MERRICK®
2480 W. 26th Avenue, Unit B225
Denver, Colorado 80211
Tel: +1 303-964-3333
Fax: +1 303-964-3355
www.merrick.com

March 3, 2022

Russell Pennington, P.E., Public Works Director
Town of Fraser
P.O. Box 370
153 Fraser Avenue
Fraser, Colorado 80442

RE: ELK CREEK PA 4W.1 DRAINAGE REVIEW

Dear Mr. Pennington:

We have reviewed the Elk Creek PA 4W.1submittal received February 2, 2022. The submittal included the Construction Plans for Condos at Elk Creek – PA 4W.1, dated January 28, 2022 by Terracina Design. We did not receive a drainage report, but some calculations and drainage maps were provided in the construction plans. We have the following comments to offer related to the drainage improvements.

Construction Plans

1. On all sheets where shown, update the 100-year floodplain limits to match the currently effective limits as defined by the Letter of Map Revision (LOMR) made effective on March 26, 2010. The limits appear to be close to the 2010 limits, except for in a few locations such as where the drainage and utility easements cross the creek (near Section C in the LOMR).
2. Looking at Google Earth, there is an existing dirt access road across Elk Creek from this site to Elk Ranch Road. We recommend removing this access road when the site is developed and restoring the vegetation and Elk Creek channel.
3. Sheets 6, 7, and 8, Utility Plans, show proposed storm sewers. Label the pipe sizes and provide plan and profiles sheets that detail the storm sewers.
4. On Sheet 9, Overall Grading Plan, a berm is proposed along the southern and western sides of the site to create a swale. Regrade the top of berm to be at least 3’ wide instead of 0’ wide.
5. On Sheet 9, Overall Grading Plan, grading for Water Quality Pond A and the berm along the southern and western sides of the site is shown outside of the Overall Project Boundary in several locations. Modify the grading to maintain the pond limits and berm to be within this boundary.
6. On Sheet 10, the temporary sediment pond for runoff from John’s Drive must also be designed to reduce peak runoffs to historic rates per criteria since it is not known how long this temporary condition will exist. Provide details for this pond.
7. On Sheet 10, a swale is proposed at the outfall of the storm sewer system that is located within the floodplain. The swale is oriented perpendicular to flood flows which would create a “dip” in the grades and a high potential for erosion in the swale and adjacent utility easement. The outfall must be extended to the edge of Elk Creek to minimize the grading disturbance.

8. On Sheet 11, the grading for Water Quality Ponds A and B is showing the bottoms to be flat. Regrade these ponds to account for trickle channels, sloping bottoms, and a minimum 4-inch depth from the trickle channel invert to the micropool elevation.
9. On Sheet 11, for Water Quality Pond B, clarify where the emergency overflow will be located and which way the overflows will be directed.
10. Provide detailed grading plans and outlet structure details for both water quality ponds.
11. Provide typical sections for all swales.
12. Verify that all buildings will have at least 1-foot of freeboard above the Elk Creek base flood elevations (BFEs).
13. On Sheets 12 and 13, Erosion Control Plans, provide a legend to define the erosion control symbols.

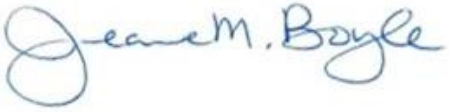
Calculations and Drainage Maps

14. Sheets 14 to 17 include a basic drainage design explanation, soils information, runoff calculations, existing and developed drainage maps, and select excerpts from previous studies and plans. This information is typically provided in a drainage report as required by Town criteria. Provide a complete drainage report, including all required calculations per the comments below, unless a variance is approved by the Town of Fraser.
15. On Sheet 14, Basins OS-1, OS-2, and OS-3 are referred to. Show these basins on the Developed Drainage Map (Sheet 16) since they could not be found on the excerpts provided.
16. Provide the following sizing calculations:
    a. All swales
    b. MHFD pond design spreadsheets referred to on Sheet 14 that size the water quality capture volume and outlet sizing.
    c. All required pond sizing calculations including for forebays, micropools, spillways, and outlet pipes.
    d. Sediment basin
    e. Riprap protection for spillways and storm pipe outfalls.
    f. Storm pipe and inlet sizing, including hydraulic grade line (HGL) calculations
    g. Provide documentation or calculations for the design flow for the 30” bypass pipe.
17. On Sheet 16, Developed Drainage Map, show the existing 30” bypass storm pipe from Old Victory Road and the existing Pond 3 outfall pipe. Note that these pipes and ponds do not appear to be existing per Google Earth. We suggest labeling them as “future by others”.
18. On Sheet 16, Developed Drainage Map, label Pond 3 and Pond 4.
19. On Sheet 16, Developed Drainage Map, Basin A1 includes area at the north end of the site that is shown draining to the north, instead of to Design Point A1 and Water Quality Pond A. If this area will not drain to Design Point A1, do not include it in Basin A1 since it affects the runoff calculations and percent imperviousness. It this area will be regraded to drain to Design Point A1, show the proposed grading and account for the land use in the percent imperviousness calculations which appears to be a proposed parking lot.

20. On Sheet 16, Developed Drainage Map, Basin C1 is showing a portion of the proposed site draining to Pond 4 for Elk Creek Condos at Grand Park located east of this site. This detention pond was not sized for runoff from this development. Therefore, runoff from this development must be routed to the proposed swale and Water Quality Pond A or Pond 4 must be resized to account for this additional runoff.

Please let us know if you have any questions.

Sincerely,
MERRICK & COMPANY



Jeanne M. Boyle, P.E., CFM