


NOTICE OF ADOPTION OF RULE

NOTICE IS HEREBY GIVEN, pursuant to the authority vested in the Commissioner of the Department of Buildings by Section 643 of the New York City Charter and in accordance with Section 1043 of the Charter, that the Department of Buildings hereby adopts the amendments to Section 3319-01 of Chapter 3300 of Title 1 of the Official Compilation of the Rules of the City of New York, regarding cranes and derricks.

This rule was first published on September 28, 2015 and a public hearing thereon was held on November 9, 2015.

Dated: 11.18.15
New York, New York



Rick D. Chandler, P.E.
Commissioner

Statement of Basis and Purpose of Rule

The Department's current regulations for cranes and derricks are found in Reference Standard RS 19-2 of the 1968 New York City Building Code (RS 19-2). This standard is being repealed and replaced by this rule.

This rule:

- addresses the minimum safety requirements for, and regulates the design, construction, permitting, installation, removal, adjustment, repair, inspection, maintenance, operation, and use of cranes and derricks.
- references, utilizes, and requires compliance with the latest nationally recognized American Society of Civil Engineers (ASCE), American Society of Mechanical Engineers (ASME), European Committee for Standardization (EN), International Organization for Standardization (ISO), and Society of Automotive Engineers (SAE) standards.
- incorporates several recommendations made by the Department's High Risk Construction Oversight (HRCO) study (issued June 2009) that pertain to cranes and derricks.
- is the first phase of a multi-phase effort to increase public safety by modernizing New York City's crane and derrick regulations.
- is based on input from over three dozen representatives of crane and derrick manufacturers, filing engineers, operating engineers, owners, and construction firms.

Subdivisions (a) through (e) of the rule incorporate and edit provisions of RS 19-2 that pertain to the certificate of approval, as well as the definitions and scope language contained in RS 19-2. The certificate of approval (also known as the "prototyping process" or "prototype") is the first of three certificates that must be obtained before a crane or derrick can operate in New York City. The certificate of approval evaluates the design of the make and model of the crane or derrick, and authorizes the make and model of the crane or derrick to operate in the city. Provisions retaining to the other two certificates (operation and on-site inspection) will be addressed by rule in subsequent phases.

Specifically:

- Subdivision (a) of the rule is derived from Section 1.0 of RS 19-2.
- It is revised to update cross references from the 1968 New York City Building Code to the New York City Construction Codes, and to utilize terminology contained in the Construction Codes.

- Language is added to clarify that equipment which meets the definition of a crane or derrick is covered by the scope of the rule, and follows similar action taken by OSHA to clarify that dedicated pile drivers and other machinery are considered to be a crane or derrick under the Occupational Safety and Health Administration (OSHA) regulations.
- Subdivision (b) of the rule is derived from Section 2.0 of RS 19-2, and contains the definitions utilized in the rule.
 - A number of the definitions are contained in Chapter 33 of the Building Code and are republished here for convenience.
 - Definitions not currently found in RS 19-2 are added.
 - The definitions of “attachments” and “component” are derived from HRCO recommendation C-20. HRCO further recommended that the department develop a system to track components and attachments; this will be assessed in a future phase.
 - The remaining definitions are currently found in RS 19-2, with some modifications made for clarity or to reflect current technology.
 - HRCO recommendation C-12 proposed that the city update its crane regulations to reflect a new type of crane, an “articulating boom crane.” The definitions for “crane” and “articulating boom crane” are modified in the rule to match earlier changes made to these definitions in the Construction Codes to conform to the HRCO recommendation.
- Subdivision (c) of the rule cross references and consolidates existing provisions for crane certificates and permits.
- Subdivision (d) of the rule contains the requirements for the certificate of approval.
 - This language replaces the provisions in section 3.0 of RS 19-2, which is deleted.
 - Paragraph (1) of subdivision (d) adopts certain items in HRCO recommendation C-7 concerning standards to be followed by crane and derrick manufacturers, as well as information crane and derrick manufacturers need to supply to the department.
 - Paragraph (1) of subdivision (d) requires technical information related to the crane or derrick’s wind design and counterweight configurations to be submitted to the department.

- Also, paragraph (1) requires an engineer to provide a technical certification as to the design of the crane or derrick.
- Current requirements from RS 19-2 for a brochure, load rating charts, and listing of components to be submitted by the manufacturer are retained in paragraph (1).
- Paragraphs (2) and (3) reflect current requirements.
- Paragraph (4) clarifies the circumstances that trigger an amendment to a certificate of approval, and the information to be filed as part of an amendment. It also establishes two new pathways to file an amendment; the first by the manufacturer and the second by an owner of a crane or derrick. These pathways are derived from OSHA, which limits the ability of an owner to modify a crane or derrick. (See 29 CFR §1926.1434).
- Paragraph (5) establishes a new pathway for manufacturers to provide updated information, such as manuals and checklists, to the department without triggering the need to file an amendment.
- Paragraph (6) provides specific criteria for providing the department with safety bulletins and recall notices.
- Paragraph (7) requires notification if the manufacturer loses its ISO accreditation.
- Paragraphs (8) and (9) reflect current requirements.
- Subdivision (e) sets forth acceptable design and testing standards for which cranes or derricks must satisfy in order to be issued a certificate of approval.

Subdivisions (f) through (x) of this rule contain items relating to jobsite specific design and operation of a crane or derrick. These are simply a re-promulgation of sections of RS 19-2, with minor edits made to renumber and correct cross-references. These sections will be amended by rule in subsequent phases.

The Department of Buildings' authority for these rules is found in sections 643 and 1043 of the New York City Charter, section 28-103.19 of the New York City Administrative Code and section 3319.1 of the New York City Building Code.

New material is underlined.

[Deleted material is in brackets.]

“Shall” and “must” denote mandatory requirements and may be used interchangeably in the rules of this department, unless otherwise specified or unless the context clearly indicates otherwise.

Section 1. Reference Standard RS-19-2 Power Operated Cranes and Derricks of the appendix to chapter 1 of title 27 of the administrative code of the city of New York, is hereby REPEALED.

§2. Chapter 3300 of Title 1 of the Rules of the City of New York is amended by adding a new Section 3319-01, to read as follows:

§3319-01 Cranes and derricks

(a) Applicability. The design, construction, permitting, installation, removal, adjustment, repair, inspection, maintenance, operation and use of cranes and derricks must conform to the requirements of Section 3319 of the New York City Building Code and this section. This includes, but is not limited to, cranes and derricks used for hoisting and/or rigging purposes; or used for construction, alteration, demolition, excavation and maintenance purposes, including for buildings, highways or sewers; or used for the installation of piles; or used for the hoisting or lowering of any article on the outside of any building or structure. This also includes any equipment that meets the definition of a crane or derrick, including, but not limited to, dedicated pile drivers and manufactured or custom designed hoisting machines.

Exceptions:

(1) Cranes and derricks listed in the exceptions set forth in Section 3319.3 of the New York City Building Code.

(2) Operators of cranes described in exceptions 3 and 4 of Section 3319.3 of the New York City Building Code are exempt from any licensing requirements where the cranes are used in connection with the installation or maintenance of street lighting or public utility overhead power distribution systems.

(b) Definitions. For the purposes of this section, the following terms have the following meanings:

ACCESSORY. A secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.

APPOINTED. Assigned specific responsibilities by the employer or by the employer's representative.

ANGLE INDICATOR (boom). An accessory which measures the angle of the boom to the horizontal.

ATTACHMENTS. Elements that can be readily added to or removed from a crane or derrick and which expand the range or function of the crane or derrick.

Examples include, but are not limited to: an auger, boom extension, clamshell, drill, jib, jib extension, or pile-driver.

AXIS OF ROTATION. The vertical axis around which the crane superstructure rotates.

AXLE. The shaft or spindle with which or about which a wheel rotates. On truck and wheel mounted cranes it refers to an automotive type of axle assembly including housing, gearing, differential, bearings and mounting appurtenances.

AXLE (bogie). Two or more automotive type axles mounted in tandem in a frame so as to divide the load between the axles and permit vertical oscillation of the wheels.

BASE (mounting). The base or carrier on which the rotating superstructure is mounted such as a truck, crawler or platform.

BOOM. A section or strut, of which the heel (lower end) is affixed to a base, carriage or support, and whose upper end supports a cable and sheaves where the load is lifted by means of wire rope and a hook.

BOOM ANGLE. The angle between the longitudinal centerline of the boom and the horizontal. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline, and boom point sheave pin centerline.

BOOM HARNESS. The block and sheave arrangement on the boom point to which the topping lift cable is reeved for lowering and raising the boom.

BOOM HOIST. A hoist drum and rope reeving system used to raise and lower the boom.

BOOM POINT. The outward end of the top section of the boom, containing the hoist sheave assembly.

BOOM STOP. A device used to limit the angle of the boom at the highest position.

BRAKE. A device used for retarding or stopping motion by friction or power means.

CAB. A housing which covers the rotating superstructure machinery and/or operators station.

CABLEWAY. A power operated system for moving loads in a generally horizontal direction in which the loads are conveyed on an overhead cable, track or carriage.

CERTIFICATE OF APPROVAL. A certificate issued by the department upon review and approval of the engineering and testing of a specific make and model of hoisting equipment to ensure compliance with the applicable provisions of this code and its referenced standards.

CERTIFICATE OF OPERATION. A certificate issued by the department annually upon satisfactory inspection of the hoisting equipment holding a certificate of approval to ensure that the equipment continues to be in compliance with this code and its referenced standards.

CERTIFICATE OF ON-SITE INSPECTION. A certificate issued by the department based on a site-specific approval of the placement, founding and operation of hoisting equipment.

CLAMSHELL. A shovel bucket with two jaws that clamp together by their own weight when it is lifted by a closing line.

CLIMBING/JUMPING. The raising or lowering of a tower or climber crane to different floors or levels of a building or structure.

CLUTCH. A friction, electromagnetic, hydraulic, pneumatic or positive mechanical device for engagement of power.

