

2016 **BUILD SAFE**
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Protection of Existing Buildings During Construction

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NYC
Buildings

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



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Course Description

- The course will describe the engineering principles that are used to establish a monitoring program during excavation, underpinning, demolition, blasting and alterations.
- New York City Building Code requirements for special inspections will be detailed.
- This course will provide specific details on a Tenant Protection Plan for occupied multiple dwellings.



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Learning Objectives

1. Participants will discuss and be able to explain the differences between a building condition survey and an engineering condition assessment.
2. Participants will discuss and be able to prepare a monitoring of adjoining buildings plan to be used to safeguard the safety of building tenants.
3. Participants will review and be able to identify requirements for special inspections of structural safety in the NYC Building Code.
4. Participants will review the criteria for monitoring masonry buildings during construction in order to mitigate risks.



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Existing Structures

Existing Being Altered

- Buildings
- Retaining Walls

Adjoining

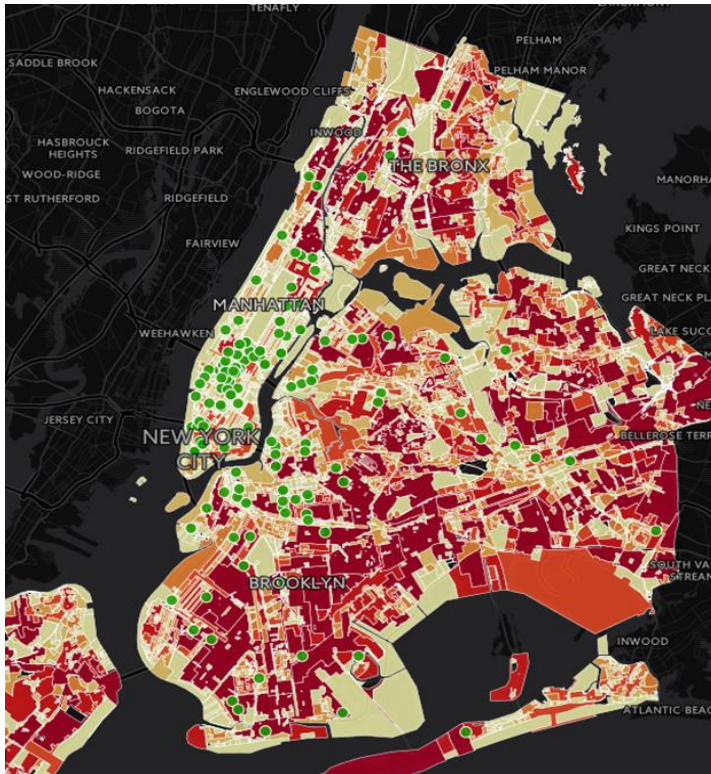
- Buildings
- Retaining Walls
- Gas and Water Piping
- Party Walls



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Accidents Affecting Adjoining Buildings

Urban Density



Next to Pre-1916 Buildings



Risks in Design & Construction

Contractor

- Schedule risk
- Cost risk
- Technical feasibility
- Physical events beyond direct control
- Transfer of risk from owner to designer to general contractor to subcontractor
- **Employee injury/fatality**

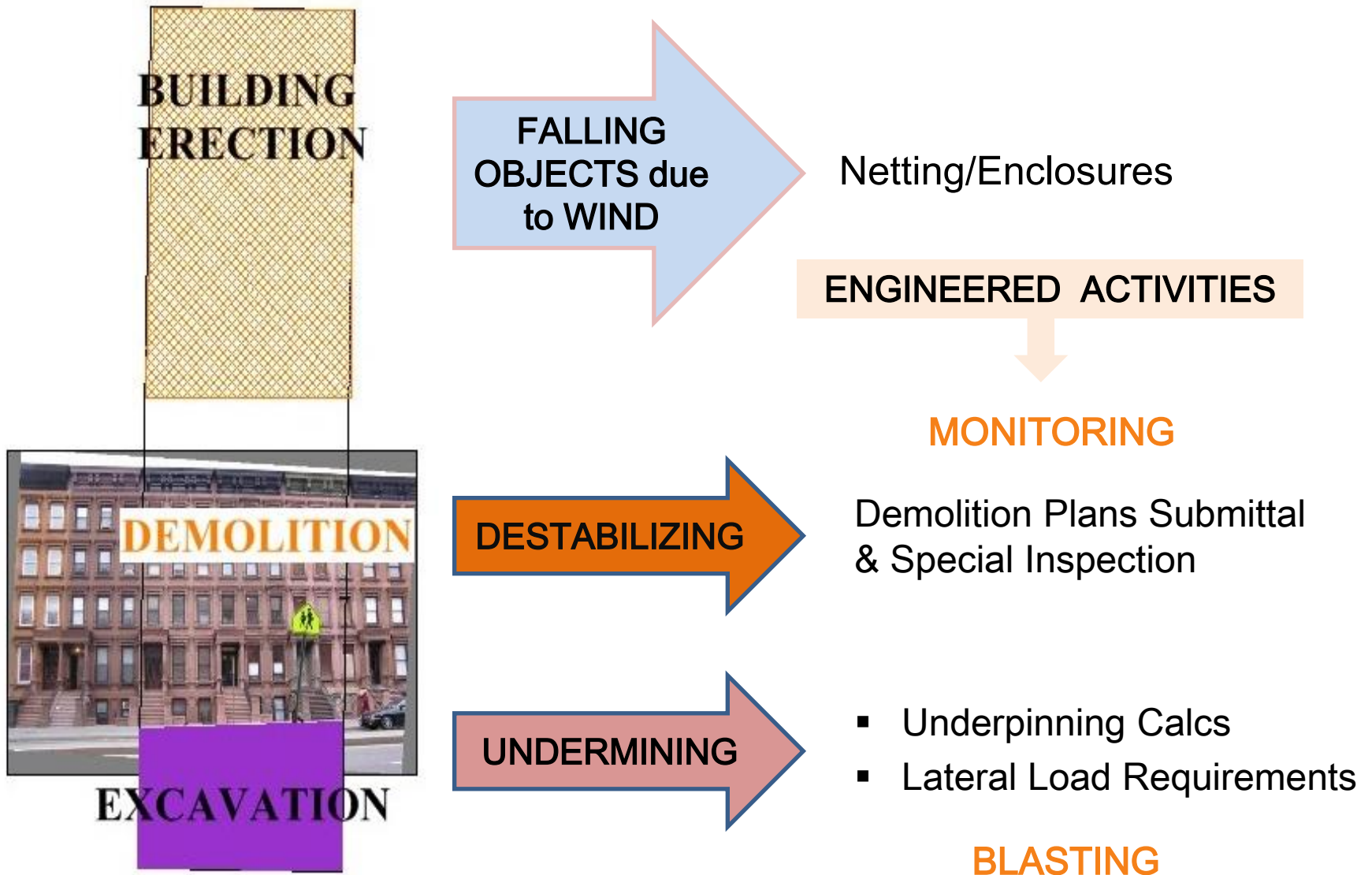
Adjoining Building

- **Fatality /Injury**
- Vacating
- Building Demolition
- Building Damage



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Construction Safety

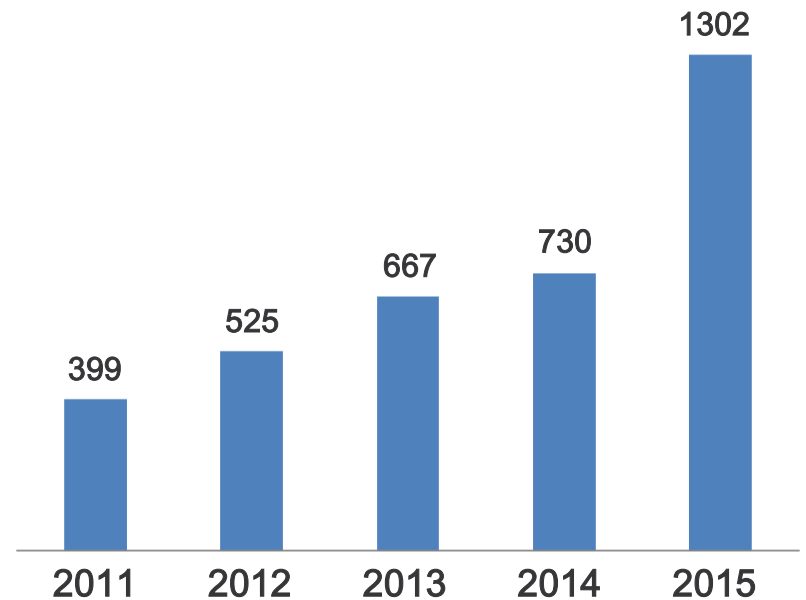
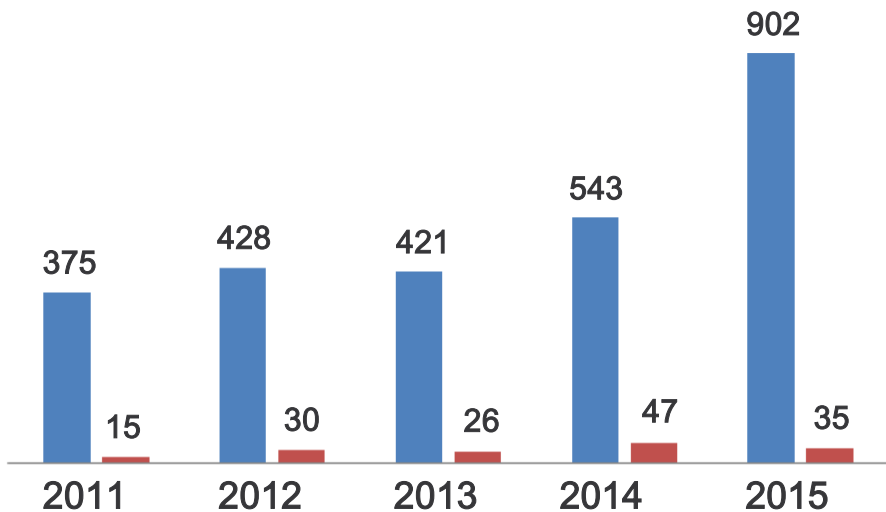


Incidents vs. NB Permits

Incidents

NB Permits Excluding 1-3 Family

- ALL INCIDENTS
- INCIDENTS ADJOINING BUILDING



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Construction Activity Affecting Adjoining Buildings 2011 - 2015

	Incidents					Five Year Total			
	2011	2012	2013	2014	2015	Incidents	Accidents	Injuries	Fatalities
Excavation/ Soil Work	6	12	11	19	15	63	7	15	2
Concrete	4	7	5	8	12	36	1	1	0
General & Interior	3	7	6	18	5	39	3	3	0
Demolition	2	4	4	6	5	21	5	7	2
Total	15	30	26	51	37	159	16	26	4



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Vacates & SWOs

Incidents Affecting Adjoining Buildings

	Incidents					Five Year Total			
	2011	2012	2013	2014	2015	Incidents	Accidents	Injuries	Fatalities
Full SWO	3	14	18	22	19	76	14	24	4
Partial SWO	5	6	6	10	10	37	4	4	0
Full Vacate	1	4	1	5	0	11	10	5	28
Partial Vacate	1	1	1	1	5	9	0	0	0
TOTAL Sites with SWO	8	19	21	30	27	105	16	26	4
TOTAL Buildings Vacated	2	4	1	2	9	18	5	9	2



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Type of Incidents Affecting Adjoining Buildings

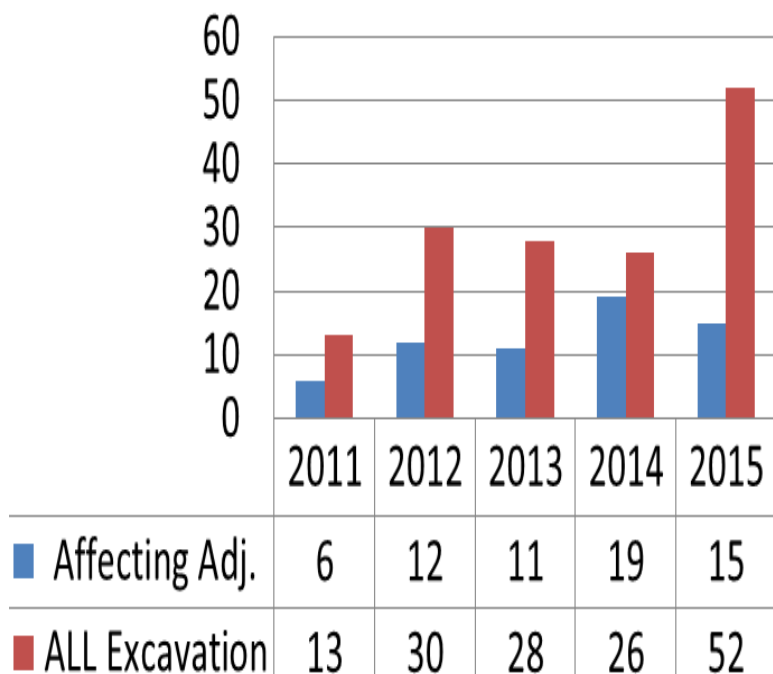
	Incidents					Five Year Total			
	2011	2012	2013	2014	2015	Incidents	Accidents	Injuries	Fatalities
Debris fell	3	5	7	16	4	35	3	3	0
Wall collapse	2	2	4	3	8	19	4	10	2
Damage	1	3	3	3	7	17	0	0	0
Cracks	2	5	2	4	3	16	0	0	0
Spill/blow out	2		3	5	2	12	1	1	0
Form fell over	1	3	1	1	5	11	0	0	0
Penetrate	1	1	1	5	1	9	0	0	0
Undermining	0	2	1	1	1	5	1	1	0
Building collapse	0	3	0	0	1	4	3	6	1
Foundation/ underpin collapse	1	0	0	1	1	3	2	1	1
Protection missing	1	1		1		3	0	0	0
Soil collapse	0	0	0	0	2	2	2	4	0
TOTAL	14	25	22	40	35	136	16	26	4



