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Grandview Reserve Development – Engineering Review #2

Dear Ms. Minter:

We have received the submitted documents listed below on March 17, 2026 , for the proposed Grandview Reserve development located at 1671 Grandview Drive in Alexandria, Kentucky.

1. Geotechnical Engineering Report for the Grandview Reserve Development prepared by Civil Solutions, dated March 5, 2026.
2. Slope Analyis Exhibit (Cross-Sections) prepared by Cardinal Engineering, dated March 11, 2026.
3. Retaining Wall Profile prepared by Cardinal Engineering, dated March 16, 2026.
4. Vegetation Delineation Exhibit (Tree Coverage Plan) prepared by Cardinal Engineering, dated March 11, 2026.
5. Cut and Fill Analyis / Geology Exhibit prepared by Cardinal Engineering, dated March 11, 2026.

As you know, Hillside development control requirements in Alexandria are provided under Article 3, Section 28 of the City's Zoning Code. Article 3.28.B. of the City's Zoning Code provides site conditions where development should be restricted which include:

1. Those properties or areas of land which lie totally or partially within land areas identified in the comprehensive plan for the city, as "physically restrictive development areas";
2. Any other areas which have slopes equal to 20% or greater;
3. Certain soil and bedrock conditions which exhibit characteristics of moderate environmental concern of construction activity such as, but not limited to, exposures of the Kope geological formation
4. Hillsides which support a substantial natural wooded cover; or
5. Land area that has known experience of landslides.

This submission was in response to the Engineering Review #1 letter dated November 17, 2025, where it was indicted that while the previously submitted information indicated that the development is not proposed to be in a Physically Restrictive Development Area within the most recent city comprehensive plan (Criteria 1), that the average slope gradients across the site are less than 20 percent (Criteria 2), and evidence of landslides were not identified during the geotechnical site investigation(Criteria 5). The proposed development achieved two conditions of Article 3.28.B. of the City's Zoning Code (Criteria 3 & 4) that is used to determine if development should be restricted.

We have reviewed the submitted documents and offer the following comments for consideration:

Geotechnical Report:

- The Engineering Review #1 letter indicted that the geotechnical report was to be amended as follows:
  - Reflect the updated survey/lidar information and current proposed site plan.
    - The proposed development plan included in the Geotechnical Engineering Report dated March 5, 2026, appears to be consistent with the exhibits submitted on March 17, 2026 (43 homes/parcels).
  - Update the foundation recommendations if not all structures are to include basements or are anticipated to encounter bedrock.
    - Per Article 3.28.C.2.d of the City's Zoning Code, any building located within the areas defined in division (B) shall be required to have geotechnically and structurally engineered foundations, as evidenced by certifications on the building plans by a registered professional engineer and a registered professional geotechnical engineer.
      - The Geotechnical Engineering Report dated March 5, 2026, provides foundation (spread footings and subsurface retain wall) recommendations. It also indicates that basement excavations will penetrate the bedrock. Bearing in native lean clay or structural fill is also appropriate if the structures do not have basements, or if the basement excavations do not encounter bedrock. Also, If any portion of the basement excavation encounters weathered shale, the remaining excavation should be undercut to also bear in weathered shale.
  - Include an evaluation of the effect on off-site slopes adjacent to the proposed development.
    - The Geotechnical Engineering Report dated March 5, 2026, indicates that off-site slope impacts are most commonly driven by (1) concentrated runoff and outlet erosion, (2) changes in subsurface moisture and seepage, and (3) grading or loading near slope crests/toes. With appropriate setbacks, carefully controlled drainage routing and discharge protection, limited infiltration near steep slopes, and strong construction-phase erosion control and sequencing, the risk of adverse off-site slope effects can be reduced. The report suggests several design and construction controls that are to minimize the likelihood of off-site slope instability or erosion should be reflected in the development site plans.
- The March 5, 2026, geotechnical engineering report supersedes the previously submitted July 24, 2025, report and reflects design evolution, not new subsurface exploration. Test pits, soils, and core geotechnical parameters are unchanged, but retaining wall scope, slope discussion, and clarity around hillside/off-site impacts were refined.

