PRELIMINARY STORM DRAINAGE STUDY

MID CONTINENT PUBLIC LIBRARY (MCPL)

EAST INDEPENDENCE BRANCH

LITTLE BLUE PARKWAY & HEARTLAND DRIVE

INDEPENDENCE, MISSOURI

PREPARED FOR

Mid Continent Public Library

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1.0 GENERAL INFORMATION

This storm drainage study is being submitted on behalf of Mid-Continent Public Library (MCPL) for the proposed development of a public library located in the southwest corner of the intersection of Little Blue Parkway and South Heartland Drive in Independence, Missouri. This property is currently undeveloped. The existing property occupies 5.49 acres. This report is being submitted to the City of Independence with the Preliminary Development Plan for approval of this development.

1.1 Project Location and Description

The proposed site is located in Section 28, Township 49 north, Range 31 west, in Independence, Jackson County, Missouri and is part of the Cracker Neck Creek Watershed. It is bounded by commercial properties to the northwest, a residential subdivision to the south and apartments to the east. (See appendix A).

The intent of the project is to construct a public library. The proposed site will include a single-story building (12,500 sf) with a trash enclosure, sidewalks, parking and associated drive lanes.

1.2 Study Purpose

The purpose of this report is to provide recommendations to ensure that stormwater runoff from the proposed development will not have an adverse impact downstream. This report will verify the development is in conformance with the adopted code for the City of Independence.

2.0 METHODOLOGY

2.1 General Criteria and References

This report was prepared in accordance with the provisions of City of Independence Stormwater Management guidelines. Storm water conveyance facilities are designed according to the Standard Specifications and Design Criteria known as “Division V – Design Criteria, Section 5600 - Storm Drainage Systems and Facilities” of the American Public Works Association, Kansas City Metropolitan Chapter (1996).

The analytical and design criteria used in the study conform to Section 5600. Based on these criteria, peak runoff rates from the proposed development were determined by using the Rational Method.

Given the size of the site and location of the existing and proposed storm, a 5-minute time of concentration was assumed for the all of the hydraulic calculations using the rational equation in this report.

2.2 Soils Descriptions

Soil classifications by the United States Department of Agriculture (USDA) on the Natural Resources Conservation Service (NRCS) Soils website for Jackson County, Missouri show the existing site consisting of the following soil types:

10178 – Udarents-Urban Land-McGirk Complex, 5 to 9 percent slopes –

HSG* Type C/D

**HSG – Hydrologic Soils Group (The NRCS information is included in the appendix).*

3.0 HYDROLOGIC/HYDRAULIC ANALYSES

3.1 Existing Conditions

Currently, the site is undeveloped grass covered lot that is wooded on the south side. There are no existing structures on the site.

The site generally drains south to the creek. The creek flows to the east under Heartland Drive to a double squash 42x30 culvert. The culvert drains to the east into the Cracker Neck Creek Watershed.

There is a 24” culvert that drains into the creek on the west side of the property under Little Blue Parkway. Offsite drainage also comes from creek as it enters the property on the west side.

3.2 Proposed Conditions Analysis

Per the included site plan, development for this site will be limited to the eastern portion of the site. Only one building will be constructed. There is a possibility of a future addition on the west side of the proposed building (2500 sf). There are no plans to construct the addition, at this time. However, the future structure has been taken into account for the purposes of this storm study. The developed Rational “C” for the stie (1.16 acres impervious) will be 0.43. The existing “C” for the site is 0.30.

Runoff for the site will be collected via surface inlets and piped to the proposed detention facility.

The following table shows the calculated existing and proposed flows in the 2, 10, and 100 year storm events:

5.0 FEMA/DWR PERMIT REQUIREMENTS

The subject property is classified as a “Zone X” Area according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), Jackson County, Missouri and Incorporated Areas Map Numbers 29095C0311G dated January 20, 2017. According to the FEMA FIRM, Zone X corresponds to areas determined to be outside the 0.2% annual chance floodplain.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The preliminary design of the MCPL East Independence Branch meets the requirements for Stormwater Management for the City of Independence. Even though, the fully developed site will result in an increase in stormwater runoff, this has been accounted for in the design of the proposed storm basin. This will actually result in a decrease in flow in the existing storm system in the 100-year storm event. No negative downstream impacts are anticipated.

Based on the information provided herein, we request approval of this Preliminary Storm Drainage Study for the MCPL East Independence Branch Development.

APPENDIX A
STORMWATER MANAGEMENT DOCUMENTS

Table 1. Hydrologic Properties & Peak Flow Comparison:

Pre vs. Post-Development Conditions

Site Description	Total Area (ac)	Pervious Area (ac)	C Value	Storm Event	K Value	Intensity (in/HR)	Runoff Q (cfs)
Pre-Development	5.47	0	0.30	2-YR	1.0	5.41	**8.9**
				10-YR	1.0	7.35	**12.1**
				100-YR	1.25	10.32	**21.2**
Post-Development	5.47	1.16	0.43	2-YR	1.0	5.41	**12.7**
				10-YR	1.0	7.35	**17.3**
				100-YR	1.25	10.32	**30.3**

3.3 Stormwater Detention

The developed area will be routed to a proposed detention facility in the southeast corner of the site through a storm water network of inlets and pipes. An outlet structure will limit the outflow of the pipe to approximately 9.3 cfs (1.7 cfs per acre) in the 100 year storm.

To achieve this release the pond will require 0.15 acre-ft of storage. The approximate water surface elevation will be 793.7 with a maximum depth of 2.7 feet.

Since no development is planned for the western portion of the property, flow patterns for the that area of the site will remain as they currently are.

The outlet structure for the detention pond will flow into the creek and into the double squash pipes to the east. The detained flow rates from outlet structure are well below the existing flow rates. There will be no rise in water surface elevations at Heartland Drive.

4.0 CLEAN WATER ACT SECTION 404 PERMITTING REQUIREMENTS

Site grading and land disturbance activities are not taking place within jurisdictional Waters of the U.S. A Section 404 permit will not be required.