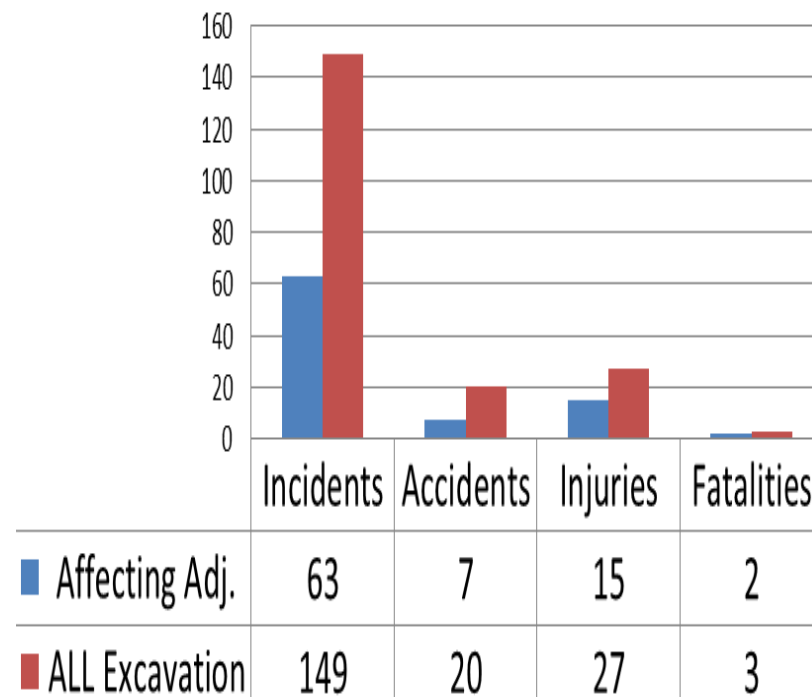
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Excavation

Excavation/Foundation Work



Excavation/Foundation Work



Excavation Incidents 2011-2015

	Incidents					Five Year Total			
	2011	2012	2013	2014	2015	Incidents	Accidents	Injuries	Fatalities
Crack	1	5	3	5	3	17	0	0	0
Damage	1		3		1	5	0	0	0
Foundation wall collapse	1		1	1	1	4	1	1	0
Made unstable		1	1	1		3	0	0	0
Movement	1		1	1		3	0	0	0
No side excavation protection		1		2	3	6	0	0	0
Penetrate		2	1	3	2	8	0	0	0
Sheeting/shoring	1	2			1	4	0	0	0
Soil collapse		3	1		2	6	4	5	1
Trench collapse		1	1		4	6	5	4	1
Undermined	1	3			1	5	0	0	0
Utility line hit	1	4	5	5	9	24	0	0	0
Wall collapse	2		1	1	4	8	2	9	1
Other	2	2	7	3	11	25	7	7	0
No damage	2	6	3	4	9	24	0	0	0
TOTAL	13	30	28	26	51	148	19	26	3



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Excavation Incidents Affecting Adjoining Property 2011-2015

	Incidents					Five Year Total			
	2011	2012	2013	2014	2015	Incidents	Accidents	Injuries	Fatalities
Crack	1	4	2	5	3	15			
Damage	1		3		1	5			
Foundation wall collapse	1			1	1	3	1	1	
Made unstable		1	1	1		3			
Movement				1		1			
No side excav protection		1				1			
Penetrate		1	1	3	2	7			
Soil collapse					2	2	2	4	
Undermined		2			1	3			
Utility line hit		1				1			
Wall collapse	2		1	1	4	8	2	9	1
Water				1		1			
Other	1	2	2	1		6			
No damage				1	5	6			
TOTAL	6	12	10	15	19	62	5	14	1



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Demolition Affecting Adjoining

Row Labels	2011	2012	2013	2014	2015	Total
Building collapse		2			1	3
Damage		1		2		3
Debris fell					1	1
Leaning wall			1			1
Penetrate	1			1		2
Vibrations		1				1
Wall collapse			3		3	6
Weatherproof missing				2		2
Egress danger	1			1		2
TOTAL	2	4	4	6	5	21



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Concrete Operations

Row Labels	2011	2012	2013	2014	2015	Total
Building collapse						
Damage		1			3	4
Debris fell	1	1	2	2	1	7
Leaning wall	1	3		1	5	10
Penetrate		1				1
Vibrations	2		3	5	2	12
TOTAL	4	7	5	8	12	36



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Water Main Hit



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Structural Hazards from Construction Activities

- Removal of support
- Applying new forces
- Applying movement
- Exposure to new forces



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Investigation for Design & Construction

- Soil exploration
- Fire separation conditions
- Available lot size
 - Encroachments
 - Party walls
 - Encroachments due to construction undermining and destabilization
 - Seismic joints
- Adjoining building condition
- Existing documents



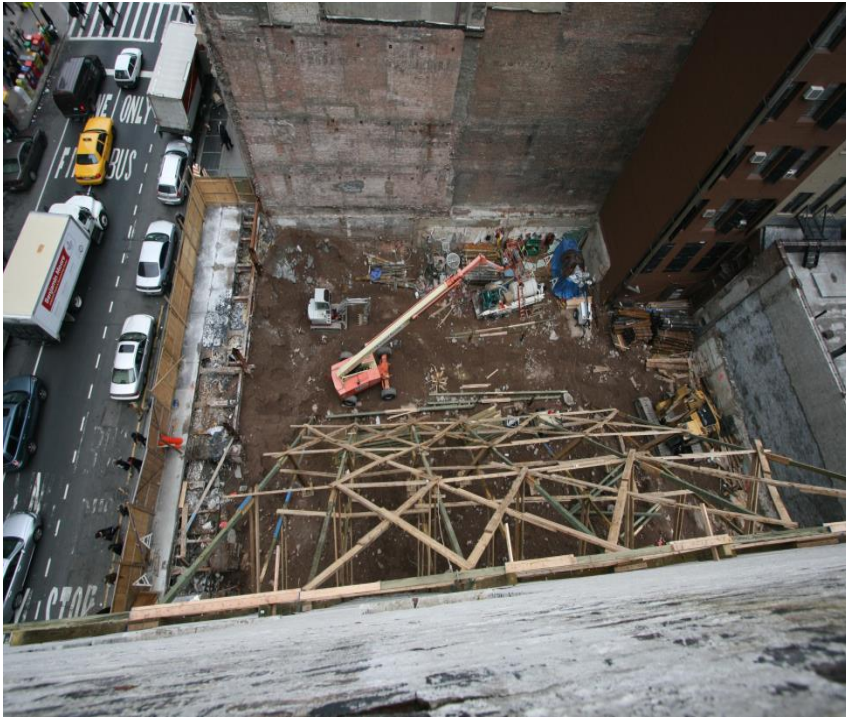
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Leaning Tower of Broadway

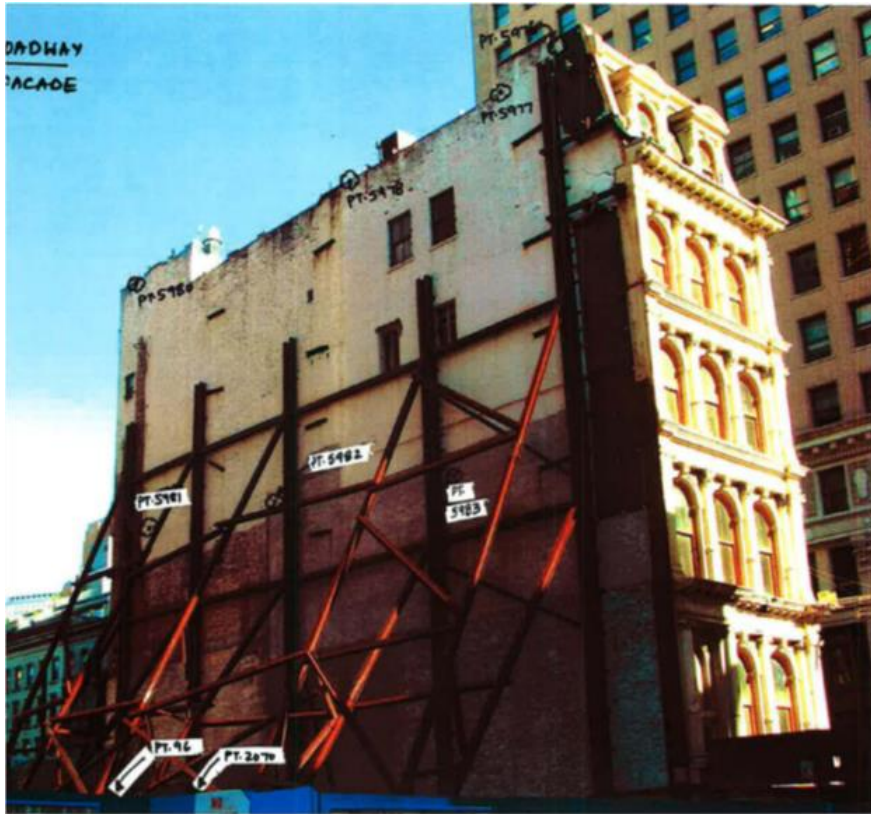


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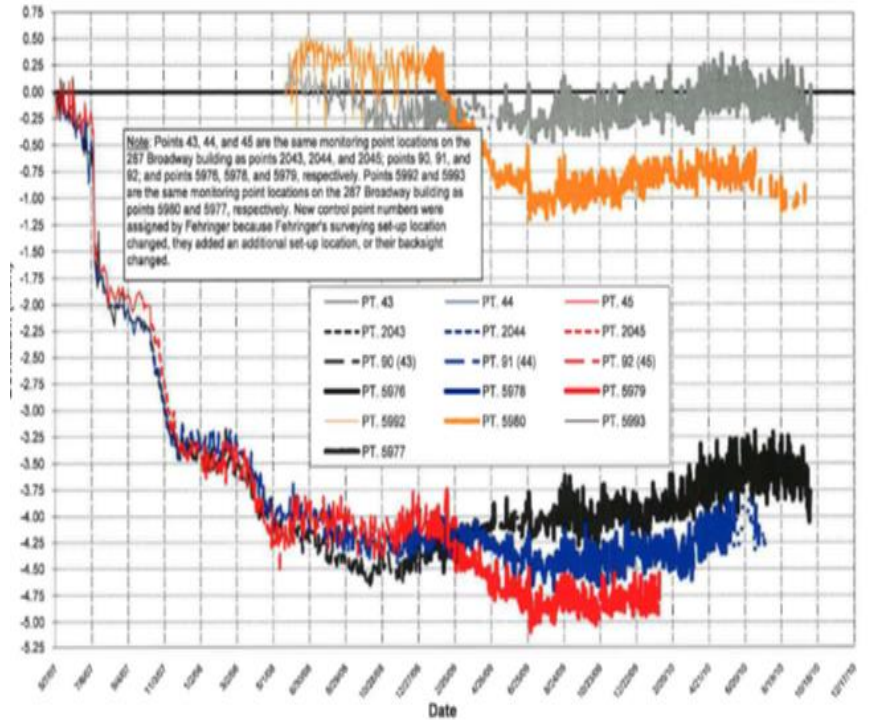
287 Broadway



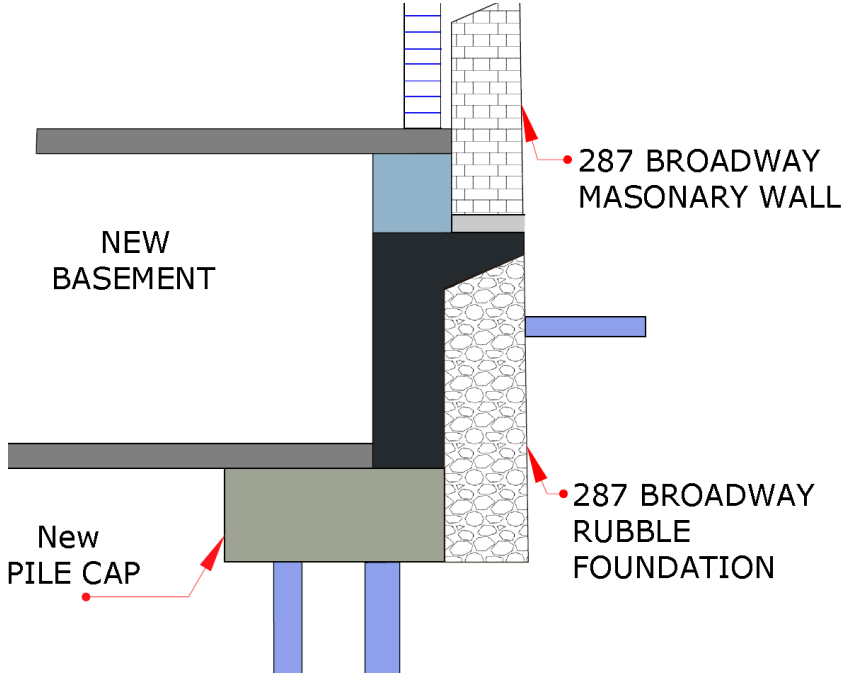
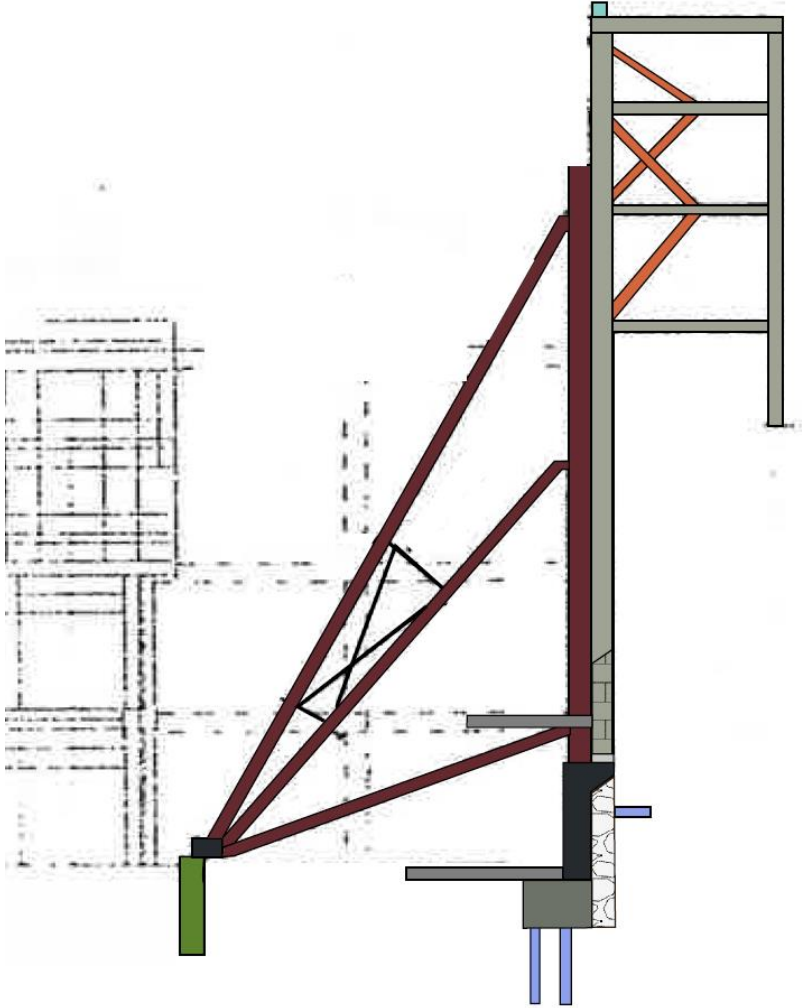
287 Broadway



287 BROADWAY
Upper, South Facade: Northing Coordinates
Points 5976 & 5977



Shoring and Wall Support



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Removal of Support

- Soil Work
 - Excavation undermining
 - Dewatering
- Alterations
 - Temporary modifications of original structural system
 - Removal of beams
 - Removal of columns
 - Severing continuity of load path
- Demolition of attached building
- Out of sequence demo

Applying New Forces on Existing

- Weight of additions
- Weight of new equipment
- Weight of construction
 - Equipment
 - Materials
- **Soil lateral forces on underpinning**
- Soil pressure on retaining walls due to new building

Applying Movement

- **Vibrations due to blasting**
- Vibrations due to other construction
- **Shimming during underpinning**
- Installation of new equipment (wind turbines, generators, etc.)



