



Braxton Copley, Deputy Director – Administration/Asset Management
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Memorandum

Date: October 28, 2020

Subject: Submitting a Request for a Waiver from the Post-Construction Water Quality Requirements of TMC 13.35.010

The City of Topeka Post Construction Stormwater Quality Policy and Topeka Municipal Code 13.35 requires land development activities that are equal to or greater than 1 acre, including projects that cause a land disturbance less than one acre that are part of a larger common plan of development, or located within an impacted watershed to implement post-construction best management practices that minimize adverse water quality impacts. However, TMC 13.35.20 allows the Director to grant a waiver for specific situations, including redevelopment when engineering studies demonstrate there is no net increase in stormwater runoff from current conditions. The waiver request shall include the following information/documentation:

- a) A brief description of the proposed land development/redevelopment project
- b) An explanation of the existing conditions of the site, along with a site plan that clearly illustrates and labels impervious areas (acres) and pervious areas (acres) of the pre-developed site.
- c) An explanation of the proposed modifications to the site, along with a site plan that clearly illustrates and labels impervious areas (acres) and pervious areas (acres) of the post-developed site.
- d) Stormwater runoff calculations for the pre-developed and post-developed conditions; including runoff for the 10-yr and 100-yr storm events. A summary of the flow reduction shall also be provided.
- e) Verification that the proposed changes to the site will not alter existing drainage patterns.
- f) Verification, in the form of runoff calculations, of the 10-yr discharge leaving the site via each driveway.

An example of a well-done waiver request is attached for reference. Upon receipt of an adequate request for a waiver from the post-construction water quality requirements, the Utilities Director will review the request. A letter will be provided to either grant or deny the waiver request.

Date:

Project No.:

To:

Subject:

Project:

Introduction

Vanfair Enterprises, Inc. is proposing to build a new 560 SF Scooters Coffee kiosk at 3830 SW 29th St., Topeka, KS. This site will have a total land disturbance of 0.63 Acres. This memo is to provide the necessary information for the proposed site to be issued a variance from the existing water quality ordinance.

Existing Conditions

The existing 0.63-acre site is currently developed with minimal green space. The site currently has:

0.15 Acres of Pervious Area
0.48 Acres of Impervious Area

See Exhibit A for existing site conditions.

Proposed Conditions

The proposed site will add approximately 0.16 acres of pervious area to the site. The proposed site will have:

0.31 Acres of Pervious Area
0.32 Acres of Impervious Area

See Exhibit B for proposed site conditions.

Stormwater Runoff Calculation

The project site stormwater runoff was calculated using the Rational Method:

$Q=CIA$ Q =Site discharge (cfs)

C =runoff coefficient

Pre-Development $C = ((0.15 \times .3) + (0.48 \times .9))/0.63 = .76$

Post-Development $C = ((0.31 \times .3) + (0.32 \times .9))/0.63 = .60$

I =Storm intensity (in/hr.),

At a time of concentration of 15 min

10year = 4.96 in/hr and 100year = 7.56 in/hr

(see Exhibit C)

Pre- and Post-development Conditions

Pre- and Post- Development Conditions	Area	Runoff Coef. "C"	Tc	Q ₁₀	Q ₁₀₀
	(ac)		(min)	(cfs)	(cfs)
Pre- Development	0.63	.76	15	2.37	3.62
Post- Development	0.63	.60	15	1.87	2.86
Pre- Post Decrease				0.50	0.76

Conclusion

Vanfair is requesting a variance from the existing water quality ordinance due to the fact that the proposed site will have more pervious area than the existing which will increase the quality of the stormwater discharge.

