TECHNICAL MEMORANDUM: STREAM BUFFER WAIVER EXAMPLE

Stream buffers have been established around Type I, II, and III streams throughout the City of Topeka. These buffers and their limits can most easily be found using the "City of Topeka Utilities Exploration Map" located at https://data.topeka.org/apps/city-of-topeka-utilities-exploration-map/explore. Stream buffers are strips of land, extending along both sides of a stream, in which natural vegetation is restored and/or maintained. Maintaining vegetation along a stream serves several important functions, including but not limited to, slowing runoff velocities, creating diffuse flow, and reducing non-point source pollution. To protect these buffers Topeka Municipal Code (TMC) 17.10.060 prohibits several activities including; clearing of existing vegetation; grading, filling or dumping; draining the buffer area; storage, use, and/or application of pesticides; housing or grazing livestock; and storage or operation of motorized vehicles. These prohibitions can inhibit development and redevelopment within areas protected by a mapped stream buffer.

There are conditions, laid out in TMC 17.10.080 in which the Director of Utilities or their designee may grant a waiver from stream buffer requirements. Generally, these conditions are as follows: projects or activities serving a public need where no feasible alternative is available, the repair and maintenance of public improvements, developments which have had buffers applied in conformance with previously issued requirements, and developments that are redeveloping parcel(s) that are predominately impervious to maintain that impervious area. Additionally a variance may be granted, subject to approval by the Director of Utilities as well as the Planning and Development Director, which counterbalances the loss of developable land with additional density elsewhere.

The following pages contain a fictional example of a development in Southwest Topeka in which ABC Engineers has applied for a waiver request based on a development that is predominantly impervious and seeks to maintain its impervious area. In this fictional example a developer has bought 2 adjoining properties and seeks to build a new retail development which will require re-platting as one lot. This waiver has been developed to comply with the requirements for a written waiver laid out in TMC 17.10.080.c. Note that no survey or plans have been developed for the purpose of this example, but where it would be required in a true submittal has been noted. Questions concerning this technical memorandum may be directed to the City of Topeka Stormwater Engineer, or the Director of Utilities.

1.0 Figure 1 Site Map

THIS GRAPHIC SHALL CONTAIN FIELD SURVEY DATA SHOWING THE EXACT LOCATION OF STREAMS, WETLANDS, AND OTHER NATURAL FEATURES

2.0 Description

This site contains a Type I stream, known as the Shunganunga creek, and associated stream buffer across approximately the northern third of this property. Drainage travels generally from south to north where it sheet flows through the established stream buffer into the Shunganunga Creek. Contours (at 2') show that the southern two-thirds of this site is relatively flat while the northern third slopes quickly towards the creek containing slopes of nearly 25-35%. This site is comprised of approximately 1.09 acres of paved impervious area as well as an additional 0.98 acres of green space (much of this contained within the stream buffer area). The stream buffer area contains a mixture of impervious area and woody vegetation. NRCS soil data indicates two prevalent soil types, silty clay loams outside the buffer and fluvents (frequently flooded) near the stream. Find the NRCS data and descriptions attached in Appendix A. The proposed site shall maintain the same 1.09 acres of impervious area.

3.0 Figure 2 Site Plan

THIS SITE PLAN SHOWS EXACT LOCATIONS OF ALL EXISTING AND PROPOSED STRUCTURES AND IMPERVIOUS COVER AS WELL AS THE LIMITS OF EXISITNG AND PROPOSED LAND DISTURBANCE THROUGHOUT THE ENTER SITE. BELOW IS A LIMITED EXAMPLE FOR ILLUSTRATION PURPOSES ONLY. MORE DETAILED MEASUREMENTS AND LAYOUTS SHOULD BE PROVIDED.

4.0 DOCUMENTATION OF UNUSUAL HARDSHIP SHOULD THE BUFFER BE MAINTAINED

In this case, no further permanent intrusions into the buffer shall be made, however temporary encroachments into the buffer will be made for construction purposes. These shall be no more than 15 feet north of the proposed northern wall of the new retail center. These must be made in order to safely construct the new building and they shall be restored with native vegetation using a KDOT specified native wildflower mix (see Appendix B).

