NYC Buildings

CRANES, HOISTS & ELEVATORS
DIGITAL COMPLIANCE

presented by

Charanjeet Singh, P.E.
Executive Engineer, Elevators

Ashraf Omran, P.E.
Executive Director, Cranes & Derricks

2010
BUILD SAFE / LIVE SAFE
CONFERENCE

Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

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

COPYRIGHT MATERIALS

The information in this document is only a summary and overview and is not intended to substitute for the full text and meaning of any law, rule or regulation. The City disclaims any liability for errors that may be contained in this document and shall not be responsible for any damages, consequential or actual, arising out of or in connection with the use of this document and/or the information contained herein. The City reserves the right to take action at variance with this document. This document shall not be construed to create a substantive or procedural right or benefit enforceable by any person. The information contained in this document is current only as of the publication date of this document.

COURSE DESCRIPTION

- During this course participants will learn about various types of Cranes, how they are designed, set up, inspected and utilized on the job site. Additionally, attendees will learn safety requirements for installing, using, operating and removing Cranes to avoid potential safety hazards. Furthermore, Attendees will learn about accessibility requirements for elevators.

LEARNING OBJECTIVES

At the end of the this course, participants will be able to:

1. Participants will be familiarized with the different types of Cranes and will be able to describe their distinctive functions.
2. Participants will examine the requirements for Cranes and apply these provisions to design installations and inspections.
3. Participants will review examples of Cranes safety hazards to identify potential safety issues, strategies for prevention and will review rules for Cranes in order to mitigate risk.
4. Participants will review and be able to describe accessibility requirements for elevators.

AGENDA

- **Elevators**
  - Unit Mission
  - Reference Codes
  - Code Committees
  - Types of Devices
  - Existing Business
    - Fire Service Access Elevator
    - Occupant Evacuation Elevator
  - New Business
    - Energy Code Requirements
    - Door Monitoring Systems
    - Single Plunger Brakes
    - Code Variations

- **Cranes & Derricks**
  - Codes & Regulations
  - Safety Hazards
  - Risk Mitigation
  - On-Site Inspection/CN
  - Assembly/Disassembly Plan & Director
  - Lift Director Rules
  - Articulating Booms
  - Log Requirements
  - Frequent Inspection
  - Anemometers

ELEVATORS

ELEVATOR UNIT
MISSION

The Elevator Division's mission is to provide the public prompt, accurate and transparent information on all elevator administrative processes and procedures. Functions include: Elevator Applications and Permits; Data Entry of Inspections & Tests Reports; DOB & PVT Violations and NYCHA Reports; Scheduling & Coordinating Acceptance Tests; Collection of Filing Fees & Civil Penalties; Customer Service; Records Management (Filing & Retrieving); BIS Training for Elevator Administrative Employees; Service Notices; Forums- Elevator Companies & Expeditors

The Elevator Inspection Unit ensures the operational safety, reliable service and lawful use of elevators, escalators, moving walks, personnel hoists, amusement rides and other related vertical transportation devices throughout New York City by performing/witnessing inspections and testing. The compliant development and safety awareness are enhanced through outreach programs. The unit supports development by permitting new technologies under pilot programs.

ELEVATOR REFERENCE CODES

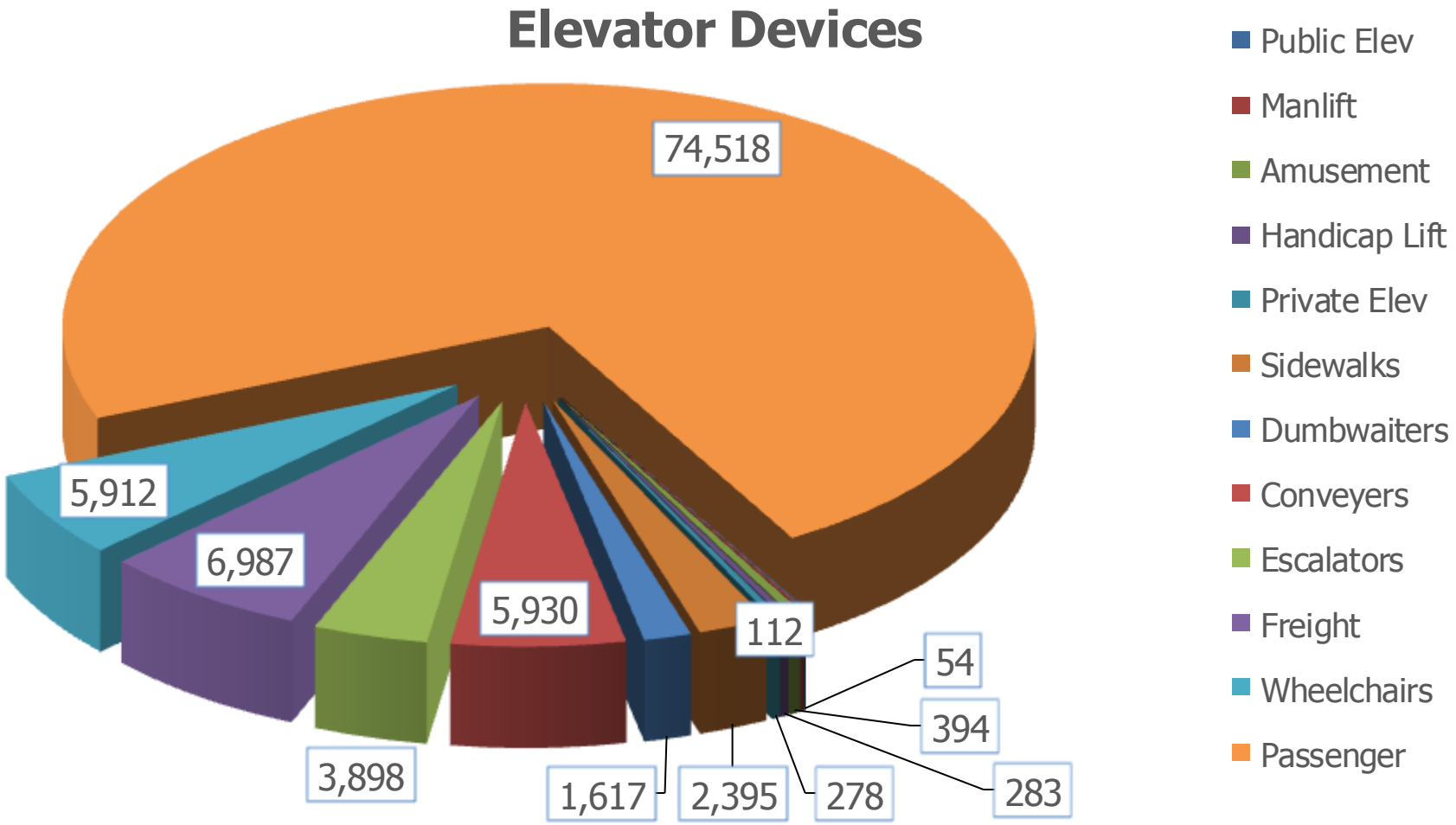
Code	Description
IBC 2009 as modified by NYC Building Code 2014 - Elevators and Conveying Systems Chapter 30	
ICC/ANSI A117.1 – 2009	**Accessible and usable buildings and facilities**
ASME A17.1/2000 with supplements A17.1a – 02 and A17.1b – 03	**Safety code for Elevators and Escalators as modified by NYC Building Code Appendix K; Chapter K1**
ASME A17.1s – 2005	**Supplement to Safety Code for Elevator and Escalator for Machine Room Less (MRL) elevators as modified by Appendix K; Chapter K4**
ASME A17.2 - 2002	**Guide for Inspection of Elevators, Escalators and Moving Walk**
ASME A17.3 - 2002	**Safety Code For Existing Elevators and Escalators as modified by Appendix K; Chapter K3**
ASME A17.5 – 2004	**Elevator and escalator electrical equipment**
ASME A17.6 – 2010	**Standard for Elevator Suspension, Compensation, and Governor Systems as modified by Appendix K; Chapter K4**
ANSI A10.4 - 1981	**Personnel Hoists and Employee Elevators on Construction and Demolition Sites**
ANSI A10.4 - 2007*	***Device Operator requirements only**
ASME A18.1 – 2005	**Safety Standard for Platform Lifts and Stairway Chairlifts**
B20.1—2006	**Safety Standard for Conveyors and Related Equipment**

CODE COMMITTEES

AFFILIATION/REPRESENTATION
NEII - National Elevator Industry, Inc.
NYCHA – New York City Housing Authority
REBNY - Real Estate Board of New York
ECNY – Elevator Conference of NY
Port Authority of NY & NJ
EMANY – Elevator Manufacturers Association of NY
FDNY - New York City Fire Department
ASME - Code Committee Member
BOMA – Buildings Owners and Managers Association of NY
Local Union – 1, 3
NYC - DOB – New York City Department of Buildings
NAEC - National Association of Elevator Contractors
DCAS - Department of Citywide Administrative Services

- NYC Elevator Code Committee consist of elevator stakeholder groups, organizations, associations and government agencies.
- Committee reviews each section of the Code and standards and makes decisions to enhance the safe and reliable service for our riders.
- Committee uses consensus-based process.

TYPES OF DEVICES



EXISTING BUSINESS

- Fire Service Access Elevator
- Occupant Evacuation Elevator

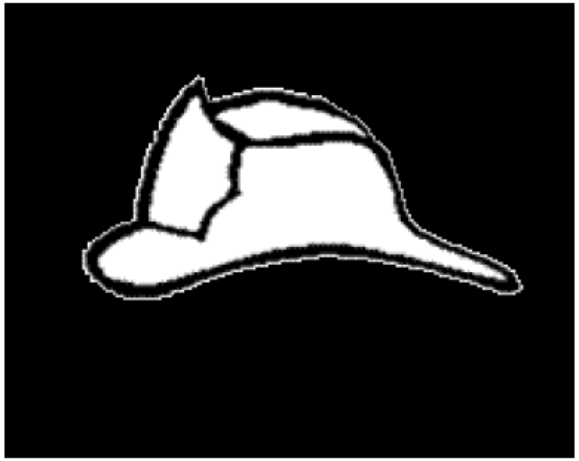
FIRE SERVICE
ACCESS ELEVATORS

- In buildings with an occupied floor more than 120 feet above the lowest level of Fire Department vehicle access, a minimum of one fire service access elevator shall be required, which shall serve every floor of the building.
- Fire service access elevators have to comply with **BC 403.6.1** and **BC 3007**.