Sincerely,



Exhibit A
Existing Conditions

Exhibit B
Proposed Conditions

Exhibit B Proposed Site Plan



Exhibit C
Intensity Verification



NOAA Atlas 14, Volume 8, Version 2
Location name: Topeka, Kansas, USA*
Latitude: 39.015°, Longitude: -95.7257°
Elevation: 930.37 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.80 (4.01-5.80)	5.66 (4.74-6.85)	7.10 (5.92-8.62)	8.33 (6.89-10.1)	10.0 (7.98-12.6)	11.4 (8.81-14.4)	12.7 (9.47-16.5)	14.1 (10.0-18.7)	16.0 (10.9-21.7)	17.4 (11.5-24.0)
10-min	3.51 (2.94-4.24)	4.15 (3.47-5.02)	5.21 (4.33-6.31)	6.10 (5.04-7.41)	7.34 (5.84-9.20)	8.32 (6.44-10.5)	9.31 (6.94-12.1)	10.3 (7.34-13.7)	11.7 (7.95-15.9)	12.7 (8.42-17.6)
15-min	2.86 (2.39-3.45)	3.37 (2.82-4.08)	4.23 (3.52-5.13)	4.96 (4.10-6.03)	5.97 (4.75-7.48)	6.76 (5.24-8.57)	7.56 (5.64-9.80)	8.39 (5.96-11.1)	9.50 (6.46-12.9)	10.4 (6.84-14.3)
30-min	2.06 (1.72-2.49)	2.44 (2.04-2.95)	3.06 (2.55-3.71)	3.59 (2.97-4.36)	4.32 (3.44-5.41)	4.89 (3.79-6.20)	5.47 (4.08-7.09)	6.07 (4.31-8.06)	6.86 (4.67-9.34)	7.47 (4.94-10.3)
60-min	1.36 (1.13-1.64)	1.62 (1.35-1.95)	2.04 (1.70-2.47)	2.40 (1.98-2.92)	2.89 (2.30-3.61)	3.27 (2.53-4.14)	3.65 (2.72-4.72)	4.04 (2.87-5.36)	4.55 (3.10-6.19)	4.95 (3.27-6.83)
2-hr	0.840 (0.708-1.01)	1.01 (0.846-1.21)	1.28 (1.07-1.54)	1.50 (1.25-1.81)	1.81 (1.44-2.24)	2.05 (1.59-2.57)	2.28 (1.71-2.93)	2.52 (1.80-3.32)	2.84 (1.94-3.83)	3.08 (2.05-4.22)
3-hr	0.627 (0.529-0.748)	0.752 (0.634-0.898)	0.957 (0.804-1.15)	1.13 (0.940-1.35)	1.36 (1.09-1.68)	1.54 (1.20-1.92)	1.71 (1.29-2.19)	1.89 (1.36-2.48)	2.13 (1.47-2.86)	2.31 (1.54-3.15)
6-hr	0.372 (0.316-0.441)	0.446 (0.378-0.529)	0.567 (0.479-0.674)	0.668 (0.561-0.797)	0.807 (0.651-0.991)	0.915 (0.720-1.14)	1.02 (0.775-1.30)	1.14 (0.820-1.48)	1.28 (0.887-1.71)	1.39 (0.938-1.89)
12-hr	0.214 (0.183-0.252)	0.254 (0.217-0.299)	0.321 (0.272-0.378)	0.377 (0.319-0.447)	0.457 (0.372-0.559)	0.521 (0.413-0.644)	0.585 (0.447-0.740)	0.652 (0.475-0.845)	0.743 (0.518-0.986)	0.813 (0.551-1.09)