COMPETENT PERSON. One who is capable of identifying existing predictable hazards in the surroundings or conditions that are unsanitary, hazardous or dangerous, and who has authorization to take prompt corrective measures to eliminate such hazards.

COMPONENT. A structural part or mechanical system that is integral to the crane or derrick, or an element that supports an integral structural part or mechanical system. Examples include, but are not limited to: a-frame, attachments, boom, boom tip, braking system, climbing frame or section, climbing mechanism, collar, counter jibs, counterweight, counterweight support system, engine, heel boom, hoist drum, hoist motor, machine deck or platform, mast, operator's cabin, pendant bars (excluding wire rope pendants), suspension system, tower base/base frame, tower top, and turntable. For a derrick, a component also includes base plates, junctions, poles and other uprights, seats, and stiff legs.

COUNTERWEIGHT. Weight used to supplement the weight of the machine in providing stability for lifting working loads.

CRANE. A power-operated machine for lifting or lowering a load and moving it horizontally which utilizes wire rope and in which the hoisting mechanism is an integral part of the machine. The definition of a crane shall also include

articulating boom crane, regardless of whether it has a hoisting mechanism integral to the machine.

ARTICULATING BOOM CRANE. A power-operated machine for lifting or lowering a load and moving it horizontally that utilizes a boom consisting of a series of folding pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders, with or without a hoisting mechanism integral to the machine.

MOBILE CRANE. A commercial truck mounted crane, crawler crane, wheel mounted crane (multiple control stations), or wheel mounted crane (single control station).

COMMERCIAL TRUCK MOUNTED CRANE (BOOM TRUCK). A crane consisting of a rotating superstructure (center post or turntable), boom, operating machinery, and one or more operator's stations mounted on a frame attached to a commercial truck chassis, usually retaining a payload hauling capability whose power source usually powers the crane. Its function is to lift, lower, and swing loads at various radii.

CRAWLER CRANE. A crane consisting of a rotating superstructure with a power plant, operating machinery, and boom, mounted on a base and equipped with crawler treads for travel. Its function is to lift, lower, and swing loads at various radii.

WHEEL MOUNTED CRANE (MULTIPLE CONTROL STATIONS). A crane consisting of a rotating superstructure, operating machinery, and operator's station and boom, mounted on a crane carrier equipped with axles and rubber-tired wheels for travel, a power source(s), and having separate stations for driving and operating. Its function is to lift, lower, and swing loads at various radii.

WHEEL MOUNTED CRANE (SINGLE CONTROL STATION). A crane consisting of a rotating superstructure, operating machinery, and boom, mounted on a crane carrier equipped with axles and rubber-tired wheels for travel, a power source, and having a single control station for driving and operating. Its function is to lift, lower, and swing loads at various radii.

TOWER CRANE. A power-operated hoisting machine that utilizes a vertical tower with a rotating superstructure and includes a load boom (jib) in order to lift or lower a load and move it horizontally.

CLIMBER CRANE. A tower crane that can be raised to a new working height, either by adding tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised inside the structure (inside climbing).

SELF-ERECTING TOWER CRANE. A tower crane that adjusts its operating radius by means of a trolley traversing a jib and that; (i) possesses vertical or nearly vertical masts that are bottom slewing and mounted on fixed, traveling, or mobile bases; and (ii) is capable of folding and unfolding to facilitate transit from jobsite to jobsite with minimal assembly.

DEDICATED PILE DRIVER. A power-operated machine that is designed exclusively to drive, hammer, press, or vibrate piles into the earth ("pile drive") and which possess the ability to both hoist the material that will be pile driven and to pile drive that material.

DERRICK. An apparatus consisting of a mast or equivalent member held at the top by guys or braces, with or without a boom, for use with a hoisting mechanism and operating ropes, for lifting or lowering a load and moving it horizontally. The definition of a derrick includes but is not limited to: A-frame derrick, basket derrick, breast derrick, Chicago boom derrick, gin pole derrick, guy derrick, shearleg derrick, and stiffleg derrick.

A-FRAME DERRICK. A derrick in which the boom is hinged from a cross member between the bottom ends of two upright members spread apart at the lower ends and joined at the top; the boom point secured to this junction of the side members, and the side members are braced or guyed from the junction point.

BASKET DERRICK. A derrick without a boom, similar to a gin pole with its base supported by ropes attached to corner posts or other parts of the structure. The base is at a lower elevation than its supports. The location of the base of a basket derrick can be changed by varying the length of the rope supports. The top of the pole is secured with multiple reeved guys to position the top of the pole to the desired location by varying the length of the upper guy lines. The load is raised and lowered by ropes through a sheave or block secured to the top of the pole.

BREAST DERRICK. A derrick without a boom. The mast consists of two side members spread farther apart at the base than at the top and tied together at top and bottom by rigid members. The mast is prevented from tipping forward by guys connected to its top. The load is raised and lowered by ropes through a sheave or block secured to the top crosspiece.

CHICAGO BOOM DERRICK. A derrick with a boom which is attached to a structure, an outside upright member of the structure serving as the mast, and the boom being stepped in a fixed socket clamped to the upright. The derrick is complete with load, boom and boom point swing line falls.

GIN POLE DERRICK. A derrick that consists of a boom without a mast and which has guys arranged from its top to permit leaning the mast in one or more directions. The load is lifted and lowered by ropes reeved through sheaves or blocks at the top of the mast and the lower block.

GUY DERRICK. A fixed derrick consisting of a mast capable of being rotated, supported in a vertical position by guys, and a boom whose bottom end is hinged or pivoted to move in a vertical plane with a reeved rope between the head of the mast and the boom point for raising and lowering the boom, and a reeved rope from the boom point for raising and lowering the load.

SHEARLEG DERRICK. A derrick without a boom. The mast, wide at the bottom and narrow at the top, is hinged at the bottom and has its top secured by a multiple reeved guy to permit handling loads at various radii by means of load tackle suspended from the mast top.

STIFFLEG DERRICK. A derrick similar to a guy derrick except that the mast is supported or held in place by two or more stiff members, called stifflegs, which are capable of resisting either tensile or compressive forces. Sills are generally provided to connect the lower ends of the stifflegs to the foot of the mast.

DISMANTLING. The final process of taking apart, piece by piece, in a specific sequence, the components of a crane. Dismantling shall include climbing and jumping.

DRUM. The cylindrical member around which a rope is wound for raising and lowering the load or boom.

DYNAMIC (loading). Loads introduced into the machine or its components by forces in motion.

ENGINEER. A person licensed and registered to practice the profession of engineering under the education law of the state of New York; except that the certifications for matters relating to the manufacturer's design and applications for prototyping a crane or derrick may be made by an engineer who is (1) employed full time by the crane or derrick manufacturer and (2) who is licensed to practice the profession of engineering under the law of any state or foreign jurisdiction, or who submits proof, acceptable to the commissioner, of his or her professional qualifications.

ERECTION. The assembly and placement of crane sections and components into place, including all operations incidental thereto. Erection shall include climbing and jumping.

EXTENSION. See "Attachment."

GANTRY(A-Frame). A structural frame, extending above the superstructure of a crane, to which the boom support ropes are reeved.

GUDGEON PIN. A pin connecting the mast cap to the mast, allowing rotation of the mast.

GUY. A rope used to steady or secure the mast or other members in the desired position.

HOISTING EQUIPMENT. Equipment used to raise and lower personnel and/or material with intermittent motion. Hoisting equipment does not include scaffolds, mast climbers, and elevators.

HOISTING MACHINE. A power operated machine used for lifting or lowering a load, utilizing a drum and wire rope, excluding elevators. This shall include but not be limited to a crane, derrick, and cableway and hydraulic lifting system, and articulating booms.

HOISTING MECHANISM. A hoist drum and rope reeving system used for lifting and lowering loads.

JIB. An extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles in the vertical plane of the boom.

JUMP (jumping). The process of adding or removing mast or tower sections to equipment that has already been erected.

LAY. That distance measured along a wire rope in which one strand makes one complete helical convolution about the core or center.

LOAD (working). The external load, in pounds (kilograms), applied to the crane or derrick, including the weight of auxiliary load attaching equipment such as load blocks, shackles, and slings.

LOAD BLOCK (upper). The assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point.

LOAD BLOCK (lower). The assembly of hook or shackle, swivel, sheaves, pins and frame suspended by the hoisting ropes.

LOAD HOIST. A hoist drum and rope reeving system used for hoisting and lowering loads.

LOAD INDICATOR. A device that measures the weight of the load.

LOAD MOMENT INDICATOR. A system that aids the operator by sensing (directly or indirectly) the overturning moment of the crane or derrick. It compares this lifting condition to the equipment's rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working.

LOAD MOMENT LIMITER. A system which aids the operator by sensing (directly or indirectly) the overturning moment of the crane or derrick. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment.

LOAD RATINGS. Crane and derrick ratings in pounds (kilograms) established by the manufacturer in accordance with standards set forth in rules promulgated by the commissioner.

LOAD RATING CHART. A full and complete range of manufacturer's crane load ratings at all stated operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset), as well as alternative ratings for use and nonuse of optional equipment on the crane, such as outriggers and extra counterweights, that affect ratings.

MANUFACTURER. A person, firm, or corporation that (i) builds or assembles, or has built or assembled, a crane or derrick, (ii) may lawfully sell and/or distribute such crane or derrick under its own name or trademark, and (iii) provides, either by itself or through authorized representatives, replacement parts, service support, technical support, safety bulletins, and recall notices for such crane or derrick.

MAST (derrick). The upright member of a derrick.

MAST (boom). A frame hinged at or near the boom hinge for use in connection with supporting a boom. The head of the mast is usually supported and raised or lowered by the boom hoist ropes.

MAST (jib). A frame hinged at or near the boom point for use in connection with supporting a jib.

MAST (tower). See "Tower."

OUTRIGGERS (crane). Extendable or fixed members attached to the mounting base that rest on supports at the outer ends used to support the crane.

QUALIFIED PERSON. A person who by possession of a recognized degree, certificate or professional standing, or who by knowledge, training and experience, has successfully demonstrated his or her ability to solve or resolve problems related to the subject matter, the work, or the project.

