



Memorandum

To: *Bruce Loney*

From: *Stacy Harwell*
Ted Witkowski
Jeff Sandberg, P.E.

Date: *February 23, 2017*

Re: *WSB Project No. 1381-80*

The preliminary plans for the Ridge Creek Development were reviewed for compliance with the City of Shakopee Ordinances. The project was also reviewed for compliance with the Joint Powers Agreement (JPA) with the Prior Lake – Spring Lake Watershed District. The JPA regulates the flow to the Prior Lake/Spring Lake Outlet Channel. The following documents were submitted for our review:

- Ridge Creek Preliminary Stormwater Management Plan, Pioneer Engineering, January 11, 2017
- Ridge Creek Plan Set, Pioneer Engineering, January 12, 2017
- Stormsewer Design Spreadsheet using Rational Method with Inlet Capacity, January 11, 2017
- HydroCAD Model Pro Prelim-116235-Ridgecreek, January 11, 2017

Based on our review of the submitted documents, at this time we have concluded the following:

- o The proposed stormwater management for this project effectively demonstrates conformance with City and JPA rate control standards.
- o City and NPDES Construction Stormwater Permit water quality goals are met through the construction of NURP basins as proposed.
- o A variance was requested for City and NPDES Construction Stormwater Permit volume reduction goals due to the presence of shallow groundwater and nearby wetlands. Our recommendation is that the variance be granted.

The following comments are offered for your consideration:

Grading, Drainage, Easements, Utility and Erosion Control Comments:

1. General

- a. The stormwater report should be signed by a licensed professional engineer. The signature block for the report was left unsigned.
- b. Section II.B of the Stormwater Management Report should be updated to include a discussion of the large wetland complex in Outlots A and F, along with any modifications to the stormsewer or drainage patterns. The Planset indicates that there are culverts to be removed 'per EOR Memo'. For completeness, this memo and any related modeling should be included as an Appendix to the report.
- c. The City of Shakopee allows orifices that are a minimum of 8" in diameter. The proposed stormwater management for the site includes a 3" orifice at Basin 400, a 5" orifice at Basin 300 and a 6" orifice at Basin 100. The Stormwater Management Report indicated that the orifices were sized in order to meet the City rate criteria of 0.1 cfs per acre for a 100 year storm event. The City allows a variance for this standard if an 8" orifice is designed such that the detention area draws down to within one foot of the normal run-out elevation within 72 hours following the onset of a 100-year rainfall event. The model,

report and planset should demonstrate that this is achieved with the associated modeled HWL and a minimum 8" orifice.

- d. Because this site falls within the Blue Lake District upstream of Deans Lake, the City requires that the improvements limit the peak discharge rate to 1/20 cfs per acre for a 10-year TP40 storm event, unless it can be shown that it is not feasible. Currently, Basin 6 and basin 6P do not meet this standard. The other basins also do not meet this standard, however, as mentioned previously, the outlets need to be redesigned with a larger (8") orifice so achieving lower rates is unlikely.
- e. Based on the observed groundwater level of 749 feet to 750 feet reported in the Stormwater Management Plan, there is a concern of groundwater impacts around the proposed stormwater basins. All of the basins have a dead pool volume that falls below 749 feet. It is recommended that the basins are lined in order to avoid adverse groundwater impacts.
- f. The proposed stormwater management for this project connects to an existing stormsewer to the east (behind Lots 15 and 16 on Street B). The stormwater report and design calculations should demonstrate that the existing system has adequate capacity for the proposed runoff entering the system.
- g. Page 8 of the Stormwater Management Plan inaccurately states, in bullet 3 under Section 2, that the basin's water quality volume is calculated as ½ inch of runoff from the new impervious surfaces created by the project. This should read "1 inch of runoff...".

2. Grading Plans

- a. The ponds should have defined access/ maintenance roads consistent with City Design criteria. Maintenance access to Basin 100 does not appear to be adequate. It does not appear that there is adequate space for a maintenance equipment (i.e.backhoe) to access the basin.
- b. All pond outfalls should have riprap to the pond bottom.
- c. The inlet and outlet locations of Basin 100 create short circuiting within the basin. This is generally not ideal for the best water quality performance of the basin. It is recommended that the inlet and outlet locations be reconsidered in order to allow for a longer flow path and residence time within the basin.
- d. EOF spot elevations at road low points and rear yard depressions are missing at several locations within the plan set and need to be added. For example, Sheet 8 has several backyard drainage areas that do not show an EOF.
- e. The ponds should have an EOF route clearly labeled and designed to City requirements. Basin 6/6A, Basin 100, Basin 300 and Basin 400 do not have an EOF identified and labelled in the Planset. Demonstration that the EOFs are adequate to control the 100-year Atlas 14 storm event is required.
- f. The NWL for the large wetland area (in Outlots A and F) is not shown in the plans and should be added.
- g. The City prohibits work in areas having steep slopes (>12%). On Sheet 8 the backyards of Lots 7 through 10 on Oak Ridge Trail indicates slopes greater than 12%. Updates to the grading plans in this area are required for conformance.
- h. Grading on Sheet 8 shows runoff directed toward Lot 9 on Oak Ridge Trail. It is recommended that drainage between lots 8 and 9 be modified to avoid flood risk to Lot 9.
- i. A secondary erosion control fence is recommended on Sheet 13 along the bluff line, due to steep slopes.
- j. Inlet protection is required at all culvert inlets. There are several control structures that do not show inlet protection, for example at Basin 100 on Sheet 13.

