BRYAN CAVE LEIGHTON PAISNER LLP

DRY-FLOODPROOFING: RECENT CASE STUDIES IN NYC

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New York, NY

Annual Conference
Association of State Floodplain Managers

May 22, 2019

Cleveland, OH

Snapshot of Bryan Cave Leighton Paisner

BRYAN CAVE LEIGHTON PAISNER BCLP

- Global law firm with 1,400 highly skilled lawyers
- Nearly 400 lawyers in real estate department
- 31 offices across North America, Europe, the Middle East and Asia
- The firm is known for its relationship-driven, collaborative culture, diverse legal experience and industry-shaping innovation
- Range of integrated capabilities, including some of the most active M&A, real estate, financial services, litigation and corporate risk practices in the world

Agenda

- **Dry-Floodproofing: Regulatory Overview**
- **Case Study 1: 67 Vestry Street, Manhattan**
- **Case Study 2: 215 N. 10th Street, Brooklyn**

Note: Both case studies are presented as schematic designs, and this presentation does not provide design details needed to demonstrate compliance with NFIP and the NYC Building Code.

Regulatory Overview

Source	Guidance
44 CFR § 60.3	FEMA TB 3 FEMA P 936 References ASCE 24 References IBC References USACE 1995
International Building Code Includes ASCE 24-14	IBC Commentary ASCE 24-14 Annex ASCE Interpretations
Local Codes e.g., New York City Building Code based on IBC	In NYC: Buildings Bulletins (i.e. flood-proof glazing)

Regulatory Overview

44 CFR 60.3 Community Obligations for A-Zones:

- **Building Sites:**
  - **New construction**
  - **Substantial improvements**
- **Subdivisions**
  - **Flood damage generally**
  - **Utilities**
  - **Drainage**
- **Water Supply and Sanitary Sewer Systems**
- **Recreational Vehicles**

Regulatory Overview

44 CFR 60.3 Community Obligations for A-Zones:

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Dry floodproofing for nonresidential buildings

Regulatory Overview

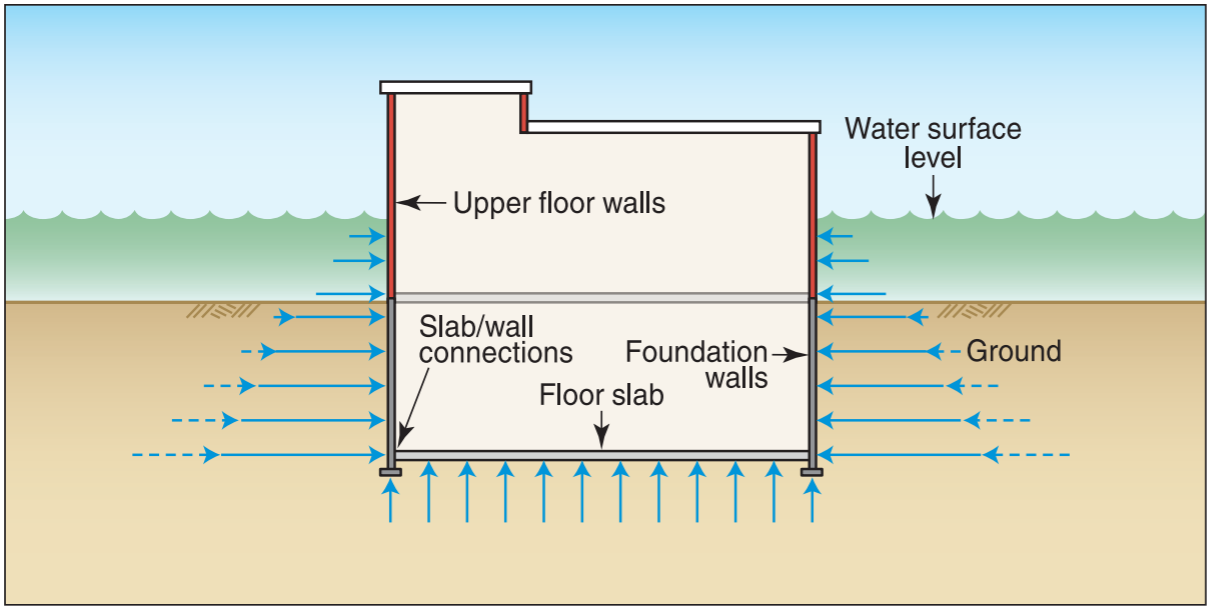

Figure 2-13. Basic building components exposed to flood loads

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Regulatory Overview

44 CF 60.3 (c) [T]he community shall:

. . .

(3) Require that all new construction and substantial improvements of non-residential structures within Zones A1-30, AE and AH zones on the community's firm

(i) [elevate] or,

(ii) together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with **walls substantially impermeable to the passage of water** and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;

. . .

Regulatory Overview

Dry floodproofing (44 CF 60.3(c)(3):

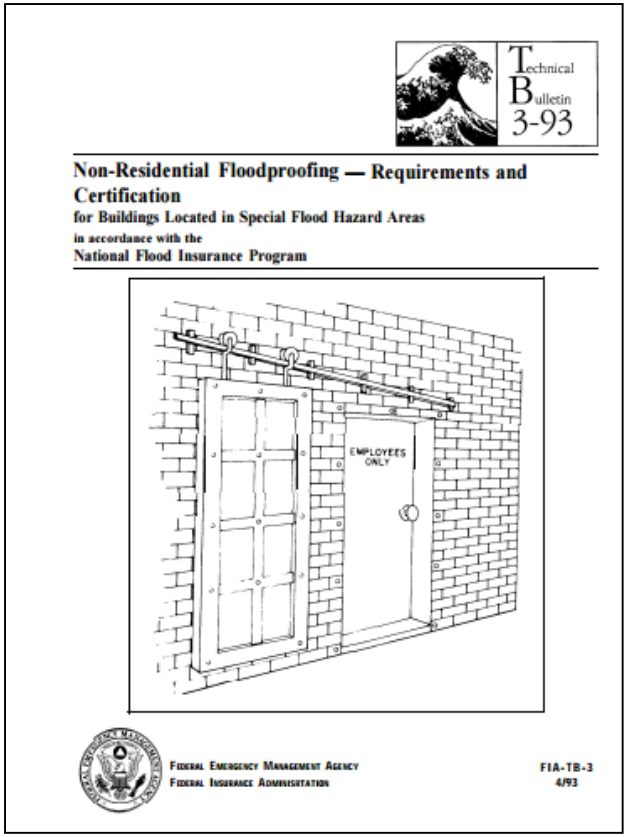
“the structure is watertight with walls substantially impermeable to the passage of water”

Regulatory Overview

FEMA TB 3-93

- "The **building** must be watertight (i.e., floodwaters must not enter the **building envelope**)"

- "The **building's walls** must be 'substantially impermeable to the passage of water.'"


Technical Bulletin 3-93

Non-Residential Floodproofing — Requirements and Certification
for Buildings Located in Special Flood Hazard Areas
in accordance with the
National Flood Insurance Program

Federal Emergency Management Agency
Federal Insurance Administration

FIA-TB-3
4/93

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Regulatory Overview

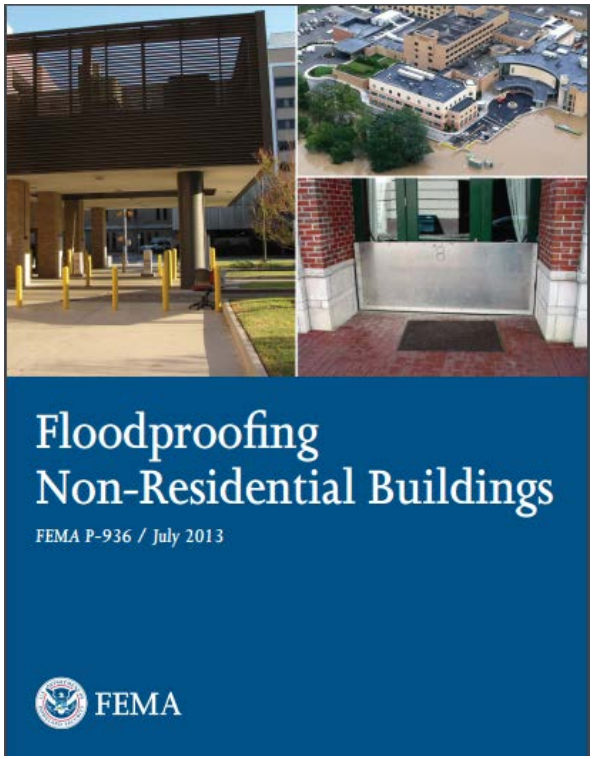
FEMA P-936 - 13

Chapter 3: Dry Floodproofing

- Continuous impermeable walls
- Flood shields for openings in exterior walls

Chapter 4: Floodwalls and Levees

- Barriers between the building and floodwaters



Regulatory Overview

FEMA P-936 - 13

Chapter 3: Dry Floodproofing

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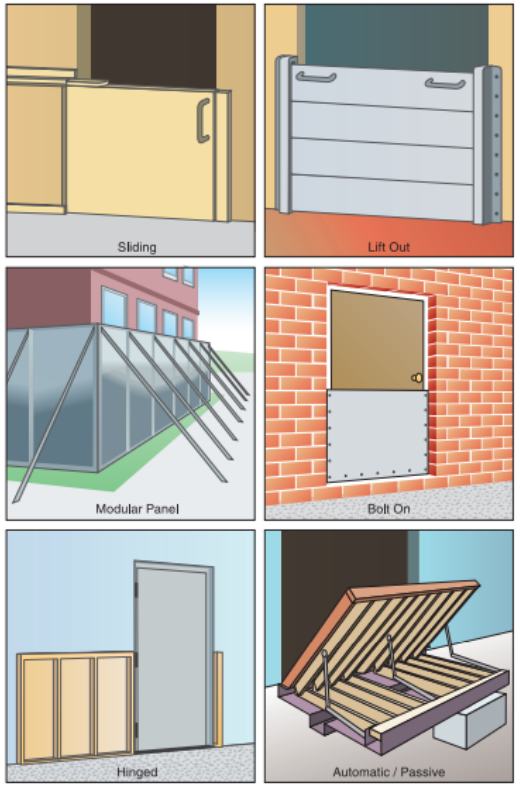

