

July 6th, 2018

JN: 18007

Catherine E. Trotter, AICP
Town Planner, Town of Fraser
153 Fraser Avenue, P.O. Box 370
Fraser, CO 80442

**Re: TKE Response to 5/4 Bowman Review Letter
GRAND PARK MEADOWS**

Dear Catherine/Tim:

General

1. A geotechnical investigation specific to this property needs to be completed, as required in Section 14-2-20 of the Town Design Standards.
TKE: The geotechnical investigation is currently being obtained and will be submitted as soon as it is completed.
2. An Engineer's Opinion of Probable Cost needs to be completed.
TKE: Cost Estimate is now included.
A Signage & Striping Plan needs to be submitted.
TKE: A Signage and Striping sheet is now included in the construction set.
3. A Lighting Plan needs to be submitted.
TKE: Lighting plan is included on the Signage and Striping sheet.
4. An updated Traffic Study needs to be completed with updated proposed units.
TKE: A traffic study will be provided by owner.
5. A CDOT access permit will be required at the US40 proposed intersection and must be provided to the Town prior to recording the final plat.
TKE: Owner will provide the required CDOT access permit.
6. The proposed dead-end water main is almost 2,000' which far exceeds the maximum allowable dead-end line of 500'. Further justification of this design variance is required.
TKE: An Automatic Flushing Valve will be installed at the end of the dead-end water main.
7. The plans should be signed/stamped by a Colorado Licensed Engineer.
TKE: The plans are now signed/stamped by a Colorado Licensed Engineer
8. It's unclear what is being proposed for parking at the townhome units. Please clarify.
TKE: Each townhome unit will have a 2-car garage. Also interior units will have one additional driveway parking space, and end units will have two driveway spaces.
9. The Town water model will be updated to incorporate this new development and determine if any deficiencies are identified in the existing and proposed system. This analysis will be completed by the Town Engineer with fees passed onto Applicant.
TKE: Files have been provided for this analysis.
10. Additional investigation into the impacts this development will have on the Town's existing sanitary system will need to be explored prior to final plat approval.
TKE: Files have been provided for this analysis.

Final Plat

1. Tract descriptions should be provided on the plat, it seems that tract D and tract G are intended as drainage easements.
TKE: (Terracina)
2. Tract labels should agree with the construction plans, there is a discrepancy in labeling.

TKE: (Terracina)

3. Trail easement for Fraser Trail should be indicated on the Plat.

TKE: (Terracina)

4. Easements to the on-site monitoring well heads shall be provided, if they are to be owned by the Town.

TKE: (Terracina)

Final Planned Development Plan

1. Sheet 3 of 7: The planning area data chart dwelling units per acre seem to be incorrect.

TKE: (Terracina)

2. Sheet 3 of 7: The snow storage areas cannot be located on the sidewalks or proposed driveways. Please revise with functional snow storage locations and area.

TKE: (Terracina)

Preliminary Construction Plans

1. Sheet 2 of 21: Clarify why standard water note 1a was deleted.

TKE: Strikethrough has been removed.

2. Sheet 5 of 21: Previous drainage studies utilized for this study should be included in the References list.

TKE: There are many drainage reports for this area that conflict each other, and caused major litigation, that your previous firm was a part of. We don't want to rehash old arguments. Please review this report as a standalone report.

3. Sheet 6 & 7 of 21: The proposed sidewalk should tie into the existing asphalt path at both ends of the project.

TKE: Sidewalks now tie in at both connections to the project.

4. Sheet 7 of 21: Update tract labels.

TKE: Labels have been updated.

5. Sheet 7 of 21: Add more design detail to proposed acceleration and deceleration lanes.

TKE: Acceleration and deceleration lanes are being designed by Felsburg Holt & Ullevig and will be incorporated into this plan set when completed.

6. Sheet 8 of 21: There is a building outline missing.

TKE: All townhomes are now shown on plans.

7. Sheet 9 of 13: Indicate location of water valve for fire hydrant near Sta 19+50.

TKE: All proposed water valves are now shown on plans, location of all valves on the water main are labeled.

8. Sheet 10 of 21: The pond in tract B does not seem to have any drainage going to the pond.

TKE: Drainage is now modified to be handled by a single pond.

9. Sheet 13 of 21: Confirm radius of curb returns meet Sec 14-3-70(2) .

TKE: All curb returns are 25' or 30' radius. Town standards require 25' min curb radius on intersections involving an arterial and/or a collector and 30' on cul-de-sacs and turnarounds for streets.

10. Sheet 14 of 21: The proposed automatic flushing valve shall be detailed, including: valves, freeze protection, outlet location, metering of water use, power, access, etc.

TKE: Detail is now provided.

11. Sheet 15 of 21: Ensure MH rims are not installed in the concrete gutters.

TKE: There are no rims in any concrete gutters.

12. Sheet 15 of 21: Indicate 1.5' of vertical separation at water and sewer main crossing near Sta 0+95.

TKE: Label added to plan/profile sheet.

13. Sheet 15 of 21: Profiles shall indicate design cover over pipe and insulation if cover is substandard.

TKE: Pipe insulation is now labeled on plan/profile sheet.

14. Sheet 17 of 21: Confirm that culverts meet the 1% minimum slope and the spacing between the pipes equal ½ the diameter.

TKE: All culverts are minimum 1.0% and there are no double pipes required.

15. Sheet 17 of 21: Add note that existing monitoring wellheads to be protected during construction.

TKE: Please see the attached plans.

16. Sheet 19 of 21: Typical road section should show 10' utility easements on both sides of road, as indicated in the Plat.

TKE: Easement is now shown on both sides on the typical road section.