REEVING. A rope system in which the rope travels around drums and sheaves.

ROPE. A continuous line of material comprised of a number of twisted or braided strands of fiber (natural or synthetic) or metal wire.

SIDE LOADING. A load applied at an angle to the vertical plane of the boom.

SILL. A member connecting the foot block and stiffleg or a member connecting the lower ends of a double member mast.

STANDING (GUY) ROPE. A supporting rope which maintains a constant distance between the points of attachment to the two components connected by the rope.

SUPERSTRUCTURE. The rotating upper frame structure of the machine and the operating machinery mounted thereon.

SWING. Rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

SWING MECHANISM. The machinery involved in providing rotation of the superstructure.

TACKLE. An assembly of ropes and sheaves arranged for hoisting and pulling.

TELESCOPIC BOOM. A boom constructed of sections of diminishing cross sections in which the sections fit within each other. The boom may be extended in a manner similar to a telescope.

TOWER. A vertical structural frame consisting of columns and bracing that are capable of supporting working and dynamic loads and transmitting them to the support(s).

TRANSIT. The moving or transporting of a crane from one job site to another.

TRAVEL. The function of the machine moving from one location to another on a job site.

TRAVEL MECHANISM. The machinery involved in providing travel power.

TWO-BLOCKING. A condition in which the lower load block or hook assembly comes into contact with the upper load block or boom point sheave assembly.

WHEEL BASE. Distance between centers of front and rear axles. For a multiple axle assembly the axle center wheel base measurement is taken as the midpoint of the assembly.

WHIPLINE. A separate hoist rope system of lighter load capacity and higher speed than provided by the main hoist.

WINCH HEAD. A power driven spool for handling of loads by means of friction between fiber or wire rope and spool.

(c) Permit requirements for cranes and derricks.

(1) Certificates of approval, operation, and on-site inspection. Cranes and derricks must possess a certificate of approval, certificate of operation, and certificate of on-site inspection when required by Section 3319 of the Building Code.

(2) Temporary construction equipment permit. A temporary construction equipment permit, such as an Alt II permit or a CD-5 permit, is required for:

(i) A mobile crane used in conjunction with the construction, alteration, or demolition of a building, and that does not meet any exception other than numbers 3 or 4 of Section 3319.3 of the New York City Building Code.

(ii) Cranes and derricks with a manufacturer's rated capacity of 1 ton (907 kg) or less and used in conjunction with the installation, alteration, maintenance, repair, or removal of a building, building systems, or equipment located on a building.

(3) Noncompliance. Where a crane or derrick requiring one or more of the certificates or permits is found not to be in compliance with one or more of the required certificates or permits, the use of such crane or derrick must cease. The crane or derrick must not be used until it has been brought into conformance with the certificates or permits, or amended certificates or permits have been issued by the department to reflect the state of the crane or derrick.

(d) Certificate of approval. Certificates of approval must comply with the requirements of Section 3319.4 of the New York City Building Code and the following.

(1) Application for a certificate of approval. To request a certificate of approval in accordance with Section 3319.4 of the New York City Building Code, a prototype application must be filed on behalf of the manufacturer or equipment owner by an engineer who meets the requirements of paragraph (2) of subdivision (d) of this section. The application and all associated content must be provided in English, with United States customary units, or where acceptable to the commissioner, metric units. When required by the department, the application must be submitted in an electronic format acceptable to the commissioner. The application must include the following information:

(i) Manuals. One or more manufacturer-furnished manuals, as necessary, to supply the information listed below. Required information is generic and does not have to provide specific part or model numbers:

(A) All configurations for which approval is sought.

(B) Overall dimensions of the crane or derrick, including for the boom, mast, jib, and attachments, or individual sections thereof, for which approval is sought.

(C) Where applicable, information on the carrier type, overall carrier length and width, and tailswing, both with outriggers extended and without.

(D) Rope information, including cable sizes and the number of drums, for both the main hoist line and the whipline.

(E) A generic listing of all safety devices and operational aids provided with the crane or derrick.

(F) Required configurations and procedures to secure the crane or derrick for unattended or out-of-service conditions. For a tower crane, other than a self-erecting tower crane, this must include boom configurations for weathervaning, information or limitations/prohibitions on locking or restricting the boom, and procedures to secure the tower crane in advance of a hurricane type wind event.

(G) For a tower crane, other than a self-erecting tower crane, erection, jumping, climbing, and dismantling procedures. Torque values for all bolted connections located on the crane and installed or modified during such work must be included. Collar details and information on how to support, install, and dismantle the collar must also be provided.

(H) For all cranes or derricks, other than a tower crane that is not a self-erecting tower crane, assembly, disassembly, and travel procedures, including, as applicable, installation and removal procedures for all attachments for which approval is sought. Torque values for all bolted connections installed or modified during crane set up or the installation of an attachment must be included.

(I) Operating instructions.

(J) Inspection criteria, including a schedule of manufacturer-recommended inspections.

(K) Maintenance criteria, including a schedule of manufacturer-recommended maintenance.

(ii) **Brochure.** A manufacturer-furnished advertising brochure or drawing showing the general configuration and specifications for which approval is sought.

(iii) **Load rating charts.** Manufacturer-furnished load rating charts showing each configuration for which approval is sought.

(iv) **Inspection checklists.** Manufacturer-furnished checklists for the inspection of the crane or derrick. Such checklists must account for all components for which approval is sought and all phases of the manufacturer's recommended schedule of inspections, for example, daily, monthly, and annual.

(v) **Maintenance checklists.** Manufacturer-furnished checklists for the maintenance of the crane or derrick. Such checklists must account for all components for which approval is sought and all phases of the manufacturer's recommended schedule of maintenance, for example, daily, monthly, and annual.

(vi) **Listing of components.** Manufacturer-furnished list of all components for which approval is sought. The list is generic and does not have to provide specific part or model numbers. The list must also be accompanied by:

(A) For a tower crane, other than a self-erecting tower crane, manufacturer-furnished drawings indicating the weight, dimensions, center of gravity, and lifting points for the boom, mast, jib, collar, and all attachments, or individual sections thereof, for which approval is sought.

(B) For all cranes or derricks, other than a tower crane that is not a self-erecting tower crane, manufacturer-furnished drawings indicating, as applicable, the weight, dimensions, center of gravity, and lifting points for the lattice boom, jib, and all attachments, or individual sections thereof, for which approval is sought.

(C) In addition to the provisions of clauses (A) and (B) above, for a crane or derrick with a telescoping boom, manufacturer-furnished drawings indicating the weight, dimensions, and center of gravity for the entire crane or derrick with the boom fully retracted and fully extended.

(vii) Counterweight tables. Manufacturer-furnished table of all counterweight combinations and counterweight attachments for each configuration for which approval is sought.

(viii) Tables of allowable installation and use.

(A) Tower cranes, other than self-erecting tower cranes. For tower cranes, other than self-erecting tower cranes, the manufacturer must submit tables that include the following data for the tower crane at its maximum free standing height in each separate standard configuration indicated in the submitted load rating charts:

1. The maximum in-service moment, based on a 45 mph in-service wind.
2. The maximum out-of-service moment, based on a 98 mph out-of-service wind.
3. The slewing moment, based on a 45 mph in-service wind.
4. Corresponding vertical loads at the foundation.

Such data must be calculated in accordance with ASCE 7- 2005, and be provided at Exposures B, C, and D. The maximum free standing height must be clearly indicated, and must be based on a 98 mph out-of-service wind, or a 45 mph in-service wind when such in-service wind produces a lower free standing height.

Special conditions in which the crane may not be used or installed (e.g. crane configuration, height, exposure, etc.) must be clearly indicated.

(B) All other cranes and derricks. For all cranes or derricks, other than tower cranes that are not self-erecting tower cranes, the manufacturer must provide tables showing the maximum in-service and out-of-service boom, mast, and attachment lengths for each configuration for which approval is sought.

(ix) Technical certification. A certification from the engineer who files the prototype application that:

(A) The crane or derrick for which approval is sought was designed and constructed in accordance with an applicable standard listed in paragraph (1) of subdivision (e) of this section. The standard and the year of the standard utilized must be noted.

(B) The manuals and load rating charts filed as part of the prototype application are in accordance with the requirements of paragraph (2) of subdivision (e) of this section.

(C) For a tower crane, other than a self-erecting tower crane, the data provided per subparagraph (viii) of paragraph (1) of subdivision (d) of this section conforms to ASCE 7- 2005.

(D) For a crane, the crane, in all configurations for which approval is sought, successfully passed the prototype testing required by paragraph (3) of subdivision (e) of this section.

(x) Contact information. The manufacturer must supply contact information for the following:

(A) Technical questions. For technical questions, an individual, employed full-time by the manufacturer, who is authorized by the manufacturer to provide answers to technical questions related to the crane or derrick.

(B) Service questions. For service questions, a 24/7 telephone hotline that is maintained or authorized by the manufacturer.

(C) Service support. For jobsite service support, a manufacturer authorized service center, distributor, or authorized service provider located within a four hour travel window of New York City, which must be able to dispatch a factory trained service technician to New York City in the event of an emergency or major malfunction, as determined by the department, with the crane or derrick.

(xi) **Safety bulletins and recall notices.** Certification from the manufacturer that safety bulletins and recall notices for the crane or derrick will be provided in accordance with paragraph (6) of subdivision (d) of this section.

(xii) **ISO certification.** The manufacturer must certify that it possesses the International Organization for Standardization (ISO), or equivalent, certification required by paragraph (4) of subdivision (e) of this section. A copy of the ISO certification, or equivalent, must be submitted.

(2) **Engineer.** The engineer who files the application for the certificate of approval must be either:

(i) A full-time employee of the manufacturer who is licensed to practice the profession of engineering under the law of any state or foreign jurisdiction, or who submits proof, acceptable to the commissioner, of his or her professional qualifications; or

(ii) A person licensed and registered to practice the profession of engineering under the education law of the state of New York.