Figure 3-10. Types of flood shields

Regulatory Overview

FEMA P-936 - 13

Chapter 3: Dry Floodproofing

- Continuous impermeable walls
- Flood shields for openings in exterior walls

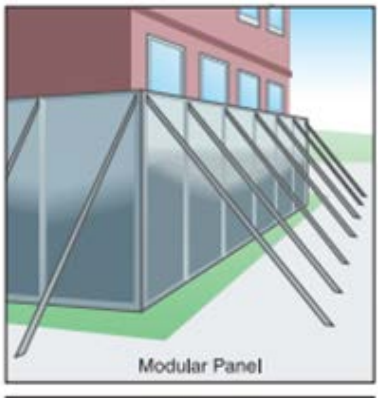

Figure 3-10. Types of flood shields

Regulatory Overview

Walls vs. Openings

Regulatory Overview

FEMA P-936 - 13

Chapter 3: Dry Floodproofing

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- Flood shields for openings in exterior walls

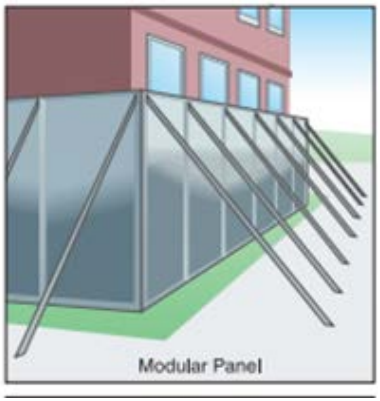
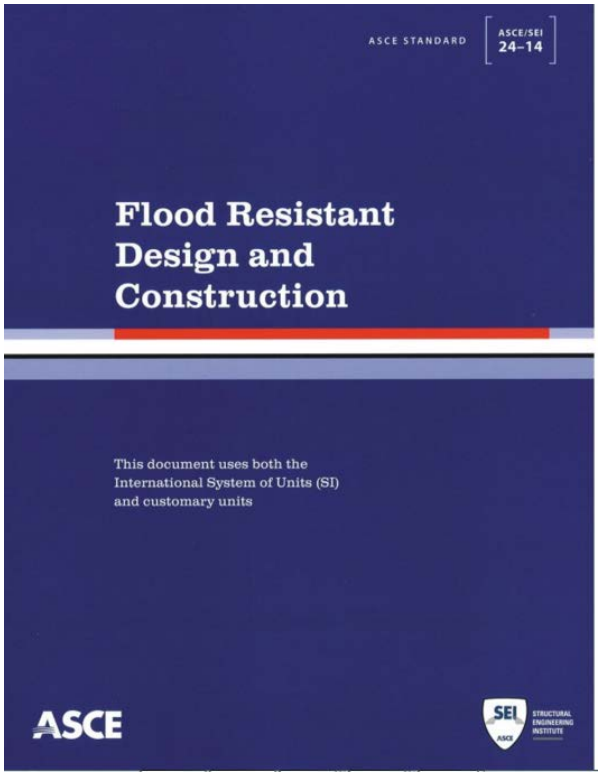


Figure 3-10. Types of flood shields

Regulatory Overview

IBC, ASCE 24 – 14

- **Section 6.2.2**



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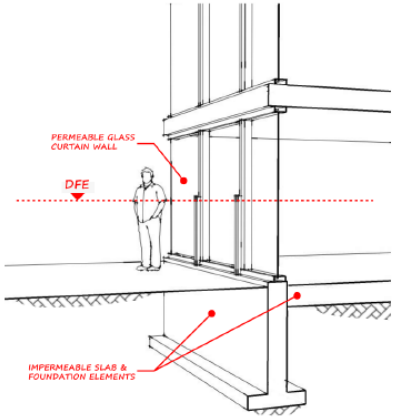
Regulatory Overview

IBC, ASCE 24 – 14

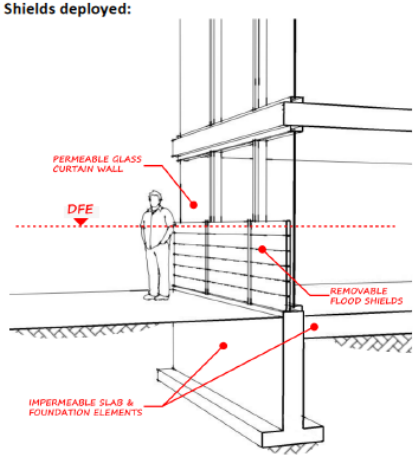
Formal Interpretation 11/29/16

Building Façade with Integrated Flood Shield Supports:

Building Façade without Flood Shields:



Building Façade with Flood Shields deployed:



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Regulatory Overview

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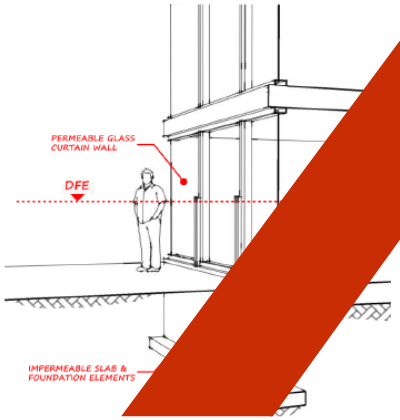
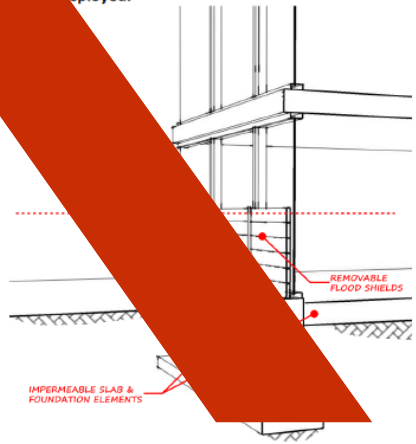


eployed:



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Regulatory Overview

NYC Local Ordinance (IBC-2012/ASCE 24/05)

- **Extensive Local Amendments:**
  - Maintenance of all required means of egress for egress/ingress during flood (ASCE 24 6.2.2)
  - Provision of alternate paths for any egress blocked by shields (ASCE 24 6.2.2)
  - Prohibition of temporary stairs for (i) residential portions of mixed buildings and (ii) buildings to be occupied during floods and (G308.7.2)
    - exception for existing buildings
  - Strict alteration provisions for non-SI/SD > sometimes requires dry floodproofing anyway

Regulatory Overview

NYC Local Ordinance (IBC-2012/ASCE 24/05)

- **Extensive Local Amendments:**
  - Prohibition of dry floodproofing for certain systems (G 304.1.2):
    - Electronically supervised sprinkler/standpipe control valves and waterflow alarms
    - Fire pumps/sprinkler booster pumps
    - Fire alarm control panels for fire extinguishing systems
    - Fire alarm zoning indicator (5 feet above DFE)
    - Fuel oil piping fill/vent (3 feet above DFE)
    - Pluming FAI and relief vents
    - Plumbing backflow preventers

Regulatory Overview

NYC Local Ordinance (IBC-2012/ASCE 24/05)

- **Extensive Local Amendments:**
  - Allowance for wave-resisting dry floodproofing in coastal A zones (G304.3)
  - Allowance for flood shields, temporary stairs and foundations to project into public right-of-way:
    - 6” above grade, 12” below grade as-of-right (BC 322.1.1, 3202.2.2)
    - Greater distances with DOT permission (34 RCNY 7-04(a)(37))
  - Requirement to construct to greater of FIRMS/PFIRMs (G 102.2.2)
  - Special inspection of flood shields (G105.4)
  - Notations on C of O for dry floodproofed spaces (G106.4)
  - Definition of “Non-residential” (G 201.2)

Agenda

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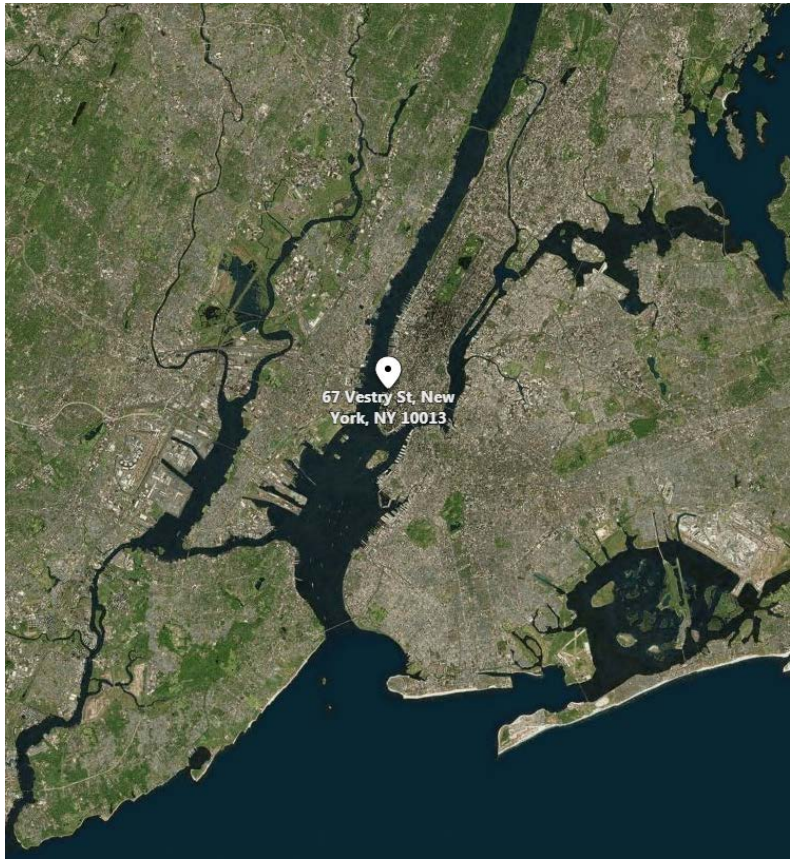
- **Case Study 1: 67 Vestry Street, Manhattan**
- **Case Study 2: 215 N. 10th Street, Brooklyn**

Note: Both case studies are presented as schematic designs, and this presentation does not provide design details needed to demonstrate compliance with NFIP and the NYC Building Code.