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Observe and Form an Opinion

Preconstruction Survey

A mapping of deficiencies to avoid law suits



Evaluation of Conditions

Understanding the capacity of the building (in its current condition) to sustain potential effects of adjoining construction.



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Monitoring Response to Control Construction Activities

EXCEEDS LIMITS



MODIFY ACTIVITY

Monitor Response

- Movement
 - Vertical
 - Out of Plumb
- Vibration
- Deterioration
 - Interior
 - Exterior
- Changes in Water Level
- Shoring & Temporary Support

Control Construction Activities

- Excavation
- Pile driving
- Lot Line Excavation
- Demolition
- Blasting

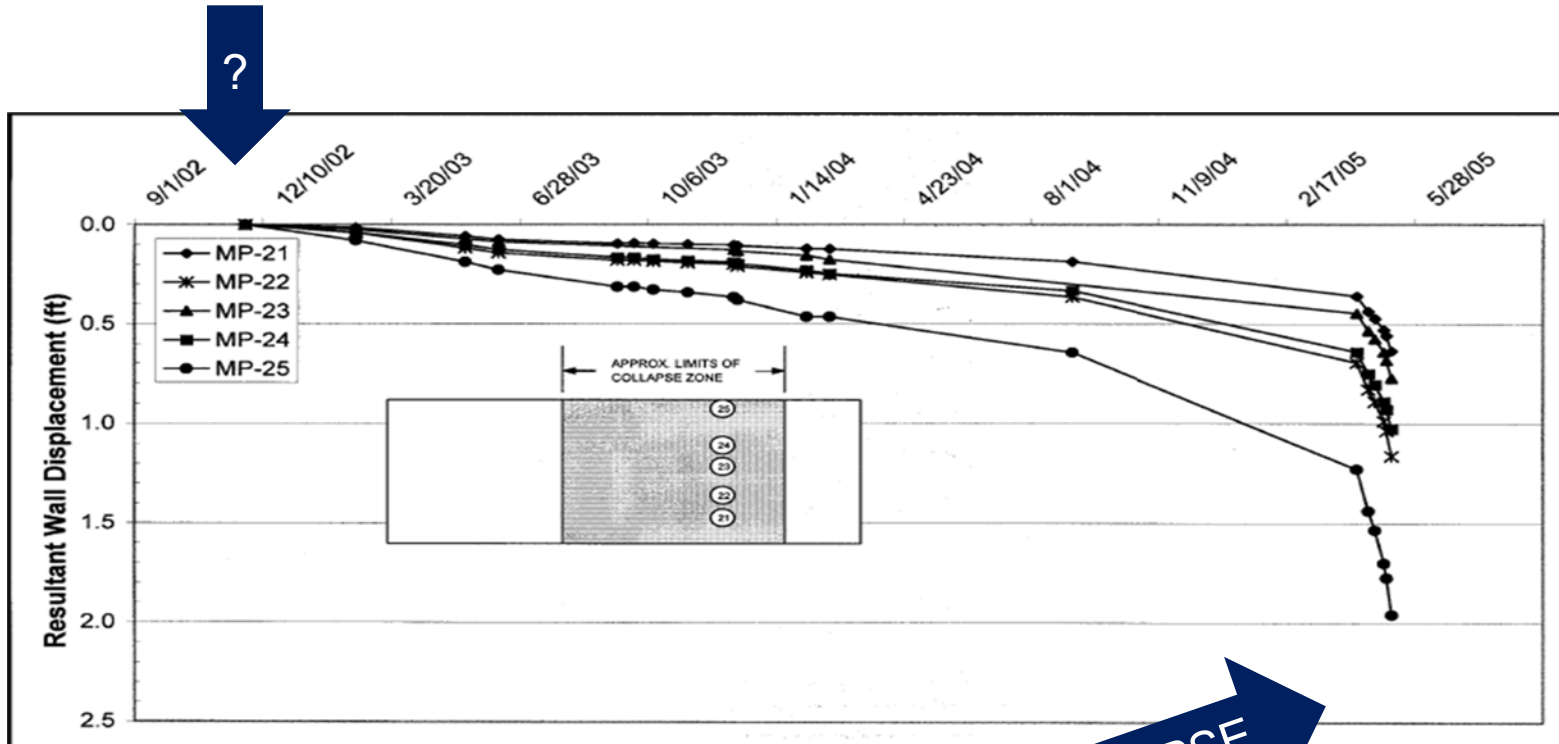
When to Start Monitoring

- Monitoring needs to start from an established baseline
- Response of structure to changes of environmental conditions should be determined prior to start of construction



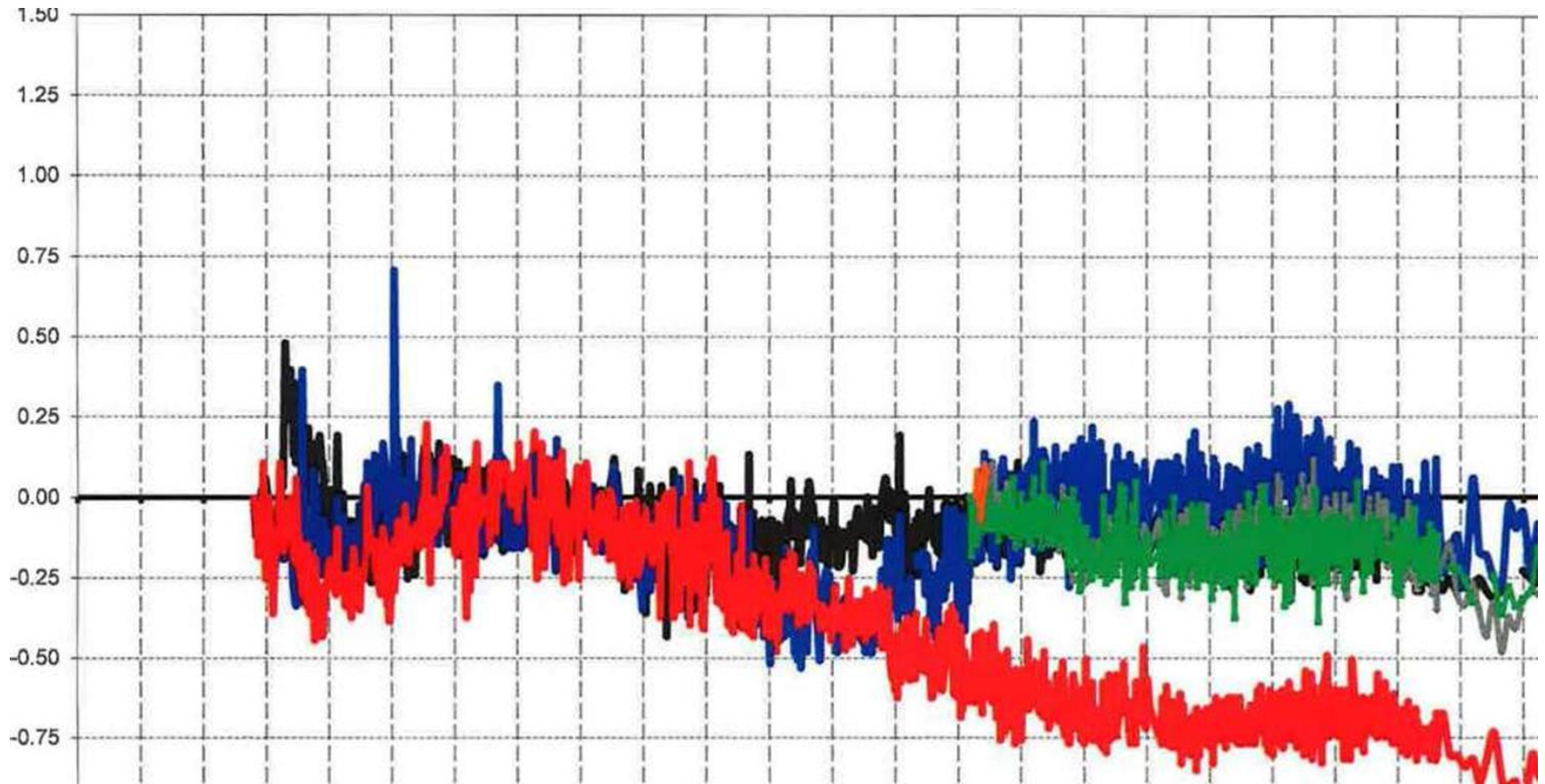
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Monitoring Needs Plan of Action



COLLAPSE

Survey Readings for One Point

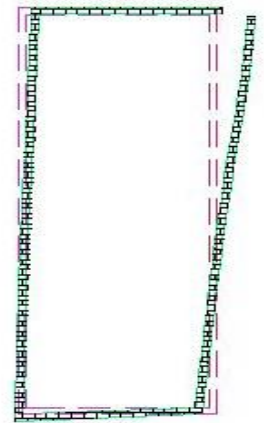
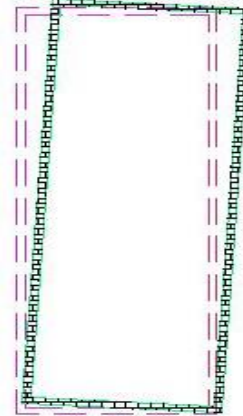
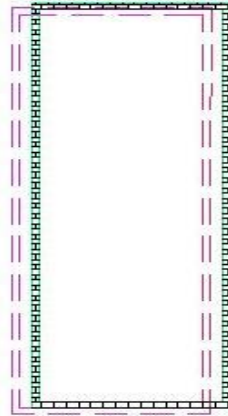
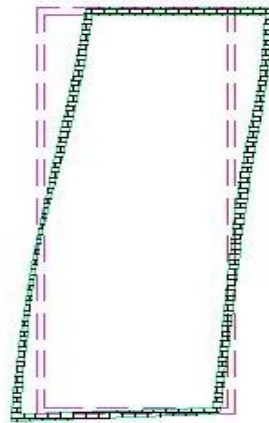
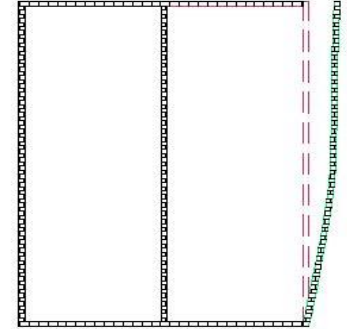
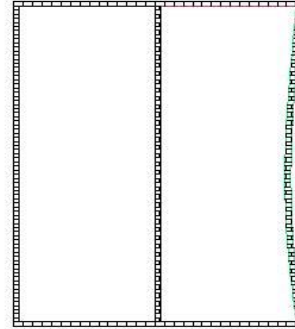
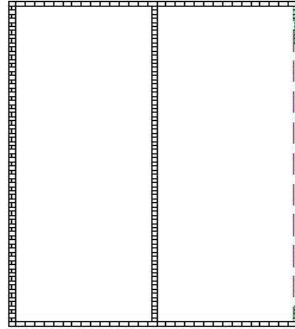
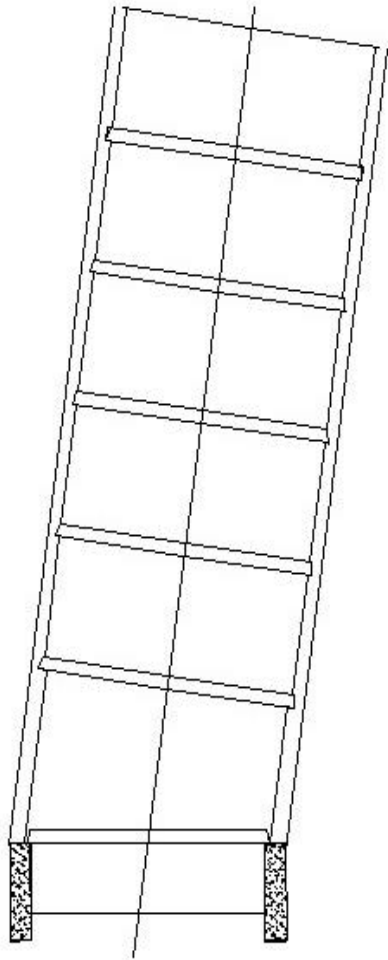


Intraday movement vs. general trend



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Potential Wall Displacement/Deformation: How Many Survey Points



Monitoring Should Make Sense



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Determining Thresholds

Instruments

- Type of instrumentation
- Accuracy of instrumentation
- Rate of readings

Structure

- Baseline
- Potential Deformations
 - Settlement
 - Lean
 - Shape of deformation
- Fragility/modes of failure