FIRE SERVICE
ACCESS ELEVATORS

Comply with sections 3007:

- Serve every floor
- Automatic sprinkler systems
- Water protection
- Fire rating of shaft
- Hoistway lighting
- Lobby requirements (120 square feet)
- Signage
- Power requirements



ELEVATORS
OCCUPANT EVACUATION

- In buildings higher than 420 feet, designated elevators permitted to be used in case of fire.
- These special occupant self-evacuation elevators must comply with **BC 403.5.2 and BC 3008**

ELEVATORS
OCCUPANT EVACUATION

Section 3008.1 – 3008.11			
Additional exit stairways: not required	Approved fire-safety and emergency-action plans	Emergency voice/ alarm communication system	Structural integrity of the hoistway
Operation	Sprinklers	Water Protection	Lobby requirements
Vision Panel	Signage	Two-way Communication	Power Requirements
Notification Appliance	Hazardous material areas		

ELEVATORS
OCCUPANT EVACUATION

After input from committees and FDNY, the following rules were developed and approved:

- **Rules for OEE operation (ASME A17/2013)**
  1 RCNY 3610-03 - Modifies Emergency Operation and Signaling Devices for Occupant Evacuation Elevators

- **Rules for Fire Alarm interface requirements for OEEs**
  1 RCNY 3616-04 - Modifies Appendix Q of the NYC Building Code (NFPA 72/2013)

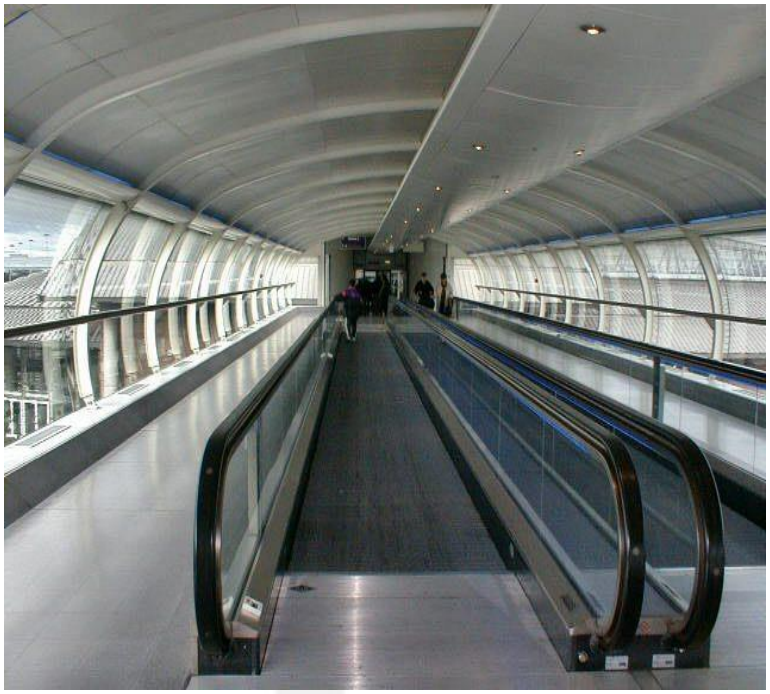
NEW BUSINESS

- Energy Code Requirements
- Door Monitoring Systems
- Single Plunger Brakes
- Code Variations
- DOB NOW

ENERGY CODE REQUIREMENTS

- Applications filed on or after October 3, 2016 will be subject to the 2016 NYCECC.
- Complete applications filed on or before October 2, 2016 will be subject to the 2014 NYCECC.
- NYCECC – New York City Energy Conservation Code.

ENERGY CODE REQUIREMENTS



- Escalators and moving walkways:
  - Must have automatic controls configured to reduce speed when not conveying passengers

ENERGY CODE REQUIREMENTS

- Escalators
  - An escalator designed either for one way down operation only or for reversible operation shall have variable frequency regenerative drive feeding back to the building electrical system when the escalator is loaded with passengers whose combined weight exceeds 750 lbs.

DOOR MONITORING SYSTEM

- **K3 - 3.10.12**: Means shall be provided on all automatic passenger and freight elevators to monitor the position of power operated car doors while the car is in the landing zone to prevent the operation of the car if the door is not closed except under certain conditions.
- Compliance deadline: **January 1, 2020**
- A permit from the department is required to do this work

DOOR MONITORING SYSTEM

- The following rules have been modified for conformance with Door Monitoring System requirements
  - RCNY 101-02
  - RCNY 101-07

Allows elevator directors to pull permits and self-certify door monitoring work with presence of third party witnessing agency

SINGLE-PLUNGER BRAKES

K3 - 3.8.4.1: All existing traction elevators with single plunger brakes must comply with either of the following:

- Alteration of single plunger assemblies to dual-plunger type

or

- Compliance with Unintended Car Movement Protection as specified by Section 2.19.2 of ASME A17.1

Compliance deadline: ***January 1, 2027***

CCD1
FEES

Required Construction Code Determinations fees

NYC Buildings

JANUARY 2018

SERVICE UPDATE

Review Fees for Construction Codes Determinations and Zoning Resolution Determinations

Effective January 28, 2018, Construction Codes Determination (CCD1) requests and Zoning Resolution Determination (ZRD1) requests submitted to the Department for review are subject to the following fees per §28-112.2 of the NYC Administrative Code, and the Rules of the Department 1RCNY 101-03.

FEES

- CCD1 or ZRD1 request for Determination..... **$1,000**
  - Pre-Determination (pre-filed job) Request
  - Request for variation of a Code requirement or MDL section 277.16
  - Appeal of an affirmation of an objection after a second plan examination review
- Appeal of CCD1 or ZRD1 Determination..... **$2,500**

A request for review of plan examination objections **must** go through a second plan examination review (requires an AI-1 form) first, which is included in the filing fee and is not subject to additional review fees. All submissions **must** include a copy of the invoice from the Borough Office where the fee was paid, except properties that are exempt from fees per §28-112.1 and this rule.

CONSTRUCTION CODES DETERMINATION FORM (CCD1)

This form will be used to request a determination for all non-zoning related issues for a filed job or a pre-filed job from the Department, including requests for variation of applicable Code or Multiple Dwelling Law provision and for appeals of such determinations. CCD1 Form - Rev. 1/18

ZONING RESOLUTION DETERMINATION FORM (ZRD1)

This form will be used to request a zoning determination for a filed job or a pre-filed job from the Department and for appeals of such zoning determinations. ZRD1 Form – Rev.1/18

SUBMISSIONS

Only one determination or appeal request may be submitted on each form

CCD1
ELEVATOR

NYC Buildings

JULY 2017

SERVICE UPDATE

Elevator Construction Code Determinations

Effective August 1 2017, Elevator Determinations will follow the same process as regular borough determinations. As such, the Department has updated the CCD1 form and created a dedicated email address for elevator Construction Code determinations and variances.

Applicants **must** send all elevator Code determination and variation requests using the revised CCD1 form to elevdeterminations@buildings.nyc.gov.

The revised CCD1 form and instructions can be accessed at:

- Form - http://www1.nyc.gov/assets/buildings/pdf/ccd1.pdf
- Instructions - http://www1.nyc.gov/assets/buildings/pdf/zrd1ccd1_instr.pdf

PERSONNEL HOISTS CAPACITY

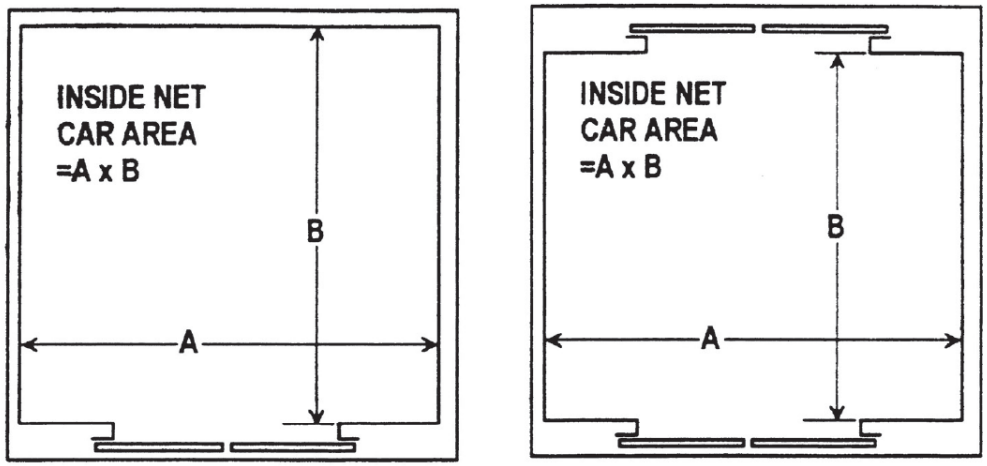


Figure 21.1 - Inside Net Platform Areas for Personnel Hoist Cars

RATED LOAD (pounds)	INSIDE NET PLATFORM AREA (square feet)
2,000	24.2
2,500	29.1
3,000	33.7
3,500	38.0
4,000	42.2
4,500	46.2
5,000	50.0
6,000	57.7
7,000	65.3
8,000	72.9
9,000	80.5
10,000	88.0

PERSONNEL HOISTS CAPACITY

- Extensions **must** be in accordance with the manufacturer's specification
- Designed and approved by a NYS Registered Professional Engineer
- Conform with provisions of ANSI A10.4-2016 code