Case Study 1: 67 Vestry Street



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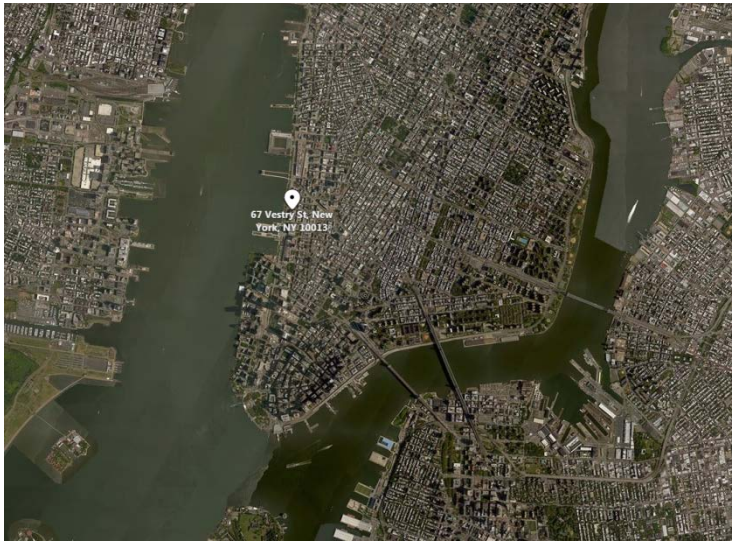

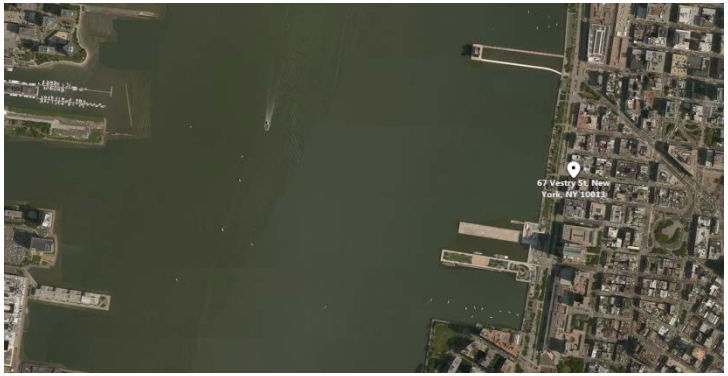

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Case Study 1: 67 Vestry Street

1897 A & P

Great Atlantic and Pacific Tea Company

2016

Photo: https://commons.wikimedia.org/w/index.php?curid=52319953

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Case Study 1: 67 Vestry Street

2019

"Substantial Improvement"

Case Study 1: 67 Vestry Street

- **NYC DOB Substantial Improvement/Damage Rule:**

1 RCNY §3606-01

CHAPTER 3600

Appendices

§3606-01 Alteration applications; determinations of market value and substantial improvement.
(a) Scope. This rule provides application submission requirements for alterations to structures located in areas of special flood hazard, provides the method for determining the market value of a structure, and provides the method for determining whether repairs, reconstructions, rehabilitations, additions or improvements constitute a substantial improvement.
(b) References. See Section BC G201.2 (definitions of market value of structure, substantial damage, and substantial improvement) and Section 28-104.7.11.
(c) Applicant's statement. Applicants shall include in every alteration application the 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."
(d) Calculation of market value. To determine the market value of a structure, the applicant shall use either of the two calculation methods below:

1) Assessment Roll Option

2) Appraisal Option

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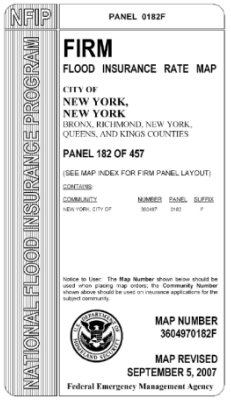
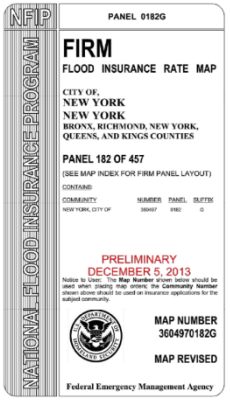
Case Study 1: 67 Vestry Street

- **Effective FIRM (2007)**
  - AE Zone 10 (NGVD 29)
    - ≈ 8.9 (NAVD 88)



- **PFIRM (2013/2015)**
  - AE Zone 12 (NAVD 88)
  - not in LIMWA



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Case Study 1: 67 Vestry Street

- **NYC Local Ordinance:**
  - BC G102.2.2
  - “Effect of preliminary flood insurance study and rate maps”

- **More Restrictive of:**
  - 2007 Effective FIRMs
  - 2013/2015 PFIRMs

Case Study 1: 67 Vestry Street

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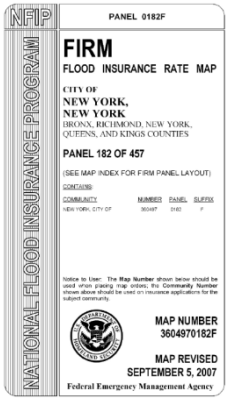

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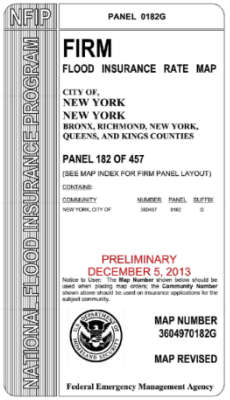

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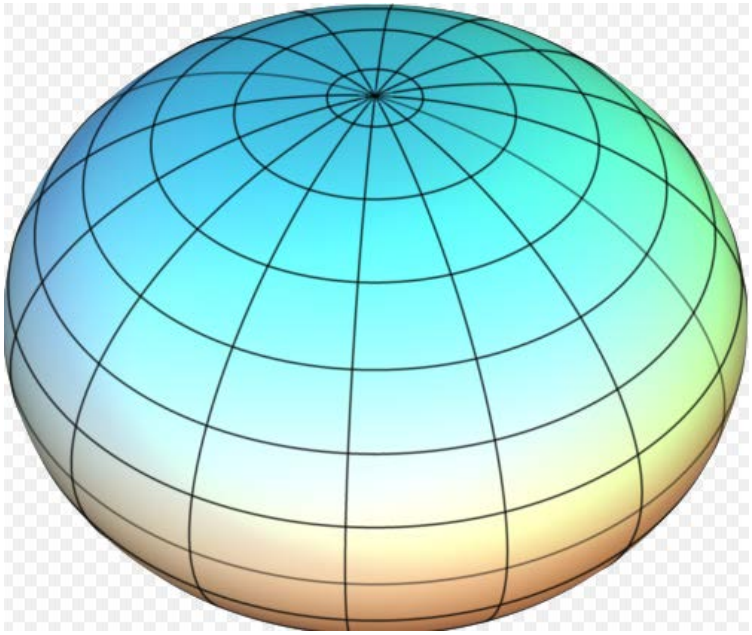

NGVD > NAVD in Manhattan

NGVD Elevations	To obtain NAVD Equivalency:	NAVD Elevations
11.040 to 11.109	-> Subtract between 1.040 and 1.109 ->	10.000
12.752	-> Subtract between 1.040 and 1.109 ->	11.643 to 11.712
10.000	-> Subtract between 1.040 and 1.109 ->	8.891 to 8.960

Oblate Spheroid

NGVD > NAVD

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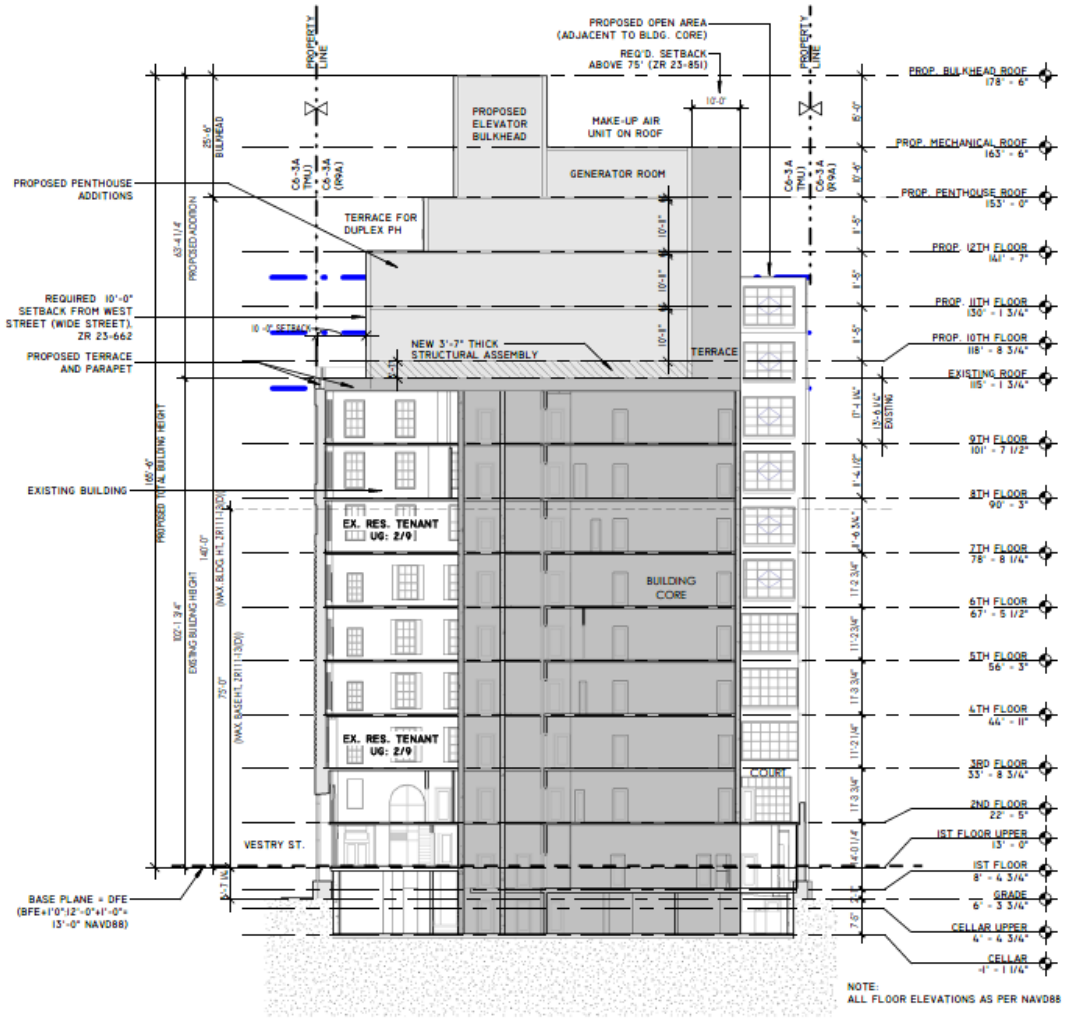
Case Study 1: 67 Vestry Street



