

**PRELIMINARY STORM WATER
MANAGEMENT STUDY**

MCPL – LEE’S SUMMIT BRANCH REMODEL

150 NORTHWEST OLDHAM PARKWAY
LEE’S SUMMIT, MISSOURI

**PREPARED FOR
MID-CONTINENT PUBLIC LIBRARY**

**PREPARED BY
OLSSON, INC.
OVERLAND PARK, KANSAS**

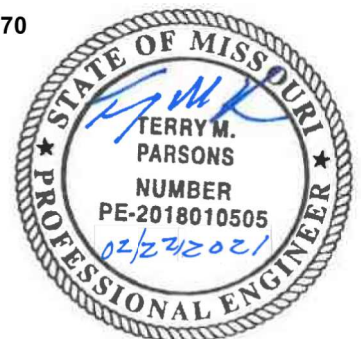
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MCPL – Lee’s Summit Branch Remodel
Preliminary Stormwater Management Study

TABLE OF CONTENTS

GENERAL INFORMATION 3

 PROJECT LOCATION AND DESCRIPTION 3

 STUDY PURPOSE 3

 SOILS DESCRIPTIONS 4

METHODOLOGY 4

 GENERAL CRITERIA AND REFERENCES 4

HYDROLOGIC/HYDRAULIC ANALYSES 5

 EXISTING CONDITIONS ANALYSIS 5

 PROPOSED CONDITIONS ANALYSIS..... 5

 STORMWATER DETENTION REQUIREMENTS 6

STORMWATER TREATMENT REQUIREMENTS 6

CLEAN WATER ACT SECTION 404 PERMITTING REQUIREMENTS 6

FEMA/DWR PERMIT REQUIREMENTS 6

CONCLUSIONS AND RECOMMENDATIONS 6

MCPL – Lee’s Summit Branch Remodel

Preliminary Stormwater Management Study

TABLES

Table 1 – Post-Development Curve Number Analysis

Table 2 – Proposed Peak Flows

APPENDICES

Appendix A: Maps

Appendix B: FEMA Flood Classification Firms

Appendix C: Soil Map

MCPL – Lee’s Summit Branch Remodel Preliminary Stormwater Management Study

GENERAL INFORMATION

This Stormwater Management Study is being submitted on behalf of the Mid-Continent Public Library (MCPL) for the proposed remodel and expansion of the existing Lee’s Summit Branch Library facility located at 150 Northwest Oldham Road in Lee’s Summit, Missouri.

Project Location and Description

The site is located on a platted lot of land recorded as Mid-Continent Add Tract A in the Northeast ¼ of Section 1, Township 47 North, Range 32 West, in Jackson County, Lee’s Summit, Missouri. Currently, the site is 1.6 acres, however, MCPL is exchanging property (approximately 0.1 acres) with the adjacent owner of the Summit Shopping to accommodate their branch expansion plans. The legal description for the adjacent property is Summit Shopping Center Lot 1 (See Exhibit 1 – Appendix A).

The Summit Shopping Center borders the library property on the north and east. Oldham Road (MoDOT Right of-Way) is to the east of the property. Residential properties border on the south. The proposed remodel plans anticipate the construction of a 6,100 sf building addition to the existing 16,500 sf. library facility. The improvements will also consist of the reconstruction of the existing parking lot, addition of a drive through service window and service area, and utility upgrades. To expand parking for the library site an agreement has been made with the owners of the Summit Shopping to construct new parking on their property.

The entirety of the existing and acquired sites are located outside of the 100-Year FEMA Floodplain (See Appendix B).

Study Purpose

The purpose of this study is to provide a Stormwater Management Plan for the proposed development in accordance with the American Public Works Association (APWA) *Standard Specifications and Design Criteria* Section 5600 “Storm Drainage Systems and Facilities”,

MCPL – Lee’s Summit Branch Remodel

Preliminary Stormwater Management Study

APWA Manual of Best Management Practices (BMP) for Stormwater Quality, and applicable City of Lee’s Summit, Missouri guidelines.

Soils Descriptions

Soil classifications were obtained from the Natural Resource Conservation Service’s website by utilizing the Web Soil Survey feature. The site soil composition and classification are listed below:

10181 – Udarents-Urban Land-Sampsel Complex, 5 to 9 percent slopes – HSG Type C.

*HSG – Hydrologic Soils Group

See Soils Map in Appendix C.

METHODOLOGY

General Criteria and References

Analytical and design criteria conform to those of Division V - *Section 5600 – “Storm Drainage Systems and Facilities”* of the Kansas City Metropolitan Chapter of the American Public Works Association’s *“Standard Specifications and Design Criteria”*. Based on these criteria’s, Post-development discharge rates for the 1, 10, and 100-year storm events will be limited to provisions in section 5608.4-C1 *Performance Criteria – “Comprehensive Control”*. Post-development discharge rates are limited to 0.5 cfs per acre for 2-Year, 2.0 cfs per acre for 10-year, and 3.0 cfs per acre for 100-year storm events. Pre and post-development flows from the site are shown below and were calculated using HEC-HMS for the 1, 10 and 100-year storm events. Existing and proposed hydrographs were calculated using the 24-hour SCS Type II rainfall distribution. Existing times of concentration were determined using Inlet Time and Travel Time equations found in Section 5602.7 of APWA Section 5600. A minimum inlet time of five minutes was utilized when calculating the times that were under five minutes. This method was also applied during the calculation of the proposed times of concentration.

