

EVALUATION OF EXISTING & ADJACENT BUILDINGS: KNOW YOUR NEIGHBOR & KEEP THEM SAFE

PRESENTED BY

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PRESENTATION DESCRIPTIONS

This presentation provides an overview for ensuring SAFE and successful construction practices inside or next to an existing building. The NYCBC requires engineering evaluations of these structures prior to construction. This seminar will show how broadly classifying buildings into Residential, Commercial, Publicly Owned and Other will easily unlock technical provisions for contemporary and prior codes as well as laws and governances for these structures. The presentation will focus on residential buildings and the SAFE maintenance of Multiple Dwellings and tenanted properties.

RANDOM OCCURRENCE?

Don't let YOUR building end up like this.



Photo Source: Google/1010 WINS



Photo Source: Google/NY Daily News

FAMILIES OF BUILDINGS

Residential (R), Commercial (C), Publicly-owned (P), Other (O)
(+/- 860K Occupiable, 150 Un-occupiable)

- Residential (R):
 - Tenement dwellings +/- 300K
 - 1&2 private dwellings +/- 520K
- Commercial (C): +/- 10K
- Publicly-owned (P): +/- 20K
- Others (O): +/- 10K



BY THE NUMBERS: RECORD DATA

Avoid confirmation bias for systemic problems

- Are collapses singular ?
- Are collapses predictive ?
- Can one extract building performance from data ?
- Are instances of Maintenance problems predictive?
- Are unsafe conditions dense in some building typologies?
 - R, C, P, O?
 - Predictive?
 - Caution: Vernacular terms and construction. Start with record data and merge with other data bases for precision

BY THE NUMBERS: PREDICTING STRUCTURAL DECAY OF EXISTING BUILDINGS

Open Data DOB Record of Structural Damage

- Since 1989 +/- 2.5M building complaints, 100 choices -> complaints include existing buildings and permitted work
- Failure to Maintain of existing buildings and accidents: Cat 1, 30, 73 – only structural -> (excludes boilers, MEP, occupancy etc.) +/- 200K
- Remove duplicates where there is more than one complaint for same structural thing = +/- 100K
- Of +/- 100K – let's see what buildings ->

BY THE NUMBERS: PREDICTING STRUCTURAL DECAY OF EXISTING BUILDINGS

Open Data DOB Record of Structural Damage *(continued)*

- +/- 60K in R: Residential regulated tenement housing regulated by HPD/DOB
- +/- 40K mostly residential private dwellings and some C: Commercial, P: Public , O: Other – DOB regulated
- 60% of all existing building structural complaints -> HPD regulated privately-owned tenements