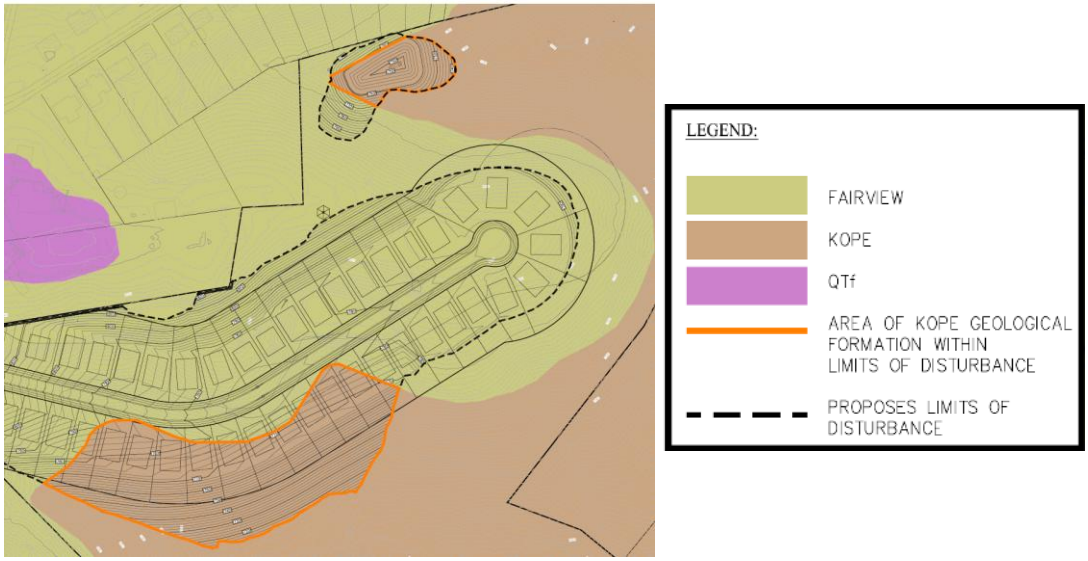
Development Site Plan:

- The Engineering Review #1 letter indicated that the development site plans were to be amended to include the following items:
  - Identification of slopes 18% and greater;

