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DOI ISSUES REPORT ON INSPECTIONAL ISSUES RELATING TO FATAL FIRE AT 130 LIBERTY STREET
--Joint Investigation with FDNY and DOB identifies "missed opportunities"
and recommends improved supervision--

ROSE GILL HEARN, Commissioner of the New York City Department of Investigation ("DOI"), announced today that DOI has issued a report of its findings and recommendations following a joint investigation with the New York City Fire Department ("FDNY") and the New York City Department of Buildings ("DOB") of those two agencies' inspectional performance at 130 Liberty Street in the months preceding the fire of August 18, 2007, where two firefighters died.

DOI Commissioner Rose Gill Hearn said, "Last December, three individual construction supervisors and one corporation were charged with criminal responsibility for the deaths of two City firefighters at 130 Liberty Street. But as today's report shows, the City has also confronted and is addressing the administrative failings of its own inspectional forces, whose efforts proved no match for the contractors' cavalier disregard for public safety. This is a necessary task, because as long as developers tolerate and employ irresponsible contractors, we must rely on our inspectors to keep us from harm. I want to thank Commissioners Scoppetta and LiMandri and their staffs for their assistance and cooperation."

FDNY Commissioner Nicholas Scoppetta said, "I want to thank Commissioner Gill Hearn and her staff at DOI, along with members of FDNY's Bureau of Investigations and Trials and the Department of Buildings, for their collaborative efforts in producing this thorough and comprehensive report. I will carefully review the findings and recommendations in the report both for suggestions on how to make further improvements to our revamped building inspection program, and as the basis for any disciplinary actions that may be warranted."

DOB Commissioner Robert LiMandri said, "Since the day of this tragic fire, we have worked closely with the Fire Department and other City agencies to make sure something like this can never happen again. As a result, there is more industry oversight and more cross training among firefighters, building inspectors and DEP inspectors. I would like to thank Commissioner Gill Hearn and her staff for their diligent work, and I look forward to reviewing the report and its recommendations so we can continue to improve our inspection procedures and increase the safety of construction sites across the City."

In gathering the facts, investigators reviewed thousands of records, including City rules and regulations for FDNY and DOB, inspectional reports, internal emails and memoranda and interviewed more than 60 FDNY and DOB employees.

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The investigation of administrative issues found that

- FDNY did not inspect the site between March 2007, when demolition commenced, and the date of the fire.
- A FDNY rule required inspections every 15 days, but the various officers responsible for inspections of 130 Liberty Street in 2007, from the local fire company through the battalion and division, either disregarded or were unaware of the rule.
- Inspectional practices varied among individual FDNY officers: two officers previously assigned to the local fire company conducted at least 14 inspections of 130 Liberty Street between May 2004 and March 2006, but their successors conducted none.
- Injuries, debris that fell on and damaged the adjacent firehouse, and other incidents resulted in various FDNY responses to 130 Liberty Street in the months preceding the fire but no inspections.
- FDNY's senior executives understood the importance of demolition inspections in ensuring firefighters' safety, but they were unaware of or did not address their subordinates' noncompliance with inspectional rules. A lack of communication up and down the chain of command meant that the importance of compliance was not communicated and reinforced to the lower ranks.
- DOB created a unit in early 2007 to inspect construction and demolition sites in lower Manhattan and stationed inspectors at 130 Liberty Street on a full-time basis but never provided specialized training or specific instructions to the inspectors, whose levels of experience varied.
- DOB's two management-level inspectors overseeing lower Manhattan met periodically with the inspectors responsible for 130 Liberty Street but did not know and never asked what in particular they were checking. One said that he "imagined" that the inspectors were tracing the standpipe in the basement and "thought" they knew what they were looking at but, in hindsight, realized that he was mistaken.
- On June 25, 2007, two months before the fatal fire, a DOB inspector discovered a breach and a plank of wood in the standpipe at an upper floor of 130 Liberty Street and, he later told DOI, advised one of the two management-level DOB inspectors mentioned above that the contractor, Bovis Lend Lease LMB, Inc., should be required to repair and hydrostatically test the standpipe to make sure that it was functioning. The upper-floor breach was repaired, but the standpipe was not tested. According to the Manhattan District Attorney's report, the catastrophic failure of the standpipe was the result of its being cut during the fall of 2006, when a 42-foot section in the basement was removed. While the plank of wood in the standpipe identified on June 25, 2007 was therefore not the cause of the catastrophic failure of the standpipe, a full test of the standpipe at that time should have revealed the pre-existing 42-foot breach. Not conducting the pressure test on June 25, 2007, which a DOB inspector thought should have been done, was a "serious missed opportunity" to discover the other issues that then existed with the standpipe.
- DOB inspectors assigned to the unit for lower Manhattan never inspected the standpipe system in the basement of 130 Liberty Street or the planks of wood covered in polyethylene sheeting that served as containment barriers in the stairwells in the months preceding the fire, attributing their failure to do so to instructions they received to stay out of asbestos-contaminated and abatement areas, which they believed were the exclusive province of environmental inspectors, and a general lack of knowledge and instruction concerning the standpipe system and its significance.

The City, including the FDNY and DOB, has implemented reforms in the aftermath of the fatal fire:

- The Mayor's Office convened a Task Force to improve the safety of construction, demolition and abatement operations in the City. Last year, the Task Force issued more than 30 recommendations to strengthen City agencies' procedures. Implemented recommendations include cross-training of FDNY, DOB and Department of Environmental Protection (DEP) inspectors, common inspection protocols, and regular inter-agency sharing of computerized and other information.
- FDNY has established a computer notification system that will alert firehouses to buildings (including buildings under construction and demolition) that must be inspected.
- DOB implemented various measures at 130 Liberty Street to ensure standard, documented inspections of key safety components, such as the standpipe system, cranes, hoists, and egress, and the enforcement of no-smoking rules.

DOI's report recommends additional reforms, including the following:

- FDNY should designate a Compliance Officer reporting to its executive level who will ensure that all rules are reasonable, practical, and enforced. Remarkably, several FDNY officers attributed their failures to inspect 130 Liberty Street to ignorance of the 15-day inspection rule and their professed belief that FDNY rules were too numerous to be known or followed by FDNY officers. Members throughout the Department should be told that they can and must contact the Compliance Officer when they know a rule is not being consistently carried out.
- FDNY scheduling practices for officers, which, under existing collective bargaining agreements, impair supervisory continuity and accountability, should be examined and reconsidered.
- DOB should implement and distribute a uniform DOB site safety log sheet and checklist of the items that contractors' site safety managers must inspect and document daily, such as the standpipe, stairwells, means of egress, guardrails, horizontal safety netting, and housekeeping.
- DOB should remind all inspectors that they must review the site safety manager's log during all applicable inspections, an existing requirement that the investigation revealed was disregarded at 130 Liberty Street.
- DOB supervisors should be expected to provide more active and meaningful supervision and guidance to their inspectors than they did in relation to 130 Liberty Street. DOB supervisors should ensure that their inspectors thoroughly understand each site they inspect, including their respective safety and environmental issues and the proper inspectional procedures to address them. DOB should draft written guidelines for supervisors, as other agencies have done, to ensure that inspections are properly planned, conducted, documented, and monitored. The guidelines should provide for supervisors' regular meetings with inspectors, regular review of inspectors' performance and reports, and follow-up meetings to ensure that safety issues are identified, addressed, and resolved.

DOI is one of the oldest law-enforcement agencies in the country. The agency investigates and refers for prosecution City employees and contractors engaged in corrupt or fraudulent activities or unethical conduct. Investigations may involve any agency, officer, elected official or employee of the City, as well as those who do business with or receive benefits from the City.

**Get the worms out of the Big Apple.
To report someone ripping off the City, call DOI at (212) 825-5959.**



Investigation of Administrative Issues Relating to the Fatal Fire of August 18, 2007 at 130 Liberty Street

**DOI Commissioner Rose Gill Hearn
FDNY Commissioner Nicholas Scoppetta
DOB Commissioner Robert LiMandri**

June 2009

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I. Introduction

On Saturday, August 18, 2007, at approximately 3:30 pm, a fire started at the former Deutsche Bank building, which is located at 130 Liberty Street in lower Manhattan. Work at the site had stopped for the day at approximately 3:00 pm, and was not scheduled to resume until Monday, August 20, 2007, since work was not done at the site on Sundays. The fire on August 18th grew to seven alarms and circumstances in the building encountered by the firefighters resulted in the deaths of New York City Firefighters Robert Beddia and Joseph Graffagnino.¹ One hundred other firefighters who responded that day were injured.

Immediately after the fire, the New York County District Attorney's Office (NYCDAO) opened a criminal investigation that resulted in criminal charges that were filed against the John Galt Corporation, two of its employees, and the Site Safety Manager of Bovis Lend Lease in December of 2008 for manslaughter, criminally negligent homicide and reckless endangerment.² At the request of the NYCDAO, the administration deferred an investigation of the facts and circumstances leading up to the fire until such time as the District Attorney determined that it would not interfere with the ongoing criminal investigation. In the meantime, Mayor Bloomberg ordered a comprehensive review of the City's regulation of construction, demolition, and abatement operations that was completed in July 2008. The Mayor accepted the 33 recommendations developed through that review, all of which are currently being implemented.³

The decontamination and deconstruction of the Deutsche Bank building was and remains a complex undertaking. At the time of the fire, these operations were taking place simultaneously, with a minimum 4-floor buffer between demolition and decontamination.⁴ Many City, State, and Federal agencies had a role in the oversight of these operations; but prior to the fire, communication between these agencies was poor—particularly with respect to conditions in the building. This lack of communication had a tragic result: the firefighters who responded to 130 Liberty Street on August 18, 2007 did not know the complexity of the conditions they would face.⁵

¹ Joseph Graffagnino was posthumously promoted to the rank of lieutenant after the fire.

² Three individuals and one company were charged: The John Galt Corp., Bovis Lend Lease's subcontractor on the project; Jeffrey Melofchik, the Site Safety Manager for Bovis on the project; Mitchel Alvo, the Director of Abatement for the John Galt Corp.; and Salvatore DePaola, a John Galt Corp. foreman. Separately, the NYCDAO entered into a non-prosecution agreement with Bovis Lend Lease LMB, Inc. Lastly, the NYCDAO also issued a 32-page written statement of facts regarding the Deutsche Bank fire that was critical of the contractors, the City's fire and buildings agencies.

³ See City of New York, Strengthening the Safety, Oversight and Coordination of Construction, Demolition and Abatement Operations: Report & Recommendations to Mayor Michael R. Bloomberg (July 2008), available online at www.nyc.gov/html/dep/pdf/pr277-08_safety_report.pdf.

⁴ Following the fire, these operations were decoupled, and decontamination is expected to be complete by July 2009.

⁵ These conditions are extensively documented in the FDNY's Investigative Report: Manhattan Box 7-7 0047, 130 Liberty Street, August 18, 2007 (August 21, 2008).

After the criminal investigation culminated in criminal charges, and notwithstanding that case, the Department of Investigation (DOI) was asked to conduct an administrative investigation jointly with the New York City Fire Department's (FDNY) Bureau of Investigations and Trials (BITS), and the Department of Buildings (DOB) Internal Audits and Disciplinary Unit (IAD), concerning and examining what went wrong within City agency operations.

During the course of this investigation, thousands of pages of documents were reviewed, nearly sixty FDNY interviews were conducted, and nearly twenty DOB interviews were conducted.

II. Administrative Investigation Regarding the Fire Department

The former Deutsche Bank building, once a 41-story office building that was damaged in the September 11, 2001 terrorist attacks, is located in lower Manhattan at 130 Liberty Street. The building is across the street from the World Trade Center site, and in its shadow sits the FDNY's 10/10 Firehouse. The 10/10 Firehouse is the home of two FDNY companies, Ladder 10 and Engine 10.

The most important and vital role of the Fire Department is to fight fires; but the members of the FDNY do much more than that. All FDNY companies are required to inspect certain buildings within their assigned administrative districts, including buildings under construction and demolition. Inspections of buildings under construction and demolition are required under a FDNY regulation that is referred to as the 15 Day Rule, since these inspections are required at least every fifteen days. The Deutsche Bank building is in Engine 10's administrative district and had been under decontamination since March 2006; demolition commenced in March 2007.

In the FDNY chain of command, companies are supervised by battalion chiefs assigned to a battalion command. Battalion One has command of various units, including Engine 10. Battalion commands, and the units assigned to them, are supervised by deputy chiefs who are assigned to a division command. Division One supervises five battalions, including Battalion One. The Manhattan Borough Command supervises both the divisions in Manhattan, including Division One. The five Borough Commanders in New York City report directly to the Chief of Operations, who reports to the Chief of Department, who reports to the Commissioner.

At the company, battalion and division level, FDNY commanders are required to designate fire prevention liaison officers. These officers, who are more commonly referred to as building inspection coordinators, are then tasked with ensuring that building inspections are carried out.

From the time demolition commenced at 130 Liberty Street on March 20, 2007, until the fatal fire on August 18, 2007, not a single inspection was done by FDNY at the site. This investigation revealed that before the fire, the 15 Day Rule was generally known within the Department, but too often disregarded and building inspection coordinators at Engine 10, Battalion One and Division One had either not been designated or did not understand or appreciate their roles.

A. FDNY Rules and Regulations

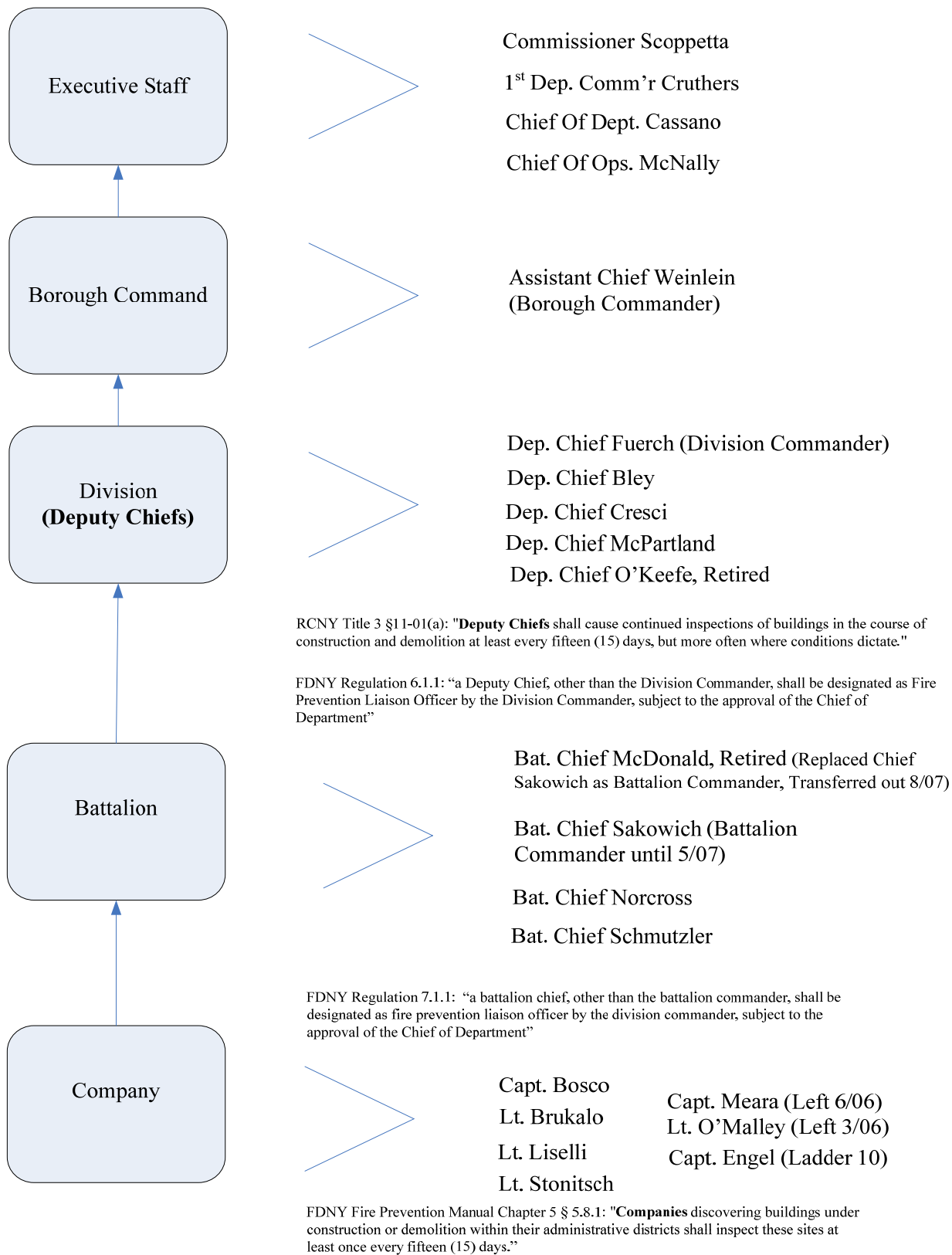
The FDNY is charged with the prevention of fire and the protection of life and property from fire; the FDNY's Fire Prevention Manual sets forth the rules that govern the Department's preventive inspection program that seeks to meet that mandate. There are several rules within the manual and within FDNY regulations generally that were in place on August 18, 2007 that form the basis of the investigative findings. All firefighters and fire officers are expected to comply with FDNY regulations and the requirements set forth in the Fire Prevention Manual.

In order to become a fire officer in the FDNY, a firefighter must take and pass an exam to achieve the first fire officer rank of lieutenant. Subsequent tests are then required for officers to move up the chain of command from lieutenant to captain, from captain to battalion chief, and from battalion chief to deputy chief. In preparation for those tests, individuals study, among other things, FDNY regulations and the Fire Prevention Manual, as requirements listed in both are on the tests.

The following rules and regulations that were in effect at the time of the fire (see attached) form the basis of the investigative findings and conclusions:

- FDNY Fire Prevention Manual Chapter 5 § 5.8.1 states that "companies discovering buildings under construction or demolition within their administrative districts shall inspect these sites at least once every fifteen (15) days."
- Rules of the City of New York (RCNY), Title 3 §11-01(a), which is reprinted in Chapter 5 of the Fire Prevention Manual states "Deputy Chiefs shall cause continued inspections of buildings in the course of construction and demolition at least every fifteen (15) days, but more often where conditions dictate."
- FDNY Fire Prevention Manual Chapter 8 § 8.4.2 states that "in order to establish the Fire Prevention administrative chain of command within the company level of operations, the Company Commander shall designate a Lieutenant of his command to have primary responsibility for the proper administration of Fire Prevention matters. He shall work in close liaison with chief officers in updating company Fire Prevention records."
- Regulation 6.1.1 outlines the administrative duties of deputy chiefs and states "a Deputy Chief, other than the Division Commander, shall be designated as Fire Prevention Liaison Officer by the Division Commander, subject to the approval of the Chief of Department."
- Regulation 7.1.1 outlines the administrative duties of battalion chiefs and states "a battalion chief, other than the battalion commander, shall be designated as fire prevention liaison officer by the division commander, subject to the approval of the Chief of Department."
- Regulation 7.4.4 states "battalion chiefs shall supervise the inspection of buildings in their Battalion administrative districts" and they "shall see that all regulations or orders relative thereto are strictly enforced."

B. FDNY Chain of Command and Relevant Officers at the Time of the Fire



C. Timeline and Relevant Documents

- **September 11, 2001** - The South Tower of the World Trade Center collapsed onto the Deutsche Bank building at 130 Liberty Street, filling the building with debris and hazardous materials.
- **September 27, 2004** – Thomas Meara, who was then the Captain of Engine 10, wrote a memo addressed to Salvatore Cassano, who was the Chief of Operations at the time, detailing a response to 130 Liberty Street for glass falling from the building.
- **December 4, 2004** – Thomas Engel, who was then the Captain of Ladder 10, wrote a memo addressed to Richard Fuerch, who was the Division One Commander at the time, requesting the development of a standard operating procedure (SOP) for 130 Liberty Street.
- **January 15, 2005** – William Siegel, who was then a Battalion Chief in Battalion One, wrote a draft memo addressed to Division One Commander Richard Fuerch, recommending weekly surveillances as well as the development of an SOP for 130 Liberty Street.
- **February 21, 2005** - William Siegel wrote a draft memo addressed to Richard Fuerch with updates to the conditions at 130 Liberty Street since the January 15, 2005 memo.
- **February 24, 2005** - Richard Fuerch wrote an e-mail to William Siegel asking if HAZMAT was consulted regarding the SOP for 130 Liberty Street and requesting a site visit.
- **February 26, 2005** - William Siegel wrote an e-mail to Division One noting that after attending a site visit at 130 Liberty Street, on January 15, 2005, Nicholas Delre, who was then a Battalion Chief in the HazMat Battalion, felt that the normal SOPs were sufficient. Siegel stated “that might be okay if everyone is made aware of the conditions of the building.” Siegel further recommended periodic updates of the Critical Information Dispatch System (CIDS) card for 130 Liberty Street based on his belief that the demolition would lead to ever-changing conditions.
- **March 22, 2005** – William Siegel wrote a draft memo addressed to Richard Fuerch with updates to the conditions at 130 Liberty Street since the February 21, 2005 memo.
- **November 17, 2005** – A memo was sent from the Manhattan Borough Command to Salvatore Cassano, who was the Chief of Operations at the time, and to Battalion One and Division One, notifying them that an “advisory committee” was created to establish communication between all parties regarding 130 Liberty Street. Battalion One was instructed to assign a Battalion Chief to represent the Department.
- **November 18, 2005** – John Bley, who was then a Deputy Chief of Division One, wrote a memo to Roger Sakowich, who was the Battalion Commander at Battalion One at the time, instructing Battalion One to assign a Battalion Chief to represent the Department at any and all advisory committee meetings regarding 130 Liberty Street.

- **November 21, 2005** – Roger Sakowich wrote a memo to Harold Meyers, who was Manhattan Borough Commander, that was examined and approved by Deputy Chief John Bley, stating that Battalion Chief Robert Norcross will be FDNY's liaison to 130 Liberty Street and that Roger Sakowich would be the alternate.
- **May 2004 – March 2006** - Captain Thomas Meara and Lieutenant Sean O'Malley of Engine 10 conducted at least fourteen inspections of 130 Liberty Street.
- **2006** - Captain Thomas Meara and Lieutenant Sean O'Malley left Engine 10 in spring for other assignments.
- **March 20, 2007** – Demolition work began at 130 Liberty Street.
- **April 8, 2007** – An e-mail was sent from Engine 10 to Roger Sakowich informing him that the Construction Supervisor at 101 Warren Street offered to schedule a walk through of that building for members of the 10 House in order to familiarize them with buildings under construction.
- **May 17, 2007** – A pipe from the Deutsche Bank building fell through the roof of the Engine 10 / Ladder 10 Firehouse
- **May 21, 2007** – The Manhattan Borough Command draft Strategic Plan was sent from the Manhattan Borough Command (specifically Gregory Bierster, a Battalion Chief at the Manhattan Borough Command) to Kerry Stephen, another Battalion Chief assigned to the Manhattan Borough Command.
- **June 7, 2007** – John Bley, who was then a Deputy Chief of Division One, wrote a memo to "Battalion's 1, 2, 4, 6, and 7", informing them that "buildings under construction are required to be inspected once every 15 days by the administrative company." Bley stated that the plan was to assign light duty personnel this responsibility. Bley requested each Battalion prepare a list of buildings under construction in their district.
- **August 7, 2007** – In response to a medical emergency run at 130 Liberty Street on August 6, 2007, Robert Norcross, who was then a Battalion Chief in Battalion One, wrote a memo to Peter Bosco, who was the Captain in Engine 10 at the time, instructing him that all safety precautions should be observed including the appropriate Personal Protective Equipment when responding to 130 Liberty Street.

D. Investigative Findings

Company Level

At the time of the fire, the aforementioned FDNY rules required companies to inspect buildings under construction or demolition within their administrative district at least once every fifteen days. On March 20, 2007, demolition began at the Deutsche Bank building site at 130 Liberty Street, which falls within the administrative district of Engine 10. Members of Engine 10 did not conduct a single inspection of the site between the time that demolition commenced on March 20, 2007 and the fatal fire on August 18, 2007.

At the company level, the captain (who is the company commander) and his lieutenants are all responsible for leading inspections within the company's administrative district on scheduled inspection days. FDNY regulations require that a company commander designate a single lieutenant as the company's building inspection coordinator, who will then have primary responsibility to oversee building inspections and other fire prevention issues.

Prior to the spring of 2006, inspections of 130 Liberty Street were taking place on a periodic basis under Captain Thomas Meara, the commanding officer at that time, and his building inspection coordinator, Lieutenant Sean O'Malley. Both officers left Engine 10 in the spring of 2006 and all inspections of the site stopped.

In December of 2006, Captain Peter Bosco was permanently assigned as the commanding officer of Engine 10. At that time, there were three lieutenants assigned to Engine 10. Lieutenants Joseph Liselli and Frank Stonitsch had recently attained their rank and been assigned to Engine 10. Lieutenant John Brukalo, on the other hand, had been in his rank at Engine 10 since early 2002. Under that command structure, there was no inspection activity at 130 Liberty Street.

Although FDNY regulations require company commanders to assign a lieutenant as the building inspection coordinator, Captain Bosco did not assign those duties to one of his lieutenants, and instead he kept the duties himself because, as he explained, he believed the fire prevention responsibilities were ultimately his.

Regarding the requirement that buildings under construction and demolition be inspected every fifteen days, Captain Bosco said that he could not remember ever conducting those types of inspections throughout his career, nor did he conduct them while at Engine 10 as he thought that it was not a "hard and fast rule." However, Captain Bosco admitted that he came across the 15 Day Rule in preparation for his captain's test. He again encountered the requirement in June of 2007, when he received a copy of a memo from Deputy Chief John Bley regarding buildings under construction. The memo stated that those buildings must be inspected every fifteen days and makes clear that the burden of inspection is on the company.

Clearly, Captain Bosco had no appreciation for his responsibilities as per 130 Liberty Street under the 15 Day Rule even though it was a building that was frequently brought to his attention. First, it was across the street from Engine 10. Second, there were several EMS runs at

the site in the months before the fire, including a run he responded to on May 9, 2007. Third, on May 17, 2007, a pipe from the Deutsche Bank building fell through the roof of his firehouse causing considerable damage. Fourth, Captain Bosco received a memo from Chief Norcross dated August 7, 2007 that reminded him to take every precaution at 130 Liberty Street. The memo stated “by now all of the members of 10/10 should be aware of the problems with this building” and concludes with the bolded and all caps line: “THE ONLY SAFE ASSUMPTION IS TO ASSUME THE WORST.”

Captain Bosco remembered receiving the memo, and he testified “I read it and then, I mean, we were all aware the building was toxic and that’s it. I don’t know if I told the lieutenants. I must have left it on the desk.” Less than two weeks before the fire, Captain Bosco missed an opportunity to discuss the site, and perhaps inspections, with the men he supervised.

Despite all of the information, warnings, and incidents relating to the site, Captain Bosco took no steps to familiarize himself with 130 Liberty Street. Prior to his arrival at the company, a file had been created for 130 Liberty Street that it is believed contained the memos from Battalion Chief William Siegel that recommended, among other things, weekly surveillances at the site. Captain Bosco never looked at this file. Captain Bosco also operated on inaccurate information that he stated came from other members of Engine 10. He said that upon his arrival to the firehouse he was told that the company did not go into 130 Liberty Street because it was toxic; however, he stated that he did not try to confirm that sentiment up the chain of command or ask for guidance.

Regarding Lieutenant Brukalo, he has been with the FDNY since 1982 and has been a lieutenant at Engine 10 since January 2002. In his time at Engine 10, he has served under four different permanently assigned captains and alongside numerous other lieutenants. But most notably, Lieutenant Brukalo worked with Captain Meara and Lieutenant O’Malley for more than four years; Lieutenant Brukalo is the longest serving lieutenant at Engine 10 before the fire. Captain Meara and Lieutenant O’Malley testified that while they were assigned to Engine 10 they maintained a list of buildings under construction and demolition and tried to inspect them on a regular basis. Lieutenant Brukalo was interviewed twice, gave inconsistent statements, saying at first he was familiar with the 15 Day Rule, but then ultimately said that he was not aware of the 15 Day Rule. Moreover, and remarkably, he was non-committal about whether inspections pursuant to the 15 Day Rule were ever conducted at Engine 10. If Lieutenant Brukalo is to be believed, he was completely oblivious to the longstanding system and practice that was in place under Captain Meara.

Unlike Lieutenants Liselli and Stonitsch, who stated that they were not aware of the 15 Day Rule prior to the fire (even though it was in the materials that they studied to achieve their rank), Lieutenant Brukalo initially testified that prior to the fire, he was aware of the requirement that buildings under construction or demolition had to be inspected every fifteen days. During his second interview, Lieutenant Brukalo gave another version of events and testified that he did not know the rule before the fire, and when questioned about how that could be the case given the lieutenant exam he took required the rules to be learned, Lieutenant Brukalo said, astoundingly, that he did not study the rules in the Fire Prevention Manual (which contain,

among safety rules, the 15 Day rule), when he studied to become a lieutenant, hoping, he said, that those rules would not “be on the test.”

Lieutenant Brukalo was also apparently confused about the *current* Building Inspection Coordinator assignment at Engine 10. Indeed, it turned out to be him – which he was refreshed about as a result of this investigation. Specifically, in his initial interview, Lieutenant Brukalo could not name who the current Building Inspection Coordinator was at Engine 10, which, of course, still has jurisdictional responsibility for 130 Liberty Street. In a separate interview, investigators learned that, in fact, Lieutenant Brukalo was apparently the Building Inspection Coordinator. In a second interview of Lieutenant Brukalo, he testified that he “forgot” that Captain John Donahue had made him the Building Inspection Coordinator shortly after he replaced Captain Bosco as the commanding officer of Engine 10 in 2007. Lieutenant Brukalo said he was reminded of that assignment after he was interviewed initially.

Battalion Level

Above the company level on the FDNY’s chain of command is the battalion level, which is led by four battalion chiefs. Under section 7.4.4 of FDNY regulations, these battalion chiefs “shall supervise the inspection of buildings in their Battalion administrative districts” and they “shall see that all regulations or orders relative thereto are strictly enforced.”

Engine 10 falls within the administrative district of Battalion One. At the time of the fire, there were three battalion chiefs working at Battalion One. John McDonald held the rank of battalion chief, but he was also designated the Battalion Commander. Battalion Chiefs Robert Norcross and Ronald Schmutzler were also in Battalion One at that time. It should be noted that Battalion Chief Roger Sakowich had only recently left Battalion One and he was the Battalion Commander from 2003 until May of 2007.

As noted earlier, once demolition began at 130 Liberty Street in March 2007, Engine 10 did not conduct a single inspection of the site pursuant to the 15 Day Rule. The testimony of the witnesses from the battalion level establishes that the enforcement of the 15 Day Rule was not a priority for them, nor was anything done to ensure that it was followed by the companies under their watch.

Chief Sakowich, who had been the commanding officer in Battalion One for more than four years, said that he had no expectation that construction or demolition inspections were taking place every fifteen days. He did say that he expected companies to “monitor” those types of sites as they deemed necessary, but then did nothing to verify that even that level of review was taking place. Chief Norcross said that he did not enforce the 15 Day Rule because he had never seen it enforced in his experience. Chief Schmutzler initially denied knowing about the 15 Day Rule, but then said because he had studied for and passed officer exams, he must have been aware of it. He said he never enforced the rule.

FDNY regulations state that all battalion chiefs have a responsibility to ensure that all required inspections are taking place; the regulations also call for a battalion chief to be specifically designated as the fire prevention liaison officer, more commonly referred to as

building inspection coordinator.⁶ There was inconsistent testimony about whom, if anyone, had this designation before the fire. Chief Sakowich could not recall who held that position while he was the commander in Battalion One, but stated that the responsibility was shared among the battalion chiefs. Chief Schmutzler thought that Chief Sakowich was his own building inspection coordinator (which is a violation of the rule) and he thought that Chief McDonald made Chief Norcross take on the role when he (McDonald) became the Battalion Commander. Chief Norcross testified that he was not the inspection coordinator at the time of the fire, although when pressed he said that it was possible that he held that designation but he could not remember. This confusion about which chief was to coordinate building inspections is indicative of the fact that the 15 Day Rule was not prioritized or uniformly enforced.

The Deutsche Bank building at 130 Liberty Street is within the jurisdiction of Battalion One and, as such, the battalion chiefs had a responsibility to supervise inspections that were required pursuant to FDNY regulations at that location. But 130 Liberty Street was more than just another building that needed to be inspected, in fact, it was a building that the battalion chiefs knew had been the subject of various issues.

As to Chief Sakowich, he was the commanding officer during the period of time in early 2005 when Chief Siegel visited and wrote about 130 Liberty Street and made detailed recommendations about inspecting the building. Chief Sakowich said he never saw the Siegel memos that contained those recommendations at the time they were written, and he did not recall hearing about them. Chief Sakowich also never saw a February 26, 2005 e-mail from Chief Siegel to “Division One” regarding formulating standard operating procedures (SOPs) for 130 Liberty Street. However, Chief Sakowich said he believed part of the Siegel recommended SOPs must have gone into effect because Chief Sakowich stated he went on one or two EMS runs at 130 Liberty Street as a battalion chief, which, he said, had to be part of a SOP. That did not cause Chief Sakowich to make inquiry about whether there were any other SOPs formulated for 130 Liberty Street. Once Chief Siegel left Battalion One in April 2005, it appears nothing further was done under Chief Sakowich’s tenure in Battalion One to enforce the recommendations.

Then in November of 2005, Chief Sakowich received a memo from Deputy Chief John Bley that stated:

In order to maintain coordination and communication between all parties during the decon and demolition of 130 Liberty St, Battalion 1 shall assign a BC [battalion chief] and an alternate to represent the Department at all advisory committee meetings. The assigned chief is responsible to keep all levels of command informed of all pertinent information and all changes in demolition operations that affect the FDNY.

Chief Sakowich made himself the alternate and assigned Chief Norcross to be the representative to the advisory committee meetings. However, Chief Norcross could not recall seeing the November 2005 memo from Chief Bley that outlined the duties. Further, it appears that Chief Sakowich did not give, nor did Chief Norcross ask for, an explanation of what the liaison job

⁶ See Section 7.1.1 of FDNY’s regulations (copy attached hereto).

entailed since after attending a few meetings, Chief Norcross said his job as point person was over.

On April 8, 2007, Lieutenant Liselli from Engine 10 emailed Chief Sakowich about an incident at a fire at 101 Warren Street that prompted him (Liselli) to ask whether he should take members of Engine 10 to construction sites to familiarize them with new construction. Lieutenant Liselli concluded his email by asking for some direction. He does not remember receiving a reply email, nor does Chief Sakowich remember reading the original email. No direction was given to Lieutenant Liselli regarding those building inspections.

Likewise, Chief Norcross had dealings with 130 Liberty Street. On August 7, 2007, he wrote a memo after he learned that members of Engine 10 responded to an emergency run at 130 Liberty Street and believed they had been exposed to toxic materials. He instructed in that memo that all safety precautions should be observed when responding to 130 Liberty Street, but did not direct that inspections be completed as per the 15 Day Rule.

Division Level

Above the battalion level on the FDNY's chain of command is the division level, which is led by four deputy chiefs, one of whom is designated division commander. Under Title 3, section 11-01(a) of the Rules of the City of New York, "Deputy Chiefs shall cause continued inspections of buildings in the course of construction and demolition at least every fifteen (15) days, but more often where conditions dictate." This rule is also reproduced in the FDNY's Fire Prevention Manual. As such, deputy chiefs are the highest ranking officers who have an affirmative duty to ensure that the rule is being enforced.

Battalion One reports to Division One. At the time of the fire, there were four deputy chiefs working in Division One. Deputy Chief Richard Fuerch was the designated Division One Commander and held that position from March 2004 until shortly after the Deutsche Bank fire. Deputy Chief John Bley has been in Division One since 2002 and Deputy Chief Paul Cresci has been in Division One since 2004. Deputy Chief Michael McPartland is a covering deputy chief and has been assigned to Division One since January 2007.⁷

Deputy Chief Fuerch testified that he was aware of the 15 Day Rule but he never enforced it. Despite the fact that the rule falls squarely on deputy chiefs, he said the reason he never enforced it is that he had never seen it enforced in his career and that there was no practice or procedure in the FDNY to do so. Nevertheless, in June 2007, after discussions with Deputy Chief Bley regarding the noticeable increase in certain buildings under construction within Division One, Deputy Chief Fuerch authorized the use of light-duty personnel for inspections of buildings under construction. Based on these discussions, Deputy Chief Bley sent a memo to the battalions in Division One, stating in relevant part:

Buildings under construction are required to be inspected once every 15 days by the administrative company. The 1st Division has received permission to allow our light duty

⁷ As a covering chief, he is not permanently assigned to the Division and may at times work at other commands throughout New York City.

personnel to perform building inspections. Our plan is to use light duty firefighters to relieve the administrative Units (sic) of the burden of inspecting buildings under construction.

Deputy Chief Fuerch acknowledged that before the Deputy Chief Bley's memo was issued, buildings undergoing construction and demolition were not inspected frequently, if at all. This memo did not, however, address buildings under demolition. Deputy Chief Fuerch stated that at the time his focus was buildings under construction and that demolition was an "afterthought." Unfortunately, this effort to use light-duty personnel did not last that long as light-duty personnel in Division One either returned to full duty or retired shortly after implementation of the plan. No additional steps were taken in Division One to address the issue of construction or demolition inspections before the fire.

Coming up through the ranks, Deputy Chief Fuerch served as building inspection coordinator as a lieutenant, captain, battalion chief and deputy chief. He was also familiar with FDNY Regulation 6.1.1, which states that "A Deputy Chief, other than the Division Commander, shall be designated as the Fire Prevention Liaison Officer by the Division Commander, subject to the approval of the Chief of Department." Deputy Chief Fuerch stated that as Division Commander he had appointed Deputy Chief John Bley as Division One building inspection coordinator, but did not seek Chief of Department approval because this was "virtually never done in the Fire Department." He was also familiar with FDNY Regulation 7.1.1, which states that "A battalion chief other than the battalion commander shall be designated as fire prevention liaison officer by the division commander, subject to the approval of the Chief of Department." Deputy Chief Fuerch stated that as Division Commander, he did not designate building inspection coordinators at the battalion level because they were "already in place." He could not recall, however, who was designated building inspection coordinator for Battalion One pre-fire.