BY THE NUMBERS: PREDICTING STRUCTURAL DECAY OF EXISTING BUILDINGS

Open Data DOB record of
structural damage

- DOB Complaints started
in 1989
- 2.5M covers existing
occupied buildings



Complaint Category Description

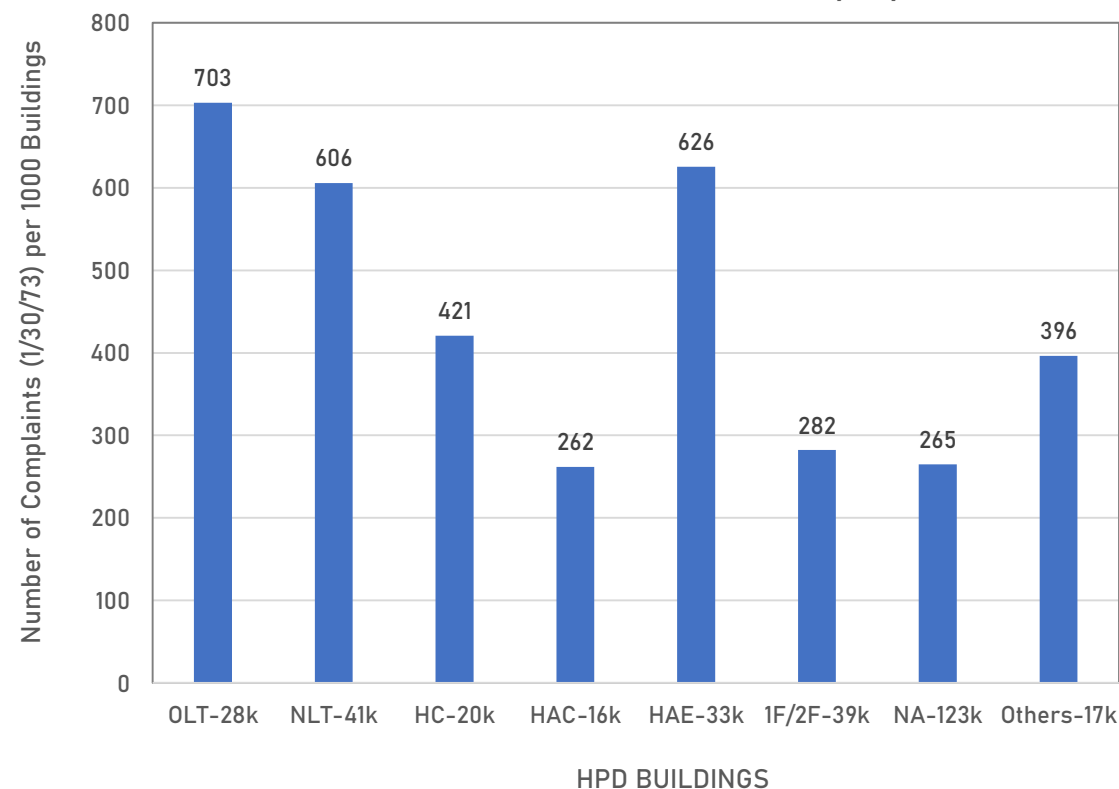
CODE	COMPLAINT CATEGORY DESCRIPTION	PRIORITY
01	Accident – Construction/Plumbing	A
04	After Hours Work – Illegal	B
05	Permit – None (Building/PA/Demo etc.)	B
06	Construction – Change Grade/Change Watercourse	B
09	Debris – Excessive	B
10	Debris/Building -Falling or In Danger of Falling	A
12	Demolition-Unsafe/Illegal/Mechanical Demo	A
13	Elevator In (FDNY) Readiness-None	A
14	Excavation - Undermining Adjacent Building	A
15	Fence - None/Inadequate/Illegal	B
16	Inadequate Support/Shoring	A
18	Material Storage – Unsafe	A
20	Landmark Building – Illegal Work	A
21	Safety Net/Guardrail-Damaged/Inadequate/None (over 6 Story/75 ft.)	B
23	Sidewalk Shed/Supported Scaffold/Inadequate/Defective/None/No Permit/No Cert	B
30	Building Shaking/Vibrating/Structural Stability Affected	A
31	Certificate of Occupancy – None/Illegal/Contrary to Co	C
35	Curb Cut/Driveway/Carport – Illegal	D
37	Egress – Locked/Blocked/Improper/No Secondary Means	A
45	Illegal Conversion	B
49	Storefront or Business Sign/Awning/Marquee/Canopy – Illegal	C
50	Sign Falling - Danger/Sign Erection or Display In Progress – Illegal	A
52	Sprinkler System – Inadequate	B
53	Vent/Exhaust – Illegal/Improper	D
54	Wall/Retaining Wall – Bulging/Cracked	B
55	Zoning – Non-conforming	D
56	Boiler – Fumes/Smoke/Carbon Monoxide	A
58	Boiler – Defective/Non-operative/No Permit	B
73	Failure to Maintain	C

