NYC Buildings

Bill de Blasio Mayor
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Rebuilding NYC After Hurricane Sandy

A Guide to New Code and Zoning Standards

For Industry Professionals

Updated 02.2015

Introduction.

This guide provides design professionals with important, information on changes in Code and Zoning standards that affect how buildings damaged in Hurricane Sandy may be repaired or reconstructed. These standards will better prepare buildings for future, extreme weather. Because of the complexity of flood regulations, building owners should consult a New York State-licensed professional engineer or registered architect.

This overview addresses flood zones, zoning, permitting, elevations, surveys and plans, Substantially Damaged/Substantial Improvements, freeboard, Tidal/Freshwater Wetlands + Coastal Erosion Hazard Areas, City-Owned Waterfront Property/Maritime Commerce and the NYC Fire Code.

Maps.

Effective Flood Insurance Rate Maps (FIRMs). On September 5, 2007, FEMA published the current effective FIRMs.

Advisory Base Flood Elevation Maps (ABFE Maps). On January 28 and February 24, 2013, the Federal Emergency Management Agency (FEMA) published Advisory Base Flood Elevation Maps for New York City. These maps provided the best available data at the time, and were allowed to be used with respect to zoning compliance for applications for construction document approval submitted prior to June 10, 2013.

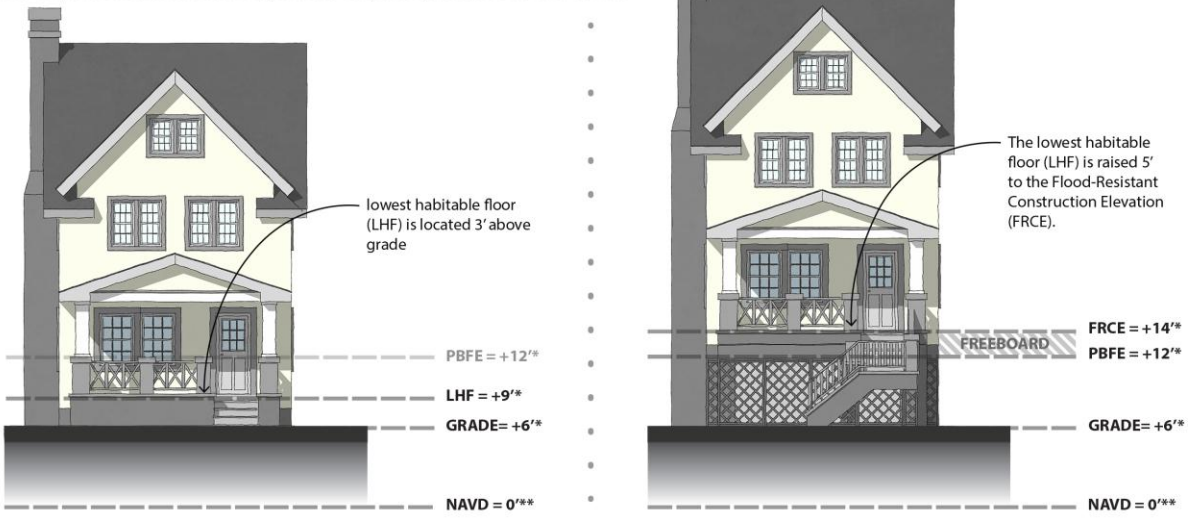
Preliminary Work Maps (Preliminary Base Flood Elevation Maps, or PBFE Maps). On June 10, 2013 FEMA published Preliminary Work Maps for New York City. These maps were used for applications for construction document approval submitted to the Department of Buildings on or after June 10, 2013 provided that a work permit was issued prior to January 6, 2014.

Preliminary Flood Insurance Rate Maps (PFIRMs). On December 5, 2013, FEMA published the PFIRMs. See region2coastal.com. On January 30, 2015, FEMA revised approximately 24 of the 457 PFIRM panels comprising the PFIRMs for New York City. The 24 revised PFIRM panels replace the corresponding PFIRM panels issued on December 5, 2013 and shall be used for regulatory purposes. Pursuant to Local Law 96/2013, all initial work permits issued on or after January 6, 2014 must comply with the more stringent of either the effective FIRMs from September, 2007 or these new PFIRMs. The PFIRMs will be replaced with updated effective FIRMs in the latter part of 2015 or in 2016.

In general, most substantially damaged residential buildings identified in these maps will be required to be elevated. For example:

1 or 2 family residence

This drawing illustrates a 1 or 2 family home as it existed on October 28, 2012. In order to elevate this home to standards recommended by FEMA Preliminary Flood Insurance Rate Maps to protect it from future flooding, a homeowner would need to take advantage of special height provisions within flood hazard areas. New zoning regulations allow maximum heights to be measured from the PBFE plus 2 feet of required freeboard (referred to as the FRCE or Flood-Resistant Construction Elevation). Existing homes may elevate the lowest habitable floor above grade to the FRCE, even if that results in a new non-compliance or an increase in the degree of non-compliance pursuant to ZR 64-431 & 64-723



Existing on October 28, 2012

Elevated to Flood-Resistant Construction Elevation

**Grades and elevations are for illustration only, and will differ depending upon location*
***North American Vertical Datum (NAVD) of 1988*

Please see glossary and additional examples of elevations beginning on page15 of this guide.

Flood Zones.

The previous City's Evacuation Flood Zone A boundaries are not synonymous with FEMA's A-zone. The New York City Office of Emergency Management has updated hurricane evacuation zones maps. The new Evacuation Zones, 1 through 6, have replaced Evacuation Zones A, B and C. Information can be accessed here: http://maps.nyc.gov/hurricane/

Location Identification. Applicants must state in all applications (Alteration Type 1, 2, or 3, or NB) whether the proposed work is located in a special flood hazard area by reviewing both the effective FEMA Flood Insurance Rate Map (FIRM) and Preliminary Flood Insurance Rate Map (PFIRM). *See 2008 NYC Building Code §28-104.9.2 (Local Law 21 of 2009)*. This must be indicated in question 20 in the PW1 form. If the proposed work is located in a special flood hazard area the applicant must include a copy of the effective FEMA Flood Insurance Rate Map (FIRM) and Preliminary Flood Insurance Rate Map (PFIRM), identify the location of the property on the maps, and whether the building is located in an A-zone or V-zone on the maps based on the more restrictive requirements of both the FIRM and PFIRM maps, However, copies of the flood maps are not required where the following conditions are met:

1. The scope of work involves only floor levels that are above the design flood elevation (DFE derived from effective FIRM and PFIRM), and
2. The building is not classified as substantially improved. See "Substantial Improvements" section later in this document for explanations for determining substantial improvements.