24-hr	0.124 (0.106-0.144)	0.145 (0.124-0.169)	0.180 (0.154-0.211)	0.211 (0.179-0.248)	0.255 (0.210-0.311)	0.291 (0.232-0.358)	0.327 (0.252-0.412)	0.366 (0.269-0.471)	0.419 (0.295-0.553)	0.460 (0.314-0.614)
2-day	0.071 (0.062-0.083)	0.083 (0.071-0.096)	0.101 (0.087-0.118)	0.118 (0.101-0.137)	0.141 (0.117-0.170)	0.160 (0.129-0.195)	0.179 (0.139-0.224)	0.200 (0.148-0.255)	0.228 (0.161-0.298)	0.250 (0.172-0.331)
3-day	0.052 (0.045-0.060)	0.060 (0.052-0.069)	0.073 (0.063-0.085)	0.085 (0.073-0.098)	0.101 (0.084-0.121)	0.114 (0.092-0.138)	0.127 (0.099-0.158)	0.141 (0.105-0.180)	0.160 (0.114-0.209)	0.175 (0.121-0.231)
4-day	0.042 (0.036-0.048)	0.048 (0.042-0.055)	0.059 (0.051-0.068)	0.067 (0.058-0.078)	0.080 (0.066-0.096)	0.090 (0.073-0.109)	0.100 (0.078-0.124)	0.111 (0.083-0.141)	0.126 (0.090-0.163)	0.137 (0.095-0.180)
7-day	0.028 (0.025-0.033)	0.032 (0.028-0.037)	0.039 (0.034-0.044)	0.044 (0.038-0.051)	0.052 (0.043-0.062)	0.058 (0.047-0.070)	0.065 (0.051-0.079)	0.071 (0.053-0.090)	0.080 (0.058-0.103)	0.087 (0.061-0.114)
10-day	0.023 (0.020-0.026)	0.026 (0.022-0.029)	0.031 (0.027-0.035)	0.035 (0.030-0.040)	0.041 (0.034-0.048)	0.046 (0.037-0.054)	0.050 (0.040-0.061)	0.055 (0.042-0.069)	0.062 (0.045-0.080)	0.067 (0.047-0.087)
20-day	0.015 (0.013-0.017)	0.017 (0.015-0.019)	0.020 (0.018-0.023)	0.023 (0.020-0.026)	0.027 (0.023-0.032)	0.030 (0.025-0.036)	0.033 (0.026-0.040)	0.036 (0.027-0.045)	0.040 (0.029-0.051)	0.043 (0.030-0.055)
30-day	0.012 (0.011-0.014)	0.014 (0.012-0.016)	0.016 (0.015-0.019)	0.019 (0.016-0.021)	0.022 (0.018-0.025)	0.024 (0.020-0.028)	0.026 (0.021-0.031)	0.028 (0.021-0.035)	0.031 (0.022-0.039)	0.033 (0.023-0.042)
45-day	0.010 (0.009-0.011)	0.011 (0.010-0.013)	0.013 (0.012-0.015)	0.015 (0.013-0.017)	0.017 (0.015-0.020)	0.019 (0.016-0.022)	0.020 (0.016-0.024)	0.022 (0.017-0.027)	0.024 (0.017-0.030)	0.025 (0.018-0.032)
60-day	0.009 (0.008-0.010)	0.010 (0.009-0.011)	0.012 (0.010-0.013)	0.013 (0.011-0.015)	0.015 (0.012-0.017)	0.016 (0.013-0.018)	0.017 (0.014-0.020)	0.018 (0.014-0.022)	0.019 (0.014-0.024)	0.020 (0.014-0.026)