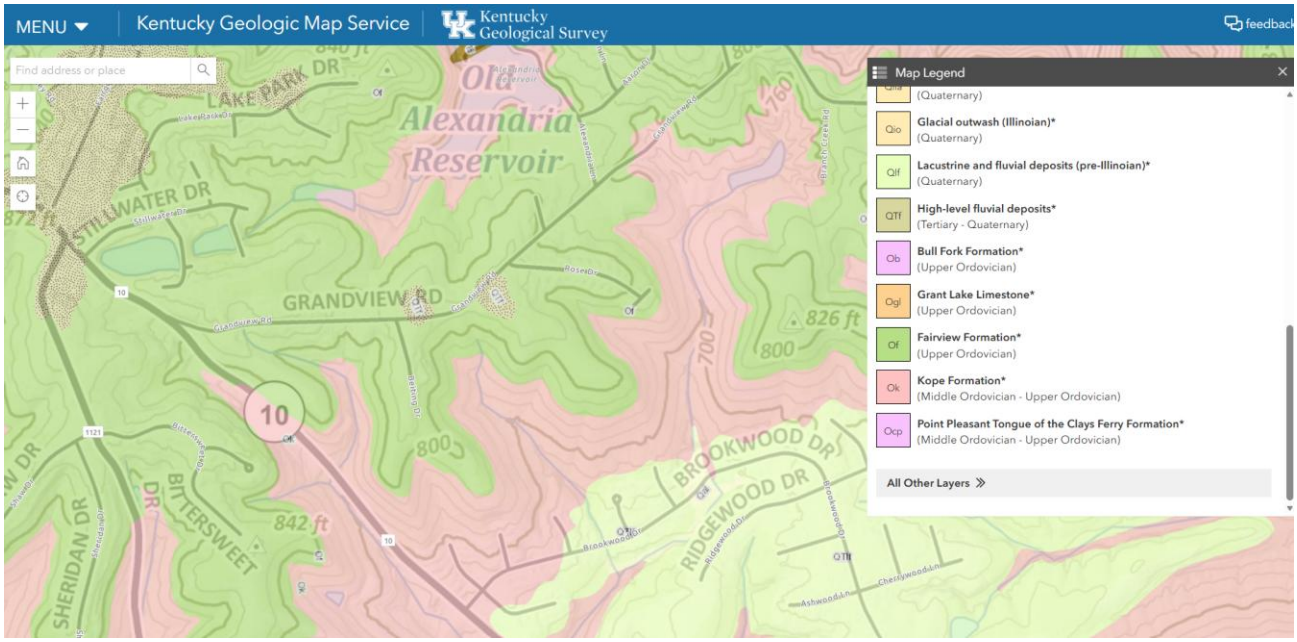
- The Slope Analyis Exhibit show cross-sections that were cut every 20 feet along the alignment of the roadway using the lidar tin surface created from Cardinal Engineering's UAV and delineated all areas ≥18% and ≥20% in accordance with §3.28. Several areas of slopes greater than 18% were identified (27 out of 61 Cross-sections ~41%). Of these 27 cross-sections, only two contain slopes ≥20% (Sections S-S & T-T).
    - Section S-S to Section W-W
    - Section Z-Z to Section J.1 – J.1
    - Section M.1 to Section O.1
    - Section Z.1 to Section B.2
    - Section E.2 to Section I.2

    It was noted by Cardinal Engineering in their March 17, 2026, submission email that the roadway and lot grading have been aligned to avoid or minimize disturbance within these slope bands. Where disturbance of steep slopes is unavoidable, the grading is paired with engineered buttressing (keyways, benches, and controlled engineered fills) specified in the geotechnical report to improve overall stability relative to existing conditions.

- Identify exposures of the Kope geological formation;
    - It was noted by Cardinal Engineering in their March 17, 2026, submission email that According to the Campbell County GIS geologic mapping, the mapped limits of the Kope Formation lie outside the areas where deep cuts or significant excavation are proposed within the residential portion of the development. Based on this mapping and the updated cut and fill analysis, It is not anticipated that any excavation into areas identified as Kope Formation, with the exception of the proposed detention basin. In the detention basin area, the grading design requires only a shallow cut of approximately 3.8 feet, and we believe the overlying soil thickness in this location is sufficient such that exposure of shale bedrock is not expected during typical construction activities. If any isolated shale seams are encountered, standard geotechnical measures will be implemented to ensure they are properly stabilized and not left exposed.



- According to the Kentucky Geological Survey interactive geologic map, The Kope Formation are located within the project site however it appears to follow along the 760' elevation contour, which generally lies outside areas of significant excavation for the housing development.



- Identify the existing wooded vegetation and the proposed clearing/disturbance limits. Include a tree survey that identifies the size and location of the trees to be removed with the development.
  - Existing vegetation and proposed clearing limits are shown on the Vegetation Delineation Exhibit. The majority of the disturbance area consists of saplings and early successional vegetation, with mature tree stands delineated separately for clarity. The exhibit identifies both the limits of disturbance and the specific areas where tree removal is proposed as part of the development.
  - According to LINK-GIS, the project site consists of 31.01 acres (PIDN: 999-99-25-277.00). The Vegetation Delineation Exhibit indicated that the proposed site disturbance area is 11.56 acres (37.3%) and the site contains 10.76 acres (34.7%) of mature tree area and 14.76 acres (47.6%) of sampling/general vegetation cover area. The total area of site disturbance within delineated mature tree area is 0.78 acres (0.57 + .21), which is equates to 7.2% (0.78/10.76). Similarly, the total area of site disturbance within sampling/general vegetation cover area is 6.94 acres (0.14 + 6.80), which is equates to 47.0% (6.94/14.76).
  - Per Article 3.28.C.2.b of the City's Zoning Code, no tree larger than eight inches in diameter, measured 24 inches above the ground, may be destroyed or removed unless specifically approved during the permit process.
    - None of the submitted documents reviewed include a tree survey or identify the size and location of the individual trees to be removed with the development.