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Case Study 1: 67 Vestry Street

Grade: 6’-7” below DFE
Cellar: 14’-1” below DFE

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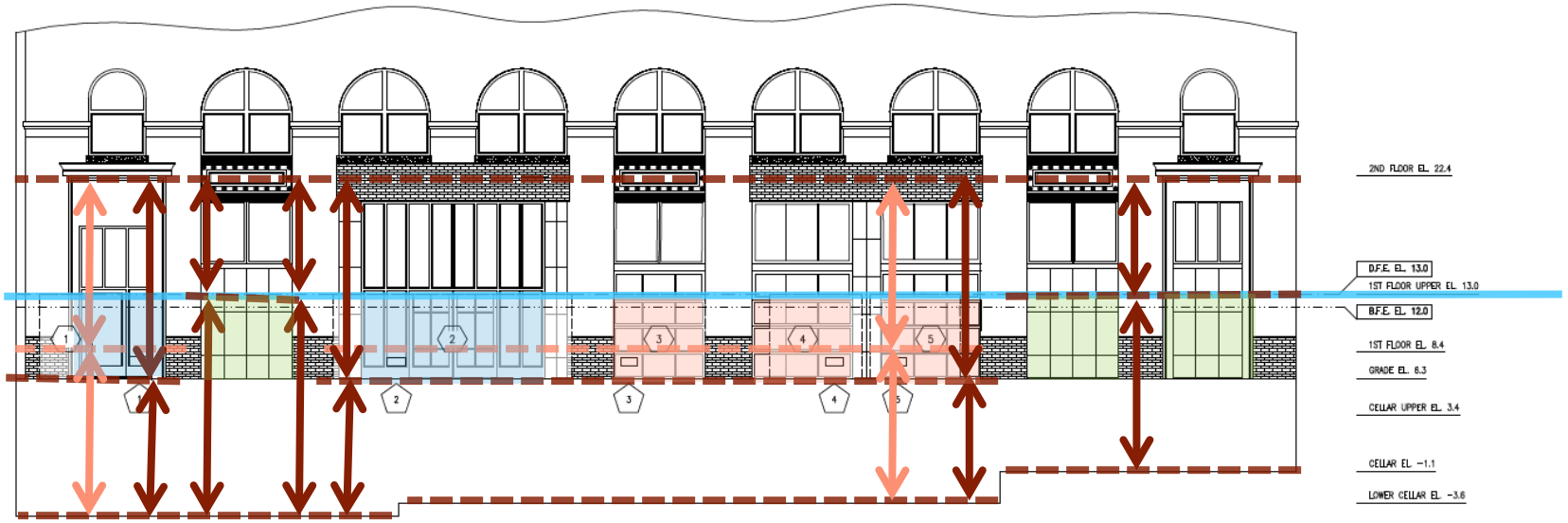
Case Study 1: 67 Vestry Street



PROPOSED NORTH ELEVATION

- Wet Floodproofed
- Solid Panels/Glazing
- Flood Shields

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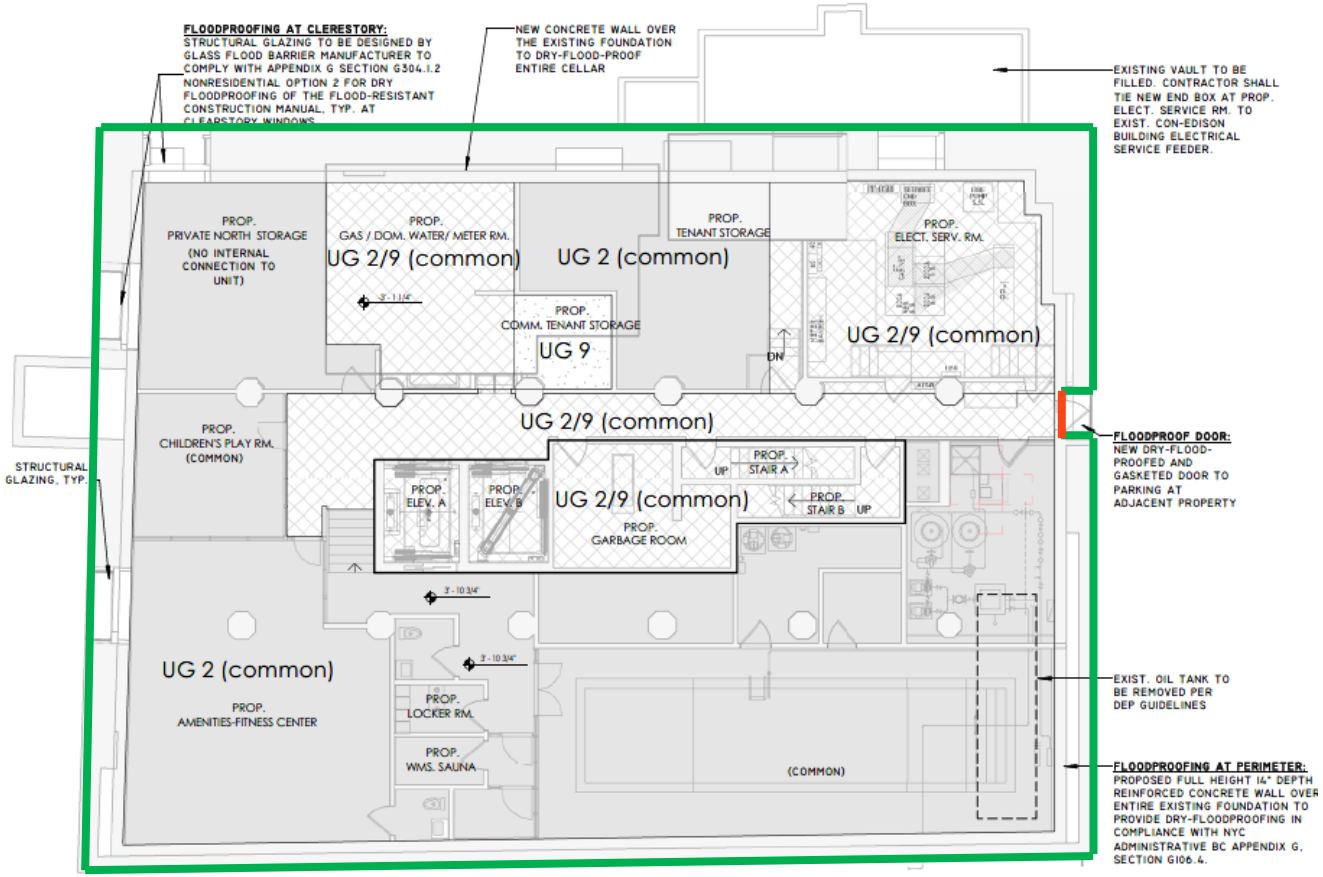
Case Study 1: 67 Vestry Street



BP ARCHITECTS

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CELLAR FLOOR PLAN
A-200.00

- Elevated
- Wet Floodproofed
- Dry Floodproofed
- Temporary Stairs/Platforms
- Solid Dry Floodproofing
- Flood Shields

