



# **DEVELOPMENT ASSISTANCE BROCHURE #10-2**

## **Final Mitigation Plans for Wetlands, Streams, and associated buffers**

The following information is provided to help applicants and their consultants prepare and submit final mitigation plans that expedite the City of Kent review. Requirements and guidelines for mitigation plans are authorized under Kent City Code Chapter 11.06 Critical Areas.

As many plan sheets should be used as will make the resulting plan set legible to all reviewers, consultants, landscapers, contractors, inspectors, and other users. Plan graphics and report text must be provided on the same plan sheets. Plan sheets are to match project final engineering sheet sizes, and shall be either 24" x 36" or 22" x 36".

The City recognizes that there may be cases in which all of the information is not practical (e.g., very small projects) or that providing more information might be necessary (e.g., large or complex projects). In the majority of cases, and unless otherwise authorized by the City of Kent, the applicant shall provide all of the information in this guidance document.

### **1.0 Project Cover**

- Project Name (Location, address, Tax Parcel Number)
- Reference Numbers (i.e., Corps application numbers)
- Date of preparation
- Who it was prepared for/contact information
- Who it was prepared by/contact information.
- Date of Wetland Delineation, who it was prepared by/contact information, and date of delineation approval.
- Party(ies) responsible for monitoring, long-term maintenance, and contingency plans. (This information is to be updated as necessary with submittal of monitoring reports.)

### **2.0 Mitigation Summary**

These tables are to be included in submitted final mitigation plans.

<b>MITIGATION SITE SUMMARY</b>		
<b>Location Information</b>	<b>Wetland Impact site(s)</b>	<b>Mitigation site(s)</b>
Tax Parcel No.(s)		
Section, Township, Range		

2.0 Mitigation Summary, continued

WETLAND IMPACT SITE(S)						
Wetland Name	On-site Size (acres)	Does the wetland continue off-site? (Y/N)	Type of Wetland (404, Isolated, PCC)	Wetland Rating & Habitat Score	Landscape Position (Floodplain, Terrace, Slope, etc.)	HGM Class (Depressional, Rivervine, Slope, etc.)
<b>Total acres of wetland impact:</b>						
<b>Total wetland acres on-site:</b>						

ACRES OF WETLAND IMPACTS AND MITIGATION (Cowardin classification)							
Wetland Type	Acres Impacted	Restoration (acres)	Creation (acres)	Enhancement (acres)	Total acres of mitigation	Mitigation ratios per KCC	*Other Mitigation Provided
Forested							
Scrub-shrub							
Emergent							
Open Water							
Aquatic Bed							
*Other							
<b>Total</b>							

\*Describe other impacts: (streams, lakes, etc.) and/or other mitigation activities.

### 3.0 Implementation Schedule

- Provide a detailed construction sequence for grading, planting, etc. that is consistent with civil construction plans.
- The City of Kent must receive notice that Construction phase of Installation has begun by the date noted on Mitigation Bond, generally within 60 days of bonding.
- Mitigation must be installed according to the approved mitigation plan.
- Installation must be supervised by a qualified biologist, a signed letter from the biologist must be provided to the City of Kent indicating that grading, if required, has been completed as approved (Kent City Code 11.06.660). Mitigation projects may require a letter from a qualified biologist confirming grading of mitigation areas prior to commencing planting of vegetation, and a second letter from the biologist confirming mitigation installation.

### 4.0 Proposed Project Development

#### 4.1 Project Description

- Describe the development project (not just the wetland area that will be affected by the development project). Examples include: residential subdivision, single-family residence, commercial/industrial facility, roads, utility line installation.

#### 4.2 Description of the Development Site

- Describe existing conditions of the proposed development site, including topography and all critical areas and classification of critical areas present.
- Describe if existing buffers are currently degraded (as defined within Kent City Code 11.06.227), and description of surrounding land uses. If the buffers, including both standard buffers and buffers which are averaged, are degraded, they shall be restored during development (Kent City Code 11.06.600.E).

### 5.0 Mitigation Approach and Impact Assessment

#### 5.1 Mitigation Approach

- Describe the specific steps taken to avoid and minimize impacts to the maximum extent practicable as outlined in Kent City Code 11.06.380 and 11.06.550.

