

June 8, 2023

Kirk Hawley, PE
AES Consulting Engineers
4120 Cox Road, Suite D
Glen Allen, VA 23060

RE: Lakefield Mews Phase IV
LOCATION: 4431 Lakefield Mews Drive
FILE NO: POD2023-00076

Dear Mr. Hawley:

The Department of Public Utilities has completed a review of the water and sewer plans that are part of the plan of development submitted to the Planning Department on May 15, 2023.

□ DPU recommends approval of these plans by the **Director of Planning**.

Please address the following comments before submitting the construction plans for signature.

General

1. Owner to submit executed Utility Agreements prior to approval of building permits or prior to the utility pre-construction meeting and authorization to proceed with utility construction by DPU. Agreements have not been executed at this time. Agreements must be executed prior to the authorization to begin utility construction or approval of building permits. An Information Sheet for the Preparation of Utility Agreements has not been submitted for review. If the Information Sheet is incomplete when submitted, we will send you comments for correction and resubmittal. If the required Information Sheet is complete when submitted, an Agreement will be forwarded to the Owner for signature within 21 days.
2. Per Rezoning case REZ2020-00024, provide an analysis of the downstream sewer system to determine if upgrades to the sewer are needed. The assessment must extend to where the downstream sewer connects to the 48" trunk sewer. Please contact either Keith Kramer or Ethan Anderson of our planning and modeling section if you have any questions.
3. Perform a corrosive soil study by taking soil samples along the proposed utility main alignment areas in accordance with Henrico DPU Standard 4.2.02G. Provide protection of mains and appurtenances against aggressive soils in accordance with DIPRA recommendations and the ductile iron pipe manufacturer recommendations.
4. Provide an exception request to the Director of Public Utilities for where hydrants are less than 50 feet from buildings and include the justification for the exception.
5. Complete and resubmit Engineering Report along with a completed Project Summary Report (form F-10). Please note that page 2 of form F-1 was not provided for the Engineering Report.
6. Any sewer that is designed for greater than 40,000 gpd average will require a certificate to construct (CTC) from DEQ. DPU will provide a flow acceptance letter for this process upon finalization of the sewer design.

C1.0 Existing Conditions Plan

7. Show the following for existing utilities:
 - Label all utility mains with size, material, and type (water or sewer).
 - There is a missing lateral to the left of existing manhole 079NW021 per GIS information.
 - There are two missing laterals on the run of sewer from manholes 079NW027 to 079NW029 per GIS information.
 - Show all existing water services and sewer laterals within Lakefield Drive as it appears that there are several missing when compared to county GIS utility information.
 - Provide GIS ID numbers for existing manholes and fire hydrants.
 - Clearly show the water main in Lakefield Drive (with extended stub to the west) and Gay Avenue.

- Show the abandoned sewer main that crosses through the Northeast of this project. Add a note on the demolition plan that abandoned sewer and manhole are to be removed as necessary for the installation of new construction and to a point outside of any utility easement.

C1.1 Demolition Plan

8. See previous comment on existing utilities information and labeling.
9. Provide the following for sanitary sewer relocation/replacement between buildings 12 and 13:
 - Provide sequence of construction for sanitary sewer relocation or replacement.
 - Provide a note stating the removal of sewer pipe from 079NW027 to 079NW029 will not occur until the new sewer pipe (MH10 to MH11) is installed and under DPU tentative acceptance.
 - Submit temporary sanitary sewer bypass plan. The contractor shall prepare a specified detailed description of the proposed pumping system.
 - Dimension the distance from the nearest existing manhole to the new manhole on each side of the relocation, on the plans. The same would apply for replacement of a line with distances and stationing shown on the plan.
 - Show existing sewer line that flows into this development, as well as other nearby sewer line that might be considered for the pump around of existing flows. Label remaining existing sewer line size and material.
 - Specify the approximate calculated existing sewer flow that needs to be pumped around.
10. Edit Note #1 to include both DPU standards 1.4.01C and 10.3.10.
11. Edit the call out of water service removals to only remove meter boxes as there are no active water meters along Lakefield Drive.
12. Add another note specifying the amount of sanitary sewer to be removed and replaced upstream of manhole 079NW029 as well to match the plan view.
13. Add the note: Contractor shall notify DPU Inspector of abandonment schedule so that work can be verified.
14. Label all laterals and services that are to be abandoned with an "X". Some were not labeled.

