SILVER BUFFALOBERRY

PERENNIA

- COMMO[illegible]W
- MOONSHINE YARROW
- DOUBLE BUBBLEMINT HYSSOP
- KUDOS GOLD HYSSOP
- SUNSET HYSSOP
- DWARF DOUBLE COREOPSIS
- LIMEROCK RUBY COREOPSIS
- MOONBEAM COREOPSIS
- RED VALERIAN
- PURPLE CONEFLOWER
- ORANGE CONEFLOWER
- TOMATO SOUP CONEFLOWER
- RED WHIRLING BUTTERFLIES
- WHIRLING BUTTERFLIES
- VARIOUS DAYLILY
- BLACK EYED SUSAN
- MAY NIGHT PURPLE SALVIA
- HUMMINGBIRD FLOWER

ORNAMENTAL GRASSES

- BIG BLUESTEM GRASS
- SIDEOATS GRAMA GRASS
- BLUE GRAMA GRASS
- BLOND AMBITION GRAMA GRASS
- FEATHER REED GRASS
- SWITCHGRASS
- LITTLE BLUESTEM GRASS
- GIANT SACATON GRASS

GENERAL NOTES:
Curbside landscaping along all roadways to be planted with a xeriscape approach using a combination of shrubs and grasses at a minimum of 1 shrub/grass every 40 Square Feet. The use of native grass is strongly encouraged. All curbside landscape will have trees, which will be centered within the curbside landscape and spaced 40' on center. Tree species diversity is strongly encouraged.

LOCAL ROADWAYS:
Street trees to be provided by builders.

ARTERIAL AND COLLECTOR BUFFER LANDSCAPE:
All arterial and collector roadways shall have a minimum 20' landscape buffer along its entire length and to be planted at a minimum of 1 Tree + 10 Shrubs ever 40 Linear Feet. Street buffer not required when adjacent to 100' min. depth of open space.

Add a note that sod will not be used. Prohibited by the Non-Functional Turf Ordinance passed in September 2022.

Note Added

Arterial and Collector Buffer Landscape

Local Roadway Landscape

General Characteristics

Building Massing:
Massing should be vertical and play off one of the other proposed styles. Large porches should be incorporated whenever possible.

Roof Form:
Roof form should be predominantly gable with hipped roofs used to accent some areas.

Covered Entries and Porches:
Porches identify the front door and should be substantial and useful. Railings contribute the the style of home.

Columns and Supports:
Columns usually incorporate brackets or corbels.

Windows and Doors:
Windows, usually single hung or grouped together, are typically horizontal in shape and incorporate grids.

Building Projections:
Building projections harmonize with the architectural style of the home, through the use of materials, textures, and colors. Building projections which do not extend to the ground plane are supported by decorative corbels, brackets, or outlookers.

Buildings Details:
Building details should include window trim and grids, shutters, corbels, brackets, gable end vents, and similar elements.

Building Materials:
Building materials include lap siding, stone, or brick.

These do not meet masonry requirement please replace.

image Revised

Note:
1. Architectural design shall comply with all applicable city codes and adopted standards for elevation materials, windows and prominence of garage doors.
2. These plan/elevation are conceptual in nature to demonstrate the architectural styles. Models and details will be provided with master architecture review.

General Characteristics

Multifamily Architecture Design Guidelines will be provided at time of development site application submittal.

The multifamily architectural style should be selected to complement and support the surrounding neighborhood within Parklands.

Elevations of a multi-family building visible from streets or common open space shall display a similar level of quality and architectural detailing. The majority of a building's architectural features and treatments shall be used on these visible elevations.

Menu of Architectural Standards

Individual dwelling units may be differentiated within a building through items required in the UDO for Multi-Family:

Building Orientation and Spacing
- Use of distinct variations in building orientation and spacing.

