



King County

King County Flood Hazard Certification

Project Name: _____

Parcel Number(s): _____ DPER Permit Number: _____

This form is current as of August 29, 2013.

Section A.1 *(to be completed by applicant or applicant's engineer)*

The goal of Section A.1 is to identify the type and location of the flood hazards on the project parcel and identify study requirements. If the proposed project does not meet the exemptions listed under Zero-Rise Analysis, Compensatory Storage Analysis, or Base Flood Depth and Base Flood Velocity Analysis, then you may need to do the specific analysis. If there are flooding issues on the project parcel, but they are not mapped, then you may need to do the specific analysis.

Find FEMA Map information at <http://www.kingcounty.gov/environment/waterandland/flooding/maps.aspx> or go directly to FEMA's site <https://msc.fema.gov>

The proposed development site lies at least partially within the King County regulatory floodplain based on review and determination from any of the following sources:

- FEMA Flood Insurance Rate Map (FIRM): Panel # _____ Panel date: _____
- Special Study as required by section 4.4.2 of the King County Surface Water Design Manual
- Other: (please note source) _____

Zero-Rise Analysis

Based on section 21A.24.250 of the King County Code, and section 4.4.2 of the King County Surface Water Design Manual, the proposed development cannot create a measurable change to the water surface elevation or energy grade line for the 100-year flood event (base flood elevation). This is to be determined and certified by a registered professional engineer using standard methods and practices accepted by the King County Department of Natural Resources and Parks (DNRP) and will be referred to as a "zero-rise analysis".

Based on a review of the potential impacts of this project, a "zero-rise analysis":

- Is required. Completion of Section B of this form by a professional engineer licensed in the State of Washington is a condition of the issuance of this permit.
- Is not required for the following reasons:
 - Elevating or improvement to an existing structure without increasing the foundation footprint of the structure.
 - Post and pier foundation system with no significant impedance to flow.
 - Coastal "A", "VE", "AE" zone.
 - Shallow flooding area (AO/AH zone) not adjacent to a riverine system. (Explain) _____
 - Ineffective flow area. (Explain) _____
 - Proposed project lies within a hydraulic shadow. (explain) _____
 - Other (explain) _____

Compensatory Storage Analysis:

Based on section 21A.24.240 of the King County Code, the proposed development cannot reduce the effective base flood storage volume of the floodplain, and must provide compensatory storage if grading or other activity displaces any effective flood storage volume. This is to be determined and certified by a registered professional engineer using standard methods and practices accepted by the King County Department of Natural Resources and Parks (DNRP) and will be referred to as a “compensatory storage analysis”.

Based on a review of the potential impacts of this project, a “compensatory storage analysis”:

- Is required. Completion of Section B of this form by a professional engineer licensed in the State of Washington is a condition of the issuance of this permit.
 - Is not required for the following reasons:
 - Elevating or improvement to an existing structure without increasing the foundation footprint of the structure.
 - Post and pier foundation system with no significant reduction in flood storage.
 - Grading or fill placed within the foundation of an existing residential structure to bring the interior foundation grade to the same level as the lowest adjacent exterior grade.
 - Other (explain)
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Base Flood Depth and Base Flood Velocity Analysis

Based on section 21A.24.240 of the King County Code, development proposals and alterations are not allowed if the base flood depth exceeds three feet and the base flood velocity exceeds three feet per second. This is to be determined and certified by a registered professional engineer using standard methods and practices accepted by the King County Department of Natural Resources and Parks (DNRP) and will be referred to as a “base flood depth and base flood velocity analysis ”.

Based on a review of the potential impacts of this project, a “base flood depth and base flood velocity analysis”:

- Is required. Completion of Section B of this form by a professional engineer licensed in the State of Washington is a condition of the issuance of this permit.
 - Is not required for the following reasons:
 - The structure is an agricultural structure and will not be used for human habitation.
 - Elevating or improvement an existing structure without increasing the foundation footprint of the structure.
 - Other (explain)
-

Submitted by: _____ Date: _____
Applicant or Applicant’s Engineer

Section A.2 *(to be completed by the DPER Drainage Engineer when applicable)*

DPER Drainage Engineer Certification

- (For sites in unmapped flood hazard areas) The development proposal site is not within the unmapped flood hazard area based on inspection of the site, and therefore further flood hazard review is not required.
- The development proposal does not involve any site disturbance, clearing, or grading, and therefore only requires a permit or approval under K.C.C. chapter 16.04 or 17.04. Further flood hazard review is not required.

