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MEMO

Date: May 6, 2015

To: Steven Schehl, PE

From: Doug Turney, PE

Subject: Carr Farms Development Preliminary Stormwater Management

Background

The following memo summarizes the detention estimate for the proposed Carr Farms Development in City of Hilliard, Ohio. Hydrologic parameters such as Runoff Curve Number (RCN) and Time of Concentration were determined using standard Natural Resources Conservation Service (NRCS) methodology. The 1-, 2-, 5-, 10-, 25-, 50-, and 100-year storm event discharge amounts were calculated using the NRCS TR-55 method. This analysis reflects the NRCS Type II distribution, 24-hr storm duration. Rainfall depths were obtained from Bulletin 71: Rainfall Frequency Atlas of the Midwest. The peak flow rates were computed using the HydroCAD 10.00 Computer Program. Stormwater detention and water quality design were designed to meet the requirements of the City of Hilliard and the Ohio EPA General Construction Permit.

Existing Conditions

The site currently consist of approximately 80 acres of agricultural land and a drainage way with a composite RCN of 77 and a Tc of 69.1 min. The site drains from southwest to northeast, to a tributary of Hayden Run Creek. The site also has approximately 115 ac of offsite area tributary to it which also drains to the tributary of Hayden Run Creek. This offsite area enters the site via existing 36" storm sewer that crosses under Leppert Road.

Proposed Conditions

Approximately 73 acres of the property will be developed and will be tributary to the proposed stormwater facilities. In areas near the stormwater management features some rear yard areas will direct release to the existing swale. These areas will be rear yard green spaces only. The resulting RCN will be 83 with a Tc of 15.0 min. The release rates resulting from the data above are as follows:

Table 1
Proposed Post-developed Release Rates

Storm Event (year)	Pre-developed Peak Flow Rates (cfs)	Post-developed Peak Flow Rates (cfs)	Allowable Release Rates (cfs)	Proposed Release Rates (cfs)
1	16.16	75.62	16.16	4.02
2	27.97	114.03	16.16	7.32
5	44.34	164.06	16.16	11.99
10	58.27	204.74	16.16	15.37
25	80.84	268.30	80.84	38.23
50	101.62	325.28	101.62	75.75
100	124.18	385.93	124.18	121.97

Furthermore, it was determined that the pre-development runoff volume was 3.3 ac-ft. while the post-development runoff volume was 4.9 ac-ft. resulting in a 10-yr critical storm.

Proposed Detention

Wet basins will be used to accommodate stormwater management (including post and pre water quality requirements) for the proposed development. The site generates a Water Quality volume of 1.1 ac-ft. (75% of WQv for Wet Basins), with additional 10.7 ac-ft. to accommodate storage while providing 0.5' of freeboard. The wet basins will also provide Water Quality (only) for the 115 acres of offsite area. This Water Quality volume for the offsite area is 1.0 ac-ft. (currently it is assumed that this 115 acres will be developed as a park). Again the wet basins will provide no detention storage for the offsite area. The total volume provided by the wet basins is 12.7 ac-ft.

Conclusion

The site will contain wet basins as shown on the site plan to accommodate required stormwater requirements. The wet basins will also provide water quality for the proposed park north of Leppert Road while providing no storage for said park.

SDS/tlf

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