

**Preliminary Stormwater Management & Drainage Report  
Gerber Collision  
555 NW Blue Parkway  
Lee's Summit, MO**

PREPARED FOR

Burman Companies  
3885 North 20<sup>th</sup> Street  
Ozark, MO 65271

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Table of Contents

A. GENERAL INFORMATION ..... 3

B. METHODOLOGY ..... 3

C. EXISTING CONDITIONS ANALYSIS ..... 3

    Table 1: Watershed Data for Lot Area ..... 3

    Table 2: Watershed Data for Existing Drainage Area..... 4

    Table 3: Precipitation Data\* ..... 4

D. PROPOSED CONDITIONS ANALYSIS ..... 4

    Table 4: Watershed Data for Lot Area ..... 4

    Table 5: Watershed Data for Proposed Drainage Area..... 4

E. CONCLUSIONS ..... 5

**Appendix**

FEMA MAP

SITE DRAINAGE MAP

EXISTING CONDITIONS CALCULATIONS

PROPOSED CONDITIONS CALCULATIONS

NRCS WEB SOIL SURVEY



## A. GENERAL INFORMATION

The purpose of this report is to analyze the stormwater impact of the proposed automotive repair shop development. The current total lot area is approximately 2.96 acres. The lot is to be split into two lots. The total lot area of the proposed lot to be developed is approximately 2.12 acres. This preliminary stormwater is for the proposed 2.12 acre lot development.

The existing land use is commercial and the site is currently unimproved. The surrounding lots to the south and north are developed commercial lots. The lot to the east is a developed multi-family residential lot. The lot is bound to the west by public right of way.

The lot will remain commercial use. The proposed improvements include an approximate 14,200 square foot automotive repair building, drive entrances, sidewalks, modular block wall, landscaped areas, and associated parking lots. Areas not identified to be improved will be left undisturbed.

The lot generally drains to the southeast corner of the property through an existing drainage channel. The channel carries drainage from an approximate 2.7 acre drainage area upstream of the proposed development. The channel and all associated drainage ultimately discharge into an unnamed tributary within the Cedar Creek watershed.

FEMA classification for the lot is Zone X based on FIRM Map 29095C0417G, effective 1/20/2017. The existing soil is Udarents-Urban land-Sampsel complex with a Hydrologic Soil Group rating of C as determined in the NRCS Soil Inventory.

## B. METHODOLOGY

Stormwater design will be in accordance with Section 5600 of the Kansas City Metropolitan Chapter of APWA Design Criteria. Hydraflow Hydrographs Extension for Autodesk Civil 3D will be utilized to model each drainage area and point of interest to determine the runoff from the SCS, Type II 24-hr rainfall event. The rainfall events to be utilized for design shall the 2-Yr (50%) Event, 10-Yr (10%) Event, and 100-Yr (1%) event as stated in APWA Section 5600.

## C. EXISTING CONDITIONS ANALYSIS

Under the comprehensive control strategy, the peak runoff of the 1%, 10%, and 50 % storm events will be evaluated and controlled. The lot is primarily undeveloped with the exception of the private street and the drive extending north from the existing retail store to the south.

A runoff coefficient (Rational Method "C") of 0.41 was calculated for the existing lot based on the 18% impervious area and hydrologic soil group previously mentioned. An existing curve number of 78 was approximated based on the calculated runoff coefficient. Refer to the attached Existing Conditions calculations and Table 1 below.

**Table 1: Watershed Data for Lot Area**

	Curve Number	Rational Method "C"	Area (Acres)	Time of Concentration (Mins)
Pre-Development	78	0.41	2.12	8



However, it is noted that drainage area of the private street do not drain onto the lot. Additionally, fringe areas located west and southwest of the existing lot drain onto the lot. The fringe areas were included in the stormwater management plan and the offsite drainage area was excluded from the stormwater management plan. Refer to the attached drainage map.

An existing runoff coefficient (Rational Method "C") of 0.32 was calculated for the existing drainage area based on the 4% impervious area. An existing curve number of 75 was approximated for the existing drainage area based on the calculated runoff coefficient. Refer to the attached Existing Conditions Calculations and Table 2 below.

**Table 2: Watershed Data for Existing Drainage Area**

	Curve Number	Rational Method "C"	Area (Acres)	Time of Concentration (Mins)
Pre-Development	75	0.32	2.15	8

In accordance with Section 5602.6, the rainfall intensity was calculated based on the time of concentration for the site.

**Table 3: Precipitation Data\***

Storm Event	2 Yr (50% Event)	10 Yr (10% Event)	100 Yr (1% Event)
Intensity	4.76	6.53	9.21

\*Precipitation data based on Table 5602-5 in APWA 5600.

## D. PROPOSED CONDITIONS ANALYSIS

The proposed developed lot will have an average estimated 68% percent impervious with a maximum percent impervious not to exceed 80% per the City requirements. A post-developed runoff coefficient (Rational Method "C") of 0.71 was calculated based on the proposed 68% impervious area. A post-developed curve number of 90 was approximated based on the calculated runoff coefficient. Refer to the attached Proposed Conditions Calculations and Table 4 below.

**Table 4: Watershed Data for Lot Area**

	Curve Number	Rational Method "C"	Lot Area (Acres)	Time of Concentration (Mins)
Post-Development	90	0.71	2.12	6

As noted previously, the lot contains an area that does not drain onto the site. Additionally, there are fringe areas that drain onto the site. When these factors are considered, the average post-developed percent impervious for the proposed drainage area was calculated to be 54% on average. A runoff coefficient (Rational Method "C") of 0.62 was calculated for the proposed drainage area based on the proposed 54% impervious area. A post-developed curve number for the drainage area of 86 was approximated based on the calculated runoff coefficient. Refer to the attached drainage map, Proposed Conditions Calculations, and Table 5 below.

**Table 5: Watershed Data for Proposed Drainage Area**

	Curve Number	Rational Method "C"	Area (Acres)	Time of Concentration (Mins)
Post-Development	86	0.62	2.15	6



The peak runoff from the 50%, 10%, and 1% storm events will be controlled to be less than or equal to the pre-developed peak runoff flows. A detention basin is proposed to control the peak post-development runoff flows. Detailed analysis of the developed condition, including, but not limited to, inlet locations, inlet sizing, pipe sizing, post-development peak runoff flows, detention basin sizing, and detention basin stage/storage/discharge calculations will be completed during the development of final construction documents.

## **E. CONCLUSIONS**

The stormwater system will be modeled and analyzed to meet the regulations and requirements of the City and APWA Sections 5600. Runoff from the proposed improvements will be detained to control the peak flow runoff rates from the 50%, 10%, and 1% storm events. Runoff from the development will not adversely affect downstream conditions.