STORM WATER DRAINAGE REPORT

LOT 298

NEWBERRY LANDINGS – 1ST PLAT

LEE'S SUMMIT, MISSOURI

1510 SE Kingspoint Drive

PREPARED FOR

PAT MCNAMARA

PREPARED BY

HG CONSULT, INC.

January 12, 2018

Project Overview

The proposed project is a speculative office /warehouse facility. The facility will be housed in a 12,000 square foot building on a 1.38 acre site. The site is not construction ready. The storm sewer system will need additional improvements to allow for proper drainage from site.

The topography of the site is a gentle slope south west to the north east. The existing storm sewer system is in place on the west side of the site on the east side of SE Broadway. The overall existing system serves the roadway with no access for Lot 298. Therefore an additional catch basin will be required to be installed on south side of Kingspoint at the north end of project site.

Drainage Assessment of the Project Site

Due to the slope of the site and the need for a flat slab, the bench and fill grading method was used for the site along with the need to have positive drainage away from the building, drainage areas directing storm water to a curb cut that forces water into the detention pond. The remainder of the site grading directs pervious areas away from the building and drainage to the east. Design requirements call for a piping system with a minimum capacity for the 10 year event, with the 100 year storm event being routed overland in an above grade manner such as swales and gutters. To insure that higher frequency storms would not cause any ponding problems or inundation of parked vehicles, the structures and piping system have been designed to the 100 year event flows. With the relatively small drainage areas, these flows are low and pipe sizes are in the 10 inch for the detention pond release pipe and a15" public sewer improvement.

Conveyance Design

As shown on the Drainage plan for the site, Area 1 (pervious area) drains into Area 2 (parking) and then to the detention pond by sheet flow over the parking and drive aisle area. This system (Area 1 and Area 2) generates a 10 year flow of 6.07 cfs and a 100 year flow of 9.40 cfs. Due to the minimal difference between the 10 and 100 year flows, it makes sense to size for the 100 year event and flows and eliminate the potential for excessive ponding in the parking areas.

Temporary Erosion and Sediment Control

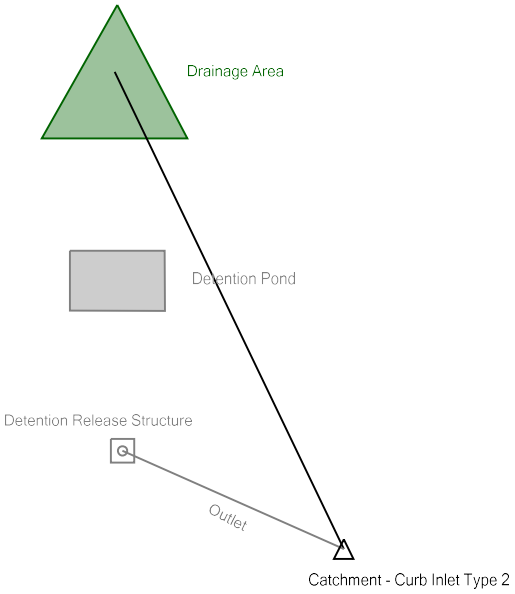
During construction and prior to paving, it will be necessary to control erosion and sediment from the site during storms with in the construction timeframe. To insure that sediment does not enter the existing storm system or runs off to the existing street, perimeter containment, through silt fence installation and inlet protection, through the use of filter socks and inlet filters. To keep construction traffic from tracking mud onto the adjacent city street, a stabilized rock construction entrance will need to be installed. These erosion control devices, and their maintenance throughout the construction timeframe, are required by ordinance and the details for them are referenced by the City's Design and Construction Manual and shown on Detail Sheets 7 and 9.

Post development water quality will be addressed through the use a water quality detention release structure. The owner will need to have a routine maintenance policy for the cleaning, repair and replacement of the detention release structure.

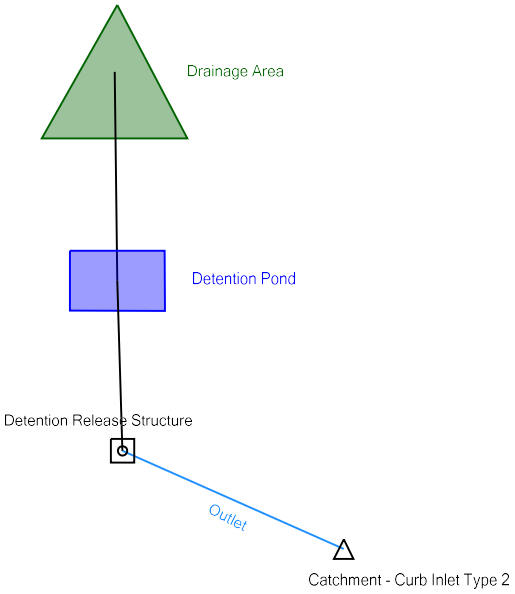
Design Calculations

See the attached for drainage area calculations, flows, pipe sizing, inlet sizing and water quality calculations as requested.

Scenario: Pre-Development Water Quality



Scenario: Post-Development Water Quality



TPC

Project Summary	
Title	TPC
Engineer	Mike Alexander, Kellen Huffman
Company	Hg Consult, Inc
Date	1/12/2018

Notes

TPC

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Drainage Area	Post-Development Water Quality	1	0.029	11.930	0.52
Drainage Area	Post-Development 2 year	2	0.151	11.920	2.85
Drainage Area	Post-Development 10 year	10	0.273	11.920	5.08
Drainage Area	Post-Development 100 year	100	0.444	11.920	8.06

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Catchment - Curb Inlet Type 2	Post-Development Water Quality	1	0.029	12.280	0.09
Catchment - Curb Inlet Type 2	Post-Development 2 year	2	0.151	12.110	0.67
Catchment - Curb Inlet Type 2	Post-Development 10 year	10	0.273	12.070	2.15
Catchment - Curb Inlet Type 2	Post-Development 100 year	100	0.444	12.070	3.22

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Detention Pond (IN)	Post-Development Water Quality	1	0.029	11.930	0.52	(N/A)	(N/A)
Detention Pond (OUT)	Post-Development Water Quality	1	0.029	12.280	0.09	1,001.76	0.009
Detention Pond (IN)	Post-Development 2 year	2	0.151	11.920	2.85	(N/A)	(N/A)
Detention Pond (OUT)	Post-Development 2 year	2	0.151	12.110	0.67	1,003.45	0.056
Detention Pond (IN)	Post-Development 10 year	10	0.273	11.920	5.08	(N/A)	(N/A)

TPC

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Detention Pond (OUT)	Post-Development 10 year	10	0.273	12.070	2.15	1,004.28	0.094
Detention Pond (IN)	Post-Development 100 year	100	0.444	11.920	8.06	(N/A)	(N/A)
Detention Pond (OUT)	Post-Development 100 year	100	0.444	12.070	3.22	1,005.19	0.146

TPC_Spillway

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Drainage Area	Post-Development 100 year	100	0.444	11.920	8.06

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Catchment - Curb Inlet Type 2	Post-Development 100 year	100	0.423	11.950	7.40

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Detention Pond (IN)	Post-Development 100 year	100	0.444	11.920	8.06	(N/A)	(N/A)
Detention Pond (OUT)	Post-Development 100 year	100	0.423	11.950	7.40	1,005.85	0.059