RESIDENTIAL TENEMENT HOUSING COMPLAINT

Distribution per HPD Rental Dwellings +/- 300K

- Pre 1901 Old Law Tenements – 28K w/20K complaints
Collapses, Demolitions, Shoring, Vacates/DHCR, pieces falling off, collateral damage (1 bldg. to 1 comp)
- Pre 1901 Converted Dwellings – 20K w/8K complaints
Collapses, Demolitions, Shoring, Vacates/DHCR, pieces falling off, collateral damage (2.5 bldgs. to 1 comp)
- Pre 1901 1- and 2-Family HPD dwellings – 140K buildings w/43K complaints
- (1- and 2-Family rented 40K, 1- and 2-Family unregistered N/A +/- 100K)
Collapses, Demolitions, Shoring, Vacates, pieces falling off, collateral damage (3.5 bldgs. to 1 comp)
- 1901 – 1929 New Law Tenements – 41K/24K complaints
Shoring, Vacates/DHCR, pieces falling off, collateral damage (2 bldgs. to 1 comp)

HPD BUILDING COMPLAINTS 1/30/73



CONSEQUENCES OF STRUCTURALLY UNSAFE BUILDINGS

UNSTABLE: Existing Building Owner Maintenance

1. A/C 28-301.1 – Owners must maintain SAFE
2. Injuries or Worse – Enforcement
3. Vacates of Families – Significant Enforcement
4. Rental vs Co-ops & Condos
5. Obligation to Relocate Families
6. Shoring/Stability – Complex -> Reconstruction \$ and Engineering

CONSEQUENCES OF STRUCTURALLY UNSAFE BUILDINGS

UNSTABLE: Existing Building Owner Maintenance *(continued)*

7. Repairs – Not so Complex -> Restore to original \$ and Engineering
8. Sales/Refinance/Insurance Issues
9. Very Disruptive

CONSEQUENCES OF STRUCTURALLY UNSAFE BUILDINGS

COLLAPSE: Existing Buildings Next to Development

1. Injuries or worse – Enforcement
2. Vacates of Families – Significant Enforcement
3. Obligation to Relocate Families
4. Rental vs Co-ops & Condos
5. Stop Work Orders – Project at Risk
6. Workers/Families Out of Work

CONSEQUENCES OF STRUCTURALLY UNSAFE BUILDINGS

COLLAPSE: Existing Buildings Next to Development (continued)

7. BC 3301.2 Failure to Safeguard Property
 - Violations are usually curable
 - Construction Error
8. BC Chapter 16: Design (source and origin report)
 - Design Errors, Field Conditions
 - Violations Long Cure Times/Hard to Cure
9. Very disruptive to all parties and families