New Design Flood Elevation Freeboards. Pursuant to *1 Rules of the City of New York §3606-04*, effective January 31, 2013, the design flood elevations have been increased for Structural Occupancy Category I and II buildings. For most buildings this will result in a design flood elevation at least 1 foot above the more stringent base flood elevation on the FIRM or the PFIRM. For one- and two-family dwellings, this will result in a design flood elevation of 2 feet above the more stringent base flood elevations on the FIRM or PFIRM. These freeboards are mandatory for all projects that have not yet obtained a permit prior to January 31, 2013 and will also apply to all projects where a permit has been issued but (i) the construction work has not begun for 180 days or more, or (ii) the construction work has been suspended or abandoned for 180 days or more. See *1 RCNY §3606-04* to see the new freeboard requirements. See also *2008 NYC Administrative Code §28-105.9* for Expiration and *2008 NYC Building Code G201.2* for Start of Construction.

Zoning.

Mayoral Executive Order. In response to the need to elevate buildings based on the Advisory Base Flood Elevation Maps, Mayoral Executive Order 230 suspended certain provisions of the Zoning Resolution that could have prevented, hindered or delayed disaster recovery. With the adoption of the Flood Resilience Text Amendment on October 9, 2013 (see below) this Mayoral Executive Order was extended for the final time on October the 13th, 2013. Five days after such date, EO 230 had expired and was not renewed. Any applications submitted for approval after the expiration of EO 230 must comply with any applicable provisions of the regulations of the Flood Resilience Zoning Resolution (ZR) Text Amendment. Applications approved by the Department pursuant to EO 230 on or before October 9, 2013 are permitted to be amended to comply with the regulations of the Flood Resilience ZR Text Amendment, provided the applications are amended to show compliance with all applicable provisions of such amendment.

Flood Resilience Zoning Resolution Text Amendment. On October 9, 2013 the City Council adopted the Flood Resilience Zoning Resolution Text Amendment. See (Flood Resilience Zoning Text Amendment - Department of City Planning). These zoning text changes are in effect. The text amendment codifies many of the provisions of the now expired EO 230 and introduces new provisions relating to:

- Measuring building height with respect to the latest FEMA flood elevations
- Accommodating building access from grade
- Locating mechanical systems above flood levels
- Accommodating off-street parking above grade
- Accommodating flood zone restrictions on ground floor use
- Improving streetscape

Prior to the adoption of the Flood Resilience ZR Text Amendment on October 9, 2013 reconstructing or elevating a building at a higher level in many instances was prohibited by the Zoning Resolution as it created new or increased existing zoning noncompliance. Also, the installation of emergency generators in required side or rear yards would be prohibited by the Zoning Resolution. Additionally, the reconstruction of certain buildings would trigger reviews by the City Planning Commission in waterfront areas. To address these and other impediments to the rebuilding of homes and businesses at safe elevations, City Council adopted the Flood Resilience Zoning Resolution Text Amendment. The text amendment codifies many of the provisions of now expired Mayoral Executive Order 230. Much like Executive Order 230 the Flood Resilience Zoning Text Amendment provides zoning relief by requiring (*ZR* §64-12) that all buildings or portions thereof comply with the flood-resistant construction standards as defined in *ZR* §64-11.

Zoning defines flood-resistant construction standards as full compliance with the provisions of Appendix G of the 2008 NYC Building Code like a new building using the higher base flood elevation and more stringent flood hazard area designation shown on either the most recent PFIRMs released by FEMA December 5, 2013, or the effective FIRMs from 2007, both of which are adopted in Section G102.2 (See Local Law 96 of 2013). Once the appropriate base flood elevation has been determined, zoning requires flood proofing to the flood-resistant construction elevation. The flood-resistant construction elevation is defined as the applicable base flood elevation plus the corresponding freeboard required by the building code. For one- and two-family homes flood proofing will require the lowest occupiable floor, as defined by the Flood Resilience Zoning Text Amendment, to be elevated to the flood-resistant construction elevation (FRCE).

Many buildings damaged by Hurricane Sandy were constructed prior to today's Zoning regulations and were deemed lawfully "noncomplying" before Hurricane Sandy, in accordance with Article V, Chapter IV of the Zoning Resolution. Under this provision, reconstruction of "noncomplying" buildings is allowed under certain circumstances, even when 100% of the structure has been destroyed. See *NYC Zoning Resolution §54-00*. To utilize this provision and reconstruct "noncomplying" buildings, permits must be issued by the Department of Buildings within two years of the storm and work must be carried on diligently thereafter. In addition, within flood zones, the Flood Resilience Text Amendment adopted by City Council on October 9, 2013 allows the reconstruction of certain "noncomplying" buildings with an allowance for an extended construction period. For buildings located within the flood zone, as defined in ZR §12-10, the provisions of reconstructing "noncomplying" buildings per ZR §*64-721* require that construction documents be approved by the Department no later than one year following the City's adoption of new final Flood Insurance Rate Maps that supersede the Flood Insurance Rate Maps in effect on October 28, 2012.The new final Flood Insurance rate Maps are expected to be adopted toward the end of 2014 or in 2015. Construction pursuant to this approval may extend six years after the adoption of new Flood Insurance Rate Maps.

In cases where reconstruction is allowed but TPPN 1/02 requires the application to be filed as a new building application, the applicant should file as a new building and indicate in the notes section of Schedule A that the new building is being reconstructed in accordance with *ZR §54-00* or *ZR §64-721*.

Construction Classification Considerations in the Fire District

The choice of contruction classification for new or existing elevated one- or two-family houses must be carefully considered, particularly in the fire district.

2008 Code, new or elevated existing homes. The 2008 Code prohibits wood-frame (Types V) one- and two-family houses in the fire district, with an exception for up to 2 stories and 2,500 sf per story in certain zoning districts (see BC D105,1, Item 9). Because the typical design solution in a flood zone is to locate the at-grade first story for parking, storage and building access, the use of wood frame construction in these 2-story buildings would allow only one story remaining for living space. Additionally, under the 2008 Code, a sprinkler allowance is not available for a wood-frame one- or two-family dwelling in the fire district (see BC D105.1 item 9). Below are several construction options available to one- and two- family homes in fire districts:

1) Higher construction class. Design/upgrade the building with a higher construction classification (concrete, masonry, metal stud, etc.), which can allow for more than two stories (see BC Table 503).
2) Podium building. Design the at-grade first story for parking, and construct the wall of this first story, and the flooring system for the second story, of Type I (noncombustible) construction, with a one hour fire separation.[1] This can allow the two stories of wood frame construction on top of a one-story noncombustible podium (see BC 509.4; D105.1, Item 9).
3) Unenclosed (or open-lattice) space under the home. Design the at-grade ground-level space under the home to be unenclosed (or open lattice), with an overhead clearance of 7 feet or less. In these cases the department does not consider this level as a story. However, strict restrictions on the types of enclosures (up to 50%, open lattice type only) and limitations on the certificate of occupancy are mandatory. See below, *Unenclosed (or Open Lattice) Ground-Level Space*.
4) Crawl space. Design the living spaces with a crawl space below it, provided that the crawl space has a clear ceiling height no more than 5 feet high and provided the resulting lowest floor of the living spaces is at or above the DFE. In this case, the crawl space is not considered a story.

[1] A non-combustible Type I one-hour rated horizontal assembly can be achieved by using a combination of composite metal decking or cold-formed steel floor assemblies, precast concrete planks with masonry columns, etc., along with the requisite fire-protection.