#### 5.2 Mitigation Impact Assessment

Describe how the development project will affect wetlands and other aquatic resources, including long-term, short-term temporary, indirect, and direct impacts. A description of following should be included in the assessment:

- Area (acreage) and landscape position of wetland(s) being affected by the development project.
- Water regime that will be affected.
- Soil characteristics of the wetland(s), and buffers. Provide a description of any proposed soil amendments.
- Vegetation and/or plant communities of the wetland(s) and buffer(s).
- Fauna known to use the wetland. Identify if endangered, threatened, sensitive, and candidate animal or plant species are known to occur in the general area. Identify if priority species or priority habitat is present as defined and listed by the Washington State Department of Fish and Wildlife.
- Functions provided by the wetland that will be impacted. The type of information needed (qualitative versus quantitative) and therefore the method used to assess functions, varies depending on the scale of the impact and complexity of the wetland. Include a description of the sampling and assessment methods used. *In order to compare the impact site with the mitigation site, it is imperative that the methods used for assessing each be the same.*

#### 6.0 Mitigation Site

Describe the site(s) selected for mitigation and rationale for the choice. A description of the mitigation site(s) shall include the following:

- Existing/Baseline Conditions of the Mitigation Site. Information provided should demonstrate that the chosen mitigation site or sites has the potential to meet the overall goals and

objectives of the mitigation project.

- Water regime of the Mitigation Site. Describe the water regime at the mitigation site(s), including the existing water regimes, source of water to the mitigation site, expected water depth(s), average outflow (winter, spring, summer, fall).
- Both qualitative and quantitative description of the water regime and how adequate amounts of water will be provided to support a wetland over the long term is required. Applicants are required to ensure that the proposed development does not result in adverse impacts to regulated wetlands and/or buffers.
- Applicants must demonstrate that detailed hydrologic calculations and analysis have been performed by a qualified wetland professional or civil engineer with experience in wetland mitigation design. Mitigation design must be driven by the results of these detailed hydrologic calculations and analysis. Acceptable computer models include Department of Ecology WWHM, HSPF, and KCRTS.
- Soil characteristics of the mitigation site(s). Pervious areas that have been cleared or graded during building construction shall have the soil moisture holding capacity restored. Soil amendments when necessary shall be 45% organic matter content for emergent wetlands, 30% organic for wooded wetlands, and 20% organic for buffers. Unless otherwise authorized, soil amendments shall be completed between May 1 and October 1.
- No slopes graded to steeper than 5:1 in buffer or 10:1 in wetlands will be allowed, unless otherwise approved by the City of Kent.
- Vegetation and/or plant communities of the mitigation site. No shade-dependent plant species will be designed or installed in direct sun.
- Functions provided by the mitigation site. Discuss how the mitigation plan will compensate for lost and degraded functions. Provide rationale for each proposed function and describe the design features that would contribute to providing the function. Functions

of the reference mitigation site shall also be assessed and discussed.

## **7.0 Mitigation Goals, Objectives, and Performance Standards**

- Describe long-term goals of the mitigation project and objectives for each goal. A minimum of at least one measurable objective shall be included for each goal.
- List Performance standards that will be used to assess whether the project is achieving its objectives. Ecological performance standards must be based on the best available science that can be measured or assessed in a practicable manner.
- Performance standards pertaining to water regime, vegetative structure and establishment, and hydric soil formation are to be established for all mitigation projects.

## **8.0 Monitoring Plan**

Monitoring plans are to include the following:

- Variables to be measured (i.e., plant survival, canopy cover, plant diversity, water levels and duration of inundation/saturation).
- Schedule and methods for sampling each variable throughout the entire monitoring period. Scientific procedures are to be used for establishing the success or failure of the project.
- The mitigation plan must address the monitoring requirements for the compensatory mitigation project, including the parameters to be monitored, the length of the monitoring period (5 years minimum), the party responsible for conducting the monitoring, the frequency for submitting monitoring reports to the City.
- A map of the sampling locations for each variable (can be identified on as-built mitigation drawings).
- Mitigation monitoring photo locations should be established that will provide a clear depiction of the mitigation site throughout the duration of the monitoring period.