Regarding 130 Liberty Street, Deputy Chief Fuerch had specific knowledge about the status of the building as far back as 2004. In December 2004, Captain Thomas Engel, who was the commanding officer for Ladder 10, wrote a memo to Deputy Chief Fuerch advising him that there had been three responses to 130 Liberty Street by Engine 10 and Ladder 10. The memo goes on to request that a SOP be developed for the site. This memo appears to have played a role in Deputy Chief Fuerch's directive to former Battalion Chief William Siegel in January 2005 to look at 130 Liberty Street. Chief Siegel visited the location and wrote a comprehensive memo on the conditions there and provided recommendations, including a recommendation that the company responsible for 130 Liberty Street conduct weekly surveillances of the building. Chief Siegel updated his findings twice after making additional visits to the site and then left the battalion in April 2005. Deputy Chief Fuerch testified that he examined and approved Chief Siegel's memo in January 2005, but he believed weekly surveillances were only required after demolition began. He further testified that he was unaware that demolition began in March 2007. Deputy Chief Fuerch was aware, though, of several EMS responses to 130 Liberty Street between March 2007 and the day of the fire, as well as the pipe from 130 Liberty Street that fell through the firehouse. None of those events, however, prompted Deputy Chief Fuerch to inquire further about the status of the building and whether surveillance inspections were taking place.

Deputy Chief John Bley testified that he had been designated as the Building Inspection Coordinator for Division One. He stated that he was aware of the 15 Day Rule, but he did not think that he ever enforced the rule as an officer based on a lack of resources. He acknowledged sending out a memo in June 2007 regarding the use of light-duty personnel to conduct inspections of buildings under construction every fifteen days after discussing the issue with Deputy Chief Fuerch. He stated that it was not a conscious decision on his part to exclude buildings under demolition, but his focus was on buildings under construction and he drafted the reference to the 15 Day Rule from memory, without reviewing the language of the rule. Regarding 130 Liberty Street, he testified that after Chief Siegel left Battalion One, no one from Division One followed up on Chief Siegel's recommendations and that it was Deputy Chief Bley's responsibility as building inspection coordinator to do so.

Deputy Chief Cresci said that he knew about the rule, but he did not believe that it was being enforced nor did he remember conducting those types of inspections as either a lieutenant or as a captain. He did, however, acknowledge that under the rules it was his responsibility as a Deputy Chief to enforce it. Regarding 130 Liberty Street, Deputy Chief Cresci went into the building on the day the pipe fell in May 2007 and attended two follow-up meetings regarding repairs to the firehouse at the request of Manhattan Borough Commander Michael Weinlein, who had asked Deputy Chief Cresci to investigate the pipe accident and take any necessary steps to prevent a similar accident from happening again at the site. Deputy Chief Cresci stated it did not occur to him at that time to send the company into 130 Liberty Street for an inspection, and he made no inquiry about the inspection history of the building.

Deputy Chief McPartland said that he was not aware of the 15 Day Rule before the August 2007 fire. He took four fire officer exams over the years to reach his rank as Deputy Chief, and having reached that rank of Deputy Chief, he is named in a rule as the officer who must ensure that the 15 Day Rule is enforced. Remarkably, he did not know that. Part of his job as Deputy Chief was to check on the inspections being done by companies in the field, answer questions and give guidance on same. He did so not having familiarized himself, he concedes, with all of the rules. He asserted that the issue of necessary inspections of buildings under construction and demolition never came up during his career in the FDNY.

Manhattan Borough Command

The current Manhattan Borough Commander, Assistant Chief Michael Weinlein, has been assigned to his position since July of 2006. At the time of the fire, the Manhattan Borough Command was staffed by Chief Weinlein and two battalion chiefs. The Manhattan Borough Command is the highest ranking officer in the borough and supervises all the divisions, battalions and companies in Manhattan.

Chief Weinlein stated that he knew of the 15 Day Rule from his studying for promotional exams. Chief Weinlein also stated that due to the size of some of the administrative areas he supervised, he expected that companies would prioritize inspection activities, and that the prioritization would vary by company and battalion. Chief Weinlein believed that companies would inspect these buildings when they could, and the regularity of these inspections would be guided by the other inspection priorities designated by the unit. He did not believe every

company under his command was inspecting, or could inspect, every building under construction every fifteen days. Rather, he expected that each company would have some system in place to monitor these buildings.

While charged with the supervision of the companies, battalions and divisions within the borough of Manhattan, as Borough Commander, Chief Weinlein was not tasked with any specific building inspection oversight. In fact, before the fire, there were no reports or tracking mechanism for construction and deconstruction inspections, and the inspections reports that did exist at the time were not given to the Borough Commands; they were sent directly from the division commands to FDNY Headquarters where the reports were compiled for statistical purposes.

Prior to the fire, Chief Weinlein, with the assistance of the various chiefs in the borough, was in the process of creating a strategic plan for Manhattan. Although it did not make it into the final plan, part of the strategic plan discussions included a recommendation to revise the FDNY's Fire Prevention Manual to make building inspection requirements, including the 15 Day Rule, more realistic and attainable. That objective within the plan was assigned to Chief Fuerch, indicating that he was part of discussions about the problems with the rule. As further evidence that Chief Weinlein thought the building inspection requirements were too onerous, in May of 2007 when he was approached about commands having a difficulty with their inspections, he gave authorization to the divisions in Manhattan to utilize light duty members to help with building inspections.

While Chief Weinlein has a great many buildings under his jurisdiction, he was aware of specific issues at 130 Liberty Street before the fire. He knew about the search for possible human remains from the September 11, 2001 attacks. He said that the first time 130 Liberty Street became a concern for him was following the construction accident on May 17, 2007 when a pipe from the site fell through the roof of the 10/10 Firehouse. Chief Weinlein related that Deputy Chief Cresci from Division One notified him of the accident that day and he headed to the firehouse to check on the condition of the firefighters.

Chief Weinlein visited the 10/10 Firehouse twice on May 17, 2007, but he focused only on how the accident happened, how to avoid a similar occurrence in the future, and what needed to be done to fix and protect the firehouse. Unfortunately, he did not use this opportunity to ask whether the building was being inspected.

Executive Level

Commissioner Nicholas Scoppetta, First Deputy Commissioner Frank Cruthers, Chief of Department Salvatore Cassano, and Chief of Operations Patrick McNally were all interviewed during this investigation, and each discussed the importance of building inspections. Chief Cassano stressed that inspections are critical because "the more familiar you were with the building, the better chance you had of surviving in a fire."

After the fire, Commissioner Scoppetta stated there was a thorough review of inspection activity, the inspection process and accountability. He recounted that many things were done

after the fire and it was at that point that he became heavily involved with inspections. Commissioner Scoppetta testified that he has approved changing the reporting requirements (by the administrative captain performing building inspections) to include the Borough Commander. This decision was made in part because he meets with staff chiefs, including Borough Commanders at bi-weekly meetings. He stated the FDNY has created a special unit of twenty civilian inspectors with five supervisors. He stated the FDNY now has a contract with IBM that includes the development of a program implementing accountability measures, such as pop-up screens (FDNY implemented automated pop-up inspection reminders for all fire companies in Fall 2007) on firehouse computers delineating buildings to be inspected in that jurisdiction, when the last inspection was done and the deadline for the next inspection. As part of the implementation of the recommendations made through the administration's review of construction, demolition and abatement work, additional measures have been taken, including a requirement that following an inspection, local companies indicate whether a site that has been inspected requires modifications to the Computer Information Dispatch System (CIDS). These are all significant, positive steps.

However, these important changes and new tools must be accompanied by what has been missing at each and every level within the chain of command -- ensuring that the tools are being used and the rules are being followed. The building inspection coordinators play an important part in enforcing the rules. In fact, First Deputy Commissioner Cruthers testified that assigning building inspection coordinators is part of the foundation of the FDNY and he could not "fathom" how that position would not be filled.

Existing FDNY rules already require that officers fill these positions at the company, battalion and division level. Further, the rules anticipate how important these roles are at the two higher levels by building in a requirement that the Chief of Department approves those officers who have been designated.

And yet, throughout this investigation there were numerous times when officers were unclear as to who held that position or what the responsibilities entailed. Chief Cassano stated that those approvals do not come up to his level in the Department, whether in an official form, via email, or verbally.

E. Investigative Conclusions and General Impressions

- This is a case of missed opportunities: stemming from a series of incidents at this building, right next to a firehouse, that did not prompt anyone to undertake any inspection in 2007 despite a rule that required it, many went into the building - to assist workers injured, to look for human remains, to address a pipe that fell - but everyone had tunnel vision.
- The investigation revealed a culture of widespread disregard for the 15 Day Rule.
 - Yet, most of the fifty firefighters and officers interviewed were aware of the 15 Day Rule.

- If it is true that you manage what you measure, then the FDNY was not prioritizing the inspection of construction/demolition sites (*i.e.*, almost every witness said that he felt that occupied A and E buildings were the most important – the buildings on which companies are asked to report).⁸
- How to conduct a building inspection is primarily learned on the job and varies greatly depending on the commanding officer.
 - Where firefighters were assigned and who their officers were appears to make a difference in knowledgeable enforcement and attention to the rules.
- This investigation showed the “shift chart” and “mutual policy,” by which officers work on average eight 24-hour shifts each month, affected consistency and continuity in communication that created gaps in the supervision of daily administrative duties such as inspections.
- The investigation revealed that the building inspection coordinator position is a designation too often without significance. FDNY rules contemplate the importance of this position by placing the final approval for the battalion and division building inspection coordinators with the Chief of Department. But we learned that this approval does not happen. And, at times, no building inspection coordinator is even formally designated.
 - An often expressed sentiment was there are too many rules to follow all of them, leaving an officer to do the best he can to set priorities. This is why having building inspection coordinators is so important, because they are the people who should create a plan for all inspections and elevate any issues pertaining to inspections up the chain of command.
- Some have argued that nobody was following the 15 Day Rule. However, we found examples of officers who were making a good faith effort to follow the rule. Specifically, Captain Meara and Lieutenant O’Malley at Engine 10 attempted to follow the rule before they left Engine 10 in 2006.
- Companies were doing six hours of scheduled building inspections each week before the fire – the requirement was increased to nine hours per week after the fire. But several witnesses (*e.g.*, Weinlein and Brukalo) said that nine hours scheduled does not mean nine hours completed because they may still be interrupted by runs just as they were during the six hours allotted.

⁸ In the Fire Prevention Manual buildings classified in category A that must be inspected annually include high-occupancy buildings such as schools, hotels, hospitals, underground transit facilities, hazardous factories and warehouses, homeless shelters, and large retail stores. Buildings designated B through E are other types of buildings that are inspected variously every two to five years.

- Sometimes memos are disseminated to a division, a rank, a company – not to a particular, identified person; sometimes the person in the division, rank, company is only there an estimated eight days per month.
- The executive team understood the importance construction and demolition inspections played in ensuring a firefighter's ability to adequately respond to, attack and survive a fire and relied on the lower ranks to carry out the FDNY rules and regulations covering this issue. While the FDNY regulation squarely places the responsibility of enforcing the 15 Day Rule on the deputy chiefs, we found that the executive team was unaware of, or did not address noncompliance with, the 15 Day Rule, and that no one appeared to communicate to the executive level that there were problems carrying out the rule. The lack of communication up and down the chain of command meant that the importance of compliance with the 15 Day Rule was not communicated and reinforced to the lower ranks.

F. Policy and Procedure Recommendations

1. Currently, battalion and division chiefs are required to work two day shifts and two night shifts every week. In practice, chiefs can arrange to work back-to-back day and evening shifts, thereby being present two 24-hour shifts each week, or approximately eight shifts per month. This practice exists under a collective bargaining agreement. This investigation showed that this type of consolidated schedule can significantly hinder the supervision of lower ranking officers in some respects including the proper, complete and consistent administration of duties, and so there should be discussion on how chiefs can provide more graduated supervision and follow-up.
2. Currently, when an officer leaves a post, the FDNY does not arrange for a formal transition period for the incoming officer. A reasonable transition period would give a new supervising officer the time to ask questions and learn about unique problems or operational challenges at his new assignment. This investigation found that the positive practices put in place by Captain Meara and Lieutenant O'Malley, including inspections at buildings under construction and at 130 Liberty Street, were not passed on to their successors, a series of covering personnel and ultimately Captain Bosco who was assigned to Engine 10 in December 2006. Moreover, as noted, the one lieutenant consistently in place under Captain Meara and through to Captain Bosco was Lieutenant Brukalo, who unfortunately, was not helpful in this regard.⁹
3. After the Deutsche Bank fire, the FDNY changed the building inspection regulation requiring each company to spend nine hours per week on all building inspections; before the fatal fire the rule had required six hours. While adding three hours of inspection time is a positive step, it does not address the problem of too much lost inspection time. Despite this change, companies continue to be

⁹ Indeed, as this report indicated, Lieutenant Brukalo did not even know that he was the Building Inspector Coordinator.

pulled away from inspections to respond to runs, as they must, but they do not make up the scheduled inspection time that was lost. So if the six, (now nine), hours are often lost, in whole or in part during any given week to runs and emergencies, the companies still do not, even since 130 Liberty's fatal fire, have to make up those hours doing inspections. In addition, the FDNY regulations dictate when, and only when, inspections can take place. Thus, there could be times during the week when the company could conduct inspections when not occupied by runs, but the regulations constrain the company from conducting inspections outside those set hours. Other conditions, such as weather, also limit when inspections can take place. The collective bargaining agreement limits the weather conditions under which inspections may occur. Many witnesses told us that the six hours *and* the nine hours of inspections in any given week are still so often interrupted. We recommend that these inspections for nine hours definitively take place by appropriate management of the company's time in conjunction with a revising of the regulation to provide the greatest flexibility as to when the inspections can take place. In sum, for safety purposes, the regulation should require nine hours of completed inspections, not merely nine hours of scheduled inspection time.

4. The officers interviewed testified that chiefs within the battalion and division do not have regular meetings on such issues as inspections, training, and administrative matters. For example, the officers from the division and battalion indicated they did not meet regularly to discuss their collective duties. Accordingly, witnesses could not speak to what their colleagues in the division or battalion were doing in certain areas such as inspections, training and administrative matters. As managers, adjustments to schedules should be made for them to meet more frequently than appears to currently be the case, to address operations and concerns.
5. The FDNY should have training for all building inspector coordinators to review the inspection rules and their responsibilities. Chief Cassano testified that the FDNY has created training for building inspector coordinators and that training is being implemented citywide.
6. One finding of this investigation was that the presence of multiple disciplines at the site – all with jurisdiction but with differing levels of access and roles - contributed to the tunnel vision, with none seeing the larger picture. So to the extent possible, certainly as it relates to the City agencies, due to the overlapping issues that the various agencies encounter, we recommend cross-training for the FDNY on the relevant parts of the DOB code; and for buildings inspectors cross-training on the relevant parts of the fire code.¹⁰

¹⁰ In July 2008, the Mayor's Office issued a report entitled "Strengthening the Safety, Oversight and Coordination of Construction, Demolition and Abatement Operations." That report included recommendations about training and information sharing that the FDNY has already implemented. For example, upon promotion, FDNY lieutenants now receive training in building and fire codes, and the Construction, Demolition and/or Abatement inspectional force that the FDNY created receive building code training. Also, the FDNY and DOB share information and

7. Designate a FDNY Compliance Officer reporting to the executive level who will ensure that operationally all rules are enforced including inspections. The remarkable complaint from so many officers that there are too many rules and regulations, some difficult to carry out, leads to the suggestion that the Compliance Officer also be tasked with analyzing rules and regulations to ensure they are reasonable and practical. Members throughout the Department should be told that they can and must contact the Compliance Officer when they know a rule is not being consistently carried out. In this investigation, witnesses stated they knew rules were not being enforced consistently, but did not feel an obligation to do anything about it because a supervisor was in place to do that, or could not say anything about such a situation beyond an immediate supervisor. Reporting problems and issues to an immediate supervisor should be the first step, but everyone should be told that a Compliance Officer is present for such issues. Everyone should exercise common sense about making these issues known.
8. The FDNY has made key changes to address the monitoring of inspections. The Borough Commander is now notified of who is performing building inspections, which will mean the executive team will have direct access to that information at its bi-weekly meetings; and the FDNY has established a computer notification system that will alert firehouses of buildings (including buildings under construction and demolition) that must be inspected. The FDNY has also embarked on a multi-year initiative to change its building safety inspection program that, when completed, will enable the FDNY to prioritize and ensure compliance with building safety inspections based on real-time data from multiple sources. And, in 2008, the FDNY implemented a Performance Safety and Accountability program, which includes accountability sessions covering key measures. These are good changes, more can be done. The FDNY executive team must inquire about and identify (and look to its staff to identify) hot-button concerns, such as widespread issues with required inspections, so they can be adequately addressed proactively or in real-time with actions such as better monitoring, policy changes or reach-outs from the executive team to the lower ranks. In short, there needs to be more fluid communication between the executives and the other FDNY ranks, particularly on issues such as noncompliance with important rules. In reflecting on how many officers and executives interviewed assumed proper inspections were being carried out, calls to mind the saying trust but verify. These are the sorts of issues that are sometimes identified at compstat-type programs that many City agencies conduct.

digital photos of most serious fire and building code violations and perform timely joint inspections. Starting in July 2009, the FDNY reports that all personnel will be trained in building inspection safety procedures, which include both fire and building code provisions.

9. The Chief of Department should delegate in writing who is to approve in each borough the “fire prevention liaison” officer (*i.e.*, the building inspector coordinator) in each division and battalion pursuant to rules 6.1.1 and 7.1.1.

In the wake of the fatal fire, the Mayor’s Office convened a Task Force to review safety, oversight and coordination of construction, demolition and abatement operations in the City. Last year, that Task Force issued more than thirty recommendations designed to strengthen City agencies’ practices and procedures in this area, with a particular focus on sharing information among the agencies that oversee and inspect such operations. Many of these recommendations have been implemented, including cross-training of FDNY, DOB and New York City Department of Environmental Protection (DEP) inspectors in a common set of safety protocols, regular inter-agency sharing of information about construction and demolition permit issuance and high-risk abatement jobs, and overhauling the process for the FDNY to refer dangerous conditions to DOB. A key recommendation was to develop a computer-based system to share inspection data and create common inspection protocols among FDNY, DOB and DEP. Implementation is already under way, and once complete, the FDNY will have a much more refined ability to conduct inspections on the basis of which sites pose the greatest safety risks.

The fire at 130 Liberty Street resulted in the tragic loss of Firefighters Joseph Graffagnino and Robert Beddia. Based on this investigation, it is anticipated that certain individuals within the Department will be the subject of disciplinary action. Indeed, the investigation established an unacceptable lack of emphasis on required inspections in lower Manhattan, and elsewhere in commands throughout the Department. Commissioner Scoppetta has sought to address this issue over the past two years. We cannot know what the required inspections at the site would have revealed. This investigation did establish how important they are to fire and safety operations.

5.8 CONSTRUCTION AND DEMOLITION OPERATIONS

- 5.8.1 Companies discovering buildings under construction or demolition within their administrative districts shall inspect these sites at least once every fifteen (15) days.
- 5.8.2 Notice of demolition operations about to commence shall be forwarded by the Bureau of Fire Prevention on Form A-102 to Division and District Offices. Deputy chiefs shall relay this information to appropriate Battalion and Company for the purpose of:
- ◆ Surveillance inspections during demolition period.
 - ◆ Corrective maintenance of building records.
 - ◆ Enforcing Fire Department rules for demolition fires.

Upon completion of demolition activities, the company in whose administrative district the premises is located, shall comply with the provisions of Sec. 2.8.8 B of this manual. Form A-102 shall be returned to Bureau of Fire Prevention indicating thereon the date that demolition of the building was recorded in company records.

District Office, upon receipt of Form A-102 shall, when premises concerned has combustible storage or equipment requiring a Fire Department permit, make required inspections to insure that all combustible permit accounts are properly voided. The provisions of the Rules of the City of New York and or pertinent Fire Prevention Directives shall be complied with.

REFERENCES:

1. F.P. Dir. 9-66, Demolition of Buildings (see Ch. 13).
2. F.P. Dir. 2-75R, Applications for Permits for Explosive Magazines (see Ch. 13).
3. Rules of N.Y.C. Title 3, Sec. 11-01, Buildings In The Course Of Construction And Buildings Under Demolition.
4. Rules of N.Y.C., Title 3, Sec. 14-06, Use Of Explosives For The Demolition Of Structures (see addendum 1).



Construction, Alteration and Demolition Sites

§11-01 Buildings in the Course of Construction and Buildings Undergoing Demolition.

§11-02 Use of Liquid Oxygen Cylinders on Construction, Alteration and Demolition Sites.

§11-03 Storage and Use of Oxygen Trailers in the Course of Construction and Demolition Work.

§11-04 Storage and Use of Ammunition for Powder Actuated Tools in the Construction and Alteration of Buildings.

§11-01 Buildings in the Course of Construction and Buildings Undergoing Demolition.

- (a) Deputy Chiefs shall cause continued inspections of buildings in the course of construction and demolition at least every fifteen (15) days, but more often where conditions dictate.
- (b) Inspections shall be for the purpose of detecting violations of the law, fire hazards or other conditions which represent hazards to workers or the public. The Fire Department is authorized to enforce provisions of the Building Code pursuant to §27-1014, Administrative Code.
- (c) Particular attention shall be given to the following:
 - (1) Requirement to maintain a safe construction operation (§27-1009 [a])
 - (2) Requirement to erect a sign containing the name, address and telephone number of general contractor and the owner of the premises. (§27-1009(c))
 - (3) Written permit from the Building Department. (§26-207)
 - (4) If construction reaches over 75 feet an elevator in readiness for use by the Fire Department must be provided. (§27-1014 (a) and 27-4270)
 - (5) Requirement relative to standpipe systems. (§27-1014 [b])
 - (6) Drying heaters and salamanders used for drying concrete or plaster. (§25-03 of these rules)
 - (7) Field offices, shanties or trailers. (§25-02)
 - (8) Storage and use of oxygen trailers. (§25-02)
 - (9) Improper storage or use of liquefied petroleum gases. (§25-01)

- (10) Improper hanging of tarpaulins.
- (11) Prohibition relative to open fires.
- (12) Improper storage and use of cartridges and cartridge rivet guns. (§11-04.)
- (13) Accumulations of combustible rubbish, old lumber and other combustible debris in and around structures. (Violation orders issued for removal of such material shall include a stipulation to "maintain premises free of such accumulations" and order shall be renewed every thirty days to keep it current. The order in effect and being superseded should not be dismissed but rather rescinded and a notation should be made on the reinspection slip and book copy of order that it has been superseded by Order No. .)

Board of Standards and Appeals rule §3-02(i)(18) provides that "combustible debris and waste material from demolition shall not be allowed to accumulate in any area of the demolition site. Combustible material and combustible waste material in excess of 15 cu. yds. shall be removed daily before the close of the day's work."

- (14) Watch person service shall be required in accordance with the provisions of §27-1024, Administrative Code which reads as follows:

Where a building being constructed or demolished occupies a ground area of more than 5000 square feet, and up to 40,000 square feet, a competent watch person shall be on duty at the site during all hours when operations are not in progress. Where the construction or demolition area occupies ground area of more than 40,000 square feet, at least one additional shall be on duty for each additional 40,000 square feet of construction or demolition area, or fraction thereof. Watch person shall be familiar with the location of street alarm boxes and the location and use of fire fighting equipment required on the job site.

- (15) Fire guards shall be required in accordance with the rules of the Board of Standards and Appeals, §3-02(e)(4)(ii).
- (16) Fire protection and fire extinguishers as provided by the Board of Standards and Appeals rules (§3-02 of the BSA rules).
- (17) Storage of limited quantities of volatile flammable oils (V.I.O.) (§27-4058(d) of the Administrative Code and §28-04 of these rules.
- (18) Fire department permits and certificates shall be required and in force as provided for in chapter 4 of title 27 of the Administrative Code.

Necessary remedial or enforcement action shall be promptly executed by members performing inspection duty.

8.4.2 Company Fire Prevention Liaison Officers:

- A. In order to establish the Fire Prevention administrative chain of command within the company level of operations, the Company Commander shall designate a Lieutenant of his command to have primary responsibility for the proper administration of Fire Prevention matters. He shall work in close liaison with chief officers in updating company Fire Prevention records.
- B. Company Commanders shall make equitable work assignments among the other lieutenants assigned to his command to permit the Company Fire Prevention liaison officer to realistically fulfill his function.
- C. Division/Battalion Fire Prevention Coordinators shall maintain an accurate record showing the designation of each unit's Company Fire Prevention liaison officer.
- D. In the event of transfer or extended leave of absence of the Company Fire Prevention liaison officer, the Company Commander shall designate a replacement.



DEPUTY CHIEFS

6.1 ADMINISTRATIVE DUTIES

- 6.1.1 A Deputy Chief in each division shall be selected by the Chief of Department to be the Division Commander and assume responsibility for the efficient administration of all units in their respective divisions.

The Division Commander shall be responsible to the Chief of Operations for executive duties and administrative policy within such division. He shall delegate specific duties equally among Deputy Chiefs in such division. Deputy Chiefs shall cooperate in the carrying out of administrative duties within divisions. The immediate superior Officer of the Deputy Chief will be the Citywide Tour Commander.

A Deputy Chief, other than the Division Commander, shall be designated as Fire Prevention Liaison Officer by the Division Commander, subject to the approval of the Chief of Department. This Officer's administrative duties shall be confined to coordination of all fire prevention activities of units within such division in accordance with procedures established by the Chief of Department. This does not exclude routine visits to units and the supervision of other required activities. In the event of an extended leave of absence of such Officer, the Division Commander shall select a temporary replacement and forward a special report for the approval of the Chief of Department.

A Deputy Chief other than the Division Commander shall be designated as Division Training officer by the Division Commander, subject to the approval of the Chief of the Department. The Training Officer's duties shall include:

- A. Monitoring of the Probationary Firefighter Development Program (AUC 323) emphasizing the proper use of the reading schedule and training notebook.
- B. Review of CD-135 to identify units that may require more assistance or supervision with training activities.
- C. Insure that periodic drills are conducted on unique local fire problems such as target hazards or buildings with pre-fire plans.
- D. Pay particular attention to newly promoted covering officers to assist and support them during drill periods.
- E. Develop appropriate topics for Multi-Unit Drill period that allow for interesting and meaningful hands on training.
- F. Insure that critiques are conducted regarding unit operations when appropriate.

- G. Insure the proper use of the Pass It On Program (ABC 1-97), including the posting and review of the most recent event.

In the event of an extended leave of absence of such officer, the Division Commander shall select a temporary replacement and forward a special report for the approval of the Chief of the Department.

- 6.1.2 Deputy Chiefs shall, before or during each tour of duty, notify the Officer Assignment Desk of any officer vacancies occurring as a result of leaves in their divisions. The Officer Assignment Desk is covered 24 hours a day, seven days a week.

6.2 RESPONSE TO ALARMS

- 6.2.1. Deputy Chiefs shall be at their respective quarters, except when department business requires their presence elsewhere. They shall not leave their administrative districts, except in response to an alarm or other emergency, without approval of the City Wide Tour Commander. They shall, while on duty, maintain communication with the Bureau of Fire Communications.

- 6.2.2 Deputy Chiefs shall respond to alarms and emergencies as provided by Regulations or orders of the department. All required information relative to such operations shall be recorded in the division fire record journal.

- 6.2.3 Deputy Chiefs shall, when operating at fires or other emergencies, maintain communication with the Bureau of Fire Communications for the purpose of receiving information of other fires or events requiring their attention.

The Deputy Chief will notify the Citywide Tour Commander of the preliminary findings of major apparatus accidents, gross negligence of members, fatal fires, unusual occurrences of a serious nature, etc. The Citywide Tour Commander will, after consulting with the Deputy Chief, determine if his response is required.

6.3 MERITORIOUS ACTS

- 6.3.1 Deputy Chiefs on duty shall thoroughly investigate and report on all meritorious acts occurring within their assigned response area at which a Deputy Chief was not present.

In cases where a Deputy Chief has not responded to an operation, the officer in command of the operation shall notify the dispatcher of the meritorious act(s).

The dispatcher shall notify the Deputy Chief on duty who is responsible for response to the area of operation.

The Deputy Chief shall respond, as promptly as possible, and conduct an investigation necessary for the processing of required reports .



BATTALION CHIEFS

7.1 ADMINISTRATIVE DUTIES

- 7.1.1 The battalion chief in each battalion, senior in such rank, shall, unless otherwise ordered by the division commander with the approval of the Chief of Department shall be the battalion commander and assume responsibility for the efficient administration of all the units in their respective battalions.

The battalion commander shall be responsible to the division commander for executive duties and administrative policy within such battalion. The Battalion Commander shall delegate specific duties equally among the battalion chiefs in such battalion. Battalion chiefs shall cooperate in the carrying out of administrative duties within battalions.

A battalion chief other than the battalion commander shall be designated as fire prevention liaison officer by the division commander, subject to the approval of the Chief of Department. The liaison officer's administrative duties shall be confined to coordination of all fire prevention activities of units within such battalion in accordance with procedures established by the Chief of Department. This does not exclude routine visits to units and the supervision of other required activities. In the event of an extended leave of absence of such officer, the battalion commander shall select a temporary replacement and forward a special report to the division commander for the approval of the Chief of Department.

A Battalion Chief other than the Battalion Commander shall be designated as Battalion Training officer by the Division Commander, subject to the approval of the Chief of the Department. The Training Officer's duties shall include:

- A. Monitoring of the Probationary Firefighter Development Program (AUC 323) emphasizing the proper use of the reading schedule and training notebook.
- B. Review of CD-135 to identify units that may require more assistance or supervision with training activities.
- C. Coordinate the Firefighter 6th grade training program
- D. Insure that periodic drills are conducted on unique local fire problems such as target hazards or buildings with pre-fire plans.
- E. Pay particular attention to newly promoted covering officers to assist and support them during drill periods.

- F. Develop appropriate topics for Multi-Unit Drill period that allow for interesting and meaningful hands on training.
- G. Insure that critiques are conducted regarding unit operations when appropriate.
- H. Insure the proper use of the Pass It On Program (ABC 1-97) including the posting and review of the most recent event.

In the event of an extended leave of absence of such officer, the Battalion Commander shall select a temporary replacement and forward a special report to the Division Commander for the approval of the Chief of the Department.

7.2 RESPONSE TO ALARMS

7.2.1 Battalion chiefs shall be at their respective quarters, except when Department business requires their presence elsewhere. They shall not leave their administrative districts, except in response to an alarm for fire or other emergency, without approval of the deputy chief on duty in the battalion's administrative division.

7.2.2 Battalion chiefs shall respond to alarms and emergencies as provided by regulations or orders of the Department, and promptly report to the officer in command. They shall assume command when first to arrive at an alarm and exercise complete control until the arrival of a superior in rank.

When a Battalion Chief arrives at the scene of an operation where an Acting Battalion Chief is the Incident Commander, the Battalion Chief shall assume command of the operation and assign the Acting Battalion Chief as needed.

7.2.3 Battalion chiefs shall, when in command of an operation, cause the prompt return of all units not required at such operation. They shall take every precaution to prevent any possibility of fire occurring after the Department leaves the scene.

7.2.4 Battalion chiefs shall, when in command, immediately transmit to the dispatcher by radio or telephone a preliminary report of the alarm. Reports shall state existing conditions, number of companies operating, and all other information required by forms provided for this purpose. Progress reports shall be transmitted in strict compliance with provisions outlined in the Communications Manual, until the fire is brought under control, or until relieved by a superior officer. When the services of fireboats, squad, or rescue companies, or other units are not required, dispatchers shall be promptly notified.

During operations, additional reports shall be transmitted of unusual occurrences, or when the attention and cooperation of other departments or agencies are required. Upon return to quarters, a more detailed report shall be telephoned to the dispatcher.

7.3 MERITORIOUS ACTS

- 7.3.1 The Battalion Chief on duty shall investigate and report on all meritorious acts, occurring within their administrative districts, at which a Battalion Chief was not present.
- 7.3.2 Battalion Chiefs shall investigate and report on all meritorious acts occurring at fires or alarms to which they responded first due.
- 7.3.3 Battalion Chiefs shall forward reports of meritorious acts (BP166) to the Deputy Chief who is charged with the final investigation.
- 7.3.4 Battalion Chiefs shall immediately notify the Deputy Chief at the scene of operations of all meritorious acts. If a Deputy Chief is not present, the Battalion Chief shall notify the dispatcher of the meritorious act(s), which shall be transmitted to the Deputy Chief responsible for response to the area of operations.

7.4 INSPECTIONS, INVESTIGATIONS

- 7.4.1 Each assigned Battalion Chief must visit at least once each week every Department building over which the Battalion has supervision, and inspect members, uniforms, apparatus, equipment, and records.

Entries in Company Journals, subsequent to last inspection by a Battalion Chief, shall be examined and an entry made by the Battalion Chief on the result of this inspection.

When practicable, visits may be made at time designated for roll call. Covering Battalion Chiefs shall cooperate in the carrying out of required inspectional visits.

- 7.4.2 Battalion Chiefs shall, when notified of missing equipment on an apparatus which has been received for permanent use or storage, conduct an investigation and forward a report of the result of this investigation as per section 11.3.17 or 11.3.19.
- 7.4.3 A Battalion Chief shall be responsible for the investigation of lost Department property. The investigating Chief shall comply with the provisions of the Manual of Requisitions and Payroll regarding lost Department Property.
- 7.4.4 Battalion Chiefs shall supervise the inspection of buildings in their Battalion administrative districts. They shall see that all Regulations or orders relative thereto are strictly enforced.

IV. Administrative Investigation Regarding the Department of Buildings

In the aftermath of the August 18, 2007 fire at 130 Liberty Street, there were indications that the New York City Department of Buildings (“DOB”) Lower Manhattan Construction Command Center (“LMCCC”) Task Force inspectors, charged with carrying out daily inspections at the site, lacked the training, inter-agency coordination, and supervision to properly ensure these inspections were taking place.

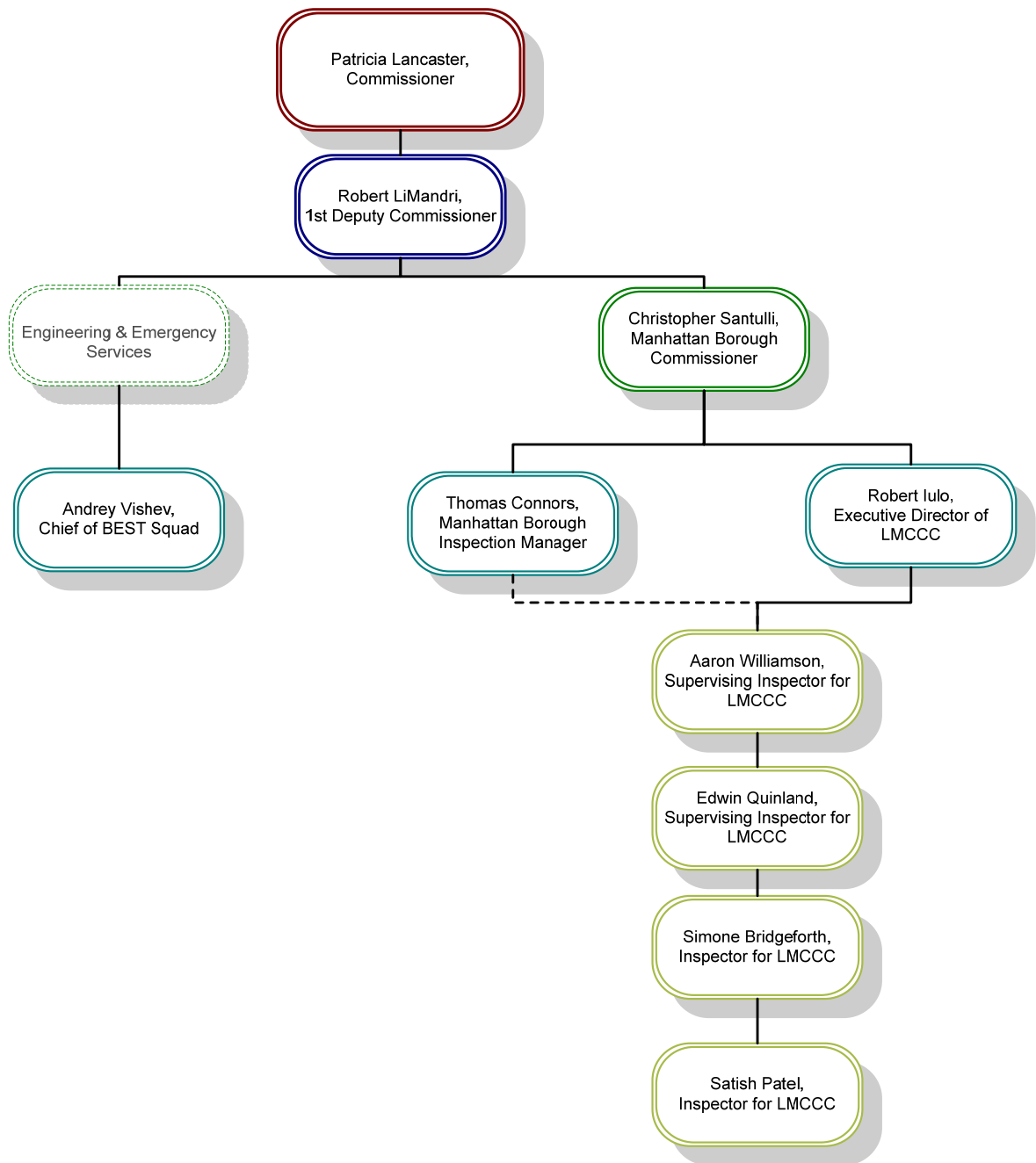
A. The Building Code of the City of New York

DOB is charged with ensuring the safe and lawful use of buildings and properties by enforcing the Building Code of the City of New York (“Building Code”). In turn, DOB inspectors are responsible for enforcing the Building Code and ensuring that contractors are in compliance with the provisions of the Building Code.