(3) **Issuance of the certificate of approval.** Upon approval of the prototype application, the department will issue an initial certificate of approval for the crane or derrick. The manuals, load rating charts, and other information submitted with the prototype application and accepted by the department are considered part of the certificate of approval.

(4) **Amendments to the certificate of approval.**

(i) **When required.** A certificate of approval must be amended in any of the following circumstances:

(A) Information provided in the load rating charts is no longer valid or will be altered.

(B) A configuration that was not provided for in the certificate of approval will be utilized.

(C) A component that was not provided for in the certificate of approval will be utilized. This includes, but is not limited to, components that have weights, dimensions, centers of gravity, or lifting points that are different from those listed in the certificate of approval.

(D) Information supplied per subparagraph (vii) of paragraph (1) of subdivision (d) of this section is no longer valid or will be altered.

(E) For a crane or derrick whose initial certificate of approval was issued on or after January 1, 2016, information supplied per subparagraph (viii) of paragraph (1) of subdivision (d) of this section is no longer valid or will be altered.

(ii) Amendment request. A request to amend a certificate of approval must be filed:

(A) On behalf of the manufacturer. On behalf of the manufacturer by an engineer who meets the requirements of paragraph (2) of subdivision (d) of this section; or

(B) On behalf of the owner. On behalf of the equipment owner by an engineer licensed and registered to practice the profession of engineering under the education law of the state of New York, provided:

1. The manufacturer is no longer in business; or

2. The equipment owner has submitted to the manufacturer a detailed description of the proposed amendment, and has asked the manufacturer to request the amendment, but:

A. The manufacturer has not rejected the request. A rejection must be in the form of a written explanation from the manufacturer that rejects the request and explains the reasons for the rejection; and

B. The manufacturer declines to review the request; or

C. The manufacturer, within 30 days of the request, fails to acknowledge the request or initiate a review of the request; or

D. The manufacturer acknowledges the request or begins a review of the request, but, within 120 days of the request, fails to submit an amendment to the department.

(iii) Content of amendment request. Amendment requests, and all associated content, must be provided in English, with United States customary units, or where acceptable to the commissioner, metric units. When required by the department, the application must be submitted in an electronic format acceptable to the commissioner. The amendment request must include the following information:

(A) A listing of revisions to the certificate of approval necessary to accord with the proposed amendment.

(B) Where load ratings are altered, revised load rating charts, along with a certification from the engineer who files the amendment request that the revised load rating charts are in accordance with the requirements of paragraph (2) of subdivision (e) of this section.

(C) Where applicable, revised component information in accordance with subparagraph (vi) of paragraph (1) of subdivision (d) of this section.

(D) Where applicable, revised counterweight information in accordance with subparagraph (vii) of paragraph (1) of subdivision (d) of this section.

(E) Where applicable, revised data in accordance with subparagraph (viii) of paragraph (1) of subdivision (d) of this section. For a tower crane, other than a self-erecting tower crane, the engineer who files the amendment request must certify that the revised data conforms to ASCE 7- 2005.

(F) Where changes are made that decrease the structural stability or structural strength of a crane, or increase the loads or stresses upon the crane, including but not limited to adding configurations, booms, or jibs, certification from the engineer who files the amendment request that the crane, as proposed to be amended, has successfully passed the prototype testing required by paragraph (3) of subdivision (e) of this section.

(G) In addition to the requirements of clauses (A) through (F) above, where the amendment request is filed on behalf of the manufacturer, any other supplements, as applicable, to the certificate of approval in accordance with paragraph (5) of subdivision (d) of this section.

(H) In addition to the requirements of clauses (A) through (F) above, where the amendment request is filed on behalf of the equipment owner:

1. A certification from the equipment owner that the manufacturer is no longer in business; or a copy of the request made to the manufacturer, along with any response from the manufacturer, as required by item 2 of clause (B) of subparagraph (ii) of paragraph (4) of subdivision (d) of this section.

2. When any information in the manufacturer's supplied manuals has to be revised, one or more revised manuals, as necessary, along with a certification from the engineer who files the amendment request that the revised manuals are in accordance with the requirements of paragraph (2) of subdivision (e) of this section. Deviations and modifications from the manufacturer's original materials must be clearly indicated.

3. When any of the checklists required by subparagraphs (iv) or (v) of paragraph (1) of subdivision (d) of this section has to be revised, one or more revised checklists, as necessary. Deviations and modifications from the manufacturer's original materials must be clearly indicated.

4. Certification from the engineer who files the amendment request, based upon a review of the design calculations and testing of the crane or derrick manufacturer by the engineer, or by sufficient calculations made by the engineer, or by testing acceptable to the commissioner, that:

A. The manufacturer's original safety factor of the equipment is not reduced by the proposed amendment.

B. The crane or derrick, as proposed to be modified by the amendment, complies with the applicable design and construction standard for the crane or derrick, as listed in paragraph (1) of subdivision (e) of this section.

5. Plates, tags, and decals as necessary to accord with the proposed amendment, along with instructions for their

use. Such items must be developed, signed, and sealed by the engineer who files the request for the amendment.

6. Certification from the engineer who files the request for amendment that the engineer approves the modification/addition stipulated in the amendment, and specifies the equipment configuration to which the approval applies.

7. Certification from the equipment owner that such owner will comply with the provisions of the amendment, including but not limited to ensuring their cranes or derricks which utilize the amendment are provided with the revised load rating charts and manuals, as well as plates, tags, and decals as necessary to accord with the proposed amendment.

(iv) **Issuance.** Upon approval of the amendment by the department, the department will issue an amended certificate of approval for the crane or derrick.

(A) **Special provisions for an amendment filed by an equipment owner.** Where an amendment request is filed by an equipment owner on or after January 1, 2016, only equipment owned by such owner may utilize the amendment. However, nothing in this clause will prohibit a separate equipment owner from filing, and the department approving, a separate amendment covering the same material.

(5) **Manufacturer supplements to the certificate of approval.** When required by subparagraphs (i) through (iv) below, the manufacturer must provide supplements to the certificate of approval. Such supplements, and all associated content, must be provided in English, with United States customary units, or where acceptable to the commissioner, metric units. When required by the department, the supplement must be submitted in an electronic format acceptable to the commissioner. Supplements must be filed by an engineer who meets the requirements of paragraph (2) of subdivision (d) of this section. No fee will be charged to file a supplement. When accepted by the department, a supplement will be considered part of the certificate of approval; except that any supplement filed under the provisions of subparagraph (iv) below will be applicable only for the specific job detailed in the certificate of on-site inspection.

(i) **Manual updates.** When the manufacturer revises any of the information required by subparagraph (i) of paragraph (1) of subdivision (d) of this section, the manufacturer must provide to the department one or more revised manuals, as necessary. The engineer who files the revised

manual must certify that the manual is in accordance with the requirements of paragraph (2) of subdivision (e) of this section.

(ii) Updates to inspection and maintenance checklists. When the manufacturer revises any of the checklists required by subparagraphs (iv) or (v) of paragraph (1) of subdivision (d) of this section, the manufacturer must provide to the department one or more revised checklists, as necessary.

Exception. Cranes or derricks whose initial certificate of approval was issued prior to January 1, 2016.

(iii) Contact information updates. When any manufacturer contact information required by subparagraph (x) of paragraph (1) of subdivision (d) of this section changes, the manufacturer must provide updated points of contact within five (5) business days of the change.

(A) Exception. Cranes or derricks whose initial certificate of approval was issued prior to January 1, 2016.

(B) No manufacturer support. Where there is no manufacturer to support a crane or derrick, the certificate of approval will remain valid.

(iv) Jobsite specific wind analysis for tower cranes. For the approval of the installation of a tower crane at a specific job site, other than a self-erecting tower crane, the following documentation must be submitted to the department prior to the approval of drawings for the certificate of on-site inspection.

(A) A copy of the jobsite specific information that the filing engineer provided to the manufacturer.

(B) A copy of the forces provided by the manufacturer to the filing engineer in response to clause (A) above, with an affirmation from the manufacturer that such forces are accurate.

(6) Safety bulletins and recall notices. The department will provide to each manufacturer a list containing the serial numbers of all cranes and derricks registered in New York City manufactured by such manufacturer. The manufacturer in turn must provide to the department all safety bulletins and recall notices issued by such manufacturer related to cranes and derricks found on the list provided by the Department when the safety bulletin or recall notice is issued. No fee will be charged to file such bulletin or notice with the department.

Safety bulletins and recall notices will not be considered part of a crane or derrick's certificate of approval and will not impact the validity of any such certificate. The department may require proof that a crane or derrick with a certificate of operation or a certificate of on-site inspection, or a crane or derrick for which such certificate(s) are sought complies with the safety bulletin or recall notice.

(7) **ISO certification.** If the manufacturer loses its International Organization for Standardization (ISO), or equivalent, certification for the make and model of the crane or derrick, this loss must be reported to the department within ten (10) business days after it occurs.

Exception. Cranes or derricks whose initial certificate of approval was issued prior to January 1, 2016.

(8) **Current certificate of approval holders.** Any crane or derrick that conforms with a previously issued, currently valid certificate of approval need not apply for a new certificate of approval.

(9) **Previously issued temporary certificates of approval.** Temporary certificates of approval issued prior to January 1, 2016, are deemed to be approved as an initial certificate of approval, retroactive to the date of issuance of the temporary certificate of approval, provided such temporary certificate of approval was not otherwise revoked prior to January 1, 2016, and provided that the prototype application for such temporary certificate of approval contained a certification from the manufacturer of the crane or derrick, or a person licensed and registered to practice the profession of engineering under the education law of the state of New York, that the crane or derrick was designed and constructed in accordance with one of the standards listed in clauses (A) through (F) of sub paragraph (i) of paragraph (1) of subdivision (e) of this section.

(10) **Suspension or revocation of a certificate of approval.** The department may suspend or revoke a certificate of approval in accordance with Section 28-105.10 of the New York City Administrative Code.