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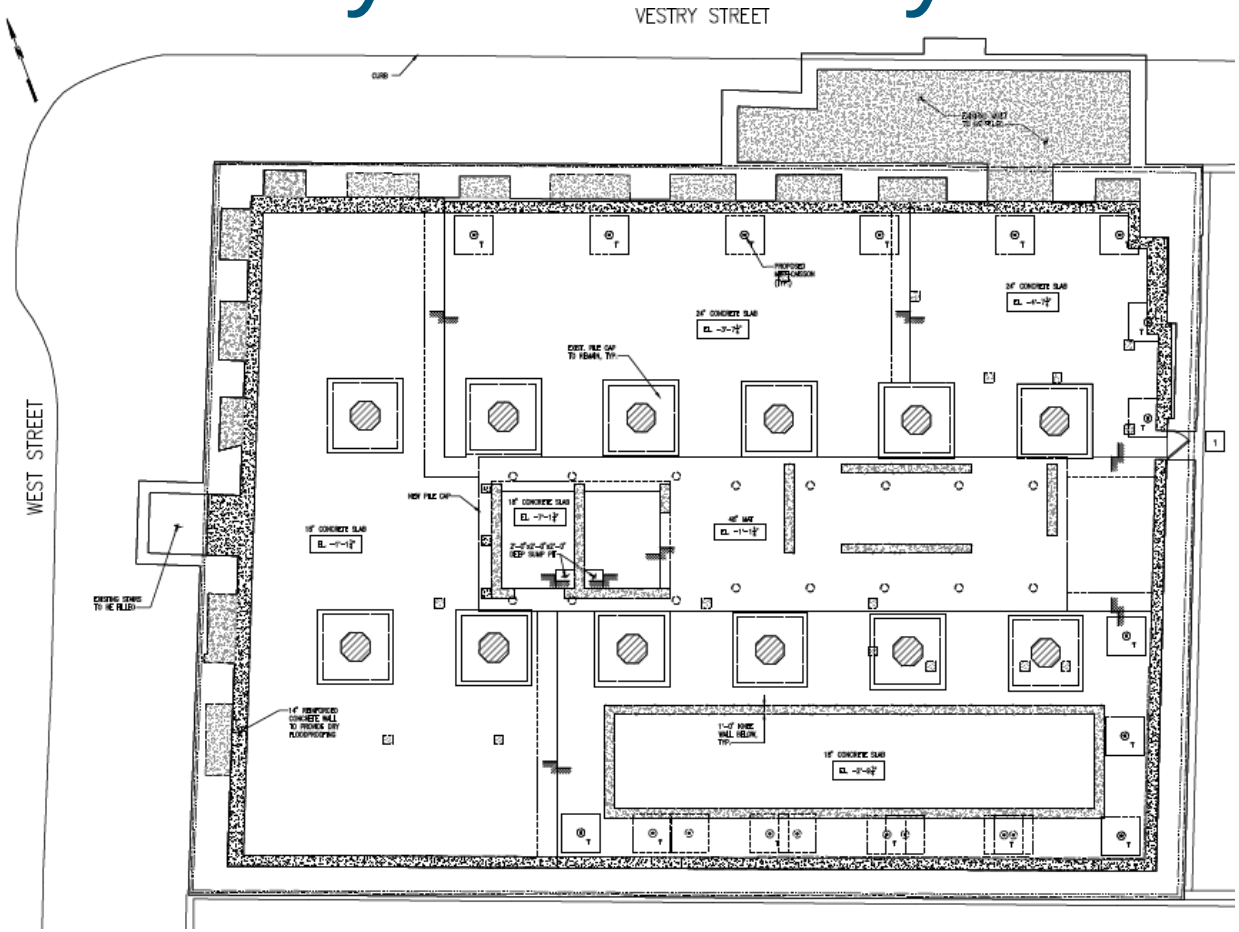
Case Study 1: 67 Vestry Street



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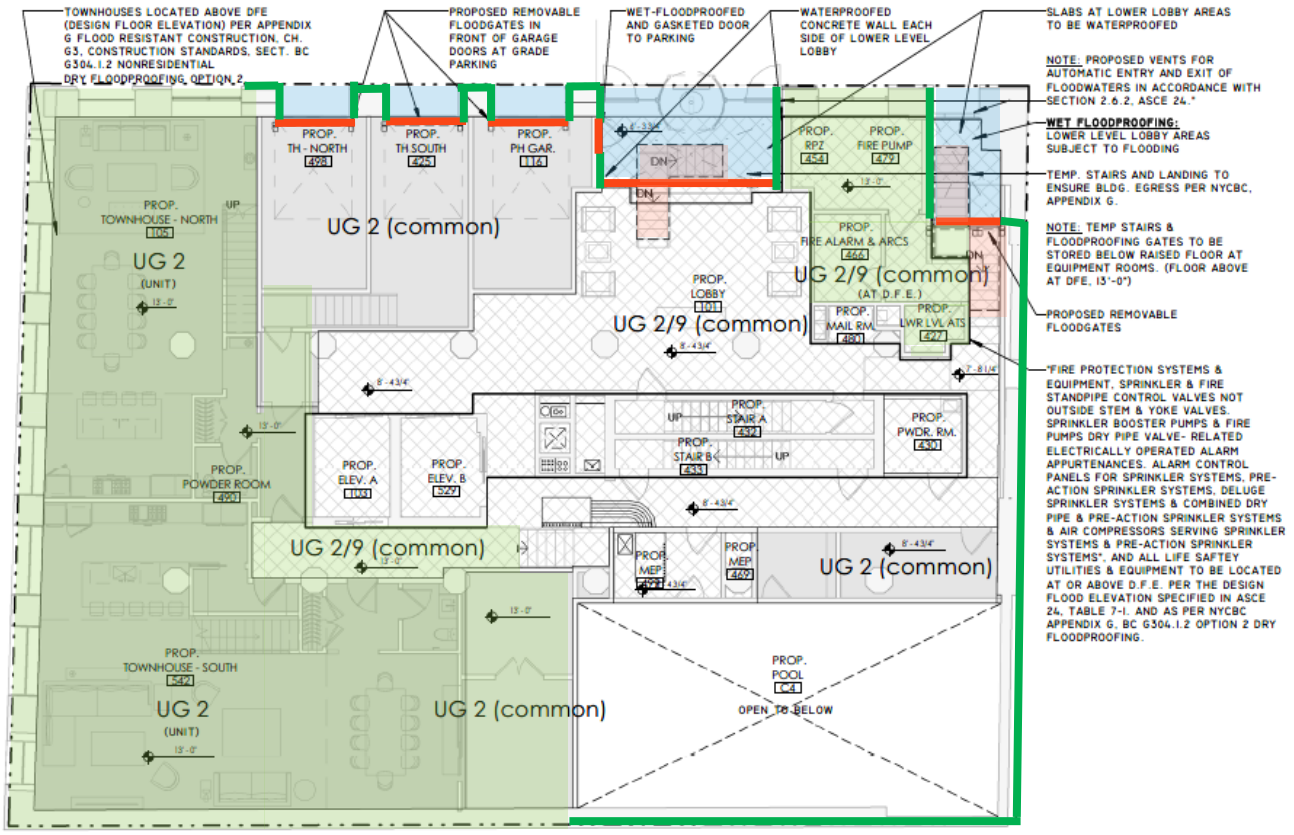

1ST FLOOR PLAN
A-201.00

- Elevated
- Wet Floodproofed
- Dry Floodproofed
- Temporary Stairs/Platforms
- Solid Dry Floodproofing
- Flood Shields

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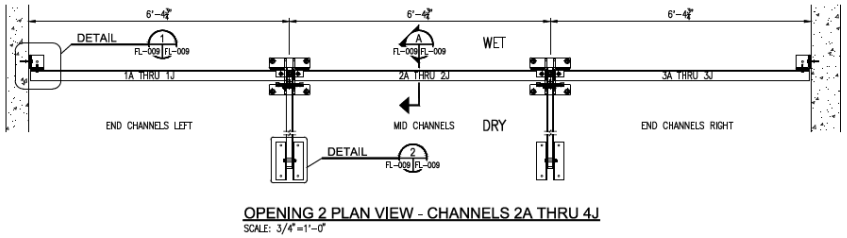
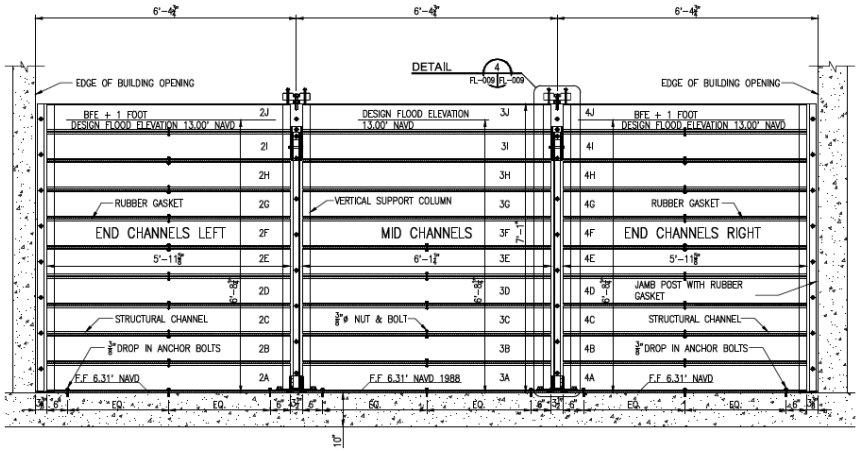
BP ARCHITECTS

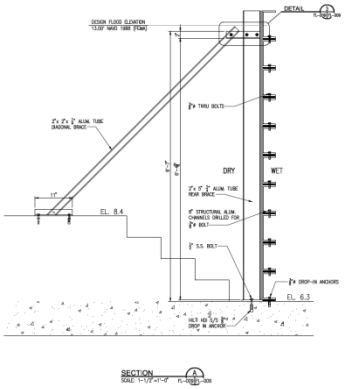
Case Study 1: 67 Vestry Street



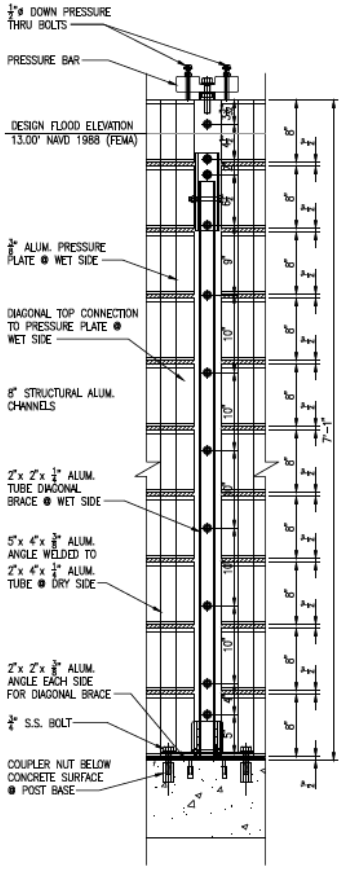
OPENING 2 PLAN VIEW - CHANNELS 2A THRU 4J
SCALE: 3/4"=1'-0"



OPENING 2 ELEVATION VIEW - CHANNELS 2A THRU 4J
SCALE: 3/4"=1'-0"