Prior to the August 18, 2007 fire, the 1968 Building Code of the City of New York was in effect. The relevant 1968 Building Code subchapters pertaining to this investigation (see attached) can be found in:

- Title 27, Subchapter 17, entitled Fire Alarm Detection and Extinguishing Equipment, Article 3, Standpipe Requirements;
- Title 27, Subchapter 19, entitled Safety of Public and Property during Construction Operations; and
- Title 27, Subchapter 6, entitled Means of Egress:
 - Article 1 General
 - Article 2 Determination of exit requirements
 - Article 3 Location of exits
 - Article 4 Number of exits
 - Article 5 Access requirements and exit types
 - Article 6 Exit lighting
 - Article 7 Exit signs
 - Article 8 Exit signs for existing buildings
 - Article 9 Stair and elevator signs

B. Chain of Command Chart as of August 2007



C. Timeline and Relevant Documents

- **Fall 2006** - Manhattan Borough Commissioner Christopher Santulli instructs Manhattan Borough Inspection Manager Thomas Connors to put together an inspection unit for the DOB LMCCC Task Force.

According to the New York County District Attorney's report, in or about the fall of 2006, a 42-foot breach of the standpipe in the basement occurred.

- **February 2007** - The DOB LMCCC Task Force moves into its office at 1 Liberty Plaza, Manhattan, NY.
- **March 2007** - DOB LMCCC Task Force begins inspections at 130 Liberty Street, Manhattan, NY.
- **May 2007** - Robert Iulo is named the DOB LMCCC Task Force Executive Director. According to the DOB, Iulo continues to also oversee Safety and Emergency Operations which includes the Buildings Enforcement Safety Team (B.E.S.T.).
- **May 17, 2007** - A pipe from 130 Liberty Street falls through the roof of the Engine 10/Ladder 10 Firehouse. DOB issues violations to Bovis Lend Lease and John Galt each for: 1) failure to safeguard public and property affected by construction operations, and 2) failure to carry out demolition in a safe and proper manner.
- **June 7, 2007** - E-mail correspondence between Connors and DOB LMCCC Inspector Aaron Williamson establishing the protocol for issuing violations at 130 Liberty Street.
- **June 25, 2007** - DOB LMCCC Inspector Williamson observes Standpipe "A" capped on the 28th floor instead of being capped at the 31st floor and Standpipe "A" also had a plank of wood lying through it. Williamson reported the incident to Bovis Lend Lease, URS and DOB LMCCC Executive Director Robert Iulo. Iulo instructs Williamson to give Bovis two hours to cure the standpipe condition and instructs Williamson not to include the standpipe incident in his June 25, 2007 Special Report.
- **August 18, 2007** - A discarded cigarette on the 17th floor of 130 Liberty Street causes a massive fire, killing Firefighters Robert Beddia and Joseph Graffagnino and injuring over 100 other firefighters.

D. Investigative Findings

130 Liberty Street was a unique exception to the standard demolition process. Typically, a building that is to be demolished must first undergo any necessary abatement. Once abatement is fully completed, the demolition process begins. With regard to 130 Liberty Street, beginning in March 2007, concurrent demolition and abatement activity was taking place, with a four-floor buffer zone between the demolition floor and the abatement floors. The buffer floors consisted of those floors that had already undergone abatement and were considered “clean” as determined by the relevant oversight environmental agencies, including the United States Environmental Protection Agency, the New York State Department of Labor, and/or the New York City Department of Environmental Protection. The purpose of the buffer zone was to protect the abatement workers from falling demolition debris.

The DOB created the DOB LMCCC Task Force in or about February 2007 with the purpose of conducting building inspections in Manhattan, south of Canal Street.¹¹ DOB LMCCC Task Force was responsible for conducting inspections at 130 Liberty Street. Unlike other building inspections, a DOB LMCCC Task Force inspector was stationed at 130 Liberty Street on a full-time basis.

Manhattan Inspection Manager Thomas Connors testified that towards the end of 2006, Manhattan Borough Commissioner Christopher Santulli instructed Connors to develop and staff an inspection unit for the DOB LMCCC Task Force. Connors stated that he posted a job flyer and eventually selected DOB inspectors Aaron Williamson, Edwin Quinland, Simone Bridgeforth, and Satish Patel.

Connors further testified that from February 2007 until about June 2007, he was unofficially overseeing the DOB LMCCC Task Force inspection unit. Connors said that in or around April or May 2007, Assistant Commissioner Robert Iulo was named Executive Director of DOB’s LMCCC Task Force.

Training

Given that DOB LMCCC was established to handle construction inspections in Lower Manhattan, Connors testified that in hiring the DOB LMCCC inspectors he was looking for construction inspectors with a minimum of five years of construction experience, which is the minimum experience requirement to be hired by the DOB as a construction inspector. They did have that construction experience, however, as each of the DOB LMCCC inspectors testified, and as Connors acknowledged, each of the inspectors had varying degrees of experience with construction inspections, and none of the DOB LMCCC inspectors had any experience on site safety/demolition projects.

In particular, DOB LMCCC Inspector Bridgeforth testified that she was not really trained about the standpipe system and that she did not understand how the standpipe system worked. She further testified that she did not trace the standpipe in the basement and that after the fire,

¹¹ Connors as well as the DOB LMCCC inspectors testified that they did not conduct certificate of occupancy or public assembly inspections. These types of inspections were conducted by the borough inspectors.

when a plumbing inspector showed her the missing section of the standpipe, she said that she did not know what she was looking at and except for being told it was the standpipe she might have thought it was a gas line.

Connors as well as the DOB LMCCC inspectors testified that a training program was initially set up between the DOB LMCCC and the DOB's Buildings Enforcement Safety Team ("B.E.S.T.") Squad¹² whereby the B.E.S.T. Squad would train the DOB LMCCC inspectors on site safety projects below Canal Street. The arrangement was supposed to be that each DOB LMCCC inspector would shadow a B.E.S.T. inspector for a two-week period whenever a B.E.S.T. inspector had to conduct a site safety inspection below Canal Street. However, the DOB LMCCC inspectors testified that they did not spend a full two weeks with a B.E.S.T. inspector.

B.E.S.T. inspectors, who are responsible for inspecting site safety and demolition projects and who reported to Andrey Vishev, who reported to Iulo, were periodically performing site safety inspections at 130 Liberty Street. Thus, Connors testified, another component of the training program for the DOB LMCCC inspectors was supposed to be that B.E.S.T. inspectors would contact them when B.E.S.T. arrived at 130 Liberty Street. B.E.S.T. inspectors were then supposed to conduct their site inspection jointly with DOB LMCCC for instructional purposes. However, Connors sent an e-mail to then Chief of B.E.S.T., Vishev, stating that he was told that the B.E.S.T. inspectors were *not* contacting the DOB LMCCC inspectors upon arriving at 130 Liberty Street. Vishev responded to Connor's e-mail stating that DOB LMCCC inspectors should be able to conduct independent inspections on their own without B.E.S.T. since they were stationed at the site full-time. Connors further testified that he had a conversation with then-Manhattan Borough Commissioner Christopher Santulli about this matter. Santulli testified that he called a meeting with Connors, Iulo, and Vishev to discuss the procedure and reaffirmed that when B.E.S.T. arrived at the site they were to notify the DOB LMCCC inspector and conduct a joint inspection. Santulli said that it was not until after the fire that he learned that this procedure had not been followed by B.E.S.T. inspectors who were managed by Vishev and Iulo. (According to DOB, prior to August 2007 Iulo had oversight of DOB LMCCC and B.E.S.T.)

Although Connors was aware that none of the DOB LMCCC inspectors had any experience on site safety/demolition projects, Connors testified that as the DOB LMCCC inspectors embarked on their assignment, he did not provide them with any type of formal training on the relevant sections of the Building Code pertaining to those areas. (According to the DOB, such training should have been provided by Vishev as Chief of B.E.S.T.) Moreover, Connors said that he did not discuss the status of the demolition at 130 Liberty Street with the DOB LMCCC inspectors, and that he never told the DOB LMCCC inspectors specifically what to inspect at the site. Similarly, the DOB LMCCC inspectors testified that they were never given any site specific training.

DOB LMCCC Inspections

The DOB LMCCC inspectors, as well as Connors, Iulo, and Santulli testified that it was DOB policy that DOB inspectors were not permitted to enter or inspect the areas undergoing abatement. The DOB LMCCC inspectors further testified that because they could not enter the

¹² B.E.S.T. is a specialized unit within DOB that is responsible for conducting site safety and demolition inspections.

abatement areas, which encompassed the stairwells and parts of the basement, they were unable to fully trace the standpipe. Moreover, they testified that they were never really clear on which areas of the basement were clean versus contaminated, and that they could not check the standpipe in the areas of the basement that were contaminated. So they just stayed away from areas of the basement that they perceived were contaminated.

The DOB LMCCC inspectors further testified that they never inspected the “kick-out” panels, which were planks of wood covered in polyethylene sheeting that served as containment barriers located in the stairwells separating the buffer floor from the abatement floor. The witnesses testified that they were told not to go onto the abatement floors. The visual vantage point the DOB LMCCC inspectors had of the kick out panels was from the buffer floor above. The DOB LMCCC inspectors saw but did not inspect the kick-out panels because it was their understanding that these kick-out panels were designed and approved by the New York City Department of Environmental Protection and were, therefore, as Santulli stated, not under their jurisdiction to inspect.

Supervision/Direction

DOB LMCCC inspectors testified that Connors had told each of them that their job responsibility was to monitor the deconstruction process at 130 Liberty Street on the demolition floors and that they were not to enter the abatement floors.

DOB LMCCC inspectors testified that they were never provided with a checklist or any specific instructions as to what to inspect. They further testified that they were never specifically told to check the standpipe, means of egress, nor were they specifically instructed to check the site safety log. While they were not specifically instructed to check the stand pipe, DOB LMCCC inspectors testified that they did conduct a visual inspection of the standpipe. This visual inspection included checking that the standpipe was capped one floor below the demolition floor, that the Siamese connection outside the building on street level was not blocked by anything, and that the required red light signifying the location of the Siamese connection was functioning. The light is in place so that firefighters can locate the Siamese connection and not have to circle a location looking for it.

Since a DOB LMCCC inspector was assigned to 130 Liberty Street full-time, according to the witnesses, a protocol was established by Connors which required inspectors to make certain notifications before issuing a violation. An e-mail dated June 7, 2007 from Connors to the DOB LMCCC inspectors and Iulo, who at that time became the DOB LMCCC Executive Director, explained to inspectors:

The protocol that was set up over a month ago for 130 Liberty, was:

- 1) Notify both the URS & Bovis site safety person of the issue, and advise of needed correction.
- 2) At the time, you were then to notify me. Now that Robert [Iulo] is on board, notification should go to him. An agreed upon time for

correction will be determined.

3) If after an agreed upon time has elapsed and correction has not happened, upon notification to Robert [Iulo] or me, the violation will be issued.

As Manhattan Inspection Manager, Connors testified that he spent part of his time involved with the DOB LMCCC Task Force up until June 2007. During that period, Connors said that he spent three to three and a half hours at the DOB LMCCC office. Since he was not there on a full-time basis, he created a system whereby the DOB LMCCC inspectors would submit daily "Special Reports" that documented the various activities for the day including photographs. Connors reviewed those Special Reports, as did Iulo when he became Executive Director of DOB LMCCC Task Force in June 2007. Connors said that while he was at the DOB LMCCC offices located at Liberty Plaza on the eastside of Ground Zero, he would meet with the inspectors to discuss any issues in their Special Reports or any issues that came up; however, Connors testified that during these meetings, he never asked the inspectors about the progress of the demolition or what they were checking. He said that he "gave the building" to the inspectors meaning that he did not want to "[lead] them by the hand" or "show them [what to] do for an inspection, this and that . . ." because he wanted the inspectors "to feel responsible" and "take control of what they were doing."

It was not until May 2007 that a full-time Executive Director of the DOB LMCCC Task Force, Robert Iulo, was officially named. Iulo had previously been Assistant Commissioner of Citywide Inspections at the DOB, responsible for B.E.S.T. and other areas. According to Iulo, a DOB memorandum was circulated in May 2007 naming him the Executive Director of the DOB LMCCC Task Force. The memorandum also stated that Iulo would continue to lead the Safety and Emergency Operations team until that position was filled. Iulo testified that based on his past experience and on what he was told about the position, that he would be attending "a lot of meetings," he felt qualified for the position. During the month of June 2007 there was a transition between Connors and Iulo. But Iulo stated that he did not physically move into his DOB LMCCC Task Force office until August 2007. Thus, Connors had been re-assigned as of June 2007, but Iulo was not fully in place until August 2007. However, Iulo testified that the DOB LMCCC inspectors had been reporting to him, as well as to Connors, beginning in May 2007.

Iulo stated that as Executive Director he did not have meetings with the DOB LMCCC inspectors, but that he visited 130 Liberty Street a few times and probably discussed the site with the inspectors then. He further testified that he probably asked the inspectors what was happening on the demolition floors, since that was his biggest concern, and that he knew the inspectors could not inspect the building as a whole.

Iulo said that he imagined the DOB LMCCC inspectors were tracing the standpipe in the basement and thought they knew what they were looking at but, in hindsight, they really did not know what they were looking at.

June 25, 2007 Standpipe Incident

DOI's investigation revealed that on June 25, 2007, DOB LMCCC Inspector Aaron Williamson discovered that Standpipe "A," one of the two standpipes at 130 Liberty Street, was not capped one floor below the demolition floor as required by Subchapter 19 of the New York City Building Code. Williamson testified that he observed that Standpipe "A" was capped on the 28th floor and not on the 31st floor, which would have been one floor below the demolition floor. According to Williamson, this constituted a "hazardous" violation.

Upon further inspection of Standpipe "A," Williamson testified that he also saw that the standpipe had been breached in that the stem of the standpipe (the part the firefighters use as a connector to hook the fire hose to the standpipe) was missing and in its place was a plank of wood lying horizontally between the two sections of pipe on the 28th floor. Williamson notified Iulo, (Connors was no longer in place), and told Iulo that a Stop Work Order needed to be issued.¹³ Iulo told Williamson not to issue the Stop Work Order but to give Bovis two hours to fix the standpipe-related violation. Williamson notified Bovis Site Safety Manager Jeff Melofchik of both violating conditions.¹⁴ However, the witnesses said and the DOB confirmed, that these circumstances made this a "hazardous" violation, meaning the inspector should not refrain from issuing the violation and Stop Work Order. Williamson also said that he told Iulo that Bovis should be made to test the standpipe following its repair.

According to Williamson, he spoke to Melofchik about this situation. According to Williamson, Melofchik stated the stem of the standpipe was removed and replaced with a plank of wood in order to clean the stem of foam used in the abatement process.

Within two hours, that portion of the standpipe where Williamson had observed the breach was fixed in that the plank of wood was removed and the stem of the standpipe had been replaced. Williamson again stated that because of the incident he told Iulo that the standpipe should be hydrostatic tested to make sure that it was functioning.¹⁵ However, Williamson said the standpipe was not tested. Williamson felt this incident was serious.

Remarkably, Iulo testified he had no recollection of this June 25, 2007 incident involving a plank of wood in the standpipe, any conversations with Williamson about such a situation and how to handle it, or any request from Williamson for the standpipe to be tested. According to Williamson's testimony, neither Williamson nor Iulo directed Bovis to test the standpipe, and Bovis did not test the standpipe on its own.

¹³ The violations issued to Bovis would have been: (1) failure to cap the standpipe one floor below the demolition floor and (2) breach in the standpipe.

¹⁴ As mentioned, the NYCDAO indicted Jeff Melofchik on December 22, 2008 for manslaughter and other criminal offenses in the deaths of Firefighters Robert Beddia and Joseph Graffagnino.

¹⁵ Such a "test shall demonstrate that the [standpipe] system will sustain a hydrostatic pressure of at least 100 psig and at least 300 psig at the Siamese connection for a period of at least one hour at the top most hose outlet and at the lowest fire pump supply connection to the [standpipe] system." Title 27 of the 1968 Building Code, Subchapter 17, Article 3, Section 27-951(g)(1)(a). Thus, the entirety of the standpipe is tested in this process from the Siamese connection to the top most hose. Any breach, anywhere in the standpipe should be detected in such a test.

Williamson filed his Special Report for June 25, 2007 with Iulo, which did not include a description of the aforementioned incident because, according to Williamson, Iulo instructed him not to include the incident from June 25, 2007 in the Special Report. However, Williamson stated that he did a second “Special Report” for his own records that did include a description of the incident. That report, he asserted, was not given to anyone. DOI obtained both versions of the June 25, 2007 Special Report, one that does and one that does not make reference to a standpipe incident. Williamson’s second “Special Report” contained one photo of the plank of wood in the standpipe that Williamson said he took on June 25, 2007. DOI checked the DOB Digital Photo System and verified that the picture Williamson took of the standpipe was uploaded to the system on June 27, 2007.

Iulo reported to Christopher Santulli, the DOB Manhattan Borough Commissioner. Williamson did not go up the chain of command and report the June 25, 2007 incident to Santulli. Williamson also testified to DOI he did not contact Connors and discuss this incident with him.

Similarly, Connors testified that he had not been told of this standpipe incident before the August 18, 2007 fire. Connors stated that a couple of days after the fire Williamson e-mailed him a picture of what appeared to be a standpipe with a plank of wood lying horizontally through the pipe. (On August 20, 2007, Williamson emailed Connors and Iulo one of the photos he took on June 25, 2007 of the standpipe with the plank of wood.) Connors could not recall his reaction to seeing this picture nor any conversations he had with Williamson regarding the standpipe. Connors said that he never saw Williamson’s second “Special Report.” Connors said that he referred Williamson’s information and the photograph to Eric Reid, who at the time was a DOB forensic engineer leading an inquiry for the DOB to determine any needed amendments to procedures or building code provisions.

Disciplinary charges were drafted against Iulo based on his failure as the DOB LMCCC Executive Director to (1) ensure that inspections were performed in an efficient and adequate manner and (2) ensure that the DOB inspectors assigned to the LMCCC were properly trained to perform their job functions at 130 Liberty Street. Iulo was officially served with charges on February 17, 2009. On February 20, 2009 Iulo officially retired from DOB with charges pending.

It should be noted that on the day of the fatal fire, August 18, 2007, it was Standpipe “A” that failed to supply the firefighters with water needed to extinguish the fire. The DOB notes that the missing stem of the standpipe with the plank of wood discovered by their LMCCC inspector Williamson on the 28th floor, was above the level of the August 18th fire, which took place on the 17th floor. The DOB also notes that the NYCDAO report stated that a 42-foot breach of the standpipe in the basement, not the breach discovered by Williamson, was what rendered the standpipe inoperable on the day of the fire. However, a pressure test of a standpipe, such as the one Williamson wanted performed on June 25, 2007, would have detected a breach anywhere in the standpipe. The DOB also notes that the provisions of the Building Code do not require hydrostatic pressure tests to be performed as a result of removal of the upper portions of the standpipe system as the upper stories of a building are being demolished. While not required, a DOB LMCCC inspector wanted one performed on June 25, 2007 due to circumstances that alarmed him.

Conclusion

DOI's investigation determined that there was an overall breakdown in several key areas regarding the oversight and inspection process of 130 Liberty Street. DOB LMCCC inspectors were not provided with adequate training for a building of this magnitude undergoing concurrent abatement and demolition. As Inspector Bridgeforth testified, she was not really trained on the standpipe system and did not understand how the standpipe system worked.

Based upon the testimony taken by DOI, 130 Liberty Street was undergoing concurrent abatement and demolition activities. It was DOB policy for inspectors not to enter the abatement floors. In light of this, there was no strategic inspection plan ever established that would provide the DOB LMCCC inspectors with the ability or access to inspect the abatement floors. Furthermore, various agencies that had access to different floors and different areas of the building did not request pertinent information from one another.

In addition, there was a lack of coordination between DOB's LMCCC Taskforce and the B.E.S.T. Squad in terms of training the DOB LMCCC inspectors. Both units reported to Iulo prior to August 2007, and yet even with one person overseeing both of those units there was still a lack of coordination. Even though DOB was made aware of the lack of coordination, and even though Santulli held a meeting to resolve this issue, there was no follow up by Santulli, Vishev, Connors and Iulo to ensure that the B.E.S.T. Squad was training the DOB LMCCC inspectors on site safety issues.

Furthermore, there was an overall lack of supervision over the DOB LMCCC inspectors. As Connors testified, he turned responsibility for inspecting the building over to the DOB LMCCC inspectors without any specific instructions or directions and assumed that they would know how to inspect a building with such complexities. In addition, when Iulo became the Executive Director he never provided the DOB LMCCC inspectors with a checklist nor did he provide them with any specific instructions or directions on what to inspect.

Regarding the June 25, 2007 standpipe incident, as Inspector Williamson testified, upon observing a plank of wood lying horizontally through the standpipe on the 28th floor, he testified that he told Iulo that a Stop Work Order should be issued and that the standpipe should be tested, pressure testing the standpipe system. Thus, if the standpipe had been tested in June 2007, and if the standpipe was cut at that time, that test should have shown that to be the case. According to the DA's report, the catastrophic failure of the standpipe was the result of it being cut during the fall of 2006. While the plank of wood in the standpipe identified on June 25, 2007 was therefore not the cause of the catastrophic failure of the standpipe, a full test of the standpipe at that time should have revealed its other breach. Not conducting the pressure test on June 25, 2007, which a DOB LMCCC inspector thought should be done, was a serious missed opportunity to discover the other issues that then existed with the standpipe.

E. DOB Reforms Since the August 18, 2007 Fire

Since August 18, 2007, DOB has implemented several changes at 130 Liberty Street to improve the building inspection process and to ensure site safety, such as:

- A site specific checklist for 130 Liberty Street was created for the inspectors.
- Inspectors were given 30 hours of OSHA training.
- Inspectors received an additional one week on-the-job training with a B.E.S.T. inspector.
- Inspectors were given training so that they can now enter the contaminated areas.
- Additional “no smoking” signs have been posted at the site and are written in both English and Spanish. A dog is now stationed at the site to detect smoking materials, such as lighters, matches, and cigarettes.
- The standpipe is now equipped with a pressurized-alarm system so that if there is a breach in the standpipe system the alarm will sound.
- The standpipe has been painted red.
- A team of ten inspectors has been dedicated to the site (six DOB inspectors and four on loan from HPD) in order to provide the required six days per week, 24 hours a day coverage matching that of the contractors’ work schedule. (This is being implemented through the abatement phase.)
- A team of six inspectors has been made available to provide full-time inspection coverage for safety issues such as egress, fire protection, and other Building Code requirements. (This will be implemented through the deconstruction phase.)
- Standard inspection checklists are now utilized so inspections can be performed consistently and completely by each inspector. Checklists include:
 - Making sure there is no unobstructed egress.
 - Enforcing a zero tolerance policy for violations of the "No Smoking" regulations adopted in the 2008 Fire Code.
 - Inspecting the crane, hoists, scaffold, and sheds for compliance with safety requirements set forth by the code and recently enacted legislation.
 - Reviewing the Site Safety Manager's log to ensure that it is kept up to date with the results of the daily oversight by the Site Safety Manager as required by law.
 - Reviewing the standpipe cutting and capping process as the demolition proceeds.
 - Tracing the critical standpipe systems completely from the Siamese connections through to the standpipe.

- Inspectors have been trained in the use of asbestos protective equipment and enter the abatement areas to inspect for safety issues such as egress, fire protection, and other Building Code requirements.
- Routine BEST inspections of the site are performed and dedicated site inspectors have been trained.
- Hazardous conditions now require immediate correction, including the issuance of any necessary ECB violations.
- DOB has allocated additional engineering and high-rise plan examination staff who focus on safe demolition means and methods and inspect the site three times per week.
- DOB now requires detailed drawings of the decontamination enclosure systems and other related physical construction required to support the abatement.
- DOB now requires engineered drawings for the removal of sections of the building, including mechanical equipment calculations and details where used.

F. Mayor's Citywide Task Force Response

Following the fire at 130 Liberty, Mayor Michael R. Bloomberg ordered a comprehensive review of oversight and operations at construction, demolition, and abatement sites. Deputy Mayor Edward Skyler led the seven-month review by a working group comprised of DOB, FDNY, the DEP, the Law Department and the Mayor's Office of Operations.

In July 2008, the working group issued a report entitled "Strengthening the Oversight of Construction, Demolition, and Abatement Operations" (CDA), which contained 33 recommendations designed to increase the safety of CDA operations in the field. The 33 recommendations focused in three key areas (and legislation has been introduced to effectuate the changes, and in some cases the legislation has been passed, but not signed by the Mayor). The three key areas are: Regulating the oversight and safety of asbestos abatement; improving inter-agency communication and enhancing safety at construction and demolition sites; and strengthening standpipe and sprinkler safety.¹⁶

In early May 2009, Deputy Mayor Skyler announced a comprehensive legislative package designed to improve safety protocols, increase City oversight and enhance inter-agency communication at construction, demolition and abatement sites in New York City.

¹⁶ The full report is available at the following link: http://www.nyc.gov/html/om/pdf/2008/pr277-08_safety_report.pdf.

G. Policy and Procedure Recommendations

However, in light of the findings of this investigation, DOI additionally recommends that DOB implement the following policy and procedure recommendations set forth below to the extent they are not already covered by the CDA task force work.

1. A uniform site safety log sheet that incorporates a checklist from the Rules of the City of New York should be created by DOB and distributed to all contractors upon obtaining a work permit that requires a site safety manager at the site. The uniform site safety log sheet should list specific items that the site safety manager is required to inspect, such as the standpipe, stairwells, means of egress, guardrails, horizontal safety netting, housekeeping, etc. This log sheet must be filled out daily by the site safety manager.
2. The DOB should send a memorandum to the entire inspectorial staff reminding them that as part of their construction monitoring duties they are required to review the site safety manager's log while inspecting site safety projects. DOI's investigation found that DOB LMCCC inspectors were not routinely checking the site safety logs.
3. We believe that reciprocal cross-training is vital and should become an established part of training for DOB and FDNY to educate their respective personnel on their respective safety requirements. As part of the implementation of the recommendations developed during the City's review of construction, demolition and abatement operations (the "CDA recommendations"), some cross-training of FDNY, DOB and DEP inspectors has occurred; this cross-training should be expanded and institutionalized.
4. The DOB should establish a cross-training program with the New York City Department of Housing Preservation and Development's demolition inspectors to further educate the DOB inspectors on demolition projects.
5. Regardless of the type of permit issued to a contractor, the DOB should not permit projects to undergo demolition until the abatement process is fully completed. DOI's investigation found that at 130 Liberty Street a demolition permit was not issued. Instead, an Alteration Type 2 permit was issued, which allowed the building to undergo concurrent abatement and demolition. There is pending legislation regarding this matter.
6. Currently, all DOB inspectors are responsible for taking pictures at construction sites during their inspections and for uploading these pictures onto the DOB digital photo system. However, based upon DOI's investigation, while pictures are being uploaded to the system, they are not being saved in a uniform manner thus making it difficult to search the system for particular pictures. Therefore, DOB should reissue to all DOB personnel the DOB March 2007 Standard Operating Procedure for Camera

Deployment and Photo Management. DOB should also specifically remind inspectors that they should follow the SOP when uploading and saving pictures to the system.

7. Additionally, DOB should remind DOB inspectors that photographs taken by DOB inspectors at construction sites should be uploaded onto the DOB digital photo system by the end of the inspector's work week.
8. DOI's investigation found that supervisors too often took a backseat role in monitoring and assisting their inspectors and inspections. DOB supervisors should guide their staff, ensuring they have a complete understanding of the site, including safety and environmental concerns and how the inspections play a role in overall safety at the site. Therefore, like other agencies, DOB should consider drafting written guidelines regarding supervision of inspectors. In the meantime, DOB should issue a memorandum reminding supervisors that they are responsible and accountable for ensuring that inspectors are properly performing inspections and enforcing compliance with the Building Code. Supervisors should also have regular meetings with their staff to anticipate potential issues and address them proactively. Additionally, supervisors should be reviewing paperwork, such as routing sheets, inspection reports and violations written by inspectors to monitor inspectors and spot any potential issues.

V. Final Observations

This administrative investigation undertaken by the City regarding the Buildings and Fire Departments revealed flaws and errors in their procedures. With such circumstances the City felt a self-examination was the right thing to do. But while there were errors by the City agencies responsible for inspecting the building, as the District Attorney said in his report, "everyone failed at the Deutsche Bank building." The subcontractor, The John Galt Corp., and the individuals permitted to work with The John Galt Corp., should never have had this project in the first place. The manner by which they conducted this project and its lack of site safety, now the subject of a criminal indictment, was an underlying problem.

**SUBCHAPTER 17
FIRE ALARM, DETECTION AND
EXTINGUISHING EQUIPMENT**

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ARTICLE 1 GENERAL

§[1700.1] **27-923 Scope.**-The provisions of this subchapter shall establish and control the minimum requirements for the design and installation of standpipe, sprinkler, fire alarm, and fire detection systems except for fire alarm systems in factory and mercantile buildings and where specific exemption is made in this code. Alterations or additions to existing systems shall comply with the requirements of this subchapter regardless of magnitude or cost.

§[1700.2] **27-924 Standards.**-The provisions of reference standard RS-17 shall be part of this subchapter.

§[1700.3] **27-925 Definitions.**-For definitions to be used in the interpretation of this subchapter, see subchapter two of this chapter.

§[1700.4] **27-926 Plans.**-For the requirements governing the filing of plans and the work to be shown on plans, see subchapter one of this chapter.

§[1700.5] **27-927 Permits.**-For the requirements governing equipment work permits, equipment use permits, see subchapter one of this chapter.

§[1700.6] **27-928 General requirements.**-All systems of standpipes, sprinklers, fire alarms, and fire detectors and all component devices thereof, as required by this subchapter specifically and by subchapters four, five, seven and eight of this chapter shall be installed in accordance with the provisions of this subchapter.

§[1700.7] ***27-929 Retroactive requirements.**-The provisions of this subchapter shall apply retroactively for the specific occupancies indicated in subdivisions (j) and (s) of section 27-954 and paragraph ten of subdivision (a) of section 27-968 of this subchapter. An application noting compliance shall be required to be filed on or before April thirteenth, nineteen hundred seventy-nine; and installation shall be required on or before January thirteenth, nineteen hundred eighty, except as otherwise provided in this code.

** Local Law 16-1987*

(a) The provisions of this article shall apply retroactively for the specific occupancies and spaces indicated in subdivisions (v), (w), and (y) of section 27-954 and subdivision (j) of section 27-972. Installation of all systems required by these sections shall be completed on or before April first, nineteen hundred eighty-seven.

*(b) Notwithstanding the provisions in subdivision a of this section, an application for a permit and approval of plans for the installation of fire alarm and signal systems as required under the provisions of article five of this subchapter in buildings classified in

occupancy group J-1 shall be filed with the department on or before June thirtieth, nineteen hundred eighty-seven and such installation shall be completed on or before December thirty-first, nineteen hundred eighty-seven.

*(c) Notwithstanding any other provision of this subchapter, the requirement to install a system of automatic sprinklers shall apply retroactively to any space in a basement, cellar or other location below grade subject to the provisions of subdivision aa of section 27-954 of this code. Installation of such system of automatic sprinklers shall be completed on or before April thirtieth, two thousand four.

**Local Law 16-1987.*

ARTICLE 2 EXISTING BUILDINGS-FIRE EXTINGUISHING EQUIPMENT

§[1701.1] **27-930 Existing standpipes.**-Standpipe systems existing on December sixth, nineteen hundred sixty-eight, shall not be required to be altered to conform to the provisions of this subchapter, except as follows:

(a) The existing installation shall meet the following minimum requirements:

(1) **WATER SUPPLIES.**-There shall be a reserve of at least two thousand five hundred gallons of water in a gravity or pressure tank for exclusive use of the standpipe; or there shall be a direct connection to a city main meeting the requirements of section 27-945 of article three of this subchapter.

(2) **GRAVITY TANKS.**-The gravity tank or tanks shall be filled by direct city water connection or by an automatic fill pump at a rate of at least forty-five gpm; and the bottom of the tank shall be located at least eleven feet six inches above the highest hose outlet under the main roof.

(3) **HOSE AND HOSE VALVES.**-Hose and hose valves shall be in good serviceable condition. Hose valve wheel handles shall be within six feet six inches of the floors or stair landings or the wheel handle may be within two feet horizontally from a stair tread and no more than six feet six inches vertically above the tread. Such hose may be omitted from hose racks in existing buildings in occupancy group J-2 provided that the provisions of paragraph five of subdivision (c) of section 27-942 of article three of this subchapter are complied with.

(4) **FIRE DEPARTMENT CONNECTIONS.**-There shall be a three inch by three inch siamese hose connection with approved caps, painted red. The word "Standpipe" shall be cast in the body of the siamese connection or on metal plates that are secured to the riser or to the face of the building behind the siamese connection.

(5) **NOZZLES.**-A five-eighths inch smooth bore nozzle with two and one-half inch hose shall be provided where the hydrostatic pressure at the hose valve is less than ten psig.

(6) **PROTECTION FROM FREEZING.**-All parts

of the standpipe system that are exposed to freezing shall be protected in accordance with the requirements of subdivision (a) of section 27-949 of article three of this subchapter.

(7) **PRESSURE REDUCING VALVES.**-Pressure reducing valves shall be provided as required by section 27-944 of article three of this subchapter.

(8) **DRIP VALVES.**-Drip valves shall be provided between the siamese connection and the check valve.

(b) When the building requires additional standpipe protection because of extension in height or in area, or the occupancy is changed to a use requiring additional protection, the new or altered part of the system shall comply with this subchapter.

§[1701.2] 27-931 Existing Sprinklers.-

(a) **Required sprinklers.**-Sprinkler systems and devices existing on December sixth, nineteen hundred sixty-eight shall not be required to be altered to conform to the provisions of this subchapter, except that when additional protection is required for a change in occupancy or for a building addition, the new or altered part of the system shall comply with this subchapter. Sprinklers in any extension or alteration shall be connected to, or extended from, the existing system or a separate water supply as provided in section 27-962 of article four of this subchapter. Additional heads shall not be connected to existing undersized piping.

(b) **Voluntary sprinklers.**-Sprinkler systems and devices existing on December sixth, nineteen hundred sixty-eight, but which are not required by this code, need not conform to the provisions of this subchapter, except that when a siamese hose connection is installed in the system, the siamese connection shall be installed and the entire system pressure tested as required by this subchapter.

ARTICLE 3 STANDPIPE REQUIREMENTS

§[1702.1] 27-932 When required.-

(a) Wet standpipe systems shall be installed:

(1) In all buildings or portions thereof exceeding six stories or seventy-five feet in height, except that open parking structures shall not require installation of a wet standpipe system unless they exceed ten parking levels or seventy-five feet in height.

(2) In all portions of buildings two or more stories in height that have a floor area of ten thousand square feet or more on any floor.

(b) Where standpipes are required by the height and area limitations of (a) of this section, a non-automatic or automatic dry standpipe system may be installed in lieu of the wet standpipe in all buildings classified in occupancy group G not over six stories or seventy-five feet in height. A dry standpipe system shall be installed in all open parking structures which

exceed three parking levels and contain not more than ten parking levels.

(c) A standpipe system shall be installed in all buildings exceeding three stories in height that have an area exceeding seven thousand five hundred square feet on any floor and where a standpipe system is not otherwise required by the provisions of this subchapter. A non-automatic or automatic dry system may be used in lieu of the wet standpipe.

(d) The following buildings shall be exempt from the provisions of subdivisions (a), (b) and (c) of this section:

(1) Buildings classified in occupancy groups F, G, H, and J that do not exceed two stories or thirty feet in height and an area of twenty thousand square feet on any floor and are provided with hand or portable fire extinguishers as required by the fire department.

(2) Buildings classified in occupancy groups E, F, G, H, and J that require a wet standpipe as provided in paragraph two of subdivision (a) and subdivision (c) of this section but not exceeding six stories or seventy-five feet in height and that are equipped throughout with an automatic wet or dry sprinkler system connected to a central supervisory station, and such system complies with the provision of this subchapter.

§[1702.2] 27-933 Yard hydrant systems required.-

Outdoor amusement and exhibition places, oil storage plants, lumber yards, trailer camps, industrial parks, and similar occupancies shall have yard hydrants installed so that the entire area may be reached by two hundred fifty feet of hose from a yard hydrant or a street hydrant. Single hydrant connection shall be at least in six inch I.P.S. Such hydrants shall be directly connected with city water main or private water main, or supplied from gravity tanks or pressure tanks, as provided in this subchapter.

(a) Where the area of such enclosure is more than forty thousand square feet and where the available city water service is less than that specified in paragraph one of subdivision (b) of section 27-945 of this article, the yard hydrant system shall be supplied as follows:

(1) A gravity tank of at least fifty thousand gallon capacity shall be provided and elevated so that the bottom of the tank is at least seventy-five feet above the highest grade elevation and at least twenty-five feet above the highest building in the area supplied by this tank.

(2) In lieu of paragraph one of this subdivision, there shall be provided a manual fire pump with a capacity of at least one thousand gpm, and a suction tank of at least fifty thousand gallon capacity. The suction tank shall be supplied through a six inch connection to the city water main controlled by an automatic ball float valve in the suction tank. A bypass shall be provided so that the pump may be fed directly from the city water main.

(3) The pump shall be located in a pump house at the street main side of the area or enclosure.

(4) Suction from a river or well may be permitted by the commissioner if the required quantity of reasonably clean fresh water may be obtained thereby, subject to the approvals of such other authorities as may have jurisdiction over the primary source of supply.

(b) The maximum distance between hydrants shall be two hundred fifty feet. At each yard hydrant, two hundred fifty feet of rubber lined hose, with a smooth bore of one and one-eighth inch approved play-pipe, shall be placed in a hose house painted red, and the words "Fire Hose" in six inch white letters shall be painted on the door.

(c) The approval of the fire department shall be obtained for location of any monitor nozzles that may be required in addition to yard hydrants. Not more than one monitor nozzle with remote control will be required for each forty thousand square feet of area or fraction thereof unless, in the fire department's opinion, an unusual hazard exists.

(d) Standpipes and sprinkler systems may be connected to a yard hydrant system in accordance with the requirements of this subchapter.

(e) Yard hydrant systems connected to city water mains shall be provided with post indicator valves located in an accessible position. Post indicator valves shall be locked open and be painted red.