- Identify areas of excavation and fill, and estimated number of cubic yards displaced;
  - The Cut Fill Analysis Exhibit outlines all excavation/fill polygons and tabulates earthwork quantities (CY) by phase. A net volume of approximately 4,174 CY of cut (130,021 CY Cut + 125,847 CY Fill) is proposed on the site. In steep slope areas, fills will be constructed on engineered keyways and benches cut into competent materials as defined in the geotechnical report, with bench drains at 50 ft intervals to daylight, and compaction to 98% Standard Proctor in ≤8 inch lifts. These specifications which were noted to be also placed as plan notes meet §3.28's hillside earthwork standards and the geotechnical recommendations.
- Provide a timing schedule and sequence indicating the anticipated starting and completion dates of the development sequence; stripping or clearing; rough grading; construction; final grading; and vegetative establishment and maintenance. The schedule shall also indicate the time of exposure of each area prior to the completion of effective erosion and sediment control measures.
  - It was noted by Cardinal Engineering in their March 17, 2026, submission email that while the appeal affects exact calendar dates, we are providing a sequenced schedule with maximum exposure durations consistent with §3.28 and the geotechnical report. Upon resolution, Cardinal Engineer is to replace placeholders with specific dates before the pre-construction meeting.
    - Phase 1 (Month 0–3): Pre con, perimeter controls, selective clearing/stripping limited to Phase 1 footprint, key utilities, and mass grading for primary roadway and upper pads. Max unstabilized exposure: 14 days; temporary stabilization applied within 7–14 days of inactivity.
    - Phase 2 (Month 3–6): Remaining road grading, bench/keyway construction for fill slopes, retaining wall foundations and first wall segments; temporary seed/mulch at the end of each bench lift.
    - Phase 3 (Month 6–10): Housing pad fine grading (blocks A–C), wall completion, storm conveyances, detention basin excavation and outlet protection.
    - Phase 4 (Month 10–14): Paving, sidewalks, final grading, permanent revegetation/landscaping, and punch list stabilization.

    Target window is start Fall 2026, streets paved by Spring 2027, substantial completion Summer 2027, subject to appeal outcome. Erosion & sediment controls remain until vegetative cover is established and verified.
- Include the specific type(s) of segmental retaining wall proposed at each location.
  - The Retaining Wall Profile and Geotechnical Engineering Report dated March 5, 2026, includes two sections of gravity wall (Redi-Rock) that are proposed across the development to support the proposed excavation and fill placement. Wall #1 extends approximately 310 feet in the east-west direction north of the proposed paved drive. The retaining wall supports the existing grade above the proposed excavation for the building pads (cut wall). Retaining Wall #2 extends approximately 80 feet in the east-

west direction north of the proposed excavation. The retaining wall supports the existing grade at the property boundary.

- Per Article 3.28.C.2.g of the City's Zoning Code, Retaining walls shall be no higher than six feet high above the ground at the base of the wall. Walls may be built in a series of smaller walls to minimize the visual impact of a higher wall; provided that, the series of walls can be built without excessive removal of vegetation during construction.
  - Retaining Wall #1 is proposed to have a maximum height of 5.5'. Retaining Wall #2 is proposed to have a maximum height of 4.9'.