1968 Code, elevated existing homes.[2] The 1968 Code generally prohibits wood-frame (Types IID and IIE) one- and two-family houses in the fire district (See 1968 Code, Table 4-1), with an exception for up to 2 stories and 2,500 square feet per story in certain zoning districts (see 27-297(a)). Because the typical design solution in a flood zone is to design the at-grade first story for parking, storage and building access, the use of wood frame construction in these 2-story buildings would allow only one story remaining for living space. Unlike the 2008 code, a podium building listed above is not an as-of-right option; however, it may be pursued on a case-by-case basis with a determination request. Below are several construction options available to one- and two- family homes in the fire district:

1) Higher construction class. Design/upgrade the building with a higher construction classification (concrete, masonry, metal stud, etc.), which can allow for more than two stories (see 1968 code, Table 4-1).
2) Sprinkler protection. Providing sprinkler protection will allow up to a 4-story building (See 1968 Code, Table 4-2).
3) Unenclosed (or open-lattice) space under the home. Design the at-grade ground-level space under the home to be unenclosed (or open lattice), with an overhead clearance of 7 feet or less. In these cases the department does not consider this level as a story. However, strict restrictions on the types of enclosures (up to 50%, open lattice –type only) and limitations on the certificate of occupancy are mandatory. See below, *Unenclosed (or Open Lattice) Ground-Level Space*.
4) Crawl space. Design the living spaces with a crawl space below it, provided that the crawl space has a clear ceiling height no more than 5 feet high and provided the resulting lowest floor of the living spaces is at or above the DFE. In this case, the crawl space is not considered a story.

Unenclosed (or Open Lattice) Ground-Level Space

For those applicants who took advantage of the zoning relief afforded by Executive Order 230 to elevate a structure located in the A-Zone, Executive Order 230 Section 1(c)(iv) mandated that for one- or two-family residences located within an A-Zone, all enclosures (if provided) below the Zoning Design Flood Elevation with a vertical clearance of five feet or greater, except for wet-flood proofed enclosures for stairs and vestibules, be of open lattice type construction. The EO has now expired and been replaced with the Flood Resilience Text Amendment, which no longer requires such residences to provide open lattice construction. Applications approved by the Department pursuant to EO 230 on or before October 9, 2013 remain subject to the unenclosed (or open lattice) limitation and the standards set forth below. However, such applications are permitted to be amended, where permitted by Appendix G and the Building Code's height and area limits, to enclose the lowest level as wet floodproofed parking, storage or building access, provided the applications show full compliance with the applicable provisions of such zoning amendment. Enclosing these areas may

[2] Subject to 28-101.4.3, pre-2008 existing homes may be elevated pursuant to the 1968 Code. Subject to 28-101.4.3 and when authorized by 27-115, 27-116, 27-117 and 27-121, pre-1968 homes may be enlarged pursuant to the 1938 Code.

mean counting the newly enclosed space as floor area or installing planting or other mandatory design features.

Where the ground floor level of a detached one- or two-family house is unenclosed (or open lattice) meeting the standards below, and the ceiling height is 7 feet or less, such ground floor level need not be counted as a story for the purposes of applying the height and area requirements of the building code (see *Construction Classification Considerations in the Fire District*, above).

The Department considers ground floor levels unenclosed (or open lattice) meeting the following:

- The construction must have at least 50% openness when viewed horizontally in any 12-inch by 12-inch area, except that the following portions need not be included when calculating the 50% required openness:
    - Structural columns up to 12 inches in width and spaced no closer than 6 feet on center;
    - Curbs no higher than 8 inches above the exterior grade; and
    - Retaining walls where portions of the enclosed space are below grade.
- Louvers, glazing, doors or other movable elements must not reduce the required opening to less than the specified 50%.
- Enclosing materials below such design flood elevation must be flood-damage resistant, including but not limited to:
    - Concrete breeze block;
    - Metal screen;
    - Wrought iron fence;
    - Decorative grillwork; and
    - Other acceptable see-through materials.
- All spaces or portion thereof limited to enclosure by open lattice shall be designed as unconditioned space in accordance with the New York City Energy Conservation Construction Code.

Note that a requirement for an unenclosed (or open lattice) ground floor level does not mandate a pile foundation system in an A Zone. Spread footing, mat or raft foundations with columns shall not be prohibited in such cases.

Exterior fire separation for houses on columns or piles.

Where a building is elevated on an open foundation system, for instance when the house in on piles in a V-zone, or to accommodate unenclosed (or open lattice) requirements, but Building Code table 602 and BC Chapter 7 require that a fire-rated wall extend to grade, the applicant may seek a variance

from the Department to allow the underside of the lowest floor to be constructed in a manner that provides at least a one-hour fire rating in lieu of the fire-rated walls.

When a new C of O is required for 1- and 2-family houses.

- Where the scope of the work triggers an NB per TPPN 1/02, a new C of O will be required.
- Where the scope of the work does not trigger an NB per TPPN 1/02:
  - Buildings already having a C of O:
    - Where the work will be inconsistent with current C of O, an Alt-1 is required and a new C of O will be issued. Examples include an inconsistency with the stated number of stories, inconsistency with description of uses, etc.
    - Where the work is not inconsistent with the current C of O, the work may be filed as an Alt-2. Examples would be where a house is being elevated/increased one story, but the very old C of O simply says "one-family dwelling" with no indication of the number of stories.
  - Pre-1938 buildings that never had a C of O:
    - Most alteration work, including elevating a house one story, will not require a C of O and may be filed as an Alt-2.

Identification of the "Floor" on the C of O for 1- and 2-family houses.

For new or substantially damaged/improved homes, first level-at-grade headroom is:

- > 7 feet, whether open or enclosed:
  - In the "Floor" column of the Schedule A, such a level-at-grade must be listed as "1".
- Constructed pursuant to BC Section 509.4 as a Type I non-combustible open or enclosed parking garage, or as a Type IV heavy timber open parking garage:
  - In the "Floor" column of the Schedule A, such a level-at-grade must be listed as "GND".
- > 5ft but $\leq$ 7 feet and, enclosed/wet floodproofed:
  - In the "Floor" column of the Schedule A, such a level-at-grade must be listed as "1 "
- > 5ft but $\leq$ 7 feet and, unenclosed (or open lattice):
  - In the "Floor" column of the Schedule A, such a level-at-grade must be listed as "GND "
- $\leq$ 5 feet, whether open or enclosed:
  - In the "Floor" column of the Schedule A, such a level-at-grade must be listed as "GND" and identified as "crawl space".

Schedule A, Generally.

Schedules A must provide information as required by Appendix G.

Schedule A, Fully Enclosed Spaces A-Zones.

For fully enclosed, wet floodproofed spaces below the base flood elevation, where allowed, the description of the proposed use on the Schedule A shall state that the space is limited to "parking", "storage", "building access" or "crawl space", and shall indicate that such use is "unfinished" and "subject to flooding." E.g.: "unfinished storage, subject to flooding", or "unfinished crawl space, subject to flooding". In such buildings, the notes on page 2 of the Schedule A shall also state:

- "Levels subject to flooding shall remain unfinished and shall not be used for any other use except as stated on this certificate."