(f) Fire extinguishing equipment, in addition to that prescribed by this section, shall be provided in accordance with requirements of chapter four of this title for oil storage plants, oil refineries, and other plants deemed by the fire commissioner to present unusual fire hazards, and also in rooms or spaces housing electrical equipment when such fire extinguishing equipment is deemed necessary.

§[1702.3] 27-934 Standpipe systems in structures being erected or demolished.-

(a) During construction or demolition of any structure for which a standpipe system is required, provision shall be made for the use of such standpipe by the fire department in accordance with the provisions of section 27-1014 of article one of subchapter nineteen and this subchapter.

(b) Temporary risers shall be at least four inches in diameter for structures less than four hundred fifty feet high and at least six inches in diameter for structures four hundred fifty feet high or more. There shall be as many risers as will be, or were, required for the permanent system. Each such riser shall be connected to a cross connection that is supplied through siamese hose connections at the street level, and shall be equipped on each floor with a two and one-half inch hose outlet valve. The installations shall be made so that each riser, cross-connection, and branch line can be plugged or capped when work is not being done on the system. The location of the siamese hose connection shall be placarded, kept free from obstruction, and identified by a red light.

§[1702.4] 27-935 Number of standpipe risers required.-

The number of standpipe risers shall be such that every point of every floor can be reached by a twenty foot stream from a nozzle attached to not more than one hundred twenty-five feet of hose connected to a riser outlet valve.

§[1702.5] 27-936 Location of standpipe risers.-

(a) Standpipe risers and two and one-half inch angle hose valves shall be located within stairway enclosures. For additional requirements see section 27-343 of article five of subchapter five and subdivision (j) of section 27-375 of article five of subchapter six of this chapter. When stairway enclosures are not available within the distance limitations of section 27-935 of this article, the standpipe risers and two and one-half inch angle hose valves shall be located as near to the enclosure as practicable, subject to the approval of the commissioner. A metal sign with one inch lettering indicating the location of the outlet shall be provided in the stair enclosure on each floor where the riser is not located in the enclosure.

(b) No standpipe riser shall be placed in any shaft containing a gas or fuel pipeline.

§[1702.6] 27-937 Omission of standpipe service.-

(a) Standpipe outlets may be omitted in portions of first floors or basements that are completely separated from the entrance hall or enclosed stairways leading to the upper floors, provided portable fire extinguishers are installed, subject to the approval of the commissioner.

(b) Standpipe protection shall be omitted from transformer vaults, high-tension switchboard rooms, and other locations where the use of hose streams would be hazardous. Any space or room that houses equipment of such nature that the use of water would be ineffective in fighting the fire, or would be hazardous, shall have a conspicuous metal sign on each door opening on such space or room stating the nature of the use and the warning: "Use Npo Water."

§[1702.7] 27-938 Size of standpipe risers.-The size of standpipe risers shall be in accordance with Table 17-1.

TABLE 17-1 SIZE OF STANDPIPE RISERS

Height ¹	Minimum Riser Size Required (I.P.S.)
150 ft. or less.....	4 in.
Greater than 150 ft.....	6 in.

Note for Table 17-1:

¹ The height shall be that of the individual riser to the highest hose outlet (not including manifold outlets) from the level of the entrance floor at street level at which the riser begins.

§[1702.8] 27-939 Devices used in system.-No device, valve, pipe, or fitting may be used in a standpipe system unless such device, valve, pipe, or fitting has been accepted or approved in accordance with the provisions of section 27-135 of article eight of subchapter one of this chapter.

§[1702.9] 27-940 Siamese connections required.-Siamese connections shall be provided as follows:

(a) One siamese connection shall be provided for each three hundred feet of exterior building wall or fraction thereof facing upon each street or public space.

(b) Where buildings face upon two parallel streets or public spaces without an intersecting street or public space, one siamese shall be provided for each three hundred feet of exterior building wall or fraction thereof facing upon each such parallel street or public space.

(c) Where a building faces upon two intersecting streets or public spaces and the total length of the exterior building walls facing upon such streets or public spaces does not exceed three hundred feet only one siamese connection need be installed provided the siamese connection is located within fifteen feet of the corner and on the longer street.

(d) Where a building faces on three streets or public spaces, one siamese connection shall be provided for each three hundred feet of building wall or fraction thereof facing upon such streets or public spaces provided that at least one siamese connection is installed on each of the parallel streets or public spaces, and further provided that the siamese connections shall be located so that the distance between them does not exceed three hundred feet.

(e) Where a building faces upon four streets or public spaces, at least one siamese connection shall be provided on each street front or public space; however, only one siamese connection need be provided at the corner of two intersecting streets or public spaces if the siamese connection is located within fifteen feet of the corner and on the longer street or public space, and if the distances between siamese connections, in all cases, does not exceed three hundred feet.

(f) In any case where the exterior building walls of a building facing a street or public space is obstructed in part by another building, one siamese connection shall be provided for each clear three hundred feet of exterior building wall or fraction thereof facing upon such street or public space.

§[1702.10] 27-941 Cross connections.-

(a) Standpipe systems that include more than one riser shall have all risers cross-connected at, or below, the street entrance floor level, except as otherwise provided in this section.

(b) Standpipe systems in buildings required by the provisions of section 27-943 of this article to have one or more zones shall be so designed and installed that the risers supplied from each zone will be cross-connected below, or in, the story of the lowest hose outlets from the water source in each zone. Horizontal intermediate check valves shall be installed in the run of each riser continuing into a higher zone in such manner as to permit all upper zones of the system to be fed through one riser from the zone below and to prevent any lower zone of the system from being supplied from a zone above.

(c) Risers supplied by an upper level cross connection shall be provided with manual control valves or remote control valves, so arranged that risers supplied by the upper level cross connections may independently be shut off from the tank supplies.

(d) Cross connections shall be at least as large as the largest riser supplied by the cross connection. However, when supplying two, but not more than four four inch risers, the cross connection shall not be less than five inches. The cross connection shall not be less than six inches for all other riser combinations.

(e) Where there is no cellar, cross connections may be hung from the ceiling of the lowest story.

(f) Each siamese connection shall be connected to a riser or to a cross connection connecting other siamese hose connections or risers. The pipe from the siamese connection to the riser or cross connection shall be five inch I.P.S., except that a four inch pipe shall be sufficient when such pipe supplies a single four inch riser system. The pipe from the siamese connection shall be run as directly as practicable to the riser or cross connection.

§[1702.11] 27-942 Hose stations.-

(a) Hose outlet valves.-

(1) At the riser on each floor served by the riser and on the entrance floor above the riser control valve, a two and one-half inch hose outlet valve shall be provided for fire department use. Such hose outlet valve shall be readily accessible from a stairway landing or from a floor, and shall be located between five feet and six feet above the landing or floor.

(2) At the top of the highest riser, there shall be provided above the main roof level, a three-way manifold equipped with three two and one-half inch hose valves with hose valve caps. Where the manifold is located other than within a heated stair enclosure or bulkhead, the control valve shall be located in a horizontal run of piping below the roof.

(b) Location.-Hose stations shall be located at the standpipe risers located either within a stair enclosure or adjacent to the entrance to such enclosure as provided in section 27-936 of this article. When the

hose station is located outside the stair enclosure and the riser is within the stair enclosure, it shall be known as and referred to as "Auxiliary Hose Station."

(1) Hose stations shall be located so that every point in the floor area served by the hose station is within twenty feet of the end of the hose nozzle with the hose in its extended position. The maximum length of hose that shall be permitted at any hose station is one hundred twenty-five feet.

(c) Size, type and quality of hose.-Hose shall be provided on hose racks at each hose station as follows:

(1) Hose shall be one and one-half inch "flax-line" unlined linen hose or equivalent, factory coupled, in occupancy groups C, E, F, G, H, and J.

(2) Hose shall be two and one-half inch cotton rubber-line, or rubber hose or equivalent, factory coupled, in occupancy group A.

(3) Hose shall be two and one-half inch "flax-line" unlined linen hose or equivalent, factory coupled, for occupancy groups other than those in paragraphs one and two of this subdivision.

(4) Hose for auxiliary hose stations shall be one and one-half inch "flax-line" unlined hose or equivalent.

(5) Hose lines shall be made up of fifty foot factory coupled hose except that required hose lengths of less than fifty feet shall be in one section of the required length. Only one length less than fifty feet will be permitted where hose length is not of equal fifty foot increments, and no length shall be less than twenty-five feet.

(6) Hose may be omitted from hose racks in occupancy groups J-1 and J-2 whenever at least three open nozzles, two one and one-half inch, and two two and one-half inch spanner wrenches, two two and one-half by one and one-half inch non-swivel reducing couplings and three hundred seventy-five feet of one and one-half inch hose are stored and maintained in a locked cabinet located on the main entrance floor in a location near the standpipe riser enclosure subject to the approval of the commissioner, and hose valves are capped with a hose valve cap fastened to the valve with a chain. The person responsible for the maintenance of the standpipe system shall maintain on the premises a key for unlocking the storage cabinet. The key shall be kept in a location where it is readily available to authorized persons, but not available to the general public. A sign shall be placed on the storage cabinet indicating the location of the key. An additional labelled key shall be kept in a locked receptacle near the storage cabinet openable by a fire department standard key. Such receptacle shall be marked "For Fire Department Use Only." A metal sign shall be placed in each stair enclosure on the main entrance floor stating clearly where the storage cabinet is located.

(7) Hose may be omitted from hose racks for non-

automatic dry standpipe systems provided that the hose outlet valves are capped with hose valve caps which are chained to the valves.

(d) Auxiliary hose stations.-

(1) Auxiliary hose stations may be installed in those occupancies where one and one-half inch hose is permitted as specified in subdivision (c) of this section.

(2) When auxiliary hose stations are installed, the required two and one-half inch hose valve at the riser shall be installed and the valve shall be equipped with a cap fastened to the valve with a chain.

§[1702.12] 27-943 Maximum pressures.-The standpipe system shall be zoned by the use of gravity tanks, automatic fire pumps, pressure tanks, and street pressure so that the maximum pressure at the inlet of any hose valve in the zone does not exceed one hundred sixty psig.

§[1702.13] 27-944 Pressure reducing valves.-

(a) When the normal hydrostatic pressure at a two and one-half inch hose outlet valve exceeds fifty-five psig, each valve shall be equipped with an adjustable type pressure reducer so that the pressure on the downstream side will not exceed fifty psig when the discharge is at the rate of two hundred gpm from a one inch orifice nozzle attached to one hundred feet of two and one-half inch unlined hose.

(b) At one and one-half inch hose stations, an adjustable type of pressure reducer shall be provided on each hose outlet valve where the hydrostatic pressure exceeds eighty-five psig and shall be so adjusted that the pressure on the downstream side will not exceed eighty psig when seventy gpm is discharged from a one-half inch orifice nozzle attached to the length of hose to be provided at the hose station.

(c) The pressure reducing valve shall be permanently marked with the address of the premises in which it is installed and with the floor location and the setting for the location at which it is to be used.

§[1702.14] 27-945 Water supply for standpipe systems.-

(a) Primary water supply for standpipe systems.-Every standpipe system except nonautomatic dry standpipe systems shall have a primary water supply available at all times at every hose outlet, or made available automatically when the hose valve at any outlet is opened. Such primary water supply may be from one or more gravity tanks, from a pressure tank or tanks, from a direct connection to a city water main, from a connection to a private water main, or from an automatic fire pump.

(b) Method of providing water supply for standpipe systems.-Combinations of two or more of the following methods shall be used; in using such

combinations, the siamese connections shall be considered as a source of supply.

(1) Direct connections of standpipes to the city water system provided one of the following conditions is met:

a. A statement furnished by the bureau of water supply of the department of environmental protection indicates a pressure in the street main that is capable of maintaining a static pressure of at least fifteen psig. at the highest hose outlet between the hours of eight a.m. and five p.m. on a normal working day when a street level fire hydrant within two hundred fifty feet of the building is supplied from the same street main and is discharging at least five hundred gpm through a two and one-half inch hydrant butt.

b. For buildings forty feet or less in height with an area of not more than twenty thousand square feet per floor, there is a four inch direct connection to the street main that is fed two ways or there is a four inch direct connection to each of two street mains on two street fronts so installed that shutting off one service will not interfere with the supply of the other, and there is sufficient pressure in the street main to maintain a minimum static pressure of twenty-five psig. at the highest required hose outlet and the department of environmental protection states that the required street pressure is available.

(2) A private yard main when meeting the conditions of a direct water connection to the city water system.

(3) Gravity tanks provided:

a. The minimum quantity of water reserved for standpipe service is thirty-five hundred gallons in each standpipe zone.

b. The bottom of the tank shall be at least twenty-five feet above the highest hose outlet that such tank supplies, (except the roof manifold) and those hose outlets in a penthouse enclosing mechanical equipment, except as otherwise provided in subparagraph e of this paragraph.

c. Each zone of the standpipe system having three risers or more shall have a total fire reserve capacity of five thousand gallons or more from one or more gravity tanks for each zone.

d. Where a group of two or more buildings, connected or separated, is operated under a single control, a single gravity tank having a fire reserve capacity of at least five thousand gallons may be accepted as the primary water supply for the several standpipe systems of such group, provided a dead riser is carried from the bottom of the tank to an underground header or cross connection system and provided each building unit has a post indicator type control valve outside or an o.s. and y. control valve inside the building at a readily accessible location. The

underground cross connection may not cross any public street without the approval of the city departments having jurisdiction.

e. Usable [sic] storage or office space on penthouse floors shall be provided with a riser outlet valve within the distances stated in section 27-935 of this article. In lieu of elevating the bottom of the gravity tank twenty-five feet above these outlets, an automatic fire pump with local supervisory alarms may be installed. The pump shall be capable of delivering two hundred fifty gpm. at a pressure of twenty-five psig. above the normal static pressure at the highest outlet supplied by the pump. The pump shall take suction from the gravity tank and be so arranged as to permit the siamese connection and any required manual fire pump to supply these outlets. No more than three stories of any penthouse or of penthouse and building stories combined, may be supplied by this method.

(4) Pressure tanks shall be acceptable as the primary supply to the system provided all of the following conditions are met:

a. A pressure tank, or tanks, so proportioned and located that a pressure of at least fifteen psig will be available at the nozzle of the highest required hose station, exclusive of roof outlets, when all the water has been discharged from the pressure tank.

b. The storage quantities stated for gravity tanks in subparagraphs a, c, and d of paragraph three of this subdivision are met and an additional volume equivalent to one-half of the required water storage space is provided for the required air.

c. An air compressor is provided with suitable automatic control and of sufficient capacity to build up air pressure of at least seventy-five psig. in the tank within three hours and to maintain thereafter an air pressure between seventy and eighty psig. The automatic control shall also maintain the proper air-to-water ratio in the pressure tank.

d. Pressure tanks shall be supplied with water through a fixed pipe, independent of the standpipe riser and at least two inches in size. The water supply and connection shall be capable of supplying the tank at a rate of at least sixty-five gpm without reducing the pressure in the tank. The tank shall have a fixed water level plate on the end opposite the gauge glass, or other equivalent indicating device.

(5) An automatic fire pump shall be acceptable as the primary supply to the system provided:

a. The building is three hundred feet high or less, or if the building is higher than three hundred feet, the automatic fire pump is used only for the lower three hundred feet. The zones above three hundred feet shall be supplied by either a gravity tank conforming to paragraph three of subdivision (b) of this section or a pressure tank conforming to paragraph four of

subdivision (b) of this section and in addition shall be supplied by the manual fire pump required by section 27-946 of this article.

b. The automatic fire pump supplying the system or section has a capacity of at least five hundred gpm with a discharge pressure of at least twenty-five but not exceeding seventy psig (above the normal) static pressure at the highest hose outlet within the zone supplied by the pump plus the frictional resistance from the pump to the outlet at a flow of five hundred gpm.

c. The electrical power to the pump is connected to the street side of the building service switch.

(c) High and low risers and cross connections in standpipe systems.-When tanks are used for the primary water supply, the standpipe systems may use separate riser systems serving, respectively, low and high parts of the building. Separate gravity tanks or pressure tanks may supply each zone, but in every case the standpipe system shall be so designed that every hose outlet of the entire system can be supplied through the required cross connections from every siamese connection and from every manually operated fire pump located at or below the street level.

(d) Use of standpipe riser for sprinkler system water supply.-Standpipe risers may be used to supply water to sprinklers in buildings classified in occupancy group E, one hundred feet or more in height, and in existing office buildings, one hundred feet or more in height, in accordance with applicable provisions of this subchapter and reference standards RS 17-1 and RS 17-2.

§[1702.15] 27-946 Fire pumps.-

(a) Additional water supply.-Additional water supply shall be provided for standpipes in buildings over three hundred feet high. The primary water supply to the standpipe system shall be supplemented by one or more manually operated fire pumps as follows:

(1) Standpipe systems in buildings more than three hundred feet high shall have at least one seven hundred fifty gpm pump or two five hundred gpm pumps. Pumps shall be capable of delivering their rated capacity at a pressure of fifty psig above the normal static pressure determined from the highest hose outlet (except the roof manifold) in the building plus the frictional resistance through the pipe from the pump to the outlet.

(2) Where a group of two or more buildings, whether connected or separated, are operated under a single ownership and one or more buildings exceed three hundred feet in height, one fire pump shall be accepted as the supplemental supply for the group. The pump shall be installed in the building where the maintenance personnel are located, and a metal sign with one inch lettering shall be installed in each building at all of the hose outlets on the entrance floor

indicating the location of the fire pump.

(b) Standpipe pump rooms and location.-

(1) Fire pumps shall be installed at the entrance floor level or below, in rooms enclosed by noncombustible construction having a two hour fire-resistance rating and that are adequately heated, ventilated, lighted, and drained. The pump room shall have access to the street level by a direct opening to a street or a court, or by a passageway or stairway having a fire-resistance rating of at least two hours.

(2) No person shall install other machinery or mechanical equipment in a fire pump room, unless the building is of construction class IA, IB, or IC.

(3) No person shall place or install any equipment containing a refrigerant classified in groups I, II, and III in subchapter thirteen of this chapter, or place or install gas piping or gas consuming devices or any other equipment within any space housing a fire pump that would create a hazardous condition.

(c) Power supply for standpipe fire pumps.-The type of fire pump and prime mover used in a standpipe system shall be suitable for the required service in a standpipe system provided for fire department use. If the prime mover employs any form of power other than an electric current supplied by a public utility, the use thereof shall be subject to the approval of the commissioner. Electrical power to the motor shall be taken from the street side of the house service switch.

(d) Combined use of fire pumps for standpipe and automatic sprinkler systems.-A fire pump that furnishes the required auxiliary water supply either to a standpipe system or to an automatic sprinkler system shall be accepted as furnishing the corresponding water supply to the other system if such pump is in the same premises, provided that in every such case of combined use, suitable relief and shutoff valves shall be installed so as to prevent the water pressure on the automatic sprinkler system resulting from any required operation of the pump for the standpipe system from becoming greater than one hundred seventy-five psig.

§[1702.16] *27-947 Direct connections of standpipes to the public water system.-

(a) Control valve.-Each service directly supplying a standpipe system or a fire pump shall be equipped with a control valve located under the sidewalk in a flush sidewalk box located within two feet of the street line, or in such other locations as may be approved by the department of environmental protection. The purpose of each such control valve shall be clearly indicated by the words "Standpipe Supply Control," cast in the cover of such flush sidewalk box or, in lieu thereof, a metal sign with one inch lettering shall be located on the exterior building wall indicating the use and location of the valve.

(b) Water supply to standpipe fire pumps.-

(1) Any required manual or automatic fire pump shall draw from two independent street water mains in different streets, except that: (i) any manual or automatic fire pump serving a building classified in occupancy group J-2 that is fully protected by a system of automatic sprinklers may draw from a single water main; and (ii) an automatic fire pump may draw from a single water main if augmented by a suction tank or tanks, and if the valves at the meter and pump are provided with tamper switches that are wired to an approved central station of an operating fire alarm company. Where two services are installed, one service from the street water main shall be run directly to the pump, and the other service may be used for domestic water supply. The connection from water to the mains to the pumps shall be at least six inch pipe size and shall be flushed before connection is made to the system. Connections shall be in accordance with subchapter sixteen of this chapter.

(2) In the event that two separate and distinct water mains are not available as a supply or the street mains cannot produce the required supply, there shall be provided a suction tank, or tanks, suitably located and of sufficient capacity to furnish the fire pump with at least a one-half hour supply at the rated capacity of such pump. Suction tanks shall be filled by a six inch connection to the water main, controlled by an automatic ball float valve in the suction tank. A six inch bypass shall be provided so that pumps may be fed directly from the street water main.

(3) When a water service supplies both the domestic service and the manual fire pump, a remote control valve shall be placed on the domestic service connection at the point where such connection is taken from the city supply or service main. Such remote control valve shall be controlled from a point near the pump control panel. In lieu of a remote control valve, a manually operated valve may be installed to shut off the entire domestic water supply to the building, provided such valve is located in the fire pump room and is properly tagged for identification.

Local Law 10-1999.

§[1702.17] 27-948 Installation of private fire hydrants.-

(a) When buildings are not required to be provided with a standpipe system, at least one entrance to the building shall be located within two hundred fifty feet of a street hydrant; or, a private hydrant of the same type as the city hydrant connected to the street water main shall be provided within two hundred fifty feet of entrance. The private hydrant shall be supplied by at least an eight inch pipe, and the domestic water supply may be connected to this private supply provided a shut-off valve is installed in a curb box in the domestic

supply within six feet of the hydrant shutoff valve.

§[1702.18] 27-949 Protection of standpipe system.-

(a) All parts of the standpipe systems that may be exposed to frost shall be protected from freezing by any one of the following methods:

(1) The piping shall be frostproofed with insulation having a thermal conductance of 0.1 Btu/hr. per square foot of surface per degree F at a mean temperature of seventy to seventy-five degrees F. Insulation shall be protected to prevent water infiltration, and when exposed to the weather the insulation shall be covered with a forty-five pound roofing felt jacket or equivalent.

(2) Steam or electric tracers may be used in conjunction with the insulation.

(b) Tanks subject to freezing temperatures shall be protected.

§[1702.19] 27-950 Standards for installation.-

Details for installation, components, sizing valves, fittings, protection against freezing, etc., for standpipe systems and related equipment shall be in accordance with reference standard RS 17-1.

§[1702.20] 27-951 Inspections and tests.-

(a) **Inspections.**-Every new system and every part of an existing system that is altered, extended, renovated, or repaired, except for ordinary repairs, shall comply with the applicable requirements of this subchapter.

(b) **Notification.**-Advance notification of tests and inspections required by this section shall be given to the commissioner.

(c) **Representation at test.**-Tests required by this section shall be conducted in the presence of the commissioner or his or her authorized representative, or in lieu thereof, the commissioner may accept a signed statement of an architect or engineer, whose name is submitted with the notification in subdivision (b) of this section, declaring that he or she has witnessed the tests and that the standpipe system meets the requirements of this code. If a representative of the commissioner does not appear within two days after receipt of such report by the commissioner, the report shall be deemed to be accepted by the commissioner.

(d) **Testing equipment required.**-All equipment, material, and labor required for testing a system or part thereof shall be furnished by, and at the expense of, the person responsible for installing the work.

(e) **Testing of system.**-Systems may be tested in sections, or parts, in accordance with the requirements of this subchapter.

(f) **Acceptance.**-Before the acceptance of such system, each system shall be subjected to the tests required by this section.

(g) **Standpipe system tests.-**

(1) **PRESSURE TESTS.-**

a. The test shall demonstrate that the system will sustain a hydrostatic pressure of at least one hundred psig, and at least three hundred psig at the siamese connection, for a period of at least one hour at the topmost hose outlet and at the lowest fire pump supply connection to the system. In buildings not exceeding three stories or forty feet in height, the test pressures need not be more than fifty psig, in excess of the normal hydrostatic pressures at the topmost hose outlet, and this pressure must be maintained for a period of at least one hour.

b. Pressure tanks shall be tested to demonstrate that they will sustain a hydrostatic pressure of at least one hundred fifty percent of the normal maximum required operating pressure for a period of at least one hour.

(2) FLOW TEST.-The system shall be flow tested to determine that water is available at the top outlet of each riser, the lowest outlet in each riser, and through each siamese connection. The system shall be flushed to remove all foreign matter from the system. Flow shall be through at least a two and one-half inch hose without nozzle at each one of the above mentioned locations at separate times.

(3) ALTERATION TESTS.-When alterations, additions, or repairs are made to a standpipe system, the entire system shall be subjected to a hydrostatic test pressure of at least fifty psig at the highest hose outlet, and in addition, a flow test shall be made as stated in paragraph two of this subdivision through the new or altered portion of the system.

(h) Pump tests.-

(1) Fire pumps shall be tested at the factory, and a certified test curve shall be furnished with each pump.

(2) Pumps shall be tested after installation to ascertain that the pump is supplying its rated capacity at the highest required hose outlet or through the roof manifold. The test shall be performed as follows:

a. At least fifty feet of approved two and one-half inch rubber lined hose equipped with a one and one-eighth inch nozzle shall be connected to the highest two and one-half inch hose outlet valve. One of these assemblies shall be connected in parallel for each two hundred fifty gpm of rated pump capacity.

b. The nozzle or nozzles of the hose assembly shall discharge at, or above, the highest required hose outlet or through a manifold.

c. Pitot tube gauge readings shall be taken at each nozzle to determine that the required pump capacity is being discharged.

d. For manually operated fire pumps, the suction and discharge pressures shall be recorded for each step or pump speed. The pump rpm electrical current, and voltage readings shall be recorded with the specific discharge pressure for each supply condition.

e. Automatic fire pumps shall be tested to ascertain that all of the automatic controls are in good working order.

f. All of the above readings shall be noted on the required standpipe diagram or a framed chart, which shall be mounted in a visible location near the pump control panel.

g. When pumps are supplied by two independent services, the test shall be conducted from each service independent of the other and, in addition, with both services supplying the pump.

(i) Test equipment for fire pumps.-

(1) For every fire pump installation, there shall be provided for test purposes at least three fifty foot lengths of approved two and one-half inch rubber lined fire hose. Hose shall be hung in the pump room or other convenient location.

(2) Three two and one-half inch by one and one-eighth inch nozzles, three spanner wrenches, and twelve washers shall be stored with the required hose.

§[1702.21] 27-952 Standpipe signal systems.-

Standpipe signal systems shall be provided in accordance with section 27-974 of article five of this subchapter.

§[1702.22] 27-953 Elevators for fire department use.-

Elevators for fire department use shall be provided as required by section 27-989 of article one of subchapter eighteen.

ARTICLE 4 AUTOMATIC SPRINKLER REQUIREMENTS

§[1703.1] * 27-954 Required sprinklers.-A system of automatic sprinklers shall be provided in the areas listed in this section and as required in subchapters four through eight of this chapter. A summary of sprinkler requirements is given in Table 17-2.

(a) Buildings classified in high hazard occupancy group A.

(b) Spaces classified in high hazard occupancy group A.

(c) Buildings classified in storage occupancy group B-1 exceeding one thousand square feet in floor area or seventy-five feet or more in height, except as modified under subdivisions a, b, and c of section 27-455 of article ten of subchapter seven of this code.

(d) Spaces classified in storage occupancy group B-1 exceeding five hundred square feet in floor area, except as modified under subdivisions a, b, and c of section 27-455 of article ten of subchapter seven of this code.

(1) Such storage spaces less than five hundred square feet in area shall install a system of automatic sprinklers, when required by the commissioner or the fire commissioner.

SUBCHAPTER 19
SAFETY OF PUBLIC AND PROPERTY DURING
CONSTRUCTION OPERATIONS

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ARTICLE 1 GENERAL

§[C26-1900.1] **27-1007 Scope.**-The provisions of this subchapter shall govern the conduct of all construction operations with regard to the safety of the public and property. For the purposes of this subchapter, construction operations shall include excavation, erection, alteration, repair, removal and demolition as related to buildings. For regulations relating to the safety of persons employed in such construction operations, the provisions of subchapter ten of the labor law as implemented by the industrial code of the state of New York, rule no. 23, shall apply.

§[C26-1900.2] **27-1008 Definitions.**-For definitions to be used in the interpretation of this subchapter, see subchapter two of this chapter.

§[C26-1900.3] 27-1009 General requirements.-

(a) A contractor engaged in building work shall institute and maintain safety measures and provide all equipment or temporary construction necessary to safeguard all persons and property affected by such contractor's operations.

(b) No structure, device, or construction equipment, whether permanent or temporary, including all partly or fully completed elements or sections of the building, shall be loaded in excess of its design capacity.

(c) At a height of no more than twelve feet above ground and on each perimeter of a construction site fronting on a public thoroughfare, a sign shall be erected no more than twenty-five square feet in size which shall bear in letters no less than six inches high, the name, address and telephone number of the owner of the property, and the name, address and telephone number of the general contractor.

(d) A construction site safety coordinator must be designated and present on a construction site in accordance with department rules and regulations.

§[C26-1900.4] **27-1010 Inspection.**- Except for the installation of underpinning and the construction of temporary retaining structures (see section 27-724 of article thirteen of subchapter eleven of this chapter) and for other operations specifically required by the provisions of this subchapter to be inspected by an engineer or an architect, inspection of operations for compliance with the provisions of this subchapter may be performed by, or under, the authority of the person superintending the work. Unless required by the provisions of this subchapter, inspection and test reports relating to operations within the scope of this subchapter need not be filed.

§[C26-1900.5] 27-1011 Sizes and stresses of materials.-

(a) **Sizes.**-All sizes and dimensions prescribed in this subchapter are minimum requirements. Lumber sizes are nominal or commercial except where stated otherwise.

(b) **Stresses.**-Except where sizes are specifically prescribed in this subchapter, temporary equipment and constructions shall be designed so that the allowable stress values prescribed in subchapter ten of this subchapter are not exceeded.

§[C26-1900.6] **27-1012 Inspection.**- Any construction equipment or device, except hand tools, that would affect the public safety when operated shall be inspected by the person superintending the work or by his or her designated representative before using the equipment or device on a specific job. Such inspection shall be carefully made, and every defect or unsafe condition shall be corrected before use is permitted. Any unsafe equipment or device shall be made safe immediately or removed from the site. Periodic inspection procedures

shall be instituted during construction operations, and a record of inspections shall be kept at the site for the duration of the work.

§[C26-1900.7] 27-1013 Utilities.-

(a) **Existing services.**-The location of all existing utilities and service lines shall be determined and adequate measures taken, or devices provided, to safeguard the public and property before such utilities are disturbed. If any utility is to be removed, relocated, or have its service interrupted, the utility company or city agency affected shall be notified at least seventy-two hours in advance.

(b) **Maintaining essential services.**-Fire preventive, sanitary, or other facilities that have been provided for the protection of life, health, and property shall be continuously maintained and protected unless authorization is obtained from the agency having jurisdiction to temporarily or permanently disconnect such facility.

(c) **Electrical work.**-All temporary electrical equipment and wiring shall meet the requirements of the electrical code of the city of New York, and shall be maintained to meet such requirements. Portions of permanent electrical installations may be used for temporary operations provided the requirements of the electrical code are met. At least seventy-two hours before work is begun that may affect a power line, above or below ground, the person superintending the work shall notify the utility company affected.

§[C26-1900.8] 27-1014 Fire protection.- Fire fighting equipment at the construction site and the conduct of all construction operations affecting fire prevention and fire fighting shall meet the requirements of the fire department.

(a) **Temporary elevator.**-Whenever in the course of building construction the work is at a height greater than seventy-five feet, at least one elevator meeting the requirements of subchapter eighteen of this chapter shall be kept in readiness at all times for fire department use.

(b) **Standpipe systems.**-Standpipe systems during construction operations shall comply with the following:

(1) If in the course of erection or alteration for which a standpipe system will be required the work reaches a height greater than seventy-five feet a permanent or temporary standpipe meeting the requirements of subchapter seventeen of this chapter shall be kept in readiness at all times for fire department use. The system shall be a dry system when freezing conditions may be encountered.

(2) In structures undergoing demolition which have existing standpipe systems, such systems shall be maintained as dry standpipes. When demolition is started, the standpipe risers shall be capped above the outlet on the floor immediately below the floor being demolished so as to maintain the standpipe system on

all lower floors for fire department use. Standpipe hose, nozzles and spanners are not required to be maintained and may be removed at any time. Siamese hose connections shall be kept free from obstruction and shall be marked by a metal sign reading, "Standpipe Siamese Connection" and by a red light at night.

(3) The standpipe system may be used for water supply necessary to demolition operations. In freezing weather such standpipe system shall be completely drained after use to prevent freezing. Existing standpipe systems shall not be utilized to convey compressed air unless the standpipe consists of two or more risers in which event one of the risers may be used to convey compressed air to any floor or portion of the premises upon application to and permission from the fire department.

(4) In structures undergoing demolition which have existing sprinkler systems with siamese hose connections, such system shall be maintained as a non-automatic sprinkler system. When demolition starts, the sprinkler risers shall be capped immediately below the floor being demolished so as to maintain the sprinkler system on all lower floors for fire department use. Siamese hose connections shall be kept free from obstruction and shall be marked by a metal sign reading "Sprinkler Siamese Connection" and by a red light at night.

§[C26-1900.9] 27-1015 Design.-Whenever design is required by the provisions of this subchapter, such design shall be executed by, or under, the supervision of an engineer or an architect who shall cause his or her seal and signature to be affixed to any drawings or specifications that may be required for the work. All such documents shall be kept at the site for inspection by the commissioner for the duration of the job.

§[C26-1900.10] 27-1016 Alternate details and procedures.-

Whenever "alternate" or "equivalent" details, materials or procedures are specified in this subchapter, they shall be permitted as provided in section 27-133 of article seven of subchapter one of this chapter. In the absence of specific criteria, the degree of structural safety shall be deemed to require a factor of safety against structural failure consistent with the requirements of subchapter ten of this chapter.

ARTICLE 2 MAINTENANCE OF SITE AND ADJACENT AREAS

§[C26-1901.1] 27-1017 Construction equipment.-

(a) **Machinery.**-All exposed, electrically charged, moving or otherwise dangerous parts of machines and construction equipment shall be located, guarded, shielded, or barricaded so as to prevent contact by the public.

(b) **Services* lines and conduits.**-Hose lines, wires, ropes, pipes, chains, etc., shall be located so that they

will not constitute a tripping hazard. Where it is necessary to carry such lines across sidewalks, or any public way, either they shall be suspended at least eight feet above the walks or suitable chamfered planks or a pedestrian bridge shall be provided.

(c) **Contractors sheds.**-Contractors sheds and offices located within thirty-feet of new construction or existing buildings shall be made of metal or other noncombustible material. Fire retardant treated wood may be used when protected from the weather.

* *As enacted but "Service" probably intended.*

**** §[C26-1901.2] 27-1018 Housekeeping.-**

(a) All areas used by the public shall be maintained free from ice, snow, grease, debris, equipment, materials, projections, tools, or other item, substance, or condition that may constitute a slipping, tripping, or other hazard.

****Local Law 61-1987.**

(b) When not being used, materials, equipment, and tools that might fall from levels above areas used by the public shall be kept away from edges or openings. When exterior walls are not in place, material piles shall be kept at least ten feet back from the perimeter of the building.

(c) Material may be stored within two feet of the edge of a building provided however that such material is stored not more than two stories below the stripping operation on concrete structures or the uppermost concrete floor on steel frame structures. Such material shall be secured against accidental movement. Storage of material on all other floors shall conform to paragraph (b) of this section and shall be secured when not being used.

(d) Waste dumpsters, debris boxes and skip boxes shall be secured and those containing material or debris shall be covered at the end of each work day. Such waste dumpsters, debris,*** boxes and skip boxes shall not be placed at the edge of the building at any time except when being moved from the floor or building.

(e) Sufficient containers of metal or other material acceptable to the commissioner shall be available for the storage of all garbage and debris. The containers shall be of three-quarter cubic yard minimum capacity.

*** *As enacted but comma probably intended to be omitted.*

§[C26-1901.3] 27-1019 Removal and storage of material.-

(a) **Removal of waste material.**-Combustible waste material or combustible debris shall not be permitted to accumulate, and shall be removed from the site at reasonable intervals, in accordance with the requirements of the fire department. No material shall be dropped or thrown outside the exterior walls of a building. Precautions shall be taken to prevent concrete or mortar washings, sand, grit, or any other material that would cause clogging from entering a sewer or drain.

Provisions of the air pollution control code concerning precautions to prevent particulate matter from becoming airborne shall apply.

(b) **Chutes.**-When chutes are used for removal of material, they shall meet the following requirements:

(1) ENCLOSURE.-

a. Material chutes that are at an angle of more than forty-five degrees with the horizontal shall be entirely enclosed on all sides, except for openings at the floor levels for the receiving of materials. Such openings shall not exceed forty-eight inches in height, measured along the wall of the chute, and all openings, except the top opening, shall be closed and secured when not in use.

b. Chutes at an angle of less than forty-five degrees with the horizontal may be open on the upper side.

(2) CONSTRUCTION.-

a. Every chute used to convey waste material from a building shall be rigidly supported and braced throughout its height. Chutes less than twenty-four inches in maximum dimension shall be constructed of not less than one inch (nominal) wood or one-eighth inch thick steel. Chutes more than twenty-four inches in maximum dimensions shall be constructed of not less than two inch (nominal) wood or three-sixteenths inch thick steel.

b. Chutes shall be provided with a metal impact plate where material is forced to change direction while falling.

c. A gate shall be provided at the lower end of every chute to control the loading of material into trucks and to close the chute at all other times. Splashboards or baffles shall be erected to prevent materials from rebounding into the street or under the sidewalk shed.

d. A bumper or curb at least four inches by four inches in section shall be provided at each chute opening where such opening is level with, or below, the floor or platform. Every space between the chute and the edge of the opening in the floor or platform shall be solidly planked.

(3) **FIRE RETARDANT CONSTRUCTION.**-All chutes, constructed of combustible material shall be covered on the exterior with corrugated steel sheeting having a minimum thickness of 24 gage [sic] through their entire height or shall be constructed of non-combustible material when used in the following applications:

a. Chutes exceeding seventy-five feet in height.

b. Alteration, repair or partial demolition of buildings classified in occupancy groups H1 and H2.

(4) **SUPPORTS.**-All structural supports of material chutes shall be of noncombustible material.

(c) **Storage of combustible material and equipment.**-Storage of combustible material and other material and equipment that present a fire hazard shall meet the requirements of the fire department.