(e) **Standards.**

(1) **Design and construction standards.**

(i) **Design and construction standards for cranes or derricks whose prototype application is submitted on or after January 1, 2016.** Cranes and derricks, and their components, whose prototype application is submitted on or after January 1, 2016 must, in their entirety, be designed and constructed in accordance with the following:

(A) Mobile cranes, other than an articulating boom crane. For a mobile crane, other than an articulating boom crane, ASME B30.5 (2004, 2007, 2011, or 2014 editions), or EN 13000 (2004, 2010, or 2014 editions).

(B) Tower cranes, other than a self-erecting tower crane. For a tower crane, other than a self-erecting tower crane, ASME B30.3 (2004, 2009, or 2012 editions), or EN 14439 (2006 or 2009 editions).

(C) Derricks. For a derrick, ASME B30.6 (2003 or 2010 editions).

(D) Articulating boom crane. For an articulating boom crane, ASME B30.22 (2005 or 2010 editions).

(E) Self-erecting tower crane. For a self-erecting tower crane, ASME B30.29 (2012 edition), or EN 14439 (2009 edition).

(F) Dedicated pile drivers. EN 996 (2009 or 2014 editions).

(G) Equivalent standards. For any type of crane or derrick, such other standard as the commissioner deems equivalent to the ASME or EN standards listed above.

(ii) Design and construction standards for cranes and derricks whose prototype application was submitted prior to January 1, 2016. Cranes and derricks, and their components, whose prototype application was submitted prior to January 1, 2016 must have been designed and constructed in accordance with the following:

(A) Mobile cranes manufactured prior to October 1, 2006 and whose prototype application was submitted prior to October 1, 2006. Mobile cranes, and their components, manufactured prior to October 1, 2006 and whose prototype application was submitted prior to October 1, 2006 must, in their entirety, be designed and constructed in accordance with ASME B30.5 – 1968.

(B) Mobile cranes manufactured on or after October 1, 2006 and whose prototype application was submitted on or after October 1, 2006 but prior to January 1, 2016. Mobile cranes, and their components, manufactured on or after October 1, 2006 and whose prototype application was submitted on or after October 1, 2006 but prior to January 1, 2016, must, in their entirety, be designed and constructed in accordance with ASME B30.5 – 2004

Chapter 5-1 except Section 5-1.9.9, or EN 13000 (2004) except Section 4.2.6.

(C) Mobile cranes manufactured prior to October 1, 2006 and whose prototype application was submitted on or after October 1, 2006 but prior to January 1, 2016. Mobile cranes, and their components, manufactured before October 1, 2006 and whose prototype application was submitted on or after October 1, 2006 but prior to January 1, 2016, must, in their entirety, be designed and constructed in accordance with one of the following standards:

(i) ASME B30.5 – 2004 Chapter 5-1 except Section 5-1.9.9;

(ii) ASME B30.5 – 2000 Chapter 5-1 except Section 5-1.9.9;

(iii) ASME B30.5 – 1994 Chapter 5-1 except Section 5-1.9.9;

(iv) ASME B30.5 – 1989 Chapter 5-1 except Section 5-1.9.9;

(v) ASME B30.5 – 1982 Chapter 5-1 except Section 5-1.9.9;

(vi) EN 13000 (2004) except Section 4.2.6; or

(vii) Such other standard as the Commissioner deems appropriate.

(2) Manuals and load rating chart standards. Manuals and load rating charts for cranes and derricks must be in English, with United States customary units, or where acceptable to the commissioner, metric units, and be in accordance with the requirements of the standard utilized for the design and construction of the crane or derrick. Manuals and load rating charts must also include manual or chart numbers, and page numbers.

(i) De-rating. Load rating charts, and amendments to load rating charts, submitted on or after January 1, 2016, may not be de-rated to circumvent licensing provisions, or to meet exemptions contained within this section or within the New York City Construction Codes.

(3) Prototype testing standards.

(i) Prototype testing of mobile cranes submitted prior to October 1, 2006. A prototype of each mobile crane, and their components, submitted before October 1, 2006 must be tested for strength and stability in accordance with ASME B30.5-1968. Lattice boom cranes must also be tested in accordance with SAE J987 - 1967 and all mobile cranes with lattice or telescopic booms must also be tested in accordance with SAE J765 - 1990.

(ii) Prototype testing of mobile cranes submitted on or after October 1, 2006. A prototype of each mobile crane, and their components, submitted on or after October 1, 2006 must meet the prototype testing requirements in Test Option A or Test Option B as outlined below:

(A) Test Option A: SAE J1063 or SAE J987,

1. The following applies to equipment with cantilevered booms (such as telescopic boom cranes): All tests listed in SAE J1063 - 1993, Table 1, must be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J1063 - 1993, Table 2 must be met.

2. The following applies to equipment with pendant supported lattice booms: All the tests listed in SAE J987 - 2003, Table 1, must be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J987 - 2003, Table 2 must be met.

(B) Test Option B: EN 13000. All testing and verification requirements of EN 13000 (2004) must be met. In applying EN 13000 (2004), the following additional requirements must be met:

1. The following applies to equipment with cantilevered booms (such as telescopic boom cranes): The analysis methodology, such as computer modeling, must demonstrate that all load cases listed in SAE J1063 - 1993 meet the strength margins listed in SAE J1063-1993 Table 2.

2. The following applies to equipment with pendant supported lattice booms: The analysis methodology, such as computer modeling, must demonstrate that all load cases listed in SAE J987 - 2003 meet the strength margins listed in SAE J987- 2003 Table 2.

3. Analysis verification. The physical testing requirements under SAE J1063 - 1993 and SAE J987 - 2003 must be met unless the reliability of the analysis methodology, such as computer modeling, has been demonstrated by a documented history of verification through strain gauge measuring or strain gauge measuring in combination with other physical testing.

(iii) Prototype testing of tower cranes manufactured on or after November 8, 2010. Tower cranes manufactured on or after November 8, 2010, must meet the prototype testing requirements in EN 14439 (2006).

(4) Manufacturing standards. Cranes and derricks, and their components, whose application for prototype approval is submitted on or after January 1, 2016 must, in their entirety, be manufactured by an entity that possesses an ISO 9001 certification, or an equivalent international certification acceptable to the commissioner.

(f) Certificate of operation. Reserved.

(g) Certificate of on-site inspection.

(1) Certificate of on-site inspection required. In order to operate a crane or derrick at a job site, a certificate of on-site inspection is required as stipulated in Section 3319.6 of the New York City Building Code. The owner of the premises, building or structure, or his designated representative, shall file an application in quadruplicate at the department office in the borough where the premises is located. Such application shall be accompanied by plans showing proposed locations of the crane or derrick, pertinent features of the site such as assumed soil bearing values, ground elevations and slopes, vaults or other subsurface structures, supporting platforms or structures, and the swing of the crane or derrick. Also, a document shall be submitted, signed by a licensed engineer or registered architect which shall include the following information where the crane or derrick is to be supported by soil:

(i) That he has inspected the soil at the proposed location or locations of the crane or derrick;

(ii) His estimate of the soil bearing value;

(iii) That he has explored the existence of any sheeting or retaining walls supporting soil adjoining any excavation which may be affected and certifies as to its adequacy;

(iv) If the crane or derrick is to be on the street, that he has explored the existence of vaults or other subsurface structures which could impair the bearing value of the street or sidewalk;

(v) That the load imposed upon the soil by the crane or derrick including supporting platform, does not exceed such bearing value under any condition of loading.

(2) Exemption from certain filings. Where a crane not exceeding 160 feet in height, including jibs and any other extensions to the boom is to be used for a period not exceeding 24 hours, or a crane not exceeding 50 feet in height, including jibs and any other extensions to the boom with a maximum rated capacity of 20 tons, is to be positioned on the roadway or sidewalk, a certificate of on-site inspection shall be required. However, the requirements relating to plans and a document of a licensed professional engineer or registered architect enumerated in paragraph (1) of subdivision (g) of this section shall not apply nor shall the three regular working day provisions be applicable under the following conditions:

(i) That a prototype approval has been obtained showing the means required to distribute the weight of the crane and the maximum working loads.

(ii) A statement from the owner of the structure, building or premises or his authorized agent that he visited the site and that there are no excavations or retaining walls and that no vaults or subsurface construction exists at the site.

(3) Exemption for cranes of a limited size. A certificate of on-site inspection shall not be required under the following conditions:

(i) For a crane not exceeding 160 feet in height including jibs and any other extensions to the boom, which is to be used for a period not exceeding 48 hours and operating entirely within the property lines and in such locations which are at least a boom length, including jibs and any extensions thereof, distant from all lot lines.

(ii) For service cranes and clamshells operated entirely within the property lines and within such locations which do not involve the moving of any loads over the roadway or sidewalk. This exemption shall apply only to cranes with a boom length, including jibs and any extension thereof, not exceeding 110 feet.

(iii) For the use of cranes as provided for in subparagraphs (i) and (ii) of paragraph (3) of subdivision (g) of this section, notice of the operation of the crane at the job site shall be given to the division of cranes and

derricks, department of buildings, by telephone and confirmed in writing. It shall be the responsibility of an appointed person to provide firm and uniform footing and, when necessary, provide substantial timbers, cribbing or other structural members sufficient to distribute the load so as not to exceed the safe bearing capacity of the underlying material.

(4) Special provisions for cranes or derricks supported by a building or structure.

(i) Statement. Where the crane or derrick is supported by a building or a structure, the statement by the licensed engineer or registered architect referred to in paragraph (1) of subdivision (g) of this section shall include the means of supporting and bracing the equipment. The swing of the crane or derrick shall be shown on the plans to insure clearance during operation. Computations shall be submitted with the application showing all reactions imposed on the structure by the crane or derrick, including those due to impact and wind. Such computations shall verify that the stability of the building or structure will not be impaired when the crane or derrick is in operation and that no structural members will be overstressed due to forces induced by the crane or derrick.

(ii) Concrete structures. If the structure is a concrete structure, test reports of the compression strength of the concrete shall be submitted to insure that the concrete supports of the crane or derrick have developed sufficient strength to support the crane or derrick before it is installed. The means for establishing concrete strength before imposing crane or derrick loads upon the structure shall be indicated on the application.

(iii) Anchorages. All anchorages for cranes and derricks shall be approved by an appointed person.