Recent Support Of Excavation Instructions

Instruments

Baseline

Frequency

Threshold

Limit

TABLE 1 – INSTRUMENT RESPONSIBILITY, INSTALLATION AND MONITORING SCHEDULE

SYMBOL	INSTRUMENTS	BASELINE	READING FREQUENCY	THRESHOLD CRITERIA	LIMITING CRITERIA
Ⓢ	SEISMOGRAPH	ONE WEEK OF CONTINUOUS 15-MINUTE HISTORGRAM PRIOR TO SOE INSTALLATION AND/OR EXCAVATION.	CONTINUOUS 15-MINUTE HISTOGRAM SUPPLEMENTED WITH A WAVEFORM FOR EVENTS ABOVE THE THRESHOLD CRITERIA. MONITOR CONTINUOUSLY THROUGHOUT SOE INSTALLATION, GENERAL EXCAVATION AND FOUNDATION CONSTRUCTION WITHIN 50 FT OF SEISMOGRAPH.	NON-LANDMARK BUILDINGS :0.5 IN/SEC LANDMARK BUILDINGS: 0.3 IN/SEC	NON-LANDMARK BUILDINGS :1 IN/SEC LANDMARK BUILDINGS: 0.5 IN/SEC
▲	OPTICAL MONITORING POINT (BUILDINGS)	PROVIDE THREE INDEPENDENT READING SETS OF X, Y, Z POSITION TWO WEEKS PRIOR TO SOE INSTALLATION AND/OR EXCAVATION.	MONITOR ALL OPTICAL POINTS WITHIN 50' OF ALL PILE DRILLING AND BRACING INSTALLATION DAILY MONITOR ALL OPTICAL POINTS TWICE PER WEEK DURING EXCAVATION	NON-LANDMARK BUILDINGS :0.5 INCH LANDMARK BUILDINGS: 0.125 INCH	NON-LANDMARK BUILDINGS : 0.75 INCH LANDMARK BUILDINGS: 0.25 INCH
▲	OPTICAL MONITORING POINT (SOLDIER/SECANT PILES)	PROVIDE THREE INDEPENDENT READING SETS OF X, Y, Z POSITION IMMEDIATELY AFTER FACE OF SOLDIER/SECANT PILE IS EXPOSED.	MONITOR ALL OPTICAL POINTS ONCE PER WEEK AFTER COMPLETING EXCAVATION UNTIL GROUND FLOOR IS CONSTRUCTED	0.5 INCH	1.0 INCH



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TPPN 10/88 – Historic Buildings

- Intended for PRESERVATION
- Movement
- Ground Water
- Temporary Shoring
- Blasting
- The maximum permissible vertical and horizontal movement shall be $\frac{1}{4}$ 6mm)
- The maximum permissible peak particle velocity shall be 0.5 in/sec.
- *Telltails* shall be installed across existing cracks and in other sensitive areas to permit changes in crack width being measured.



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Evaluating the Present Condition of Masonry Buildings

- Deterioration by Water
 - Interior
 - Exterior
- Cracks size, location, orientation
- Verticality (Out of Plumb)
- Bulging



Understanding Cracks



Initial or 'Historic' Crack

- The crack might have a cause that has been controlled or was transitory.
- It is not the crack in itself, but the result on the stability of the system.



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'Historic' Crack



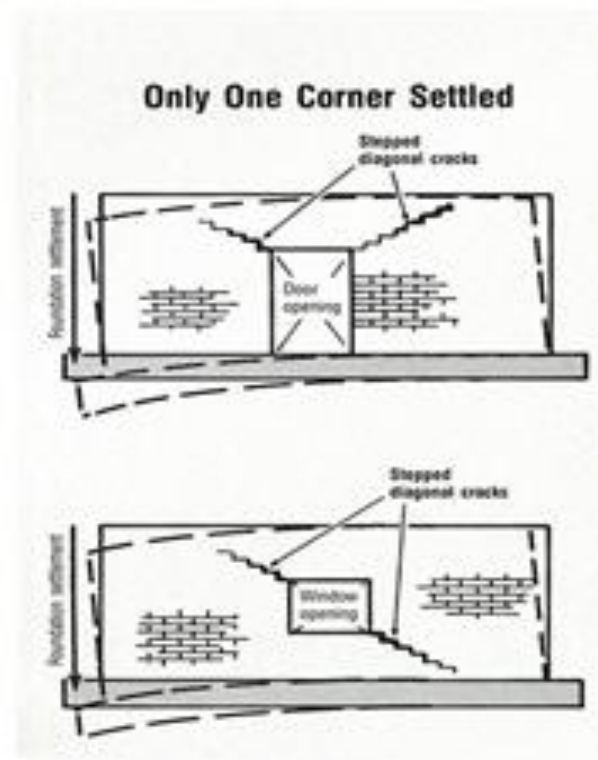
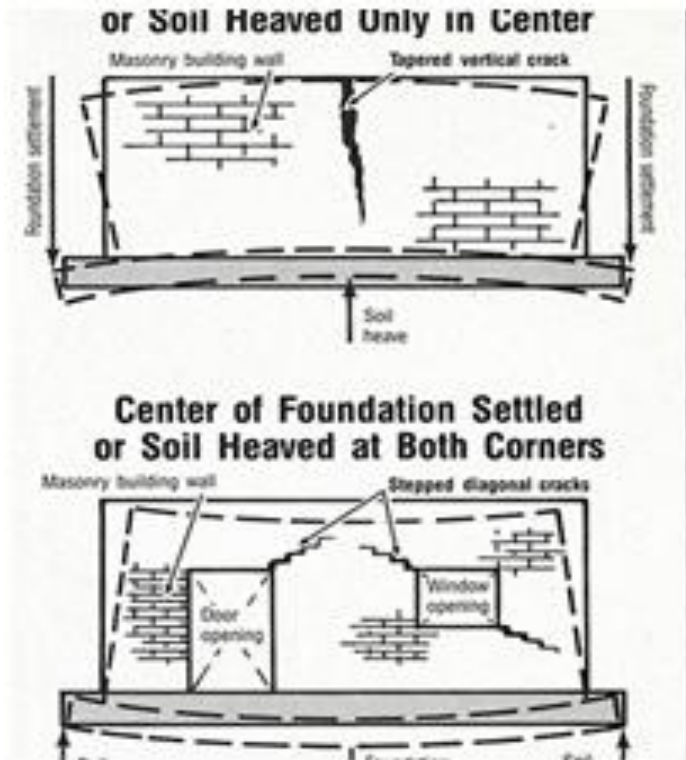
Historic



Crack

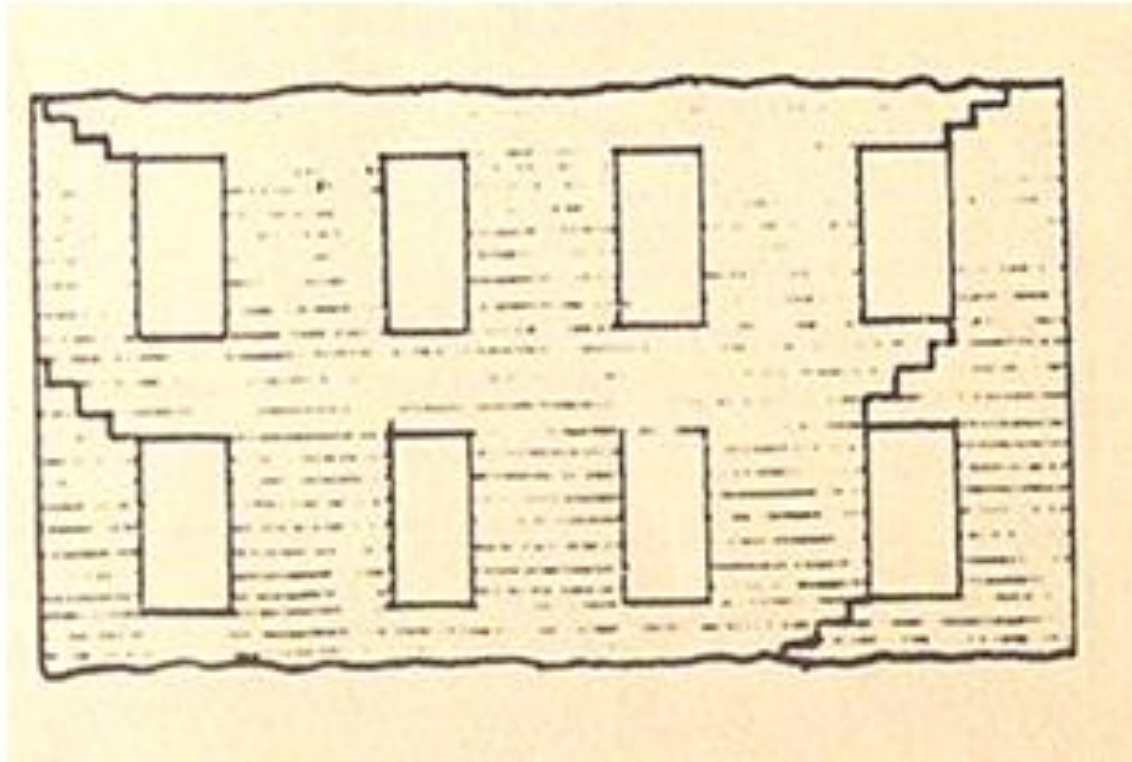
Cracks Need to be Analyzed In Context

Settlement Cracks

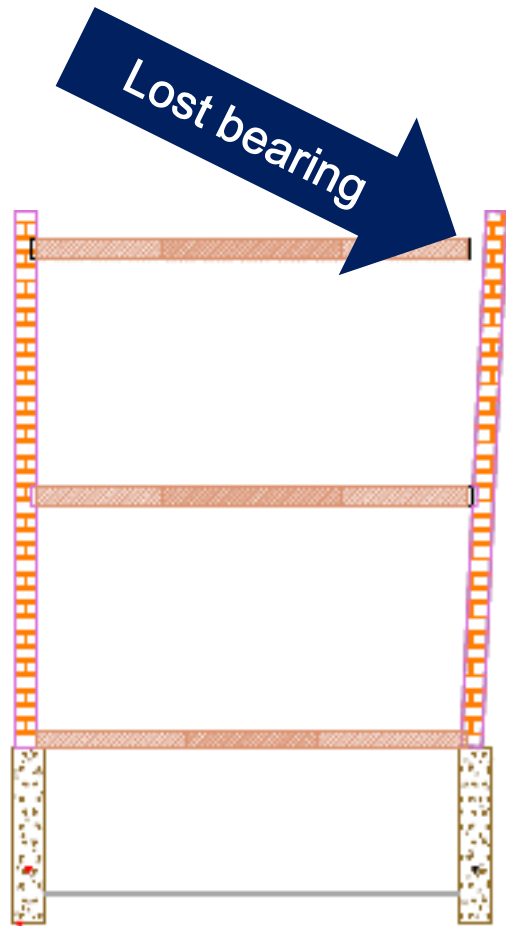


Cracks Need To Be Analyzed In Context

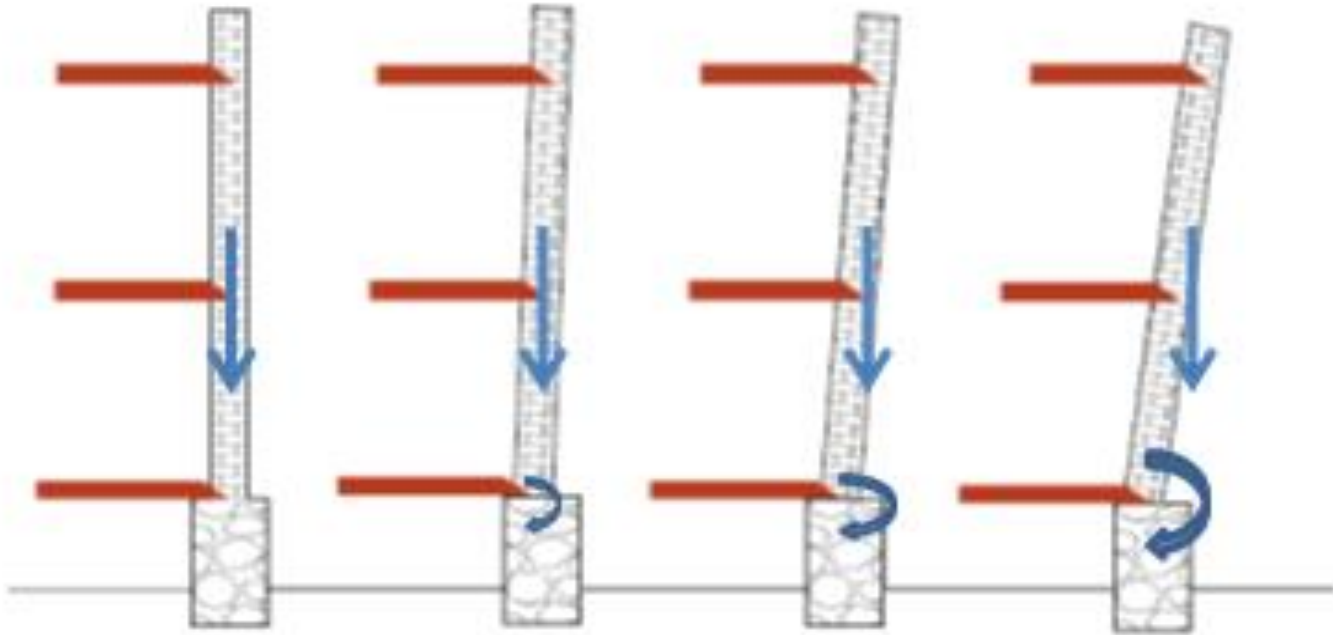
Weakest Section Crack



Potential Effect of Lean



Lean of Building Might Not be a Stable Condition



Tendency to tilt will increase

Monitoring Cracks



Collapse - Demo & Adjoining Excavation

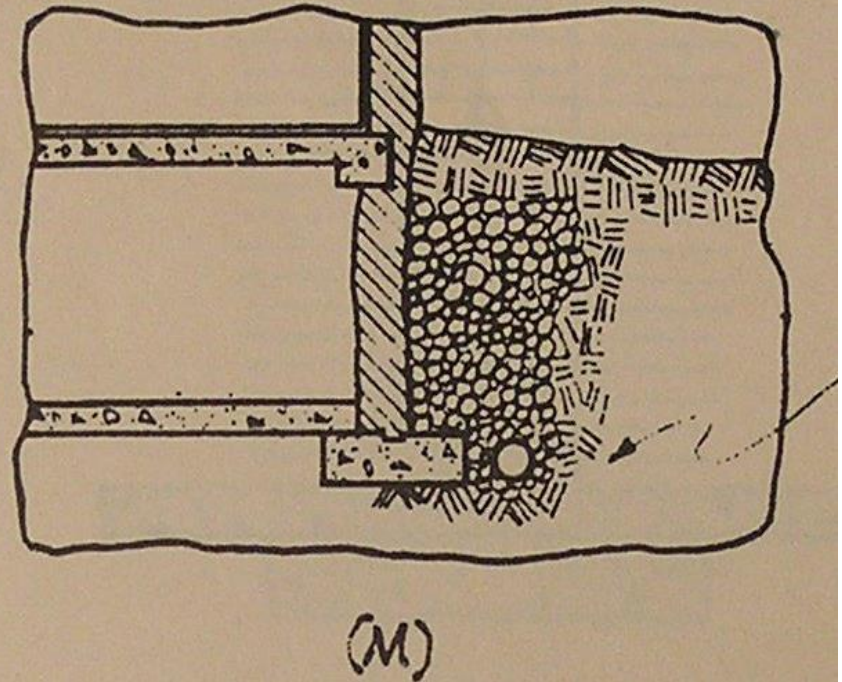


Bulging Basements

Demolished Building

*Very Dangerous Bulging
basement wall resulting
from inadequate section
to act as retaining wall.*