§[C26-1901.4] 27-1020 Obstruction of sidewalks and streets.-The requirements of the department of transportation shall apply with regard to the closing of streets or to the obstruction of any part thereof, except as hereinafter provided. Building department personnel are authorized to consider failure to display a current department of transportation permit for any street or sidewalk closing or obstruction not authorized by this code as a violation of this section; and to direct removal thereof.

§[C26-1901.5] 27-1021 Protection of sidewalks.-Unless the street is officially closed to the public during construction operations, the following minimum safeguards shall be provided for the protection of the public:

(a) Types of safeguards and when required.-

* (1) a. A sidewalk shed shall be erected when a structure higher than forty feet is to be constructed or a structure higher than twenty-five feet is to be demolished and the horizontal distance from the structure being built or demolished to the inside edge of the permanent or temporary walkway is equal to one-half or less of the height of the structure. No sidewalk shed shall be erected unless and until a special permit therefor has been issued by the department. Each applicant for a sidewalk shed permit shall state the reason the sidewalk shed is needed. The term of the sidewalk shed permit shall be one year, or upon the expiration of the contractor's insurance, if such time period is less than one year. No renewals of shed permits, except for new buildings under construction, will be given unless an architect or engineer conducts a thorough examination of that part of the premises on which work is being conducted and submits a report acceptable to the commissioner, which clearly documents the condition of the applicable part of the premises and the scope of work that has been performed thereon, and estimates the time needed to complete the work. To renew a shed permit for a new building under construction, each applicant shall file an application with the commissioner. All renewal applications shall include the name and address of the owner of the premises.

* *Local Law 93-1996; Local Law 33-1991.*

b. Following the receipt of a permit to erect a sidewalk shed, the permit holder shall post a sign on the sidewalk shed. Such sign shall include the name, address, telephone number, and permit number of the permit holder. The sign shall also include the date that the permit expires. The sign shall measure twenty-five square feet.

(2) A sidewalk shed shall be erected regardless of the height of the structure or the horizontal distance between the structure and the sidewalk when material or debris is to be moved by a hoist, crane, derrick, or chute over a sidewalk or temporary sidewalk that is not closed to the public.

(3) A fence, in lieu of a sidewalk shed, may be constructed along the inside edge of the walkway or temporary walkway when a structure higher than forty feet is to be constructed or a structure higher than twenty-five feet is to be demolished and the horizontal distance from the structure being built or demolished to the inside edge of the permanent or temporary walkway is between one-half and three-quarters of the height of the structure. If permission to close the sidewalk has been obtained from the department of transportation, such fence may be erected along the curb or outside of the curb to such extent as may be approved by the department of transportation. The fence shall be returned at its ends to the extent necessary to effectively close off the site.

(4) For cases that do not fall within the circumstances described in paragraphs one through three of this subdivision, a standard guard rail (section 27-1050 of article eight of subchapter nineteen of this chapter), in lieu of a sidewalk shed or fence, may be constructed along the inside edge of such walkway or temporary walkway. If permission to close the sidewalk has been obtained from the department of transportation, the railing may be constructed along the curb or outside of the curb to such extent as may be approved by the department [sic] of transportation. The railing shall be returned at its ends to the extent necessary to effectively close off the site.

*(5) A sidewalk shed shall be erected when a portion of a facade over forty feet above curb level is being altered or repaired and the horizontal distance from the portion of the structure being altered or repaired to the inside edge of the temporary or permanent walkway is less than one-half the height of the structure being altered or repaired. Applications for sidewalk shed permits shall meet the requirements listed in paragraph one of this subdivision. Where a sidewalk shed is erected in conjunction with the repair of an unsafe condition of a facade, or for the repair of any other violation issued by the department, and such repairs have not been made, and the sidewalk shed has not been removed within two years from the date of issuance of the original sidewalk shed permit, in addition to any of the penalties provided for in section 27-129 of this code, the owner of the building shall be liable for a civil penalty in the amount of two hundred fifty dollars per month for every month or part thereof during which such sidewalk shed is not removed, unless such owner has submitted a report in compliance with section 26-252 of this code and the commissioner determines that the unsafe condition could not be repaired within such two-year period. Provided, however, that nothing in this paragraph shall be construed to prevent the commissioner, prior to the end of such two-year period, from taking action against the owner of a building for failure to repair an unsafe

condition pursuant to section 27-129 of this code or any rules and regulations promulgated thereunder.

* *Local Law 33-1991.*

**(6) Horizontal safety netting shall be provided on the sides of a structure more than six stories or seventy-five feet in height above the adjoining ground or adjoining roof level, whichever is applicable, when, while under construction, the facade of such structure is not enclosed and there is exposure to the public or adjacent property as determined in rules and regulations promulgated by the Commissioner. Vertical safety netting or screening shall be provided at the sides of a structure more than six stories or seventy-five feet in height above the adjoining ground or adjoining roof level, whichever is applicable, when, while under construction, the facade of such structure is not enclosed and is exposed to the public or adjacent property as determined by rules and regulations promulgated by the commissioner. In addition, safety netting shall be provided as required by section 27-1022.

** *Local Law 61-1987.*

(b) Sidewalk sheds.-

(1) Every sidewalk shed deck shall be designed and constructed to carry a live load of at least three hundred psf. However, a live load of one hundred fifty psf may be permitted for buildings less than one hundred feet in height provided there is no storage thereon. The members of the sidewalk shed shall be adequately braced and connected to prevent displacement or distortion of the framework. Where posts supporting the shed deck are placed beyond the curb, such posts shall be protected against displacement by vehicles.

(2) The deck of the sidewalk shed shall consist of planking closely laid, and made tight.

(3) Steel, or other materials having equivalent strength and suitability may be used in lieu of wood to construct sidewalk sheds.

(4) Where deemed necessary by the commissioner, the deck shall cover the entire width of the sidewalk, except for reasonably small clearances at the building line and the curb.

(5) Except as authorized by paragraph seven, sidewalk sheds shall extend at least the entire length of the property line of the structure unless constructed solely to comply with paragraph two of subdivision (a) of this section, and may extend beyond the curb to such extent as may be approved by the department of transportation.

(6) The outer side and ends of the deck of the shed shall be provided with a substantial enclosure at least three feet six inches high. Such enclosure may be vertical or inclined outward at approximately forty-five degrees, and shall consist of boards laid close together and secured to braced uprights, of galvanized wire screen not less than no. 16 steel wire gage with a one-half inch mesh, of corrugated metal, or of solid

plywood. Temporary removal of portions of the enclosure shall be permitted for handling material.

(7) a. For all buildings one hundred feet or more in height, the deck and protective guards of the sidewalk shed shall be extended parallel with the curb at least twenty feet beyond the ends of all faces of the structure [regardless of whether such extensions are in front of the property being developed or in front of adjacent]*** property. Extensions of sidewalk sheds complying with the foregoing shall be constructed so as not to unreasonably obstruct, either visually or physically, entrances, egress, driveways and show windows of adjacent properties.

*** *Copy in brackets not enacted but probably intended.*

b. All sidewalk sheds shall provide a protection for the full width of the shed extending upward at an angle of forty-five degrees from the ends of the deck and outward a horizontal distance of at least five feet beyond the ends of the shed. Such sloping end protection shall be constructed to meet the requirements of paragraph one of this subdivision with substantial outriggers bearing on and securely attached to, the deck.

(8) The passageway shall be wide enough to accommodate pedestrian traffic normal for that location without causing congestion; but in no case shall the width be less than four feet. The passageway shall have a minimum clear ceiling height of eight feet.

(9) Unless the top deck of the sidewalk shed is built solidly against the face of the structure in such a manner that no material can fall onto the sidewalk, the side of the shed toward the structure shall be solidly sealed with wood or other suitable material for the full height of the shed. Solid sliding or in swinging [*sic*] gates may be provided as necessary for the proper prosecution of the work.

*(10) The underside of the sidewalk sheds shall be lighted at all times either by natural or artificial light. The level of illumination shall be the equivalent of that produced by two hundred watt, thirty-four hundred lumen minimum, standard incandescent lamps enclosed in vandal-proof fixtures and spaced fifteen feet apart and eight feet above the floor level. Artificial lighting units shall be inspected nightly; and burned out or inoperative units shall be replaced or repaired immediately.

* *Local Law 33-1991.*

(11) When a sidewalk shed is required for the erection of a structure, construction of the structure shall stop at a height of forty feet unless, and until, the sidewalk shed has been completed. Such shed shall remain in place until the structure is enclosed, all exterior work completed and the sash is glazed above the second story, exterior of the facade is cleaned down, and all outside handling of material, equipment and machinery, and all dismantling of a material hoist, or climber or tower crane or the use of a derrick in their removal,

above the second story is completed.

(12) When a sidewalk shed is required for the demolition of a structure, the sidewalk shed shall be completed before any demolition work is performed. Such shed shall remain in place until the structure has been razed to the height of the shed and as long as necessary to meet the requirements of paragraph two of subdivision (a) of this section.

(c) **Fences.**-Fences shall be at least eight feet high, and constructed of wood or other suitable material. They shall be built solid for their entire length, except for openings with solid sliding or in swinging *sic* gates as are required for the proper prosecution of the work, and for viewing panels, which shall be blocked with plexiglass or equivalent nonfrangible material.

(d) **Openings in sidewalk sheds, fences, and railings.**-Openings in sidewalk sheds, fences, and railings for loading purposes shall be kept closed at all times except during actual loading operations.

(e) **Temporary walkways.**-Where permission has been granted by the department of transportation to locate a temporary walkway beyond the curb line, such temporary walkway shall be provided with a standard guard rail (section 27-1050 of article eight of subchapter nineteen of this chapter) on the traffic side. All temporary walkways shall be illuminated at all times as required in paragraph ten of subdivision (b) of this section.

(f) **Foot bridges.**-

(1) When a temporary foot bridge is used as a sidewalk in front of a structure during construction work, the bridge shall be wide enough to accommodate normal traffic without congestion; but in no case shall it be less than four feet. The bridge, and steps or ramps, shall be designed and constructed to carry a live load of one hundred fifty psf. The walkway on such bridge shall be provided with standard guard rails for its entire length and shall be provided with steps at both ends or with inclined ramps at a maximum slope of one in four. Ramps shall have cleats to prevent slipping.

(2) Where planks are used to pave the walkway, they shall be laid close and securely fastened to prevent displacement. Planks shall be of uniform thickness, and all exposed ends on ramps shall be provided with beveled fillers to eliminate tripping hazards.

(3) Foot bridges shall be illuminated at all times as required in paragraph ten of subdivision (b) of this section.

**** (g) Safety netting.**-

(1) When required to be installed horizontally, safety netting shall include a structural mesh lined with a fine mesh of a size and strength sufficient to catch falling tools and materials.

(2) When required to be installed vertically, safety netting or its equivalent shall include a fine mesh of a size and strength sufficient to contain falling tools and

materials. Such netting shall be secured and kept closed at all times except during actual loading operations or perimeter construction operations.

(3) In addition to the requirements set forth in paragraphs one and two of this subdivision, required safety netting and its supports shall comply with reference standard RS 19-4 and all applicable rules and regulations promulgated by the commissioner. Scaffolding, screening or its equivalent shall comply with rules and regulations promulgated by the commissioner.

**** Local Law 61-1987.**

**** §[C26-1901.6] 27-1022 Safety netting and scaffolding.-**

(a) When required.-

(1) When demolishing the exterior walls or the roof of a structure more than six stories or seventy-five feet above the adjoining ground or adjoining roof level, whichever is applicable, horizontal safety netting shall be provided on the sides of a structure where there is exposure to the public or adjacent property as determined by rules and regulations promulgated by the Commissioner unless an exterior built-up scaffold providing equivalent protection has been erected. The horizontal safety netting or scaffolding shall be required in addition to the sidewalk sheds, fences, or railing required under section 27-1021 of this article, and shall be constructed and maintained not more than two stories or thirty feet below the story from which the exterior walls and roof are being removed until such demolition has progressed to within six stories or seventy-five feet of the ground level.

(2) When exterior walls are being constructed more than six stories or seventy-five feet above the adjoining ground or adjoining roof level, whichever is applicable horizontal safety netting shall be provided on the sides of the structure where the facade of such structure is not enclosed and is exposed to the public or adjacent property as determined by rules and regulations promulgated by the commissioner. Such safety netting shall be maintained at a level not more than two stories or thirty feet below the stripping operation on concrete structures or the uppermost concrete floor on steel frame structures and in addition, on such lower stories as required pursuant to rules and regulations promulgated by the commissioner.

(b) Debris shall be removed at least daily from safety netting provided in accordance with the requirements of this section.

(c) **Storage of material.**- Safety netting shall not be used for storing materials.

**** Local Law 61-1987.**

§[C26-1901.7] 27-1023 Warning signs and lights.-

(a) **Obstructions and openings.**-Where a material pile or other obstruction, or an excavation, opening, or other hazard is located in, or adjacent to, a way open for use by persons other than workmen, such hazard shall be indicated by red flags or signs during daylight hours, and by red lanterns, red lights, oil flares, flashing beacons, lighted signs, or equivalent devices from sunset to sunrise. Such warning devices shall be located no more than thirty feet apart.

(b) **Dangerous areas.**-In areas where special danger to the public exists, such as at vehicle entrances and exits, hoisting areas, points of storage of explosives or highly flammable material, or discharge ends of chutes, descriptive warning signs shall be provided. Such warning signs shall contain the word "danger" in prominent letters and, where in, or adjacent to, a public way, shall be illuminated from sunset to sunrise. Barricades and/or designated personnel shall be provided to the extent necessary to keep the public away from such areas or to guide them around the areas.

(c) **Vehicular traffic.**-Whenever any work is being performed over, on, or in close proximity to a highway, street, or similar public way, control and protection of traffic shall be provided by barricades, signals, signs, flagmen, or other devices, equipment, and personnel in accordance with the requirements and standards of the department of transportation.

***§[C26-1901.8] 27-1024 Watchmen and flagmen.-**

(a) **Watchmen.**-Where a building being constructed or demolished occupies a ground area of more than five thousand square feet, and up to forty thousand square feet, a competent watchman shall be on duty at the site during all hours when operations are not in progress. Where the construction or demolition area occupies a ground area of more than forty thousand square feet at least one additional watchman shall be on duty for each additional forty thousand square feet of construction or demolition area, or fraction thereof. Watchmen shall be familiar with the location of street fire alarm boxes and the location and use of fire fighting equipment required to be on the job site.

(b) **Flagmen.**-A flagman shall be provided whenever intermittent operations are conducted on, or across, areas open to use by persons other than workmen, or when dangerous operations, such as blasting, may affect such areas.

** As enacted but nonsexist terms probably intended.*

§[C26-1901.9] 27-1025 Escape hatches required.-

(a) Where salamanders or other heating equipment are used to provide temporary heating during the placing of concrete for a floor, an escape hatch shall be provided from the floor where the concrete is being placed, which shall extend through at least one story immediately below

such floor. The escape hatch shall be located as near to the center of the building as shall be practical.

(b) The escape hatch shall be constructed with at least two ladders enclosed in a metal shield. The ladders shall extend from a distance of three feet above the floor under construction to at least two stories below unless such floor is less than two stories above the lowest floor. The metal shield shall enclose the ladders on all sides from the top of the floor where the concrete is being placed to at least the top of the floor next below.

(c) The inside dimensions between faces of the shield shall be not less than three feet eight inches.

(d) The space between the shield and the perimeter of the opening in the floor under construction and also between the shield and the perimeter of the opening in the floor next below, shall be decked over with two inch or heavier planking covered with plywood or sheet metal so as to make the decking smoke tight. At the termination of the ladders the opening in the floor shall be covered completely with two inch planking or other material of equivalent strength.

ARTICLE 3 PROTECTION OF ADJOINING PROPERTY

§[C26-1902.1] 27-1026 General.-

(a) **License to enter adjoining premises.**-The provisions of chapter one of title twenty-six of the administrative code, as amended, shall apply.

(b) **Physical examination.-**

(1) When permission to enter upon adjoining property has been obtained, a physical examination of such property shall be conducted by the person initiating the construction or demolition operations prior to the commencement of the operations and at reasonable periods during the progress of the work.

(2) During demolition operations, the provisions of section 27-1037 of article six of this subchapter shall also apply.

(c) **Adjoining walls.**-When any construction operation exposes or breaches an adjoining wall, the contractor shall maintain the structural integrity of such wall and maintain all required fire exits and passageways or provide substitutions meeting the requirements of this code. Portions of the wall exposed by construction operations shall be protected against the elements, and shall be restored or left permanently protected after completion of operations.

(d) **Weatherproof integrity of adjoining buildings.**-Where the weatherproof integrity of an adjoining building is impaired by construction operations, the flashing shall be restored, copings replaced, or other necessary measures taken to restore the weatherproof integrity of such adjoining buildings. See paragraph three of subdivision (a) of section 27-1037 of article six of this subchapter.

§[C26-1902.2] 27-1027 Abandoned and discontinued operations.-

(a) **Fencing.**-If any construction operation is abandoned, discontinued or interrupted, a solid fence at least eight feet high shall be provided to protect the public from potential hazards on the site.

(b) **Filing** and grading.**-If an excavation has been completed or partly completed and discontinued or interrupted, and the required permit has expired under the provisions of section 27-196 of article nineteen of subchapter one of this chapter and a permit for a proposed building has not been issued within six months after the completion of such operations, the lot shall be filled and graded to eliminate all steep slopes, holes, obstructions, or similar sources of hazard. Fill shall consist of clean, noncombustible material. The final surface shall be graded in such a manner as to drain the lot, eliminate pockets in the fill, and prevent the accumulation of water, without damaging any foundations on the premises or on adjoining property.

As enacted but "filling" probably intended.

§[C26-1902.3] 27-1028 Excavation or filling operations affecting adjoining property.-Whenever an excavation or fill is to be made that will affect safety, stability, or usability of adjoining properties or buildings, the adjoining properties or buildings shall be protected as required by the provisions of article four of this subchapter.

§[C26-1902.4] 27-1029 Foundation operations affecting adjacent properties.-Whenever subsurface operations are conducted that may impose loads or movements on adjoining property, such as driving of piles, compaction of soils, or soil solidification, the effects of such operations on adjoining property and structures shall be considered. The owner of the property that may be affected shall be given forty-eight hours written notice of the intention to perform such operations. Where construction operations will cause changes in the ground water level under adjacent buildings, the effects of such changes on the stability and settlement of the adjacent foundations shall be investigated and provision made to prevent damage to such buildings. When in the opinion of the commissioner a potential hazard exists, elevations of the adjacent buildings shall be recorded by an architect or engineer at intervals of twenty-four hours or less as determined by the commissioner to ascertain if movement has occurred.

§[C26-1902.5] 27-1030 Protection of trees.-No trees outside the street line shall be disturbed or removed without the permission of the commissioner of parks and recreation. Protection meeting the requirements of the department of parks and recreation shall be

provided around the trunks of all such trees, and written notification shall also be made to the department of parks and recreation at least forty-eight hours prior to commencement of such work. No deleterious, caustic, or acid materials shall be dumped or mixed within ten feet of any such tree, nor shall salt for the removal of ice or snow be applied when runoff will drain to a tree.

ARTICLE 4 EXCAVATION OPERATIONS

§[C26-1903.1] 27-1031 General requirements.-The provisions of this section shall apply to all excavations, including those made for the purposes of taking earth, sand, gravel, or other material as well as for purposes of construction. The provisions of article three of this subchapter as applicable shall apply. The provisions of subchapter seven of chapter one of title twenty-six of the administrative code, as amended, shall also apply.

(a) **Support of adjoining ground.-**

(1) **RETAINING STRUCTURE REQUIRED.**-When the regulation of a lot requires the ground on such lot to be raised or lowered and kept higher than the ground of an adjoining lot, provided the ground of such adjoining lot is not maintained at a grade lower than in conformity with the street or streets on which it is situated, or where an excavation has been made or a fill placed on any lot meeting the curb level requirements, and the adjoining land is maintained at a grade in conformity with or lower than the street or streets on which it is situated, and is without permanent structures other than frame sheds or similar structures, a retaining structure shall be constructed as required for the safe support of the adjoining ground and unless the bank between the adjoining properties is maintained at a safe angle of repose. Any necessary retaining wall shall be built and maintained jointly by the owners on each side, unless otherwise agreed to by both owners.

(2) **SURPLUS RETAINING STRUCTURE.**-Where any owner shall insist on maintaining his or her ground either higher or lower than the legal regulation prescribed in the administrative code, the surplus retaining structure that may be necessary to support such height or provide for such excavation shall be made and maintained at the sole expense of such owner, and any additional thickness that may be required shall be built on the land of such owner.

(3) **REMOVAL OF RETAINING STRUCTURES.**-Any retaining structure erected as provided under paragraphs one and two of this subdivision, standing partly on the land of each owner, may be removed by either owner when the original reason for the erection of such retaining structure ceases to exist.

(b) **Support of adjoining structures.-**

(1) **EXCAVATION DEPTH MORE THAN TEN FEET.**-When an excavation is carried to a depth more than ten feet below the legally established curb level the person who causes such excavation to be made shall, at all times and at his or her own expense, preserve and

protect from injury any adjoining structures, the safety of which may be affected by such part of the excavation as exceeds ten feet below the legally established curb level provided such person is afforded a license to enter and inspect the adjoining buildings and property.

a. Such person shall support the vertical load of the adjoining structure by proper foundations, underpinning, or other equivalent means where the level of the foundations of the adjoining structure is at or above the level of the bottom of the new excavation.

b. Where the existing adjoining structure is below the level of the new construction, provision shall be made to support any increased vertical or lateral load on the existing adjoining structure caused by the new construction.

c. Where the new construction will result in a decrease in the frost protection for an existing foundation below the minimums established in subchapter eleven of this chapter, the existing foundation shall be modified as necessary to restore the required frost protection.

(2) **EXCAVATION DEPTH TEN FEET OR LESS.**-Where an excavation is carried to a depth of ten feet or less below the legally established curb level, the owner of the adjoining structure shall preserve and protect the safety of his or her structure provided such owner is afforded a license to enter and inspect the property where the excavation is to be made.

(c) **Support of party walls.**-Where a party wall will be affected by excavation, regardless of the depth, the person who causes the excavation to be made shall preserve such party wall at his or her own expense so that it shall be, and shall remain, in a safe condition.

(d) **Drainage.**-All excavations shall be drained and the drainage maintained as long as the excavation continues or remains. Where necessary, pumping shall be used. No condition shall be created as a result of construction operations that will interfere with natural surface drainage. Water courses, drainage ditches, etc., shall not be obstructed by refuse, waste building materials, earth, stones, tree stumps, branches, or other debris that may interfere with surface drainage or cause the impoundment of surface waters.

(e) **Access.**-Every excavation shall be provided with safe means of ingress and egress kept available at all times.

§[C26-1903.2] 27-1032 Protection of sides of excavations.-

(a) **Shoring and bracing and sheeting.**-With the exception of rock cuts, the sides of all excavations, including related or resulting embankments, five feet or greater in depth or height measured from the level of the adjacent ground surface to the deepest point of the excavation, shall be protected and maintained by shoring, bracing and sheeting, sheet piling, or by other retaining structures. Alternatively, excavated slopes may be inclined not steeper than forty-five degrees or stepped so that the average slope is not steeper than forty-five degrees with no step more than five feet high, provided such slope does not endanger any structure,

including subsurface structures. All sides or slopes of excavations or embankments shall be inspected after rainstorms, or any other hazard-increasing event, and safe conditions shall be restored. Sheet piling and bracing used in trench excavations shall be at least equivalent in strength to that specified in tables 19-1 and 19-2.

(b) **Guard rail.**-In addition to the requirements of section 27-1021 of article two of this subchapter, a standard guard rail or a solid enclosure at least three feet six inches high shall be provided along the open sides of excavations, except that such guard rail or solid enclosure may be omitted from a side or sides when access to the adjoining area is precluded, or where side slopes are one vertical to three horizontal or flatter.

(c) **Placing of construction material.**-Excavated material and superimposed loads such as equipment, trucks, etc., shall not be placed closer to the edge of the excavation than a distance equal to one and one-half times the depth of such excavation, unless the excavation is in rock or unless the sides of the excavation have been sloped or sheet piled (or sheeted) and shored to withstand the lateral force imposed by such superimposed loads. When sheet piling is used, it shall extend at least six inches above the natural level of the ground. In the case of open excavations with side slopes, the edge of excavation shall be taken as the toe of the slope.

(d) **Mechanical diggers.**-Where trenching more than five feet in depth is done by a mechanical digger, the required protection shall follow the boom as closely as practical.

ARTICLE 5 ERECTION OPERATIONS

§[C26-1904.1] 27-1033 Protection of sidewalks.-The provisions of section 27-1021 of article two of this subchapter as applicable shall apply.

§[C26-1904.2] 27-1034 Structural steel assembly.-

(a) **Placing of structural members.-**

(1) During the placing of a structural member, the load shall not be released from the hoisting rope until the member is securely supported.

(2) Open web steel joists that are hoisted singly shall be transferred from their place of storage directly to their permanent location and safely secured. No load shall be placed on open web steel joists until they are permanently fastened in place.

(b) **Tag lines.**-While structural members or assemblies are being hoisted, tag lines shall be used to prevent uncontrolled movement.

(c) **Erection of trusses.**-All trusses shall be laterally braced or guyed as necessary for the safety of the structure.

(d) **Erection of frames.**-All structural frames shall be properly braced with shores or guyed cables and turnbuckles as necessary for the safety of the structure.

TABLE 19-1 MINIMUM SIZES OF TIMBER BRACING AND TIMBER SHEET PILING FOR TRENCHES FOUR FEET WIDE OR LESS^a

Depth of Trench, (ft.)	Sheet Piling		Stringers		Cross Bracing	
	Size (in.)	Horizontal Spacing (ft.)	Size (in.)	Vertical Spacing (ft.)	Size (in.)	Horizontal Spacing (ft.)
Hard and solid soil						
5-10.....	2 x 6	6	2 x 6	6	2 x 6	6
10-15.....	2 x 6	4	2 x 6	6	2 x 6	4
More than 15...	2 x 6	tight	4 x 8	4	4 x 8	6
Soil likely to crack or crumble						
5-10.....	2 x 6	3	2 x 6	5	2 x 6	5
10-15.....	2 x 6	2	2 x 6	4	2 x 6	4
More than 15...	2 x 6	tight	4 x 10	4	4 x 10	6
Soft, sandy filled-in loose soil						
5-10.....	2 x 6	tight	4 x 6	6	4 x 6	6
10-15.....	2 x 6	tight	4 x 6	5	4 x 6	6
More than 15...	2 x 6	tight	4 x 12	4	4 x 12	6
Where hydrostatic pressure exists						
To 10.....	2 x 6	tight	6 x 8	4	6 x 8	6
More than 10...	3 x 6	tight	6 x 10	4	6 x 10	6

Note for Table 19-1:

^aSteel sheet piling and bracing of equivalent strength may be substituted for wood sheet piling and timber bracing.**TABLE 19-2 MINIMUM SIZES OF TIMBER BRACING AND TIMBER SHEET PILING FOR TRENCHES FOUR TO EIGHT FEET WIDE^a**

Depth of trench, (ft.)	Sheet Piling		Stringers		Cross Bracing	
	Size (in.)	Horizontal Spacing (ft.)	Size (in.)	Vertical Spacing (ft.)	Size (in.)	Horizontal Spacing (ft.)
Hard and solid soil						
5-10.....	2 X 6	6	4 X 6	4	4 X 6	6
10-20.....	2 X 6	tight	6 X 6	4	6 X 6	6
More than 20...	2 X 6	tight	6 X 8	4	6 X 8	6
Soil likely to crack or crumble						
5-10.....	2 X 6	3	4 X 6	4	4 X 6	6
10-20.....	2 X 6	tight	6 X 6	4	6 X 6	6
More than 20...	2 X 6	tight	6 X 8	4	6 X 8	6
Soft, sandy filled-in loose soil						
5-10.....	2 X 6	tight	4 X 6	4	4 X 6	6
10-20.....	2 X 6	tight	6 X 6	4	6 X 6	6
More than 20...	2 X 6	tight	6 X 8	4	6 X 8	6
Where hydrostatic pressure exists						
To 10.....	2 X 6	tight	6 X 8	4	6 X 8	6
More than 10...	3 X 6	tight	6 X 10	4	6 X 10	6

Note for Table 19-2:

^aSteel sheet piling and bracing of equivalent strength may be substituted for wood sheet piling and timber bracing.**§[C26-1904.3] 27-1035 Concrete formwork.-****(a) General requirements.-**

(1) Formwork, including all related braces, shoring, framing, and auxiliary construction shall be proportioned, erected, supported, braced, and maintained so that it will safely support all vertical and lateral loads that might be

applied until such loads can be supported by the permanent construction.

(2) Vertical and lateral loads shall be carried to the ground by the formwork system, by the new construction after it has attained adequate strength for that purpose, or by existing structures.

(3) Forms shall be properly braced or tied together so as to maintain position and shape, and shall conform to the sizes and shapes of members as shown on the design drawings.

(4) Ramps and runways shall meet the requirements of article nine of this subchapter.

(b) Inspection.-

(1) Formwork, including shores, reshores, braces, and other supports, shall be inspected by an engineer or architect to verify the sizes of the concrete members being formed, as provided in article five of subchapter ten of this chapter. In addition, such forms shall be inspected for conformance with the form design drawings, when such drawings are required by the provisions of subdivision (c) of this section; and/or conformance with the provisions of this section. Such inspections may be made by the person superintending the work. Both such inspections shall be made prior to placement of reinforcing steel. Subsequently, inspections shall be made by the person superintending the work periodically during the placement of concrete to detect incipient problems.

(2) During and after concreting, the elevations, camber, and vertical alignment of formwork systems shall be checked using tell-tale devices.

(3) A record of all such inspections shall be kept at the site available to the commissioner, and the names of the

persons doing the inspecting and the name of the foreman in charge of formwork shall be posted in the field office.

(c) Design of concrete formwork.-Wherever the shore height exceeds fourteen feet or the total load on the forms exceeds one hundred fifty psf, or wherever power buggies or two-stage shores are used, the forms, including shoring foundation, shall be designed as provided in section 27-1015 of article one of this subchapter, and shall be constructed in conformance with such design. Formwork drawings shall be prepared. The allowable stresses for design shall meet the requirements of subchapter ten of this chapter. A copy of the design drawings and any construction drawings and specifications shall be kept on the job available to the commissioner.

(1) **VERTICAL LOADS.-**Vertical loads shall include the total dead and live loads. Dead load shall include the weight of formwork plus the weight of the reinforcement and fresh concrete. Live load shall allow for the weight of workers and equipment, with allowance for impact, but in no case shall less than twenty psf be allowed.

(2) **LATERAL CONCRETE PRESSURE.-**Design of forms, ties, and bracing shall assume that minimum lateral pressures of fresh concrete are as shown in table 19-3.

TABLE 19-3 MINIMUM LATERAL PRESSURES TO BE ASSUMED FOR FRESH CONCRETE WEIGHING 150 POUNDS PER CUBIC FOOT

Type of Work	Minimum Lateral Pressure Assumed (psf)	Limitations
Columns: Ordinary work with normal internal vibration	$p = 150 + \frac{9000R}{T}$	Maximum 3,000 psf or 150h, whichever is less
Walls: Rate of placement at 7 ft. per hr. or less	$p = 150 + \frac{9000R}{T}$	Maximum 2,000 psf or 150h, whichever is less
Walls: Rate of placement at greater than 7 feet per hr.	$p = 150 + \frac{43400}{T} + \frac{2800R}{T}$	Maximum 2,000 psf or 150h, whichever is less
Slabs	$p = 150h$	None

Where:

R = rate of placement, ft. per hr.

T = temperature of concrete in the forms, deg. F.

h = height of fresh concrete above point considered, ft.

Notes for Table 19-3:

^a Allowances for change in lateral pressure shall be made for concrete weighing [sic] other than one hundred fifty pcf; for concrete containing pozzolanic additions or cements other than type I, for concrete having slumps greater than six in., or for concrete consolidated by revibration or external vibration of forms.

^b Where retarding admixtures are employed under hot weather conditions an effective value of temperature less than that of the concrete in the forms shall be used in the above formulae.

^c If retarding admixtures are used in cold weather, the lateral pressure may be assumed as that exerted by a fluid weighing [sic] one hundred fifty pcf.

(3) **EXTERNAL LATERAL LOADS.-**

- a. Braces and shores shall be designed to resist all external lateral loads such as wind, cable tensions, inclined supports, dumping of concrete, and starting and stopping of equipment.
- b. In no case shall the assumed value of lateral load due to wind, dumping of concrete, and equipment acting in any direction at each floorline be less than one hundred plf edge or two percent of total dead load of the floor, whichever is greater.
- c. Except for foundation walls that are poured against a rigid backing, wall forms shall be designed for a minimum lateral load of ten psf, and bracing for wall forms shall be designed for a lateral load of at least one hundred plf of wall, applied at the top. The lateral load acting on walls greater than fourteen feet high shall be determined by analysis of conditions applicable to the site and building.

(4) **SPECIAL LOADS.-**The formwork shall be designed for any special conditions of construction likely to occur, such as unsymmetrical placement of concrete, impact of machine-delivered concrete, uplift, and concentrated loads.

(5) **SHORING AND BRACING.-**

- a. When patented or commercial devices that are not susceptible to design are used for shoring, bracing, or splicing, they shall be approved.
- b. Splices shall develop the full strength of the spliced members.
- c. Where shore height exceeds ten feet, or when necessary to provide structural stability, diagonal bracing shall be provided. Struts, anchored into masonry or to panel joints of adjacent braced bays, may be used to prevent buckling of individual members not supported by the diagonal bracing; but, bracing an entire tier of shores with struts without diagonal bracing will not be permitted unless the system can be demonstrated to be braced by other rigid construction.
- d. The unbraced length of shores shall not exceed the maximum length determined in accordance with the applicable reference standard in subchapter ten of this chapter for the structural material used.

(6) **FOUNDATIONS.-**Foundations for shores more than ten feet high and supported on the ground shall be designed.

(7) **SETTLEMENT.-**Falsework shall be so constructed that vertical adjustments can be made to compensate for take-up and settlements. Wedges, jacks, or other positive means shall be provided for this purpose.

(8) **POWER BUGGIES.-**For special requirements for runways, ramps, and platforms used by power buggies, see section 27-1053 of article nine of this subchapter.

(d) Construction.-

(1) Field constructed lap splices, other than approved devices, shall not be used more often than for every other shore under slabs or for every third shore under

beams, and shall develop the full strength of the members. Such spliced shores shall be uniformly distributed throughout the work. Splices shall not be located near the midheight of the shores unless lateral support is provided, nor midway between points of lateral support.

(2) Vertical shores for multifloor forms shall be set plumb and in alignment with lower tiers so that loads from upper tiers are transferred directly to the lower tiers, or adequate transfer members shall be provided. Provision shall be made to transfer the lateral loads to the ground or to completed construction of adequate strength.

(3) Vertical shores shall be so erected that they cannot tilt, and shall have firm bearing. Inclined shores and the bearing ends of all shores shall be braced against slipping or sliding. The bearing surfaces shall be cut square and have a tight fit at splices.

(4) Runways for moving equipment shall be provided with struts or legs as required, and shall be supported directly on the formwork or structural member and not on the reinforcement.

(5) Any unsafe condition or necessary adjustment revealed by inspection shall be remedied immediately. If, during construction, any weakness develops and the falsework shows any undue settlement or distortion, the work shall be stopped, the affected construction removed if permanently damaged, and the falsework strengthened.

(e) Removal of forms and shoring.-

(1) Forms shall be removed in such a manner as to assure the complete safety of the structure.

(2) Where the structure as a whole is supported on shores, then beam and girder sides, columns, and similar vertical forms may be removed after twenty-four hours provided the concrete is sufficiently hard to withstand damage thereby. In no case shall the supporting forms or shoring be removed until the members have acquired sufficient strength to support safely their weight and the load thereon.

(3) The results of control tests, including concrete cylinder specimens prepared in accordance with reference standard RS 10-52, cast-in-place cores, or other device which will produce test specimens representative of the condition of the concrete in place, of suitable size and proportions, and approved by the architect or engineer shall be deemed evidence that the concrete has attained sufficient strength or such strength as may be specified on the drawings. The contractor may submit alternate methods of stripping, reshoring, and strength control for approval by the architect or engineer and subject to review by the commissioner.

(f) Reshoring.-Reshoring shall be provided to support the construction where forms and shores are stripped before the concrete has gained adequate strength to support the superimposed loads due to construction above.

***(1) INSTALLATION LIMITATIONS.**-Reshores of wood or metal shall be screw adjusted or jacked and locked or wedged. Wedges shall not be used within ten feet of the facade or at such other locations as determined by rules and regulations promulgated by the commissioner. Reshores shall not be jacked or screwed so tight that they preload the floor below or remove the normal deflection of the slab above. In no case shall shores be so located as to significantly alter the pattern of stresses determined in the original structural analysis or to induce tensile stresses where reinforcing bars are not provided. Reshores within ten feet of the facade shall be secured.

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(2) BRACING. - Lateral bracing shall be provided during reshoring operations, and reshores shall be located as close as practical to the same position on each floor to provide continuous support from floor to floor.

(3) RESHORING BEAM AND GIRDER CONSTRUCTION.- Where reshoring of beam and girder construction is required, the forms shall not be removed from more than one girder at a time, and the girder shall be reshored before any other supports are removed. After the supporting girders are reshored, the form shall be removed from one beam with its adjacent slabs and the beam shall be reshored before any other supports are removed. Slabs spanning ten feet or more shall be reshored along the center line of the span.

(4) RESHORING FLAT SLABS.-Where reshoring of flat slab construction is required, the shores for the area within the intersection of the middle strips of each panel shall be left in place at all times until the concrete has attained sufficient strength to support the loading to which it will be subjected. After the other shores in each panel have been removed, reshores shall be placed on the column lines at [sic] the mid-points between columns, before the next panel is stripped.

(g) Slip form construction.-

(1) The applicable provisions of subdivision (c) of section 27-1035 of this article shall apply.

(2) All slip forms shall be designed, and the construction and sliding operations shall be carried out under the personal supervision of the person superintending the work or his or her designated representative.

(3) Lateral and diagonal bracing for forms shall be provided to insure that the shape of the structure will not be unduly distorted during the sliding operation.

