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REASONABLY SAFE FROM FLOODING PROFESSIONAL CERTIFICATION

River Point District as described by metes and bounds description

Project Name and Address

I, Brad Woznak certify that the design for the aforementioned development is reasonably safe from flooding in accordance with the guidance provided within FEMA's Technical Bulletin 10-01 related to ensuring that structures are reasonably safe from flooding and in accordance with accepted professional practices.

Signature

10/29/2020

Date

Sr. Professional Engineer

Title

Professional Engineer

Type of License

36737-006

License Number

3535 Vadnais Center Drive, St Paul, MN 55110; phone: 651.490.2125

Address and Phone

Professional Seal



7/31/2022

License Expiration Date

Simplified Approach

Design Requirements

If, for a building and building site, **all** the requirements listed below are met (see Figure 10), the building is reasonably safe from flooding. If all of these requirements are not met, the more detailed analysis described under Engineered Basement Option, on page 19 of this bulletin, should be performed to determine whether the building is reasonably safe from flooding.

-  The ground surface around the building and within a defined setback distance from the edge of the SFHA (see next item) must be at or above the BFE.
-  The setback is the distance from the edge of the SFHA to the nearest wall of the basement. The minimum allowable setback distance is 20 feet.
 - No basements proposed; finished grade includes a minimum of 2 feet of freeboard over BFE.
-  The ground around the building must be compacted fill; the fill material—or soil of similar classification and degree of permeability—must extend to at least 5 feet below the bottom of the basement floor slab.
 - Construction specifications will specify material and compaction requirements; borings will confirm subsurface soil characteristics below floor slab.
-  The fill material must be compacted to at least 95 percent of Standard Laboratory Maximum Dry Density (Standard Proctor), according to ASTM Standard D-698. Fill soils must be fine-grained soils of low permeability, such as those classified as CH, CL, SC, or ML according to ASTM Standard D-2487, *Classification of Soils for Engineering Purposes*. See Table 1804.2 in the 2000 *International Building Code (IBC)* for descriptions of these soil types.
 - Compaction requirements to be included in construction specifications; since finished grade is above BFE with no basements allowed low permeability soils will not be required.
-  The fill material must be homogeneous and isotropic; that is, the soil must be all of one material, and the engineering properties must be the same in all directions.
 - Requirements to be included in construction specifications.
-  The elevation of the basement floor should be no more than 5 feet below the BFE.
 - N/A as no basements are allowed.
-  There must be a granular drainage layer beneath the floor slab, and a ¼-horsepower sump pump with a backup power supply must be provided to remove the seepage flow. The pump must be rated at four times the estimated seepage rate and must discharge above the BFE and away from the building. This arrangement is essential to prevent flooding of the basement or uplift of the floor under the effect of the seepage pressure.
 - N/A finished grade and low floor elevations above BFE.
-  The drainage system must be equipped with a positive means of preventing backflow.
 - N/A finished grade and low floor elevations above BFE.
-  Model building codes (such as the 2000 International Residential Code) also address foundation drainage (IRC Section R405) and foundation walls (IRC Section R404). Model building codes generally allow foundation drains to discharge through either mechanical means or gravity drains. In addition, there is often an exception to the requirement for drainage systems in well-drained soils. However, in or near floodplains, well-drained soils can, in fact, help convey groundwater towards the building foundation. Therefore, this exception should not apply in or near floodplains.
 - N/A finished grade and low floor elevations above BFE.



In some cases in or near floodplains, even with standard drainage systems, hydrostatic pressures from groundwater against the basement can result. When a standard drainage system is unable to eliminate hydrostatic pressure on the foundation, model building codes, including the 2000 International Residential Code (IRC Section R404.1.3), require that the foundation be designed in accordance with accepted engineering practice. **The simplified approach contained in this Technical Bulletin assumes no hydrostatic pressure on the foundation and should be used only when a standard drainage system, discharged by a sump pump that is equipped with backup power and that discharges above BFE, is employed.** For other drainage systems, the designer should use the engineered basement option presented on page 19 of this bulletin and other appropriate building code requirements.