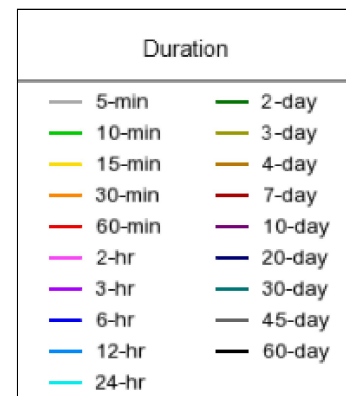
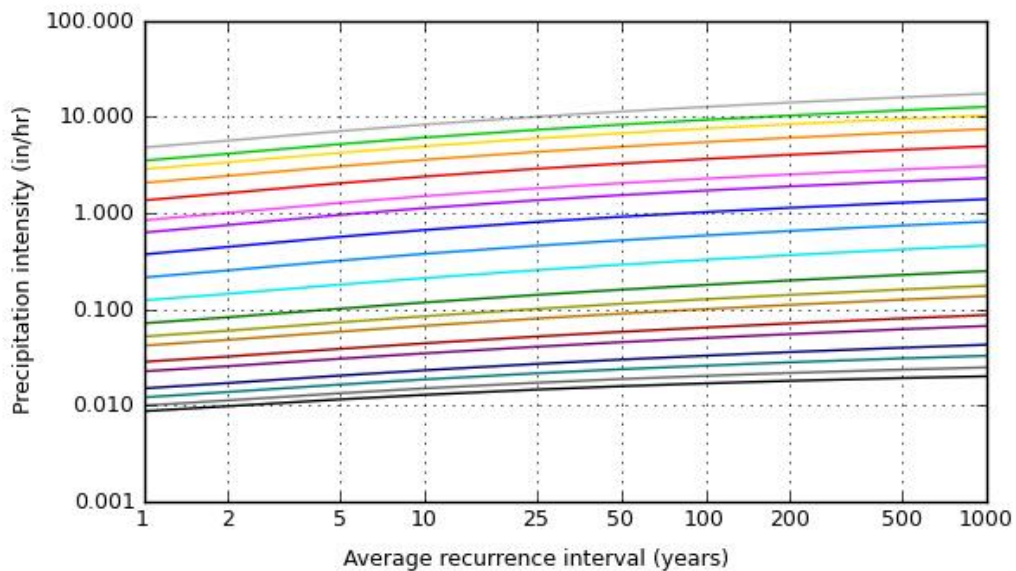
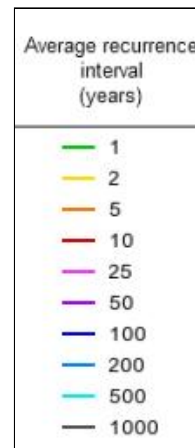
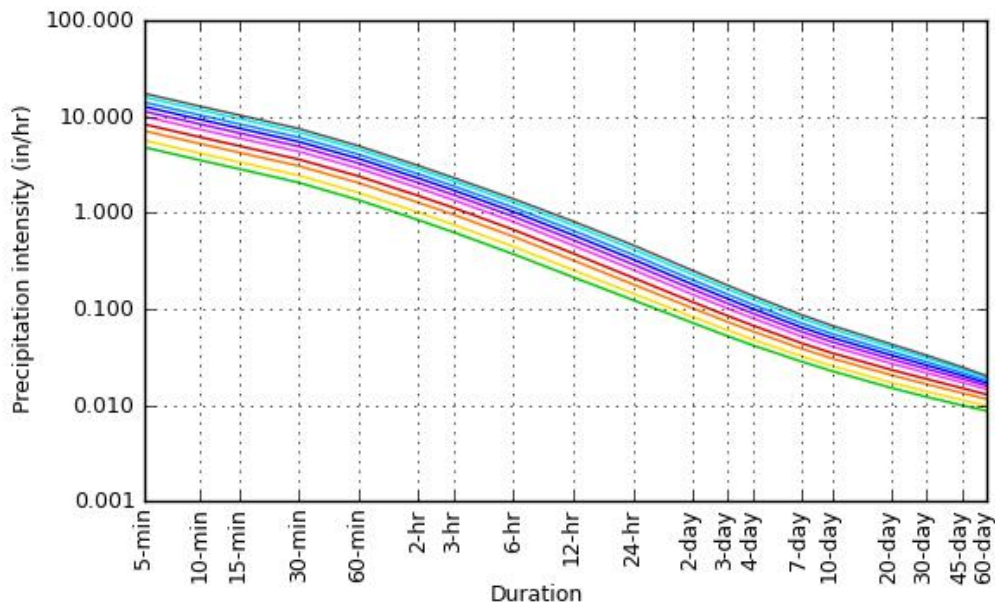
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based intensity-duration-frequency (IDF) curves