(4) Jacks shall be spaced, anchored, and operated in such a manner that the vertical load on all jacks is approximately equal and does not exceed the capacity of any jack. Jacks shall be provided with automatic holding devices.

(5) Forms shall be leveled before and after they are filled, and shall be maintained level throughout the slide. Drifting of the forms from alignment or designed

dimensions, and torsional movement shall be prevented. Horizontal and vertical alignment of structure shall be checked at least once during every twenty-four hours that the slide is in operation.

(h) Lift method construction.-

(1) The casting bed and supporting construction shall be designed to carry the dead load of the stacked slabs and any live load that may be imposed.

(2) Slabs shall not be lifted until the concrete has attained adequate strength to support its own weight and any superimposed loads without exceeding the stress values established in subchapter ten of this chapter.

(3) Lifting of all parts of the slab shall be approximately simultaneous and at a uniform rate. The lifting equipment shall be constantly engaged to prevent slippage or retrogression of the slab during lifting operations.

(4) Care shall be taken to insure that collar keyholes or other lifting attachment openings are in direct vertical alignment for all slabs. Wedges shall be inserted between the collar opening and column to maintain clearance on all sides of the column. Blockouts shall be provided to prevent concrete from entering space between collar and column as well as the lifting attachment openings.

(5) Temporary bracing for lateral support of columns shall be provided during lifting operations and shall remain in place until its function can be assumed by permanent connections of slabs to columns, permanent bracing walls, or other means of lateral support, unless it can be shown that all columns, their base connections to footings, the footings, and soil are adequate as a cantilever system to resist all prescribed lateral forces.

(6) The assumed value of lateral forces in lift slab construction due to unsymmetrical loads, lifting reactions, or wind shall be at least fifty plf of floor edge or one percent of the total load lifted, whichever is greater.

(7) No person shall be allowed to enter the area immediately under slabs during the actual movement of lifting nor shall any construction operations be commenced in this area, other than fixing the connections of slabs to columns or providing other positive supports, until such connections or supports are completed and the load of all lifted slabs has been transferred from lifting equipment thereto.

(i) Prestressed construction.-Solid safety shields shall be provided at end anchorages of prestressing beds, or where necessary, for protection against breakage of prestressing strands, cables, or other assemblies during prestressing or casting operations.

ARTICLE 6 DEMOLITION OPERATIONS

§[C26-1905.1] 27-1036 Preparations.-

(a) Utilities and service lines.-The provisions of section 27-1013 of article one of this subchapter and article fourteen of subchapter one of this chapter shall apply.

(b) Condition of structure.-Where a structure to be demolished has been partially wrecked or weakened by fire, flood, explosion, age, or other causes, it shall be shored or braced to the extent necessary to permit orderly demolition without collapse. The necessary measures shall be determined by the contractor subject to approval by the commissioner.

(c) Hazards to be removed.

(1) Before commencement of actual demolition, all glass in windows, doors, skylights, and fixtures shall be removed.

(2) In any structure more than twenty-five feet high, any window or other exterior wall opening that is within twenty-feet of a floor opening used for the passage of debris from floors above shall be solidly boarded up or otherwise substantially covered, unless such window or opening is so located as to preclude the possibility of any person being injured by material that may fall from such window or opening. See section 27-1022 of article two of this subchapter.

(3) Before demolition is started, the cellar and all floors shall be thoroughly cleaned of combustible materials and debris. All fixtures and equipment that would cause voids in the fill shall be removed. If the cellar is to be filled to grade, the first floor construction shall be removed and the existing cellar floor shall be broken up to the extent necessary to provide ground drainage and prevent accumulation of water. If the cellar is not to be filled, positive cellar drainage shall be provided.

(d) Examination and procedure.-Before any material is stored on any floor, the existing flooring adjacent to the bearing walls shall be removed and ends of floor beams in the bearing walls shall be carefully examined to ascertain their condition and the amount of bearing on the bearing wall. If they are found to be in poor condition or to have insufficient bearing, no material shall be deposited on the floor until these beams are shored from the cellar floor through each successive floor. No bearing partition shall be removed from any floor until the floor beams on the floor above have been removed and lowered. All header beams and headers at stair openings and chimneys shall be carefully examined, and where required shall be shored from the cellar floor through successive floors. All operations shall be continually inspected as the work progresses to detect any hazards that may develop.

§[C26-1905.2] 27-1037 Protection of adjacent structures.-The applicable provisions of article three of this subchapter shall apply.

(a) Adjoining walls.

(1) All beams in party walls shall be cut off close to the walls, stub ends removed without weakening existing masonry, and beam pockets cleaned of loose mortar. The owner of the demolished structure shall, at his or her own expense, bend over all wall anchors at the beam ends in the standing wall and shall brick-up all

open beam holes with sound brick and cement mortar.

(2) The stability and condition of the remaining walls shall be investigated and all necessary steps taken to protect same. Where the floor beams of the adjacent building bear on the party wall, the person causing the demolition to be made shall ascertain that such beams are anchored into the wall and, where such anchorage is lacking, shall provide anchorage or otherwise brace the standing wall.

(3) Roofing material of adjoining buildings shall be bent over and flashed. All door or other openings in party walls shall be sealed and weatherproofed. Cornices, where cut, shall be properly sealed. Parapets and any walls that have been disturbed shall be pointed up and made weathertight. All exposed furring, lath, and plaster on party walls shall be removed, and any loose wall material shall be firmly anchored or removed and replaced.

(4) All unnecessary chimney breasts, projections and any other debris exposed on party walls shall be removed by the person causing the demolition of the structure and all openings shall be bricked up flush on the exterior side of the party wall. All masonry which is in poor condition shall be pointed and patched.

(b) Party wall exits.-No party wall balcony or horizontal fire exit shall be demolished, removed, or obstructed in any manner that would destroy the full effectiveness of such fire exit as means of egress, unless a substitute means of egress meeting the requirements of this code has been provided.

§[C26-1905.3] 27-1038 Protection of sidewalks.-The provisions of section 27-1021 of article two of this subchapter as applicable shall apply.

§[C26-1905.4] 27-1039 Demolition operations.-

(a) Walls.

(1) Demolition of walls and partitions shall proceed in a systematic manner, and all work above each tier of floor beams shall be completed before any of the supporting structural members are disturbed.

(2) Sections of masonry walls shall not be loosened or permitted to fall in such masses as to affect the carrying capacity of floors or the stability of structural supports.

(3) No wall, chimney, or other structural part shall be left in such condition that it may collapse or be toppled by wind, vibration or any other cause.

(4) No section of wall with a height more than twenty-two times its thickness shall be permitted to stand without bracing.

(5) Where brick or masonry chimneys cannot be safely toppled or dropped, all materials shall be dropped down on the inside of such chimneys.

(6) All enclosed vertical shafts and stairs shall be maintained enclosed at all floors except the uppermost floor being demolished, and all work on the uppermost floor shall be completed before stair and shaft enclosures on the floor below are disturbed. All hand rails and banisters

shall be left in place until actual demolition of such floor is in progress.

(b) Structural steel and heavy timbers.-

(1) Steel and heavy timber construction shall be demolished column length-by-column length and tier-by-tier. Any structural member that is being dismembered shall not be supporting any load other than its own weight, and such member shall be chained or lashed in place to prevent any uncontrolled swing or drop.

(2) Structural members shall not be thrown or dropped from the building, but shall be slowly and carefully lowered by hoists equipped with adequate brakes and non-reversing safety devices.

(c) Use of derricks.-Where a derrick is used for demolition, an investigation of the floor on which the derrick rests shall be made by an engineer or architect to determine its adequacy for the loading to be imposed; strengthening shall be designed and added as required to limit the imposed stresses to the values permitted by the provisions of subchapter ten of this chapter. A report summarizing such investigation and design shall be prepared and kept at the site available to the commissioner.

(d) Mechanical methods of demolition.-The mechanical method of demolition, whereby the wrecking of a building or part thereof is accomplished by smashing the walls or floors with a heavy weight suspended by a cable, or whereby the walls are collapsed by the use of a power shovel, tractor, or other mechanical contrivance, shall be permitted only upon issuance of a special permit by the department and in accordance with the following requirements:

(1) The building or structure, or remaining portion thereof, shall not be more than eighty feet in height.

(2) A safety zone, as determined by the commissioner, shall be provided around the demolition area. Fences constructed as required in section 27-1021 of article two of this subchapter shall be erected to prevent persons other than workers from entering such safety zone.

(3) Unless permitted by the commissioner, the mechanical method of demolition shall not be used where any building, or portion thereof, occupied by one or more persons is located within the safety zone.

(4) Where a swinging weight is used, two or more separate cable slings shall be used to attach the ball to a safety or moused hook and the supporting cable shall be of such length or so restrained that it is not possible for the weight to swing against any structure other than the structure being demolished.

(5) Where mechanical demolition operations may involve a street, the requirements of the department of transportation shall be met.

(e) Removal and storage of material.-

(1) **PHYSICAL REMOVAL.-**Debris, bricks, and similar material shall be removed by means of chutes, buckets, or hoists or through openings in the floors of the structure. Openings in any floor shall not aggregate more than twenty-five percent of the area of that floor

unless it can be shown to the satisfaction of the commissioner that larger openings will not impair the stability of the structure.

a. Every opening used for the removal of debris in every floor except the top or working floor, shall be provided with a tight enclosure from floor to floor, equivalent to that afforded by planking not less than two inches in thickness. As an alternative in buildings when not more than six stories in height, such openings may be protected by a tight temporary covering equivalent to that afforded by planks not less than two inches in thickness and laid close. Wherever such covering has been temporarily removed to permit debris removal floor openings shall be protected by standard guard rails or railings. Such covering shall be promptly replaced in position upon the ceasing of such work at the end of each work day.

b. Every opening not used for the removal of debris in any floor shall be solidly planked over.

(2) STORAGE OF MATERIAL.-

a. Material shall not be stored on catch platforms, working platforms, floors, or stairways of any structure except that any one floor of a building to be demolished may be used for the temporary storage of material when such floor can be shown to be of adequate strength to support one and one-half times the load to be superimposed.

b. Storage spaces shall not interfere with access to any stairway or passageway, and suitable barricades shall be provided so as to prevent material from sliding or rebounding into any space accessible to the public. All material shall be safely piled in such storage locations in a manner that will not overload any part of the structure or create any hazard.

c. In buildings of noncombustible construction, floor slabs to an elevation of not more than twenty-five feet above the legally established curb level may be removed to provide temporary storage for debris, provided that: (1) the stored debris is piled with sufficient uniformity to prevent lateral displacement of interior walls or columns; (2) the height of the piled material will not burst the exterior walls due to accumulated pressure; and (3) the operation does not otherwise endanger the stability of the structure.

d. Debris stored in the cellar shall not be piled above the level of the adjacent exterior grade unless the contractor provides sheet-piling, shoring, bracing, or such other means necessary to insure the stability of the walls and to prevent any wall from collapsing due to the pressure of accumulated material.

(f) Dust.-Dust producing operations shall be wetted down to the extent necessary to lay the dust.

(g) Use of explosives.-The use of explosives in demolition operations shall conform to the requirements and limitations imposed by the fire department. The toppling of buildings by the use of explosives is prohibited except where such procedure is permitted by the commissioner.

(h) Temporary elevators.-Whenever, in the course of

building demolition, the work is at a height greater than seventy-five feet, at least one elevator meeting the requirements of subchapter eighteen of this chapter shall be kept in readiness at all times for fire department use.

§[C26-1905.5] **27-1040 Completed demolitions.**-At the completion of demolition operations, unless new construction is to follow within a period of thirty calendar days, the site shall be graded, drained, or otherwise protected as provided in section 27-1027 of article three of this subchapter.

ARTICLE 7 REPAIR AND ALTERATION OPERATIONS

§[C26-1906.1] **27-1041 General requirements.**-Building repair or alteration operations shall be considered as construction operations and shall be governed by the regulations established in this subchapter. Where alterations are conducted in occupied buildings, barricades, signs, drop cloths, etc., shall be erected as required to provide reasonable protection for the occupants against hazard and nuisance.

ARTICLE 8 SCAFFOLDS

§[C26-1907.1] **27-1042 General provisions for all scaffolds.**-All scaffolds shall be erected and maintained so that the safety of public and property will not be impaired by falling material, tools or debris or by collapse of the scaffold.

(a) Materials and construction.-

(1) All lumber used in scaffolds or their supports shall be at least equal in strength and quality to construction grade Douglas fir.

TABLE 19-4 SIZE AND NUMBER OF NAILS REQUIRED FOR SCAFFOLD CONSTRUCTION

Thickness of Smaller Member (in.)	Trade Size of Nail	Length of Nail (in.)
1	8d	2 ½
2	20d	4
3	60d	6
4	—	8
Width of Smaller Member (in.)	Minimum Number of Nails Required	
4	2	
6	3	
8	4	
10	5	
12	5	

(b) Loading and design.-

(1) **DESIGN REQUIRED.**-All exterior pole scaffolds over seventy-five feet high and all multiple-point suspension scaffolds, including all supports, fastenings,

connections, and details, shall be designed. Design drawings shall be prepared and kept at the site available to the commissioner. The construction shall be executed in accordance with such design. All other scaffolding shall be constructed of sizes and numbers of members as hereinafter required or, in the absence of such requirements shall be demonstrated to be capable of supporting, without collapse, not less than four times the maximum weight required to be suspended therefrom or placed thereon when in use.

(2) **LOADING.**-No standard scaffold as defined herein, shall be loaded in excess of the maximum load for which it is designated in paragraph three of this subdivision. Loads shall not be concentrated so as to cause stresses in excess of the allowable values designated in subchapter ten of this chapter.

(3) STANDARD SCAFFOLD DESIGNATIONS.-

a. **Light duty scaffold.**-The light duty scaffold is to be used for loads up to twenty-five psf, and is intended for use by carpenters, painters, or others of similar trades. It shall not be used to support loads more severe than those imposed by such workers and a minimum amount of lightweight materials.

b. **Medium duty scaffold.**-The medium [duty]* scaffold is to be used for loads up to fifty psf, and is intended for use by bricklayers or plasterers. It shall not be used to support loads more severe than those imposed by such workers and a moderate amount of their materials.

**Copy in brackets not enacted but probably intended.*

c. **Heavy duty scaffold.**-The heavy duty scaffold is to be used for loads up to seventy-five psf, and is intended for use by stone masons. It shall not be used to support loads more severe than those imposed by such workers and a reasonable supply of their materials.

(4) **FOOTINGS AND ANCHORAGE.**-The footings and anchorage for every scaffold shall be sound and rigid, capable of carrying the maximum load without settlement or deformation, and secure against movement in any direction. Supports such as barrels, boxes, loose brick, loose stone, or other unstable constructions shall not be used.

(c) Planking.-

(1) The minimum width of every planked platform shall be eighteen inches, except as otherwise noted hereinafter. Unless otherwise indicated, the sizes in this subchapter for load-bearing planks shall denote undressed lumber, full thickness.

(2) Except as otherwise indicated in this section, planks shall overhang their end supports at least six inches, or they shall be securely fastened to prevent dislodgment. In no case shall the overhang exceed eighteen inches. Planks shall be laid tight, and inclined planking shall be fastened in place.

(3) The maximum permissible spans for two inch plank shall be as shown in table 19-5.

(4) The maximum permissible span for one and one-

quarter inch plank of full thickness shall be six feet. The maximum permissible working load shall be fifty psf.

(d) Erection and removal.-Only workers with experience in erecting or removing scaffolds shall be

employed. They shall work under the supervision of a designated superintendent or foreman who shall enforce such measures as necessary for the protection of public and property.

TABLE 19-5 MAXIMUM PERMISSIBLE SPANS FOR TWO-INCH PLANK USED ON SCAFFOLDS

Material	Full Thickness Undressed Lumber			Lumber of Nominal Thickness		
	25	50	75	25	50	75
Working Load (psf).....	25	50	75	25	50	75
Permissible Span (ft.)...	10	8	6	8	6	5

(e) Maintenance and repair.-All scaffolds shall be maintained in safe condition. No scaffold shall be altered, removed, or partially dismantled while it is in active use. Every damaged or weakened scaffold shall be immediately repaired and shall not be used until such repairs have been completed, and, in the case of suspended scaffolds, tested as required under subdivision (b) of section 27-1045 of this article.

(f) Fire retardant construction.-With the exception of the planking, all scaffolds shall be noncombustible material when used in the following applications:

- (1) Exterior scaffolds exceeding seventy-five feet in height.
- (2) Interior scaffolds exceeding twenty-one feet in height.
- (3) All scaffolds used in the alteration, repair, or partial demolition of buildings in occupancy groups H-1 and H-2.

(g) Guard rails and toeboards.-

- (1) Except for scaffold platforms ten feet or less above the ground or for scaffolds used on the interior of a building at a height ten feet or less above a floor, the open sides and ends of every scaffold platform shall be provided with a standard guard rail and toeboard as described in section 27-1050 of this article, unless otherwise specified for the particular type of scaffold.
- (2) Where it is possible for the public to pass under, or next to a scaffold, the space between the top rail and toeboard shall be enclosed with a wire screen composed of not less than no. 18 steel wire gage with a maximum one-half inch mesh.
- (3) Toeboards shall be installed so that no open space exists between the platform and the toeboard.

§[C26-1907.2] 27-1043 Pole scaffolds.-

(a) Poles.-Scaffold poles shall be plumb and the foot ends shall be secured against lateral movement. Where wood poles are spliced, the squared end of the upper section shall bear uniformly on the squared end of the lower section, and the two ends shall be rigidly fastened together with two or more wood splice plates, each at least four feet in length. The plates shall be placed at right angles to each other, shall overlap the abutting ends of the pole equally, and shall have a combined sectional area not less than fifty percent of the cross sectional area of the pole. Splicing of adjacent poles

shall be staggered. Splices shall be close to ledgers, but so located as not to interfere with the fastenings.

(b) Bracing.-Pole scaffolds shall be braced and stayed to prevent movement away from the building. Diagonal or equivalent bracing shall be provided to prevent the poles from moving in a direction parallel to the building face, and shall be so installed that every spliced section of every pole is braced to adjacent poles.

(c) Planking.-

(1) Where planks are butted end to end, parallel putlogs or bearers shall be provided not more than eight inches apart so that butted ends rest on separate putlogs or bearers. Ends shall be nailed or cleated.

(2) Where platform planks are used with overlapping ends, the ends of both the upper and lower planks shall overlap the putlog or bearer by a[t]* least six inches.

**Copy in brackets not enacted but probably intended.*

(3) Planks shall be laid close together and shall be of sufficient length to extend over three bearers.

(d) Connections.-

(1) Ledgers shall not be spliced between poles but shall overlap the poles at each end by at least four inches. Where ledgers lap each other, bearing-blocks attached to the pole shall be provided to support the ledger.

(2) The ends of all wooden braces shall overlap the nailed fastenings an amount sufficient to prevent the ends of the braces from splitting.

(e) Putlogs for single pole scaffolds.-All putlogs shall be set with the greater dimension vertical and shall be long enough to project beyond the outer edge of the poles by at least twelve inches. Putlogs shall be supported on the ledger and located against the side of the poles and fastened to either the pole or the ledger. The other end of the putlog shall rest in the wall of the building, with at least four inch bearing, and shall not be notched or cut down, except for light duty scaffolds, which may be notched or cut down to fit into a space made by the removal of a brick. In such cases, the notch shall be made on the top of the putlog just deep enough to permit it to be inserted in the hole in the wall.

(f) Bearers for independent pole scaffolds.-Bearers shall be set with their greater dimensions vertical, and shall be long enough to project over the ledgers beyond the outer row of poles by at least twelve inches and beyond the inner row of poles by at least two inches.

Bearers shall be supported on the ledgers, and located against the sides of the poles and fastened to them.

(g) **Free standing scaffolds.**-Unless guyed, free standing scaffolds shall have a minimum base dimension of at least twenty-five percent of the height of the scaffold.

(h) **Erection and removal.**-When a new working level is desired, the existing planks shall be left undisturbed until the new working level is framed. As the platform level is abandoned with the progress of the work, all

members other than the planking, railing, and toeboards shall be left intact. When removing a scaffold, the sequence of removing the members shall be the reverse of that used in erection.

(i) **Standard designs.**-All wood pole scaffolds seventy-five feet high or less shall be constructed in accordance with the minimum nominal sizes and maximum spacings shown in tables 19-6 through 19-11. For pole scaffolds more than seventy-five feet high, see paragraph one of subdivision (b) of section 27-1042 of this article.

TABLE 19-6 MINIMUM SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE LIGHT DUTY SCAFFOLDS

Uniformly Distributed Load	Not to Exceed 25 psf				
Max. height of scaffold.....	20'	40'	60'	75'	
Poles or uprights (min.).....	2" x 4"	3" x 4"	4" x 4"	Top 60' 4" x 4"	Lower Sect. 4" x 6"
Pole foundation (min.).....			2" x 9"		
Max. pole spacing (longitudinal).			10' - 0"		
Max. width of scaffold.....			5' - 0"		
Bearers or putlogs (min.).....		3" x 4" or 2" x 6" (on edge)			
Ledgers (minimum):					
With 6'-0" pole space.....			1" x 6" (on edge)		
With 10'-0" pole space.....			1 1/4" x 9" (on edge)		
Vertical spacing of ledgers (max.)			7'-0"		
Non-supporting stringers.....			1" x 4"		
Tie-ins.....			1" x 4"		
Bracing.....			1" x 4"		
Planking:					
Not more than 6' span.....			1 1/4" x 9"		
Up to 10' span.....			2" x 9"		
Toeboards.....			1" x 6"		
Guard rails.....			2" x 4"		

§[C26-1907.3] 27-1044 Outrigger scaffolds.-

Outrigger scaffolds shall not be used for loading in excess of fifty psf (medium duty).

(a) **Outrigger beams.**-Outrigger beams shall not extend more than six feet beyond the face of the building. The inboard end of outrigger beams, measured from the fulcrum point to the extreme point of support, shall be at least one and one-half times the outboard end in length. The fulcrum point of the beam shall rest on a secure bearing at least six inches in each horizontal dimension. The beam shall be secured against movement and shall be securely braced against tipping at both fulcrum point and inboard end. Outriggers shall not be less than three inches by ten inches set on edge, plumb, and spaced not to exceed six feet on centers for light and medium duty scaffolds.

(b) **Inboard supports.**-The inboard ends of outrigger beams shall be securely fixed to resist all vertical, horizontal, and torsional forces.

(c) **Platform.**-The platform shall be constructed of at least two inch by nine inch planks, securely fastened to the outriggers, and laid tight to within three inch[es]* of

the face of the building.

(d) **Guard rail and toeboard.**-The railing posts for the required standard guard rail and toeboard shall be securely braced to the outriggers.

**Copy in brackets not enacted but probably intended.*

(e) **Superstructures.**-Supports for superstructures placed on outrigger scaffolds shall be set directly over the outrigger beams and shall be secured in place. Such structures shall not exceed six feet in height. Horses shall not be used as supports for such superstructures.

§[C26-1907.4] 27-1045 General provisions for suspended scaffolds.-

(a) **Installation and use.**-Suspended scaffolds shall be erected and operated in such a manner that suspension elements are vertical and in a plane parallel to the wall at all times. The installation or change of position of any suspended scaffold shall be performed under the supervision of a designated superintendent or foreman who shall enforce such measures as may be required for the safe execution of such operation.

TABLE 19-7 MINIMUM SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE MEDIUM DUTY SCAFFOLDS

Uniformly Distributed Load	Not to exceed 50 psf				
Max. height of scaffold.....	20'	40'	60'	75'	
				Top 60'	Lower Sect.
Poles or uprights (min.).....	3" x 4" or 2" x 6"	4" x 4"	4" x 6"	4" x 6"	4" x 6"
Pole foundation (min.).....			2" x 9"		
Max. pole spacing (longitudinal)...			8' - 0"		
Max. width of scaffold.....	5' - 0"			8' - 0'	
Bearers or putlogs (min.).....	3" x 4" or 2" x 8" (on edge)			3" x 5" or 2" x 9" (on edge)	
Max. spacing of bearers or putlogs.			8' - 0"		
Ledgers (minimum).....			2" x 9" (on edge)		
Vertical spacing of ledgers (max.)..			7' - 0"		
Non-supporting stringers.....			1" x 6" or 1 1/4" x 4"		
Tie-ins.....			1" x 6"		
Bracing.....			1" x 6"		
Planking:					
Not more than 6' span.....			1 1/4" x 9"		
Up to 8' span.....			2" x 9"		
Toeboards.....			2" x 9"		
Guard rails.....			2" x 4"		

***As enacted but 6" x 6" probably intended.*

TABLE 19-8 MINIMUM SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE HEAVY DUTY SCAFFOLDS

Uniformly Distributed Load	Not to exceed 75 psf				
Max. height of scaffold.....	20'	40'	60'	75'	
				Top 60'	Lower Sect.
Poles or uprights (min.).....	3" x 4" or 2" x 6"	4" x 4"	4" x 6"	4" x 6"	6" x 6"
Pole foundation (min.).....			2" x 9"		
Max. pole spacing (longitudinal)...			6' - 0"		
Max. width of scaffold.....	5' - 0"			8' - 0"	
Bearers or putlogs (min.).....	3" x 5"			3" x 6" or 2" x 9"	
Max. spacing of bearers or putlogs.			6' - 0"		
Ledgers (minimum).....			2" x 9" (on edge)		
Vertical spacing of ledgers (max.)..			7' - 0"		
Non-supporting stringers.....			2" x 4"		
Tie-ins.....			1" x 6"		
Bracing.....			1" x 6"		
Planking.....			2" x 9"		
Toeboards.....			2" x 9"		
Guard rails.....			2" x 4"		

(b) Tests and inspections required.-All suspended scaffolds shall be inspected daily by the user before use. A record of such inspections shall be kept and maintained at the field office of the user. Upon delivery of the scaffold equipment to the site, the supplier of such equipment shall furnish a certificate from an independent testing laboratory or a licensed professional

engineer stating that physical tests of a prototype of the equipment were conducted and that such equipment is capable of withstanding at least four times the maximum allowable live loads. Such certificates shall be kept at the field office of the user and shall be available for inspection by a representative of the department of buildings. This section, however, shall

not be construed to reduce the factors of safety specified elsewhere in this code for various appurtenances to this equipment. In addition, tests prescribed in section 27-998 of article three of subchapter eighteen shall be performed with the full rated live load on the scaffold at the test intervals specified therein and at such other intervals as the commissioner may require.

(c) **Tie-ins.**-Scaffolds shall be tied into the building or structure, and means therefor shall be provided. Window cleaners anchors, window frames, millions*, or similar elements shall not be used as tie-in anchors or brace-back points.

(d) **Wire rope.**-Wire rope used for support of suspended scaffolds shall be capable of supporting six times the actual applied load without failure, but shall not be less than five-sixteenths of an inch in diameter for use with light duty platforms or one-half inch in diameter for use with medium or heavy duty platforms. Wire rope shall be rigged to blocks of proper size or to other approved devices. For other provisions concerning wire rope, see section 27-1055 of article ten of this subchapter.

*As enacted but "mullions" probably intended.

TABLE 19-9 MINIMUM SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE LIGHT DUTY SCAFFOLDS

Uniformly Distributed Load			Not to exceed 25 psf		
Max. height of scaffold.....	20'	40'	60'	Top 60'	75' Lower Sect.
Poles or uprights (min.).....	2" x 4"	3" x 4" or 2" x 6"	4" x 4"	4" x 4"	4" x 6"
Pole foundation (min.).....			2" x 9"		
Max. pole spacing (longitudinal):					
With 1 1/4" x 9" ledgers.....			6' - 0"		
With 2" x 9" ledgers.....			10' - 0"		
Max. pole spacing (transverse)....			10' - 0" ^a		
Ledgers (minimum).....		1 1/4" x 9" (on edge) or 2" x 9"			
Vertical spacing of ledgers (max.)		7' - 0"			
Bearers (minimum).....		1 1/4" x 9" (on edge)			
Non-supporting stringers.....		1" x 4"			
Bracing.....		1" x 4"			
Planking:					
Not more than 6' span.....		1 1/4" x 9"			
Up to 10' span.....		2" x 9"			
Toeboards.....		1" x 6"			
Guard rails.....		2" x 4"			

Note for Table 19-9:

^a Total base dimension in both directions to be at least 25 per cent of height.

§[C26-1907.5] 27-1046 Two-point suspension scaffolds.-

(a) **Width and support.**-Two-point suspension platforms shall be at least twenty inches but not more than thirty inches in width. Each end of the platform shall be supported by an approved stirrup or hanger, and the platform shall be securely fastened thereto. Not more than two hangers or stirrups shall be used to support one scaffold.

(b) **Hangers.**-Hangers or stirrups shall be of steel or wrought iron. Each such hanger shall be formed to properly fit the platform, and shall be provided with a loop or eye at the top for securing the supporting hook on the block, and with loops or equivalent means to support the top rail and midrail. The hanger or stirrup shall be placed at least six inches but not more than eighteen inches from the end of the platform.

(c) **Roof irons.**-Roof irons or hooks shall be of steel or wrought iron not less than seven-eighths of an inch in diameter or other size of equivalent strength and shall be securely anchored. Where the upper block hook does not directly engage the roof iron, the connection shall be made with wire rope of required strength but in no case shall the wire rope be less than one-half inch in diameter.

(d) **Fibre rope.-**

(1) The use of fibre rope shall be limited to light duty two-point suspension scaffolds. Fibre rope shall be at least equivalent in strength and suitability to three-quarter inch first quality unspliced manila rope.

(2) Fibre rope shall not be permitted for or near any work involving the use of corrosive substances or where the upper block is more than one hundred feet

above the platform.

(3) All blocks shall fit the size of rope they carry, and shall be so constructed as not to chafe the rope.

(e) Use.-

(1) Needle beam scaffolds shall not be used over areas used by the public.

(2) Two or more two-point suspension scaffolds shall not be combined into one by bridging the distance between them or by any form of connection.

(3) Not more than two workers shall be permitted to work on one scaffold at one time.

(4) Every two-point suspension scaffold shall be equipped with an approved device to raise, lower, and hold the scaffold in position.

(f) Platforms.-The platforms of every two-point suspension scaffold shall be one of the following types, or an approved equivalent.

(1) **LADDER TYPE PLATFORM.-**consisting of boards upon a horizontal ladder, the sides of which are parallel. The ladder shall be capable of sustaining, without failure in any part, at least four times the maximum load allowed to be placed thereon, and rungs shall be at least one and one-eighth inches in diameter with seven-eighths inch tenons mortised into the side stringers at least seven-eighths of an inch and spaced at not more than eighteen inches. Stringers shall be tied together with metal rods at least one-quarter inch in diameter located not more than five feet apart and which pass through the stringers and are riveted up tight against washers at both ends. The platform shall consist of at least one-half inch by three inch planks, shall fill the space between the sides of the hangers, and shall be securely fastened to the hangers by U-bolts passing around the hangers and bolted up tight on the inside face of the stringers.

(2) **PLANK TYPE PLATFORM.-**consisting of planks supported on stirrups or hangers. The planks shall have a uniform thickness of at least two inches and a width of at least nine inches. The planks shall extend at least six inches but not more than eighteen inches beyond the supporting hangers, and a bar shall be nailed across the platform on the underside at each end to prevent the platform from slipping off the hanger. Where two or more planks are used, they shall be fastened together by cleats not less than one inch by six inches nailed on the underside at intervals of four feet or less. Planks shall not be spliced.

(3) **BEAM TYPE PLATFORM.-**consisting of longitudinal side stringers with cross beams on which longitudinal platform planks are laid. Beam platforms shall have side stringers not less than two inches by eight inches. The stringers shall be supported on the hangers, located to fill the full width of the hangers, and the clear span between hangers shall not exceed twenty-four feet. The ends of the stringers shall extend at least six inches but not more than eighteen inches beyond the

hangers, and shall be fastened to the hangers by U-bolts passing around the hangers and bolted up tight on the inside face of the stringers. The platform shall be supported on two inch by six inch cross beams, on edge, set between the side stringers, securely nailed thereto, and spaced not more than four feet on centers. The platform boards shall consist of material not less than one inch by six inches, nailed tight together, and extended to the outside face of the stringers. The ends of all platform boards shall rest on the cross beams and shall be nailed securely thereto.

(g) Guard rail and toeboard.-The outside edge of the platform, and the open ends (when stirrups do not afford adequate protection) shall be provided with a two-rail guard rail and a toeboard securely fastened at intervals not exceeding ten feet. Where there is a space between the scaffold and the structure greater than six inches, a similar guard rail shall be provided at the inside of the platform.

§[C26-1907.6] 27-1047 Multiple-point suspension scaffolds.-

(a) General.-

(1) All multiple-point suspension scaffolds shall be supported by wire ropes. The use of fibre ropes is not permitted.

(2) Provision shall be made to prevent supports from slipping off the ends of outrigger beams.

(3) Outrigger beams and platform bearers shall be of metal.

(b) Outrigger beams.-

(1) The overhang of outrigger beams shall not exceed that specified by the design, and the inboard length of beam shall be at least one and one-half times the outboard length.

(2) Outrigger beams shall be anchored and braced at both fulcrum point and inboard end to resist all vertical, horizontal, and torsional forces.

(3) Supporting points for outrigger beams shall be level, smooth, and of sufficient area (at least six inches by six inches) to provide a firm seat.

(4) The wire rope suspenders shall be securely fastened to the outrigger beams by steel shackles or equivalent means. The shackles and outrigger beams shall be so located that the ropes will hang vertically.

(5) Outrigger beams shall be of the sizes required for the design, but shall be at least equivalent in strength to a standard 7 I 15.3 [sic] steel I-beam, and shall be spaced not more than ten feet center-to-center.

(c) Hoisting machines.-

(1) Suspended scaffolds shall be provided with an approved hoisting machine of either the platform or overhead type.

(2) At least four turns of rope shall at all times remain on the hoisting drum, and the end of the rope shall be properly secured to the drum.

(3) The hoisting rope shall be inspected regularly,

maintained, and lubricated.

(d) Platform.-

- (1) Platform widths shall be limited to eight feet.
- (2) Platform planking shall be laid tight and securely fastened to the bearers, shall overlap the supporting bearers at each end of the scaffold at least six inches but

not more than eighteen inches, and shall not be supported across more than two bearers.

- (3) Platform bearers shall be at least the equivalent of a pair of two and one-half inch by two and one-half inch by one-quarter inch standard angles.

TABLE 19-10 MINIMUM SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE MEDIUM DUTY SCAFFOLDS

Uniformly Distributed Load			Not to exceed 50 psf		
Max. height of scaffold.....	20'	40'	60'	Top 60'	75' Lower Sect.
Poles or uprights (min.).....	3" x 4" or 2" x 6"	4" x 4"	4" x 6"	4" x 6"	6" x 6"
Pole foundation (min.).....			2" x 9"		
Max. pole spacing (longitudinal)...			8' - 0"		
Max. pole spacing (transverse)....			10' - 0" ^a		
Ledgers (minimum).....			2" x 9" (on edge)		
Vertical spacing of ledgers (max.)			6' - 0"		
Bearers (minimum).....			2" x 9" (on edge)		
Non-supporting stringers.....			1 1/4" x 4" or 1" x 6"		
Bracing.....			1" x 6"		
Planking:					
Not more than 6' span.....			1 1/4" x 9"		
More than 6' span.....			2" x 9"		
Toeboards.....			2" x 9"		
Guard rails.....			2" x 4"		

Note for Table 19-10:

^a Total base dimension in both directions to be at least 25 per cent of height.

TABLE 19-11 MINIMUM SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE HEAVY DUTY SCAFFOLDS

Uniformly Distributed Load			Not to exceed 75 psf		
Max. height of scaffold.....	20'	40'	60'	Top 60'	75' Lower Sect.
Poles or uprights (min.).....	4" x 4"	4" x 4"	4" x 6"	4" x 6"	6" x 6"
Pole foundation (min.).....			2" x 9"		
Max. pole spacing (longitudinal)...			6' - 0" ^a		
Max. pole spacing (transverse)....			10' - 0" ^a		
Ledgers (minimum).....			2" x 9" (on edge)		
Vertical spacing of ledgers (max.)			5' - 0"		
Bearers (minimum).....			2" x 9" (on edge)		
Non-supporting stringers.....			1 1/4" x 9"		
Bracing.....			1" x 6"		
Planking.....			2" x 9"		
Toeboards.....			2" x 9"		
Guard rails.....			2" x 4"		

Note for Table 19-11:

^a Total base dimension in both directions to be at least 25 per cent of height.

- (e) Guard rail and toeboard.**-The outside edge of the platform and open ends shall be provided with a

standard guard rail and toeboard (section 27-1050 of this article) except that spacing of the vertical supports may be increased to not more than ten feet. Where there is a space between the scaffold and the structure in excess of six inches, a similar guard rail shall be provided at the inside edge of the platform.

(f) Erection and removal.-

(1) Multiple-point suspension scaffolds shall be installed, relocated, and raised or lowered under the supervision of a designated superintendent or foreman who shall enforce such measures as may be required for the safe execution of such operations.

(2) During raising or lowering, the levels of the various sections of the scaffolds shall be kept uniform and the differential height between sections minimized.

§[C26-1907.7] 27-1048 Manually-propelled free standing scaffolds. - All manually propelled free standing scaffolds shall meet the following requirements and shall be approved:

(1) Work platforms shall be tightly planked for the full width of the scaffold except for necessary entrance openings. Planks shall be secured in place.

(2) Platforms shall have a guard railing.

(3) Where a ladder is used to approach a platform, the ladder shall be secured to the scaffold.

(4) Handholds shall be provided for safe passage from the ladder to the platform.

(5) Unless temporarily braced to adjacent structure, the ratio of the platform height to the least base dimension shall be such as to assure stability, but in no case shall such height be more than four times the least base dimension.

(6) Provision shall be made to prevent the scaffold from falling during movement from one location to another.

(7) While the scaffold is in use by any person, it shall rest upon a stable footing and shall stand plumb. The casters or wheels shall be locked in position.

(8) While the scaffold is being moved, no person shall be suffered or permitted to ride, and all tools, equipment, and material shall be removed.

