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PROJECT REVIEW | A Review of Shady Grove Subdivision

Village of Cottage Grove, WI

CLIENT LIAISON:

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DATE:

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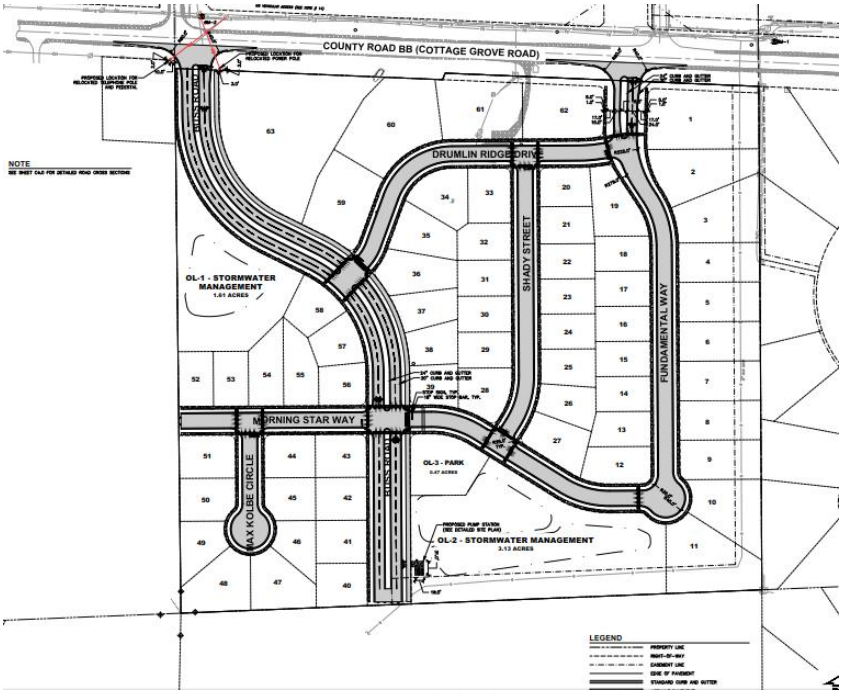

Proposed Shady Grove Subdivision

SHADY GROVE ENGINEERING REVIEW

MSA has reviewed the Preliminary Plat submitted by JSD Professional Services, Inc. for the proposed residential subdivision located along Cottage Grove Road. The Civil Plans for the proposed development, dated June 10, 2019 included the following:

1. Title Sheet
2. Existing Conditions
3. Site Layout Plan
4. Grading Plan
5. Utility Plan
6. Plan and Profile Sheets of Street and Utility
7. Typical Roadway Cross Sections
8. Pump Station Details & Forcemain Plan & Profile

SUBMITTAL REVIEW NOTES

MSA recommends the proposed submittal be approved, contingent on the following conditions and resubmittal of the detention basin design:

Preliminary Plat
See MSA markups on the Preliminary Plat.

1. Provide a table of lot that includes net lot area. All remaining land areas not intended for sewer service or street use will be set into environmental corridor.

2. List minimum building opening elevations and minimum first floor elevations for lots within the plat.

Master Site Plan

1. Intersection curb for Buss Road and Fundamental Way shall be designed to meet the future back of curb at 30 feet from the dedicated ROW line.
2. Buss Road from Drumlin Ridge to Cottage Grove Road shall be four lane, no parking.
3. Buss Road from Drumlin Ridge to the south shall be two lane with parking lanes for on-street parking.

Mass Grading Plan

1. Complete Erosion Control Checklist and Land Disturbance Permit Application prior to site disturbance.
    b. As a part of this process the developer will need to provide an opinion of probable costs for erosion control and stormwater management.
    c. Developer will need to provide a recorded Stormwater Maintenance Agreement.
4. Disturbance area is anticipated to be greater than one acre. Obtain and provide copy of DNR NOI Permit.
5. Storm sewer shall be extended to provide connections for Cottage Grove Road at Buss Road, midblock in up to two locations and at Fundamental Way.
6. Retaining wall will be required on the south side of the bike path along Cottage Grove Road, east of Fundamental Way. Show the “future multi-use trail” and “retaining wall” on the plan.
7. Refer to the stormwater management comments. Raise the elevation of incoming storm sewer to the main detention basin to 916.0 or greater. This will affect the grading for the main detention basin.