Summary/Considerations:

- As previously noted, Hillside development control requirements in Alexandria are provided under Article 3, Section 28 of the City's Zoning Code. Article 3.28.B. of the City's Zoning Code provides site conditions where development should be restricted which include:
  - Those properties or areas of land which lie totally or partially within land areas identified in the comprehensive plan for the city, as "physically restrictive development areas";
    - The development is not proposed to be in a Physically Restrictive Development Area within the most recent city comprehensive plan.
  - Any other areas which have slopes equal to 20% or greater;
    - Portions of the proposed development are located in areas with existing slopes equal to or greater than 20 percent. Based on the submitted grading plans and supporting geotechnical recommendations, the proposed engineering controls—including controlled grading, benching into competent material, slope geometry limits, retaining wall systems where required, and surface and subsurface drainage measures—are intended to minimize slope instability and long-term stability concerns. With implementation of these measures in accordance with the approved plans and geotechnical recommendations, the proposed development is not anticipated to adversely impact slope stability on-site or adjacent to the project area.

- Certain soil and bedrock conditions which exhibit characteristics of moderate environmental concern of construction activity such as, but not limited to, exposures of the Kope geological formation;
  - The submitted information has addressed potential exposures of the Kope Formation.
- Hillsides which support a substantial natural wooded cover; or
  - The submitted information supports a substantial natural wooded cover with only 0.78 acres (7.2%) of site disturbance being located within delineated mature tree area.
- Land area that has known experience of landslides.
  - The Geotechnical Engineering Report dated March 5, 2026, indicated that Hillside slippage and evidence of landslides were not identified during the site investigation. It should also be noted that according to the Kentucky Geological Survey interactive geologic map, there were no landside areas located on the project site.

- A tree survey shall be provided identifying all existing trees greater than eight inches DBH located within the limits of disturbance and within 15 feet of proposed grading, utilities, or construction activities. The survey shall identify species, size (DBH), condition, and clearly distinguish trees proposed to remain versus trees proposed for removal and provide for the appropriate protection measures. The tree survey shall be prepared by a qualified professional and incorporated into the site plan set. No land disturbance permits shall be approved until the tree survey has been reviewed and accepted.
- The natural and constructed drainage patterns within this subdivision are integral to the proper functioning of stormwater management facilities and protection of adjacent properties. A Grading and Drainage Restriction Covenant similar the below draft shall be recorded.

  No Lot owner shall perform, permit, or cause any significant grading, filling, excavation, re-contouring, or other alteration of existing ground elevations, nor modify surface or subsurface drainage patterns, stormwater conveyance features, swales, ditches, or drainage structures on any Lot, without prior written review and approval.

  Any proposed activity that may reasonably be expected to alter runoff characteristics, flow direction, discharge location, drainage capacity, or impact adjacent properties or public infrastructure shall require submission of plans prepared and sealed by a Professional Engineer licensed in the State of Kentucky, demonstrating that the proposed work will not create adverse drainage, erosion, or flooding impacts.

  Such plans shall be subject to review and approval by [the Subdivision's Reviewing Authority / Homeowners' Association / City Engineer] prior to commencement of work.

  Unauthorized grading or drainage modifications shall constitute a violation of this Covenant and may be subject to enforcement actions, including restoration to original conditions at the Lot owner's expense.
- Based on review of the submitted plans, reports, and supporting geotechnical information, the proposed development has been evaluated for potential impacts to adjacent public and private property. Provided that the recommended procedures are followed and the proposed

engineering controls are designed, installed, and maintained in accordance with the approved plans and geotechnical recommendations, there is no apparent danger to adjacent public or private property associated with the proposed development.

Please note that the review comments provided are based exclusively on the specific documents and plan sheets submitted at this time. This review does not include verification of the overall site plan, coordination with other site elements, or compliance of unsubmitted or unreviewed components. The applicant is responsible for updating the site plan to address all review comments and for ensuring full consistency across all plan sheets and documents. The Development is to comply with all requirements of the City of Alexandria's Zoning Regulations and the City of Alexandria's Subdivision Regulations, unless approved otherwise. The items contained herein should not be consider final or all-inclusive and are subject to change pending review of subsequent submittals. If you have any questions about the above listed comments feel free to reach out to me. My contact Information is shown below.

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