MCPL – Lee’s Summit Branch Remodel

Preliminary Stormwater Management Study

HYDROLOGIC/HYDRAULIC ANALYSES

Existing Conditions Analysis

The existing site is currently functioning as a branch for MCPL. The Summit Shopping Center borders the library property on the north and east. Oldham Road (MoDOT Right of-Way) is to the east of the property. Residential properties border on the south. An agreement has been arranged with Summit Shopping Center to exchange property on the northern edge of the library property. The library will gain a portion of the shopping center property to enable the library to construct its expansion. The shopping center will gain ownership of the entrance. An access entrance will be granted to Library to maintain access.

Current runoff for the existing library is collected by existing storm infrastructure that drains to a ditch along Oldham Parkway and McClendon Drive on the east side of the property. Roof drains on the west side of the building daylight above ground. The runoff continues to the south and then turns to the east to an existing flume in the parking area. Approximately 4 acres to the north and west of the library drains from the existing shopping center parking across the northern edge of the library property. Almost the entirety of the studied area drains by pipe or ditch to a storm structure at the southeast corner of the site to an area inlet shown as Outfall "A" on the existing conditions exhibit. A turfed area on the south of the site drains to the backyards of the residences to the south. Approximately 0.02 acres drain directly to McClendon Drive.

Exhibit 1 in Appendix A shows the existing conditions for the site.

Proposed Conditions Analysis

A new 6,100 sf addition will be constructed on the north side of the existing library. The parking area will be rearranged to maximize parking for the larger building. Additional parking will also be constructed to the northeast of the proposed building on the shopping center property. This will serve as parking for both library and shopping center patrons.

MCPL – Lee’s Summit Branch Remodel

Preliminary Stormwater Management Study

City staff has noted that there has been flooding issues in the areas south of the site. In order to prevent an increase in runoff, asphaltic pavement will be removed south and west of the building to offset the increase in impervious areas for the building and new parking. Impervious area on the library site will decrease by approximately 3100 sf on the library site. Impervious area will decrease by approximately 100 sf on the shopping center site. Exhibit 2 in Appendix A shows proposed site plan.

The Stormwater Management Plan noted as Exhibit 3 in Appendix A shows the proposed improvements. The site drainage patterns will remain the same as existing. Site drainage will be improved with the addition of more efficiently placed drainage structures and enclosed storm sewer system. The decrease in impervious area will decrease runoff from the site. The system continues to drain to Outfall “A”. The structure at Outfall “A” will be reconstructed as a portion of the site improvements.

Table 1: Post-Development Curve Number Analysis

Sub-Area	Area (AC)	Soil Group	Curve Number
Pavement, Buildings, Impervious	1.7	C	98
Turf (Good)	0.9	C	84

A peak flow analysis of the post-development site was conducted using HEC-HMS, the composite curve number, and rainfall and distribution information acquired from APWA section 5600. Post-development peak flows to the outfall are summarized in the Table 2. Exhibit 4 in Appendix A shows the drainage calculations for the proposed site.

Table 2: Proposed Peak Flows

Sub-Area / Outfall	Tributary Area (acres)	Q (1-Year Storm) (cfs)	Q (10-Year Storm) (cfs)	Q (100-Year Storm) (cfs)
Outfall A	2.6	8.2	16.2	23.1

MCPL – Lee’s Summit Branch Remodel

Preliminary Stormwater Management Study

Existing offsite drainage patterns on the south side of the property and at the entrance will remain the same as pre construction.

Stormwater Detention Requirements

As stated previously, impervious areas will decrease on the site. Therefore, detention will not be required. The decrease in impervious area is below the 5000 sf increase threshold, and therefore exempt from the requirements Section 5601.3.

STORMWATER TREATMENT REQUIREMENTS

The decrease in impervious area is below the 5000 sf increase threshold, and therefore exempt from the requirements Section 5601.3

CLEAN WATER ACT SECTION 404 PERMITTING REQUIREMENTS

No jurisdictional Waters of the United States have been identified on the study site. Therefore, a Section 404 permit is not required.

FEMA/DWR PERMIT REQUIREMENTS

No FEMA permitting or submittals will be required on this site because there are no FEMA delineated floodplains on the site. A copy of the FIRM map for this area has been included in Appendix B.

CONCLUSIONS AND RECOMMENDATIONS

As outlined in the preceding report, removal of existing pavement south and west of the library building will result in a net decrease in impervious areas on the site. Therefore, runoff rates in the post-development condition will decrease, protecting downstream properties. Based on these facts and other information provided herein, we request approval of this stormwater study.