*Lack of drainage of base
of wall causes built up of
hydrostatic pressure.*



Causes of URM Buildings Failure

Aging/Affected by

- Loss of support at foundation
- Unrestrained lean of entire structure
- Out of plane demand on bearing walls (rotation) induced by
 - Rotted joists of masonry with poor mortar
 - Underpinning
 - Bulging
- Compression associated with creep or buckling

Original Empirical Design

- Non-redundant
- No alternative load path
- Large distance between shear walls
- Poor connections diaphragm shear walls



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Demolition: Anchoring Floor Joists



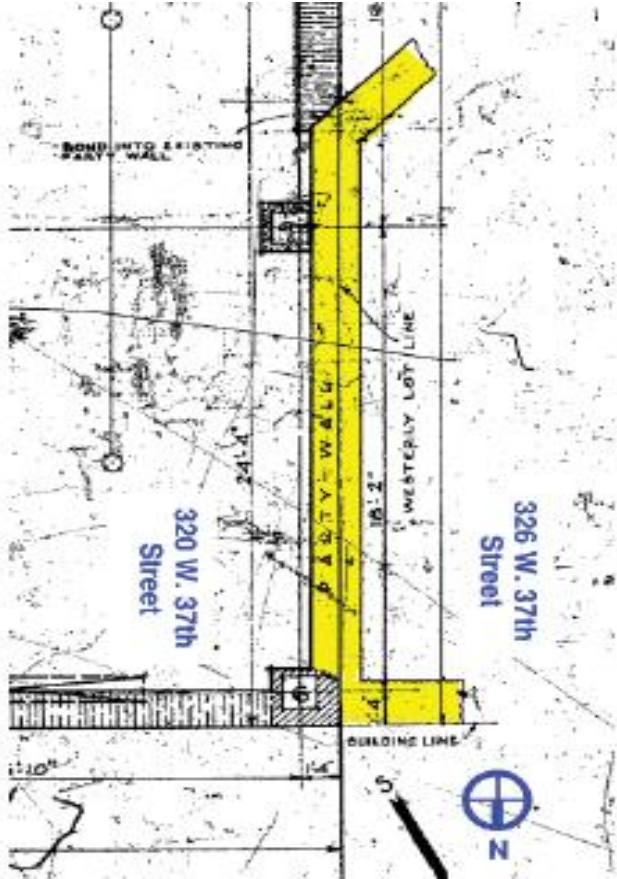
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Collapsed Party Wall



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Understanding Buildings to be Underpinned



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Fatality



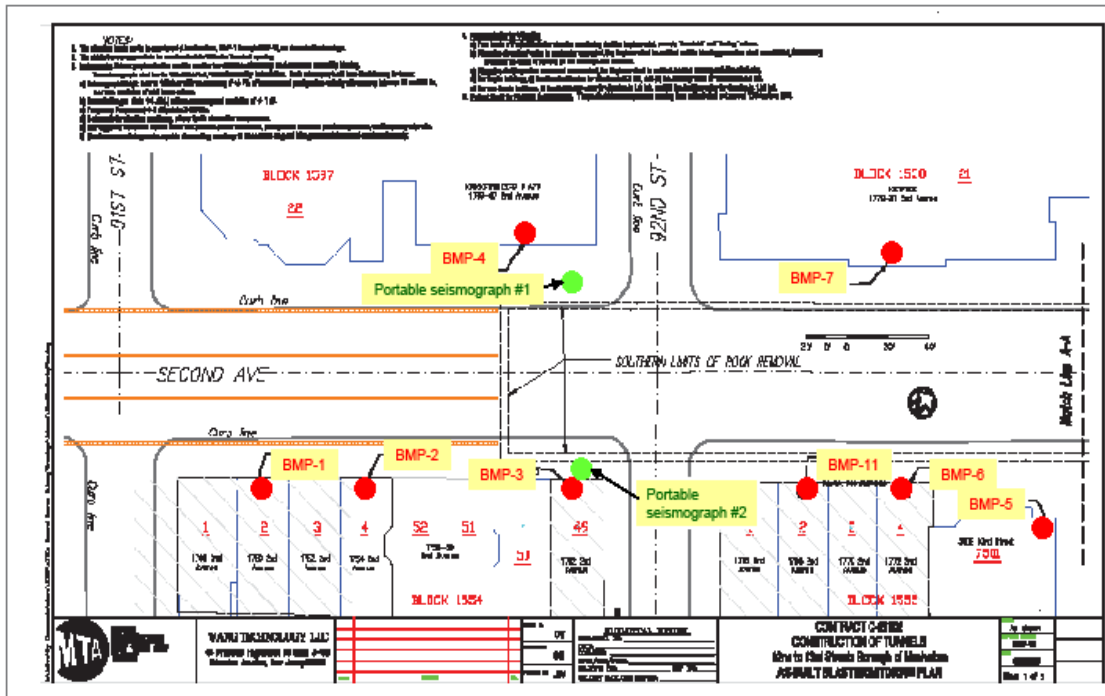
Understanding Buildings to be Underpinned



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Second Avenue Subway CUT & COVER + BLASTING

Blast Monitoring Plan: 91st– 93rd St



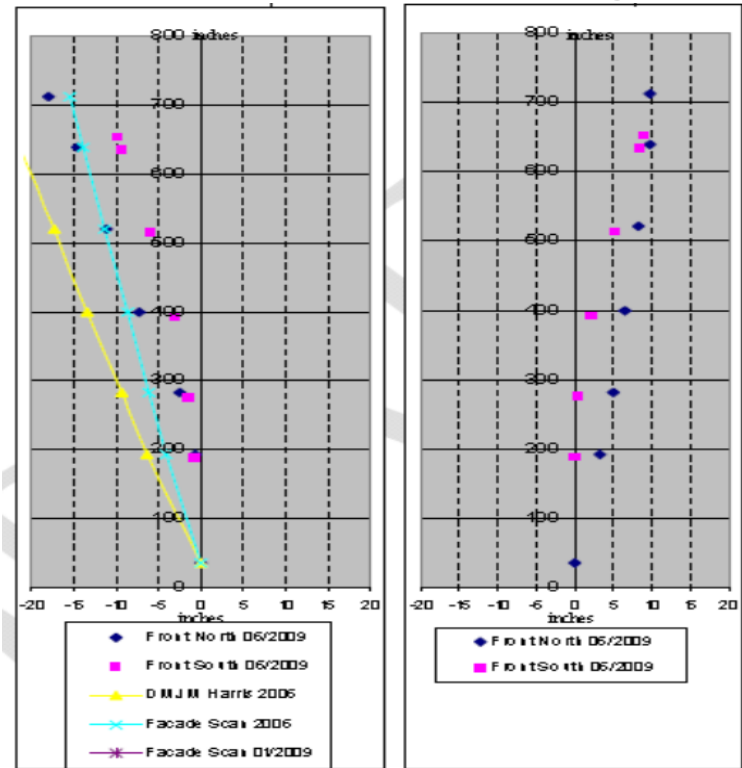
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Blasting

Building separation noted after blasting



Recorded movement in blast area of building



Blasting Monitoring Criteria

Building Address	DOB Classification per MOU	Contract Building Condition	Contract Response Values							
			Horizontal Movement (in)			Settlement (in)			Vibration (in/sec)	
			Threshold*	Limiting*	Current Maximum**	Threshold*	Limiting*	Current Maximum	Threshold	Limiting
94 th to 95 th St – West Side										
1831 2 nd Ave	Group A	Not Fragile	0.5	0.7	0.40	0.3	0.5	0.36	N/A	N/A
94 th to 95 th St – East Side										
1838 2 nd Ave	Group A	Not Fragile	0.5	0.8	0.35	0.7	1.0	0.21	N/A	N/A
95 th to 96 th St – West Side										
1849 2 nd Ave	Group B	Not Fragile	0.5	0.7	0.47	0.3	0.5	0.32	1.5	1.92
95 th to 96 th St – East Side										
1840 2 nd Ave	Group C	Fragile	0.6	0.9	0.75	1.3	2.0	1.42	0.3	0.5
1847 – 46 2 nd Ave	Group A	Not Fragile	0.5	0.8	0.37	0.7	1.0	0.37	1.5	1.92

- Where should geophones be placed?
- Is USBM criteria valid for NYC buildings?
- Tall Buildings



Plan of Action

	Type A	Type B	Type C w/shed	Type C	Type D
Vibration limiting	1.9	0.5	0.5	0.5	TBD
One-time reached report by engineer next day	3	1.5	1.5	0.75	Same as TBD
Value reached more than three times same day	2	0.75	0.75	0.5	
Displacement real-time notification and report by engineer	0.4	0.4	X	0.4	TBD
Cumulative horizontal	0.4	0.5	X	0.5	Same as TBD
One time horizontal or vertical	0.33	0.5	X	0.4	



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Controlling Blast or Vibration

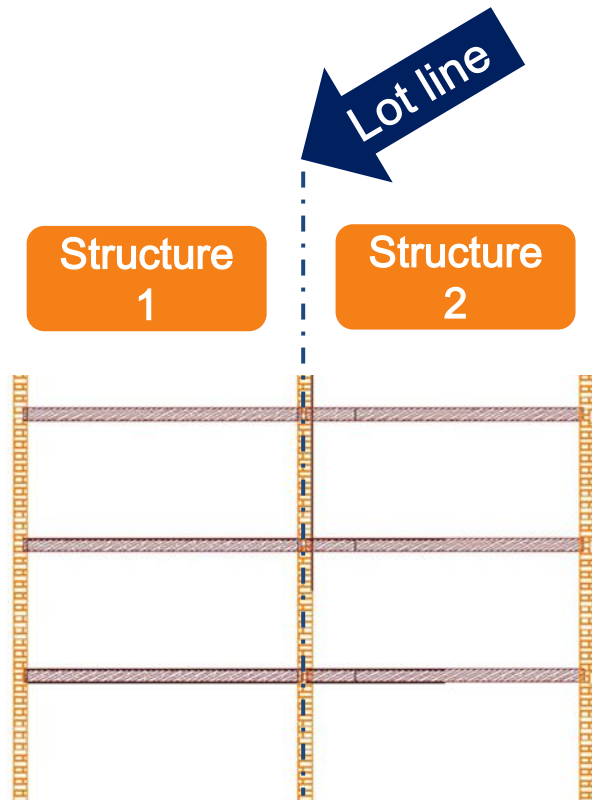


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Party Wall vs. Adjoining Wall