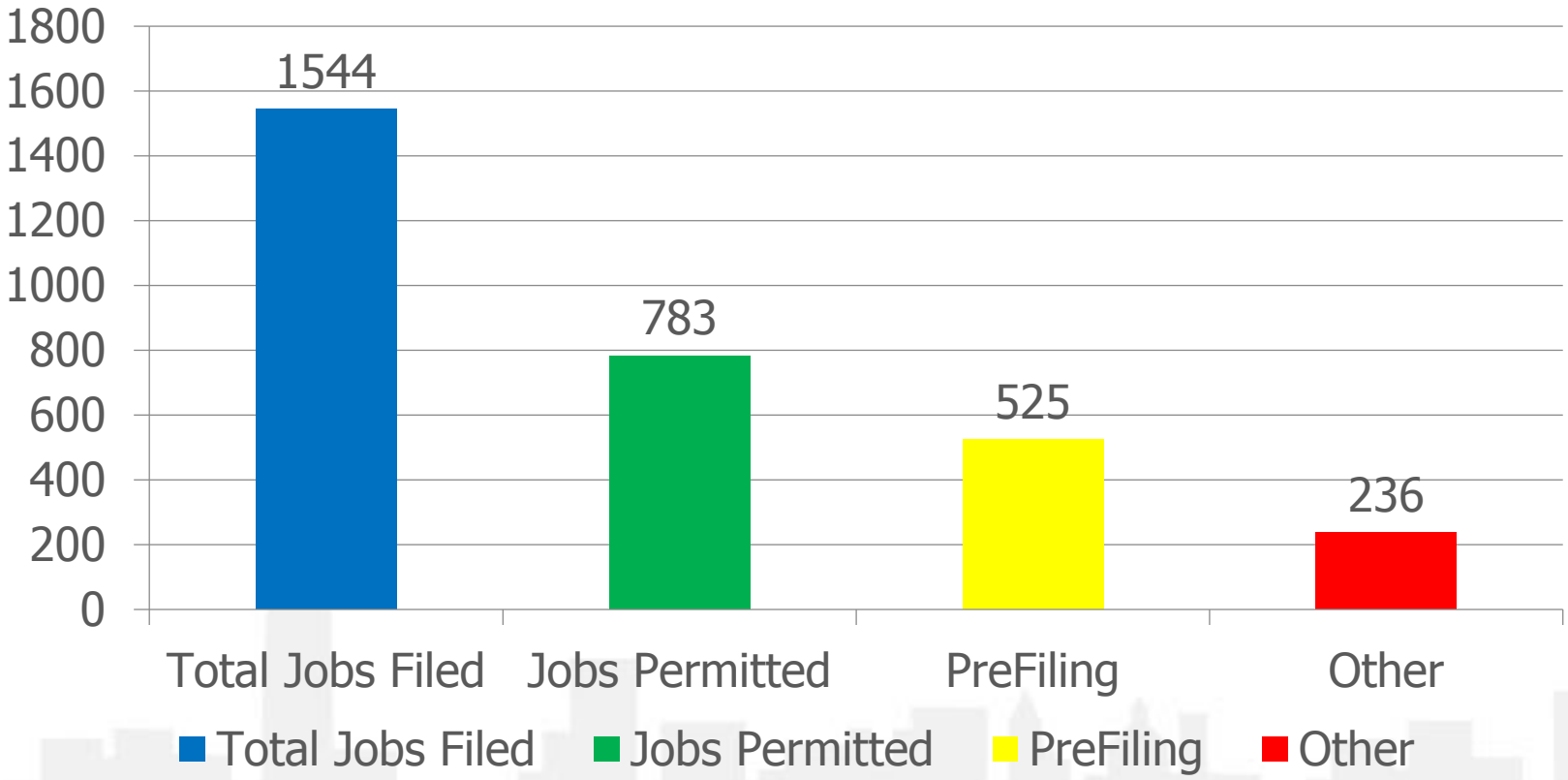
PERSONNEL HOISTS CAPACITY

- Overload detection device to prevent overloading of the cars.
- Rated load ratio to inside net platform area shall not be less than 82 psf
- Safeties must be capable of supporting the DL + LL + OL, where:
  - **DL** = dead load of the car
  - **LL** = live load of the car
  - **OL** margin weight allowed by overload detection device
- No passengers except operator and handlers allowed when hoisting material
- Material properly secured
- Platform size limited by clear visible markings/sensors
- Proper capacity signage

PASSENGER ELEVATORS
in PRIVATE RESIDENCES

- Must fully comply with either part 2 or part 3 of ASME A17.1.
- Must comply with the ANSI A117.1 for platform size requirements of a passenger elevator.
- Must comply with emergency operation and signaling devices: provide Firefighter's Emergency Operation Phase 1 and Phase 2.

DOB NOW
TOTAL ELEVATOR FILINGS



PAPER APPLICATION FILINGS

- Personnel hoist
- Accessibility Lifts
- Amusement Rides
- Removal/Dismantle
- PAA's for existing paper applications

ASBESTOS REQUIREMENTS

- For elevator work involving penetration of building materials, a Certified Asbestos Investigator (CAI) is required to submit a NYC Department of Environmental Protection (DEP) ACP5 Form prior to the issuance of an elevator permit.

ASBESTOS REQUIREMENTS
ACP5 FORM

The ACP5 Form **must** certify one of the following:

- Where work disturbs any building materials, no asbestos containing materials (ACM) are present.
- Subject work area does not require an ***asbestos project***, but some minimal ACM was present and abated.
- An asbestos abatement project was performed and completed, ensuring that all ACM was removed.
- In **DOB NOW: *Build***, the permit applicant will be asked to provide the DEP ACP5 control # in the **asbestos abatement compliance** section.

ASBESTOS REQUIREMENTS
EXEMPTIONS

- An elevator director/co-director or a registered design professional may file for an exemption in DOB NOW for elevator work with no penetration of building material(s).
- Under the **Asbestos Abatement Compliance** section of the filing, the applicant will select that the scope of work is exempt from the asbestos requirement
- An elevator director/co-director or a registered design professional may file for an exemption in DOB NOW for elevator work with no penetration of building material(s). Under the asbestos abatement compliance section of the filing, the applicant will select that the scope of work is exempt from the asbestos requirement