Schedule A, Unenclosed (or Open Type) Spaces in A-Zones.

For levels that are restricted by the Executive Order 230 to open lattice construction, or that are open so that the level-at-grade is deemed not a story, the description of the proposed use on the Schedule A shall state that the space is limited to "parking" or "storage" and shall indicate that such use in "unconditioned," "open to the outer air," and "subject to flooding." E.g.: "unconditioned storage, open to outer air (subject to flooding)" or "unconditioned parking for 1 car and storage, open to outer air (subject to flooding)." In such buildings, the notes on page 2 of the Schedule A shall also state:

- "The lowest level is subject to flooding and shall contain only flood-damage-resistant materials, with enclosures restricted to open lattice construction that is at least 50 percent open."

Substantially Damaged/Substantial Improvements.

Any building classified as substantially damaged or as a substantial improvement must be elevated/reconstructed to fully comply with the flood zone regulations for new buildings in Appendix G of the 2008 NYC Building Code. For residential buildings, this includes elevating the habitable spaces and filling in the basement or cellar.

Even if the building is allowed to be repaired or renovated under the 1938 or 1968 NYC Building Codes, all aspects of the work must comply with all the provisions in Appendix G, Per 2008 NYC Administrative Code §28-104.9.4 (Local Law 21 of 2009).

Every alteration application in a special flood hazard area, regardless of cost, must include an applicant's statement: "Work proposed in this application (is/is not) included in a substantial improvement as defined by Section BC G201.2 and 1 RCNY 3606-01." *See 1 RCNY §3606-01(c).*

Every alteration application in a special flood hazard area that is not classified as substantially damaged or as a substantial improvement, and has an estimated cost of over $40,000, must also include calculations of buildings' market value and relevant documentation. See *1 RCNY §3606-01*,

FEMA's Substantial Improvement/Substantial Damage Desk Reference and/or FEMA's Substantial Damage Estimator Tool.

Cost Calculations. These buildings must provide two estimated cost calculations in their applications:

1) **Substantial Damage**. The applicant must compare the construction costs to restore the building to its pre-Hurricane Sandy condition, even if the owner does not intend to do so, **to** the market value of the building prior to Hurricane Sandy (calculated per 1 RCNY §3606-01).

   If the cost to restore the building equals or exceeds 50 percent of the market value of the building, then the building **MUST** comply with the a flood zone regulations for new buildings in Appendix G, even if the owner does not want to restore the building to its prior condition.

2) **Substantial Improvement**. The applicant must compare the cumulative construction cost of the alteration work, regardless of the time necessary to complete the work **to** the market value of the building before the start of construction (calculated per 1 RCNY §3606-01). The cost of a project shall include all work in a given application plus all related applications within the scope of the project. The cost must also include unrelated work if it is to be performed during the same time period as the project. The cost shall not include improvements that are unrelated to Sandy damage repair, provided :

1) such improvements are not required to be filed with the Department per 1 RCNY 101-14 and are completed before any "project" plans are approved.
2) such improvements were filed with DOB, and:
   - the associated work permits, no matter when issued, were signed-off before the "project" plans are approved; or
   - the associated work permits were issued prior to February 20, 2004, regardless of the sign-off status of such permits

   If the cumulative construction costs equal or exceed 50 percent of the market value of the building, then the building **MUST** comply with the flood zone regulations for new buildings in Appendix G, even if the owner does not want to elevate the building.

Increased Cost of Compliance Coverage.

FEMA and/or insurance companies may require owners to produce a certification from the City stating the building was substantially damaged by Hurricane Sandy. This typically allows the insurer to provide an additional payout to help cover costs to elevate, relocate and/or demolish the building. See FEMA's Increased Cost of Compliance Coverage. To obtain such a statement from the Department, the owner must submit an insurer's statement of loss or a certification from an architect or engineer, along with calculations in accordance with 1 RCNY §3606-01to the Department of Buildings' appropriate borough office.

The calculations may be submitted prior to any filings or applications for work. After the Department has reviewed the calculations, the Department Borough Commissioner will provide a letter stating that the building was substantially damaged. For red-tagged buildings that were demolished by the City, the Borough Commissioner can provide the letter without submissions by an architect or engineer.

Other Than Substantially Damaged/Substantial Improvement.

Buildings not classified as substantially damaged or as a substantial improvement are not required to elevate/reconstruct the entire building according to the flood zone regulations for new buildings in Appendix G. However, the Department strongly recommends that licensed design professional counsel their clients to comply with these regulations, as well as relocate essential equipment and electrical panels above flood levels wherever possible.

Even though buildings not classified as substantially damaged or a substantial improvement do not have to comply with the flood zone regulations for new buildings, storm-damaged buildings must still comply with some Code requirements for alteration and repair work. All alterations and repair work must comply with Appendix G of the 2008 NYC Building Code even if the building is allowed to be repaired or reconstructed under the 1938 or 1968 Building Codes. *See 2008 NYC Administrative Code §28-104.9.4 (Local Law 21 of 2009).*

For example, Appendix G, Section 102.9, Item 9 allows equipment or finishes of the same types in the same locations to be replaced, but does not allow for an increase in the degree of noncompliance with Appendix G. In this case, the licensed design professional is urged to counsel the owner to improve the flood-resistance of the building even if not required.

Work That Does Not Require a Permit.

Permits do not need to be obtained from the Department for certain types of work, including removing and replacing non-fire-rated wallboards and insulation in the same locations and minor deck or porch repairs, such as replacing less than 25 percent of a railing or decking. *See 2008 NYC Administrative Code §28-105.4 and 1 RCNY §101-14*.

Code Compliance. Permit-exempt work still must comply with the NYC Construction Codes as well as all other applicable laws, codes and rules, and permits may still be required by other agencies, i.e. the Landmarks Preservation Commission, Department of City Planning or the New York State Department of Environmental Conservation.

Costs. In special flood hazard areas, the cost of any permit-exempt work must still be calculated into the substantial damage/substantial improvement calculations in the Flood Zones.

Elevation Data for Surveys and Plans.

In addition to required drawings, applications must include a site survey prepared by a New York State-licensed surveyor. All signed and sealed plans and surveys must clearly indicate which datum is referenced thereon, and must also contain all conversions necessary for the Department to verify

compliance with the applicable Flood Insurance Rate Map and/or Preliminary Base Flood Elevation Map, as applicable to the project. Local Law 96 of 2013 requires all initial construction documents for new projects submitted to the department (including surveys and plot plans) on or after Monday, January 6, 2014 to indicate elevations above sea level based using NAVD as a primary datum. Placing a secondary datum in parentheses, adjacent to the NAVD elevations, is acceptable provided that a legend is presented clearly explaining the conversion convention used. Projects submitted prior to January 6, 2014 using an elevation datum other than NAVD should submit subsequent documents (amended construction documents, final surveys, etc.) in the same datum that was previously accepted.