C3.0 Layout

15. The number of units listed for some buildings appears to be low and inconsistent with the details shown. Please review and coordinate with the meter sizing calculations on sheet C3.9.

C3.1 Utility Plan

16. Confirm whether Lakefield Drive will remain a public right of way or be converted to a private road. If the latter, then utility easements shall be provided for all DPU public utilities.
17. Sanitary sewer can be designated as private where not serving any offsite properties and not within public right of way. Therefore, sewer from existing manhole 4 to manhole 1, manholes 5 to 4, and manholes 11 to 7A can be designated as private. However, these facilities shall still be designed in accordance with DPU Standards.
18. The existing dead end run of sewer upstream of manhole 11 within Lakefield Drive is to be replaced given the large number of existing laterals that are to be abandoned as well as new laterals and manholes that will need to be installed at locations which conflict with the existing lateral connections. This will also allow for the sewer to be relayed at a lower slope so that more separation can be provided between upstream storm sewer and sanitary sewer crossing above manhole 9. In addition, this will beneficially allow a standard precast structure for manhole 9, instead of a doghouse structure, and allow for abandonment/removal of the remainder of existing sewer upstream of manhole 9 location that is not needed.
19. Provide sewer calculations for projected flow thru onsite sewer from EX 6 down to EX 4 to confirm adequate capacity.
20. The small waterline loop around buildings 3, 4, and 5 can be omitted if hydrant, fire line, and water service connections can be made to the other water main.
21. Provide a water meter for each individual apartment building. Connection fees will be based on the number of apartment units and not the meters to the apartments.
22. A note on the plan states that backflow preventers are located inside buildings. Please clarify whether these are for the domestic service or fire line or both. Point out the location of backflow preventers and reduced pressure detector assemblies with size and reference to the appropriate detail. A backflow preventer for the

domestic service would not be required in this case. The backflow preventer for each fire line is a reduced pressure detector assembly (a backflow preventer with a parallel detector meter) that is required to be installed per D-435. Please show the exact location within each building and specify the size along with a reference to D-435.

23. Provide backflow prevention for the water supply line to the pool. An RPZ must be provided on the feed line to the chemical treatment system that will protect the other domestic users.
24. The installation of appurtenances shown for each fire line is not clear in its representation on the plan. Please note that the FDC connection must be after the reduced pressure detector assembly (RPDA) and cannot be on the line going into the building with the internal RPDA. Also, is a PIV really needed on these lines? In addition, given the internal RPDA each building should have its own fire line.
25. The sewer relocation shown between buildings 12 and 13 is too close to the building 12. Provide at least 10 feet separation from the pipe OD to the building footing as well as any other features that might extend outward such as the roof, decks, awnings, etc. A 20-foot utility easement is to be provided and centered on the sewer main at a minimum. In addition, the laterals to buildings 12 and 13 are to connect to sewer within the street given the tight space between the buildings.
26. Per preliminary plan comment letter dated June 1, 2021, access to sanitary sewer shall be provided to 3200 Gay Avenue (GPIN 810-717-4213) via standard utility easement near the northeast corner of this property which is the topographic low point area. In addition, a manhole must be provided on the main at the point of tie-in that lines up with the centerline of the easement.
27. Provide 8" waterline to the end along the front of building 6 as this is the minimum size required for fire protection to multifamily residences.
28. Provide the following:
 - See previous comments on existing utilities information and labeling.
 - Provide benchmarks consistent with DPU Spec. 5.5 L. Add a note stating that contractor shall reestablish benchmarks if temporary and can be disturbed.
 - County monumentation referenced for site survey.
 - Minimum of 3 GIS northing/easting reference points.
 - Reference to county water and sewer books as: CWB/CSB 79NW
29. Provide the following notes:
 - Connections to existing manholes without stubs or bricked-up openings shall be the equal of either Kor-N-Seal w/stainless steel expander ring or Press-Seal w/nylon expander sleeve installed by core drilling manhole and in strict accordance with manufacturer's specifications.
 - Where possible in unpaved areas, manhole castings shall be approximately 12 inches above final grade using appropriate covers (i.e. – vandal proof/watertight).
 - Contractor/Inspector to refer to the demolition plan sheet for abandonment or removal of any existing water and sewer utilities.
30. Update the material quantities list in accordance with all comments and per the following:
 - Separate between public and private owned utilities.
31. Provide a minimum of 10 feet of horizontal separation between the sanitary sewer mains and storm sewer structures. See proposed 48" storm sewer versus existing sanitary sewer from manholes EX3-EX4.
32. Provide a minimum of 5-6 feet of horizontal separation between storm sewer and waterline.
33. Revise all tees connecting to the existing watermain to be called out as tapping sleeve and valves.
34. Label the correct size of service line or water line stub to each water service per D-520 and D-530. For example, the size of the corporation stops, and service line should be one size larger than the water meter for 5/8" and 1" meters per D-520. Also, service connection piping for 1 1/2" and 2" meters will be based on service line length per D-530.
35. For the portion of fire line that DPU will own up to the boundary valve, all fire lines are to be at least 4" in size with an 8"x4" tee and 4" valve at the main and a 4" boundary valve at the easement boundary. Revise plan and profiles accordingly.
36. For fire protection call outs, provide the following:
 - Label all appurtenances (e.g., 8"x6" tee and 6" G.V and include them in the materials list).
 - Show hydrant valves at the tee rather than at the hydrant. Hydrants, valves, and valve boxes must be located outside of curb and gutter and sidewalks.