(5) Exemption for pile drivers and clamshells. A certificate of on-site inspection shall not be required for pile drivers or clamshells operating entirely within the lot lines under the following conditions:

(i) Where pile driving equipment is designed or supported on a platform so that the soil bearing pressure does not exceed 500 pounds per square foot, a certificate of on-site inspection shall not be required.

(ii) Where clamshells are operating on construction sites and are at least the depth of excavation height from the edge of the excavation and where the soil bearing pressure does not exceed 500 lbs. per square foot, a certificate of on-site inspection shall not be required.

(iii) Where the pressure on the soil is in excess of 500 pounds per square foot but does not exceed 2,500 pounds per square foot, a pile driver or

clamshell may be operated without a certificate of on-site inspection under the following conditions:

(A) That borings have been filed with the department in the construction application under which the work is being performed, and

(B) An amendment is filed to such application by an engineer or architect certifying that on the basis of the borings, the soil is adequate to support the load to be imposed thereon by the subject equipment.

(6) **Cableways.** The requirements of paragraphs (1) and (4) of subdivision (g) of this section, and Section 3319.6 of the New York City Building Code, also apply to cableways.

(7) **Special provisions for cranes operating on a sidewalk or roadway.** Notwithstanding the provisions of paragraphs (1) through (6) of this subdivision, where a crane is operated on the sidewalk or roadway, a permit from the department of transportation shall be obtained and the pressure on such surface shall not exceed 3500 pounds per square foot. The pressure shall be distributed on the roadway by means of timber platforms extending not less than twelve (12) inches beyond the base of the outriggers on all sides and sufficiently thick to uniformly distribute the pressure as required above of all the loads including the weight of the crane. The timber mats shall have a minimum thickness of two (2) inches. All cranes equipped with steel tracks shall be supported by timber platforms not less than six inches thick and covering the entire base of the crane.

(h) **Unsafe hoisting machines.** When it is found that equipment is dangerous or unsafe a notice or order to stop work may be issued by the commissioner, or his authorized representative. Such notice or order may be given to the owner or lessee of the equipment involved, or to the agent of any of them, or to the person or persons executing the work or operating the equipment in writing. If the operation of the hoisting machine is not discontinued, the inspector shall report same to his superior and an engineer shall be sent to reinspect. Upon confirmation of the unsafe condition by the engineer, the hoisting machine shall be red tagged. All persons shall be prohibited from using the said equipment until the danger is removed or the unsafe condition is rectified. An unsafe notice shall not be removed from the equipment, except by an authorized inspector or representative of the department of buildings.

(i) **Annual renewal of the certificate of operation.** Application for renewal of a certificate of operation, as stipulated in Section 3319.5 of the New York City Building Code, shall be accompanied by inspection and maintenance records in accordance with paragraph (1) of subdivision (k) of this section and paragraph (1) of subdivision (m) of this section. Upon approval of the application, a new certificate of operation shall be issued after a satisfactory inspection by a department inspector.

(j) **Load rating chart for tower and climber cranes.** A substantial, durable and clearly legible rating chart shall be provided with each tower and climber crane and securely affixed in the cab. The chart shall include load ratings approved by the department for specific lengths of components, counterweights, swing, and radii.

(k) **Inspection of cranes and derricks.**

(1) **Certification and inspections required.** The owner of a crane or derrick when applying for a certificate of approval in accordance with subdivision (d) of this section shall certify that all applicable regulations regarding inspection and maintenance will be complied with. All inspections required by the owner shall be performed only by appointed personnel. The inspections shall be performed to provide information requested in a department supplied chart and all deficiencies shall be corrected. No record of information not required by such chart shall be required to be maintained in writing.

(2) **Inspection classification.** Inspection procedure for cranes and derricks in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the crane or derrick and the degrees of their exposure to wear, deterioration or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below:

(i) **Frequent inspection.** Daily to monthly intervals.

(ii) **Periodic inspection.** 1 to 12 month intervals or as specifically recommended by the manufacturer.

(3) **Frequent inspection.** Items such as the following shall be inspected for defects at intervals as defined in subparagraph (i) of paragraph (2) of subdivision (k) of this section or as specifically indicated, including observation during operation for any defects which might appear between regular inspections. Any defects revealed by inspection shall be corrected. Where such defects constitute a safety hazard, the crane or derrick shall not be operated until such defects are corrected.

(i) All control mechanisms for maladjustment interfering with proper operation.-Daily.

(ii) All control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.

(iii) All safety devices for malfunction.

(iv) Deterioration or leakage in air or hydraulic systems. - Daily

(v) Crane or derrick hooks with deformations or cracks. - Refer to clause (C) of subparagraph (iii) of paragraph (3) of subdivision (l) of this section.

(vi) Rope reeving for non-compliance with crane or derrick manufacturer's recommendations.

(vii) Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, moisture accumulation, weatherproofing and grounding.

(viii) Tension in derrick guys. - Daily.

(ix) Plumb of derrick mast.

(x) Hoist brakes, clutches and operating levers. - Check daily for proper functioning before beginning operations.

(4) Periodic inspections of cranes and derricks. Complete inspections of the crane or derrick shall be performed at intervals as generally defined in subparagraph (ii) of paragraph (2) of subdivision (k) of this section, depending upon its activity, severity of service, and environment, or as required by subparagraphs (i) and (ii) of paragraph (2) of subdivision (k) of this section. These inspections shall include the requirements of subdivision (k) of this section, and in addition, items specifically indicated below. Any defects revealed by inspection shall be corrected. Where such defects constitute a safety hazard the crane or derrick shall not be operated until such defects are corrected.

(i) Deformed, cracked or corroded members in the crane or derrick structure and boom.

(ii) Loose bolts or rivets.

(iii) Cracked or worn sheaves and drums.

(iv) Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers and locking devices.

(v) Excessive wear on brake and clutch system parts, linings, pawls and ratchets.

(vi) Load, boom angle and other indicators over their full range, for any significant inaccuracies.

(vii) Gasoline, diesel, electric or other power plants for improper performance or non-compliance with safety requirements.

(viii) Excessive wear of chain drive sprockets and excessive chain stretch.

(ix) Crane or derrick hooks. Magnetic particle or other suitable crack detecting inspection should be performed at least once each year by an inspection agency retained by the owner and approved by the department. Certified inspection reports are to be made available to the department upon request.

(x) Travel steering, braking and locking devices, for malfunction.

(xi) Excessively worn or damaged tires.

(xii) Derrick gudgeon pin for cracks, wear and distortion each time the derrick is to be erected.

(xiii) Foundation or supports shall be inspected for continued ability to sustain the imposed loads.

(5) Cranes or derricks not in regular use.

(i) A crane or derrick which has been idle for the period of one month or more, but less than six months, shall be given an inspection by the owner conforming with requirements of paragraph (3) of subdivision (k) of this section and subparagraph (i) of paragraph (1) of subdivision (m) of this section before an application for a certificate of on-site inspection in accordance with Section 3319.6 of the New York City Building Code is submitted to the department.

(ii) A crane which has been idle for the period of over six months, shall be given a complete inspection by the owner conforming with requirements of paragraphs (3) and (4) of subdivision (k) of this section and subparagraph (ii) of paragraph (1) of subdivision (m) of this section before an application for a certificate of on-site inspection in accordance with Section 3319.6 of the New York City Building Code is submitted to the department.

(l) Maintenance of Cranes and Derricks.

(1) Preventive maintenance.

(i) A preventive maintenance program based on the crane or derrick manufacturer's recommendations shall be established. Dated and detailed records shall be readily available to the department.

(ii) It is recommended that replacement parts be obtained from the original equipment manufacturer.

(2) Maintenance procedure.

(i) Before adjustments and repairs are started on a crane or derrick, the following precautions shall be taken as applicable:

(A) Crane or derrick placed or arranged where it will cause the least interference with other equipment or operations in the area.

(B) All controls at the "off" positions.

(C) Starting means rendered inoperative.

(D) Warning or "out of order" signs placed on the crane or derrick and hoist.

(E) Power plant stopped or disconnected at take-off.

(F) Boom lowered to the ground if possible or otherwise secured against dropping.

(G) Lower load block lowered to the ground or otherwise secured against dropping.

(ii) After adjustment and repairs have been made, the crane or derrick shall not be operated until all guards have been reinstalled, safety devices reactivated and maintenance equipment removed.

(3) Adjustments and Repairs.

(i) Any unsafe conditions disclosed by the inspection requirements of subdivision (k) of this section shall be corrected before operation of the crane or derrick is resumed. Adjustments and repairs shall be done only by a competent person.

(ii) Adjustments shall be maintained to assure correct functioning of components. The following are examples:

(A) All functional operating mechanisms.

- (B) Safety devices.
- (C) Control systems.
- (D) Power plants.
- (E) Tie downs or anchorages.
- (F) Signal system.
- (G) Guys.

(iii) Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples:

- (A) All critical parts of functional operating mechanisms which are cracked, broken, corroded, bent or excessively worn.
- (B) All critical parts of the crane or derrick structure which are cracked, bent, broken or excessively corroded.
- (C) Crane or derrick hooks showing defects described in 15.3.5 shall be discarded. Repairs by welding or reshaping are not acceptable unless written approval of the department is obtained.
- (D) Pitted or burned electrical contacts should be corrected only by replacement and in sets. Controller parts should be lubricated as recommended by the manufacturer.

(iv) All replacement parts or repairs shall have at least the original safety factor and be in accordance with the specifications of the manufacturer. Approval of the department shall be required for the replacement or repair of main structural members as listed below, for which no fee will be required:

- (A) Boom or mast;
- (B) Jib or extensions;
- (C) Gentries;
- (D) Counterweight supports and attachments;
- (E) Rope; and
- (F) Overturning stability.

Exception: Only clauses (A), (B) and (E) above apply to derricks.

(4) Lubrication of Cranes and Derricks.