Roof Form:
- Use of distinct variations in roof form and material

Entries and Porches:
- Four-sided building design
- Facade character elements
- Entry design

Building Materials:
- Use of distinct variations in materials between individual buildings Primary building materials

and masonry standards per the UDO

Building Details:
- Use of distinct color variation between individual buildings

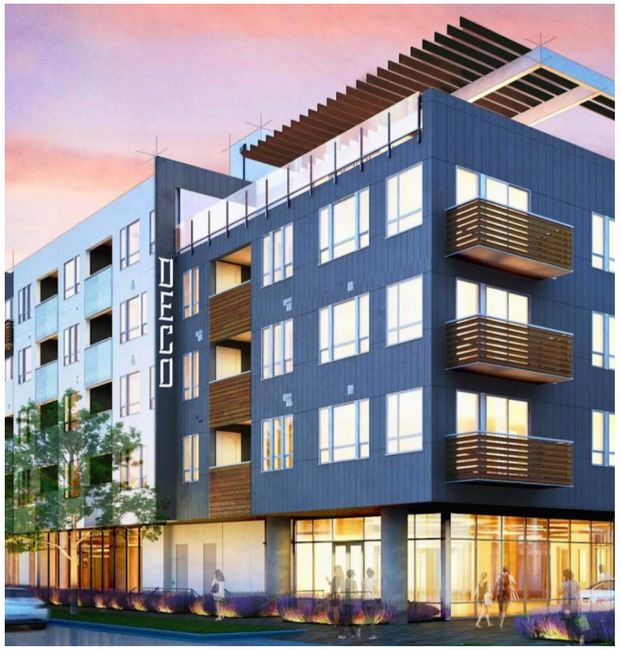
Building Projections:

Variations in Massing and articulation:
- Horizontal articulation
- Vertical articulation
- Maximum building length

Note:
1. Architectural design shall comply with all applicable city codes and adopted standards for elevation materials, windows and prominence of garage doors.
2. These plan/elevation are conceptual in nature to demonstrate the architectural styles. Models and details will be provided with master architecture review.

text Revised

Multifamily elevation designs should also be provided with their local site plan review



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1. Architectural design shall comply with all applicable city codes and adopted standards for elevation materials, windows and prominence of garage doors.
2. These plan/elevation are conceptual in nature to demonstrate the architectural styles. Additional models and details will be provided with master architecture review.

text Revised

Multifamily elevation designs should also be provided with their local site plan review

From:	Layla Rosales
To:	Dillon Cook
Subject:	FW: Vistas at Kings Point Fire Station response
Date:	Monday, July 31, 2023 2:55:58 PM
Attachments:	image002.png image004.png

Layla Rosales, PLA
Principal

Terracina Design
CRAFTING COMMUNITIES FOR A DECADE
10200 E. Girard Ave
Suite A-314
Denver, CO 80231
P : 303-632-8867 ex. 101
M : 720-290-6228

From: Dean, Mike <MDEAN@auroragov.org>
Sent: Wednesday, June 28, 2023 1:39 PM
To: Layla Rosales <lrosales@terracinadesign.com>
Cc: Mike Weiher <mweiher@terracinadesign.com>; Polk, William <wpolk@auroragov.org>; Apodaca, Mark <mapodaca@auroragov.org>; Cox, Jacob <jcox@auroragov.org>
Subject: RE: Vistas at Kings Point Fire Station response

Good Morning Layla,

I wanted to confirm that your request to remove the 3.5-acre permanent fire station land dedication for the Kings Point South has been approved. Please disregard our previous requests on this matter.

Please let me know if there's anything else I can do for you. I'm happy to help!

Best Regards,

Mike Dean

Manager of Fire/Life Safety & Liaison to Aurora Fire Rescue
Public Works | Building Division | City of Aurora
office 303.739.7447 | *mobile* 303.956.6434

Facebook | Twitter | Instagram | Nextdoor | AuroraTV.org

Colorado's only IAS accredited Building Department

From: Layla Rosales <lrosales@terracinadesign.com>
Sent: Tuesday, June 20, 2023 10:17 AM
To: Dean, Mike <MDEAN@auroragov.org>
Cc: Mike Weiher <mweiher@terracinadesign.com>
Subject: Vistas at Kings Point Fire Station response

Mike-

See attached per our conversation last week. Please let me know if you need anything further.

I appreciate your assistance.

Thank you,

Layla Rosales, PLA
Principal

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