Drainage

1. The drainage map should include contours for the entire proposed site.

TKE: Please review the drawings provided.

2. Add existing culverts information (including bike trail and highway culverts) including size, slope and capacity to the final drainage calculations.

TKE: This information was added to the drainage report.

3. The culvert designs need to be finalized including: hydraulic calculations (where necessary), size, material (RCP is required in roads), grades, cover, inverts, etc.

TKE: Please see Sheet 5 for the culvert calculations.

4. More detailed information is needed for the ponds including: cross-section and proposed material layers, outlet structure design, berm and overflow weir cross-sections, dimensions and/or horizontal control, etc.

TKE: Please refer to the pond construction plan.

5. Address potential issues with groundwater elevations and performance of sand filter basins.

TKE: Please see the attached percolation tests. This ground is native sand and gravel that readily accepts water. Per UDFCD, we have filter fabric between the sand filter and the native ground. Sand Filter Maintenance program is on Sheet 5.

6. Percolation tests will be required for the design engineer to confirm that sand filter basins are a viable water quality treatment option for this site.

TKE: Percolation tests have been conducted and results are included with this submittal.

7. The design engineer shall recommend inspection, maintenance and filter replacement schedule to ensure that the proposed sand filter basins continue to perform as designed.

TKE: Maintenance and inspection notes are now included on sheet 5.

8. It appears this development is in the path of the existing pond overflow pathways. The location of existing pond overflows needs to be indicated on the plans and downstream infrastructure shall be designed to ensure that pond overflow locations are controlled and not allowed to impact downstream infrastructure (particular attention should be paid to pond overflow near Sta 18+00 – 19+00) .

TKE: The proposed pond overflow path has been modified to use the existing structure with the downstream swale relocated through the meadow rather than along US40. The reality is that all of these ponds have multiple inflow and outlet capabilities that are actively managed by the developer. The multitude of combinations of flow direction and redirection cannot be present in a simple drainage study. The ability to change flows and redirect stormwater as required is an integral part of this system.

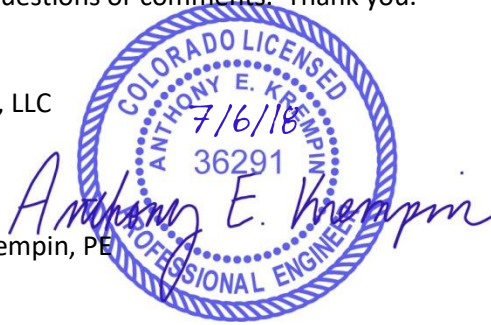
9. There are two distinct drainage systems that convey flows from the upstream drainage basins flowing through (and adjacent to) the development and it appears that the proposed grading plan is potentially re-directing these flows. It's not clear in the current study the quantity of stormwater runoff being conveyed to these systems. This needs to be clarified.

TKE: Drainage concept has been revised to keep existing pond & meadow drainage within the meadow and flows along US40 to remain separate along US40.

10. Proposed drainage channel (including cross-pan at Sta 2+95) and culvert capacity calculations shall be provided.
TKE: Calculations are now included.
11. It appears that a culvert should be installed at the intersection of Road A and Old Victory Road. Please clarify.
TKE: A culvert is now added at this intersection.
12. Additional information should be included to further explain the statement that “reserve capacity is available” for stormwater detention in the existing ponds, including explanation of how water levels in the ponds will be controlled to maintain additional volume for detention.
TKE: The large surface areas of the ponds and the nature of the outlet structures acting as weirs allows for unaccounted stormwater detention as the storm level rises in the ponds. The pond water surface elevation is controlled by the outlet structures and is constantly changed pending irrigation and wetlands mitigation requirements. Since we have a direct path to the river, detention is not an important feature of these feature ponds. There is also a secondary water quality treatment ability of the natural grassy swales and stormwater retention in the feature ponds themselves.
13. Design flows at design point JB should combine the surface runoff from upstream basins and the flows from the adjacent pond(s) overtopping.
TKE: See response #8. The ponds will be actively managed by on-site staff. The reality of irrigation diversions, wetlands ponds, and redirectable outlet structures cannot be fully studied or accounted for in a drainage study. The critical issue is that we treat water quality flows. Through the sand filter pond, this neighborhood is directly treated. The upstream grassy swales and retention/feature ponds provide secondary upstream treatment.
14. The Applicant is proposing to not detain stormwater runoff, which appears to be acceptable considering the minor increase in stormwater flows and because there are no downstream properties between this property and the river. A formal variance request shall be submitted, per Town Code Section 14-6-20, including a discussion about the capacity of the downstream infrastructure.
TKE: Please see the attached variance request #1.
15. Original Drainage Study from HCE and attached FEMA map show 100-year flows from Leland Creek impacting this development, but this does not appear to be addressed in the drainage report.
TKE: There is no FEMA floodplain on any portion of this site.
16. Total volume of Sand Filter Basins is short of the calculated required volume on spreadsheet.
TKE: The WQCV volume required by Full Spectrum Detention is 0.152 ac-ft. The volume provided is 0.156 ac-ft. We showed the legacy WQCV calculations of 0.158 ac-ft for comparison sake. There is so much secondary upstream treatment by grassy swales and retention time in the feature ponds, that there is no question that water quality is adequately addressed with this subdivision.
17. Based on the proposed grading it appears that flows from design point JB are conveyed to design point US40-B, but design flows would indicate otherwise. This needs to be clarified.
TKE: Please see the revised grading. The flow from JB is routed to JD and on to POA US40 just upstream of the Safeway entrance.

Please call with any questions or comments. Thank you.

Sincerely,
TopKnot Engineering, LLC



Anthony E. (Tony) Krempin, PE
Principal