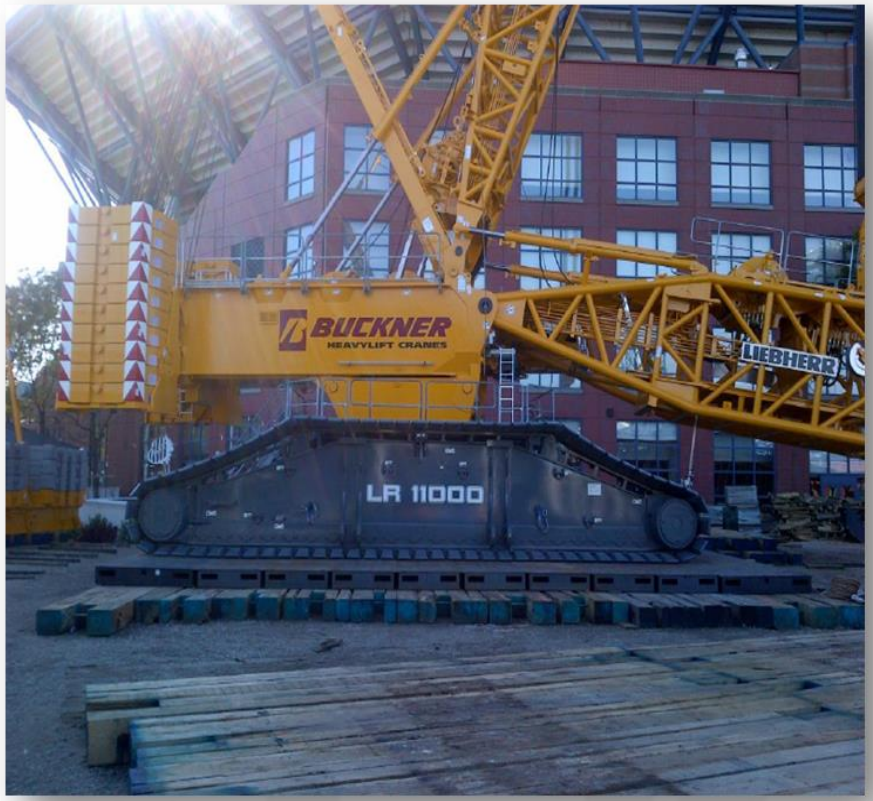
CRANES
CODES & REGULATIONS

TYPES OF CRANES
TOWER CRANES

Luffing Jib

Hammer Head

TYPES OF CRANES
MOBILE CRANES



Crawler Crane

Hydraulic Crane

DERRICK & PILE DRIVER

Derrick

Pile Driver

CRANES
SAFETY HAZARDS

NYC Buildings
2018 BUILD SAFE / LIVE SAFE CONFERENCE

TORN ROPE & SLING

IMPROPER SETUP

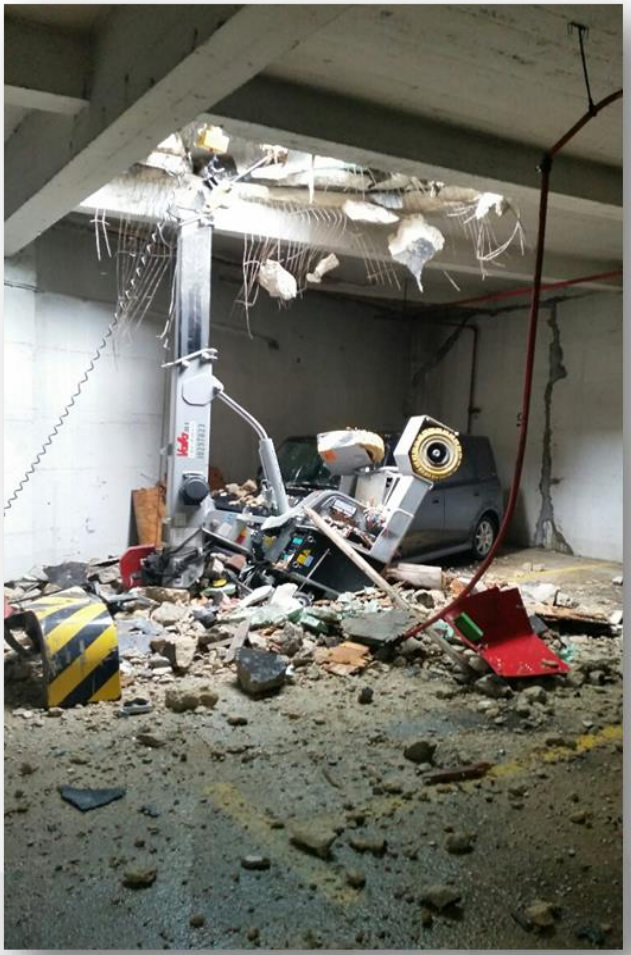
IMPROPER SETUP

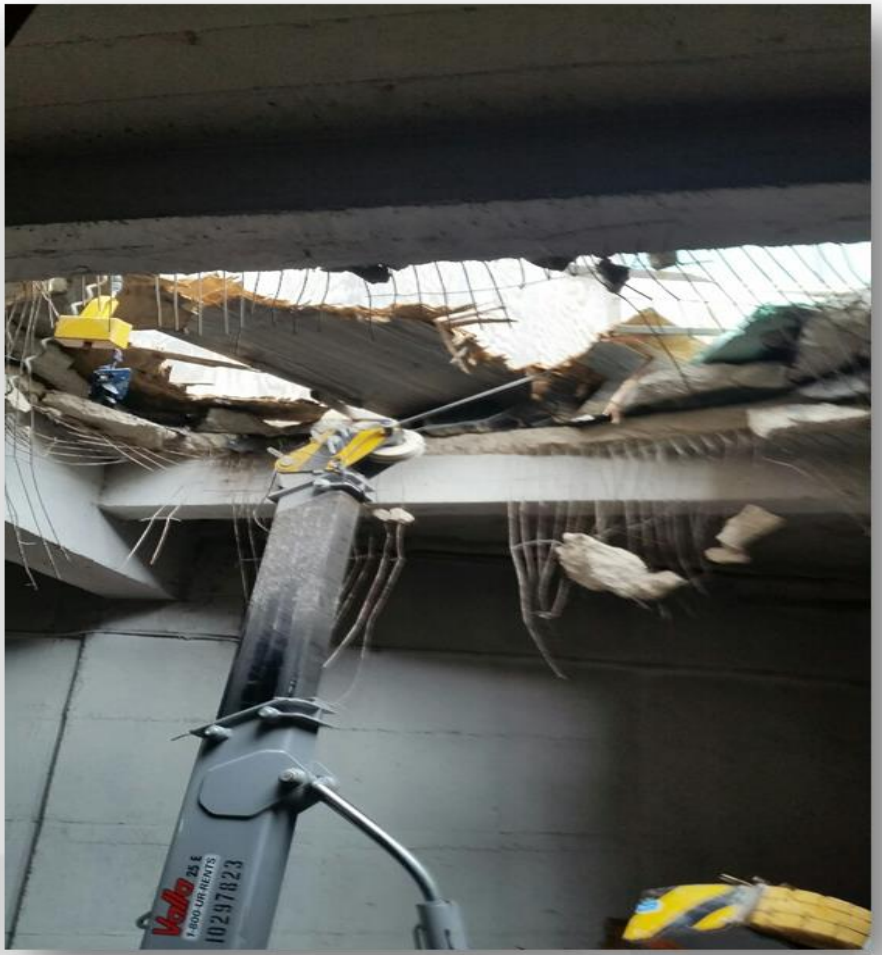
LOOSE BOLT

BENT BOOM LACING

INSUFFICIENT CLEARANCE

IMPROPER TIEBACK





ILLEGAL OPERATION

ILLEGAL OPERATION

INCOMPETENT OPERATOR

CRANES
RISK MITIGATION

CRANES
CODE & RULES

Chapter 3319: Ongoing

1RCNY 3319-01

- Phase 1: Prototype – went into effect on January 1, 2016
- Phase 2: Onsite Inspection – will be in effect 5/24/2017
- Phase 3 & 4: CD Inspection & Crane Operations – anticipated 2019

1RCNY 3319-02: Lift Director Rule

- Went into effect on 5/24/2017 for tower cranes and derricks
- Went into effect for all other mobile cranes approved on/after 7/1/2017

CRANES
ON-SITE INSPECTION/CN

CERTIFICATE OF ON-SITE INSPECTION

New Rules 3319-01 *(went into effect 5/24/2017)*

Application for Certificate of On-Site Inspection

1. Cranes and Derricks Notice Plan
2. Assembly/Disassembly Plan
3. Pre-operational Test Procedures
4. Load Imposed
5. Wind Action Plan
6. Certifications
7. Calculations

CRANE NOTICE APPLICATION

Cranes and derricks notice plan (filed by a licensed NYS Professional Engineer) with the following information:

- Ground and Subsurface Elements
- Site Condition
- Location and Configuration
- Foundation, Tie-ins, and Supporting Elements
- Bolted Connections
- Welded Connections
- Anchors
- Structural Steel
- Counterweights
- Aviation Hazards
- Electrical Information
- Special Inspection
- Range of Tolerance

LOAD IMPOSED

Where the crane or derrick imparts a load on a building or structure, the application **must** be accompanied by either:

A. Sealed and stamped **reviewed for load** imposed by EOR of the project.

B. Signed and sealed letter from the EOR attesting to the adequacy of the building structure to support loads imposed.

C. For a project for which there is no EOR, a signed and sealed letter from the crane EOR attesting to the adequacy of the building structure to support imposed loads.

WIND ACTION PLAN

The application **must** be accompanied by a wind action plan:

A. Content

1. Load reductions, if any, due to wind.
2. The maximum in-service wind threshold.
3. Wind thresholds, configurations, and procedures, including angles and sequencing, for parking and securing the crane in each applicable out-of-service position (e.g. retracted, parked, jackknifed, laid down, and/or other special protective measures for wind)
4. The communication protocol for safeguarding the crane in the event of changes in weather forecasts over weekends or longer stoppage periods.

WIND ACTION PLAN

(continued)

B. Self-contained document

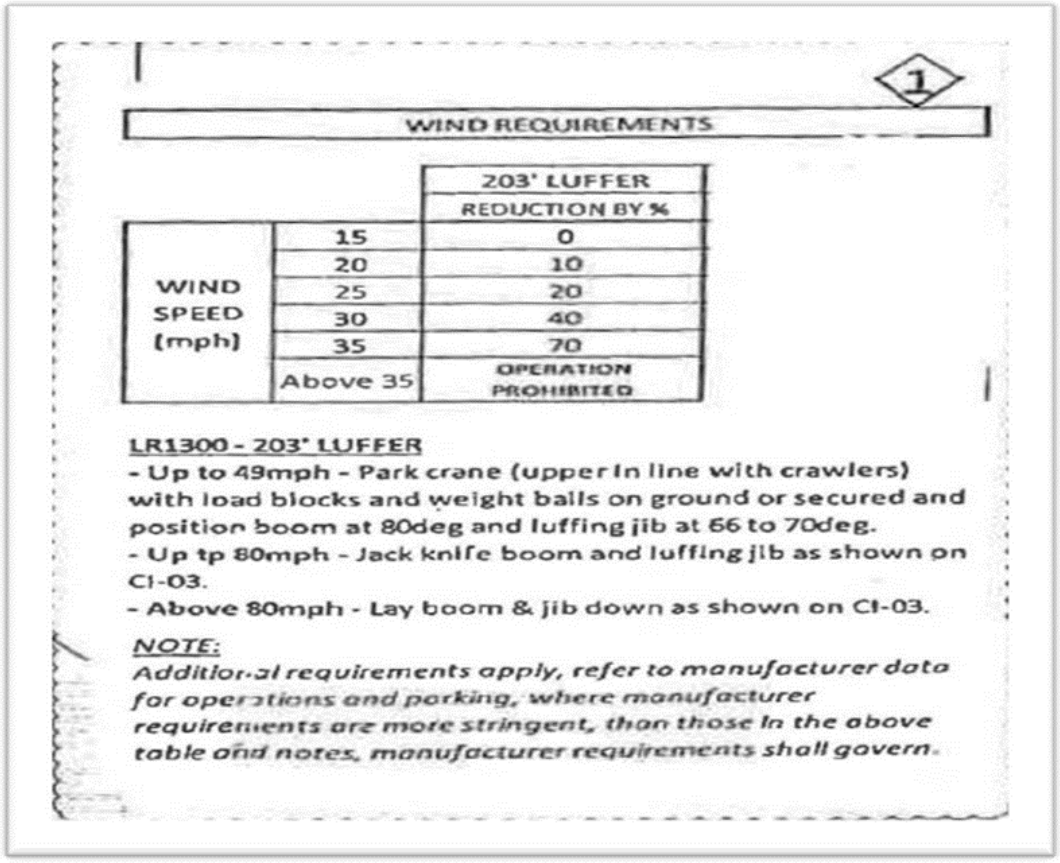
C. Maximum in-service threshold (30 mph or per manufacturer whichever more stringent)

D. Specific to configuration

E. Able to be implemented based upon site conditions

F. Emergency action plan

WIND ACTION PLAN
IN-SERVICE/DURING OPERATION
OUT OF SERVICE



1

WIND REQUIREMENTS

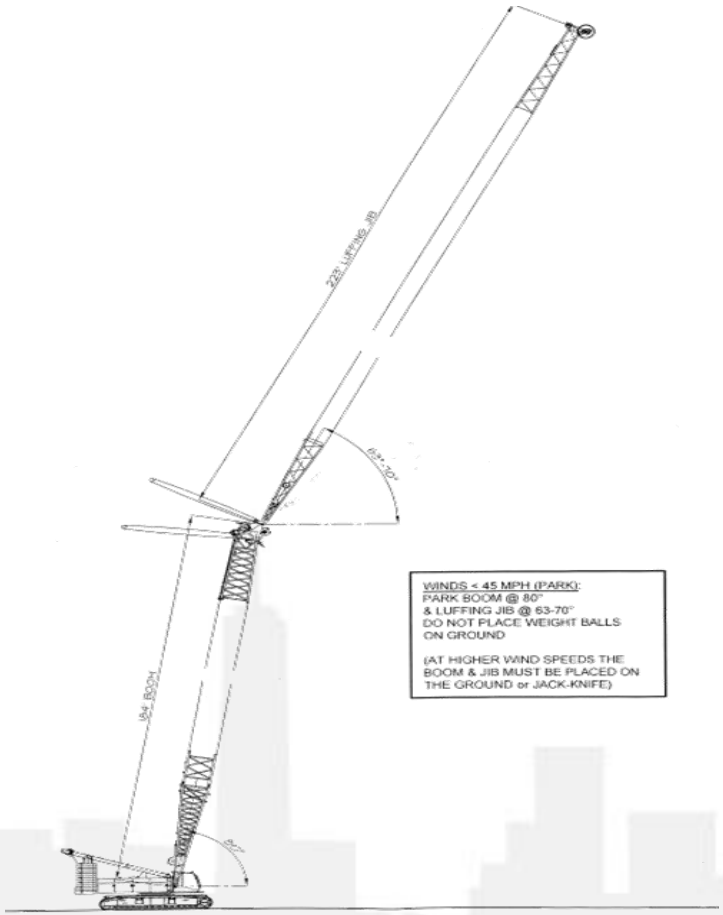
		203' LUFFER REDUCTION BY %
WIND SPEED (mph)	15	0
	20	10
	25	20
	30	40
	35	70
	Above 35	OPERATION PROHIBITED

LR1300 - 203' LUFFER

- Up to 49mph - Park crane (upper in line with crawlers) with load blocks and weight balls on ground or secured and position boom at 80deg and luffing jib at 66 to 70deg.
- Up tp 80mph - Jack knife boom and luffing jib as shown on C1-03.
- Above 80mph - Lay boom & jib down as shown on C1-03.