Plan and Profile Sheets

1. C9.10 – Station 101+14 shall be the high point in the watermain at the hydrant location. Adjust the watermain profile.
2. C9.11 and others. Align the forcemain note with the pipe in profile view. Please verify the purpose of the added depth selected in the design. Typically, seven to eight feet of depth is adequate with verification of sewer and water lateral crossings.
3. C9.12 – MH A-1, provide an additional outlet invert and one pipe length of 18 feet as a future outlet at 0.40% to the south. Install a plug in the manhole.
4. Provide information on private utility crossings and street lighting locations as they become available and prior to final plan approval.
5. The Developer will fund the LED street lighting as supplied by Alliant Energy.

Street Cross Sections

1. No Comments.

Stormwater Management

1. Extend the Cottage Grove Road culvert pipe for the large drainageway to a point south of the Cottage Grove Road right of way line. The distance shall allow for a 5 foot bike path shoulder (6:1 max slope) and a 4:1 back slope to the endwall invert.
2. The area between lot 9 and 10 is a sump that requires protection from fill. Provide a twenty-foot wide drainage easement for the maintenance of pass-through drainage.

HydroCAD modeling:

1.) *Off-Site Areas*

a. The HydroCAD modeling includes 135.7 acres of off-site area to the north. Rate control comparisons are made inclusive of this area, and the large flows coming off this area are overwhelming the contribution of on-site runoff and obscuring the effects of proposed detention facilities. For example, 1-yr peak flows from the 135.7 acre north off-site area are predicted to be 67 cfs; yet cumulative flows from the entire 146.7 acre area discharging to the wet is only 68 cfs.

Additionally, the north off-site area is actually closer in size to 164.3 acres and does not include only agricultural land, but 28.8 acres of development associated with Westlawn Estates 4th Addition.

Modeling of conveyance facilities responsible for passing regional flows through the site should include off-site areas; modified as above. MSA can provide regional watershed boundaries as well as model data for the Westland subdivision. Modeling for demonstration of on-site rate control should include the only the (entire) development site plus off-site areas passing through proposed BMPs.

b. Off-site areas to the east are handled differently under existing and proposed conditions. Off-site (sub)watersheds should be evaluated under both existing and proposed conditions in identical ways so as to prevent unintentional changes in runoff rates/volumes due to aggregation of model input data.

c. The southern ½ of CTH 'BB' east of Fundamental Way drains to a roadside ditch and comes onto the project site. This is not accommodated in either existing or proposed conditions. Additionally, while the Village has plans to improve CTH 'BB' to a curb-and-gutter cross-section which would eliminate overland flow to the roadside ditch, the previous plans for this project had accommodated collection of runoff from at least a portion of this road.

2.) *Landlocked Area*. Additional detail should be provided for the partially landlocked basin within subwatershed B. The precise bottom elevation and overflow elevation should be identified and existing conditions modeling revised to include the effects of this storage area which may reduce low flows from this area to near zero.

3.) *Selection of Runoff Curve Numbers*

a. Soil maps show the study area to be predominantly HSG B soils; with only a small portion of HSG C soils on site; however, off-site areas to the north are modeled as

containing cropland with a runoff curve number of 78 which corresponds to HSG C soils. Additionally, there is no accommodation for HSG C soils on site.

b. Subcatchment A-4 under proposed conditions is classified entirely as cropland; however, only a small off-site portion is cropland. Other land uses include residential land (on- and off-site) and areas where the infiltration basin will be constructed (off-site areas should be separately modeled per comment 1b above).

4.) *Calculation of times of concentration*

a. There are several instances where times-of-concentration are based on very long sheet-flow paths. Post-development subcatchment A-4, A-6, and B-1 include 300 feet, 42 feet, and 260 feet respectively. Sheet flow lengths should not exceed 100 feet.
b. Post-development subcatchment B-2 contains no sheet flow component, beginning with shallow concentrated flow.
c. Pre-development subcatchments 5S (off-site North), and post development subcatchments A-2, A-3, and A-5 all manually entered values which need to be explained.

5.) *Pond overflow weirs.* Are all modeled in HydroCAD as sharp crested weirs,

WinSLAMM Modeling

1.) *Off-Site Areas.* Off-site areas need to be modeled as separate source areas 'treated' by an other device such that TSS and TP loads are reduced to zero. On-site practices need to be shown to achieve appropriate reductions for site-generated TSS and TP loads.
2.) *TP-modeling*. Total Phosphorus pollutant loads should be turned on in the model to verify that the site achieves necessary TP reductions in accordance with Village Ordinance standards.
3.) Infiltration Basin Outlet Pipes
   a. The infiltration basin is modeled as having the primary outlets at the basin bottom (i.e. no 'infiltration storage'). Because of limitations in the models calculation routine, this is almost certainly resulting in on overestimation of infiltration performance.
   b. The infiltration basin model input data does not include the dual 18" pipes at elevation 915.5 (6" above pond bottom).

