FINISHED FLOOR HEIGHT ANALYSIS

Steph McDougal, November 2017

The City of Houston is developing historic preservation design guidelines for the three Houston Heights Historic Districts: Houston Heights Historic District East, Houston Heights Historic District West, and Houston Heights Historic District South. The design guidelines document, in its current draft form (released August 2017) includes a limit on finished floor height of 30" above natural grade. This paper explains what "finished floor height" means, why it is regulated as a component of building scale, and the rationale behind recommending an increase of 2" for a 32" maximum finished floor height standard.

WHAT IS "FINISHED FLOOR HEIGHT"?

Finished floor height is the measurement from the natural grade of the property to the top surface of the floor inside the home. Although the interior floor is not visible from the outside of the house, the deck of a front porch is typically at the same level; therefore, for existing residential buildings, we use the height of the top surface of the front porch deck as a proxy for finished floor height.

WHY IS FINISHED FLOOR HEIGHT REGULATED?

The City of Houston's historic preservation ordinance requires new buildings and additions to existing buildings to be **compatible in size, scale, and massing** with the historic ("contributing") buildings within the context area. That means that the proposed project should fit in visually with the historic buildings on its blockface and the opposing blockface (the "context area").

Historic neighborhoods and streetscapes have a visual *rhythm* that is created when buildings have similar setbacks and when the size of buildings and the scale of building components (including front porches, windows and doors, etc.) are similar. The size of buildings and their components is a major factor in maintaining the rhythm of the streetscape; when the size and scale of neighboring buildings are similar, the various features begin to line up visually, which conveys a sense of continuity and character that ties a neighborhood together. New projects must maintain that visual rhythm in order to be harmonious with existing buildings and meet the requirements of the historic preservation ordinance.

HOW WAS THE MAXIMUM FINISHED FLOOR HEIGHT DETERMINED?

In 2013-2014, planners in the Historic Preservation Office began collecting dimensional data in the Houston Heights Historic Districts, using a Leica DISTO D8 laser distance-measuring device. They collected measurements for 353 contributing buildings in the three Houston Heights Historic Districts, including front porch deck height above natural grade, which serves as a proxy for finished floor height (FFH) for existing buildings. From that data, they determined that 30” was an appropriate FFH.

In 2017, following questions about the 30" maximum finished floor height standard, as published in the Houston Heights Historic Districts Design Guidelines, we analyzed data from the aforementioned 353 contributing buildings. This included:

- 230 buildings in Houston Heights Historic District East (25% of district)
- 39 buildings in Houston Heights Historic District South (5% of district)
- 84 buildings in Houston Heights Historic District West (16% of district)

All of the north-south streets, which account for the majority of addresses in these districts, appear to be represented in this sample. The finished floor height ranged from 11" to 72", with 242 (68.5%) houses having a FFH of 30" or less. Of those, 129 of those (36.5%) have a FFH of 24" or less. Only 7 properties (2%) had a FFH above 42". Excluding those outliers, the average FFH of this sample is 26.5", and the median for this sample is 27".

We also looked at 55 applications for Certificates of Appropriateness that provided finished floor height as one of the dimensional data points. This included:

- 20 buildings in Houston Heights Historic District East
- 25 buildings in Houston Heights Historic District South
- 10 buildings in Houston Heights Historic District West

The finished floor height in this sample ranged from 9-3/8" to 39", with an average FFH of 28.875" and a median of 26", which is consistent with the larger data sample.

Because the maximum finished floor height standard of 30” is several inches higher than the average FFH and represents the high end of the majority of FFH measured, we found that this measurable standard is both reasonable and appropriate in order to maintain compatible building size and scale with contributing buildings in these historic districts.

With that said, traditionally constructed foundations were lower than modern foundations, due to assembly techniques and components involved. Following the October HAHC meeting, staff consulted with HAHC members, architect David Bucek and builder Steve McNeil, and modeled several foundation/ substructure configurations for pier-and-beam buildings. While staff confirmed that 30" is achievable using modern building techniques, an FFH of 32” would allow better air circulation and ventilation to keep foundations dry, and allow flexibility in construction while maintaining a compatible appearance. (See diagram on next page.) Therefore, we recommend that the maximum FFH be increased from 30" to 32" in all instances where it is mentioned in the Houston Heights Historic Districts Design Guidelines.

PLATFORM FRAMING/FLUSH BEAM EXAMPLE

Finished Floor Height – 32”

Note: Dimensional lumber, flooring, and subflooring are commonly described using nominal measurements, such as “2x4,” which are different from their actual measurements, shown below.