NOTE:
Additional requirements apply, refer to manufacturer data for operations and parking, where manufacturer requirements are more stringent, than those in the above table and notes, manufacturer requirements shall govern.

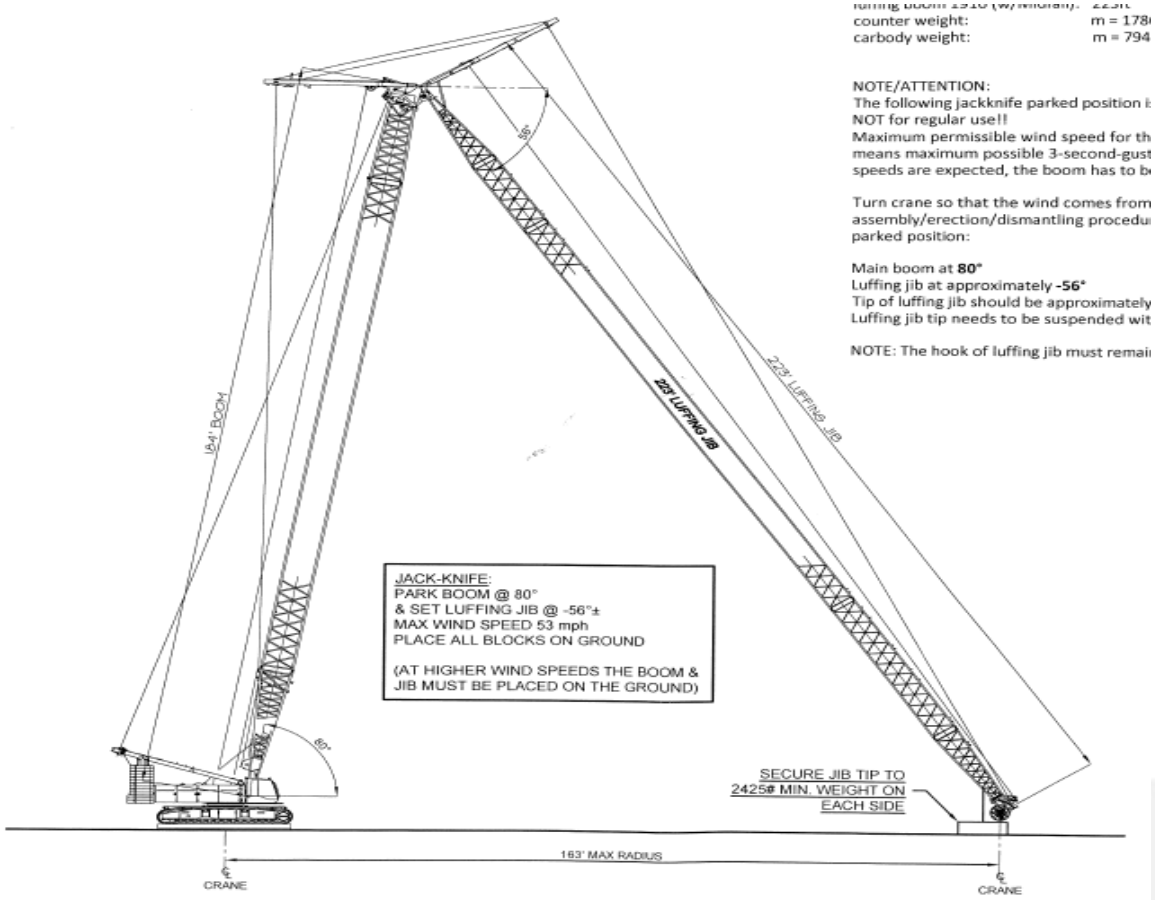
CRAWLER CRANE
OUT OF SERVICE PARKED POSITION



WINDS < 45 MPH (PARK):
PARK BOOM @ 80°
& LUFFING JIB @ 63-70°
DO NOT PLACE WEIGHT BALLS
ON GROUND

(AT HIGHER WIND SPEEDS THE
BOOM & JIB MUST BE PLACED ON
THE GROUND or JACK-KNIFE)

CRAWLER CRANE
OUT OF SERVICE JACKKNIFING



CRAWLER CRANE
OUT OF SERVICE JACKKNIFING

LIEBHERR LR1200 JACK-KNIFE POSITION
Crane: LR 1200 - SN# 135.023

Crane Configuration:

main boom 2320:	184ft
luffing boom 1916 (w/Midfall):	223ft
counter weight:	m = 178600lbs = 81t
carbody weight:	m = 79400lbs =36t

NOTE/ATTENTION:
The following jackknife parked position is only allowed exceptionally for this configuration and NOT for regular use!!
Maximum permissible wind speed for the jackknife parked position = **53 miles/hour,** which means maximum possible 3-second-gust-wind speed at maximum elevated height. If higher wind speeds are expected, the boom has to be laid flat on the ground.

Turn crane so that the wind comes from behind, if it is possible; then follow the manual's assembly/erection/dismantling procedures to place the crane in the following final jackknife parked position:

Main boom at **80°**
Luffing jib at approximately **-56°**
Tip of luffing jib should be approximately 1m (3.5ft) above ground
Luffing jib tip needs to be suspended with an allowed force of 2.0t (2425 lbs) to each side

NOTE: The hook of luffing jib must remain on the ground for final jackknife parked position.

JACK-KNIFE:
PARK BOOM @ 80°
& SET LUFFING JIB @ -56°±
MAX WIND SPEED 53 mph
PLACE ALL BLOCKS ON GROUND

(AT HIGHER WIND SPEEDS THE BOOM & JIB MUST BE PLACED ON THE GROUND)

CRAWLER CRANE
SEQUENCE OF LAYING DOWN

Laying the 1916 fly jib head down on the ground

- Lower the jib until the wheels on the 1916 fly jib head reach the ground (Figure 344) or the lowering movement of the fly jib adjusting winch is stopped by the "Fly jib lower limit switch".

The touch-down point of the 1916 fly jib head depends on the boom combination:

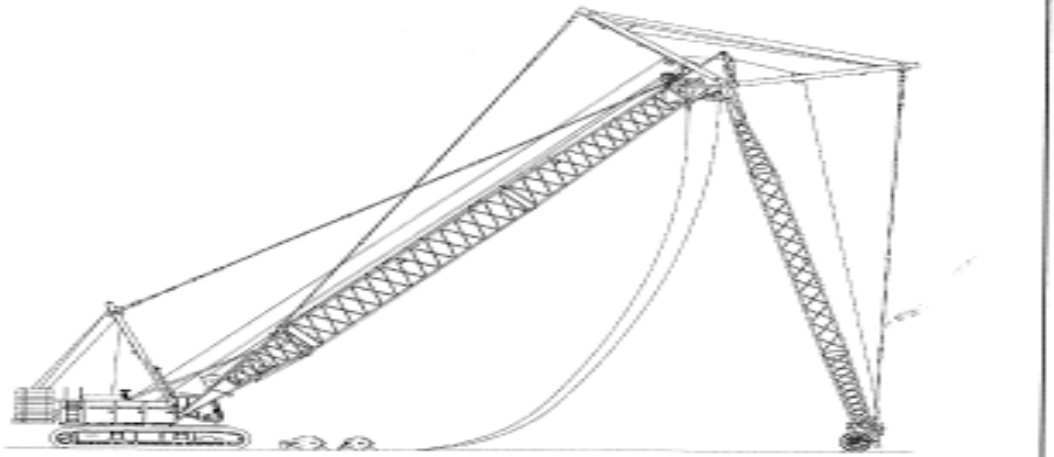
In the case of long fly jibs , the 1916 fly jib head will already be on the ground before the limit switch trips.

With short fly jibs, after the limit switch trips, the boom must be slowly lowered using the main boom adjusting winch until the 1916 fly jib head touches the ground.

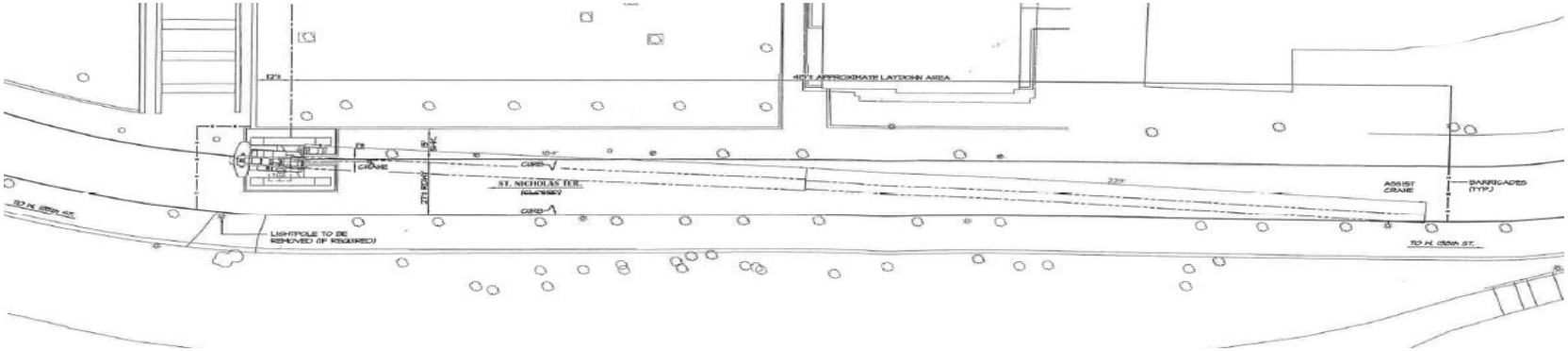
IMPORTANT!