3. Utility Plans

- a. The City requires skimmer structures for all new pond outlet structures. The model, report and planset should be updated to include skimmer structures.
- b. Catch basins in non-paved areas must be placed on property corners and property lines when possible.
- c. Haul routes should be added to Sheets 13 and 14.

4. HydroCAD Model

- a. The HydroCAD model should include the large wetland complex located within the overall site drainage.
- b. The HydroCAD model should include several of the backyard depression areas in order to establish a HWL and confirm that there is adequate freeboard during a 100-year storm event. For example, Sheet 8 includes a depression area with a control structure behind Lots 9 and 10 of Street B.
- c. The HydroCAD model should include a NWL for the wetland along with documentation of how that was defined (i.e. per the wetland delineation report or other means).
- d. The HWL for the wetland should be modeled and reflected in the HydroCAD model or used as a beginning condition for the 100-year storm event model in order to incorporate tailwater impacts to the upstream ponding areas (Basin 100 and Basin 300).
- e. Emergency overflow from each of the ponds should be modeled as a 'secondary outlet'.
- f. It is unclear if the outlet control structures are modeled accurately because a standard detail for the outlet control structures was not submitted.
- g. The model should be updated to include an MSE3 rainfall distribution for the Atlas 14 storm events.
- h. The full HydroCAD report should be exported and included in the stormwater report, with error messages turned 'on'.
- i. The HydroCAD model should reflect the updated outlet control structures at each of the basins, as previously mentioned. The Planset should show the updated NWL and HWL at each of the basins.

5. Volume Control

- a. Infiltration in this area is not feasible due to high groundwater elevations and wetland areas. As such, the proposed stormwater management report requests a variance from the City for this criteria. It is worth noting that the proposed development includes several backyard grassed drainage swales that may provide some volume reduction for the project. In addition, the proposed stormwater management includes NURP basins to meet water quality goals. Due to the local high groundwater, it is recommended that this variance is granted.

6. Rate Control

- a. Rate control conformance is achieved with utilizing the smallest allowable orifices at each of the basins. Updates to the HydroCAD model, as mentioned above, are required in order for consistency between the plans and model results.
- b. More accurate modeling of EOF routes and drainage for the site is also required, as previously outlined in these comments.

7. Water Quality

- a. The proposed stormwater basins meet NURP criteria and City water quality standards and are in conformance with NPDES requirements.
- b. As part of the Minnesota River TMDL the City requires a reduction in its non-point source phosphorus loading to the Minnesota River by a minimum of 30%. The stormwater report should provide documentation, including a water quality model, of how this standard is met.

8. Easements

- a. Drainage and utility easements are required over all stormwater BMPs and drainageways. A drainage easement covering the area encompassed by the 100-year HWL is required around all stormwater detention areas. The updated HWL for each of the basins, as described in this memo, should be used to define the easement boundary.
- b. A drainage and utility easement is required for the large backyard depression, control structure and stormsewer in Outlot E, Sheet 11.
- c. There is a catch basin and backyard drainage swale shown on Sheet 8 that falls within the 50 foot setback from the bluff. The City requires a 50 foot storm water pond setback from the top of a bluff. This area is not designed as a pond, however, ponding during

large storm events will likely occur. Developer should demonstrate this area is in conformance with the bluff setback ordinance.

- d. The depression area in Outlot E, shown in Sheet 11, extends into the backyard areas of Lots 4 and 5. This area is drained via a 15" RCP. The Engineer should document the 100-year HWL in this area is and modify the drainage and utility easement to encompass it, if necessary.
- e. The easement width for the pipe run from CBMH-103 to STM-101 should be verified to meet the City of Shakopee Design Criteria. STMH-314 to CBMH-310 should also be verified.

9. Wetlands

- a. Wetlands are impacted as a result of this project. The City is the LGU for wetland management and conformance with the Wetland Conservation Act. Please provide documentation of the wetland delineation report, avoidance review, joint State/Federal Application form and Wetland Replacement Plan. Any Notice of Decision documents should also be included.
- b. The MnRAM wetland classification and category should be noted in the plan set. This should correspond with the wetland buffer setbacks and widths are defined in the plans.
- c. Wetland monumentation at the lot corners or very 200 feet, whichever is shorter, is required and needs to be shown in the plan set. Sec. 16.12 Subd.3.C defines the wetland marker requirements for the City.
- d. Basin 6A includes grading in the wetland buffer area. To be in conformance with City code, this area is required to follow Sec. 16.12 Subd.3.B, which defines the vegetation requirements. This includes the erosion protection, re-vegetation criteria and long term maintenance.
- e. Sheet 6 shows the wetland buffer area crossing into structures on Lots 2 through 7. This is not allowed per City code.
- f. Sheet 11 shows the wetland buffer area within the backyard areas of Lots 2 through 7 and a portion of 10 on Street D. These lots will be subject to restricted covenants in accordance with City wetland buffer management as defined in Sec.16.12.

10. Outstanding Submittals

- a. SWPPP.
- b. A complete erosion control plan showing all erosion control measures, including inlet protection, silt fencing, bio-roll erosion checks and limits of land disturbance. Refer to Chapter 16 of the City Code for a complete list of requirements. This is particularly important for this project as there are steep slopes and wetland areas within the project boundary.
- c. Cross section detail for NURP basins.
- d. Outlet control structure detail for each of the four basins.
- e. Operation and maintenance plan for all proposed stormwater BMPs.
- f. Documentation of Wetland Conservation Act (WCA) permits and State/Federal notice of decision.
- g. Wetland delineation report and wetland replacement plan.

We request that the Engineer address these comments and provide the outstanding submittals for our review as this project continues to move forward. Please do not hesitate to contact us with any comments or questions you have regarding our review.