Reviewed by: _____ Date: _____
DPER Drainage Engineer

Section B (to be completed by the applicant's engineer)

The goal of Section B is to identify and present which analytical methodologies were used to demonstrate compliance with the King County Code. This section shall be completed by an engineer licensed in the State of Washington when an analysis is required per Section A.

I have considered the hazards represented on Panel _____ of the Flood Insurance Study for King County, dated _____, _____, and the supporting documentation for DPER Permit Number _____. I have also searched for and considered all other available information including: Preliminary Flood Insurance Rate Maps (P-FIRMs); Preliminary Flood Insurance Studies; Draft flood boundary work maps and associated technical reports; Critical areas reports prepared in accordance with FEMA standards set forth at 44 C.F.R. Part 65 and consistent with the King County Surface Water Design Manual provisions for floodplain analysis set forth at section 4.4.2; Letter of Map Amendments (LOMAs); Letter of Map Revisions (LOMRs); Channel migration zone maps and studies; Historical flood hazard information; and Site topography and ground elevations. All sources are clearly identified in the attached report. In addition, I have created new data where existing sources are not sufficient to assure compliance, and the attached report clearly documents my methods and assumptions.

I certify that the attached technical data supports the fact that this submitted design will meet requirements for protection of floodplain storage and floodplain conveyance, as well as base flood depth and base flood velocity requirements, as set forth in King County Code, Title 21A. Compliance is achieved as described below.

Code Requirement	Analytical Methodology (check one or more)	Engineering Certification Required?
No impact to 100-year flood elevations, floodway elevations and floodway widths (no encroachments or obstruction of floodwaters). No reduction in floodplain conveyance both onsite and on adjacent properties, during 100-year flood event ("zero-rise" floodplain).	<input type="checkbox"/> Hand calculations showing that flood conveyance ($K=1.49/n AR^{2/3}$) will equal or exceed existing values at every location.	Yes
	<input type="checkbox"/> HEC-RAS analysis showing that neither the water surface nor the energy grade will rise by even 0.01 feet at any location when proposed conditions are compared to existing conditions.	Yes
	<input type="checkbox"/> Other. See attached information.	Yes
Compensatory floodplain storage provided (no net fill).	<input type="checkbox"/> Volumetric calculations to show that compensatory storage provides equivalent volume at equivalent elevations to that being displaced, and is hydraulically connected to the source of flooding. For this purpose, equivalent elevations means having similar relationship to ordinary high water and to the best available ten-year, fifty-year and one-hundred-year water surface profiles;	Yes
	<input type="checkbox"/> Other. See attached information.	Yes
Base flood depth does not exceed 3 feet or base flood velocity does not exceed 3 feet per second.	<input type="checkbox"/> Base flood depth and base flood velocity mapping and data show less than 3 feet depth or less than a velocity of 3 feet per second at the project location.	Yes
	<input type="checkbox"/> Other. See attached information.	Yes

Attached are all support data and calculations.

Professional Engineer's stamp, if methodology requires certification.

Signature

Date

Name and Title

Company

Address

City, State, Zip

Section C (to be completed by the DNRP, RFMS engineer)

Based on a review of the subject development proposal, the River and Floodplain Management Section of the Department of Natural Resources and Parks determines the following:

- No flood hazard analysis is required.
- A flood hazard analysis is required and the development proposal meets the zero rise, compensatory storage, and base flood depth and base flood velocity requirements of King County Code 21A.24.24.240, 21A.24.250, 21A.24.260 and the King County Surface Water Design Manual Section 4.4.2. This determination does not include a review of the other flood hazard areas standards in King County Code 21A.24.240, 21A.24.250, 21A.24.260, 21A.24.270, and 21A.24.272.
- A flood hazard analysis is required and the development proposal meets the zero rise, compensatory storage, and base flood depth and base flood velocity requirements of King County Code 21A.24.24.240, 21A.24.250, 21A.24.260 and the King County Surface Water Design Manual Section 4.4.2; however this approval is with additional comments or conditions (DNRP, RFMS shall provide comments in an e-mail or another written format to DPER).
- A flood hazard analysis is required and the development proposal *does not* meet the zero rise, compensatory storage, and base flood depth and base flood velocity requirements of King County Code 21A.24.24.240, 21A.24.250, 21A.24.260 and the King County Surface Water Design Manual Section 4.4.2.

Reason(s) not approved:

Reviewed by: _____
DNRP, RFMS Engineer

Date: _____