## 9.0 Maintenance Plan

Maintenance extends from planting final acceptance and continues throughout the length of the mitigation monitoring period following final acceptance of planting.

Maintenance plans are to include the following:

- A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed. Provide a description of a plan for activities such as inspecting irrigation systems, replacing plants, preventing and/or managing animal grazing, removing trash.
- An adaptive management plan or contingency plan. A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource.
- A timetable and methods that will be used to control non-native, invasive, and noxious plants. Unless otherwise authorized, removal of invasive and noxious plants shall be done by hand, with hand-pulling of all weeds within the drip ring of any installed woody plant. NO weed-whipping will be allowed between woody plants within cluster or clumped plantings.
- Maintenance plans shall include all actions required to maintain plants free of insects and disease eliminate competition with grasses and weeds, and die-back or mortality due to inadequate soil moisture.
- Emergent plants shall be enclosed in waterfowl exclusion fencing, consisting of the following: a perimeter fencing of either chicken wire or plastic construction limits fencing (high enough to stand at least 2-3 feet above maximum water surface elevation) PLUS additional plastic/wire fencing woven as a random pattern throughout the interior portion of the emergent zone to preclude waterfowl from landing on the water surface inside the perimeter fencing to graze on the emergent plants. All of this fencing shall be removed after the third winter, post-installation.
- Remove silt fences when adjacent herbaceous vegetation reaches one foot in height or as approved by the City of Kent.

## 10.0 Contingency Plan

- Outline the steps and corrective measures that will be taken if monitoring indicates that performance standards are not being met. The contingency plan should outline the steps that will be taken for each performance standard if it is not met.
- Contingency plans can include, but are not limited to: regrading, additional plant installation, erosion control, modifications to hydrology, and plant substitutions of type, size, quantity, and location. Such Contingency Plan shall be submitted to the City of Kent by December 31 of any year when deficiencies are discovered.

## 11.0 Mitigation Site Plan Designs

Mitigation site plans shall include the following (as applicable):

### 11.1 Vicinity Map

- North arrow.
- Driving directions from the nearest highway.
- Street names/numbers.

### 11.2 Site Plan

- An overall development site plan identifying location of critical area and/or buffer impacts and mitigation area(s).
- Location of wildlife-passable fencing and sensitive areas signs (Kent City Code 11.06.630).

### 11.3 Temporary Erosion and Sediment Control Plan

- Temporary erosion and sediment control methods (standard specifications and details can be included with civil engineering plan set with reference to applicable sections). Include a schedule and sequencing for removal of temporary erosion control structures.

### 11.4 Clearing and Grubbing Plan

- Identify vegetation to remain and vegetation to be removed from the mitigation site. Specifications shall include methods for protecting existing vegetation to remain and identification of disposal methods for vegetation removed.
- Plans shall include contingency measures for incidental damage done to vegetation specified to remain.

## 11.5 Grading Plan

- Grading plans and specifications for mitigation sites, if applicable, must be included in the project civil engineering plans sheets. Refer to the City of Kent Development Assistance Brochure #1-3 Excavation and Grading Permits and Grading Plans for additional information for grading plan requirements.

## 11.6 Planting Plan

Planting types and densities should be specific to demonstrated hydrology and site conditions. The following densities should enable mitigations to meet their performance standards. Quantities are average, based on container-grown material – divisions, slips, cuttings, and bare-root materials require higher planting densities to compensate for lower survival rates. Rough equation to correlate is: 1'-3' = 1 gal.; 2'-4' = 2 gal.; 4'-6' = 5 gal. Planting densities only give figures for total plants per area – plants should be placed in random, naturalized clusters. The City of Kent does not permit balled and burlaped plants for mitigation projects.

The following guidelines are minimum acceptable densities per plant community. Densities may vary according to site conditions and design, subject to approval by the City of Kent. When adjacent to sidewalks, trees shall be located at a distance to prevent future sidewalk buckling from mature root structures. Note: Mulch rings are to be applied to all trees and shrubs in buffer planting areas. Refer to the City of Kent planting specifications details for further information.

Emergent Wetlands (FAC, FACW, OR OBL Species) are to be planted to:

- Emergents 1' O.C., or one per square foot of area (this assumes 10" plug or 4" pot).
- Vegetation for created and/or enhanced emergent wetlands is to be container grown and not site seeded.