5.0 Alternative Plan, or Why One Does Not Exist

Unfortunately, an alternative plan is not available for this site. Required setbacks and parking spaces for this development limit the ability to adjust the location of the building as well as significant adjustments to the impervious area.

6.0 Total Area and length of Proposed Intrusion

IN THIS EXAMPLE GIS MEASUREMENTS ARE USED, THESE SHOULD BE DETERMINED BY FIELD SURVEY

The total area of permanent intrusion is approximately 0.09 acres of impervious area, and that same intrusion exists today. This intrusion is approximately 455 feet long. In addition there will be a temporary intrusion measuring 15’ wide x 212’ long for a total area of 3,180 sq ft.

7.0 Proposed Mitigation

The permanent structure shall intrude no further into the stream buffer than the existing development does, and the temporary intrusion shall be restored to existing grade and using a K-DOT native wildflower mix (Appendix B) to establish native vegetation.

NOTE THIS IS AN EXAMPLE ONLY. THE DIRECTOR MAY REQUIRE ADDITIONAL DOCUMENTATION INCLUDING SITE DESIGN, LANDSCAPE PLANTING, FENCING, THE PLACEMENT OF SIGNS, AND THE ESTABLISHMENT OF WATER QUALITY BMPS IN ORDER TO REDUCE ADVERSE IMPACTS ON WATER QUALITY, STREAMS, WETLANDS, AND FLOODPLAINS (TMC 17.10.080.D)

APPENDIX A: NRCS SOIL DATA

Shawnee County, Kansas

9982—Fluvents, frequently flooded

Map Unit Setting

National map unit symbol: 1lyxf
Elevation: 730 to 1,700 feet
Mean annual precipitation: 31 to 47 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 175 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvents and similar soils: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvents

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: About 33 to 38 inches
Frequency of flooding: Frequent
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Unranked

Minor Components

Aquolls

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R106XY032NE - Subirrigated

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Shawnee County, Kansas
Survey Area Data: Version 20, Sep 14, 2021

Shawnee County, Kansas

7173—Reading silty clay loam, rarely flooded

Map Unit Setting

National map unit symbol: 2tpxm
Elevation: 980 to 1,660 feet
Mean annual precipitation: 31 to 38 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 175 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Reading, rarely flooded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reading, Rarely Flooded

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 8 inches: silty clay loam
A - 8 to 14 inches: silty clay loam
Bt1 - 14 to 39 inches: silty clay loam
Bt2 - 39 to 56 inches: silty clay loam
C - 56 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 12.6 inches)

Interpretive groups

Land capability classification (irrigated): 1

Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: R076XY113KS - Loamy Lowland
Hydric soil rating: No

Minor Components

Chase, rarely flooded
Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R076XY113KS - Loamy Lowland
Hydric soil rating: No

Ivan, occasionally flooded
Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R076XY113KS - Loamy Lowland
Hydric soil rating: No

Tully
Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R076XY115KS - Loamy Hills
Hydric soil rating: No

Kennebec, occasionally flooded
Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R076XY113KS - Loamy Lowland
Hydric soil rating: No

Wabash, occasionally ponded
Percent of map unit: 1 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R106XY065NE - Wet Subirrigated
Hydric soil rating: Yes

Aquolls, occasionally ponded
Percent of map unit: 1 percent
Landform: Depressions on flood plains
Down-slope shape: Linear, concave

Across-slope shape: Linear, concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Shawnee County, Kansas
Survey Area Data: Version 20, Sep 14, 2021

APPENDIX B: NATIVE WILDFLOWER MIX

Table 2
Native Wildflower Mix (KDOT)

COMMON NAME	RATE (PLS lbs/acre)
Black Eyed Susan	0.10
Illinois Bundleflower	1.80
Maximilian Sunflower	0.15
Purple Prairie Clover	0.40
Showy Partridge Pea	2.90
Upright Prairie Coneflower	0.10
Butterfly Milkweed	0.30
Stiff Goldenrod	0.10
Pinnate Prairie Coneflower	0.05
Lance-leaf Coreopsis	0.10
New England Aster	0.05
Pale Purple Coneflower	0.20
Plains Coreopsis	0.05
Hoary Verbena	0.05
Roundhead Lespedeza	0.30
Thickspike Gayfeather	0.40
Wild Bergamot	0.05
Smooth Oxeye	0.20
Lemon Mint	0.05
	7.35