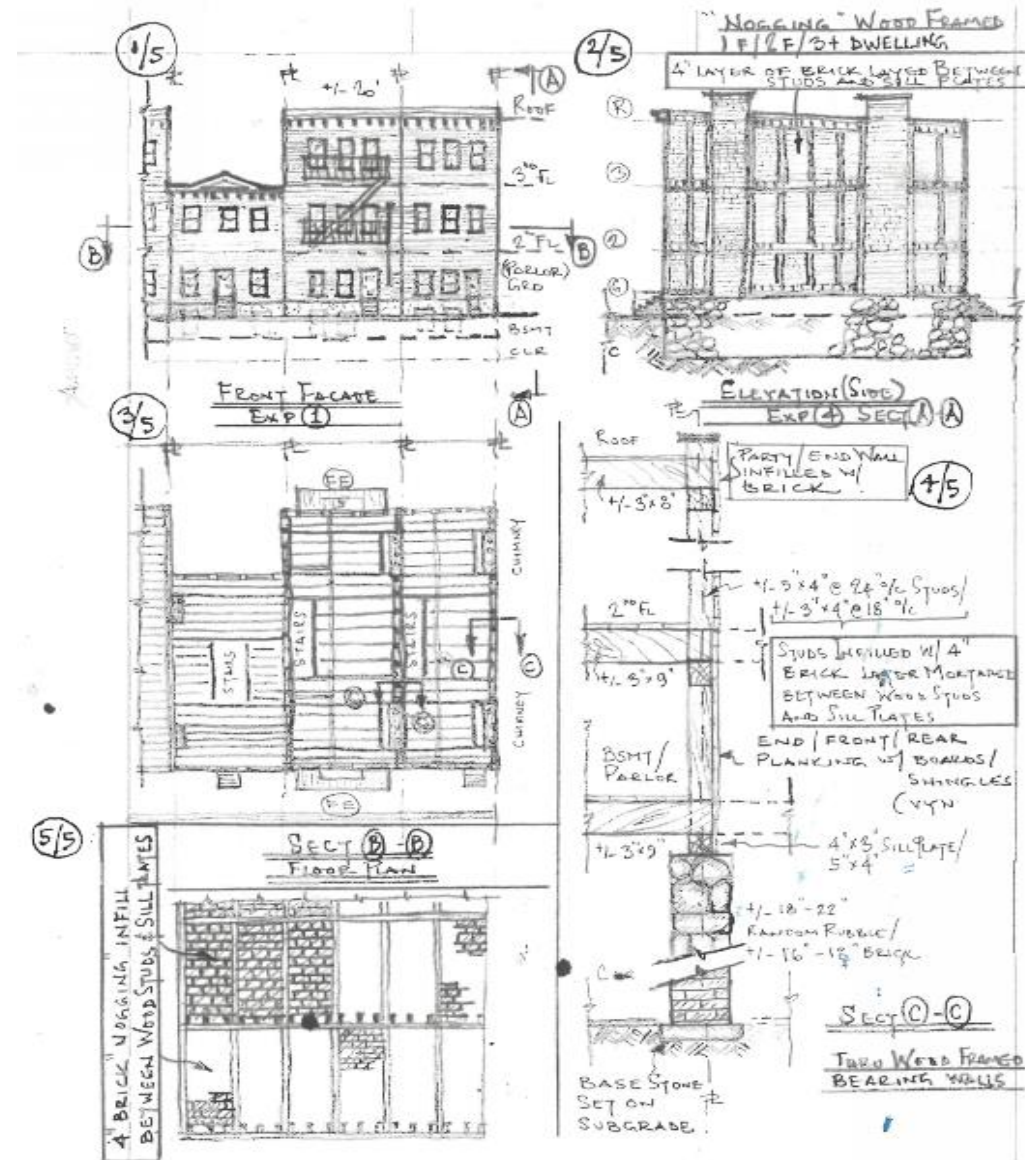
PRE 1901 EXISTING RESIDENTIAL BUILDINGS +/- 90K

- Pre 1929 multiple dwellings; OLT, NLT, Converted dwellings is only 10% of existing housing; +/- 60% of structural problems and 90% collapses
- Prescriptively built following 19 Century codes.
- Patterns/families of buildings. Only a few types of buildings; brick bearing walls and wood
- Kit of parts: “In kind repairs” prescriptive reconstruction: very effective
- Over 150 years, original high safety factor, now low safety factor
- Slow rate of structural decay goes undetected and trauma (fires, water damage)
- Repairs/reconstruction disproportionally high % to \$ value of these small buildings
- Engineering evaluations can be complex unless prescriptive. Specialty experience
- Small groups of tenants.