The PBFE Maps and the ABFE Maps issued by FEMA are measured to the North American Vertical Datum of 1988 (NAVD). The NAVD datum is not a one-to-one conversion from the National Geodetic Vertical Datum of 1929 or the five borough datum because the NAVD takes into account the oblate shape of the earth. This conversion is typically performed by a New York State-licensed surveyor. Therefore, a conversion to/from NAVD requires a different conversion for each site, based on the site's latitude and longitude.

Please see the following general examples.

Table 104.7.6.1

BRONX Elevations	To obtain NGVD Equivalency:	NGVD Elevations	To obtain NAVD Equivalency:	NAVD Elevations
8.422 to 8.495	-> Add 2.608 - >	11.030 to 11.083	-> Subtract between 1.030 and 1.083->	10.000
10.000	-> Add 2.608 ->	12.608	-> Subtract between 1.030 and 1.083 ->	11.525 to 11.578
7.392	-> Add 2.608 ->	10.000	- > Subtract between 1.030 and 1.083 ->	8.917 to 8.970

Table 104.7.6.2

BROOKLYN Elevations	To obtain NGVD Equivalency:	NGVD Elevations	To obtain NAVD Equivalency:	NAVD Elevations
8.546 to 8.572	-> Add 2.547 - >	11.093 to 11.119	-> Subtract between 1.093 and 1.119 ->	10.000
10.000	-> Add 2.547 ->	12.547	-> Subtract between 1.093 and 1.119 ->	11.428 to 11.454
7.453	-> Add 2.547 ->	10.000	-> Subtract between 1.093 and 1.119 ->	8.881 to 8.907

Table 104.7.6.3

MANHATTAN Elevations	To obtain NGVD Equivalency:	NGVD Elevations	To obtain NAVD Equivalency:	NAVD Elevations
8.288 to 8.357	-> Add 2.752- >	11.040 to 11.109	-> Subtract between 1.040 and 1.109 ->	10.000
10.000	-> Add 2.752->	12.752	-> Subtract between 1.040 and 1.109 ->	11.643 to 11.712
7.248	-> Add 2.752 ->	10.000	-> Subtract between 1.040 and 1.109 ->	8.891 to 8.960

Table 104.7.6.4

QUEENS Elevations	To obtain NGVD Equivalency:	NGVD Elevations	To obtain NAVD Equivalency:	NAVD Elevations
8.361 to 8.381	-> Add 2.725->	11.086 to 11.106	-> Subtract between 1.086 and 1.106 ->	10.000
10.000	-> Add 2.725->	12.725	-> Subtract between 1.086 and 1.106 ->	11.619 to 11.639
7.275	-> Add 2.725->	10.000	-> Subtract between 1.086 and 1.106 ->	8.914 to 8.894

Table 104.7.6.5

STATEN ISLAND Elevations	To obtain NGVD Equivalency:	NGVD Elevations	To obtain NAVD Equivalency:	NAVD Elevations
7.835 to 7.917	-> Add 3.192- >	11.027 to 11.109	-> Subtract between 1.027 and 1.109 ->	10.000
10.000	-> Add 3.192->	13.192	-> Subtract between 1.027 and 1.109 ->	12.083 to 12.165
6.808	-> Add 3.192 ->	10.000	-> Subtract between 1.027 and 1.109 ->	8.891 to 8.973

Notes:

- When going from **NGVD29 to NAVD88**, the output number is **subtracted** from the given elevations.
- When going from **NAVD88 to NGVD29**, the output number is **added** to the given elevations.
- The National Oceanic and Atmospheric Administration (NOAA) of the US Department of Commerce is an agency that provides daily weather forecasts, severe storm warnings and climate monitoring. Learn about NOAA at noaa.gov/about-noaa.html. The National Geodetic Survey (NGS) of NOAA provides the framework for all positioning activities in the nation, such as latitude, longitude, elevation and shoreline information.
- To convert from NGVD 29 to NAVD88, visit NGS at ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl.

Voluntary Freeboard.

The Department strongly encourages applicants to design buildings to a higher standard than required. Besides decreasing the risk of damage in future storms, owners will also have significant savings on flood insurance premiums for each foot of freeboard (elevation height above the required Base Flood Elevation, or BFE).

Tidal/Freshwater Wetlands + Coastal Erosion Hazard Areas.

Many buildings damaged by Hurricane Sandy are in areas regulated by the New York State Department of Environmental Conservation (DEC) because they are located in or in close proximity to tidal wetlands, freshwater wetlands and/or coastal erosion hazard areas. Applicants repairing or reconstructing buildings in these areas must follow the Operational Buildings Bulletin 2009-012, which outlines DEC's permit requirements and jurisdictional determinations that must be obtained before the Department of Buildings can approve any application. DEC allows a streamlined permitting process (general permit), for various categories of repairs or reconstructions. See http://www.dec.ny.gov/permits/89343.html for more information.

City-Owned Waterfront Property/Maritime Commerce

According to the NYC Charter §643(7), most applications for buildings on City-owned waterfront land or buildings used for maritime commerce are under the jurisdiction of the Department of Small Business Services (SBS). These applications should be filed with SBS.

Fire Code.

Many of the buildings damaged by Hurricane Sandy will be required to have sprinkler systems installed when repaired or reconstructed. *See NYC Fire Code §503.8* and the Fire Department's FAQs.

Where sufficient water supply for a sprinkler system is not available from the City's water supply, the National Fire Protection Association standard (NFPA 13, 13R or 13D) allows an as-of-right allowance for an on-site water tank to supply the needed water supply.

Glossary of Terms

A zone. An area of special flood hazard without high velocity wave action, as indicated on FEMA Flood Insurance Rate Maps or Preliminary Base Flood Elevation Maps

V zone. An area of special flood hazard subject to high velocity wave action, as indicated on FEMA Flood Insurance Rate Maps or Preliminary Base Flood Elevation Maps

ABFE. Advisory Base Flood Elevation, as specified on FEMA Advisory Base Flood Elevation Maps

BFE. Base Flood Elevation, as specified on effective FEMA Flood Insurance Rate Maps

DFE. Design Flood Elevation, as specified in Appendix G of the NYC Building Code

FIRM. FEMA Flood Insurance Rate Map

FRCE. Zoning Design Flood Elevation, as specified in ZR §64-11

PFIRM. Preliminary Floor Insurance rate Map.

