

## STORMWATER MANAGEMENT SUMMARY

**Date:** February 22, 2024  
**Project:** Hyland-Croy Commercial  
**Re:** Stormwater Management Summary  
**From:** Jay Bohman

**Site Summary:**

Hyland-Croy Commercial is a proposed commercial development in Jerome Township, Union County, Ohio. Located at the southwest corner of Weldon Road and Hyland-Croy Road, this development encompasses 21.0 acres. An automobile dealership is planned to be constructed on Lot 1, with future commercial uses to be constructed on Lots 2 and 3 as users are identified. The Gordon Tri-County Ditch, which borders the site to the south, serves as its natural drainage outlet and is ultimately tributary to the Scioto River.

Stormwater management will follow the guidance of the Union County Technical Design Standards and the Ohio EPA’s General Construction Permit.

**Pre-Developed Conditions:**

Union County soil maps identify the onsite soils as Crosby silt loam and Brookston silty clay loam. All soils are classified within hydrologic soil group D. Cultivated row crops make up approximately 19.6 acres of the existing property; these areas were modeled with a curve number of 84. Wooded riparian corridor and brush areas cover the remaining acreage; a curve number of 77 was applied to these areas. Approximately 0.13 acres of offsite area are tributary to the project site from the north. This apparent topsoil stockpile area was modeled as a poor brush area with a curve number of 83. This area will be directed to the on-site detention area where it will be treated for water quality, and it will be included in release rate calculations as a pass-through flow. Preliminary peak rates of runoff calculated for the existing conditions are summarized in Table 1 below.

<b>Tributary Area Name</b>	<b>Q1 (cfs)</b>	<b>Q2 (cfs)</b>	<b>Q5 (cfs)</b>	<b>Q10 (cfs)</b>	<b>Q25 (cfs)</b>	<b>Q50 (cfs)</b>	<b>Q100 (cfs)</b>
Site	10.14	11.81	18.39	22.96	27.62	31.87	34.21
Offsite	0.24	0.28	0.43	0.53	0.64	0.73	0.78

**Table 1 – Existing Runoff Rates**

**Critical Storm:**

Per the Union County Technical Design Standards, the allowable release rate from the site is determined by following the guidance of the critical storm method. For all storm events up to and including the critical storm, runoff must be discharged from the site at a rate not to exceed the 1-year pre-developed runoff rate. Storm events with less frequent recurrence intervals than the critical storm shall be controlled to limit the peak rate of runoff to the predevelopment peak rate from the same frequency storm.

Preliminary analysis of the pre-developed and post-developed conditions show that 1-year runoff volumes will increase by approximately 82%, resulting in a 10-year critical storm. A summary of allowable release rates based on this analysis is given in Table 2.

<b>Tributary Area Name</b>	<b>Q1 (cfs)</b>	<b>Q2 (cfs)</b>	<b>Q5 (cfs)</b>	<b>Q10 (cfs)</b>	<b>Q25 (cfs)</b>	<b>Q50 (cfs)</b>	<b>Q100 (cfs)</b>
Site	10.14	10.14	10.14	10.14	27.62	31.87	34.21
Offsite	0.24	0.28	0.43	0.53	0.64	0.73	0.78
Composite	10.38	10.42	10.57	10.67	28.26	32.60	34.99

**Table 2 – Allowable Release Rates**

**Proposed Conditions:**

In the developed condition, storm sewers and overland flood routing will convey runoff to a proposed master retention basin at the south of the site. The basin will utilize a control structure to provide both water quality and quantity control for its contributing watershed and then release to the Gordon Tri-County Ditch through an outlet pipe. Preliminary modeling of the basin and control structure yields release rates which meet allowable conditions, as summarized in Table 3.

	<b>Q1 (cfs)</b>	<b>Q2 (cfs)</b>	<b>Q5 (cfs)</b>	<b>Q10 (cfs)</b>	<b>Q25 (cfs)</b>	<b>Q50 (cfs)</b>	<b>Q100 (cfs)</b>
Basin	5.01	6.11	9.02	10.58	20.18	30.40	31.40

**Table 3 – Preliminary Basin Release Rates**

**Storm Water Quality Control:**

Per the Ohio EPA General Construction Permit, a stormwater Best Management Practice (BMP) is required to treat the 0.9” rainfall event. Water quality control for the site will be provided via an open-air retention basin with extended release device. The outlet structure will have an orifice sized to draw down the water quality volume of the BMP over 24 hours, and not more than half the volume in the first third of the drawdown time. Water quality pre-treatment requirements will be met through the use of forebay and micropool areas at the basin inlets and outlet, respectively.

**Erosion and Sediment Control:**

The proposed retention basin will be utilized as a Temporary Sediment Basin to meet the Ohio EPA requirements that, during construction, a site must provide means by which to control the sediment laden runoff from the construction site. For each acre of drainage area that is tributary to the BMP, a dewatering drawdown volume of 67 cu. yd. must be provided. The BMP is additionally required to provide a sediment storage volume of 37 cu. yd. for each acre of disturbed area tributary to them. Preliminary analysis of the basin yields volumes that meet or exceed these requirements.

**Culvert Crossing:**

A future roadway crossing of the Gordon Tri-County ditch is considered for such time as the land south of the ditch is redeveloped, should the developer thereof desire to connect their roadway system to those of this project. Full hydraulic design of this culvert, if desired, will be completed at such time.

**Conclusion:**

Hyland-Croy Commercial will utilize a master retention basin to provide stormwater quantity control in accordance with the critical storm method required by the Union County Engineer’s office. Water quality control will follow the requirements of the Ohio EPA’s General Construction Permit.