16” Concrete pier (2 blocks, 8” each) or poured concrete

1.5“ Sleeper plate (2x8: actual measurement 1½” x 7¼”)

11.25” Perimeter Sill (2x12 joist hung flush with perimeter sill: actual measurement 1½” x 11¼”)

0.75” Subfloor (1” nominal; actual measurement ¾”)

0.75” Flooring (1” nominal; actual measurement ¾”)

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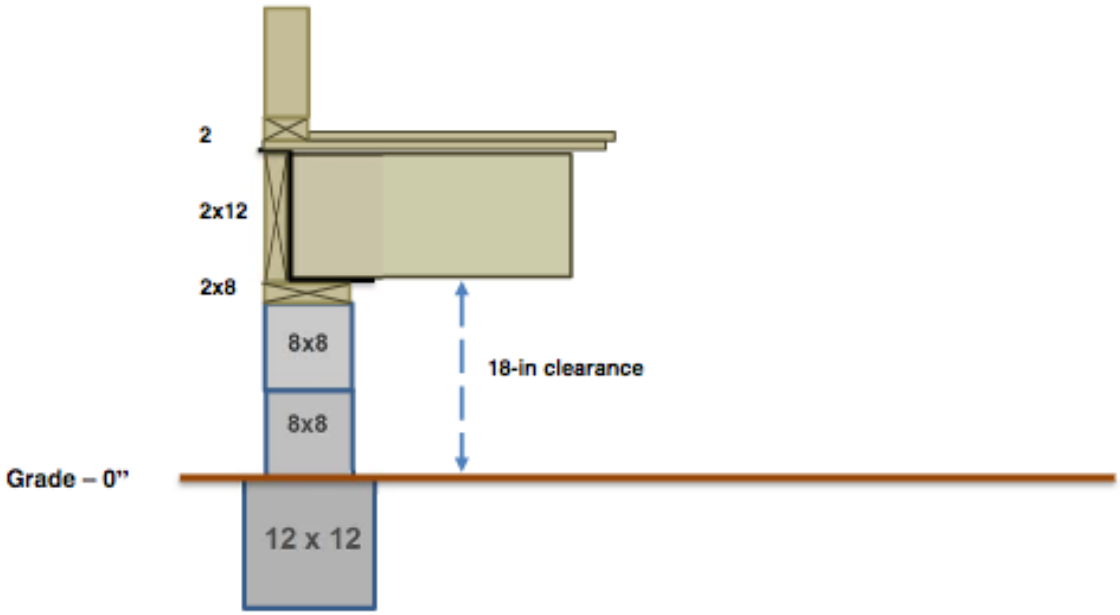
30.25” Total height at finished floor



CAN A PROPERTY OWNER RAISE THEIR BUILDING?

A property owner already can apply for a Certificate of Appropriateness to increase the finished floor height of their building. Applicants must provide supporting documentation of existing adverse conditions to justify the need to raise the building, as well as plans for preventing damage to chimneys, porches, etc. which will be at risk during the elevation process.

WHAT ABOUT FLOODING?

Hurricane Harvey caused widespread flooding throughout the City of Houston and the greater Houston area. Understandably, some citizens are concerned about how a maximum finished floor height might affect property owners whose homes are located in flood-prone areas.

In order to evaluate the potential risk of flooding in the Houston Heights Historic Districts, we consulted maps showing the extent of flooding, provided by the City of Houston's Geographic Information Systems (GIS) office in the Planning and Development Department. The flooding extents maps showed some street flooding, but no property flooding, in the Houston Heights Historic Districts. We also requested data about 3-1-1 calls on high water from the time period during Hurricane Harvey, and none of the calls received were from the Houston Heights Historic Districts. (A map showing 3-1-1 high-water calls is available online at https://houstonrecovers.org/numbers/ under the Responses tab.)

We are aware of only two properties in the Houston Heights Historic Districts where houses took on water during the storm: in one case, the house had a finished floor height of 18" and had 2" of water in the house, and in the other case, the portion of the house that flooded was a slab-on-grade rec room addition, which flooded from the back yard. (The house with the finished floor height of 18" has since applied for and received a Certificate of Appropriateness to raise the house.)

Most flooding in Houston during Hurricane Harvey, as in other major rain events, took place along bayous, including White Oak Bayou, which is outside the Houston Heights Historic Districts. The GIS office provided a topographic map showing that the Houston Heights Historic Districts are 47'–61' above sea level; the properties along White Oak Bayou that flooded are about 7' lower in elevation. In addition, the Federal Emergency Management Agency (FEMA) regularly revises flood risk maps to indicate which properties are at risk of flooding. The properties along White Oak Bayou are in a Flood Hazard Area, but the Houston Heights Historic Districts are classified as Minimal Flood Risk areas.

Understanding that data is still being collected, we have discussed this with former Councilmember Steve Costello, now leading Houston's Resiliency task force, and he agrees that if FEMA flood maps are revised at some point in the future to indicate that some part of the Houston Heights Historic Districts are at risk for flooding, we will revisit this topic at that time and make any adjustments to the maximum finished floor height based on technical data.