-N/A finished grade and low floor elevations above BFE.

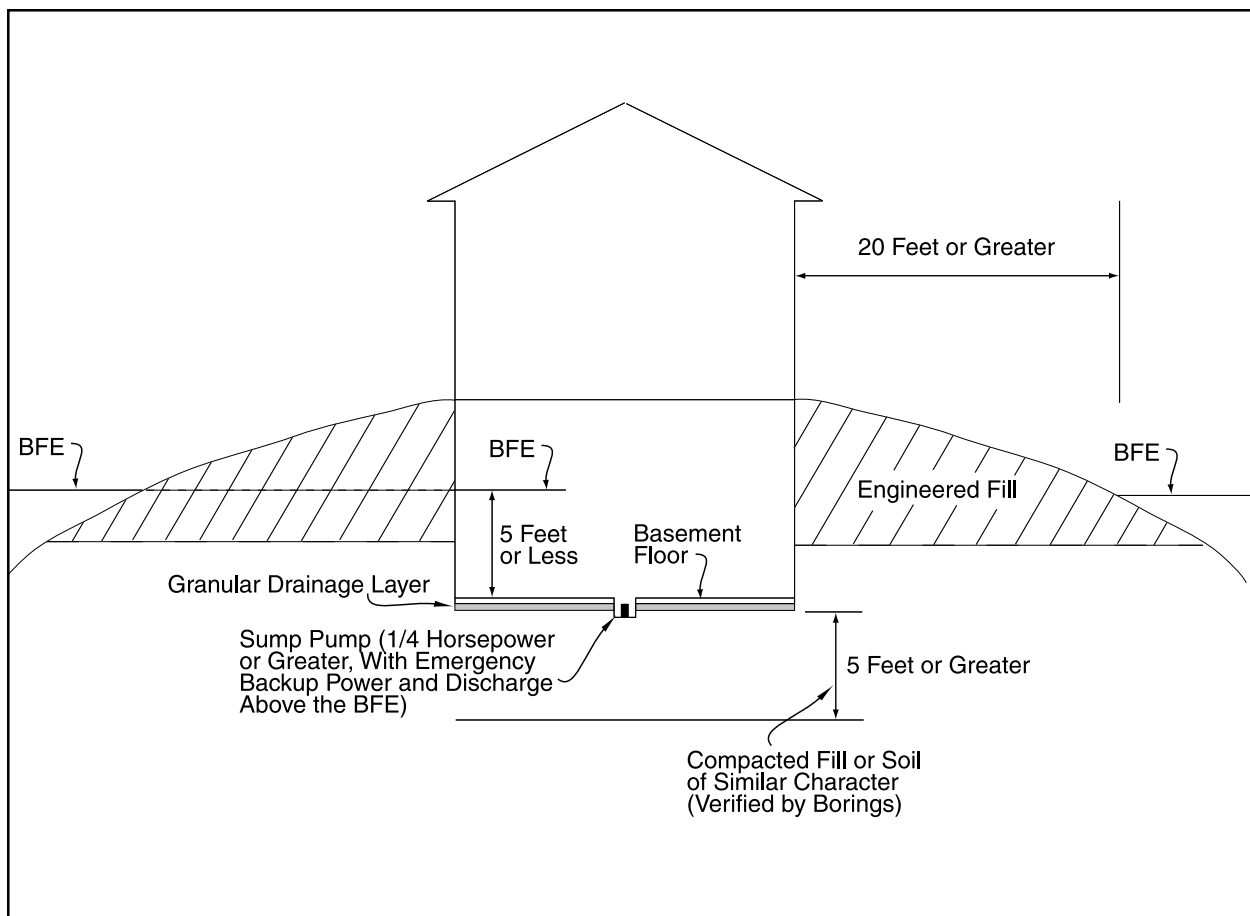


Figure 10 Requirements for use of the simplified approach to basement construction.