Shrub Wetlands (FAC, FACW, OR OBL Species) are to be planted to:

- Shrubs 5' O.C., or 0.04 per square foot of area; (this assumes 2 gal. size);
- **Plus** herbs and groundcovers 4' O.C., or 0.063 per square foot of area; (10" plug or 4" pot); or hydroseed between woody plants with a native seed mix comprised of grasses, forbs, and herbs.

Forested Wetlands (FACU- TO FACW Species) are planted to either:

- Trees 9' O.C., or 0.012 per square foot of area; (this assumes 2-5 gal. size) – such trees are to be at least 50% conifers unless otherwise approved by the City of Kent;
- **Plus** shrubs 6' O.C., or 0.028 per square foot (this assumes 1-2 gal. size);
- **Plus** herbs and groundcovers 4' O.C., or 0.063 per square foot of area (10" plug or 4" pot); or hydroseed between woody plants with a native seed mix comprised of grasses, forbs, and herbs.

OR A Two-Step Process:

- Plant alders, cottonwood, willows (other seral species, e.g., big-leaf maple, Douglas fir, as appropriate to site) at densities of 8' O.C., or 0.016 per square foot (assumes 2 gal. size); **plus** overseed with a native seed mix comprised of grasses, forbs, and herbs.
- After three years or greater than 85% survival, underplant with: Conifers (e.g., Sitka spruce, western red cedar, hemlock in a wetter-to-drier continuum) 12' O.C., .007 per square foot of area, (this assumes 2-5 gal.size); **Plus** shade-tolerant or dependent sub-canopy species (e.g., Indian plum, vine maple, etc.) 9' O.C., .012 per square foot of area, (assumes 1-2 gal. size).

Buffers (UPL, FACU, OR FAC Species) are to be planted to:

- Trees 9' O.C., or 0.012 per square foot of area; (this assumes 2-5 gal. size) – such trees are to be at least 50% conifers;
- **Plus** shrubs 6' O.C., or 0.028 per square foot (this assumes 1-2 gal. size);
- **Plus** herbs and groundcovers 4' O.C., or 0.063 per square foot of area (10" plug or 4" pot); or overseed with a native seed mix comprised of grasses, forbs, and herbs.

**At a minimum, planting plans shall depict the following information:**

- Topographic map on which the distribution and spacing of vegetation to be planted is displayed.
- Existing trees more than 6-inches caliper with identification symbol. For additional information regarding tree identification and retention requirements, refer to Kent City Code 15.08.240 Preservation of Trees.

- List of plant materials (common and Latin name of each species to be used, size of each that will be planted, quantity and spacing).
- Cross-section drawing showing water levels in relation to plant distributions. The projected average water level during winter wet season, early growing season, and late summer dry season shall be depicted.
- Habitat structures and features as applicable.

### **11.7 Mitigation Plan Specification and Details**

Include mitigation specifications and details as needed to assure success. At a minimum and as applicable, the following details shall be included:

- Planting details; use City of Kent details for trees and shrubs.
- City of Kent standard split-rail wooden wildlife fencing.
- City of Kent standard Sensitive Areas Signs.
- Habitat structures and details. Large woody debris (LWD) is coniferous logs with a diameter of at least 12-inches along 6 feet of the length and a minimum total length of 20 feet, with root wads attached. Individual root wads as habitat features are coniferous species that are < 6 feet long with a minimum bole diameter of 8 inches. Large wood includes whole coniferous trees with root wad and limbs attached, or pieces of trees with or without root wads and limbs. Snags are coniferous species that are 20 feet minimum in length **with branches intact**. Snags are to be installed to a minimum depth of one-fourth of the tree height.
- Hydraulic controls (i.e., weirs, inlets and/or outlets). Note: water control structures and special features to be shown in both plan and cross-section.
- Description of method for irrigating the plants until they are established, including frequency and amount of water. Supplemental water is recommended for a minimum of two growing seasons.

### **12.0 Bond Quantity Worksheet**

- A Sensitive Areas Bond Quantity Worksheet is to be submitted with the Final Mitigation Plan for Wetlands, Streams, and associated buffers.