SECTION



DETAIL
SCALE: 1-1/2"=1'-0"

FLOOD SHIELD DETAILS

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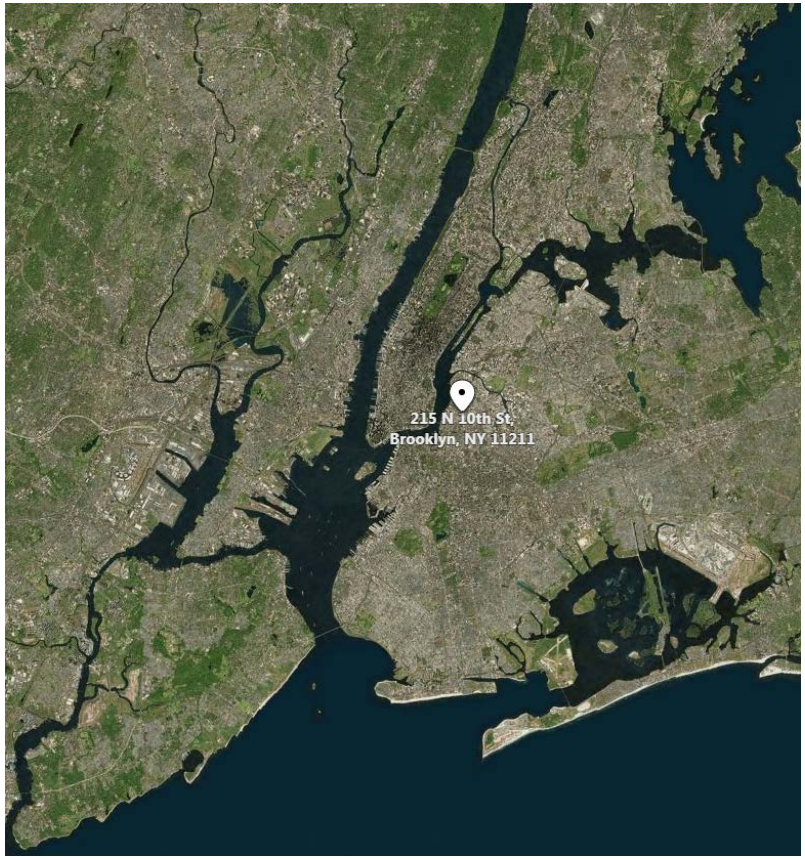
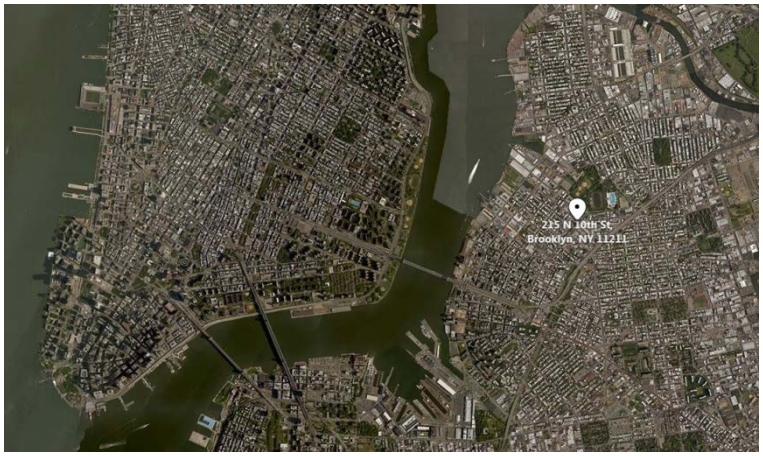
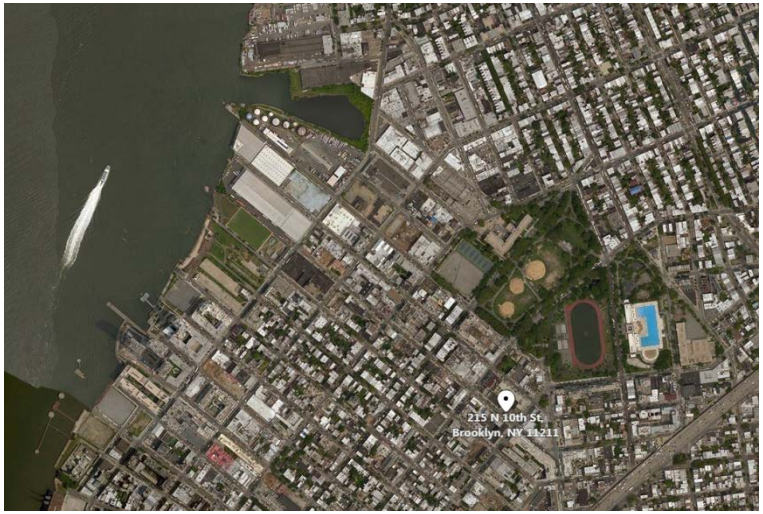


Case Study 2: 215 N. 10th Street





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Case Study 2: 215 N. 10th Street

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Case Study 2: 215 N. 10th Street

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  - AE Zone 10 (NGVD 29)
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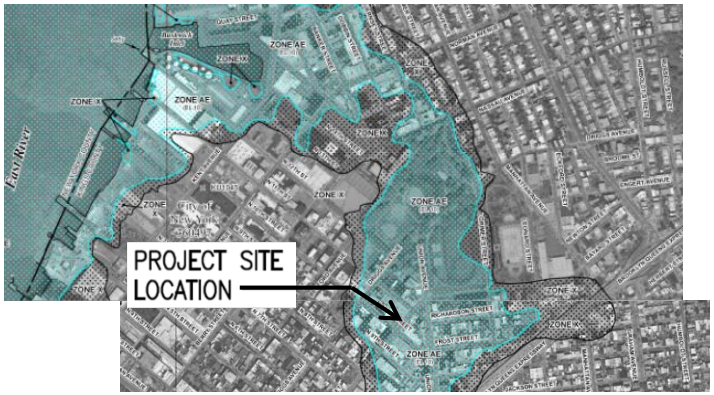
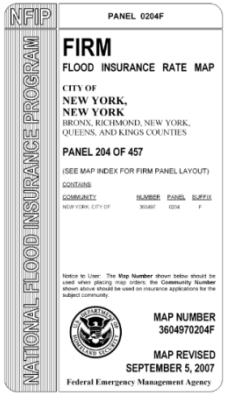
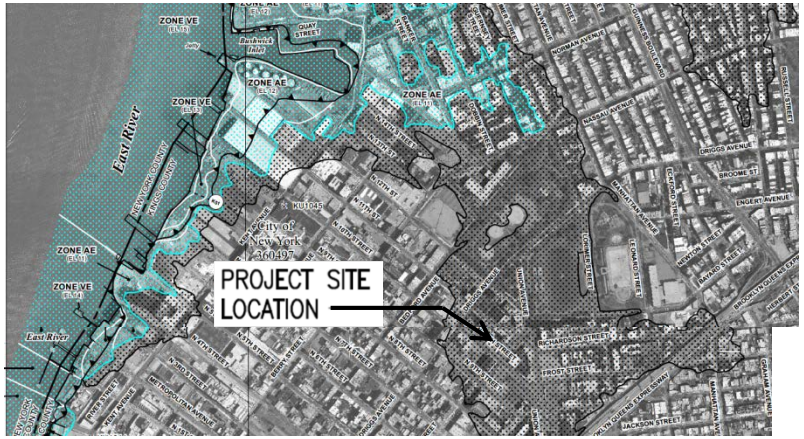
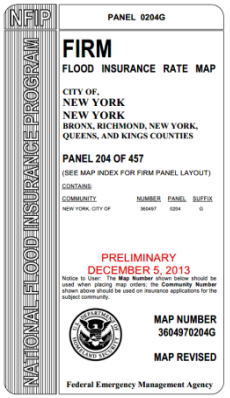




- **PFIRM (2013/2015)**
  - X Zone





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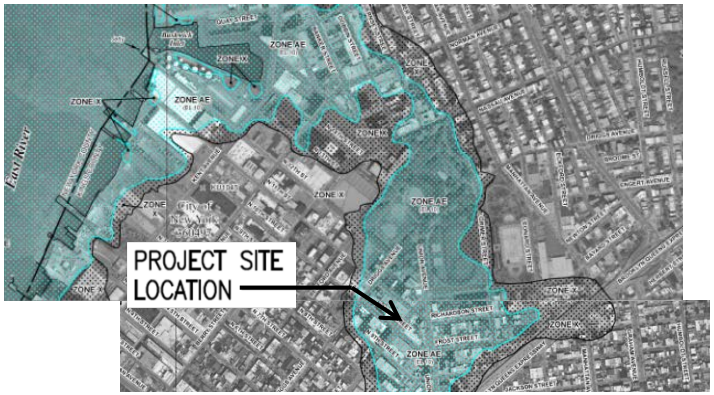
Case Study 2: 215 N. 10th Street

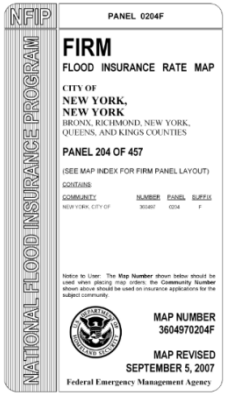
- **NYC Local Ordinance:**
  - BC G102.2.2
  - “Effect of preliminary flood insurance study and rate maps”