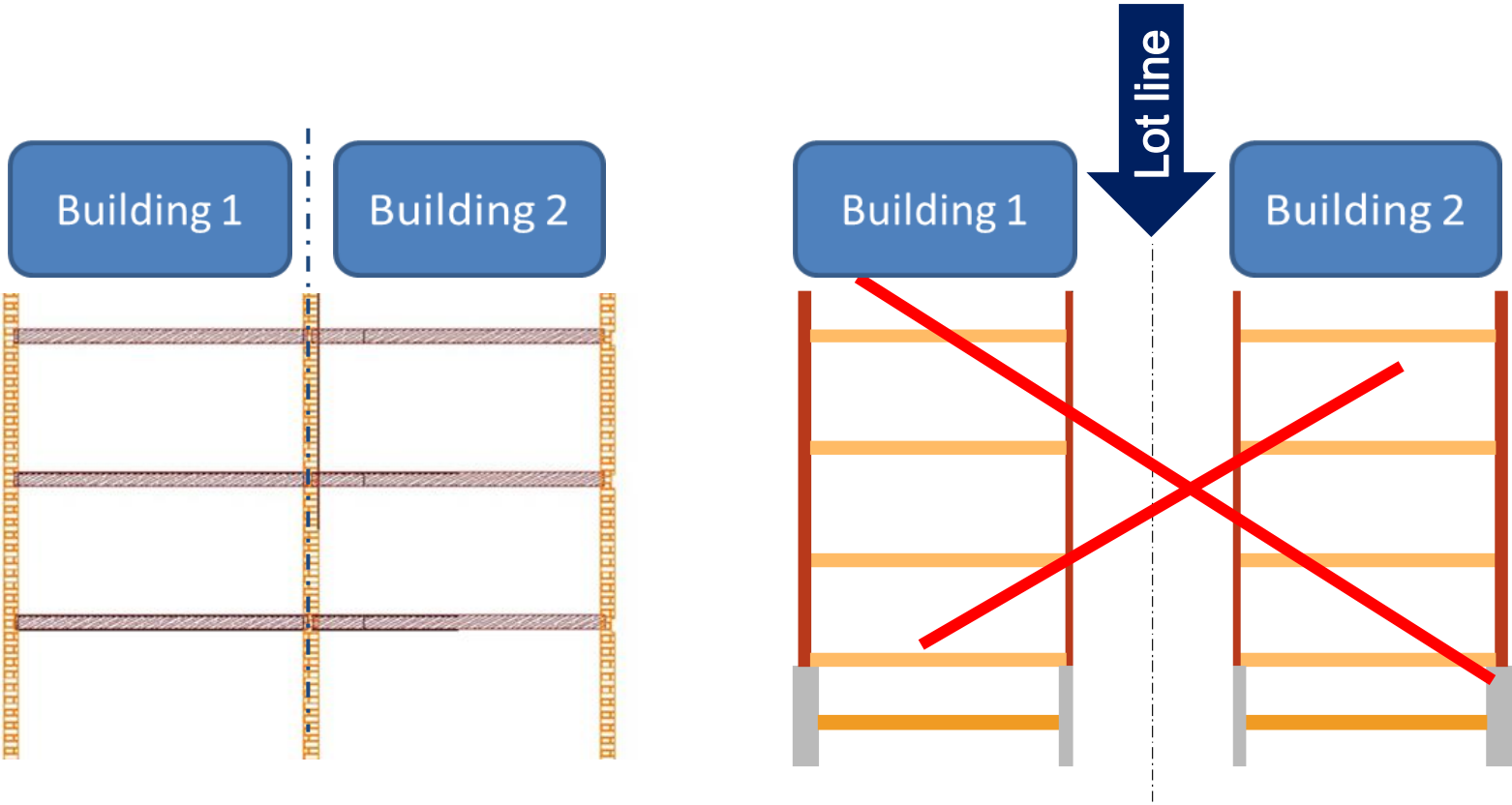
Party Wall: Fire Separation



Issues include

- Party Wall Protection
- Party Wall Attachment
- Seismic Separation

Party Wall Building vs. Structure

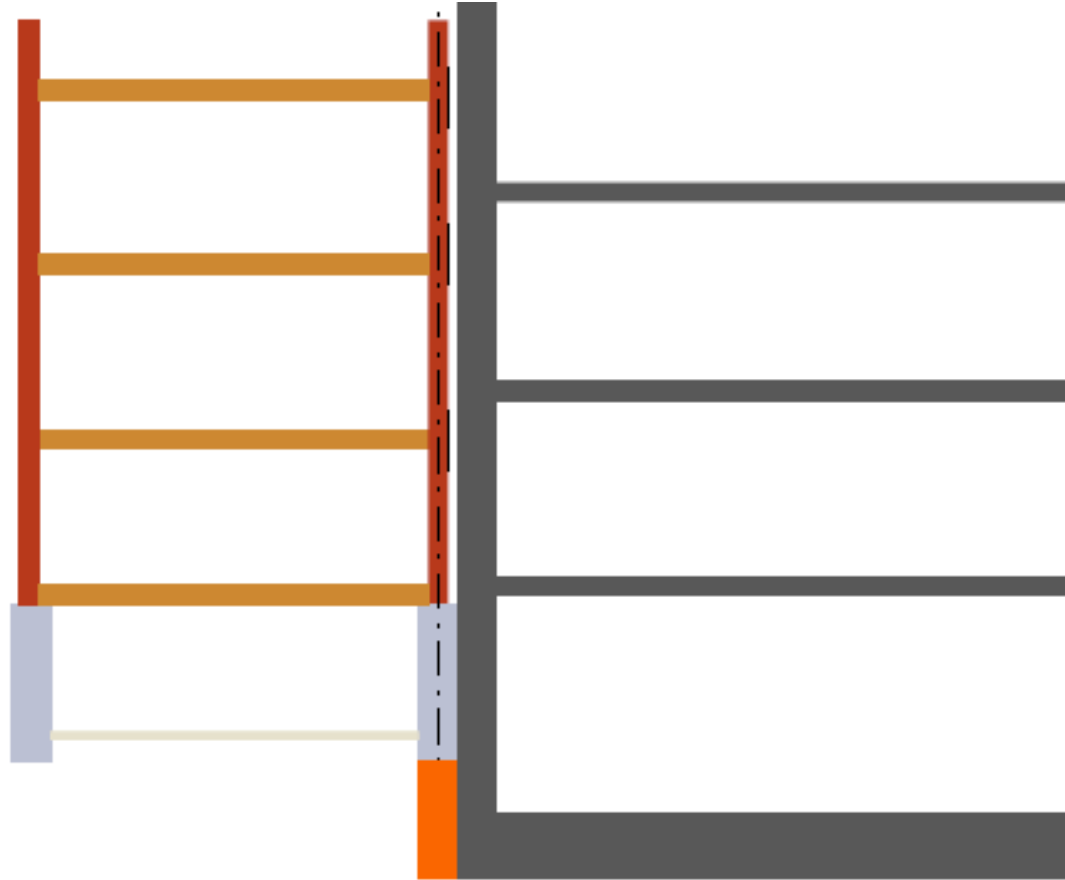


Ownership Remains in Common



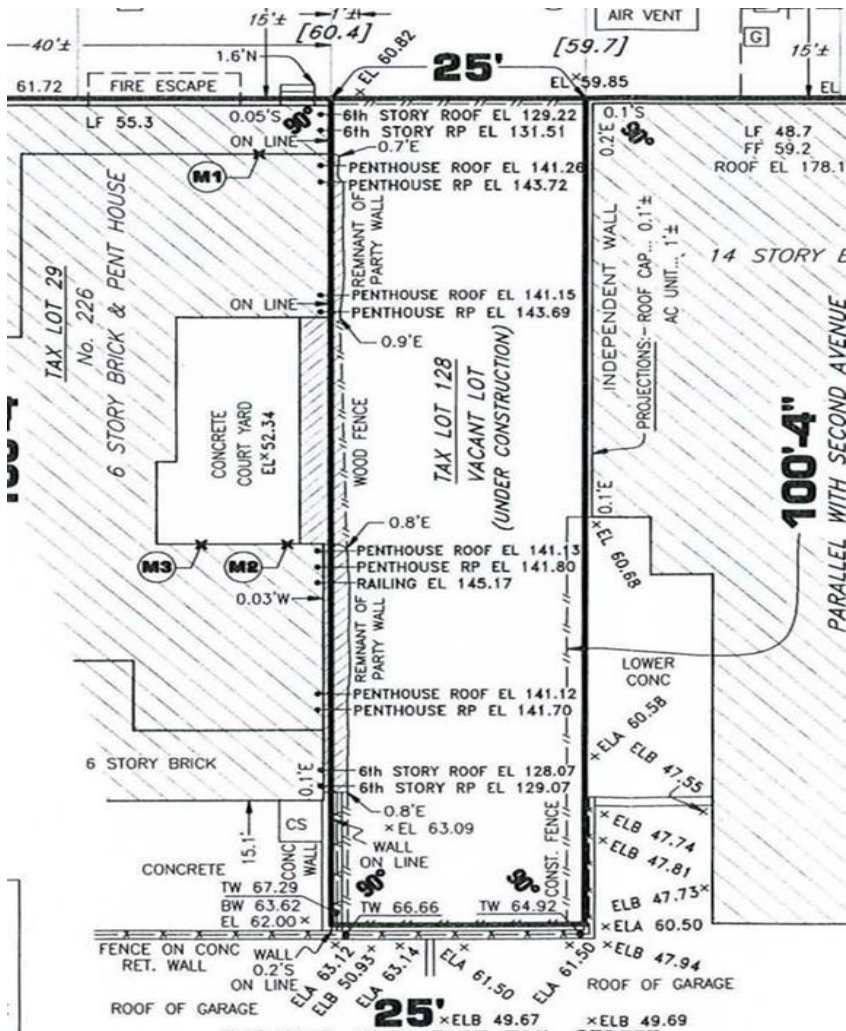
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Typical Party Wall Condition



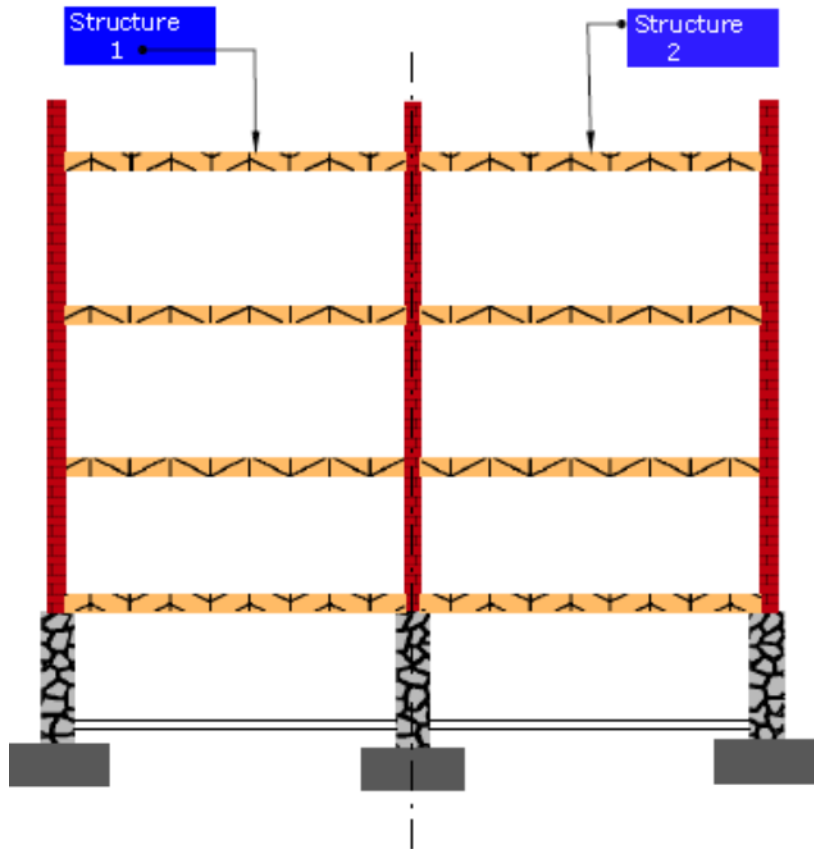
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Party Walls: Remnants



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Party Walls: Foundation



Party Foundation Cut



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Seismic Joint



Lot Line Retaining Walls



Special + Progress Inspections

A background image showing construction workers in hard hats and safety gear working on a site. One worker in the foreground is wearing a dark jacket and pants, leaning over. Another worker is visible in the background wearing a white hard hat and safety glasses. The scene is a construction site with various equipment and materials.

What are Special Inspections and Progress Inspections?

- Inspections performed by third-party inspectors during construction to verify compliance with the approved plans

1968 NYC Building Code

- Also contained similar third-party inspection requirements called Controlled Inspections

Special + Progress Inspections

Who can perform Special Inspections?

- DOB-Registered Special Inspection Agencies

Who can perform Progress Inspections?

- P.E. or RA with relevant experience, or someone under their direct supervision



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Special Inspections (BC Chapter 17)

Applicability

- New buildings
- Alterations of existing buildings

2014 NYC Construction Codes

- BC Chapter 17
- AC 28-114, Approved Agencies
- AC 28-115, Special Inspection Agencies and Special Inspectors
- AC 28-116, Inspections and Sign-off of completed work



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Department Rules and Regulations (1 RCNY 101-06)

Special Inspectors & Special Inspections Agency Rule

- Registration
- Organization
 - Accreditation for Class 1
- Qualifications
 - Primary Inspectors
 - Supplemental Inspectors



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General (BC 1704.1)

Reorganized Duties and Responsibilities

Similar to requirements of

- 1 RCNY §101-06
- 2008 Codes

Duties identified for

- Applicant of Record
- Special Inspection Agency
- Permit Holder



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Duties of Registered Design Professional of Record (BC 1704.1.1)

1. Identify required inspections
{Similar to AC 28-104.7.7}
2. Respond to reports of field discrepancies
3. Review shop drawings, where provided
{1 RCNY §101-06}
4. Review deviations from construction documents and file those that are approved
{AC 28-104.3}



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Duties of Special Inspection Agency (BC 1704.1.2)

1. Independence from contractors performing work
 - Obligation to avoid conflict of interest
{1 RCNY 101-06}
 - Hired by owner {BC 1704.1}

Applicant of record can perform special inspections, provided

- Registered as an SIA for required inspections
- Complies with independence & conflict of interest requirements



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Special Inspection Agency Duties (BC 1704.1.2)

2. **Construction Documents {1 RCNY 101-06}**
 - Confirm documents are sufficient to enable proper special inspection
 - Confirm shop drawings and sketches accepted by Registered Design Professional of Record

3. **Inspection – Confirm work is in compliance with**
 - Approved construction documents
 - Approved shop drawings, where provided
 - Special inspection requirements of Code and Department rules and regulations



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Special Inspection Agency Duties (BC 1704.1.2)

4. Reporting {1 RCNY 101-06}

- Report discrepancies to contractor
- Report uncorrected discrepancies to owner and applicant of record
- Report conditions noted as hazardous to life, safety or health that are not immediately corrected to the immediate attention of the Commissioner
- Buildings Bulletin 2016-006
- Final report (TR1) required prior to C of O/Letter of Completion
- Reports of partially completed work can be accepted
- Keep records for period of 6 years from date of project sign-off



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Permit Holder Duties (BC 1704.1.3)

1. Permit applications require identification of special inspection agencies (TR1) {AC 28-116}
2. Designers of temporary installations subject to special inspection required to be identified (e.g. sheeting & shoring) {2008 BC 1704.1.1.2}
3. Provide 72 hours notice in writing to special inspection agency {AC 28-116.2.3}

Permit Holder Duties (BC 1704.1.3) (continued)

4. Make work accessible and keep exposed for special inspection {AC 28-116}
5. Correct deficiencies identified by special inspection agencies

NOTE: A satisfactory inspection by a special inspection agency or the acceptance by the Department of a satisfactory report of an inspection by a special inspection agency shall not be construed to be an approval by the Department of a violation of the provisions of this Code or of any other provision of law. {AC 28-116.1}



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Inspection of Fabricators (BC 1704.2)

- Special inspection must be performed in fabricator's plant
 - Exception: Approved Fabricators
- Approved fabricator requirements (BC 1704.2.2)
 - Largely based on independent fabricator certification programs (PCI)
- In-plant special inspection (BC 1704.2.2.3)
 - Approved fabricator work subject to inspection of 5% of work, minimum