Wet Pond Design:

1.) The low-flow outlet for the OL2 wet pond is to be installed at elevation 912.0 – which is below the floor of the downstream infiltration basin which is set at elevation 915.0. The effective normal water level for the pond will then be controlled either by infiltration or by the elevation of the lowest gravity outflow pipe from the infiltration basin which is elevation 915.0. This will have large effect on the water quality and rate control performance of the wet pond and it is likely to cause more frequent overflows of the wet pond containment berm.
2.) The construction plans include a 'secondary outlet structure' which suggests that there will be two outlet risers; which isn't supported by other plan data or modeling.

Infiltration/Biofilter Design:

1.) Construction details (and modeling) for the biofiltration basin shows only 0.5 foot of engineered soil, which is less than the minimum 2-feet required by WDNR Conservation Practice Standard 1002. Additionally, the placement of the underdrain within the cross-section puts it within the engineered soil, as opposed to within the rock storage area where it should be. This further reduces the effective depth of filtration provided by the engineered soil.

2.) The construction detail for the biofilter makes it appear as though there is a depth of infiltration storage, however, invert data provided indicates that the primary outlet pipes will be on the bottom of the infiltration basin.

Lift Station & Forcemain

1. Lift Station and forcemain shall comply with all provisions of Section 505-519 of the Village of Cottage Grove Standard Specifications for Public Works Improvements (called standard specifications herein). The review included herein does not comment specifically on all requirements included in that section. Plans shall provide enough detail to verify that they are consistent with the standard specifications.
2. l2" Grinder pumps are not acceptable. Pump shall be a non-clog submersible pump as specified in Section 506.2.2 of the standard specifications. Pumps shall be resistant to clogging/plugging due to non-woven wipes; recessed/vortex impeller, single-vane back-swept impeller (e.g. Flygt N-impeller) or similar. Recommend for a full size impeller with minimal or no trimming to limit gap between impeller and volute.
3. Provide all start-up commissioning services as specified in Section 506 of the standard specifications
4. A field pump test (i.e. drawdown test) shall be completed by the Contractor and witnessed by the Village Engineer. See 506.3.4
5. Electrical (power, instrumentation, and control) design is incomplete. Provide one-line diagram, P&IDs, electrical site plan, and network/telemetry architecture drawings. Plans shall complement the Section 507 through 516 of the standard specifications.
6. Generator plan is incomplete. Design information shall be shown on drawings requested in Comment #6. Generator shall be Cummins to match Village's generator fleet. Automatic transfer switch and associated control shall be provided for standby generator.
7. Confirm power supply is compatible with specified pumps
8. The vertical 4" pipe with flanged connection in the wet well is not acceptable. Provide a tee (or cross) in valve vault with extended flanged pipe. Flanged pipe shall be equipped with quick connect for connection to Village-provided trash pump stationed at-grade. Vault door shall be located above quick-connect for easy access from surface w/o vault entry. See Section 506.3.1(C).
9. Provide an odor control vent scrubber on the end of the vent pipe. Syneco Systems Peacemaker vent scrubber, or equal. Provide a spare case of scrubbers to the Village.
10. A minimum wet well diameter of 6-feet shall be provided for adequate maintenance access. In addition, fall protection (i.e. safety grating) is required. This will require a larger hatch frame in order to maintain the same clear opening identified on the plans. There needs to be a minimum

of 12" clearance between the corner of the hatch and the edge of the concrete manhole top/edge. Therefore, a >6-foot diameter top is necessary.

11. Provide fire hydrant and adequately sized hydrant lead in lieu of ¾" yard hydrant shown.
12. Steps into wet well are prohibited (Note #6, Sheet C14.0)
13. Epoxy coated steel pipe supports shall be utilized in all locations (wall and floor)
14. Valve vault drain design is unacceptable as the stainless steel flap valve does not provide effective barrier from sewer gases migrating to the valve vault. At minimum, pipe should be extended in the wet well to below the low water level to provide a hydraulic break to minimize gas migration. It is recommended, that the pipe be cast into the valve vault base, and terminated in a center sump. In addition, it is recommended that a ball valve be cast into the base as well with an access cover.
15. Warning sign is unacceptable. Sign shall comply with Section 506.2.10(2) of the standard specifications

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