- **More Restrictive of:**
  - 2007 Effective FIRMs
  - 2013/2015 PFIRMs

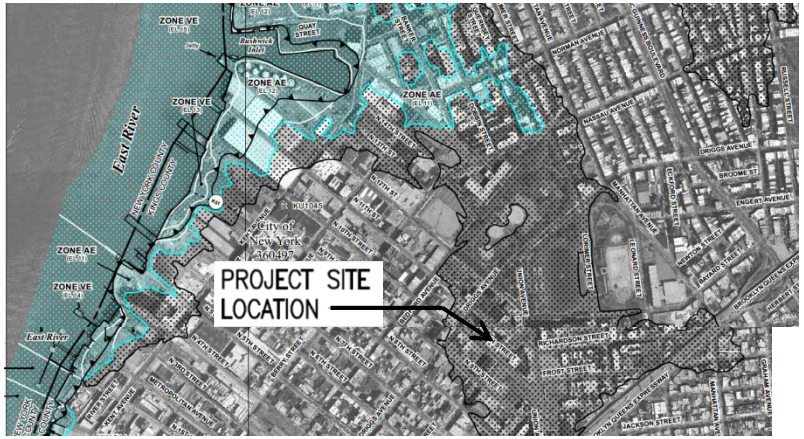
Case Study 2: 215 N. 10th Street

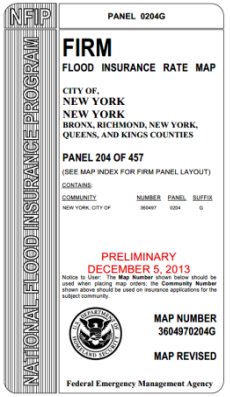
- **Effective FIRM (2007)**
  - AE Zone 10 (NGVD 29)
    - ≈ 8.9 (NAVD 88)





- **PFIRM (2013/2015)**
  - X Zone





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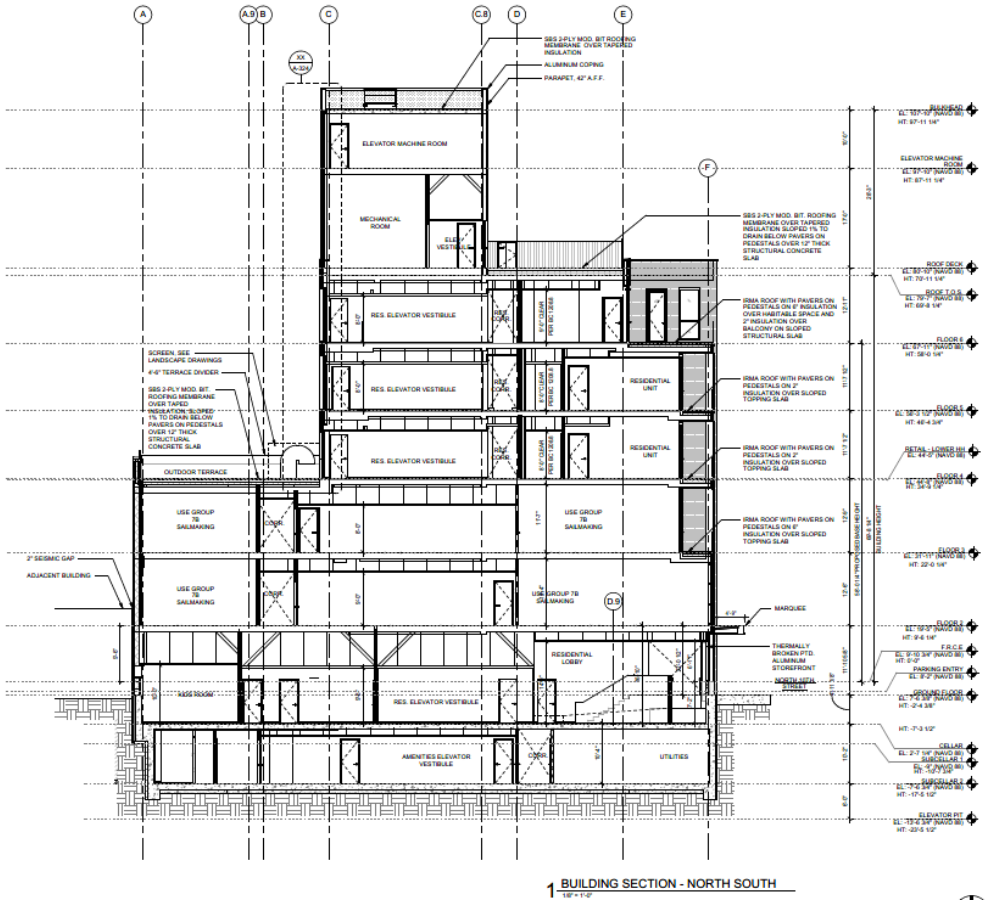
Case Study 2: 215 N. 10th Street



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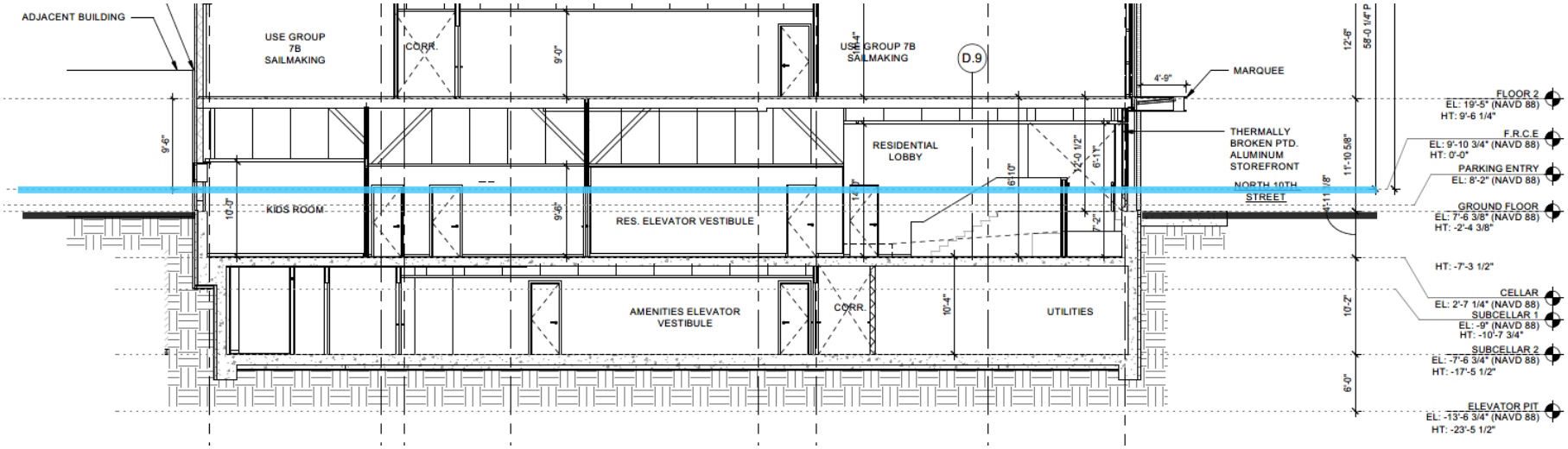
MAY 19-23 #ASFPM2019

Case Study 2: 215 N. 10th Street



Grade: 2’-4” below DFE
Subcellar: 17’-4” below DFE

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Case Study 2: 215 N. 10th Street

- Wet Floodproofed
- Solid Panels/Glazing
- Flood Shields

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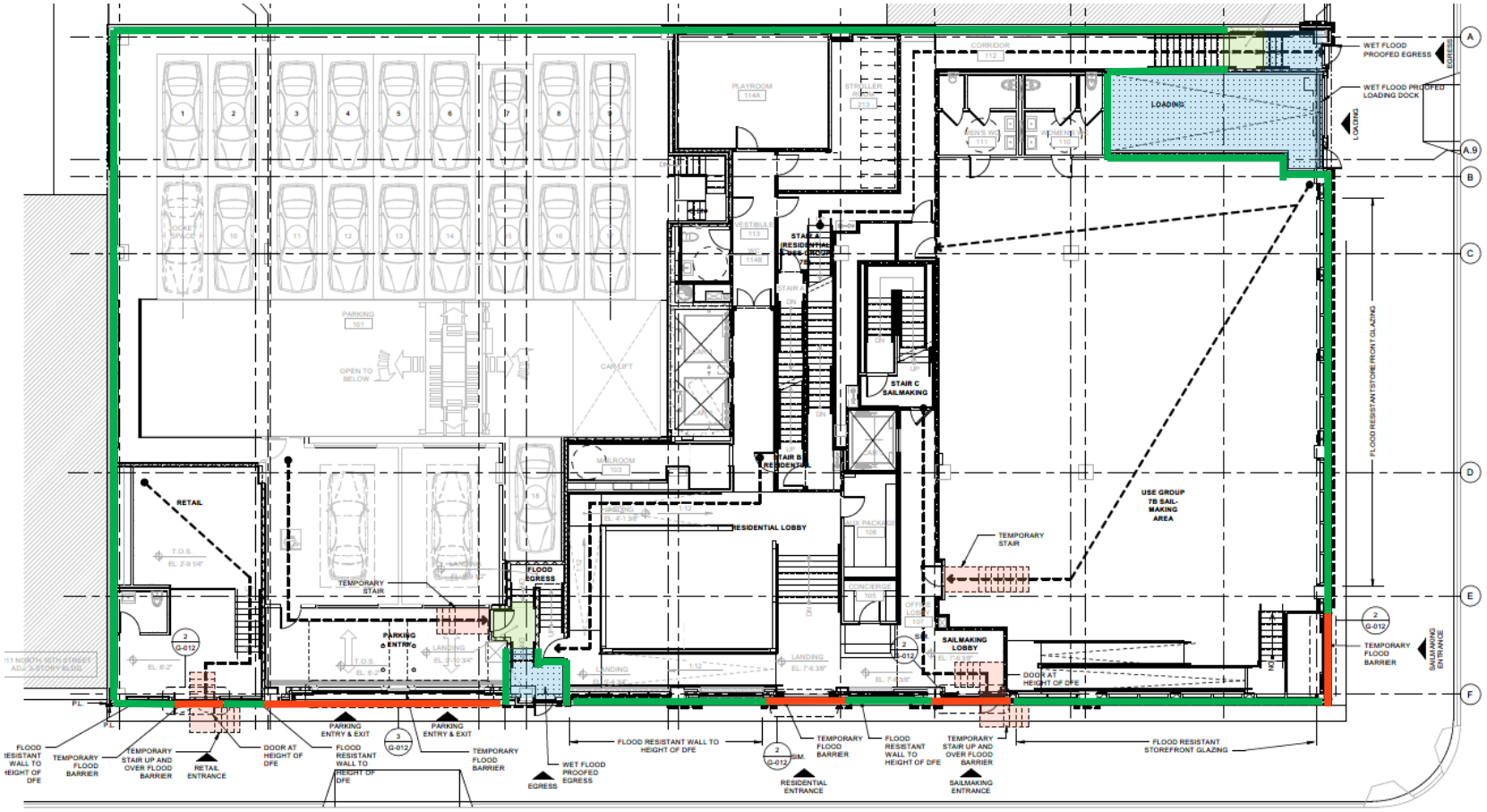
Case Study 2: 215 N. 10th Street