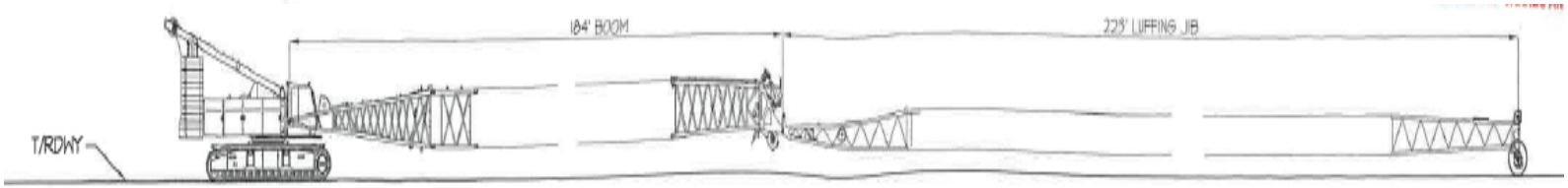
In the case of a tip boom*, employ an assistant to ensure that the tip boom* folds forwards towards the 1916 fly jib head after making contact with the ground. Then set the running wheels of the 1916 fly jib head down on the ground.

344



CRAWLER CRANE
OUT OF SERVICE LAYDOWN





BUILDING CODE: TOWER CRANES
SITE-SPECIFIC WIND ANALYSIS

NYC Building Code 1618 (Loads on Temporary Installations)

Installations governed by this code shall be defined as temporary when such installations are intended to be taken apart or removed after a limited period following their installation including but not limited to **CRANES**.

Loads on Temporary Structures:

1. Shall be designed and constructed to resist loads as per NYC BC Chapter 16.
2. All temporary installations reducing the design environmental loads shall include action plan. (Basic wind speed can be reduced by applying a factor of 0.8 with an action plan).
3. Action plan shall be reliably implemented with one day's notice or less.

TOWER CRANES
SITE-SPECIFIC WIND ANALYSIS

1RCNY 3319-01

A. Cover each configuration for which approval is sought.

B. Crane EOR to provide the manufacturer the following:
   1. Project address
   2. Crane make and model
   3. Maximum lifting capacity
   4. Distance of crane from building

Site-Specific Wind Analysis for Tower Cranes

1RCNY 3319-01 *(continued)*

C. Required information from manufacturer:
   - Maximum moment
   - Slewing moment
   - Corresponding vertical loads on foundation

D. Certification from the manufacturer that analysis is based on information provided by the crane EOR

E. Certification from the manufacturer that all components can sustain wind load as specified above

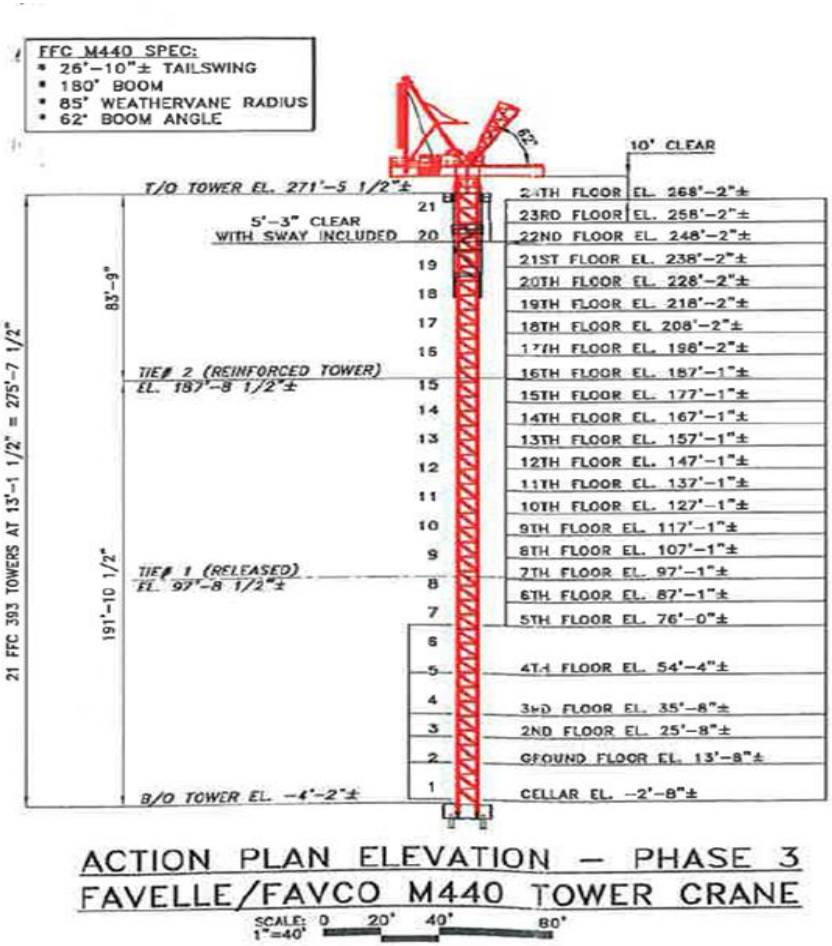
F. Note any special condition in which the crane may not be used or installed

Site-Specific Wind Analysis for Tower Cranes

1RCNY 3319-01 (continued)

5. Proposed tie-in spacing
6. Elevations and sections
7. Action plan in case reduction factor is applied
8. Wind load conditions, exposure category, wind distribution:
   - In-service of at least 45 mph
   - Out-of-service in accordance with NYC BC Chapter 16

TOWER CRANE ACTION PLAN



LOAD TEST
PROTOCOL & APPROVAL

For tower cranes, self-erecting tower cranes, and derricks, the application **must** be accompanied by procedures for the pre-operational test:

1. Tower crane (ASME B30.3 2016)
2. Self-erecting tower crane (ASME B30.29 2012)
3. Derrick (ASME B30.6)

CRANES
ASSEMBLY/DISASSEMBLY PLAN & DIRECTOR

CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS

Requirements

- Assembly/Disassembly Plan
- Assembly/Disassembly Director
- Review of Assembly/Disassembly Plan
- Training of Assembly/Disassembly Director
- Training of Assembly/Disassembly Crew

CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS

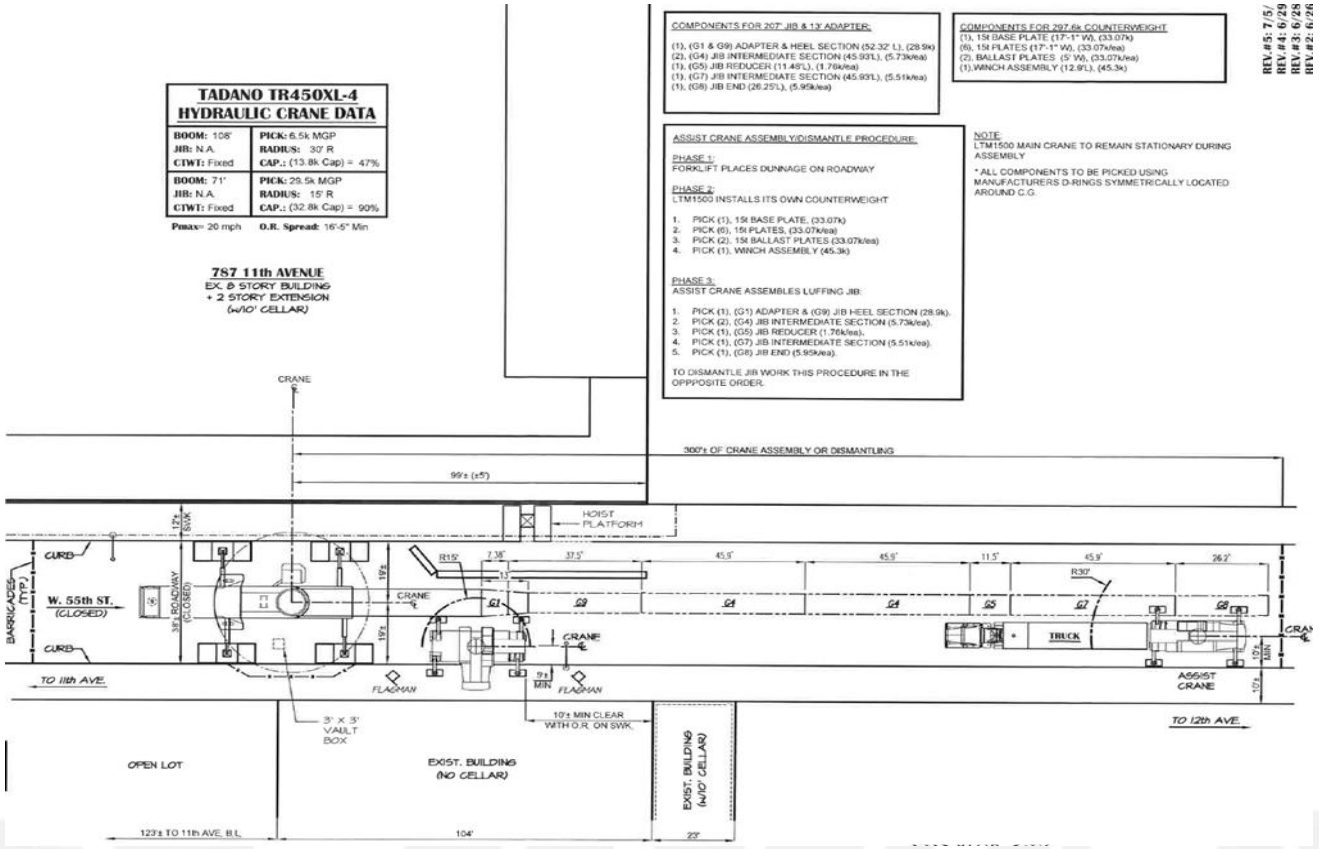
- Recent changes to 1RCNY 3319-01 establish new assembly/disassembly (A/D) requirements for mobile cranes and derricks.
- A/D defined as the installation or removal of structural components or attachments to a crane or derrick, or the installation of any elements that connect or attach a crane or derrick to a building or structure.
- *EXCEPTION:* A/D not applicable to operations exclusive to counterweight installation or removal, or to the unfolding and pinning of a boom or swing-away jib.
- *EXCEPTION:* Self-erecting tower crane with no additional mast sections added.

CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS

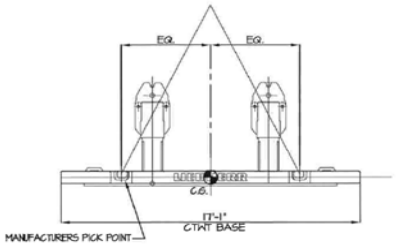
Assembly/Disassembly Plan: For a crane or derrick that requires components to be assembled or disassembled at the site, the application **must** include an A/D plan. The plan **must** include the following required by 1RCNY 3319-01 (g)(2)(ii):

- Content
- Self contained document
- Maximum A/D wind threshold
- Specific to configurations
- Able to be implemented based upon site condition

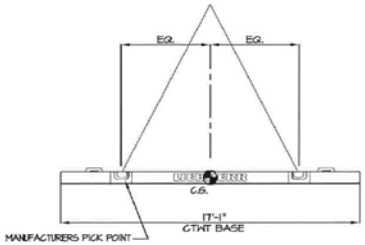
CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS



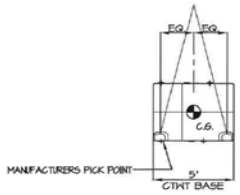
CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS



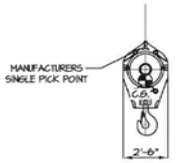
15T (33.07k) COUNTERWEIGHT BASE



15T (33.07k) COUNTERWEIGHT PLATE



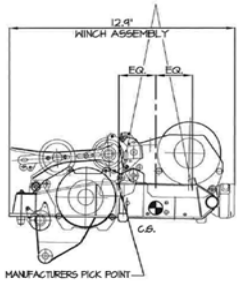
15T (33.07k) COUNTERWEIGHT BALLAST PLATE



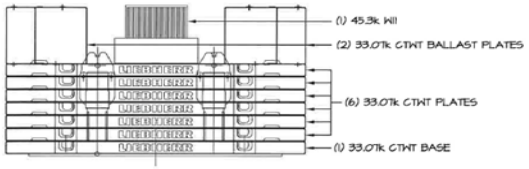
2.7k HOOK BLOCK

COMPONENTS FOR 297.6k COUNTERWEIGHT
(1), 15t BASE PLATE (17'-1" W), (33.07k)
(6), 15t PLATES (17'-1" W), (33.07k/ea)
(2), BALLAST PLATES (5' W), (33.07k/ea)
(1),WINCH ASSEMBLY (12.9'L), (45.3k)

ALL COMPONENTS TO BE SELF ASSEMBLED WITH LTM1500

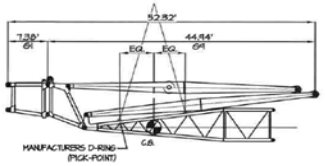


22.5t (45.3k) WINCH ASSEMBLY

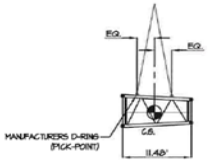


LIEBHERR LTM1500 - 297.6K COUNTERWEIGHT ASSEMBLED

CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS



LUFFING JIB HEEL SECTION
(G1 & G9 COMBINED WT = 28.9k)



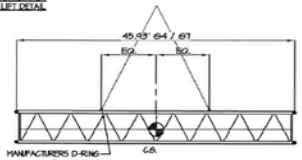
LUFFING JIB REDUCER SECTION
(G5 WT = 1.76k)

COMPONENTS FOR 207' JIB & ADAPTER:

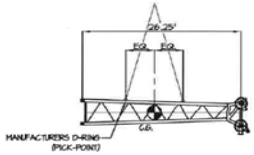
(1), (G1 & G9) ADAPTER & HEEL SECTION (52.32' L), (28.9k)
(2), (G4) JIB INTERMEDIATE SECTION (45.93'L), (5.73k/ea)
(1), (G5) JIB REDUCER (11.48'L), (1.76k/ea)
(1), (G7) JIB INTERMEDIATE SECTION (45.93'L), (5.51k/ea)
(1), (G8) JIB END (26.25'L), (5.95k/ea)

ALL COMPONENTS TO BE HOISTED WITH ASSIST CRANE

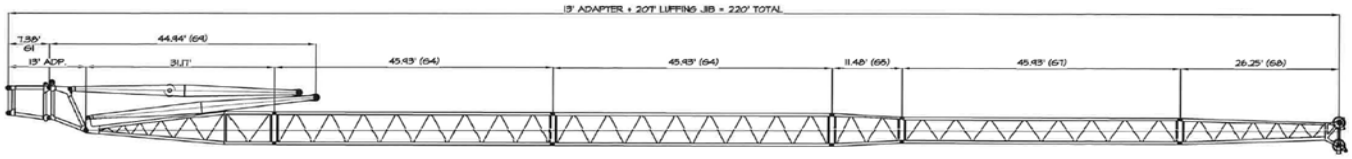
REFER TO OPERATORS MANUAL FOR G4 & G6 COMBINED LIFT DETAIL



LUFFING JIB INTERMEDIATE SECTION
(G4 WT = 5.73k)
(G7 WT = 5.51k)



LUFFING JIB END SECTION
(G8 WT = 5.95k)



LIEBHERR LTM1500 - 207' LUFFING JIB + 13' ADAPTER ASSEMBLED

MAIN CRANE CN#515/17
ASSIST CRANE CN#516/17

0 5' 10' 15' 30'
GRAPHICAL SCALE: 1" = 15'

CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS

Assembly/disassembly director: No crane or derrick that requires a certificate of on-site inspection (CN) may be assembled or disassembled unless an A/D director provides continuous, onsite supervision of such operation, and ensures compliance with approved A/D plan, and as applicable, relevant rigging plans.

- Designation and qualifications
- Training and licensing
- Review of the A/D plan

CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS

- **Designation and qualifications**: The A/D director must be designated by the equipment user and must meet the criteria for both a competent and a qualified person.
- **Training and licensing**: If the A/D operation involves items to be hoisted or lowered, the A/D director must be a licensed master or tower crane rigger, a master rigging foreman, or be trained or certified as a rigging supervisor.
- **Review of the A/D plan**: Before A/D operation, the A/D director must review the approved A/D plan, and as applicable, relevant rigging plans.

CRANES & DERRICKS
NEW ASSEMBLY/DISASSEMBLY REQUIREMENTS

Training of assembly/disassembly crew : RC 3319-01 (i)(6)

- A/D director **must** ensure all members of the A/D crew, including signalpersons, understand their tasks and hazards related to their tasks.
- If A/D operation involves items to be hoisted or lowered, the individuals who attach or detach these items from the hoisting equipment's hook (used in conjunction with the A/D operation) **must** be trained or certified as a rigging crew member.
- Signalpersons **must** also be trained or certified as a rigging crew member.

ASSEMBLY/DISASSEMBLY DIRECTOR

All cranes with certificate of onsite inspection that require assembly/disassembly will require an assembly/disassembly director to ensure compliance with assembly/disassembly plans.

- **Must** be designated by equipment user and meet the criteria for both competent and qualified person.
- If assembly/disassembly involves hoisting/lowering articles, the assembly/disassembly **must** be either:
  1. Licensed Master Rigger
  2. Tower crane rigger
  3. Master rigging foreman trained or certified as rigging supervisor per section 3316.9.2, or completed training requirements per section 3319.10

EXCEPTION: *Tower crane erection, jumping, climbing, or dismantling must be supervised by a licensed master/tower crane rigger*

COMMISSIONER'S ORDER
CRAWLER CRANES

- As of May 24, 2017, 3319-01 & 3319-02 supersede certain sections of June 30, 2016 Commissioner's Order for crawler cranes. These include:

REQUIREMENT	COMMISSIONER'S ORDER	NEW PROVISION
Anemometer	III, IV & V	1RCNY 3319-01(t)(7)
In-service (in-operation) Wind Threshold	VI & VII	1RCNY 3319-01(t)(3), (4), and (5)
Parking and Securing the Crane	VIII & IX	1RCNY 3319-01(h), 1RCNY 3319-01(k)(2), and 1RCNY 3319-01(t)(3), (4), and (5)
Wind Action Plan	X, XI, XII, XIII, XIV, XV & XVI	1RCNY 3319-01(g)(2)(v) and 1RCNY 3319-01(u)
Lift Director	XVII	1RCNY 3319-02(c)
Designation of the Lift Director	XVIII, XIX & XX	1RCNY 3319-02(c) and (d) Note: Submit CD12 form to C&D to notify DOB of primary Lift Director designation
Duties of the Lift Director	XXI	1RCNY 3319-02(e)
Ordering Corrective Action and Notification to DOB	XXII	1RCNY 3319-02(f)
Authority to Stop Operations	XXIII	1RCNY 3319-02(g)
Responsibility for Crane and Rigging Operations	XXIV	1RCNY 3319-01(i)(2), 1RCNY 3319-01(p)(2), and 1RCNY 3319-02(h)
Pre-shift Meeting	XXV, XXVI & XXVII	1RCNY 3319-02(j)

CRANES

LIFT DIRECTOR RULES

(effective 5/24/17)

CRANES
LIFT DIRECTOR

- Present at jobsite full time and while crane is performing certain tasks
- Lift director is required when:
  - Crane or derrick is picking a load
  - Crane is traveling at the site
  - Crane or derrick is being placed into parked condition or taken O.S.
  - Crane or derrick boom/jib is being laid down or jackknifed
  - The crane or derrick boom/jib is being raised from laid down or jackknifed
  - Other protective measures for wind are being installed or removed

CRANES: LIFT DIRECTOR RESPONSIBILITIES

Ensuring

- Crane or derrick is located and configured in accordance with the approved notice plans prior to each shift or if relocating.
- Site conditions match approved notice plans.
- Traffic and pedestrian controls are in place.
- HMO, rigging supervisor, rigging crew possess proper licensing, and or training cards.
- HMO and rigging supervisor are present throughout the shift.
- Weather conditions and forecasts are monitored as warranted.

CRANES: LIFT DIRECTOR
RESPONSIBILITIES

- Coordination with HMO, rigging supervisor for the various crane operation, cease of operation, out of service action plans are implemented in accordance with notice plan.
- HMO ceases operations at the end of the shift or as weather conditions warrant.
- HMO has completed a written record prior to leaving the site.
- When warranted during O.S. periods, appropriate personnel return to the site to take further steps to secure the crane of derrick.

CRANES: LIFT DIRECTOR RESPONSIBILITIES

- When carrying load over an occupied building, the top two floor are vacated prior to start of such operation in accordance with **3319-01(q)(3)(v)**.
- Prior to a critical pick the master rigger or the P.E. has verified the pick plan in accordance with **Section 3316.9.1**
- Compliance with **3319-01(s)(3)** for overhead power lines.
- Required frequent inspections are performed prior to start of the shift.
- Crane operator is informed of the weight of load, moving, and placing locations of these loads.

