CITY OF MUKILTEO

Date Stamp

Floodplain V Zone Design Certificate

This certificate is required for all new or substantially improved structures in the VE Zone. Structures in Velocity Zones, or "V Zones", are subject to a greater hazard than structures constructed in other types of floodplains. Not only do they have to be elevated above the Base Flood Elevation (BFE), they must be protected from the impact of waves from hurricane-force winds and coastal erosion.

As part of the agreement for making flood insurance available in Mukilteo, the National Flood Insurance Program (NFIP) requires the city to adopt floodplain management regulations that specify minimum design and construction requirements. Those requirements include a certification of the structural design and the proposed methods of construction.

The Federal Emergency Management Agency (FEMA) recommends that the design professional use American Society of Civil Engineers (ASCE) publications "*ASCE 24: Flood Resistant Design and Construction*" and "*ASCE 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*" as appropriate engineering standards.

Specifically, NFIP regulations and Mukilteo's floodplain management regulations require that:

1. A registered professional engineer or architect shall develop or review the structural design, specifications, and plans for the construction.
2. A registered professional engineer or architect shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice in meeting these criteria:
    a. The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to, or above, the Base Flood Elevation (BFE).
    b. The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. ASCE 7 provides guidelines on different load combinations, which include flood and wind loads.

The V Zone Design certification should take into consideration the NFIP Free-of-Obstruction requirement for V Zones. The space below the lowest floor must be free of obstructions (e.g., building element, equipment, or other fixed objects that can transfer flood loads to the foundation, or that can cause floodwaters or waves to be deflected into the building), or must be constructed with non-supporting breakaway walls, open lattice, or insect screening (see NFIP Technical Bulletin 5, available online at https://www.fema.gov/nfip-technical-bulletins).

Note: The V Zone design certificate is not a substitute for the Elevation Certificate (, which is required to certify as-built elevations needed for flood insurance rating.

Please complete the attached certificate and submit it to the Permit Center. Staff will review the form to determine if any additional information is needed.

Additional information about floodplains can be found in Chapter 15.12 of the Mukilteo Municipal Code. Maps of the floodplain areas can be found online at:

- Mukilteo's Critical Areas Map, available at https://mukilteowa.gov/maps/interactive-maps/, or
- FEMA's Flood Map Service Center, available at https://msc.fema.gov/portal/advanceSearch

CITY OF MUKILTEO

V Zone Design Certificate

☐ **Pre-Construction** ☐ **As-Built**

Date Stamp

Certificate and plans must be signed by a professional engineer or architect licensed in Washington State.

Name: _____ NFIP Policy No.: *For Insurance Company Use Only*

Project Location: _____ Permit No(s): _____

SECTION I: FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Community: **Mukilteo (530235)** FIRM Map (June 19, 2020): ☐ **53061C1010F** ☐ **53061C1015F** FIRM Zone: **VE**

SECTION II: ELEVATION INFORMATION USED FOR DESIGN

This section documents the elevations / depths used in the design. It does not replace the required Floodplain Elevation Certificate.

1. FIRM Base Flood Elevation (BFE) _____ Feet (NAVD 88)
2. Elevation of the Bottom of the Lowest Horizontal Structural Member _____ Feet (NAVD 88)
3. Elevation of the Lowest Adjacent Grade _____ Feet (NAVD 88)
4. Approximate depth of Anticipated Scour / Erosion Used for Foundation Design _____ Feet (NAVD 88)
5. Embedment Depth of Pilings of Foundation Below Lowest Adjacent Grade _____ Feet (NAVD 88)

SECTION III: V ZONE DESIGN CERTIFICATON STATEMENT

I certify that I developed or reviewed the structural design, plans and specifications for construction. The design and methods of construction to be used are in accordance with accepted standards of practice for meeting the following:

- The bottom of the lowest horizontal structural member of the lowest floor (excluding piles and columns) is elevated to or above the BFE; and
- The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the combined effects of wind and water loads acting simultaneously on all building components. Water loading values used are those associated with the base flood. Wind loading values used are those required by the applicable state or local building code. The potential for scour and erosion at the foundation has been anticipated for conditions associated with the base flood, including wave action.

For "As Built" certifications, I certify that construction was done in accordance with the design parameters above.

SECTION IV: BREAKAWAY WALL DESIGN CERTIFICATON STATEMENT

This section is required when breakaway walls exceed a design safe loading of 20 pounds per square foot.

I certify that I developed or reviewed the structural design, plans, and specifications for construction of breakaway walls to be constructed under the above-referenced structure and that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the following:

- Breakaway wall collapse shall result from a water load less than that which would occur during the base flood.
- The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all structure components (see Section III).

SECTION V: CERTIFICATION

I certify under penalty of perjury that the foregoing is true and correct (RCW 9A.72.085) for Section(s) ☐ III and/or ☐ IV.

Signature: _____ Date: _____

Title: _____ WA License No.: _____