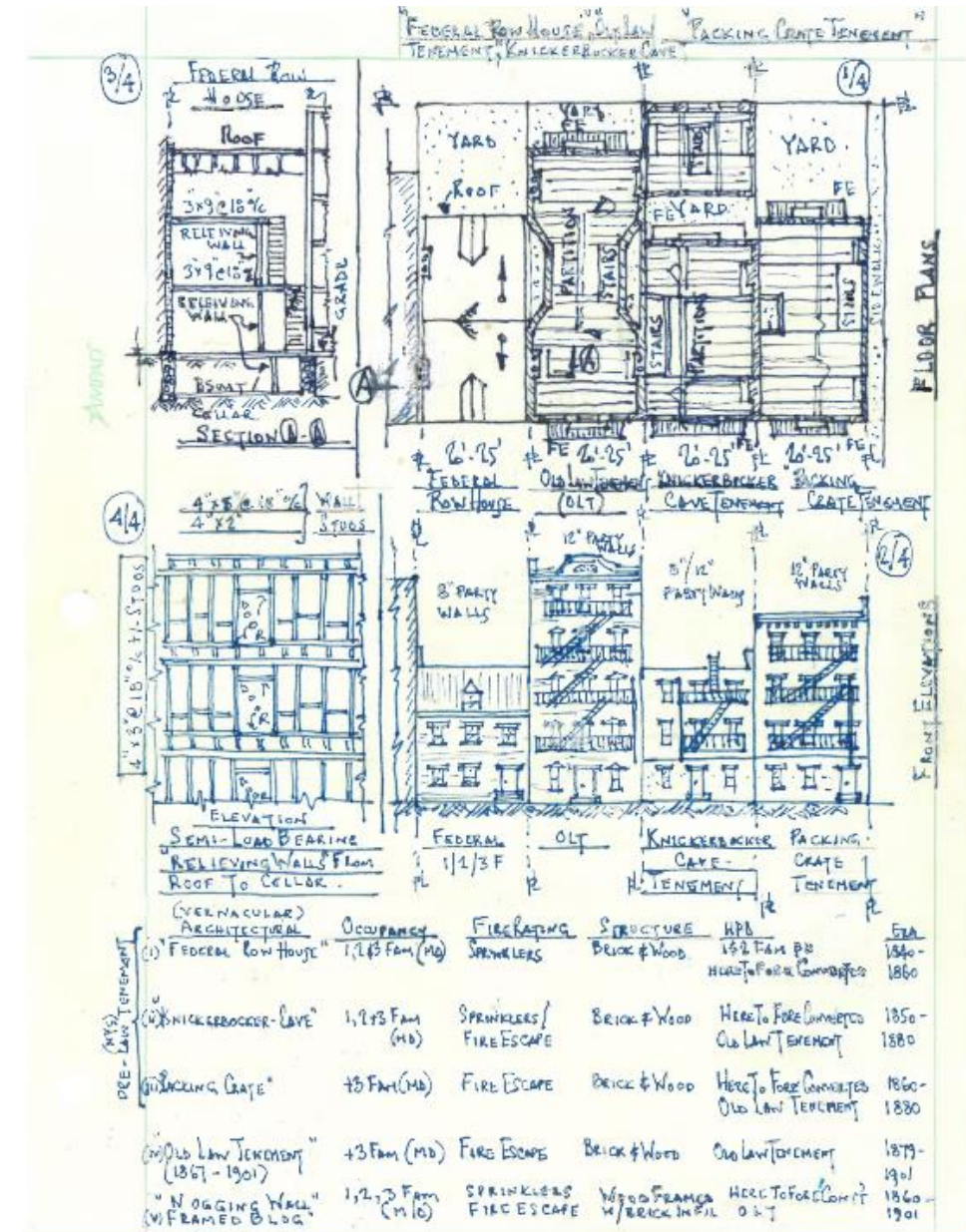
19TH CENTURY PRESCRIPTIVE CODE 1901 WOOD FRAMED NOGGIN WALL TENEMENT

- Wall thickness mostly 4"x5" at 8" o/c with "brick wide infill"
- Platform framed
- Fire Escapes - MDL/BSA
- Relieving Walls around stairs-critical
- Partitions : +/- 4"x5"
- Always wood headers and trimmers around stairs and chimneys
- Floor joists +/- 3"x 10" @ 18" o/c
- Walls "Plumb, Straight and True"