(i) All moving parts of the crane or derrick and hoist for which lubrication is specified, including rope and chain, shall be regularly lubricated. Lubricating systems shall be checked for proper delivery of lubricant. Particular care should be taken to follow manufacturer's recommendations as to point and frequency of lubrication, maintenance of lubricant levels and types of lubricants to be used. Lubrication shall be performed under the supervision of the crane operator, oiler or maintenance engineer.

(ii) Machinery shall be stationary while lubricants are being applied and protection provided as called for in clauses (B) through (E) of subparagraph (i) of paragraph (2) of subdivision (1) of this section inclusive, unless such machinery is equipped for automatic lubrication.

(m) Rope Inspection, Replacement and Maintenance by Owner for Cranes and Derricks.

(1) Rope Inspection.

(i) Frequent Inspection.

(A) All ropes in continuous service shall be visually inspected once every working day. A visual inspection shall consist of observation of all rope that can reasonably be expected to be in use during the day's operation. This visual inspection shall be directed towards discovering gross damage that may be an immediate hazard, including the following:

1. Distortion of the rope such as kinking, crushing, unstranding, birdcaging, main strand displacement, or core protrusion. Loss of rope diameter in a short rope length or unevenness of outer strands should provide evidence that the rope or ropes must be replaced.

2. General corrosion

3. Broken or cut strands

4. Number, distribution and type of visible broken wires (See subparagraph (ii) of paragraph (2) of subdivision (m) of this section for further guidance)

5. Core failure in rotation-resistant ropes. When such damage is discovered, the rope shall be either removed from service or given an inspection as detailed in subparagraph (ii) of paragraph (1) of subdivision (m) of this section.

(B) Care shall be taken when inspecting sections of rapid deterioration such as flange points, crossover points, and repetitive pickup points.

(C) Care shall be taken when inspecting the following types of rope:

1. Rotation-resistant rope.

2. Boom hoist rope.

(ii) Periodic Inspection.

(A) There shall be periodic inspections performed at least annually. The inspection frequency shall be determined by a qualified person and shall be based on such factors as expected rope life as determined by experience on the particular installation or similar installations, severity of the environment, percentage of capacity lifts, frequency rates of operation, and exposure to shock loads. Inspections need not be at equal calendar intervals and should be more frequent as the rope approaches the end of its useful life.

(B) In the event a periodic inspection is not feasible within a 12-month period due to existing set-up and configuration of the equipment or due to site conditions, such periodic inspection shall be performed as soon as it becomes feasible but no longer than an additional 6 months for running ropes and, for standing ropes, at the time of disassembly. Written notification and approval of the commissioner must be obtained prior to extending the use of the rope beyond the 12-month inspection period.

(C) Periodic inspections shall be performed by a qualified person. This inspection shall cover the entire length of rope. Only the surface wires of the rope shall be inspected. Any deterioration resulting in an appreciable loss of original strength shall be noted and determination made as to whether further use of the rope would constitute a hazard. The periodic inspection shall include examination of the following:

1. Points listed in clause (A) of subparagraph (i) of paragraph (1) of subdivision (m) of this section.

2. Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

3. Severely corroded or broken wires at end connections.

4. Severely corroded, cracked bent, worn or improperly applied end connections.

(D) Care shall be taken when inspecting sections of rapid deterioration, such as the following:

1. Sections in contact with saddles, equalizer sheaves, or other sheaves where rope travel is limited.

2. Sections of the rope at or near terminal ends where corroded or broken wires may protrude.

(E) All rope that has been idle for a period of six months or more shall be given a periodic inspection before it is placed into service.

(2) Rope Replacement.

(i) When a rope reaches any one of the specified removal criteria, it may be allowed to operate to the end of the work shift, based on the judgement of a qualified person. The rope shall be replaced after that work shift, at the end of the day, or at the latest time prior to the equipment being used by the next work shift.

(ii) Removal criteria for rope replacement shall meet manufacturer's specification or as follows:

(A) Broken Wires:

1. In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay.

2. In rotation-resistant ropes, two randomly distributed broken wires in six diameters or four randomly distributed broken wires in 30 rope diameters.

3. One outer wire broken at the point of contact with the core rope that has worked its way out of the rope structure and protrudes or loops out from the rope structure. Additional inspection of this section is required.

4. Kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure.

5. Evidence of heat damage from any cause.

6. Reductions from nominal diameter of more than the following:

A. 1/64 in. for diameters up to and including 5/16 in.

B. 1/32 in. for diameters up to and including 1/2 in.

C. 3/64 in. for diameters up to and including 3/4 in.

D. 1/16 in. for diameters up to and including 1 1/8 in.

E. 3/32 in. for diameters up to and including 1 1/2 in.

7. In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(iii) Replacement rope shall have strength rating at least as great as the original rope furnished or recommended by the crane manufacturer. Any deviation from the original size, grade, or construction shall be specified by the rope manufacturer, the crane manufacturer, or a qualified person.

(iv) Discarded rope shall not be used for slings.

(3) Rope Maintenance.

(i) Rope shall be stored to prevent damage or deterioration.

(ii) Unreeling or uncoiling of rope shall be done as recommended by the rope manufacturer and with extreme care to avoid kinking or inducing a twist.

(iii) Before cutting a rope, seizings shall be placed on each side of the place where the rope is to be cut to prevent unlaying of the strands. On preformed rope, one seizing on each side of the cut is required. On non-preformed ropes of 7/8 inch diameter or smaller, two seizings on each side of the cut are required, and for non-preformed rope of one inch diameter or larger, three seizings on each side of the cut are required.

(iv) During installation care shall be observed to avoid dragging of the rope in dirt or around objects which will scrape, nick, crush, or induce sharp bends in it.

(v) Rope should be maintained in a well lubricated condition. It is important that lubricant applied as part of a maintenance program shall be compatible with the original lubricant and to this end the rope manufacturer should be consulted. Those sections of rope which are located over sheaves or otherwise hidden during inspection and maintenance procedures require special attention when lubricating rope. The object of rope lubrication is to reduce internal friction and to prevent corrosion. Periodic field lubrication is particularly important for non-rotating rope.

(n) Safety Devices Required. All cranes and derricks shall be equipped with safety devices as provided herein, except equipment used exclusively for pile driving, clamshell and dragline used for excavation. The commissioner shall approve these safety devices.

(1) Indicators or Limiters. All mobile cranes with a maximum rated capacity of 3 tons or more shall be equipped with a load indicator, load moment indicator, or a load moment limiter.

(i) Cranes with a total boom length including jibs and any other extensions not exceeding 150 feet shall be exempt.

(ii) Cranes manufactured before December 30, 1993 shall be exempt. The margin of stability for determination of load ratings of these cranes shall be established at 75 percent of the load, which will produce a condition of tipping or balance with the boom in the least stable direction relative to the mounting where overturning stability governs the lifting performance.

(iii) Cranes shall have a radius or boom angle indicator provided in conjunction with a load indicator.

(2) Anti-Two Blocking Features. All mobile cranes with a maximum rated capacity exceeding one ton manufactured after February 28, 1992, shall be equipped with anti-two-blocking features as follows:

(i) Telescopic Boom Cranes shall have an anti-two-block device for all points of two-blocking that automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom and/or jib tip.

(ii) Lattice Boom Cranes shall have an anti-two-block device for all points of two-blocking that either automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom and/or jib tip or warns the operator in time for the operator to prevent two-blocking.

(3) Additional Safety Devices Required. All mobile cranes with a maximum rated capacity exceeding one ton shall be equipped with the following additional safety devices:

(i) A deadman control on the control levers in the cab or crane operator's station, where the crane is electrically powered.

(ii) An effective audible warning and operating signal on the outside of the cab.

(iii) Boom stops and boom hoist safety shutoffs. However, boom stops shall not be required for telescopic booms.

(iv) An indicator for leveling the crane.

(v) Hoist drum rotation indicator if the drum is not visible from the operator's station.

(4) Malfunctioning Safety Devices. The load indicator, load moment indicator, load moment limiter, hoist drum rotation indicator, and the anti-two blocking devices shall also be known as operational aids, which provide information to facilitate the operation of a crane or that take control of particular functions without action of the operator when a limiting condition is sensed. When any of these operational aids are inoperative or malfunctioning, the following alternative measures shall be implemented to allow continued use of the crane:

(i) Load indicator, load moment indicator, or load moment limiter: The weight of the load shall be determined from a reliable source (such as the manufacturer's equipment specification), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight) or by other equally reliable means before the load is

hoisted. To ensure that the weight of the load does not exceed the crane ratings at the maximum radius at which the load is to be handled, the radius shall be determined through the use of a boom angle indicator, radius indicator or by measurement.

(ii) Hoist drum rotation indicator: Mirrors and/or remote video cameras and displays shall be provided so that the operator can see the drum.

(iii) Anti-two-block device: The cable shall be clearly marked (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking or an additional signal person shall be utilized to monitor the position of the load block or overhaul ball.

(iv) Recalibration or repair of the safety device shall be accomplished as soon as is reasonably possible, as determined by a qualified person.

(5) Tower Cranes and Climber Cranes. All tower cranes and climber cranes excluding truck-mounted tower cranes shall have the following:

(i) Warning light activated at 100% allowable overturning moment,

(ii) Acoustic signal sounding at 105% allowable overturning moment,

(iii) Automatic stop if 110% allowable overturning moment is reached,

(iv) Automatic stop if load exceeds maximum rated load in high gear,

(v) Automatic stop if load exceeds maximum rated load in intermediate gear,

(vi) Automatic stop if load exceeds maximum rated load in low gear,

(vii) Predeceleration before top position of the hook,

(viii) Limit switch for top position of the hook,

(ix) Predeceleration before low position of the hook,

(x) Limit switch for the trolley traveling out,

(xi) Limit switch for the trolley traveling in,

(xii) Acceleration limit on the hoisting movement,

(xiii) Acceleration limit on the swing movement,

(xiv) Acceleration limit on the trolley movement, and

(xv) Deadman control on both control levers in box.

(6) Derricks. Safety devices for derricks shall be approved by the commissioner and shall be installed within six months after said devices are accepted. However, where electrically powered, a deadman control on control levers shall be installed prior to applying for a certificate of operation pursuant to Section 3319.5 of the New York City Building Code.