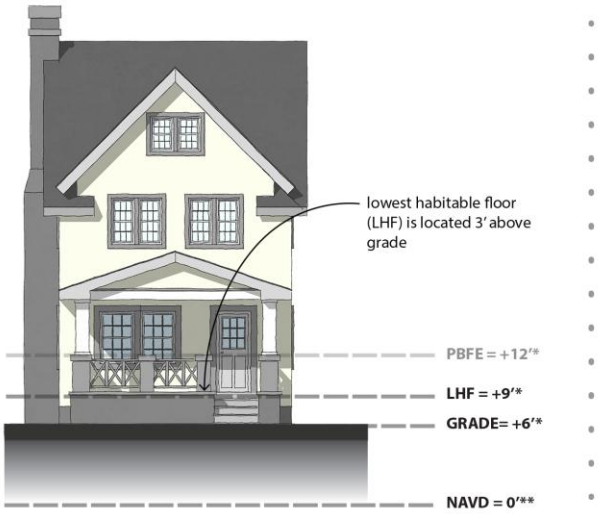
PBFE. Preliminary Base Flood Elevation, as specified on FEMA Preliminary Work Maps

ZDFE. Zoning Design Flood Elevation, as specified in Section 2 of Executive Order

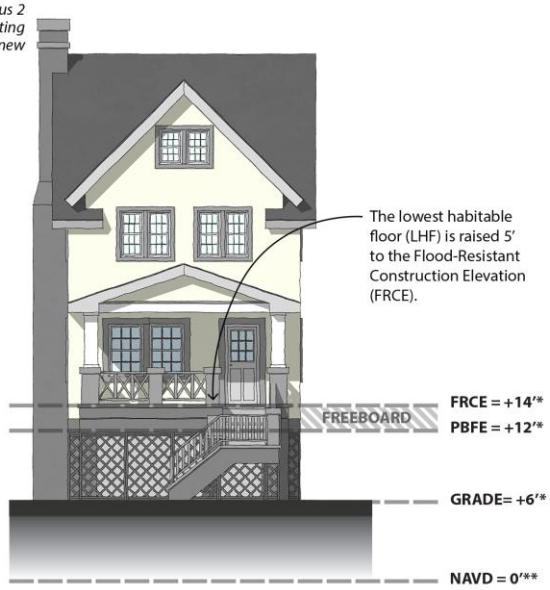
Additional Examples of Elevations

1 or 2 family residence

This drawing illustrates a 1 or 2 family home as it existed on October 28, 2012. In order to elevate this home to standards recommended by FEMA Preliminary Flood Insurance Rate Maps to protect it from future flooding, a homeowner would need to take advantage of special height provisions within flood hazard areas. New zoning regulations allow maximum heights to be measured from the PBFE plus 2 feet of required freeboard (referred to as the FRCE or Flood-Resistant Construction Elevation). Existing homes may elevate the lowest habitable floor above grade to the FRCE, even if that results in a new non-compliance or an increase in the degree of non-compliance pursuant to ZR 64-431 & 64-723



Existing on October 28, 2012



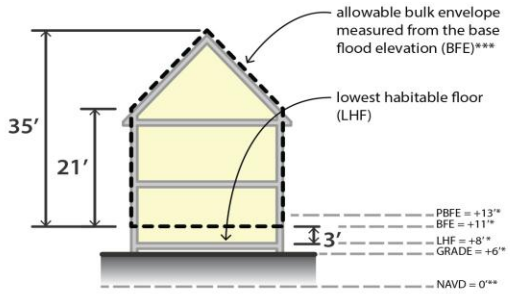
Elevated to Flood-Resistant Construction Elevation

**Grades and elevations are for illustration only, and will differ depending upon location*
***North American Vertical Datum (NAVD) of 1988*

EXAMPLE 1a

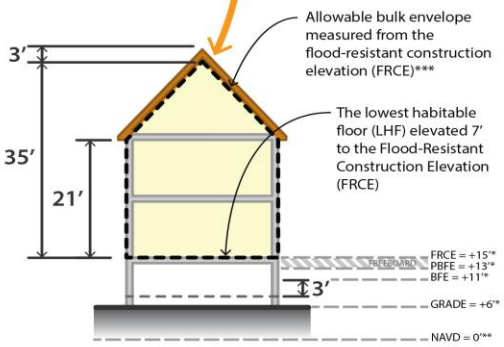
Complying 1 or 2 family residences in A zone

*This diagram illustrates a single or two family home, complying as of October 28, 2012. This home can be elevated to the flood-resistant construction elevation (FRCE), and new non-compliances as to height limitations would be permitted pursuant to **Section 64-431** of the Zoning Resolution.*



Existing on October 28, 2012

EFFECTIVE PER TEXT AMENDMENT:
New non-compliances may be created to the extent necessary to raise the level of the lowest habitable floor (LHF) previously located above grade to the flood-resistant construction elevation (FRCE)



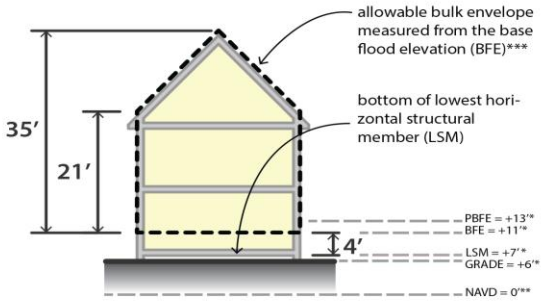
Elevated to Flood-Resistant Construction Elevation

**Grades and elevations are for illustration only, and will differ depending upon location*
***North American Vertical Datum (NAVD) of 1988*
****Example utilizes an R3 district bulk envelope*

EXAMPLE 1b

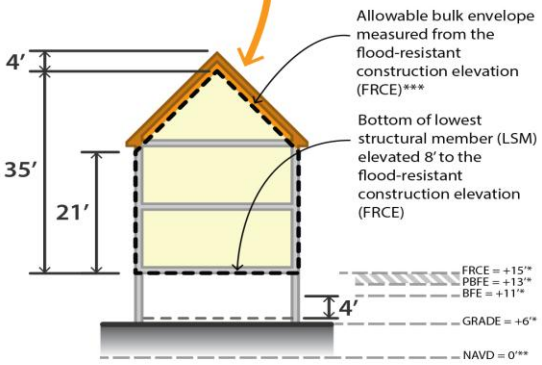
Complying 1 or 2 family residences in V zone

*This diagram illustrates a single or two family home, complying as of October 28, 2012. This home can be elevated to the flood-resistant construction elevation (FRCE), and new non-compliances as to height limitations would be permitted pursuant to **Section 64-431** of the Zoning Resolution.*



Existing on October 28, 2012

EFFECTIVE PER TEXT AMENDMENT:
In V-Zones, new non-compliances may be created to the extent necessary to raise the bottom of the lowest horizontal structural member (LSM) supporting the lowest habitable floor previously above grade to the flood-resistant construction elevation (FRCE)



Elevated to Flood-Resistant Construction Elevation

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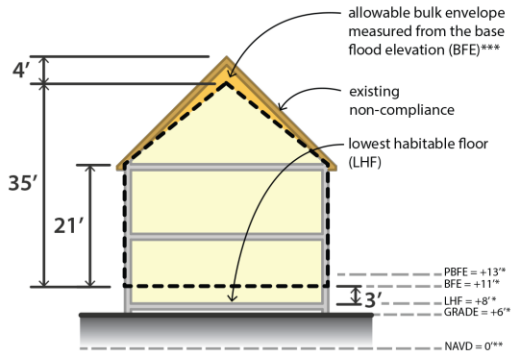
***North American Vertical Datum (NAVD) of 1988*
****Example utilizes an R3 district bulk envelope*

