



GUIDE FOR HOME ELEVATION PROJECTS

Introduction

This guide describes the necessary project elements for the process of elevating a single-family residence. General contractors and engineers are encouraged to use the information in this guide, combined with their own site visits, evaluations and estimates to begin and complete each project.

Project Description

The purpose of the project is to design and construction foundations under existing homes to elevate the lowest finished floor to either one foot above the 100-year base flood elevation (BFE); or to the flood of record, whichever is higher. The goal of elevating the home is to reduce or eliminate repetitive financial loss due to flood damage.

General Design Requirements

Final design will have the lowest finished floor level of the home one foot above the BFE, or to the flood record, whichever is higher. The elevation of the finished floor level is required to be determined by a licensed surveyor. A Washington State licensed surveyor must perform and submit two elevation certificates:

1. A pre-elevation certificate to determine what height to elevate to.
2. A post-elevation certificate is required after foundation construction to verify the first finished floor (FFE) level has been elevated to the required height.

In addition to the elevation certificate, the following conditions must be considered as part of the design:

- The design must demonstrate all venting requirements will be met and must provide for hydrostatic equalization between any enclosed area and the exterior.
- All new construction must be done with materials that are resistant to flood damage.
- Plumbing, mechanical, electrical and similar fixtures must be elevated to the same elevation as the finished floor.

Permit Submittal Requirements:

The property owner or contractor must submit the following documentation prior to commencing any site work:

- A complete building permit application. (development permit, building attachment, estimate sheet, etc.) A pre-elevation certificate.
- Two complete sets of construction designs. (foundation plan including vents, stem wall plan, etc.) A dimensioned site plan indicating location of the home & setbacks to each property line.

Permit application review time is approximately two weeks. Permit application fees will be calculated upon submittal, are based on the project value (bid price) and are due prior to issuance of the permit.



HOME ELEVATION INSPECTION CHECKLIST

First Inspection Prior to Pouring Concrete:

- Elevation benchmark for the FFE has been established and installed by a licensed surveyor.
- Adequate footing size
- Rebar installed per approved plans
- Vertical rebar attached per approved plans
- Adequate crawl space ventilation has been installed
- Location of vents are per approved plan and are within 1' of the finished grade ○
18" x 24" access to crawl space has been installed

Second Inspection Prior to Setting Home on New Foundation:

- All cells are filled with grout
- Anchor bolts are installed per approved plans
- Sill plates are of treated material

Third Inspection When All Work is Complete:

- Under floor piers extend a minimum of 8" above grade
- Impervious membrane installed between pier and post
- Plumbing lines are installed and supported per code
- Backflow prevention and cleanouts have been installed per code
- No piping is directly imbedded into footing or stem walls (sleeved)
- Clothes dryer duct is made of smooth metal and vented to the exterior of the home
- Horizontal duct supports are installed per code
- Floor insulation and vapor retarder are installed per code
- Crawl space access door installed per code
- Positive post to beam connections in place
- 6 mil-poly installed on the ground per code
- Stairs, decks, landings and guard/handrails installed per code
- All grading & site work is complete and sloped away from the foundation wall
- Post-elevation certificate has been submitted and approved

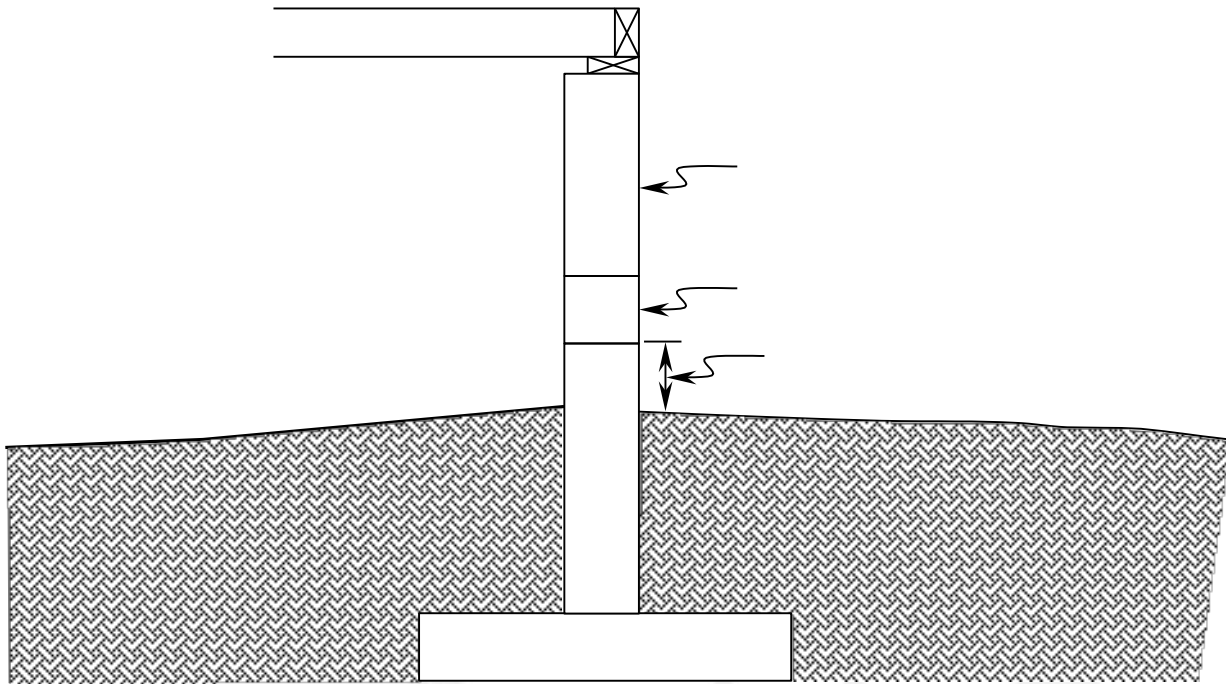
Guidance for Non-Engineered Foundation Openings