19TH CENTURY PRESCRIPTIVE CODE PRE 1901 TENEMENTS

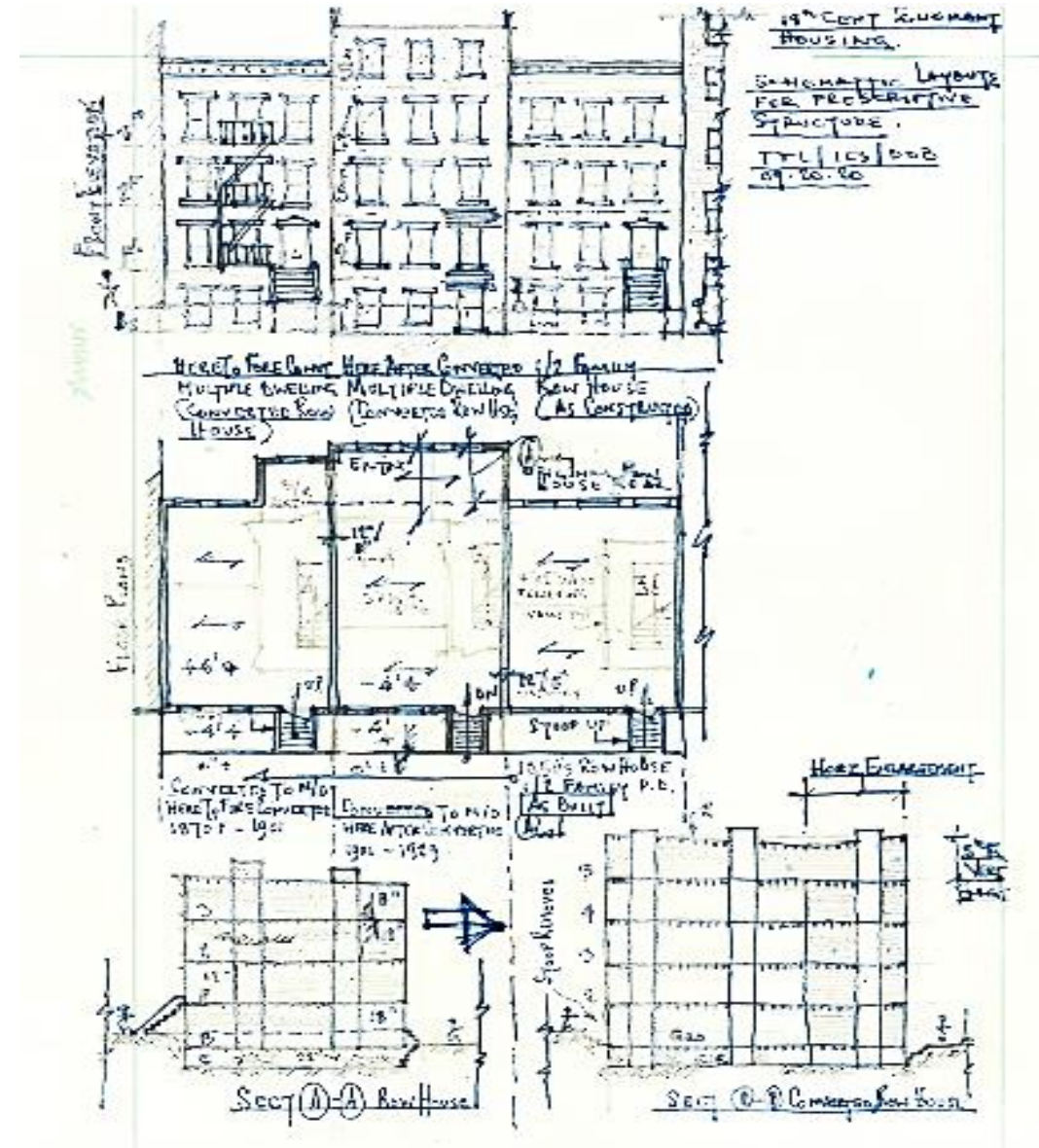
- Wall thickness mostly 12"
- Fire Escapes – MDL/BSA
- Relieving Walls around stairs-critical
- Partitions : +/- 4"x5"
- Always wood headers and trimmers around stairs and chimneys
- Floor joists +/- 3"x 10" @ 18" o/c
- Walls "Plumb, Straight and True"