EXAMPLE 2

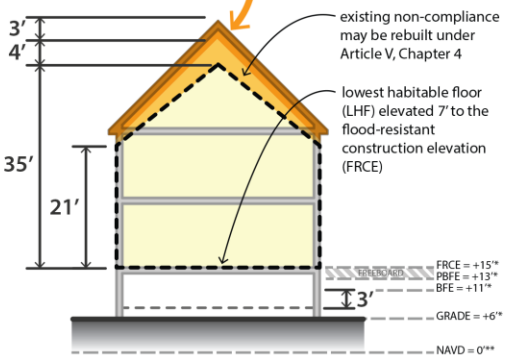
1 or 2 family residence, non-complying as to height

*This diagram illustrates a single or two family home, non-complying as to height as of October 28, 2012. This home can be elevated to the flood-resistant construction elevation (FRCE), and an increase in existing non-compliances as to height limitations would be permitted pursuant to **Section 64-723** of the Zoning Resolution.*



Existing on October 28, 2012

EFFECTIVE PER TEXT AMENDMENT:
Increases in non-compliances are permitted to the extent necessary to raise the level of the lowest habitable floor (LHF) previously located above grade to the flood-resistant construction elevation (FRCE)



Elevated to Flood-Resistant Construction Elevation

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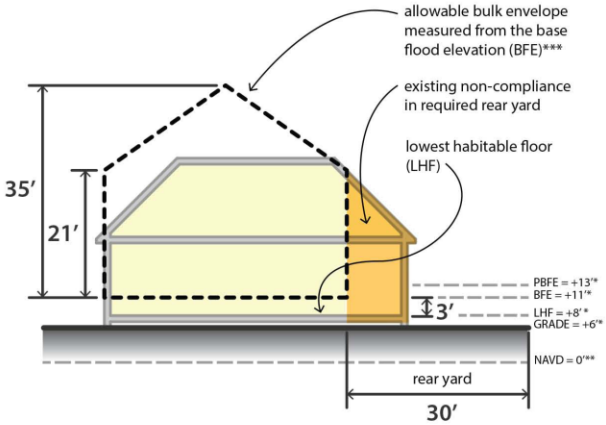
***North American Vertical Datum (NAVD) of 1988*
****Example utilizes an R3 district bulk envelope*

EXAMPLE 3

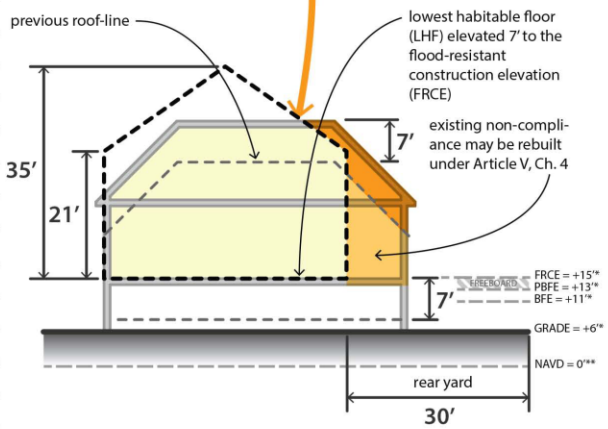
1 or 2 family residence, non-complying as to yards

*This diagram illustrates a single or two family home, non-complying as to yards as of October 28, 2012. This home can be elevated to the flood-resistant construction elevation (FRCE), and an increase in existing non-compliances and the creation of new non-compliances would be permitted pursuant to **Section 64-723** of the Zoning Resolution.*



Existing on October 28, 2012

EFFECTIVE PER TEXT AMENDMENT:
New and increased non-compliances are permitted to the extent necessary to raise the level of the lowest habitable floor (LHF) previously located above grade to the flood-resistant construction elevation (FRCE)



Elevated to Flood-Resistant Construction Elevation

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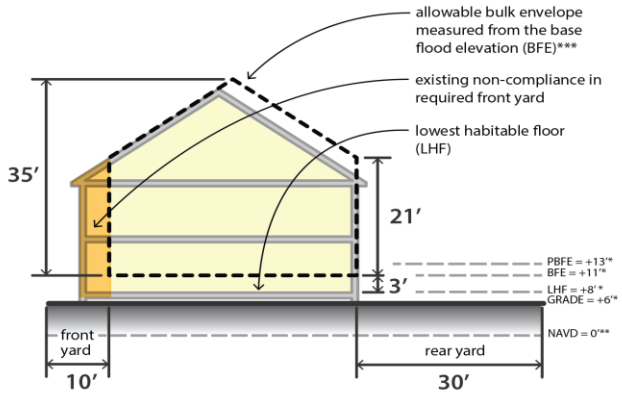
***North American Vertical Datum (NAVD) of 1988*
****Example utilizes an R3 district bulk envelope*

EXAMPLE 4

1 or 2 family residence repositioned on zoning lot

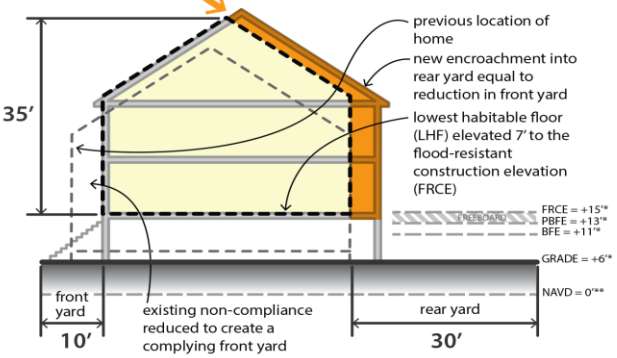
*This diagram illustrates a single or two family home, non-complying as to yards as of October 28, 2012. This home can be elevated to the flood-resistant construction elevation, and an increase in existing non-compliances and the creation of new non-compliances would be permitted pursuant to **Section 64-722 and 64-723** of the Zoning Resolution.*



Existing on October 28, 2012

EFFECTIVE PER TEXT AMENDMENT:
New non-compliances are allowed to the extent necessary to raise the level of the lowest habitable floor (LHF) previously located above grade to the flood-resistant construction elevation (FRCE).

House can be repositioned on lot to accommodate stairs to an elevated first floor, provided the footprint is not increased. As a result of the repositioning, the rear of the building may encroach, or further encroach, into a required yard provided that an existing encroachment in the front yard is reduced by at least the same depth, up to the dimension of a complying front yard. Any such encroachment shall maintain an 8′ distance from the rear of the building to any other residence and at least 4 feet of rear yard shall remain.