- Reference detail D-495 for fire hydrants.
 - Reference detail D-476 for boundary valves.
 - FDC lines require a reduced pressure detector assembly. Show and call out with appropriate detail.
37. Provide at least 5' of separation between water service, fire hydrant, and FDC lines.
38. Adjust easements around fire hydrants to have at least 8' of clearance all around. Additionally, include the sewer mains in the utility easement with the water mains.
39. Provide additional utility easement for existing water and sewer mains so that there is 20-foot easement width.
40. Move the FH assembly that is to the left of Bldg 6 to be at the end of this line with a plug.
41. Revise the northern connection to the existing 8" water main in Lakefield Dr. to connect to the existing water stub in this area.
42. Call out distance from front or back of curb to waterline.
43. Call out the bend in the waterline below MH1.
44. Coordinate the lead lines for appurtenances serving Bldgs 3, 7, and 8. It appears that the labels were switched.
45. Call out all vertical waterline adjustment locations.
46. Provide the following for sanitary laterals:
- Specify lateral pipe materials. Any laterals connecting to a DI sewer main will also need to be DI.
 - Laterals installed at 2.08% minimum slope up to utility easement boundary.
 - Specify cast iron compression type tapping saddle for lateral connections to existing sewer main.
47. Show bearings on all sewer mains. Additionally, show the flow direction from MH10-11 and internal angles at each of these manholes as well as manholes ex2 and ex6.
48. Label manholes 9 as a doghouse manhole and dimension the distance from the manhole to the nearest existing manhole. Provide field verified invert elevations at the adjacent upstream and downstream manholes on which to base the designed invert to allow for a 0.1-foot drop across manholes.
49. Label monitoring MH7A and MH7 to have a vandal proof/watertight frame and cover with reference to detail D-160.
50. Sanitary sewer run from MH7A to MH8 and MH7 to EX4 will need to be DI.
51. Locate laterals for buildings 9 and 10 toward the back closer to MH7 so that there is adequate room for maintenance and repairs without impacting building foundations.
52. Label monitoring manhole 7A as per D-125. In addition, specify the lateral slope entering monitoring manhole 7A. This needs to be 2-5% for adequate flow sampling velocity.

C3.2& C3.2A Utility Profiles

53. Update profiles in accordance with all comments.
54. Provide typical cover depth call out throughout profiles for water main at 3.5 feet minimum. Sewer mains within roads that are less than 5.5 feet of cover shall be DIP with all other sewer main having at least 3.5 feet of cover minimum.
55. For all sanitary sewer profiles, provide separate sewer stationing starting at the most downstream connection and proceeding upgradient with equalities at each junction manhole. Minimize stationing changes by using the longest chain of sewerline runs in the same stationing sequence. Locate sewer stationing away from road stationing to provide clarity.
56. Provide profiles for sewer laterals where crossing waterlines and storm sewers and verify adequate separation.
57. Regarding STR#8-STR#9 profile:
- Include the lateral entering monitoring manhole 7A and provide a slope of 2-5% as previously commented.
 - If possible, lower the sanitary run to give at least 12" of separation from the storm crossing near STA11+60. Relaying sewer from manholes 11 to 9 at a lower slope will allow for this.
58. Regarding EX STR#1-EX STR#4:
- Provide at least 0.1' drop across all manholes proposed and existing with the sewer modifications.
 - Provide field verified inverts for existing sewer manholes. Review whether there is zero amount of invert elevation drop at manhole ex3.
59. Regarding STR#1-EX STR #4:

- Coordinate pipe material of MH1-MH2 with what is shown on the plan view. This needs to be DIP.
 - Show all water pipe crossings (e.g., hydrants, fire lines, 4" domestic lines).
60. Regarding STR#4-STR#5:
- Show waterline as DIP where crossing under sanitary sewer as this is a vertical adjustment.
61. Revise the title on profile "STR #EX8 – STR#11" to "STR #EX6 – STR#11". In addition, provide the following:
- Design for at least 0.1' drop across manhole 10.
62. Regarding Waterline STA9+50 to 18+00 profile:
- Coordinate the bend near STA10+60 to match plan view.
 - Revise the call out near STA11+40 to be a gate valve.
 - Switch the callouts near STA17+30 to match plan view.
 - Revise callouts for tees near STA10+10 to match plan view.
63. Regarding Waterline STA49+75 to 52+00 profile:
- This profile will be deleted per plan view comment.
64. Regarding Waterline STA29+50 to 37+00 profile:
- Revise the call out near STA35+75 to be a 8"x6" tee for a fire hydrant assembly.
 - The vertical waterline adjustment near STA 32+85 appears to be unnecessary if there is at least 6 inches of clearance from the top of the storm pipe.

C3.3 Water model

65. Label all pipes on the map.
66. Model results must show pressures for ISO fire flow and how the fire flow is divided up between multiple hydrants.
67. Provide the "C" value used for the model. This should be a global value of 120.

C3.6 Utility Details

68. Provide the following details and notes from the 2014 DPU Standards and details:
- watertight/vandalproof manhole frame and cover detail (D-160 non traffic rated).
 - Waterline vertical realignment (D-485)
 - Monitoring manhole (D-125)
 - Water service installation for 1 ½ "and 2" meters (D-530)
 - 1 ½ "and 2" meter setting with corp. stop (D-534)
 - Backflow preventer with domestic meter – RPZ outside/in building (D-400/D-405)
 - Electronic marker Placement details D-740 and D-750.
 - Add the following note: "Electronic markers (ball type) shall be installed on all water mains and sewer gravity mains in accordance with specification 2.2.05N and 4.2.02E of the 2014 DPU Design and Construction Standards."

C3.7-C3.9 Utility Details

69. The following regard the ISO fire flow estimate forms:
- Use current ISO exposure values per the June 2014 Guide for Determination of Needed Fire Flow. Only the worst single exposure is required.
 - Where required flow exceeds 1000 gpm, show that 2 fire hydrants are required at the bottom of the form.
 - Per June 2014 guidelines, only exposures within 40 feet are to be counted.
 - Are there any rated fire division walls or building separation walls within each apartment building? This will impact the total area assumed for the calculation.
70. The following regard the meter sizing forms:
- Revise applicable forms to show 1 meter per building in accordance with previous comment.
 - Review number of apartment units shown per building versus the fixtures shown as there is not a consistent correlation for some of the forms where a particular fixture is listed versus the number of apartment units.

C4.2-C4.3 Storm Profiles

71. Show all sewer main, water main and sewer lateral crossings within storm profiles.

L1.0 Conceptual Landscape Plan

72. Show all easements.
73. Note that tree plantings must be located outside of all utility easements or at least 10 feet away from utilities within right of ways. All other proposed landscaping must not obscure visibility or hinder maintenance of above grade or at grade utilities.
74. Any non-tree landscaping within utility easements requires the following statement on the landscaping plan: The owner is responsible for replacement of any planting (i.e., shrubs, etc.) damaged or removed by DPU, or it's agent, as required for maintenance of county owned water and/or sewer facilities.

If you have any questions concerning the above noted comments or the plans, please contact me at 501-4501 or Kiara Korkuc at 501-4993 for any necessary clarifications.

Sincerely,

John L. Clark

John L. Clark PE
Utilities Engineer

cc: Ben Simon – Lakefield Mews IV

bc: Marchelle Sossong
Daniel Ivy
Kiara Korkuc
Spencer Norman, Planning

JLC/vr