1 PLAN AT GRADE - FLOOD-PROOFING PLAN
1/8" = 1'-0"

- Elevated
- Wet Floodproofed
- Dry Floodproofed
- Temporary Stairs/Platforms

- Solid Dry Floodproofing
- Flood Shields

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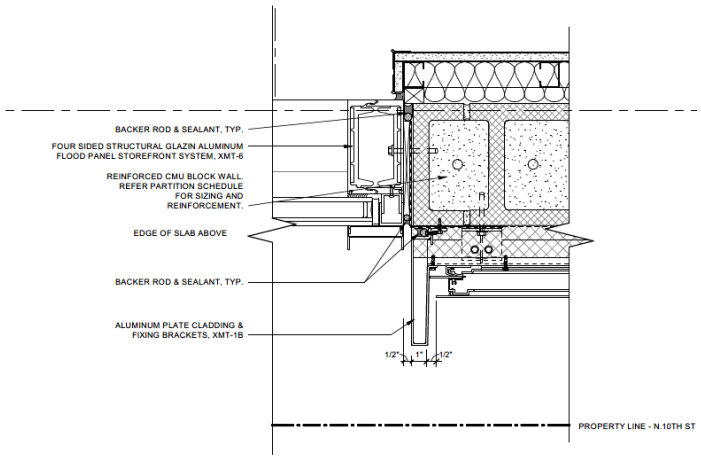
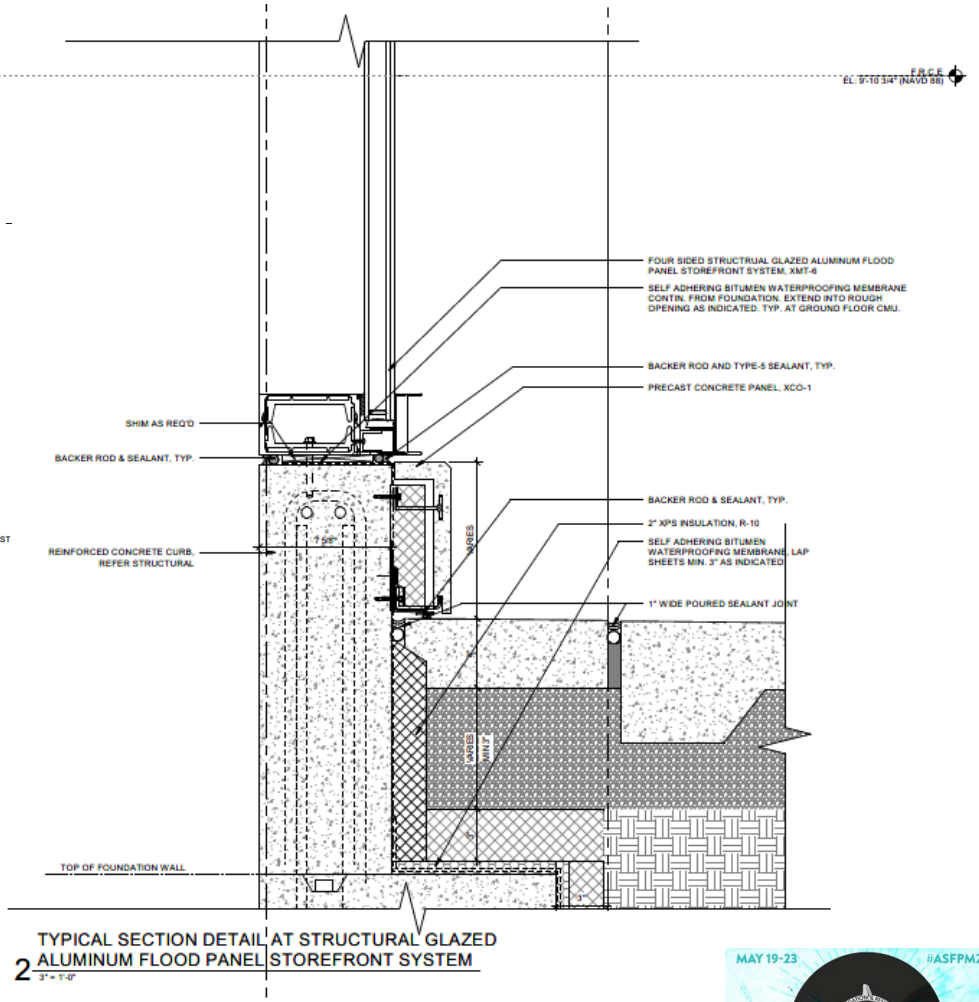
Case Study 2: 215 N. 10th Street



1 TYPICAL PLAN DETAIL AT STRUCTURAL GLAZED ALUMINUM FLOOD PANEL STOREFRONT SYSTEM
3" = 1'-0"



2 TYPICAL SECTION DETAIL AT STRUCTURAL GLAZED ALUMINUM FLOOD PANEL STOREFRONT SYSTEM
3" = 1'-0"

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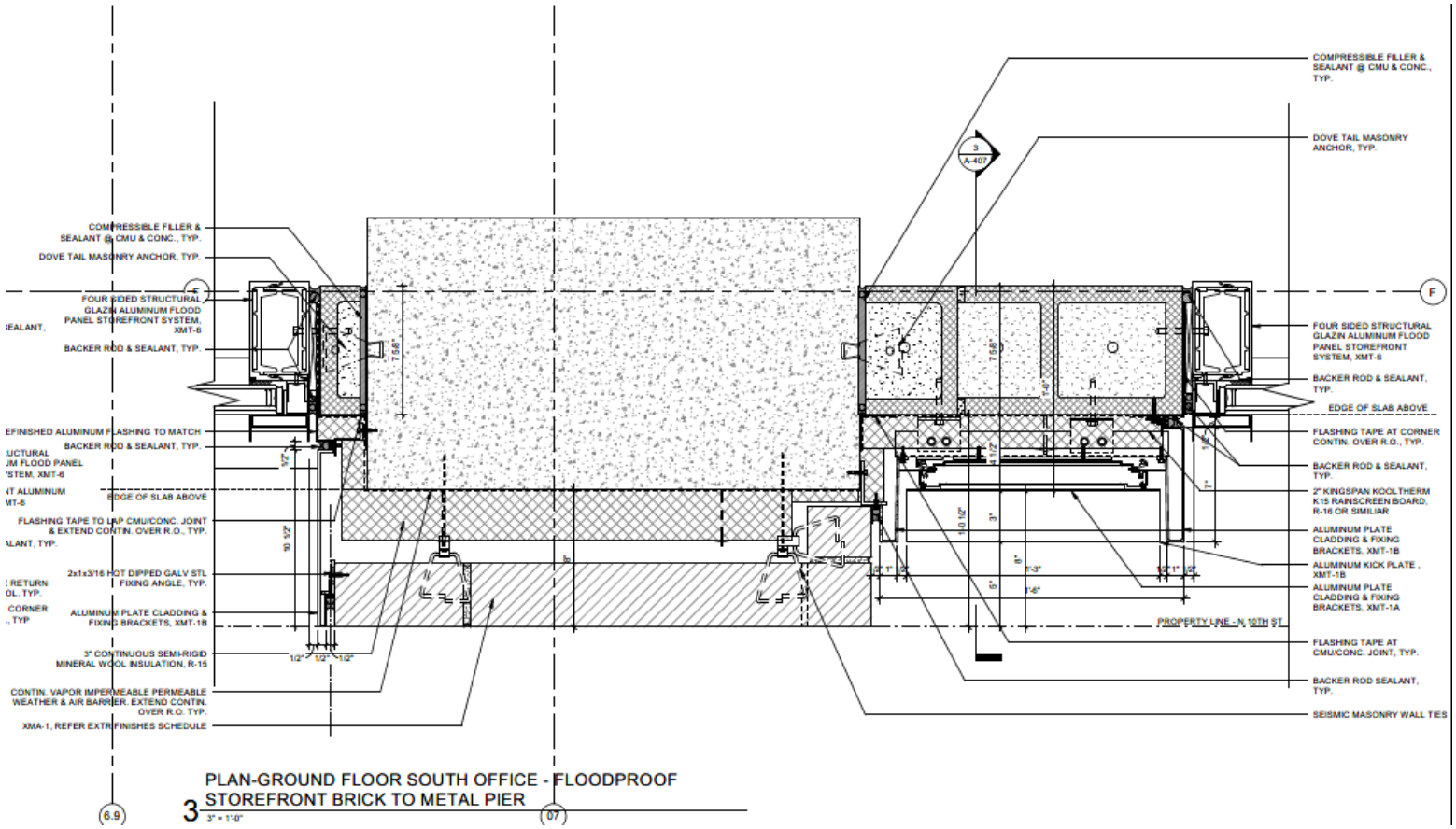
Case Study 2: 215 N. 10th Street



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DRY-FLOODPROOFING: RECENT CASE STUDIES IN NYC

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Partner, Land Use Team
Real Estate Client Service Group
New York, NY

Annual Conference
Association of State Floodplain Managers

May 22, 2019

Cleveland, OH