

PRELIMINARY STORMWATER MANAGEMENT FACILITIES REPORT FOR



Site Address:

250 NW McNary Court
Lee's Summit, MO 64086

Developer:

TM Crowley
501 Pennsylvania Parkway Suite 160
Indianapolis, IN 46280
630-441-0165

Prepared By:



Dated: November 3, 2020

STORMWATER FACILITIES MANAGEMENT REPORT
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Introduction

The proposed improvements that are depicted on the Preliminary Development Plan provides the design for the proposed development for Petsuites located at 250 NW McNary court. The development will increase the impervious area of the site therefore changing the characteristics of the stormwater runoff. The information supplied in this report will provide evidence that the Post Developed Stormwater Runoff has been mitigated appropriately with the Best Management Practices proposed for this development.

Project Narrative

TM Crowley is developing the subject property for Petsuites of America. The property size is ±2.11 acres and is located at the west end of the cul-de-sac on McNary Court. The proposed building will consist of a veterinary clinic and PetSuites for a total of 14,100 sq. ft. The overall drainage patterns of the existing area drain east to west towards the existing railroad.

FEMA Classification

This property is classified as Zone "X" areas outside the 100 year floodplain per 29095C0417G map effective date of 1/20/2017. There are no known flooding

issues. associated with this property.

National Flood Hazard Layer FIRMette



94°23'27"W 38°55'48"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, X, A99
	With BFE or Depth Zone AE, AO, AH, VE, AR Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile. Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee. See Notes, Zone X
	Area with Flood Risk due to Levee. Zone D
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard Zone X
	Effective LOWRs Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
OTHER FEATURES	20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
MAP PANELS	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/29/2020 at 10:35 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Wetland and USACE Involvement

There are no wetlands listed associated with the national wetlands inventory.










National Wetlands Inventory Map



November 2, 2020

Wetlands

- | | | | | | |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland |  | Lake |
|  | Estuarine and Marine Wetland |  | Freshwater Forested/Shrub Wetland |  | Other |
| | |  | Freshwater Pond |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Site Area Calculations

Property Size

2.11 Acres

Pre-Development Condition

2.11 Acres of Grass

CN=74

Post-Development Condition

0.69 Acres of Impervious Area (Buildings and Pavement)

CN=98

1.42 Acres of Pervious Area

CN=74

"CN" Value Weighted Average

CN=82

Methodology

The methodology used for the project is Hydro CAD 10.10-3a for determination of SCS TR-55 hydrographs. The hydraulics for the project will be determined using Autodesk Civil 3D 2020 Storm Sewer Analysis. To determine the Storm Intensity and Frequency the overall project pre-development condition and post development condition was determined by the SCS method using NOAA's precipitation intensity data from their website.

Existing Condition Analysis

The summary of comprehensive control requirements shall be per 5601.5.A.4 and 5608.4 the "Comprehensive Control" release rate strategy. Assumed time of concentration associated with the areas were used to due to the minimal area to discharge locations.

The default strategy of comprehensive protection of the 1% (100 year event), 10% (10 year event) and 50% (2 year event) is being provided with this development. Comprehensive controls shall be the following:

- 50% storm peak rate less than nor equal to 0.5 cfs per site acre
- 10% storm peak rate less than nor equal to 2.0 cfs per site acre
- 1% storm peak rate less than nor equal to 3.0 cfs per site acre

Existing Conditions Summary Table

ID	RUNOFF (cfs)	TC	IMPERVIOUS AREA (ac.)	PERVIOUS AREA (ac.)	Total Area (ac.)	COMPOSITE CN
AREA A						
2-Year	2.79	30	0.99	0.175	1.17	94
10-Year	4.43	30	0.99	0.175	1.17	94
100-Year	6.58	30	0.99	0.175	1.17	94
AREA B						
2-Year	0.12	5	0.00	0.05	0.05	74
10-Year	0.24	5	0.00	0.05	0.05	74
100-Year	0.42	5	0.00	0.05	0.05	74
AREA C						
2-Year	0.35	5	0.00	0.15	0.15	74
10-Year	0.73	5	0.00	0.15	0.15	74
100-Year	1.27	5	0.00	0.15	0.15	74
AREA D						
2-Year	0.14	5	0.00	0.06	0.06	74
10-Year	0.29	5	0.00	0.06	0.06	74
100-Year	0.51	5	0.00	0.06	0.06	74
AREA E						
2-Year	6.56	20	1.84	0.325	2.17	94
10-Year	10.38	20	1.84	0.325	2.17	94
100-Year	15.41	20	1.84	0.325	2.17	94
AREA F						
2-Year	3.57	10	0.00	1.89	1.89	74
10-Year	7.6	10	0.00	1.89	1.89	74
100-Year	13.44	10	0.00	1.89	1.89	74
AREA G						
2-Year	0.04	10	0.00	0.02	0.02	74
10-Year	0.08	10	0.00	0.02	0.02	74
100-Year	0.14	10	0.00	0.02	0.02	74
AREA H						
2-Year	0.02	10	0.00	0.01	0.01	74
10-Year	0.04	10	0.00	0.01	0.01	74
100-Year	0.07	10	0.00	0.01	0.01	74

The site is an open field with a wooded area to the west. It is surrounded by commercial properties except the west which is railroad right of way. The existing runoff drains to the west. Due to the minimal TC and unknown relationship of discharge for the offsite basin we determined a 30 minute TC for Area A otherwise areas B, C and D were five minute time of concentrations. Area F, G, and H were given 10 minute time of concentrations representing the existing onsite conditions.