19TH CENTURY PRESCRIPTIVE CODE PRE 1901 ROW HOUSE

Converted Dwelling Vertical & Horizontal Enlargement

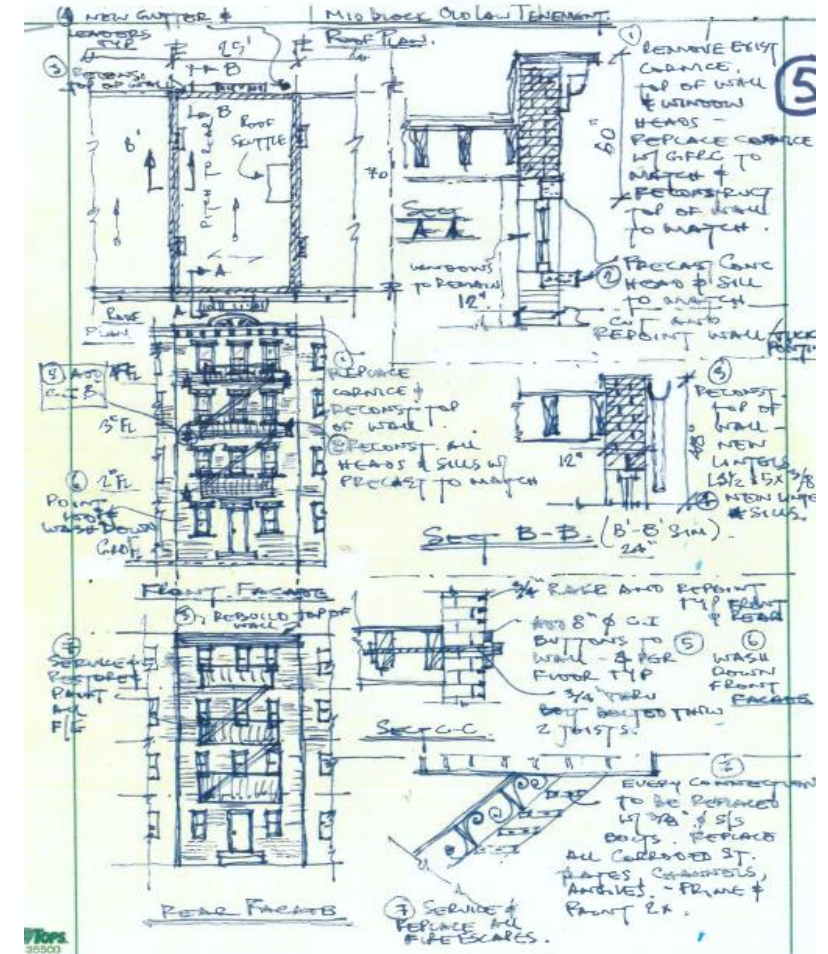
- Wall thickness mostly 12"
- Fire Escapes - MDL/BSA at rear
- Relieving Walls around stairs- critical
- Partitions : +/- 4"x5"
- Always wood headers and trimmers around stairs and chimneys
- Floor joists +/- 3"x 10" @ 18" o/c
- Walls Plumb, Straight and True



RECAP: TRIAGING HOUSING STOCK

What buildings are at risk? Where are the buildings located?