Latitude: 39.0150°, Longitude: -95.7257°



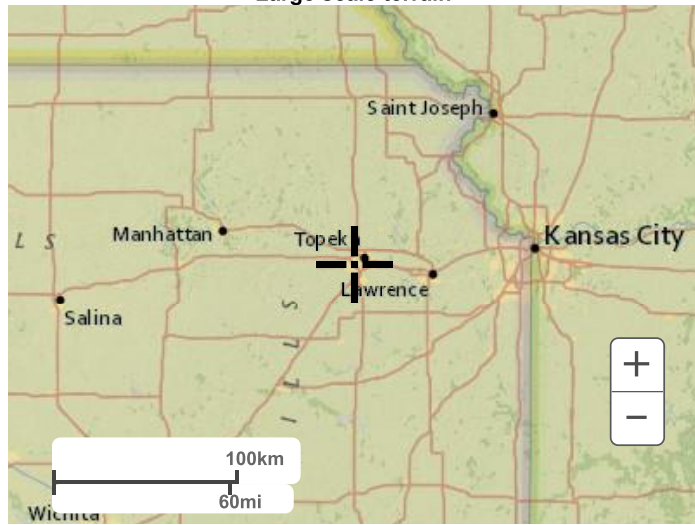
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Maps & aerials

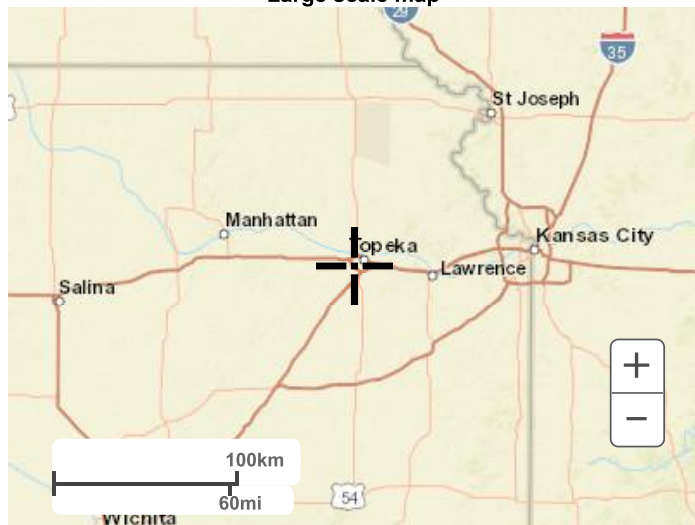
Small scale terrain



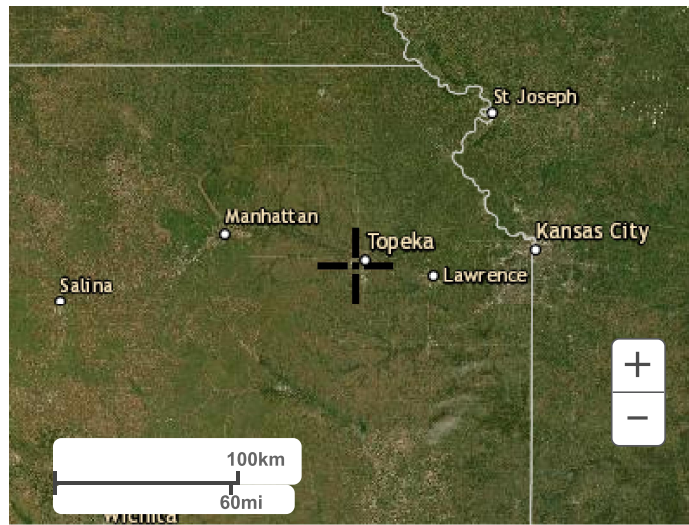
Large scale terrain



Large scale map



Large scale aerial



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