CRANES: LIFT DIRECTOR
RESPONSIBILITIES

- Crane operator's verification has been obtained that weight does not exceed crane capacity.
- Constant communication is maintained between the operator, rigging supervisor, and signalpersons.
- Load is properly rigged before it is lifted.

CRANE
ARTICULATING BOOMS

CRANE
ARTICULATING BOOM

Illegal Use

CRANE
ARTICULATING BOOM

Permitting and Licensing Requirements

Prior approval of the Department of Buildings is not required as per **NYC Building Code 3319.3** to use an articulating boom crane at a jobsite, provided all of the followings are met:

- The articulating boom crane is used exclusively to load or unload a truck or trailer;
- The length of the boom does not exceed 135 feet; and
- The material is not raised vertically more than 100 feet during the unloading process.

CRANE
ARTICULATING BOOM

Permitting and Licensing Requirements

A prototype, CN, CD, and HMO licensee are required if an articulating boom crane is used for any other type of work at a job site including but not limited to:

- Deliveries at a jobsite beyond the maximums specified in 3319.3.
- Holding steel, HVAC equipment, hoist towers, scaffolding, sidewalk shed components, or any other loads in place while they are bolted or otherwise affixed.
- Assisting in the demolition of a building.

CRANE & DERRICK
LOG REQUIREMENTS

CRANE & DERRICK
LOG REQUIREMENTS

- 1 RCNY 3319-01 and 1 RCNY 3319-02 requires equipment user to record and maintain certain information at the jobsite.
- All entries **must** be signed and dated by individual who recorded the information.

NOTE: In addition, for the erection, jumping, climbing, or dismantling of a tower or climber crane, the pre-jump safety meeting log requirements of Section 3319.8.6 of the New York City Building Code continue to apply.

CRANE & DERRICK
LOG REQUIREMENTS

Crane or Derrick Log: For a crane or derrick requiring a CN, equipment user **must** maintain for duration of the job a crane or derrick log. As per **1RCNY 3319-01(h)**, the log **must** contain the following information:

- Equipment user custody of the crane or derrick
- Records of inspections (such records **must** be signed and dated by the hoisting machine operator who performed the inspection)
- Meeting log for the erection, climbing, jumping, or dismantling of a tower crane
- Date and time of pre-shift meetings, along with names, titles, and company affiliations of those who participated in the meeting
- The A/D Director for the assembly/disassembly operation

CRANE & DERRICK
LOG REQUIREMENTS

- **Frequent (pre-shift) inspections:** Results of the pre-shift inspection required by 1 RCNY 3319-01(k)(1) **must** be recorded by the HMO and kept in the cab or at the operator's station.
- **Parking/securing (post-shift) inspection:** Results of the post-shift inspection, required by 1 RCNY 3319-01(k)(2), **must** be recorded by the HMO and kept in the cab or at the operator's station.
- **Pre-shift meeting:** For all pre-shift meetings, date, time, participants' names, titles, and company affiliation, required by 1 RCNY 3319-02(j), **must** be recorded in the jobsite crane or derrick log.

*NOTE: The entry **must** be made by equipment user's authorized representative.*

CRANE & DERRICK
LOG REQUIREMENTS

Assembly/disassembly information: Before A/D operation, the A/D director **must** record their name and contact information in the log.

- If A/D director changes before work completion, new A/D director **must** enter their name and contact information before starting A/D director duties.

Equipment user information: When equipment user obtains or releases custody over the crane or derrick, his authorized representative **must** record this action, along with date, time, and corporate name, in log.

- All equipment users **must** be indicated on DOB-approved CD4/CD4EQ.

Change of lift director: If lift director changes, new lift director **must** record this change, along with name, date, and time in the log.

- CD-12 **must** be amended if permanent lift director is changed, or if an alternate will be acting in place for two consecutive weeks or longer.

CRANE & DERRICK
FREQUENT INSPECTION

CRANES & DERRICKS
FREQUENT INSPECTION REQUIREMENTS

Recent amendments to 1RCNY 3319-01 have revised the frequent inspection requirements for cranes and derricks. Prior to each shift, the HMO **must** inspect the crane or derrick.

Inspection criteria can be found in 1RCNY 3319-01(k)(1) and apply to the following devices:

- Mobile cranes
- Dedicated pile drivers
- Articulating boom cranes
- Tower cranes
- Self-erecting tower cranes
- Derricks

CRANES & DERRICKS
FREQUENT INSPECTION REQUIREMENTS

- **1RCNY 3319-01(k)(1)(A)(ii) Record of inspection.** Where the crane or derrick requires a certificate of on-site inspection, at the conclusion of the inspection the hoisting machine operator **must** record the results of the inspection in the crane or derrick log required by subdivision (h) of this section. Any deficiencies must be clearly noted.

- **1RCNY 3319-01(k)(1)(A)(iii) Defects.** Any defects revealed by the inspection **must** be corrected. Where such defects constitute a safety hazard, the crane or derrick cannot be operated until such defects are corrected.

CRANE & DERRICK
ANEMOMETERS

LATTICE CRANES
ANEMOMETERS REQUIREMENTS

Recent amendments to 1RCNY 3319-01 expanded requirements for lattice cranes to be equipped with anemometers.

- Crawler cranes with lattice boom/jib currently require an anemometer
- Tower cranes **must** be equipped with an anemometer by May 24, 2017
- All other mobile cranes that use a lattice boom or lattice jib **must** be equipped with an anemometer if CN is issued on/after May 24, 2017.

NOTE: An anemometer is not required if the crane is used for pile driving or clamshell operations.

LATTICE CRANES
ANEMOMETERS REQUIREMENTS

The anemometer:

- **Must** be provided by crane manufacturer or its approved entity
- **Must** be installed at the top of the boom or other location specified by the crane manufacturer.
- **Must** measure a 3-second gust wind.
- **Must** be available to the HMO at the operator's station with a real-time display.

DERRICKS
ANEMOMETERS REQUIREMENTS

Recent amendments to **1RCNY 3319-01** require anemometers to be used during derrick operations.

One of two options may be selected:

- An anemometer located on the derrick, or
- An anemometer located at a high point of the site

DERRICKS
ANEMOMETERS REQUIREMENTS

An anemometer located on the derrick:

- **Must** be provided by crane manufacturer or an approved entity.
- **Must** be installed at the top of the boom or other location specified by derrick manufacturer.
- **Must** measure a 3-second gust wind.
- **Must** be available to HMO at the operator's station with a real time display.

DERRICKS
ANEMOMETERS REQUIREMENTS

An anemometer located at a high point of the site:

- **Must** be located at the site's high point approximate to derrick boom's height and location.
- **Must** be freely exposed to the wind.
- **Must** be calibrated in accordance with ASTM D5096-02.
- **Must** measure a 3-second gust wind.
- **Must** be available to the HMO at the operator's station with a real time display, or provide a HMO designated person to monitor display and alert the HMO when measurements near, meet, or exceed the thresholds specified in the approved wind action plan.

CRANE AGE BILL

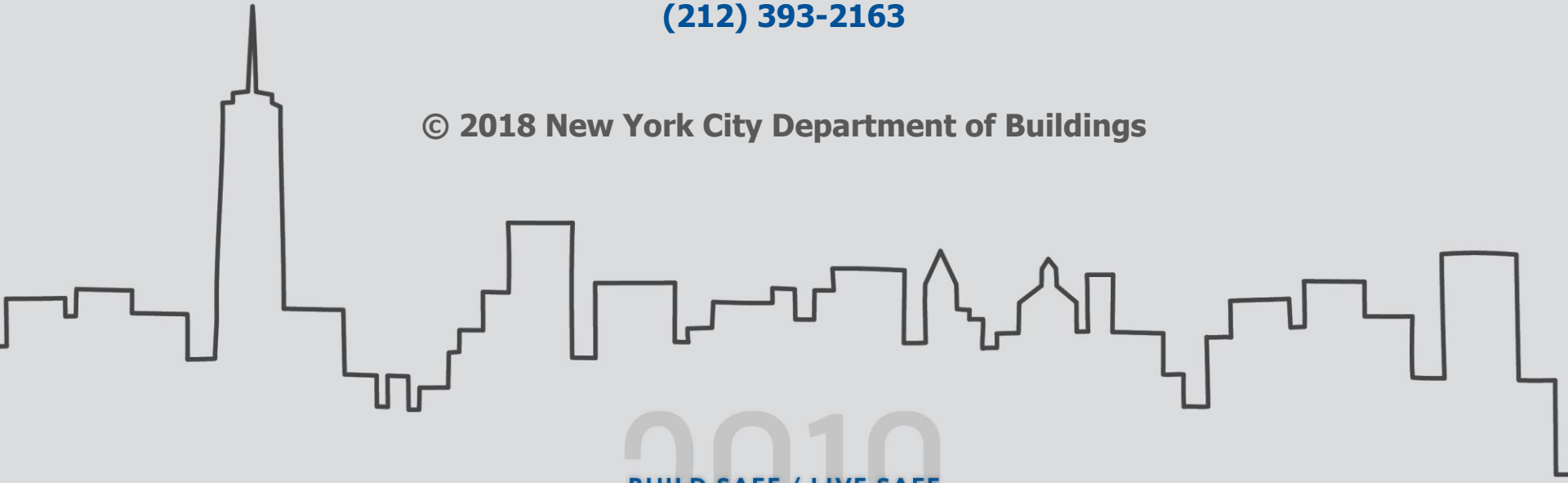
- To encourage crane modernization, recent amendments to **NYCBC 3302.1** and **3319.13** set rules for how long a crane in NYC can be used.
- **NYCBC 3302.1** redefines the manufacturer date of a crane to the earliest of either:
  - The date the crane was originally manufactured for its intended purpose.
  - The date that the oldest major component of the crane was originally manufactured.
- **NYCBC 3319.13** sets a standard for the maximum duration a crane can operate in NYC.
  - **3319.13** age limitations for cranes. Only cranes having an age of less than 25 years from the manufacture date may be used in New York City. Notwithstanding the provisions of Section 3319.5, the certificate of operation for a crane with an age greater than 25 years from the manufacture date shall be deemed to have expired.

QUESTIONS

This concludes the
American Institute of Architects
Continuing Education Systems Course.

NYC Department of Buildings Contact for AIA:

Melanie Guzman
Melaguzman@buildings.nyc.gov
(212) 393-2163



BUILD SAFE / LIVE SAFE
CONFERENCE
2018