

**MEMORANDUM**

**To:** Town of Fraser  
**Attn:** Catherine Trotter, Town Planner  
**From:** Tim Gagnon, P.E.  
**Date:** August 15, 2018  
**RE:** Meadows at Grand Park – Final Plat Design Review

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Per your request, Bowman Consulting has reviewed portions of the Preliminary Plat Packet received from Grand Park for the above referenced project, including:

1. Final Plat, dated 7/6/2018, from Core Consultants
2. Final Planned Development Plan, dated 7/7/2018, from Terracina Design
3. Preliminary Construction Plans, dated 7/6/2018, from TKE Engineering
4. Response Letter, dated 7/6/18, from TKE Engineering
5. Engineer's Opinion Of Probable Cost, dated 7/6/18, from TKE Engineering
6. Trip Generation Review Letter, dated 6/8/18, from Felsburg, Holt and Ullevig

Based on our review of this information the following review comments shall be addressed prior to Final Plat acceptance:

**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.
2. A CDOT access permit will be required at the proposed intersection with US Highway 40 and must be provided to the Town prior to recording the final plat.
3. 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.
4. 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.
5. Proposed walking trail is shown on the FPDP, but no information is shown on the construction plans or cost estimate.

**Final Plat**

6. The existing drainage easement at the 42" highway culvert should be extended through Parcel A.
7. Easements to the on-site monitoring well heads shall be provided, if they are to be owned by the Town.

**Final Planned Development Plan**

8. The Landscape Plan does not appear to be complete.

**Cost Estimate**

9. The following line items should be added to the cost estimate: landscaping, lighting, ADA ramps.

### **Preliminary Construction Plans**

10. Sheet 8 of 23: Riprap outlet protection should be added to the proposed 42" culvert at STA 2+20.
11. Sheet 10 & 11 of 23: Detailed grading information for the multi-family units should be shown (as they have been on other multi-family plats) including finished floor elevations, sidewalks, parking areas, grading around the buildings, to ensure they meet Town Code requirements.
12. Sheet 12 of 23: Design information needs to be provided to show how water from concrete curb will be discharged to proposed sand filter basin and not to the main drainage channel (i.e. hard surface/concrete drain pan/channel).
13. Sheets 13 & 14 of 23: It does not appear that fire lines have been shown for each fourplex building, which is necessary if these buildings are sprinkled.
14. Sheets 13 & 14 of 23: In order to minimize the number of taps in the mains and road, the Town may consider requiring that each building have one water service for water and fire suppression, with one sanitary service, and have these lines split after they enter each building.
15. Sheets 19 of 23: Pedestrian road crossings that meet ADA requirements should be installed at the intersection of Street A and Old Victory Road, including ramps, detectable warning strips, etc.
16. Sheets 19 of 23: The ADA ramps at the intersection of Street A and Street B should be realigned so they are directly across the street from each other, and not skewed as currently shown.

### **Drainage**

17. Add existing culverts information to the map (including bike trail and highway culverts) and include capacity calculations.
18. There is contradictory information for the percentage of hydrologic soil types shown on the Runoff Coefficients table and the Detention Basin Stage Storage spreadsheet. On-site percolation results would indicate that the percentages shown on the Runoff Coefficients table is likely more accurate. Please clarify.
19. Sheet 5 includes recommendations for inspection, maintenance and filter replacement schedule for the sand filter basins, which is important for the long-term integrity and effectiveness of sand filter systems. These inspections and maintenance recommendations should be required of the HOA (or entity responsible for pond maintenance) by either a plat note, or language added to the Declarations and Covenants.
20. It appears this development is in the path of the existing pond overflow pathways. The location of the overflow path of the two existing ponds to the east of the development needs to be indicated on the plans and safely conveyed to downstream drainage infrastructure without adversely impacting residences.
21. 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 was missing from the latest submittal.
22. The Original Drainage Study from HCE for Grand Park and the drainage memo from JRS used to size the 42" RCP under US Hwy 40 both indicate 100-year flows from Leland Creek, along with flows from the upstream meadow, impacting flows in this development, but these flows are not addressed in the drainage report. Please clarify.
23. There does not appear to be a well-defined path for overflow water for the 24-inch culvert at the proposed highway entrance. It appears that it may be conveyed uncontrolled towards Lots 10 and 11 and possibly towards the multi-family units 40 and 41. Please clarify.

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24. Overflow considerations for the proposed culvert at STA 2+20 needs to be addressed. It appears that stormwater may overtop Old Victory Road and be conveyed uncontrolled towards the Elk Creek Condos. Please clarify.
25. The major drainage way proposed upstream of the 42-inch culvert shall be designed to maintain a minimum one-foot of free board as required by the Drainage Standards.
26. Drainage flows ( $Q_{100} = 0.7\text{cfs}$ ) at Design Point EC1 would indicate that flows are no longer being conveyed to Elk Creek, through the existing storm sewer system under Old Victory Road, which has been planned in previously approved drainage plans. It appears that all upstream drainage is now being proposed to be conveyed to the 24" and 42" culverts at US Highway 40. This is a significant variation to the conveyance locations and flows from previously approved drainage studies and plans. However, the proposed drainage plan does not address these previous studies and does not describe why significant changes to these past reports is justified, which includes a clearer depiction of what flows (and basins) are being conveyed to the highway culverts, along with their calculated capacities. Please clarify.
27. The culvert at STA 2+20 is labeled with different sizes throughout the plans and hydraulic capacity calculations. Please clarify.