There are two points of interest associated with the existing conditions.

Existing Point of Interest #1

Point of Interest #1 – Existing Runoff to West of Site

This is in relationship to the property and the overland flow to the existing railway. The discharge associated with this is shown in Areas C, D, F, G and H. Area D drains offsite to the existing inlet at the street however its discharge associated with the project remains along with a small area of Area H that drains offsite however it is nominal of an area.

ID	RUNOFF (cfs)	TC	IMPERVIOUS AREA (ac.)	PERVIOUS AREA (ac.)	Total Area (ac.)	COMPOSITE CN
AREA C						
2-Year	0.35	5	0.00	0.15	0.15	74
10-Year	0.73	5	0.00	0.15	0.15	74
100-Year	1.27	5	0.00	0.15	0.15	74
AREA D						
2-Year	0.14	5	0.00	0.06	0.06	74
10-Year	0.29	5	0.00	0.06	0.06	74
100-Year	0.51	5	0.00	0.06	0.06	74
AREA F						
2-Year	3.57	10	0.00	1.89	1.89	74
10-Year	7.6	10	0.00	1.89	1.89	74
100-Year	13.44	10	0.00	1.89	1.89	74
AREA G						
2-Year	0.04	10	0.00	0.02	0.02	74
10-Year	0.08	10	0.00	0.02	0.02	74
100-Year	0.14	10	0.00	0.02	0.02	74
AREA H						
2-Year	0.02	10	0.00	0.01	0.01	74
10-Year	0.04	10	0.00	0.01	0.01	74
100-Year	0.07	10	0.00	0.01	0.01	74
2-Year	4.12					
10-Year	8.74					
100-Year	15.43					

The values listed at the bottom of the table are the combined runoff for the storm events for the existing conditions for the runoff onsite that leads offsite or to the existing storm sewers.

Existing Point of Interest #2

This point of interest is in relationship with the neighboring stormwater runoff that is collected in what appears to be a water quality basin. This is noted as area A. A longer time of concentration was provided to address the ponding area and reduced release rate and timing. We considering this 30 minute TC as conservative and protects the proposed project from potentially overcompensating with a larger TC and our calculations would not handle to the correct amount of stormwater.

ID	RUNOFF (cfs)	TC	IMPERVIOUS AREA (ac.)	PERVIOUS AREA (ac.)	Total Area (ac.)	COMPOSITE CN
AREA A						
2-Year	2.79	30	0.99	0.175	1.17	94
10-Year	4.43	30	0.99	0.175	1.17	94
100-Year	6.58	30	0.99	0.175	1.17	94

Allowable Release Rate Calculation

Due to this project providing the comprehensive control strategy that is listed in the existing condition analysis, our storm peak rate is based from the Existing Point of Interest #1. Since our site area is larger than the area listed in Existing Point of Interest #1 a table has been provided of the allowed release rates.

	Release Rate Per Acre (ac per cfs)	Site Area (ac.)	Allowable release rate (c.f.s.)
2 Year	0.50	2.11	1.06
10 Year	2.00	2.11	4.22
100 Year	3.00	2.11	6.33

Proposed Development Analysis

The proposed project will change the existing stormwater runoff by the increase of impervious area. The bypass areas have been mitigated to the maximum extent practical and the detention has accommodated for such areas. There is an overall reduction in the total runoff based on the proposed conditions as referenced in the Differential Runoff Table. The table was derived per the event tables from HydroCAD.

The proposed project will increase the impervious surface however it will reduce the runoff for the overall disturbed area per APWA 5600. This project proposes that areas that will route through the detention will meet the allowable release rate. The bypass areas consist of existing woodlands that will remain in place therefore to meet the requirements we would have to remove the existing vegetation in place.

Due to the orifice size for the WQv event designed at 1.5" the full water volume design cannot be obtained unless the orifice size is reduced to 0.67". Most municipalities in the Midwest with extended detention or channel protection requirements do not allow an orifice size less than 1.5". While we have a larger orifice size than the calculations state for the 40 hour extended detention, we are within 0.07 cfs of meeting the release rate.

Proposed Drainage Conditions Analysis

The proposed drainage area map that is referenced in the attachments provide a visual indicator for the runoff of each drainage area map. The proposed project will change the existing stormwater runoff by the increase of impervious area. The bypass areas have been mitigated to the maximum extent practical and the detention has accommodated for such areas. There is an overall reduction in the total runoff based on the proposed conditions as referenced in the Differential Runoff Table. The table was derived per the event tables from HydroCAD.