Structural Stability (BC 1704.20)

- Reorganized inspection program requirements
- Structural safety during construction operations (2008) → Structural stability of existing buildings (2014)
- Exception for lintel replacement spanning \leq four feet

877-224-3356

Structural Stability (BC 1704.20)

Requires Special Inspection for the following construction operations

- Existing Structures (BC 1704.20.1)
 - Construction operations influencing adjacent structures
- Excavations (BC 1704.20.2)
 - Slurry (BC 1704.20.2.1)
- Underpinning (BC 1704.20.3)
- Demolition (BC 1704.20.4)
- Raising and Moving of a Building (BC 1704.20.5)



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Structural Stability (BC 1704.20)

Structural Materials and Methods of Construction

- Temporary protections shall be subject to special inspection when such materials and methods of construction would be subject to special inspection as a permanent installation

- Including but not limited to special inspection for
 - Concrete - including testing requirements (BC 1704.4)
 - Structural Steel welding (BC1704.3)
 - Deep Foundation Elements (BC 1704.8)
 - Pile Driving
 - Rock Anchors



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Structural Stability (BC 1704.20)

Required for all Structural Stability Inspections

- **Inspection Program (BC 1704.20.6)**
 - Identify portions of work to be inspected
 - Professionals performing design
 - Dates of delivery of structural stability design documents
 - Schedule of periodic inspections

- **Design Documents (BC 1704.20.7)**
 - Prepared by professional
 - Must be site-specific designs
 - Maintained at site



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Structural Stability (BC 1704.20)

Required for all Structural Stability Inspections (continued)

- **Monitoring (BC 1704.20.7.1)** - Structural stability design documents include monitoring requirements where applicable
 - Building specific
 - Operation specific
 - Specify monitoring frequency, tolerances, and reporting criteria
 - TPPN 10/88 may not be sufficient for your specific case



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Structural Stability (BC 1704.20)

Required for all Structural Stability Inspections (continued)

- **Inspection during Construction Operations (BC 1704.20.8)**
 - Visit jobsite during ongoing work
 - Verify operations conform to design documents
 - Follow monitoring protocols (BC 1704.7.1)
 - Report deficiencies and discrepancies (BC1704.1.2)
- **Records of Special Inspections (BC 1704.20.7)**
 - Log book maintained at site and by Special Inspector
 - Includes: names of personnel, date & time of inspections, observations
- **Special requirements for Work in Occupied Multiple Dwellings (BC 1704.20.10)**



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Excavations



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Excavations

Applicable sections of Chapter 33

- BC 3304.4 (Protection of sides of excavation)
- BC 3304.12 (Slurry)
- BC 3304.2 (Support of excavation drawings)
- 3309.4 (Soil or foundation work affecting adjoining property)
- 3309.4.2 (Support of party walls)
- 3309.8 (Adjoining walls)

Special Inspection

- Protection of the sides of excavations (2008)
Excavations (2014)



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Excavations

Excavations must be supported (BC 3304.4)

Common methods

- 45 degree sloped embankment
- Sheeting, shoring, or bracing



Excavations

Slurry (BC 3304.12)



Slurry is a method utilized to support excavations

Excavations

Support of Excavation Plans (SOE) (BC 3304.2)

- Must be specific to the site
- Prepared by licensed professional
- Monitoring plan must be included (BC 1704.20.7.1)
- For slurry construction, shall include
 - Slurry mix proportions
 - Slurry installation procedures
- Exemptions to SOE plans for certain work



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Excavations

Special Inspections

- Where sheeting, shoring, or bracing or other methods to protect sides of excavations (including slurry) are utilized, special inspection is required (BC 3304.4)
- Identify special inspections for *Excavations-Sheeting, Shoring, and Bracing*; and
- Other Special Inspections based on materials and methods used, including but not limited to
 - Structural Steel – Welding
 - Deep Foundation Elements (includes rock anchors)
 - Concrete Cast-in-Place



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Underpinning



Underpinning

Applicable Sections

- BC 1704.20.3 (Structural Stability - Underpinning)
- BC 1802 (Geotechnical Investigations & Material Classifications)
- BC 1814 (Underpinning And Support Of Adjacent Property)
- BC 3309.4 (Soil or foundation work affecting adjoining property)
- BC 3309.5 (Underpinning)
- BC 3309.8 (Adjoining walls)



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Underpinning

Underpinning Plans

- Site-specific & prepared by licensed professional
- Plans for Underpinning Must Indicate
 - Underpinning is required
 - The depth of the existing foundation and any existing underpinning
 - Details of new underpinning
 - The depth of required new underpinning
 - If a party wall is to be underpinned



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Underpinning

Underpinning Plans (cont.)

- Underpinning plans must be filed
- If this occurs under a separate application, the plans for the primary work must contain a note that the contractor will retain a NYS PE to develop site specific underpinning plans and fill file under a separate application



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Underpinning

Special Inspections

- Special Inspection for **underpinning** is required
- Monitoring plan must be included (BC 1704.20.7.1)
- New permanent installations installed with the underpinning require their own special inspection (e.g. *steel, concrete, etc.*)
- Underpinning special inspection must be performed by a Class I or Class II Special Inspection Agency.



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Demolition



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Demolition (BC 1704.20.4)

- Non-hand-held mechanical means of demolition used from within a building subject to special inspection
- Non-hand-held mechanical means of moving debris from within a building added
- Applicable Sections
 - BC 3306 (Demolition)
 - BC 3309.8 (Adjoining walls)



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Demolition (BC 1704.20.4)

Site specific plans required prepared by licensed professional must indicate

- Details of the building demolished clearly showing the extent and sequence of demolition
- Details of Bracing and shoring
- Listing and description of all mechanical equipment (other than handheld)
 - Scope of equipment work and positioning of equipment
 - Calculations showing the adequacy of the existing structure to support loads
- Description of protective methods



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Raising and Moving of a Building (BC 1704.20.5)

Plans shall include (continued)

- Limiting allowances for deviation from horizontal or plumb lines.
- The type of machinery and installation to be used during the raising, lifting, elevating or moving operation and the rate/speed. No machinery can be substituted without a signed and sealed approval by the registered design professional of record.
- The construction or other work necessary to maintain the safety and integrity of the building to be raised, lifted, elevated or moved when such building is in a weakened condition or becomes weakened in the process of raising, lifting, elevating or moving.
- The protection of pedestrians and adjoining buildings pursuant to Section BC 3306.2, except that netting per Section BC 3308 is not required.



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Protection of Party Walls

3309.8 Adjoining walls. When any construction or demolition operation exposes or breaches an adjoining wall, including load bearing and non load-bearing walls as well as party walls and non party walls, the person causing the construction or demolition operation shall, at his or her own expense, perform the following:

- Maintain the structural integrity of such walls and adjoining structure, and have a registered design professional investigate the stability and condition of the wall and adjoining structure and take all necessary steps to protect such wall and structure



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Protection of Party Walls

3309.8 Adjoining walls. (continued)

- Maintain all required fire exits and passageways or provide substitutions meeting the requirements of this Code.
- Cut off close to the walls all beams in party walls, remove stub ends without weakening existing masonry, clean beam pockets of loose mortar, bend over all wall anchors at the beam ends in the standing wall, and brick-up all open beam holes with sound brick and cement mortar.



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Protection of Party Walls

3309.8 Adjoining walls. (continued)

- Where the floor beams of the adjacent building bear on the party wall, the person causing the demolition shall ascertain that such beams are anchored into the wall and, where such anchorage is lacking, shall provide anchorage or otherwise brace the standing wall.



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Protection of Party Walls

3309.8 Adjoining walls. (continued)

All non load-bearing chimney breasts, projections and any other debris exposed on party walls shall be examined and monitored by the person causing the demolition. Removal of such items shall be made under the supervision of a registered design professional, and only if the stability of the adjacent building or structure will not be affected.

- All openings shall be bricked up flush on the exterior side of the party wall. All masonry that is in poor condition shall be pointed and patched.



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Raising and Moving a Building



Photo courtesy of FEMA http://www.fema.gov/media-library-data/b5dfeea3-a95e-4e19-b17b-dcef32f3cc1b/64636_medium.jpg



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Raising and Moving of a Building (BC 1704.20.5)

- Added by Local Law 29 of 2013
- Special Inspection of means and methods of raising/moving operations (Buildings Bulletin 2015-010)
- Site-specific plans prepared by licensed professional required



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Raising and Moving of a Building (BC 1704.20.5)

Plans shall include

- Written sequence of operations, a list of all items that need to be monitored during the operation, and an analysis investigating the possible need to protect adjoining construction.
- The capacity of the soil to temporarily support any installation used in the raising or moving operation.
- The maximum weight of the building to be raised or moved.
- The lateral loads that need to be resisted during the raising or moving operation per BC Chapter 16, or due to the maximum design permitted misalignment of the designed supporting system.



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Raising and Moving of a Building (BC 1704.20.5)

Special Inspections

- “Raising and Moving of a Building” special inspection required
- Other Special Inspections based on materials and methods used during construction of new building elements (foundations, walls, structure, etc.), including but not limited to:
 - *Structural Steel: Welding*
 - *Deep Foundation Elements* (helical piles)
 - *Concrete – Cast-In-Place*



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Tenant Protection Plan

- What is a **Tenant Protection Plan**? When is it required by the **NYC Building Code**?
- What should it include to assure **safety of tenants** during construction, alteration or demolition operations?
- Who is **responsible for monitoring compliance** with the **Tenant Protection Plan** during construction, alteration or demolition operations?



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Tenant Protection Plan

2014 AC §28-104.8.4 Tenant protection plan.

Construction documents for alterations of buildings in which any dwelling unit will be occupied during construction shall include a tenant protection plan. Such plan shall contain a statement that the building contains dwelling units that will be occupied during construction and shall indicate in sufficient detail the specific units that are or may be occupied during construction, the means and methods to be employed to safeguard the safety and health of the occupants, including, where applicable, details such as temporary fire-rated assemblies, opening protectives, or dust containment procedures.



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Tenant Protection Plan

2014 BC 3303.10.1 Tenant protection plan.

In buildings containing occupied dwelling units, including newly constructed buildings that are partially occupied where work is still ongoing within the building, all construction or demolition work shall be performed in accordance with a tenant protection plan as required by Chapter 1 of Title 28 of the *Administrative Code*.



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History of Tenant Safety Concerns

ARSON IN NEW YORK: 1983



CITY OF NEW YORK

Edward I. Koch, Mayor



Prepared by
The Arson Strike Force
Angelo Pisani, Jr.
Coordinator

May 1985

A 1985 report prepared by Mayor Ed Koch's **Arson Strike Force** revealed that There were 6,094 recorded arsons in 1983 of which 5,557 occurred in buildings.

- Two-thirds of arsons in buildings occurred in occupied buildings.
- 68.4% of arsons occurred in multiple dwellings.
- Arsons resulted in 1,719 injuries to uniformed personnel, 243 injuries to civilians and 27 fatalities.

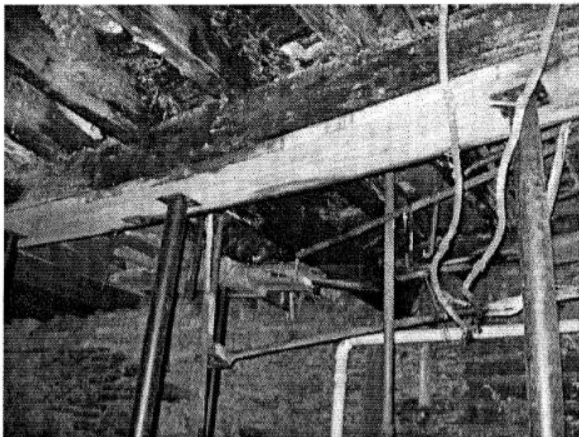


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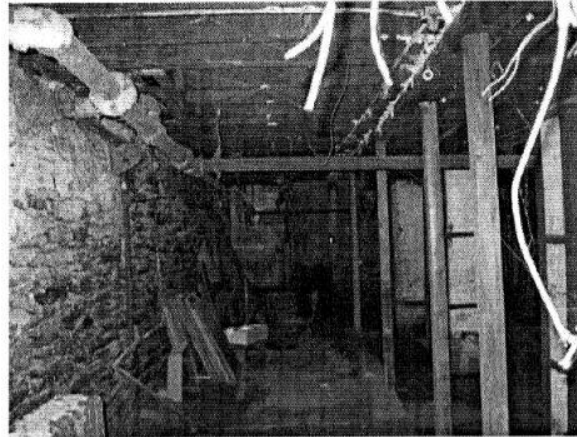
Windermere Apartments



- Built in 1881
- At 400 West 57th Street
- Historical landmark
- Years of neglect, tenant harassment and litigation
- Interior while it was occupied
- Obvious fire hazard
- Led to Special Clinton District



P-67 Basement. Wood joists are supported by 12"x12" piece of lumber and pipe shores.



P-68 Basement. Pipe shores at approximately 8 feet on center.



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Local Law 19 of 1983

Certificate of No Harassment (CONH)

- It prohibited an owner from obtaining a permit to alter or demolish a rooming house or SRO until it can be certified that no illegal evictions occurred in the three years before the date of application.
- Today, CONH or Exemption is required from HPD in order to alter or demolish a Single Room Occupancy (SRO) Multiple dwelling or a Multiple dwelling in following locations:
 - The Special Clinton District
 - The Special Hudson Yards District
 - Preservation Area P-2 of the Special Garment Center District
 - The Greenpoint-Williamsburg Anti-Harassment Area
 - The Special West Chelsea District



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Department Memo of 1983



DEPARTMENT OF BUILDINGS
EXECUTIVE OFFICES
120 WALL STREET, NEW YORK, N.Y. 10005
ROBERT ESNARD, R.A. Commissioner

CAROL FELSTEIN
Deputy Commissioner

Date: August 10, 1983
To: Borough Superintendents
From: Carol Felstein *CF*
Re: Arson Strike Force

As we agreed at our meeting on July 27, the following procedures will be followed in response to concerns raised by the Mayor's Arson Strike Force:

1. All Docket Advice Sheets are to be forwarded to the Arson Strike Force, attention of Mr. Hoey, Director. The Strike Force will return notated copies indicating those buildings where there have been past incidents of suspected arson or negligently caused fires, as well as their comments on the requested action.
2. A comprehensive tenant protection plan is required to be submitted prior to any approval for the rehabilitation of any occupied multiple dwelling (unless the building is an SRO and is already so covered under Local Law 19 of 1983). This plan should cover all aspects of tenants' safety during the course of construction. For buildings indicated on the Docket Sheets as known to the Arson Strike Force, the plan shall set forth in detail the efforts to be taken to insure tenants' safety from additional fire hazards that may arise during the alteration work.