- Pre 1901 private Old Law Tenement – 28K
+/- 4 story buildings. Masonry or wood. Stores on ground
Downtown Brooklyn and Manhattan
- Pre 1901 private Converted Dwellings – 20K
+/- 3 story buildings. Masonry or wood. Stores on ground
Downtown Brooklyn and Manhattan
- Pre 1929 private New Law Tenements – 40K
+/- 5 story buildings. Masonry.
Downtown Brooklyn, Manhattan, Bronx, some Queens
- 1 and 2 private Family Dwellings – N/A's +/- 100K
+/- 3 story buildings. Masonry or wood. Stores on ground
Brooklyn, Manhattan, Bronx, some Queens



EXISTING BUILDINGS: MAINTENANCE

Common Problems with 150 Year Old Aging Buildings

1. Old and New Law Tenements, Converted Dwellings, 1 & 2 family Dwellings
Bits falling off as a public safety problem: local problem
Like with like Prescriptive Repairs - *EFFECTIVE*
Parapets, cornices, brownstone, terracotta, brick
2. Old and New Law Tenements, Converted Dwellings, 1 & 2 family dwellings
Failing/rotten floors under bathrooms and kitchens: local problem
Like with like Prescriptive Repairs - *EFFECTIVE*
Sister wood floor joists. Replace joists
3. Old and New Law Tenements, Converted Dwellings, 1 & 2 family dwellings
Buckled exterior bearing wall - **SERIOUS STABILITY ISSUE**
IMMEDIATE Shoring and **RECONSTRUCTION** in kind
Long Term Vacates, Complex Issues, Disruptive

EXISTING BUILDINGS: MAINTENANCE

Common Problems with 150 Year Old Aging Buildings

1. Like with like
Prescriptive
Repairs –
EFFECTIVE
2. Parapets, cornices,
brownstone,
terracotta, brick
3. Bits falling off as a
public safety
problem: local
problem



EXISTING BUILDINGS: MAINTENANCE

Common Problems with 150 Year Old Aging Buildings

- Failing and partially collapsed floors, roofs, chimneys



EXISTING BUILDINGS: MAINTENANCE

Common Problems with 150 Year Old Aging Buildings

Buckled Walls/Tilting Buildings

- Immediate shoring required – inside/outside
- Resulting in vacates
Department enforcement actions, and Stop Work Orders



EXISTING BUILDINGS: MAINTENANCE

Buckled Walls

- Shore the building
- Reframe the floors
- Rebuild the walls



BEFORE & AFTER RECONSTRUCTION 12 MONTHS



OPEN DATA REFERENCES

- Consequences of Structurally UNSAFE: 1. Unstable 2. Collapse
<https://www1.nyc.gov/site/buildings/about/about.page>
<https://www1.nyc.gov/site/buildings/codes/nyc-code.page>
- Families of Buildings: R,C,P,O (+/- 860K Occupiable, 150 Un-occupiable)
<https://data.cityofnewyork.us/Housing-Development/Multiple-Dwelling-Registrations/tesw-yqqr>
<https://data.cityofnewyork.us/Housing-Development/Buildings-Subject-to-HPD-Jurisdiction/kj4p-ruqc>
<https://data.cityofnewyork.us/City-Government/NYC-Zoning-Tax-Lot-Database/fdkv-4t4z>
<https://www1.nyc.gov/site/dcas/about/who-we-are.page>
- Residential Tenement Housing Complaint Distribution per HPD Rental Dwellings +/- 300K
<https://data.cityofnewyork.us/Housing-Development/Multiple-Dwelling-Registrations/tesw-yqqr>
<https://data.cityofnewyork.us/Housing-Development/Buildings-Subject-to-HPD-Jurisdiction/kj4p-ruqc>
- By the Numbers: Predicting Structural Decay of Existing Buildings
<https://data.cityofnewyork.us/Housing-Development/DOB-Complaints-Received/eabe-havv>
https://www1.nyc.gov/assets/buildings/pdf/complaint_category.pdf
- Residential Tenement Housing Complaint Distribution per HPD Rental Dwellings +/- 300K
<https://data.cityofnewyork.us/Housing-Development/Multiple-Dwelling-Registrations/tesw-yqqr>
<https://data.cityofnewyork.us/Housing-Development/Buildings-Subject-to-HPD-Jurisdiction/kj4p-ruqc>



THANK YOU