(From Technical Bulletin TB 11-01)

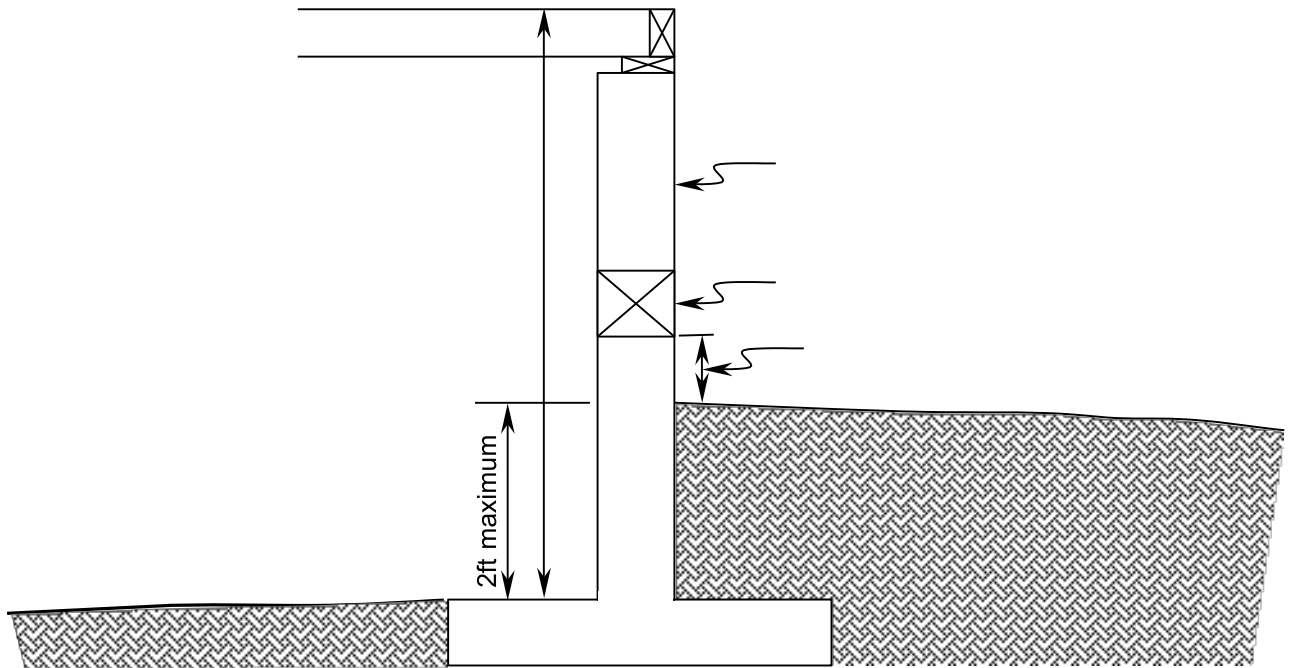
Each of the following four design criteria must be met for new and substantially improved A-zone buildings that have enclosed areas below the Base Flood Elevation with openings not designed and certified by a design professional:

1. There must be a minimum of two openings on different sides of each enclosed area. If a building has more than one enclosed area, each area must have openings on exterior walls to allow floodwater to directly enter.
2. The total area of all openings must be at least 1 square inch for each 1 square foot of enclosed area
3. The bottom of each opening can be no more than 1 foot above the adjacent grade.
4. Any louvers, screens, or other opening covers must not block or impede the automatic flow of floodwaters into and out of the enclosed area.

“PREFERRED” Crawlspace Construction



Below Grade Crawlspace Construction



Additional Requirements for Below-Grade Crawlspaces:

Buildings that have below grade crawlspaces will have higher insurance premiums than buildings that have the bottom of the crawlspace filled to a level at or above the adjacent exterior grade. The following provisions must be met for below grade crawlspace construction in a flood zone not to be considered a basement.

1. The interior grade of a crawlspace below the Base Flood Elevation must not be more than **2 feet below** the lowest adjacent exterior grade.
2. The height of the below-grade crawlspace, measured from the interior grade of the crawlspace to the top of the finished floor **must not exceed 5 feet at any point**. The height limitation is the maximum allowable **unsupported** wall height according to the engineering analyses and building code requirements for flood hazard areas. This limitation will also prevent these crawlspaces from being converted into habitable spaces.
3. There must be an **adequate drainage system** that removes floodwaters from the interior area of the crawlspace. The enclosed area should be drained within a reasonable time after a flood event. The type of drainage system will vary because of the site gradient and other drainage characteristics; such as soil types. Possible options include natural drainage through porous, well-drained soils, and drainage systems such as perforated pipes, drainage tiles, or gravel or crushed stone drainage by gravity or mechanical means.
4. The velocity of floodwaters at the site **should not exceed 5 feet per second** for any crawlspace. For velocities in excess of 5 feet per second, other foundation types should be used.
5. Below-grade crawlspace construction in accordance with the requirements listed above will not be considered basements.