§[C26-1907.8] 27-1049 Power operated free standing scaffolds.-Records of the inspection, servicing, and maintenance of all power operated free standing scaffolds shall be kept by the user. These records are to be submitted on forms furnished by the commissioner and are to be made available whenever called for by the commissioner. All power operated scaffolds whether free standing or suspended shall meet the applicable requirements of subchapter eighteen of this chapter.

§[C26-1907.9] 27-1050 Standard guard rail and

toeboard.-

(a) Standard guard rail.-

(1) GENERAL REQUIREMENTS.-A standard guard rail shall consist of a two inch by four inch wood top rail (S4S) not less than three feet nor more than three feet six inches above the platform and a one inch by four inch wood intermediate rail (S4S) midway between the top rail and the floor or toeboard, both supported by two inch by four inch wood posts (S4S) spaced not more than eight feet apart.

(2) ALTERNATE METAL RAILING.-In lieu of wood construction, posts and rails may be constructed of at least one and one-quarter inch diameter standard pipe or of at least two inch by two inch by one-quarter inch angles. Spacing of rails and posts shall be as required in paragraph one of this subdivision.

(3) REMOVABLE SECTIONS OF RAILING.-To provide necessary openings for intermittent operations, one or more sections of a required railing may be hinged or supported in sockets. When supported in sockets, rails shall be so constructed that they cannot be jolted out. A button or hook may be used to hold the rail in fixed position. Substantial chains or ropes may be used to guard such openings in standard railings. Where so used, the chains or ropes shall be taut at the same height as the rails of the standard railing.

(b) Standard toeboard.-A standard toeboard shall be at least five and one-half inches high and constructed of metal, wood, or other substantial material. It shall be installed, where required, along the edge of any floor, opening, platform, ramp, or runway. Such toeboard shall be securely fastened to the posts and so installed that no open space exists between the floor and the toeboard.

ARTICLE 9 STRUCTURAL RAMPS, RUNWAYS, AND PLATFORMS

§[C26-1908.1] 27-1051 Ramps and runways (including elevated walkways).-

(a) Construction.-All runways and ramps shall be constructed, braced and supported to resist lateral displacement and all vertical loads, including impact.

(b) For motor vehicle use.-Runways and ramps for the use of motor vehicles may consist of an earthfill or may be structurally supported. They shall have a clear width of not less than twelve feet with timber curbs at least eight inches by eight inches placed parallel to, and secured to, the sides of the runway or ramp. The flooring of structurally supported ramps shall consist of no smaller than three inch planking full size, undressed, or equivalent material, with spans designed for the loads to be imposed.

(c) For use of workers only.-Runways and ramps for the use of workers shall be at least one foot six inches in clear width. Where used for wheelbarrows, hand-

carts, or hand-trucks, runways and ramps shall be at least three feet in clear width. Flooring shall consist of at least two inch planking spanning as permitted by table 19-5, laid close, butt-joined, and securely fastened.

(d) Slope limitations.-Ramps shall have a slope not steeper than one in four. If the slope is steeper than one in eight, the ramp shall be provided with cleats spaced not more than fourteen inches apart and securely fastened to the planking to afford a foothold. Spaces in the cleats may be provided for the passage of the wheels of vehicles. The total rise of a continuous ramp used by workers carrying material or using wheelbarrows, hand-carts, or hand-trucks shall not exceed twelve feet unless broken by horizontal landings at least four feet in length.

(e) Guard rail required.-

(1) All runways and ramps located more than five feet above the ground or floor shall be provided with a standard guard rail and toeboard (section 27-1050 of article eight of this subchapter) on open sides.

(2) Where it is possible for the public to pass under, or next to, runways or ramps, the space between the top rail and the toeboard shall be enclosed with a wire screen composed of not less than no. 18 steel wire gage with a maximum one-half inch mesh.

§[C26-1908.2] 27-1052 Platforms.-

(a) Planking. -Platforms used as working areas, or for the unloading of wheelbarrows, hand-trucks, or carts shall have a floor consisting of at least two inch planking spanning as permitted by table 19-5. Platforms for the use of motor trucks shall have a floor of at least three inch planking, full size, undressed or equivalent materials with spans designed for the loads to be imposed. Planking shall be laid close and shall be butt-joined and securely fastened.

(b) Guard rail required.-

(1) Every platform more than five feet above the ground or above a floor shall be provided with a standard guard rail and toeboard (section 27-1050 of article eight of this subchapter), except that the side of the platform used for the loading or unloading of vehicles may be protected by a timber curb at least eight inches by eight inches for motor trucks or four inches by four inches for wheelbarrows and hand-trucks in lieu of the standard guard rail and toeboard.

(2) Where it is possible for the public to pass under, or next to, platforms, the space between the top rail and the toeboard shall be enclosed with a wire screen composed of not less than no. 18 steel wire gage with a maximum one-half inch mesh.

§[C26-1908.3] 27-1053 Special requirements where power buggies are used.-Runways, ramps, platforms, and other surfaces upon which power buggies are operated shall meet the following minimum requirements:

(1) They shall be designed.

(2) They shall be able to sustain, without failure, at least four times the maximum live load for which they are intended.

(3) The minimum width, inside of curbs, for any ramp, runway, or platform shall be two feet wider than the outside width of any power buggy operated thereon without passing, and three feet wider than twice such buggy width in the places where passing occurs.

(4) All runways shall be essentially level transversely.

(5) Curbs shall be furnished along all buggy traffic paths that are nearer than ten feet horizontally to any unenclosed area, shaft, or other open space into which or through which, a fall of more than twelve inches from such surface is possible, except as set forth in subdivision seven of this section.

(6) Where curbs are not required because the buggy is operated on a surface not over twelve inches above another surface, the lower surface shall be strong enough to sustain the loaded vehicle in the event of a fall thereon.

(7) Curbs may be omitted at actual dumping points more than twelve inches above other surfaces if the edge over which dumping occurs is provided with bumpers or other means that will effectively stop the buggy from running over the edge while dumping.

(8) Curbs must be at least seven inches high, securely fastened, and capable of resisting side impact, and shall be equivalent to at least two inch by eight inch plank set on edge against uprights securely fastened and braced at not more than four foot intervals.

ARTICLE 10 MATERIAL HANDLING AND HOISTING EQUIPMENT

§[C26-1909.1] 27-1054 General requirements.-

Material handling and hoisting equipment shall be installed, operated, and maintained to eliminate hazard to the public or to property. It shall be unlawful to operate any such equipment which is not provided with a positive means for preventing the unauthorized operation of such machine. The means whereby such machines may be made inoperative shall be determined by the commissioner.

(a) Operation.-Only operators designated by the person causing such machinery to be used shall operate hoisting or material handling machinery. Operators and signalmen shall be experienced at the operation they perform. Riggers and hoisting machine operators shall be licensed as required under chapter one of title twenty-six of the administrative code. The operator shall be responsible for making the machine inoperative before he or she leaves the machine.

(b) Loading.-Material handling and hoisting equipment shall not be loaded in excess of the rated load specified

by the manufacturer, except for power operated cranes and derricks where the provisions of section 27-1057 of this article are controlling. Except for power operated cranes and derricks if such data are not available, the safe loads and, where applicable, charts of reach vs. capacity, shall be established by an engineer or architect. All loads shall be properly trimmed to prevent the dislodgement of any part during raising, lowering, swinging or transit. Suspended loads shall be securely slung and properly balanced before they are set in motion. Rated load capacities and required charts shall be conspicuously posted on all material handling and hoisting machinery or on the job site and shall be available to the commissioner at all times.

(c) **Refueling.**-Open lights, flames, or spark-producing devices shall be kept at a safe distance while refueling an internal combustion engine, and no person shall smoke or carry lighted smoking material in the immediate vicinity of the refueling area. The engine shall be stopped during refueling. Fuel shall be kept in containers that meet the requirements of the fire department. "No smoking" signs shall be conspicuously posted in all fueling or fuel storage areas.

§[C26-1909.2] 27-1055 Rigging, rope, chains, and their appurtenances and fittings.-

(a) **Hoisting line.**-Only wire rope shall be used with power driven hoisting machinery, except that either wire or fibre rope may be used on winchheads or capstan hoists.

(b) **Wire rope or cable.**-

(1) All hoisting cable shall be at least one-half inch diameter plow steel grade.

(2) Wire cable shall not be used under the following conditions:

a. When it is knotted or kinked.

b. When more than ten percent of the total wires are broken in any lay, a lay being that distance measured along the cable in which one strand makes a complete revolution around the cable axis.

c. When the wires on the crown of the strands are worn down or rusted to less than sixty percent of their original cross-sectional area.

d. When any combination of broken wires, rust, or abrasion has reduced the strength of the cable to eighty percent or less of its original strength.

(3) At least four turns of the cable shall remain on the hoist drum at all times.

(4) Wire cable fastenings shall conform to the provisions of article eleven of subchapter ten of this chapter, and shall consist of zinc-filled sockets, wedge sockets with at least one cable clip above the socket, thimble and splice connections, or thimble and cable slips*.

(5) Where cable clips are used, the minimum number shall conform to the following:

**As enacted but "clips" probably intended.*

Diameter of wire rope	No. of clips
Up to and incl. 3/4 in.....	3
From 3/4 in. up to and incl. 1 in.....	4
From 1 in. up to and incl. 1 1/4 in.....	5
From 1 1/4 in. up to and incl. 2 1/2 in..	6

(6) Clip spacing shall be at least six times the diameter of the cable, and the "U" part of the clip shall be placed over the short end of the cable. After the rope is in service and while it is under tension, the nuts on the clips shall be retightened.

(7) Cables and blocks used to change the direction of cables shall not be located in any area used by the public.

(c) **Fibre rope.**-

(1) Fibre rope shall be equal in strength, durability and quality to long fibered manila hemp rope, and shall be used and maintained in accordance with the recommendations of the manufacturer.

(2) Before rope is used it shall be carefully inspected for abrasions and severe wear. Rope that has been exposed to acid shall be destroyed and not used.

(3) Frozen rope shall be thawed out and inspected before being used.

(4) Rope shall not be made fast to sharp objects or surfaces, and sharp bends shall be avoided.

(5) Rope shall be stored in a dry place and protected.

(d) **Sheaves.**-

(1) Load-bearing sheaves shall be of diameter and grooving as recommended by the manufacturer to accommodate the particular rope under the proposed conditions of use.

(2) Sheaves and blocks that are worn, chipped, or otherwise damaged shall not be used.

(3) Sheaves and blocks intended for use with fibre rope shall not be used for wire rope.

(e) **Fittings.**-

(1) All wire rope fittings, including sockets, thimbles, clips, blocks, shackles, etc. shall be of the standard size, diameter, and grooving to fit the size of and to develop the breaking load capacity of the rope on which they are to be installed.

(2) Hooks, shackles, or other fittings deformed due to wear, over-stress, or other cause shall not be used.

(3) Safety hooks or open type hooks with wire mousings shall be used where loads may be accidentally unhooked.

(f) **Chains.**-

(1) Chains having deformed links or links that are stretched from their original length shall not be used. Defective links or portions of the chain shall be replaced only by links or sections furnished by the manufacturer for the particular chain involved, unless a substitute link can be shown to be equivalent in strength and suitability. All repairs to chains shall be made by an experienced blacksmith or chainwright, except that alloy steel chains shall be repaired only by the

manufacturer of such chains.

(2) When in constant use, steel chains should be normalized and wrought iron chains should be annealed at intervals not to exceed six months. The annealing or normalizing shall be done by the manufacturer or in strict accordance with such manufacturers specifications.

(3) Chains shall not be used as slings in hoisting operations. Chains shall not be knotted, nor shall they be shortened or spliced, by the use of nails or bolts.

(g) Slings.-

(1) Blocks or heavy padding shall be used at corners of the load to protect the sling from sharp bending.

(2) When lifting a load with multiple slings, the slings shall be so arranged as to equalize the load between the slings.

(3) The ends of slings made of wire or fibre shall be properly spliced to form the eyes. Eyes for wire rope shall be formed using thimbles.

(4) Wire rope slings shall be frequently inspected and lubricated.

(h) Accidents. - The owner or person directly in charge of any rigging equipment shall immediately notify the commissioner following any accident involving such equipment. When an accident involves the failure or destruction of any part of the rigging equipment, no person shall use or operate such equipment or any part thereof or remove such equipment or any part thereof from the immediate area of the job site without the permission of the commissioner.

* Local Law 15-1993.

§[C26-1909.3] 27-1056 Material platform hoists and bucket hoists.-As used in this section, a material platform or bucket hoist means a power or manually operated suspended platform or bucket contained by guide rails and used for raising or lowering material exclusively, and controlled from a point outside the conveyance.

(a) Construction of material hoist towers.-

(1) Where the design of material hoist towers utilizes standard manufactured elements the loading shall not exceed the rated values established by the manufacturer. If specifically designed for the given installation, the design shall be prepared by an engineer or architect, and the construction shall conform to that design. For all material hoist towers more than six stories high, whether of manufactured units or specifically designed for the site, plans showing the design, including the guying, bracing, and foundations shall be submitted to the commissioner for approval prior to construction. Approval of such plans is subject to the provisions established in article nine of subchapter one of this chapter for approval of plans for new construction.

(2) Standard guard rails and toeboards shall be placed on the open sides of runways connecting the tower to the structure.

(3) The provisions of subdivision (f) of section 27-1042 of article eight of this subchapter relating to fire retardant construction of scaffolds shall apply to the construction of hoist towers.

(4) An enclosure shall be installed around the hoistway below the lowest landing to prevent unauthorized access to the space under any hoist.

(5) Exterior hoist towers may be used with or without an enclosure on all sides. When a hoist tower is enclosed, except for entrance and exit openings, it shall be enclosed on all sides for the entire height, with a screen enclosure with one-half inch mesh, No. 18 U.S. gage [sic] wires. When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed on all four sides for the full height between the floor and the overhead protective covering with one-half inch mesh of No. 14 U.S. gage [sic] wire or the equivalent. The hoist platform enclosure shall include the required gates for loading and unloading.

(b) Hoist cars.-Platforms for material hoist cars shall have sufficient strength to support five times the rated capacity, and the wire rope supporting material hoist cars or bucket hoists shall be capable of supporting eight times the rated capacity. The rated capacity shall be conspicuously posted and maintained on the cross head or side members. On the top of every material hoist cage there shall be an overhead protective cover of two inch planking, three-quarters inch plywood or other material of equivalent strength.

(c) Hoist machinery.-

(1) The car and counterweight, if provided, shall be equipped with safety devices capable of stopping and sustaining the counterweight and/or sustaining the car with its capacity load in the event of breakage of the hoisting or counterweight ropes.

(2) A sign or plate giving the maximum load capacity shall be posted in a conspicuous place near every hoist engine.

§[C26-1909.4] 27-1057 Testing inspection, approval and use of power operated cranes, derricks and cableways.-No owner or other person shall authorize or permit the operation of any power operated crane or derrick without a certificate of approval, a certificate of operation and a certificate of on-site inspection. No owner or other person shall authorize or permit the operation of any cableway without a certificate of on-site inspection.

(a) Exceptions.-

(1) The requirements of this section shall not apply to excavating or earth-moving equipment, except cranes used with clamshells.

(2) The requirements of this section shall not apply to cranes or derricks performing an emergency use pursuant to the lawful order of the head of any department.

(3) The requirements of this section shall not apply to truck cranes with telescopic, hydraulic or folding booms, including jibs and any other extensions to the boom, not exceeding one hundred thirty-five feet in length with a manufacturer's rated capacity of three tons or less, except that a certificate of operation, as provided for in this section and in reference standard RS 19-2 shall be required for such cranes with jibs and any other extensions to the boom exceeding fifty feet in length. The above requirement for a certificate of operation shall not apply to a crane used exclusively as a man basket.

(4) The requirements of this section shall not apply to a mobile crane with a boom, including jibs and any other extensions to the boom, not exceeding fifty feet in length with a rated capacity of three tons or less. The commissioner may, by rule and regulation, exempt other mobile cranes of limited size and capacity from any or all of the requirements of this section.

(5) The requirements of this section shall not apply to hoisting machines permanently mounted on the bed of material delivery trucks which are used exclusively for loading and unloading such trucks, provided that the length of boom does not exceed the length of the truck bed by more than five feet and that any material transported thereon shall not be raised more than two feet in the unloading process. Operators of such equipment shall be exempt from licensing requirements prescribed in section 26-166 of title twenty-six of the administrative code.

(b) Certificate of approval.-

(1) The owner of such crane or derrick shall file an application for a certificate of approval on a form prescribed by the department, together with such information as set forth in reference standard RS 19-2 and shall contain the various boom lengths and applicable load ratings for which approval is requested.

(2) Upon the approval by the department of information submitted pursuant to reference standard RS 19-2 and an inspection of the equipment, the department shall issue a certificate of approval for the equipment. Said equipment may be used with pile driving leads, mounted compressors, boilers, magnets, hammers, pile hammers, extractors, jetting equipment, augers, drills, vibrating hammers, mandrels, hoe rams and other similar attachments. A new certificate of approval shall be required when a crane is modified or altered to increase the boom length, jibs or any extensions to the boom beyond the maximum approval length or when the load ratings are increased.

(c) Certificate of operation.-

(1) Upon issuance of a certificate of approval, the department shall also issue the initial certificate of operation which shall expire one year from the date of issuance. The owner of such crane or derrick shall renew the certificate of operation each year.

(2) The commissioner shall approve the crane or

derrick if he or she is satisfied after inspections and tests that said crane or derrick is in a safe operating condition.

(3) If the owner applies for renewal of a certificate of operation within not more than sixty or less than thirty days prior to the date of expiration of his or her certificate, such owner may continue to use his or her crane or derrick until the department grants or denies him or her a new certificate.

(4) No change in such crane or derrick not provided for in the certificate of operation may be made until the owner obtains a new certificate of operation.

(d) Certificate of on-site inspection.-

(1) The owner of the premises, building or structure, or his or her designated representative, shall obtain a certificate of on-site inspection for the use of any power operated crane, derrick or cableway used for construction purposes at each job site. Such owner or his or her designated representative shall file an application for a certificate of on-site inspection on a form prescribed by the department, and the fee for such application shall be as provided in section 26-215 of title twenty-six of the administrative code. The applicant shall specify the date when the equipment will be at the job site for use, which date shall be not less than three regular working days from the date of filing said application. Such application shall include the information as set forth in the applicable provisions of reference standards RS 19-2 and RS 19-3.

(2) Upon approval of the application, a copy of said approval shall be given to the applicant. It shall have noted thereon that the equipment shall not be operated prior to the date indicated, which date shall be not less than three regular working days from the filing of the application unless otherwise provided in the applicable provisions of reference standard RS 19-2. It shall be unlawful to operate the aforesaid equipment before the specified date, unless it has been inspected and found to be satisfactory by the department. If the equipment has not been inspected by the department on or before the said date, then the equipment may be operated, pending inspection, provided that the conditions and statements contained in the approved application are complied with. Upon inspection by the department and a finding of satisfactory compliance, the approval shall be deemed to be a certificate of on-site inspection.

(3) The certificate of on-site inspection is only valid if the conditions and statements contained in the approved application are complied with and the hoisting machine is operated in conformance with the provisions of this section and the rules and regulations applicable thereto.

(4) No certificate of on-site inspection shall be required where any article is hoisted or lowered on the outside of any completed building, or for the installation of boilers and tanks, or for the erection, maintenance or removal of signs or sign structures, under the supervision of a

master or special rigger or a master or special sign hanger in conformance with the provisions of chapter one of title twenty-six of the administrative code.

(e) The commissioner shall inquire into the cause of any accident involving hoisting machinery.-The owner or person directly in charge of any hoisting machinery shall immediately notify the administrator and the commissioner following any accident involving hoisting machinery. When an accident involves the failure or destruction of any part of a hoisting machine, no person shall do either of the following, without the permission of the commissioner:

- (1) use such hoisting machine, or
- (2) remove the hoisting machine or any part thereof from the area of the job site.

(f) Any person who wilfully violates any provision of this section shall be guilty of an offense and shall be subject to a fine not exceeding one thousand dollars.

(g) The commissioner may issue temporary certificates of approval, operation and on-site inspection for any power operated crane during the pendency of an application for certificates of approval and operation upon inspection and upon such analysis and testing as the commissioner may deem necessary. The commissioner may revoke such temporary certificates if the application is denied.

(h) Special requirements for cranes and derricks.-The construction, installation, inspection, maintenance and use of power operated cranes and derricks shall be in conformance with reference standard RS 19-2.

(i) Special requirements for cableways.-The construction, installation, inspection, maintenance and use of cableways shall be in conformance with reference standards RS 18-5 and RS 19-3.

§[C26-1909.5] 27-1058 Conveyors and cableways.-

(a) Walkways.-Walkways along belt conveyors or bucket conveyors shall be kept free of materials and, where five feet or more above the ground, shall be provided with a standard guard rail and toeboard along the outside of the walkway. The guard rail and toeboard may be omitted on the side toward the belt if the walkway is located adjacent to the conveyor.

(b) Trippers.-Where trippers are used to control discharge, a device for throwing the belt or bucket drive into neutral shall be installed at each end of the runway.

(c) Spillage.-Where conveyor belts cross any traveled way, trays shall be installed to catch spillage and overhead protection shall be provided for persons or traffic passing beneath.

§[C26-1909.6] 27-1059 Trucks.-

(a) Maintenance.-All parts and accessories of trucks shall be kept in repair. Brakes shall be so maintained that the vehicle with full load may be held on any grade that may be encountered on the job. Provision shall be made for the immediate application of wheel blocks to trucks traversing ramps steeper than one in ten.

(b) Loading.-Trucks shall not be loaded beyond the

manufacturer's rated capacity, nor beyond the legal load limit, where applicable. The loads shall be trimmed before the truck is set in motion to prevent spillage. Loads that project beyond the sides of the truck, or that may be dislodged in transit, shall be removed or securely lashed in place.

§[C26-1909.7] 27-1060 Power buggies.-As used in this section, the term "power buggy" shall mean an automotive vehicle designed or used for the transportation of materials on or about construction sites. It shall not include automobiles, motor trucks, general purpose tractors, or excavating or material handling machinery.

(a) Responsibility of employers and workers.-

(1) Every person causing a power buggy to be used shall provide trained and competent operators and shall carry out or enforce all provisions of this section pertaining to the use, operation, and maintenance thereof.

(2) No person other than the operator assigned by the employer shall operate a power buggy. A power buggy shall be in charge and custody of the operator assigned, and no other person shall in any way interfere with or handle it, nor shall the operator cause or permit any other person to do so.

(3) No power buggy shall be operated unless it is in good operating condition and is so constructed that it is stable under conditions of normal use.

(b) Operation and Construction.-

(1) **BRAKES.**-Every power buggy shall be provided with brakes and tire surfaces capable of bringing it to a full stop within twenty-five feet on a level surface that is similar to the one on which it will be used and at full rated load and maximum design speed. Brakes shall be capable of being fixed in engagement to hold the full load stationary on a twenty-five percent grade.

(2) **ACCIDENTAL STARTING.**-All movement controls of every power buggy shall be so arranged or shielded that they cannot be inadvertently engaged or the buggy accidentally set in motion.

(3) **PARKING ON GRADES.**-No power buggy shall be left unattended on any grade sufficiently steep to cause it to coast if free of engine and brake resistance.

(4) **USE ON RAMPS, RUNWAYS AND PLATFORMS.**-Power buggies shall not be used on ramps, runways, or platforms that do not meet the requirements of section 27-1053 of article nine of this subchapter.

§[C26-1909.8] 27-1061 Lift and fork trucks.-

(a) Load capacity.-A metal plate with readily legible etched or stamped figures giving the capacity rating in pounds shall be attached to every lift or fork truck.

(b) Maintenance.-All parts and accessories of lift or fork trucks shall be kept in repair and with brakes adequate to maintain the fully loaded vehicle on any grade that may be encountered on the job.

(c) Loading.-No lift or fork truck shall be loaded beyond its capacity rating. No hand-operated pallet truck loaded so that any point on the load is at a greater

height than four feet six inches above the floor shall be moved by pushing unless handled by two persons.

(d) **Prohibited use.**-No lift or fork truck shall be in motion when the loaded forks are elevated higher than necessary to clear obstructions, except as may be required for positioning, picking up, or depositing the load.

§[C26-1909.9] **27-1062 Hand propelled vehicles.**-Hand propelled vehicles shall be constructed and braked to withstand the loads to be carried and shall be maintained in repair. Vehicles with loose parts shall not be used.

§[C26-1909.10] **27-1063 Mixing machines.**-Where the public may have access to the working area near charging skips, guard rails shall be erected to enclose the area under the raised skip and the mixing machine. Each time before raising or lowering the charging skip, the operator shall ascertain that no one is in the danger zone.

§[C26-1909.11] **27-1064 Jacks.**-

(a) **Marking.**-The rated capacity of every jack shall be legibly marked in a prominent location on the jack by casting or stamping. The manufacturer shall designate the intended supporting point of the load and the maximum permissible length of lever and force applied.

(b) **Overtravel to be limited.**-Every jack shall, where practicable, be provided with a positive stop to prevent overtravel; otherwise an indicator to clearly show overtravel shall be provided on the jack.

(c) **Maintenance.**-Lubrication and operation of jacks shall be in accordance with the recommendations of the manufacturer.

(d) **Foundations.**-Jacks shall rest on a firm, level foundation adequate to support the load.

(e) **Blocking required.**-When the object has been lifted to the desired height, blocking or cribbing shall be immediately placed under it.

ARTICLE 11 EXPLOSIVE POWERED AND PROJECTILE TOOLS

§[C26-1910.1] **27-1065 General.**-All explosive powered and projectile tools shall be approved.

§[C26-1910.2] **27-1066 Explosive powered tools.**-

(a) The provisions of reference standard RS 19-1 shall apply.

(b) The care and storage of explosives shall meet the requirements of the fire department.

§[C26-1910.3] **27-1067 Projectile tools.**-

(a) **Basic requirements.**-

(1) Unless in a particular case the board shall otherwise determine, design and construction must be such as to retain safely all internal pressures which may occur during operation, the discharge mechanism shall be such that the projectile cannot [*sic*] be discharged by dropping the tool, the discharge mechanism shall be such that the discharge of each projectile shall be

dependent on a separate and distinct act by the operator, and all safety features shall be durable.

(2) A tool shall have such other characteristics as the board may find necessary or proper to provide safety, alternative or in addition to the foregoing. Such other characteristics may include devices and materials external to the tool itself but associated with its function, and may also include in respect to high velocity projectile tools the basic requirements set forth above for explosive powered tools which discharge projectiles with comparable velocities.

(b) **Maintenance.**-Every projectile tool shall be properly maintained. No such tool shall be used if any part thereof necessary to retain internal pressures or to prevent accidental discharge of a projectile is not in sound and operable condition.

(c) **Operation.**-

(1) A projectile [tool]* shall be operated only by an authorized operator who shall be the owner, lessee, or other person having proprietary custody of the tool or any other person whom he or she may authorize to operate it.

(2) While a projectile tool is in the care and custody of an authorized operator, no other person shall handle or in any way molest it.

(3) No authorized operator of a projectile tool shall leave it unattended while it is in a condition to discharge a projectile.

(4) No person shall use a projectile tool for any purpose other than that for which it was manufactured, nor shall such person point it at another person or hold it at an angle permitting the projectile to fly free.

(5) No person shall use a projectile tool in such a way as to endanger persons who may be in the vicinity.

**Copy in brackets not enacted but probably intended.*

ARTICLE 12 EXPLOSIVES AND BLASTING

§[C26-1911.1] **27-1068 General.**-

All handling, transporting, and use of explosives shall meet the requirements of the fire department.

ARTICLE 13 FLAMMABLE AND COMBUSTIBLE MIXTURES, COMPRESSED GASES, AND OTHER HAZARDOUS MATERIALS

§[C26-1912.1] **27-1069 General.**-The transportation, handling, storage, and use of all volatile flammable oils, flammable and combustible mixtures, compressed gases, and other hazardous materials shall meet the requirements of the fire department. Also, see subdivision (b) of section 27-1023 of article two of this subchapter, warning signs and lights.

SUBCHAPTER 6 MEANS OF EGRESS

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ARTICLE 1 GENERAL

§[C26-600.1] 27-354 Scope. -

The provisions of this subchapter shall control the design, construction, protection, location, arrangement and maintenance of required exit facilities to provide safe means of egress from all buildings hereafter erected, altered or changed in occupancy, except that exit requirements for special uses and occupancies, as provided in subchapters seven and eight of this chapter, shall take precedence over the provisions of this subchapter and except further that buildings in existence on December sixth, nineteen hundred sixty-eight shall comply with the applicable requirements of section 27-356 of this article, section 27-371 of article five of this subchapter and articles eight and nine of this subchapter.

§[C26-600.2] 27-355 Definitions. - For definitions to be used in the interpretation of this subchapter, see subchapter two of this chapter.

§[C26-600.3] 27-356 **Inadequate exits for existing structures.** - Every structure existing on December sixth, nineteen hundred sixty-eight which is not provided with exit facilities as prescribed in this code, and in which the exit facilities are, in the opinion of the commissioner, inadequate for the safety of the occupants, shall be provided with such means of egress or fire protection as the commissioner shall direct.

ARTICLE 2 DETERMINATION OF EXIT REQUIREMENTS

§[C26-601.1] 27-357 **Exit requirements.** -

The determination of exit requirements for a building shall be based upon the occupancy group classification of the building, the number of occupants, the floor area, the travel distance to an exit, and the capacity of the exits, as provided in table 6-1 and herein. Every floor of a building shall be provided with exit facilities for its occupant load. The occupant loads of floors shall not be cumulative for the purpose of designing vertical exits, except where one floor is used by another as a means of egress. Vertical exits provided from any floor above grade may serve simultaneously all floors above grade, and vertical exits provided from any floor below grade may serve simultaneously all floors below grade.

(a) **Mixed occupancy.** - When a building is classified in more than one occupancy group in accordance with the provisions of section 27-239 of article two of subchapter three of this chapter, the exit requirements for the entire building shall be determined on the basis of the occupancy group having the strictest exit requirements, or the exit requirements for each building section shall be determined separately.

(b) **Incidental occupancies.** - When a building contains incidental occupancies classified in occupancy groups other than that under which the building is classified, the exit requirements for the floor on which such occupancies occur shall be based upon those of the occupancy group under which the building is classified; but the access and exit requirements for the incidental occupancy shall be based upon the occupancy group classification of the incidental occupancy.

(c) **Multiple occupancy or use.** - Where a building, floor, or space is used for multiple purposes involving different activities at different times, that occupancy involving the greatest number of occupants shall be used in determining the exit requirements.

*****(d) Building access.** - All buildings classified in other than occupancy groups A, mechanical and electrical equipment rooms and boiler and furnace rooms of D-2 or J-3 shall have at least one primary entrance accessible to and usable by individuals who use wheelchairs. Such

entrance shall provide access to a level that makes elevators available in buildings where elevators are provided. Where ramps are used to comply with this requirement, they shall have a slope not greater than one in twelve and shall otherwise conform to the provisions of section 27-377 and reference standard RS 4-6.

The commissioner may waive the requirements of this section in the alteration of buildings existing on the effective date of this code in accordance with section 27.292† of this code.

****Local Law 58-1987.*

†*As enacted but "27-292" probably intended.*

§[C26-601.2] 27-358 **Occupant load.** -

The number of occupants for whom exit facilities shall be provided shall be established either (1) by the actual number of occupants for whom each occupied space, floor, or building, as the case may be, is designed, or (2) by using the appropriate occupant-area ratios from table 6-2, whichever is larger. The occupant load of any space shall include the occupant load of all spaces that discharge through it in order to gain access to an exit.

(a) **Unlisted occupancies.** - Where data regarding the sq. ft. per person for an occupancy is not listed in table 6-2, the occupant load shall be established by an architect or engineer, subject to the approval of the commissioner.

(b) **Modifications.** -

(1) When the actual occupant load of any space will be significantly lower than that listed in table 6-2, the commissioner may establish a lower basis for the determination of the occupant load.

(2). When a building existing on December sixth, nineteen hundred sixty-eight is altered or changed in occupancy or use so as to require enlarged exit facilities, the commissioner may authorize the alteration or change in occupancy or use without an enlargement of exit facilities, provided the occupant load is limited to that accommodated by the existing exit facilities as determined by the provisions of this code, and the building or space is posted accordingly with a sign. Such signs shall be at least twelve inches in width and sixteen inches in height. The lettering shall be red on a white background. The letters shall be not less than one inch high and the numerals not less than one and one-quarter inches high.

(c) **Nonsimultaneous occupancy.** - The occupant load of toilets, locker rooms, meeting rooms, storage rooms, employee cafeterias, and similar rooms or spaces that are not occupied at the same time as other rooms or spaces on the same floor of a building, may be omitted from the occupant load calculation of the floor on which they are located to the extent that such spaces serve occupied rooms on the same floor.

TABLE 6-1 DETERMINATION OF EXIT AND ACCESS REQUIREMENTS

Occupancy Group of Building or Space	Group Designation	Maximum Travel Distance (ft.) ^a		Capacity Number of Persons per Unit of Width				Corridors ⁱ	
		Unsprinklered	Sprinklered	Doors Openings ^m		Stairs, Escalators ^k	Ramps, ^b Corridors, Exit Passages, ^j Horizontal Exits	Min. Width (in.)	Max. Dead End ^h (length in ft.)
				To Outdoors at Grade	All Other Exit and Corridor Doors				
High Hazard	A	N.P.	150	50	40	30	50	36	N.P.
Storage	B-1 ^c	100	150	75	60	45	75	36	50
	B-2 ^c	125	175	75	60	45	75	36	N.R.
Mercantile	C	150	200	100	80	60	100	36	50
Industrial	D-1	125	175	100	80	60	100	44	50
	D-2	150	200	100	80	60	100	44	50
Business	E	200	300	100	80	60	100	44	50
Assembly*	F	150	200	100	80	60	100	44	30
Educational	G	150	200	100	80	60	100	66 ^e	30 ^d
Institutional	H-1	125	175	50	40	30	50	36	40
	H-2	125	175	30	30	15	30	96 ^f	30 ^g
Residential	J-1	150	200	50	40	30	50	36	40
	J-2	150	200	50	40	30	50	36	40
	J-3	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.

N.P. — Not Permitted

N.R. — No Requirements (except as provided in section 27-375)

*See Table 8-1 for exit and access requirements applying to places of assembly.

****Notes:**^a For method of measurement, see subdivision (c) of section 27-360 of this article.^b Reduce listed capacity of ramps by twenty-five percent when slope exceeds one in ten.^c Except for public garages. (See article ten of subchapter seven of this chapter.)^d There shall not be more than one classroom on each side of a corridor between an exit and the end of the corridor (dead end).^e Applies to corridors serving classrooms. Other corridors shall have a minimum width of forty-four inches.^f Applies to corridors serving patients. Other corridors shall have a minimum width of forty-four inches.^g There shall be no patient bedrooms between an exit and the end of the corridor (dead end).^h See subdivision (d) of section 27-369 of article five of this subchapter for permissible increase.ⁱ See section 27-369 of article five of this subchapter.^j See section 27-370 of article five of this subchapter.^k See section 27-378 of article five of this subchapter.^m Where a door opening is divided by mullions into two or more doors openings, each such opening shall be measured separately in computing the number of units of exit width.****There is no note l.****§[C26-601.3] 27-359 Capacity of exits. -**

The capacity of exits and access facilities shall be measured in units of width of twenty-two inches, and the number of persons per unit of width shall be determined by the occupancy group classification and type of exit as listed in table 6-1. Fractions of a unit of width less than twelve inches shall not be credited. Where twelve inches or more are added to one or more full units of width, one-half unit of width may be credited. Where

computations of total required width give fractional results, the next larger integral number of exit units or integral number plus one-half, shall be used. A fraction less than one-half may be neglected in cases where such fraction constitutes less than ten per cent of the total required number of units. Notwithstanding any of the above computations, no exit or access facility shall be narrower than the minimum width requirements specified in table 6-1, or elsewhere in this code.

**TABLE 6-2 OCCUPANT LOAD
REQUIREMENTS NET AREA TABLE**

Occupancy	Net Floor Area per Occupant (sq. ft.)
Billiard rooms.....	50
Bowling alleys.....	50
Classrooms.....	20
Dance floors.....	10
Dining spaces (nonresidential).....	12
Exhibition spaces.....	10
Garages and open parking structures..	250
Gymnasiums.....	15
Habitable rooms.....	140
Industrial shops.....	200
In schools.....	30
Institutional sleeping rooms	
Adults.....	75
Children (except as listed below)...	50
Day Care	
a. under 6 mos.....	50
b. 6 mos. *- 2 yrs.....	40
c. 2 yrs. *- 6 yrs.....	30
Institutional staff, all.....	30
Kindergartens.....	35
Kitchens (nonresidential).....	200
Laboratories.....	50
Preparation rooms.....	100
Libraries.....	25
Locker rooms.....	12
Offices.....	100
Passenger terminals or platforms.....	1.5xC
Sales areas (retail).....	
1 st floor or basement.....	25
All other floors.....	50
Seating areas (audience) in all places of assembly	
Fixed seats.....	D
Moveable seats.....	10
Skating rinks.....	15
Stages (See subchapter eight).....	—
Standing room (audience) in all places of assembly.....	4
Storage rooms.....	200

Notes:

C—capacity of all passenger vehicles that can be unloaded simultaneously.

D—designed number of seats or occupants.

*Dash not enacted but probably intended

§[C26-601.4] 27-360 Travel distance. -**a) General requirement. -**

The maximum travel distance from the most remote point in any room or space to the center of a door opening directly on an open exterior space, a vertical exit, an interior stair, an exit passageway or to a horizontal exit shall not be greater than the limit specified in table 6-1 for the occupancy group classification of the room or space.

(b) Travel distance within dwelling units. -

In buildings classified in occupancy groups J-1 and J-2, the maximum travel distance from the centerline of a door from any habitable room within a dwelling unit either to the centerline of a door opening on a corridor or to the center of a door opening on an exit shall not be greater than forty feet, except that for buildings classified in occupancy group J-2 of construction class I-A, the distance may be increased to fifty feet. Such travel distances shall be included in the maximum travel distance established in subdivision (a) of this section.

(c) Measurement. - Travel distance shall be measured along a natural and unobstructed path of travel. Where the path of travel is over an access stair, it shall be measured along an inclined straight line through the center of the outer edge of each tread.