Elevated to Flood-Resistant Construction Elevation

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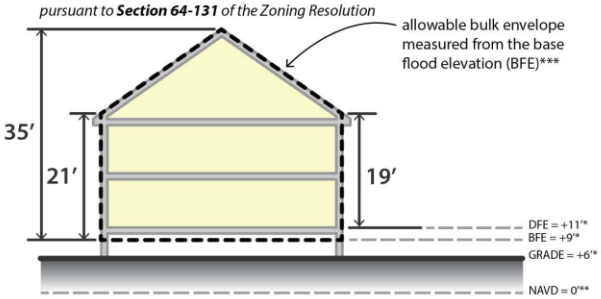
***North American Vertical Datum (NAVD) of 1988*
****Example utilizes an R3 district bulk envelope*

EXAMPLE 5

Development or enlargement of 1 or 2 family home

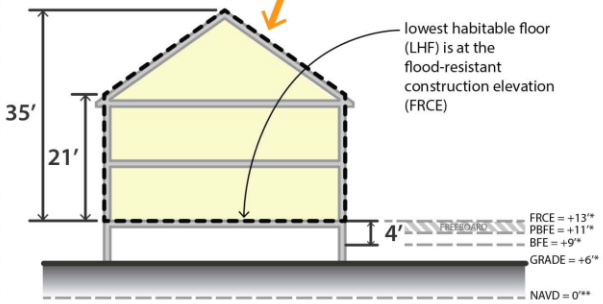
The diagram below illustrates a single or two family home developed or enlarged after January 2013 changes to the Building Code have taken effect, which require the lowest habitable floor (LHF) to be elevated above the base flood elevation (BFE) an additional 2′ known as freeboard. Without special zoning provisions in flood hazard areas, height is measured from the BFE, resulting in lower effective perimeter walls and lower floor-to-ceiling heights inside the home.

*The diagram on the right illustrates that if the LHF is constructed to the flood-resistant construction elevation, no loss of perimeter wall or floor-to-ceiling heights will occur, since height is measured from the FRCE in flood hazard areas pursuant to **Section 64-131** of the Zoning Resolution*



New home built with code changes, & without zoning text amendment

EFFECTIVE PER TEXT AMENDMENT:
Height is measured from the flood-resistant construction elevation (FRCE) in flood hazard areas



New home built with code changes, & with zoning text amendment

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****Example utilizes an R3 district bulk envelope*

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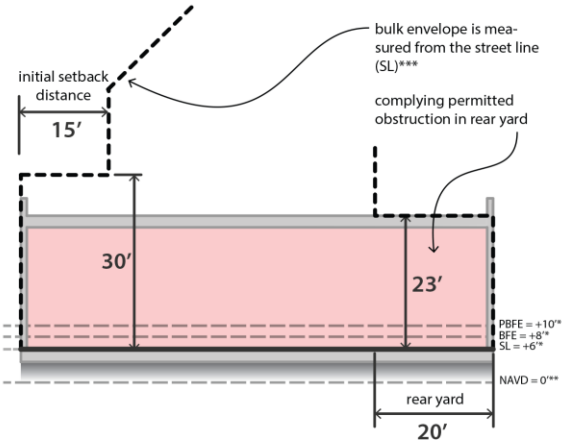
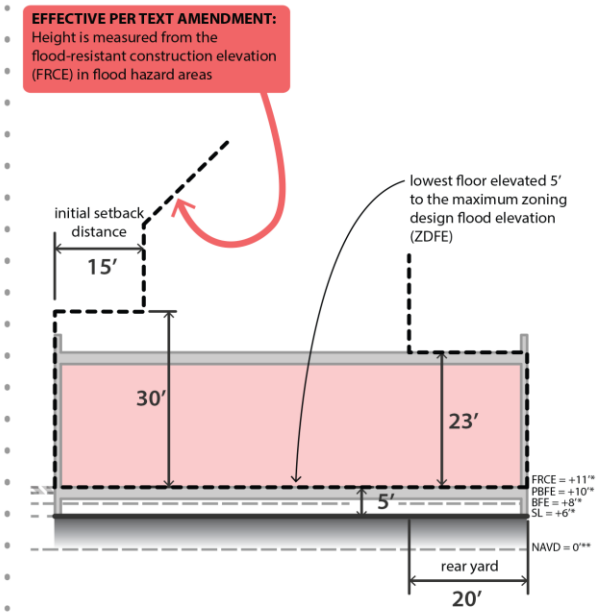
EXAMPLE 6

Complying commercial building

*This diagram illustrates a complying commercial building as of October 28, 2012. This building can be elevated to the flood-resistant construction elevation (FRCE) because height in flood hazard areas is now measured from FRCE pursuant to **Section 64-131** of the Zoning Resolution.*



Existing on October 28, 2012



Elevated to Flood-Resistant Construction Elevation

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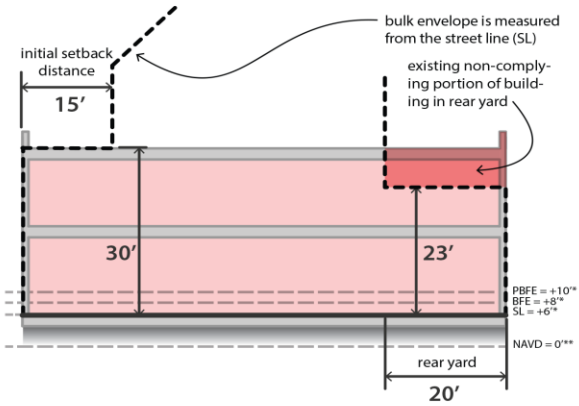
***North American Vertical Datum (NAVD) of 1988*
****Example utilizes an C2-2 district bulk envelope*

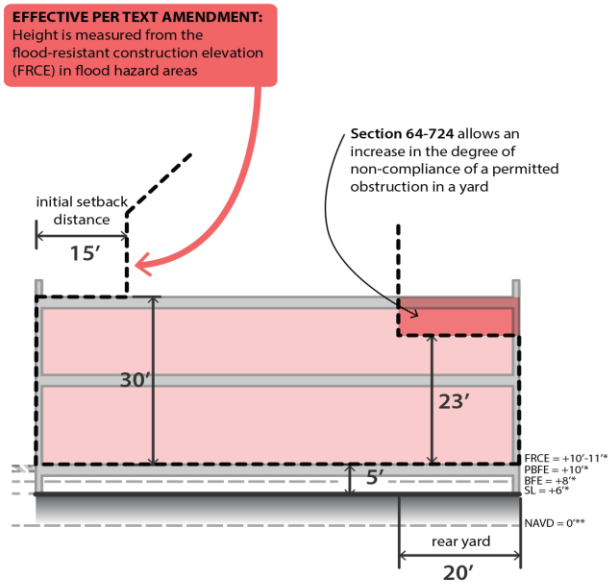
EXAMPLE 7

Commercial building, non-complying as to yards

*This diagram illustrates a commercial building, non-complying as to yards as of October 28, 2012. This building can be elevated to the flood-resistant construction elevation (FRCE), and new non-noncompliances or increases to existing non-compliances as to height and yards are permitted pursuant to **Section 64-724** of the Zoning Resolution.*



Existing on October 28, 2012



Elevated to Flood-Resistant Construction Elevation

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***North American Vertical Datum (NAVD) of 1988*
****Example utilizes an C2-2 district bulk envelope*

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This guide is to clarify the procedures and requirements for New York State-licensed registered architects and professional engineers performing Hurricane Sandy-related repair and reconstruction work. It provides an overview and does not contain all applicable requirements for repair and reconstruction work.