The Department of Buildings issued a memo on 8/10/1983 requiring a **comprehensive tenant protection plan** for all buildings not covered by LL 19/83



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Department Memo of 1983

2. A comprehensive tenant protection plan is required to be submitted prior to any approval for the rehabilitation of any occupied multiple dwelling (unless the building is an SRO and is already so covered under Local Law 19 of 1983). This plan should cover all aspects of tenants' safety during the course of construction. For buildings indicated on the Docket Sheets as known to the Arson Strike Force, the plan shall set forth in detail the efforts to be taken to insure tenants' safety from additional fire hazards that may arise during the alteration work.



DEPARTMENT OF BUILDINGS

EXECUTIVE OFFICES

120 WALL STREET, NEW YORK, N.Y. 10005

ROBERT ESNARD, R.A. Commissioner

NYC
Buildings

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Elements of Tenant Protection Plan

2014 AC §28-104.8.4 Tenant Protection Plan.

The elements of the tenant protection plan may vary depending on the nature and scope of the work but at a minimum shall make detailed and specific provisions for:

1. Egress
2. Fire safety
3. Health requirements
4. Compliance with housing standards
5. Structural safety
6. Noise restrictions
7. Other



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1. Egress Provisions



At all times in the course of construction provision shall be made for adequate egress as required by this code and the tenant protection plan shall identify the egress that will be provided. Required egress shall not be obstructed at any time except where approved by the Commissioner.

Egress Plan

Egress Plan should include

- Location of exits
- Egress path/s to exits
- Signage and emergency lighting
- Construction zone, vacant areas and occupied areas



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Egress Plan

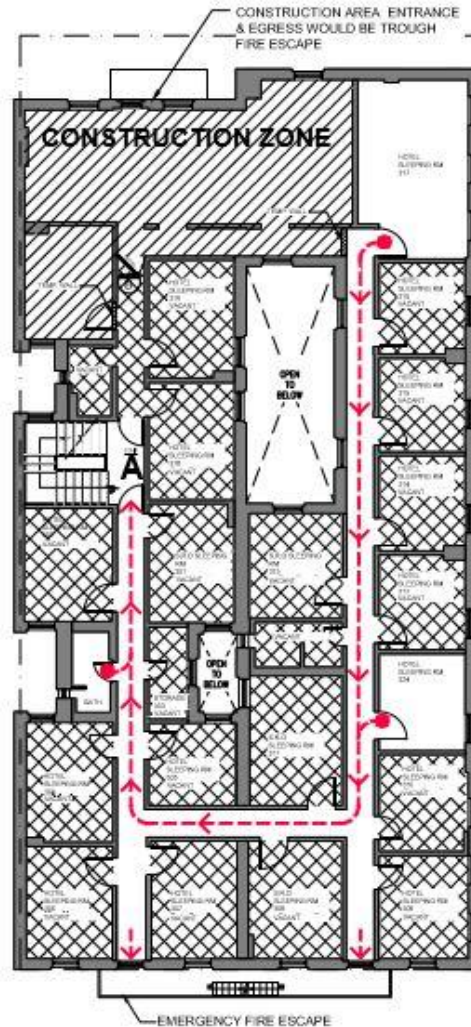
STAIRWELL SIGNAGE

CONSTRUCTION ZONE

3" MIN LETTERING

AUTHORIZED
PERSONNEL ONLY
BEYOND THIS POINT

SIGNAGE TO BE LOCATED IN STAIRWELLS AT ALL UNOCCUPIED CONSTRUCTION FLOORS.



LEGEND



VACANT AREA

AREA NOT IN SCOPE FOR TEMPORARY CERTIFICATE OF OCCUPANCY - ALL AREAS NOT HATCHED ARE READY FOR OCCUPANCY



CONSTRUCTION ZONE

AREA NOT IN SCOPE FOR TEMPORARY CERTIFICATE OF OCCUPANCY - ALL AREAS NOT HATCHED ARE READY FOR OCCUPANCY



STANDPIPE LOCATION



EXIT SIGN
(WALL OR CLG MOUNTED)
ARROW INDICATES DIRECTION OF EXIT



OMNIDIRECTIONAL
TEMPORARY EMERGENCY
LIGHTING

1 3RD FLOOR PLAN
SCALE: 3/16" = 1'-0"



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2. Fire Safety Provisions



All necessary laws and controls, including those with respect to occupied dwellings, as well as additional safety measures necessitated by the construction shall be strictly observed.



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3. Health Requirements



Specification of methods to be used for control of dust, disposal of construction debris, pest control and maintenance of sanitary facilities, and limitation of noise to acceptable levels shall be included.

4. Compliance with Housing Standards



The requirements of the **New York City Housing Maintenance Code**, and, where applicable, the **New York State Multiple Dwelling Law** shall be strictly observed.



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5. Structural Safety



No structural work shall be done that may endanger the occupants.



6. Noise Restrictions



Where hours of the day or the days of the week in which construction work may be undertaken are limited pursuant to the **New York City Noise Control Code**, such limitations shall be stated.



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Project Specific Tenant Protection Plan Service Notes or TPP Notes and Plans

TENANT PROTECTION PLAN: (PER AC 104.8.4)

1. ALL WORK TO BE DONE IN ACCORDANCE WITH THE 2014 NEW YORK CITY BUILDING CODE, ARTICLE 19, AND REGULATIONS OF ALL OTHER AGENCIES HAVING JURISDICTION.
2. ALL EXISTING MEANS OF EGRESS FROM THE BUILDING TO BE MAINTAINED CLEAR AND FREE OF ALL OBSTRUCTIONS, SUCH AS BUILDING MATERIALS, TOOLS, ETC.
3. ALL REGULATIONS RELATED TO FIRE SAFETY SHALL BE STRICTLY OBSERVED. CONTRACTORS SHALL PROVIDE THE REQUIRED NUMBER OF PORTABLE FIRE EXTINGUISHERS IN REQUIRED LOCATIONS.
4. CONTRACTOR, AT ALL TIMES, TO MAKE SURE THERE IS NO LEAKAGE OF NATURAL GAS IN THE BUILDING, OR ANY FLAMMABLE GAS USED IN CONSTRUCTION.
5. ALL FLAMMABLE MATERIALS TO BE KEPT TIGHTLY SEALED IN THEIR RESPECTIVE MANUFACTURER'S CONTAINERS SUCH MATERIALS ARE TO BE KEPT AWAY FROM HEAT.
6. ALL FLAMMABLE MATERIALS TO BE USED AND STORED IN AN ADEQUATELY VENTILATED SPACE.
7. DEBRIS, DIRT, AND DUST TO BE KEPT TO A MINIMUM AND BE CONFINED TO THE IMMEDIATE CONSTRUCTION AREA.
8. CONTRACTOR TO ISOLATE CONSTRUCTION AREA FROM OCCUPIED BUILDING AREAS BY MEANS OF TEMPORARY PARTITIONS OF HEAVY WEIGHT DROP CLOTHS.
9. CONTRACTOR TO PROVIDE ADEQUATE TEMPORARY BRACING AND SHORING WHEREVER ANY STRUCTURAL WORK IS INVOLVED.
10. ALL MATERIALS STORED AT CONSTRUCTION AREA, AND/OR IN ANY AREA OF THE BUILDING, ARE TO SECURED IN A LOCKED AREA. ACCESS TO AREAS TO BE CONTROLLED BY OWNER AND/OR GENERAL CONTRACTOR.
11. ALL MATERIALS TO BE STORED IN AN ORDERLY FASHION.
12. CONSTRUCTION WILL BE CONFINED TO THE NON-PUBLIC SPACES AND THE CONTRACTOR WILL TAKE ADEQUATE MEASURES TO ENSURE THE DUST, DIRT OR OTHER SUCH INCONVENIENCE WILL NOT AFFECT THE APARTMENT UNITS.
13. ALL REGULATIONS RELATED TO THE SAFE HANDLING OF LEAD BASED MATERIALS AND ASBESTOS CONTAINING MATERIALS SHALL BE OBSERVED AND CARRIED OUT BY PERSONS TRAINED AND AUTHORIZED TO PERFORM SUCH WORK.
14. ALL NYC AND NYS REGULATIONS PERTAINING TO REQUIRED HOUSING STANDARDS SHALL BE COMPLIED WITH.
15. DEBRIS, DIRT AND DUST TO BE CLEANED UP AND CLEARED FROM BUILDING PERIODICALLY TO AVOID ANY EXCESSIVE ACCUMULATION.



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Project Specific Tenant Protection Plan Service Notes or TPP Notes and Plans

16. ALL DEMOLITION, REPAIR, AND ALTERATION OPERATIONS TO BE DONE IN ACCORDANCE WITH NEW YORK CITY BUILDING CODE, ARTICLE 19, SUB-ARTICLES 27-1036 AND 27-1039.
17. NO WORK SHALL BE DONE THAT IMPAIRS THE STRUCTURAL SAFETY OF THE BUILDING OR OCCUPANTS.
18. NOTICE SHALL BE GIVEN WHERE CONTEMPLATED WORK IS SUBJECT TO RESTRICTIONS PERTAINING TO THE NYC NOISE CONTROL CODE.
19. ALL ELECTRICAL POWER TO BE SHUT-OFF WHERE THERE IS EXPOSED CONDUIT.
20. ALL ELECTRICAL POWER IN THE CONSTRUCTION AREA TO BE SHUT OFF AFTER WORKING HOURS.
21. WORK SHALL NOT INTERFERE WITH HEATING, ELECTRICAL, GAS, OR PLUMBING SERVICE TO OTHER TENANTS.
22. WORK SHALL TAKE PLACE DURING NORMAL WORKING HOURS ONLY: 8:00 A.M. TO 5:00 P.M. MONDAY THROUGH FRIDAY (NOT ON HOLIDAYS).
23. THERE WILL BE NO ONE UTILIZING THE HALLWAYS DURING THE COURSE OF THE CONSTRUCTION WORK.
24. CONSTRUCTION OPERATIONS WILL NOT INVOLVE INTERRUPTION OF HEATING, WATER, OR ELECTRICAL WORK.
25. THE ENGINEER HAS NOT BEEN RETAINED TO SUPERVISE CONSTRUCTION.
26. THE ENGINEER IS NOT RESPONSIBLE FOR JOB SITE SAFETY AND HAS NO RESPONSIBILITY FOR DIRECTING AND/OR SUPERVISING THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION PROCEDURES AND SAFETY, AND THE ENGINEER IS NOT ACCOUNTABLE ANY VIOLATIONS OF O.S.H.A. OR OTHER SAFETY REGULATIONS.
27. VISITS TO THE SITE BY THE ENGINEER ARE ONLY INTENDED TO ENSURE COMPLIANCE WITH THE DESIGN AND SHOULD NOT BE CONSTRUED AS BEING RELATED TO SITE SAFETY.

NOTE:

ALL EXISTING RESIDENTIAL DWELLING UNITS IN THE SUBJECT BUILDING TO REMAIN OCCUPIED DURING CONSTRUCTION.



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Tenant Protection Plan Service Notice



January 2016

SERVICE UPDATE

Tenant Protection Plans: Available on BISWeb

Effective January 25, 2016, a stand-alone Tenant Protection Plan document must be submitted for all buildings being altered or demolished, containing one or more dwelling units that will remain occupied during construction. The Tenant Protection Plan will be available to the public through the Department's website.

The Tenant Protection Plan notes and any supporting drawings should continue to be on the building plans for all filings. However, a new form has been created ([TPP1](#)) to satisfy the required item—**Tenant Protection Plan and Notes**. The form must adhere to the six Tenant Protection areas cited in the Code (28-104.8.4) that apply to the work being done and must contain supporting drawings, if required.



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Tenant Protection Plan Service Notice

TPP Process

- The applicant must complete the new TPP1 form prior to approval. The job will not be approved otherwise.
- Once the TPP1 is completed, the applicant must print; sign and seal, then submit/upload the TPP1 as a Required Item.
- All supporting attachments and drawings must be legible and appended to the TPP1. Dimensions must not exceed 11 x 17.

*NOTE: you must submit the TPP1 to satisfy this required item.
Incomplete TPP1 Required Items may extend your time to approval.*



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Tenant Protection Plan Service Notice

Viewing a TPP

- The clickable Tenant Protection Plan Required Item will now be visible on the Required Items screen.

NYC Department of Buildings

B-SCAN List of Required Items

11 TOTAL ITEMS REQUIRED FOR JOB	WHO	PRI	REQUIRED		RECEIVED		DATE	WAIVED	AUTO
	RECV ⁺	TO	ID	DATE	ID	DATE	CERTIFIED		
RA0236 HIGH LINE - PARKS APPROVAL REQUIRED	T	APP	CLE	10/30/2015					Yes
RB0143 TENANT PROTECTION PLAN AND NOTES	T	APP	CLE	10/30/2015					Yes
RB0152 VERIFY DOB PLAN NAMING STANDARD IS MET	N	APP	CLE	10/30/2015					Yes



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Special Inspection to Verify Compliance with TPP

2014 BC 1704.20.10 Special requirements for work in occupied multiple dwellings.

When alteration or construction operations are performed at occupied multiple dwellings, the special inspector shall periodically verify compliance with a tenant protection plan as provided for in Chapter 1 of Title 28 of the *Administrative Code*.



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Occupant Protection Plan

2014 BC 3303.10 Operations in occupied buildings.

When construction or demolition activity occurs in an occupied building, barricades, signs, drop cloths, and other protective means shall be installed and maintained as necessary to provide reasonable protection for the occupants against hazard and nuisance. Such protective means shall be indicated on an **occupant protection plan**, or where a **tenant protection plan** is required by **Section 3303.10.1**, on a **tenant protection plan**.



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