(o) Characteristics and Special Requirements for Derricks.

(1) Rated load marking.

(i) For derricks, a substantial, durable and clearly legible load rating chart shall be provided for each particular installation. The rating chart shall be securely affixed where it is visible to personnel responsible for the operation of, the equipment. The chart shall include but not be limited to the following data:

(A) Manufacturer's load ratings as approved by the department at corresponding ranges of boom angle or operating radii.

(B) Specific lengths of components on which the load ratings are based.

(C) Required parts for hoist reeving.

(D) Size and construction of all ropes shall be shown either on the rating chart or in the operating manual.

(ii) For all other derricks, the manufacturer shall provide sufficient information from which capacity charts can be prepared and approved by the department for the particular installation. The capacity charts shall be located either at the derrick or the job site office.

(2) Construction.

(i) General. Derricks shall be constructed to adequately meet all stresses imposed on all members and components.

(ii) Guy derricks.

(A) The minimum number of guys is six. Preferably, the guys should be equally spaced around the mast.

(B) The manufacturer shall furnish complete information recommending:

1. The number of guys;
2. The spacing around the mast;
3. The maximum vertical slope and initial tension or sag of all guys;
4. The size and construction of rope to be used in each.

(C) The mast base shall permit free rotation of the mast with allowance for slight tilting of the mast caused by guy slack.

(D) The mast cap shall:

1. Permit free rotation of the mast;
2. Adequately withstand tilting and cramping action imposed by the guy loads;
3. Be secured to the mast to prevent disengagement during erection; and
4. Be provided with means for attachment of guy ropes.

(iii) Stiff leg derrick.

(A) The mast shall be supported in the vertical position by two stiff legs one end of each being connected to the top of the mast and the other end securely anchored. The stiff legs shall be capable of withstanding the loads imposed by the boom at any point within its range of swing.

(B) The mast base shall:

1. Permit free rotation of mast;
2. Permit slight inclination of the mast without binding; and
3. Provide means to prevent the mast from lifting out of its socket when the mast is in tension.

(C) The stiff leg connecting member at the top of the mast shall:

1. Permit free rotation of the mast;
2. Adequately withstand the loads imposed by the action of the stiff legs; and
3. Be so secured as to oppose lift off forces at all times.

(3) Ropes and reeving accessories.

(i) Guy ropes.

(A) Guy ropes shall be of suitable size, grade and construction to withstand the maximum load imposed.

(B) The nominal breaking strength of each rope shall be no less than three times the load applied to the rope.

(C) Tie downs or kicker devices which may be easily loosened shall have locknuts or other suitable provision to prevent loosening.

(ii) Boom hoist ropes.

(A) Boom hoist ropes shall be of suitable size, grade and construction to withstand the maximum load imposed.

(B) The live rope reeving system in a boom suspension shall withstand the maximum load imposed and be of sufficient length to permit lowering the boom point to horizontal position with at least three full wraps of rope remaining on the hoist drum.

(C) The nominal breaking strength of the most heavily loaded rope in a system shall be no less than three and a half times the loads applied to that rope.

(iii) Main hoist ropes.

(A) Main hoist ropes shall be of a suitable size and construction to withstand the maximum load imposed.

(B) Ropes in the main hoisting system shall be of sufficient length for the entire range of movement specified for the application with at least three full wraps of rope on the hoist drum at all times.

(C) The nominal breaking strength of the most heavily loaded rope in a system shall be no less than three and a half times the load applied to that rope.

(iv) Reeving accessories.

(A) Socketing shall be done in the manner specified by the manufacturer of the assembly.

(B) Rope end shall be anchored securely to the drum.

(C) Eyes shall be made in an approved manner and rope thimbles should be used in the eye.

(D) U-bolt clips shall have the U-bolt on the dead or short end, and the saddle on the live or long end of the rope. Spacing and number of all types of clips shall be in accordance with the clip manufacturer's recommendation and submitted to the department. Clips shall be drop-forged steel in all sizes manufactured commercially. When a newly installed rope has been in operation for an hour, all nuts on the clip bolts shall be retightened, and they should be checked for tightness at frequent intervals thereafter.

(E) Swaged, compressed, or wedge-socket fittings shall be applied as recommended by the rope, derrick, or fitting manufacturer.

(F) Where a half wedge socket is used it shall be of a positive locking type.

(G) If a load is supported by more than one rope, the tension in the parts shall be equalized.

(v) Sheaves.

(A) Sheave grooves shall be smooth and free from surface defects which could cause rope damage. The cross sectional radius at the bottom of the groove should be such as to form a close fitting saddle for the size rope used and the sides of the groove should be tapered outwardly to facilitate entrance of the rope into the groove. Flange corners should be rounded and the rims should run true about the axis of rotation.

(B) Sheaves carrying ropes which can be momentarily unloaded shall be provided with close fitting guards or other suitable devices

to guide the rope back into the groove when the load is applied again.

(C) The sheaves in the lower load block shall be equipped with close-fitting guards that will prevent ropes from becoming fouled when the block is lying on the ground with ropes loose.

(D) Means should be provided, if necessary, to prevent chafing of the ropes.

(E) All running sheaves shall be equipped with means for lubrication. Permanently lubricated, sealed and/or shielded bearings shall be acceptable.

(F) Boom and hoisting sheaves shall have pitch diameters not less than eighteen times the nominal diameter of the rope used.

(G) Boom point sheaves should be provided with suitable guides to limit the offlead angle of the rope when entering the grooves from either side.

(4) Anchoring and guying.

(i) Guy derricks.

(A) The mast base shall be securely anchored. Maximum horizontal and downward vertical thrusts encountered when handling rated loads with the particular guy slope and spacing stipulated for the application are among the design factors for which provision must be made.

(B) The guys shall be secured to the ground or other firm anchorage. Maximum horizontal and vertical pulls encountered while handling rated loads with the particular guy slope and spacing stipulated for the application are among the factors for which provision must be made.

(ii) Stiff leg derricks.

(A) The mast base shall be securely anchored. Maximum horizontal and upward and downward vertical thrusts encountered while handling rated loads stipulated for the application with the particular stiff-leg spacing and slope are among the factors for which provision must be made.

(B) The stiff legs shall be securely anchored. Maximum horizontal and vertical upward and downward thrusts encountered while handling rated loads with the particular stiff-leg arrangement stipulated for the application are among the factors for which provision must be made.

(5) Hoist. The hoist shall be suitable for the derrick work intended and shall be securely anchored to prevent displacement from the imposed loads.

(p) Operation of Cranes and Derricks.

(1) Operators.

(i) Cranes and derricks shall be operated only by the following persons:

(A) Persons licensed as operators by the department of buildings in accordance with Section 28-405 of the Administrative Code of the City of New York.

(B) Learners in the presence of and under the direct supervision of a licensed operator.

(ii) No person other than those listed under subparagraph (i) of paragraph (1) of subdivision (p) of this section and persons such as oilers and supervisors, whose duties require them to do so, shall enter the cab of a crane and then only in the performance of his duties and with knowledge and consent of the operator.

(2) Operating practices.

(i) The operator shall not engage in any practice which will divert his attention while actually engaged in operating the crane or derrick hoist.

(ii) The operator shall respond to signals only from the appointed signal men.

(iii) The operator shall be responsible for the operation of the crane or derrick hoist.

(iv) For mobile cranes, the warning signal shall be sounded each time before on-site traveling and intermittently during such travel, particularly when approaching workmen.

(v) Before leaving his crane or derrick unattended, the operator shall:

- (A) Land any attached load, bucket, lifting magnet, or other device.
- (B) Disengage clutches.
- (C) Set travel, swing, boom brakes and other locking devices.
- (D) Put controls in the "off" position.
- (E) Stop the engine.
- (F) Secure mobile cranes against accidental travel.
- (G) Lock and secure the equipment against unauthorized operation.
- (vi) On leaving a mobile crane overnight, ground chocks shall be set and crane booms shall be lowered to ground level or otherwise fastened securely against displacement by wind loads or other external forces.
- (vii) If there is a warning sign on the switch or engine starting controls, the operator shall not close the switch or start engine until the warning sign has been removed by the person placing it there.
- (viii) Before closing the switch, or starting the engine, the operator shall see to it that all controls are in the "off" position and all personnel are in the clear.
- (ix) If power fails during operation, the operator shall:
 - (A) Set all brakes and locking devices.
 - (B) Move all clutch or other power controls to the "off " position.
 - (C) Communicate with the appointed individual in charge of operations.
 - (D) If practical, the suspended load should be landed under brake control.
- (x) The operator shall familiarize himself with the equipment and its proper care. If adjustments or repairs are necessary, or any defects are known he shall report the same promptly to his employer or other person responsible for the equipment and shall also notify the next operator of the defects upon changing shifts.

(xi) All controls shall be tested by the operator at the start of a new shift. If any controls do not operate properly, they shall be adjusted or repaired before operations are begun.

(xii) Booms of mobile cranes which are being assembled or disassembled on the ground with or without support of the boom harness (equalizing sheaves, bridal and boom pendants) should be securely supported by proper blocking to prevent dropping of the boom sections.

(q) Handling the Load. No crane or derrick shall be loaded beyond the rated load.

(1) Size of load. On all operations involving cranes or derricks which are not equipped with those safety devices which make use of load measuring systems, there shall be a competent appointed individual assigned on a full-time basis to be responsible for determining the magnitude of loads to be lifted or lowered. The operator shall not make a lift unless he has first determined the weight of the load or is informed of such weight by the appointed person responsible for the operation.

(2) Attaching the load.

(i) The hoist rope shall not be wrapped around the load.

(ii) The load shall be attached to the hook by means of slings or other approved devices.

(3) Moving the load.

(i) The appointed individual directing the lift shall see that:

(A) In the case of a mobile crane, the crane is level and where necessary, chocked properly.

(B) The load is well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(ii) Before starting to hoist, he shall take care that:

(A) Hoist ropes are not kinked.

(B) Multiple part lines are not twisted around each other.

(C) The hook is brought over the load in such a manner as to prevent swinging.