ARTICLE 3 LOCATION OF EXITS**§[C26-602.1] 27-361 Arrangement. -**

All exits and access facilities shall be located so that they are clearly visible, or their locations clearly indicated, and they shall be kept readily accessible and unobstructed at all times.

§[C26-602.2] 27-362 Tenant spaces. -

When more than one tenant occupies a building or floor area, each tenant shall have direct access to the required number of exits without passing through premises occupied by other tenants, except as permitted for balconies in subdivision (g) of section 27-369 of article five of this subchapter.

§[C26-602.3] 27-363 Remote location. -

When more than one exit is required from a floor of a building, each exit shall be placed as remote from the others as is practicable. Door openings to scissor stairs shall be* at least fifteen feet distant from each other. In all other buildings, the minimum distance between such doors shall be the greater of thirty feet or one-third the maximum travel distance of the floor, provided, however, that where such distance will result in travel distances exceeding those authorized in section 27-357 additional vertical exits shall be provided.

** As enacted but this sentence probably intended to begin "Door openings to vertical exits in buildings in occupancy group G or J-2 shall be"...*

§[C26-602.4] 27-364 Exit discharge. -

All vertical exits shall extend in a continuous enclosure to discharge directly, or by way of a yard, court, or exit passageway, to an open exterior space. When vertical exits serving floors above grade continue in the same enclosure to serve floors below grade, the portion of such vertical exits above grade shall be separated from the portion below grade by construction having at least a one hour fire-resistance rating, with three-quarter hour self-closing doors opening in the direction of exit travel from the floors below grade, except that buildings classified in residential occupancy group J-3 and educational occupancy group G shall be exempt from this requirement.

ARTICLE 4 NUMBER OF EXITS**§[C26-603.1] 27-365 Egress from rooms and spaces. -**

(a) There shall be at least two door openings, remote from each other and leading to exits, from every room or enclosed space in which the total occupant loads exceeds the number of persons listed in table 6-3.

**TABLE 6-3 MAXIMUM OCCUPANT LOAD—
SPACES WITH ONE DOOR
[Max. Occupant Load]****

Occupancy Group Classification	Max. Occupant Load with One Door
A	10
B	50
C	75
D	50
E	75
F	75
G	75
H	15
J	20

****[] As enacted but this heading probably intended to be omitted.**

(b) Except as otherwise provided for in subdivisions (c) and (d) of this section, in buildings of combustible construction group II exceeding two stories in height there shall be at least two door openings from each J-1 or J-2 dwelling unit which shall be remote from each other. Each door opening shall lead to separate exits either directly or by separate corridors or one door opening shall lead to an exit and the other to a balcony complying with subdivision (g) of section 27-369 of article five of this subchapter.

(c) In buildings or spaces classified in occupancy group J-2 not more than three stories and forty feet in height, occupied by not more than four families on each story and of combustible construction group II there shall be at least two door openings from each J-2 dwelling unit which shall be remote from each other. One door opening shall lead to an exit and the other to a balcony complying with subdivision (g) of section 27-369 of article five of this subchapter.

(d) Buildings not exceeding three stories in height and occupied exclusively by not more than one family on each story without boarders, roomers or lodgers are exempt from the provisions of subdivisions (b) and (c) of this section.

§[C26-603.2] 27-366 Exits from floors. -

1. There shall be at least two independent exits, remote from each other, from every floor of a building, except that only one exit may be provided from floors in:

(a) One and two family dwellings.

(b) Buildings classified in occupancy group J-2 of Noncombustible construction group I or occupancy group E that are not more than sixty feet in height, have a gross area of two thousand square feet or less per floor, and have a maximum travel distance of fifty feet on any floor.

(c) Buildings classified in occupancy group J-1 or J-2 that are not more than two stories and thirty feet in height and have a maximum travel distance of eighty feet and the corridors and stair enclosure are provided with automatic sprinkler protection complying with the construction provisions of subchapter seventeen of this chapter.

(d) Buildings classified in occupancy group J-2 occupied exclusively by not more than one family on each story without boarders, roomers or lodgers and not more than three stories and forty feet in height, and the stair enclosure is provided with automatic sprinkler protection complying with the construction provisions of subchapter seventeen of this chapter and without openings between any garage and the exit passageway.

(e) Buildings classified in occupancy group J-2 not more than three stories and forty feet in height occupied by not more than four families on each story.

2. Notwithstanding the exit requirements of this section, in buildings classified in occupancy group J-2 of construction class I-A, one level of an apartment occupying a part of not more than two floors need only be provided with a balcony that complies with subdivision (g) of section 27-369 of article five of this subchapter, provided that, in addition, the stair within such apartment shall be at least two feet six inches in width and terminates not more than twenty feet from a corridor door on the other level that shall provide the required access to at least two independent exits. The center line of such corridor door shall be not more than fifty feet from any room within such apartment.

3. Notwithstanding any other provision of this section, when, within a building, any place of assembly has an occupant load between five hundred and nine hundred ninety-nine persons, there shall be provided at least three independent exits, remote from each other, from each floor; any such place of assembly with an occupant load of one thousand or more persons shall be provided with at least four independent exits, remote from each other, from each floor.

§[C26-603.3] 27-367 Exit reduction. -

When a floor area has access to areas of refuge that comply with the requirements of section 27-372 of article five of this subchapter; the number of persons for whom vertical exits are to be provided may be reduced to fifty per cent of the occupant load of the floor area when one area of refuge is provided, and may be reduced to thirty-three and one-third percent of the floor area when two areas of refuge are provided. This section shall not be applicable to any new or altered place of assembly, except for such places of assembly in fully sprinklered office buildings which occupy less than twenty per cent of the floor area occupied by the principal use.

ARTICLE 5 ACCESS REQUIREMENTS AND EXIT TYPES

§[C26-604.1] 27-368 General. -

(a) Means of egress shall be provided for all buildings by one or more of the facilities listed below. Access and exit facilities not specifically covered in this section shall not be used to satisfy the exit requirements of this code. Fire escapes shall not be permitted on new construction, with the exception of group homes. Fire escapes may be used as exits on buildings existing on December sixth, nineteen hundred sixty-eight when such buildings are altered, subject to the approval of the commissioner, or as provided in subdivision (b) hereof. Elevators or escalators shall be provided in all new buildings exceeding four stories in height except that buildings or building sections classified in occupancy group H-2 exceeding one story in height and buildings or building sections classified in occupancy group G or J-1 exceeding two stories in height shall be provided with elevators.

(b) In group homes all floors used by children shall have alternate exits remotely located from each other and readily accessible to the occupants. Fire escapes shall be permitted as the second means of egress.

§[C26-604.2] 27-369 Corridors.-

Corridors shall be kept readily accessible and unobstructed at all times. Corridors shall be kept free of combustible contents except that in buildings classified in occupancy groups G, H-1 and H-2, combustible contents may be stored in noncombustible lockers and combustible bulletin boards meeting the requirements of table 5-4 shall be permitted.

(a) **Capacity.** - The capacity and minimum width of corridors shall be as listed in table 6-1. Width shall be measured in the clear between the narrowest points produced by any projections such as radiators, lockers, drinking fountains, or room or locker door swings, except that such width may be reduced by projections up to eighteen inches wide to the extent of two inches per unit of

exit width if the total area of such projections does not exceed five percent of the area of the wall on which they occur.

(b) **Height.** - Corridors shall have a clear height of seven feet six inches for at least seventy-five percent of the floor area, with no point less than seven feet in height. No projection below the ceiling shall be located so as to obstruct full view of exit signs.

(c) **Length.** - Corridors shall be subdivided by smoke barriers, as defined in subchapter two, into the following lengths:

Educational occupancy group G.....	300 ft.
Institutional occupancy groups H-1 and H-2.....	150 ft.
Residential occupancy groups J-1 and J-2.....	150 ft.

Where smoke barriers are penetrated by doors, such doors shall be smoke stop doors in conformance with subdivision (c) of section 27-371 of this article.

(d) **Dead ends.** - Dead ends in corridors shall not exceed the length listed in Table 6-1, except that in all occupancy groups except occupancy group H, when a corridor is completely enclosed in construction having a two hour fire-resistance rating, with all corridor doors being self-closing and having a fire protection rating of one and one-half hours, the permissible length of dead ends may be increased one hundred percent above the length listed in table 6-1. Dead end distance shall be measured from the centerline of the door opening nearest to the closed end of the corridor to the center of an exit door opening, or the center of that point in the corridor where travel to two or more exits becomes available in two directions.

(e) **Changes in level.** - Changes in level requiring less than two risers in a corridor shall be by a ramp complying with section 27-377 of this article. Risers and treads shall comply with the requirements of subdivision (e) of section 27-375 of this article.

(f) **Exterior corridors.** - Exterior corridors shall be roofed, and shall have solid floors drained to prevent accumulations of standing water. Such floors may serve as fire canopies when so constructed. Exterior corridors shall be protected along their outer side by guards or parapets at least three feet six inches high. Openings in guards or parapets shall be of such dimensions as to prevent the passage of a five-inch dia. ball. Where the outer side of an exterior corridor is more than fifty percent enclosed with solid material, it shall be treated as an interior corridor.

(g) **Balconies.** - Balconies may serve as a means of egress from dwelling units in buildings classified in occupancy group J-2 under the following conditions:

- (1) They shall serve at least two dwelling units.
- (2) They shall be constructed as required for exterior corridors, except that parapets or guards shall not be higher than four feet on the outer side of the balcony.
- (3) The dwelling units served by balconies shall be

separated from each other by construction having at least a two hour fire-resistance rating. Such separation shall extend at least three feet beyond the outside face of the exterior wall of the building, although such projection may be reduced to two feet six inches provided that any window opening on each such balcony served by the fire separation shall be at least two inches from such fire separation for every one inch that such separation is less than thirty-six inches. An opening at least twenty inches wide shall be provided between the end of this separation and the balcony parapet or guard, and the opening shall be maintained free and unobstructed for the full height of the balcony, except that privacy screens openable from either side may be permitted in the opening.

(4) Access from dwelling units to the balconies shall be through doors having glass panels at least two feet wide and four feet high, without muntins, screens, or other obstructions to hinder entry by breaking the glass panels. The doors shall be lockable only from the inside by devices that can be easily released from the outside after breaking the glass. A combination lock or lock required to be opened by a key or removable device or tool shall not be used.

(h) Construction. -

(1) **INTERIOR CORRIDORS.** - Interior corridors shall be completely enclosed within fire separations to provide a minimum fire-resistance rating of one hour except as otherwise provided in subparagraphs a through c of this paragraph:

a. For buildings or spaces classified in occupancy group J-1 or J-2 of combustible construction group II exceeding two stories in height, except for buildings not exceeding three stories in height and occupied exclusively by not more than one family on each story without boarders, roomers or lodgers, corridors shall be enclosed within fire separations providing a minimum fire-resistance rating of two hours.

b. Corridor partitions may be omitted or may be constructed of unrated noncombustible material in buildings in occupancy group H-2 in the following instances: nurses stations not exceeding three hundred fifty square feet in area, waiting spaces, lounges and recreational spaces for patients and visitors which do not exceed five hundred square feet in area, spaces used solely for public telephones, and all other spaces which are completely protected by an automatic wet sprinkler system complying with the construction requirements of subchapter seventeen of this code.

c. Corridor partitions may be omitted in spaces of occupancy group H-1 used for detention of persons under legal restraint.

(2) **EXTERIOR CORRIDORS AND BALCONIES.** - Exterior corridors and balconies shall be constructed of non-combustible materials.

(i) Borrowed lights. - No operable transoms shall be permitted in walls of corridors. In corridors required to

have a one hour fire-resistance rating, fixed one-quarter inch wire glass panels may be installed in not more than twenty percent of the common wall between the corridor and any room or space, provided that no panel exceeds seven hundred twenty square inches in area; however, openings permitted in paragraph three of subdivision (h) of section 27-370 of this article may be permitted provided all of the limitations and requirements specified in that section are complied with, except that openings in corridor walls serving as fire divisions required to have a fire-resistance rating shall be limited to those specified in section 27-342 of article five of subchapter five of this chapter.

(j) Ventilation. - Corridors shall be ventilated in accordance with the requirements of subchapter twelve of this chapter. Corridors shall not be used as open plenums or as ducts to exhaust air from rooms or spaces opening upon them, except as permitted in reference standard RS 13-1.

(k) Interior finish. - The interior finish of corridors shall be in accordance with the requirements of table 54.

§[C26-604.3] 27-370 Exit passageways. -

Exit passageways shall be maintained free of obstructions at all times. Not more than fifty percent of the total number of vertical exits provided for a building may be served by a single exit passageway, except as provided in subdivision (h) of section 27-370 of this article.

(a) Capacity. - The capacity of exit passageways shall be as listed in table 6-1.

(b) Width. - The width of an exit passageway serving one vertical exit shall be equal to the width of the vertical exit. The width of an exit passageway serving two or more vertical exits shall be equal to seventy-five percent of the width of all of the vertical exits that it serves. Width shall be measured in the clear between the narrowest points at any projections such as radiators, door swings, or pilasters.

(c) Height. - Exit passageways shall have a clear height of seven feet six inches for at least seventy-five percent of the floor area, with no point less than seven feet in height. No projection below the ceiling shall be located so as to obstruct full view of exit signs.

(d) Changes in level. - Changes in level requiring less than two risers in an exit passageway shall be by a ramp complying with section 27-377 of this article. Risers and treads shall comply with the requirements of subdivision (e) of section 27-375 of this article.

(e) Construction. - The construction of exit passageways shall be as required by table 3-4 for the applicable construction class of the building.

(f) Openings. - No openings other than exit doors shall be permitted in exit passageways, except as provided in subdivision (h) of this section.

(g) Interior finish. - The interior finish of exit passageways shall be in accordance with the requirements of table 5-4.

(h) Street floor lobbies. - Street floor lobbies may be used as exit passageways when they comply with the requirements of subdivisions (a) through (g) of this section subject to the following modifications:

(1) **VERTICAL EXITS SERVED.** - One hundred percent of the total number of vertical exits provided for a building may be served by a street floor lobby, if egress is provided in two different directions from the discharge points of all vertical exits to open exterior spaces that are remote from each other.

(2) **WIDTH.** - Street floor lobbies serving as exit passageways shall be increased in width to accommodate the occupant load of all communicating spaces on the lobby floor that exit through them. The capacity per unit of width shall be as listed in table 6-1.

(3) **OPENINGS.** - Openings between street floor lobbies serving as exit passageways and elevators or communicating spaces shall comply with the following:

a. **Doors.** -

1. Doors to stairways and elevators, and unsprinklered communicating spaces classified in occupancy group B-2, D-2, F-1 or F-2 shall be self-closing fire doors having a one and one-half hour fire protection rating.

2. Doors to unsprinklered communicating spaces classified in occupancy group G, H or J, or sprinklered communicating spaces classified in occupancy group B-2, D-2, F-1 or F-2 may be either:

(a) self-closing fire doors having a three-quarter hour fire protection rating, or

(b) glass or other noncombustible doors installed in conjunction with automatic fire doors having a one and one-half hour fire protection rating, with sprinkler heads installed over the doors on the room side.

3. No other door openings shall be authorized except as otherwise provided in this section.

b. **Other openings.** - Other openings to spaces classified in occupancy group C, E, F, G, H or J shall be permitted, provided they have a maximum length of eight feet and a maximum height of eight feet, are glazed by one-quarter inch polished plate glass or equivalent and are protected by automatic fire doors having a one and one-half hour fire protection rating and by automatic sprinklers complying with the construction requirements of subchapter seventeen of this chapter over the openings on the room side.

c. **Separations and limitations.** - Openings permitted by subparagraphs a and b of this paragraph shall not exceed in total length fifty percent of the length of such enclosure wall except where the length of such wall is less than sixteen feet. Adjoining openings shall be separated from each other a minimum of three feet by construction having a two hour fire-resistance rating.

d. Notwithstanding the restrictions in subparagraphs

a, b, and c of this paragraph, the following openings may be authorized:

1. A space classified in occupancy group C, E, F-3 or F-4 within fire separations having a minimum fire-resistance rating of one hour, with an area not exceeding twenty-five hundred square feet, may have an unlimited length of show window under the following conditions:

(a) The maximum depth of show window shall be three feet.

(b) Automatic sprinklers complying with the construction requirements of subchapter seventeen of this chapter, shall be provided in the show window display area.

(c) The show window display area shall be protected on all sides, except for the glazed window, by construction having a two hour fire-resistance rating with access provided by means of a fireproof self-closing door having a three-quarter hour fire protection rating.

(d) The show window shall be glazed by one-quarter inch polished plate glass or equivalent.

(e) Glass or other noncombustible doors may be used for entrance to or egress from the space within fire separations when installed in combination with automatic fire doors having a one and one-half hour fire protection rating. Such automatic fire doors shall be located on the room side and shall be held open by approved door-holding devices actuated to release automatically upon the activation of smoke detecting devices, whether of the photoelectric cell or other approved type. In addition, automatic sprinkler heads, complying with the construction requirements of subchapter seventeen of this chapter, shall be provided over the door openings on the room side.

2. A space classified in occupancy group C, E, F-3, or F-4 within fire separations having a minimum fire-resistance rating of one hour, with an area not exceeding three thousand square feet, may have a maximum total length of unprotected openings upon a corridor or exit passageway not exceeding fifty percent of the space frontage along such corridor or exit passageway under the following conditions:

(a) The entire space shall be provided with automatic sprinklers complying with the construction requirements of subchapter seventeen of this chapter.

(b) The show window shall be glazed by one-quarter inch polished plate glass or equivalent.

(c) All corridor or exit passageway doors shall be self-closing, noncombustible, and smokeproof.

3. Show windows or other openings of unlimited lengths and heights shall be permitted on any corridor or exit passageway without requirements for fire-resistance doors under the following conditions:

(a) The entire floor area, including the corridors or exit passageways, shall be provided with automatic sprinklers complying with the construction requirements of subchapter seventeen of this chapter.

(b) The occupancy of all spaces on the floor shall be limited to occupancy groups C, E, F-3 and F-4.

(c) The widths of the corridors or passageways shall exceed the requirements of table 6-1 or subdivision (b) of this section, whichever is applicable, by at least fifty percent.

(d) All doors opening on the corridors or exit passageways shall be smokeproof, noncombustible, self-closing doors.

(e) Show windows or other openings shall be glazed by one-quarter inch polished plate glass or equivalent.

(f) Each corridor or exit passageway shall be provided with a fresh air intake, a positive smoke exhaust system and smoke detectors which, when activated, shall permit circulation only of fresh air.

(4) **OCCUPANCY.** - Street floor lobbies serving as exit passageways may be occupied by newsstands, candy and tobacco stands, information booths or similar occupancies, if such stands or booths are constructed of noncombustible materials, or of materials which comply with the requirements of section 27-348 of article five of subchapter five of this chapter for interior finish for exit passageways, provided that such stands or booths:

a. do not occupy more than one hundred square feet or five percent of the net floor area of the lobby, whichever is greater; and

b. do not reduce the required clear width of the lobby at any point; and

c. if constructed of combustible materials are protected by no less than two automatic sprinkler heads. Water for such sprinkler heads may be supplied from the domestic water supply system.

§[C26-604.4] 27-371 Doors. -

Exit doors and doors providing access to exits shall comply with the following:

(a) **Exit doors.** - Doors for required exits shall be self-closing swinging doors with a one and one-half hour fire protection rating, except in occupancy group J-3 buildings and except that:

(1) Exterior street floor exit doors having an exterior separation of more than fifteen feet need not have a fire-protection rating.

(2) Doors into stairs and exit passageways shall have at least a three-quarter hour fire protection rating.

(b) **Corridor doors.** - Doors that provide access to interior corridors required to have a one hour fire-resistance rating shall be self-closing swinging fire doors with a three-quarter hour fire-protection rating, except that in buildings classified in occupancy group G, in which an acceptable interior fire alarm system is installed and in which regular supervised fire drills are held, the doors to rooms or spaces devoted exclusively to non-hazardous uses in occupancy group G need not

be fire-rated, provided they are swinging, self-closing one and three-quarter inch solid core wood, and have a maximum area of seven hundred twenty square inches of one-quarter inch thick wired glass vision panels. Other corridor doors except those provided for in subdivision (d) of section 27-369 of this article, shall be self-closing, swinging, noncombustible or one and three-quarter inch solid core wood doors, except that in buildings classified in occupancy group H-2 the doors need not be self-closing. Noncombustible mail slots having an area not exceeding forty square inches may be provided in corridor doors when the opening is protected by a closure activated by gravity or a spring device so as to keep it closed when not in use. Noncombustible louvers may be installed in corridor doors opening into toilets, service sink closets, and electric closets. Notwithstanding the foregoing restrictions in this subdivision, doors not prohibited by subdivision (d) of this section may open from spaces into corridors when in compliance with all of the provisions of paragraph three of subdivision (h) of section 27-370 of this article.

(c) **Smoke stop doors.** - Smoke stop doors shall be self-closing, swinging doors of metal, metal covered, or one and three-quarter inch solid core wood with clear wire glass panels having a minimum area of six hundred square inches per door and a maximum area of twelve hundred ninety-six square inches per door, except that in buildings not over two stories high, smoke stop doors may be of one and three-eighths inch solid core wood with clear wire glass panels, unless the doors are also used as horizontal exits in which case they shall comply with the provisions of subdivision (b) of section 27-373 of this article. Smoke stop doors may be double-acting but shall close the opening completely with only such clearance as is reasonably necessary for proper operation. Smoke stop doors shall normally be in the closed position, except that they may be left open if they are arranged to close automatically by an approved device which is actuated by an interior fire alarm system meeting the requirements of subchapter seventeen of this chapter.

(d) **Prohibited doors.** - Vertically sliding doors, rolling shutters, and folding doors shall not be used as exit doors or as corridor doors, except that overhead garage doors may serve as exits from buildings classified in occupancy group J-3, and except that sliding or rolling doors or gates may be used in F-2 places of assembly provided they are kept open when the place of assembly is occupied. Revolving doors may be used only to the extent permitted by subdivision (m) of section 27-371 of this article. Automatic horizontally sliding fire doors shall be permitted only in horizontal exits in fire divisions required to have a four hour fire-resistance rating as specified in Table 5-3.

(e) **Door opening widths.** - The capacity of exit and corridor door openings shall be as listed in table 6-1.

Door jambs or stops and the door thickness when open shall not reduce the required width by more than three inches for each twenty-two inches of width. The maximum width of any swinging door leaf shall be forty-eight inches. The minimum nominal width of corridor and exit door openings shall be thirty-six inches, except that where a door opening is divided by mullions into two or more door openings, the minimum nominal width of each such opening shall be thirty-two inches. The minimum nominal width of other door openings shall be as follows:

(1) Door openings to all habitable and occupiable rooms. - thirty-two inches.

(2) Door swinging in pairs (no mullion), opening. - forty-eight inches.

(3) Door openings to rooms used by bedridden patients and all single door openings used by patients in buildings classified occupancy group H-2. - forty-four inches.

(4) Door openings to toilet rooms in buildings to which the public has free access shall be thirty-two inches.

(5) Door openings giving access to at least one toilet, lavatory and bathtub or shower in each dwelling unit, in buildings or spaces classified in occupancy group J-1 or J-2, when such dwelling unit is accessible to individuals in wheelchairs [sic] - thirty-two inches.

(6) Door openings giving access to all toilets, lavatories and bathtubs or showers serving single room occupancies, which are accessible to individuals in wheelchairs-thirty-two inches.

*(7) Door openings for people having physical disabilities shall additionally comply with the requirements of reference standard RS 4-6.

*Local Law 58-1987.

(f) Door heights.- The minimum nominal door opening height for exit and corridor doors shall be six feet eight inches. Door jambs, stops, sills, and closers shall not reduce the clear opening to less than six feet six inches.

(g) Door swing.- Exit doors, corridor doors from rooms or spaces classified in high hazard occupancy group A, or from factories as defined in the labor law, and corridor doors from rooms required to have more than one door under the provisions of section 27-365 of article four of this subchapter, shall swing in the direction of exit travel, except:

(1) Doors from rooms of instruction in buildings classified in occupancy group G, having an occupant load of less than seventy-five persons.

(2) Exterior street floor exit doors from lobbies in buildings classified in occupancy groups J-2 and J-3.

(3) Exterior street floor exit doors from spaces in occupancy group C or E not exceeding two thousand square feet in area, and occupied by less than fifty persons, where the maximum travel distance to a door does not exceed fifty feet.

(h) Floor level. - The floor on both sides of all exit and corridor doors shall be essentially level and at the same elevation for a distance, perpendicular to the door opening, at least equal to the width of the door leaf, except that where doors lead out of a building the floor level inside may be seven and one-half inches higher than the level outside.

(i) Closed doors. - Exit doors and corridor doors shall normally be kept in the closed position, except that corridor doors in buildings classified in occupancy group H-2 shall be exempt from this requirement.

(j) Door and window hardware. - Doors and windows shall be equipped with hardware as follows:

(1) FIRE PROTECTION REQUIREMENTS. -

a. Exit doors and corridors shall be readily openable at all times from the side from which egress is to be made and shall not require a key to operate from that side, except that:

1. Locks may be used in penal and mental institutions and areas, where required for security.

2. Locks may be used in banks, museums, jewelry stores and other places where extra safeguards are required, subject to the approval of the commissioner, and provided the locks are equipped with electrical release devices for remote control in case of emergency.

3. Stairways leading from the top floor to a roof may be provided with locked wire mesh gates openable by key in buildings classified in occupancy group G. The use of a hook and eye closing device on the inside of all doors to roofs shall be permitted.

*b Doors opening into interior stair enclosures shall not be locked from either side with the following exceptions:

1. Doors may be locked to prevent access to the stair at the street floor.

2. In buildings classified in occupancy group E, less than one hundred feet in height, the doors may be locked on the stair side on each floor above the street floor.

3. In buildings classified in occupancy group E, one hundred feet or more in height, and existing office buildings one hundred feet or more in height, the doors may be locked on the stair side above the street floor except that at intervals of four stories or less, doors shall be openable from the stair side without the use of a key to permit reentry at such floors. In addition, the door on every floor where a keyed switch is required by the provisions of subchapter eighteen of this chapter shall be openable from the stair side without the use of a key to permit reentry at such floors.

4. When a locked door is provided with an automatic fail safe system for opening such door in the event of the activation of any automatic fire detecting device or when any elevator in readiness as provided in section 27-989 of subchapter eighteen of this chapter is activated, such door shall be deemed as openable from

the stair side [sic]. The installation of such automatic fail safe system shall comply with the requirements of reference standards RS 17-3A and RS 17-3B, whichever is applicable. Stair reentry signs required under section 27-394 of article nine of this subchapter shall specify that reentry is provided only during fire emergencies.

**Local Law 14-1993.*

c. Latch bolts shall be provided on all exit doors and corridor doors to hold them in a closed position against the pressure of expanding gases except that this requirement shall not apply to doors in stair enclosures in buildings classified in occupancy group G.

(2) **SECURITY REQUIREMENTS.** - The following provisions shall apply to all buildings erected or altered after December sixth, nineteen hundred sixty-eight that may be classified in residential occupancy group J-2. Existing buildings in such group shall comply with the requirements of article eleven of subchapter two.

a. Building entrance doors and other exterior exit doors shall be equipped with heavy duty lock sets with auxiliary latch bolts to prevent the latch from being manipulated by means other than a key. Latch sets shall have stopwork in the inside cylinder controlled by a master key only. Outside cylinders of main entrance door locks shall be operated by the tenants' key, which shall not be keyed to also open the tenants' apartment door. A light or lights shall be provided at or near the outside of the front entranceway of the building providing not less than five foot candles intensity measured at the floor level for the full width of the entranceway.

b. Doors to dwelling units shall be equipped with a heavy duty latch set and a heavy duty dead bolt operable by a key from the outside and a thumbturn from the inside. Those doors shall also be equipped with a chain guard so as to permit partial opening of the door. Dwelling unit entrance doors shall also be equipped with a viewing device located so as to enable a person on the inside of the entrance door to view a person immediately outside.

c. All openable windows shall be equipped with sash locks designed to be openable from the inside only. Grilles lockable from the inside only may be placed on the inside or outside of windows that are accessible from grade but that do not serve to provide access to exits.

d. Buildings classified in occupancy group J-2 containing eight or more dwelling units shall be provided with an intercommunication system located at the door giving access to the main entrance hall or lobby, consisting of a device or devices for voice communication between the occupant of each dwelling unit and a person outside said door to the main entrance hall or lobby, and permitting such dwelling unit occupant to release the locking mechanism of said door from the dwelling unit.

(k) Panic hardware. -

(1) Exit doors shall be equipped with fire exit bolts when providing an exit from:

a. Buildings classified in occupancy group G, except exit doors opening directly outdoors at grade from rooms having an occupant load of less than seventy-five persons,

b. F-1 places of assembly,

c. F-2, F-3 and F-4 places of assembly having an occupant load exceeding three hundred persons, except places of assembly having doors that are not equipped with locks and are openable at all times.

(2) Fire exit bolts shall be of an approved type, and shall release when a pressure exceeding fifteen pounds is applied to the releasing device in the direction of exit travel. The bars or panels shall extend at least two-thirds of the width of the door and shall be placed at least thirty inches, but not more than forty-four inches above the floor.

(l) Power operated doors. - Power operated doors or power assisted manually operated doors, may be used as exit or corridor doors provided they remain closed in case of power failure but shall be manually operable. No power operated door shall be credited as a required exit unless it swings in the direction of exit travel.

(m) Revolving doors. - Revolving doors shall not be used as exits in buildings classified in occupancy group F-1 or F-2, G, or H; nor shall revolving doors be used in any occupancy as interior doors providing access to exits, at the foot of stairs, or at the head of basement stairs. Where revolving doors are used as exits, they shall comply with the following:

(1) They may provide not more than one unit or exit width for each revolving door and not more than fifty percent of the required exit capacity at any location, provided that the revolving doors are located adjacent to, or within twenty feet, of swinging doors that provide the remaining required exit capacity at that location.

(2) They shall be collapsible, and designed and constructed so that:

a. Each wing is independently supported by a hanger with a corrosion resistant safety release which, when pressure of between sixty to eighty pounds is exerted simultaneously on the wings on opposite sides of the door pivot, the door wings will fold back on themselves in the direction of egress.

b. Each wing is provided with at least one push bar and glazed with at least 7/32 in. plate or tempered glass.

c. The inside diameter of the enclosure is at least six feet six inches.

d. The freely operable maximum rate of revolving speed is controlled so that it is not greater than fifteen rpm.

e. The upper surface of the floor finish within the door enclosure is flush with the adjacent floor area, and permanently secured in place.

(3) The owner shall be responsible at all times for the operation and maintenance of revolving doors, and shall have the doors inspected at intervals not to exceed

six months. All parts of the doors, including the safety releases and speed control mechanism, shall be maintained in good working order. Inspection reports shall be made in writing and kept on file at the premises for at least two years.

(n) Turnstiles. - No turnstile or other device designed to restrict travel shall be placed so as to obstruct any required exit, except that approved turnstiles that turn freely in the direction of exit travel may be used in any occupancy where revolving doors are permitted. Turnstiles shall be not more than thirty-six inches nor less than thirty inches high and shall be of such design as to provide twenty-two inches clear width as the turnstile rotates. Each turnstile may be credited with a capacity of one unit of exit width. Not more than fifty percent of the required exit capacity may be provided by turnstiles at any location. The balance of the required exit capacity shall be provided by swinging doors located within twenty feet of the turnstiles. Turnstiles over thirty-six inches high shall meet the applicable requirements of this code for revolving doors.

§[C26-604.5] 27-372 Area of refuge. -

Areas of refuge shall comply with the following:

(a) Separation. - Areas of refuge shall be separated from the area which they serve by construction having at least a two hour fire-resistance rating.

(b) Floor area. - Areas of refuge shall provide clear public space or space occupied by the same tenant or owner, adequate in size to hold the occupant load it receives from the floor area it serves as computed by the provision of section 27-367 of article four of this subchapter, in addition to its own occupant load, allowing at least three square feet per person, except that in buildings classified in occupancy group H-2 for patient areas only, the allowance shall be at least thirty square feet per person.

(c) Required exits. - Areas of refuge shall be provided with at least one vertical exit. When an area of refuge is located higher than the eleventh floor of a building, the vertical exit shall be supplemented by at least one elevator.

(d) Locking. - Doors providing access to areas of refuge shall be kept unlocked at all times when any floor area served by the area of refuge is occupied.

§[C26-604.6] 27-373 Horizontal exits. -

A horizontal exit to an area of refuge may consist of doors through walls or partitions having at least a two hour fire-resistance rating; of a balcony or exterior vestibule leading around the end of a fire division to another fire area or building; or it may be a bridge or tunnel between two buildings. Horizontal exits shall comply with the following:

(a) Capacity. - The capacity of horizontal exits shall be as listed in table 6-1. Only the widths of doors swinging in the direction of exit travel to the area of refuge shall

be counted.

(b) Door requirements. - Doors shall be swinging, self-closing doors having a fire protection rating of one and one-half hours, except that doors [sic] in fire divisions having a three hour or four hour fire-resistance rating shall have opening protective as required by table 5-3. Each swinging door shall swing in the direction of exit travel, and when travel is in both directions, as when two areas of refuge serve as areas of refuge for each other, at least two door openings shall be provided, the doors of which shall swing in opposite directions. Signs shall be placed over each door on the side from which egress is made, indicating the exit door.

(c) Balconies, bridges and tunnels. -

When serving as horizontal exits, balconies, bridges, and tunnels shall comply with the following:

(1) Their width shall be equal to at least the width of the doors opening on them, but in no case less than three feet eight inches.

(2) They shall be enclosed at each end by doors complying with subdivision (b) of this section.

(3) The floor level at doors shall be the same as that of the building except that the floor level of open balconies or open bridges shall be approximately seven and one-half inches lower.

(4) Where there is a difference in level between the areas connected, the floors of the horizontal exit shall be ramped not more than one inch in ten inches.

(5) Exterior wall openings within thirty feet horizontally of any open bridge or balcony or below any open bridge or balcony shall be provided with opening protectives having a three-quarter hour fire protection rating.

(6) Balconies shall not face or open on yards or courts less than twelve feet wide, and shall be constructed as required for exterior corridors.

(7) Exterior bridges shall be constructed of noncombustible materials. Interior bridges or tunnels shall be constructed of materials providing a two hour fire-resistance rating.

§[C26-604.7] 27-374 Supplemental vertical exits. -

Enclosed interior stairs, ramps, or escalators may provide access to an area of refuge located on a floor nearer to the street floor, when complying with the following:

(a) Limitation. - They shall be supplemental vertical exits serving no other purpose than to connect a floor area with an area of refuge.

(b) Capacity. - The capacity of supplemental vertical exits shall be as listed for stairs in table 6-1.

(c) Construction. - Supplemental vertical exits shall comply with all of the construction requirements for interior stairs as provided in section 27-375 of this article.

(d) Openings. - There shall be no openings in supplemental vertical exit enclosures other than the exit doors and doors leading into the area of refuge.

(e) Identification. - Every supplemental vertical exit shall have a sign at the entrance designating its destination reading, "EXIT TO AREA OF REFUGE ON..... FLOOR."

§[C26-604.8] 27-375 Interior stairs. - Interior stairs shall comply with the following requirements:

(a) **Capacity.** - The capacity of interior stairs shall be as listed in table 6-1.

(b) **Width.** - The width of interior stairs shall be the clear width between walls, grilles, guards, or newel posts. Stair stringers may project into the required width not more than two inches on each side of the stair. No interior stair shall be reduced in width in the direction of exit travel. Interior stairs shall be at least forty-four inches wide except as follows:

(1) Interior stairs may be not less than thirty-six inches wide when serving not more than thirty occupants per stair on any floor in buildings classified in occupancy groups J-1 and J-2, or when serving buildings classified in occupancy group J-3 and exceeding four stories in height, or when serving not more than sixty occupants per stair on any floor in buildings classified in occupancy groups E, B, and D.

(2) Interior stairs may be not less than thirty inches wide when serving mezzanines having an occupant load not exceeding twenty-five persons or when located in buildings classified in occupancy group J-3 not more than three stories in height. Interior stairs in four story buildings classified in occupancy group J-3 shall be a minimum of thirty-three inches in width.

(c) **Headroom.** - The clear headroom shall be at least seven feet, except that in buildings classified in occupancy groups J-2 and J-3, the minimum clear headroom may be six feet eight inches. Headroom in a flight of stairs shall be measured vertically between two parallel inclined planes, one of which contains the line of the nosing or upper front edge of each tread and extends to its intersection with a landing and the other of which is through any point directly above the first plane that limits the headroom of the stair.

(d) **Landings and platforms.** - Landings and platforms shall be provided at the head and foot of each flight of stairs, except at the head of basement stairs in one- and two-family dwellings, and shall comply with the following:

(1) The minimum width of landings and platforms perpendicular to the direction of travel shall be equal to at least the width of the stairs except that on a straight-run stair, the distance between risers of upper and lower flights at intermediate landings or platforms need not be more than forty-four inches.

(2) The maximum vertical rise of a single flight of stairs between floors, between landings or platforms, or between a floor and a landing or platform, shall not exceed eight feet in buildings classified in occupancy groups F and H, and twelve feet in all other occupancy groups. No flight of stairs shall have less than two risers.

(3) Landings and platforms shall be enclosed on sides by walls, grilles or guards at least three feet high.

(e) **Risers and treads.** - Risers and treads shall comply with table 6-4 and with the following:

(1) The sum of two risers plus one tread exclusive

of nosing shall be not less than twenty-four nor more than twenty-five and one-half inches.

(2) Riser height and tread width shall be constant in any flight of stairs from story to story.

(3) Winders shall not be permitted in required exit stairs except in one- and two-family dwellings and except as permitted in subdivision 1 of this section. The width of winder treads when measured eighteen inches from the narrower end shall be at least equal to the width of treads above or below the winding section.

(4) Curving or skewed stairs may be used as exits when the tread and riser relationship is in accordance with table 6-4 when measured at a point eighteen inches in from the narrow end of the tread; and no tread shall be more than three inches narrower or three inches wider at any point than the width established eighteen inches in from the narrow end.

(f) **Guards and handrails.** - Stairs shall have walls, grilles, or guards at the sides and shall have handrails on both sides, except that stairs less than forty-four inches wide may have a handrail on one side only. Handrails shall provide a finger clearance of one and one-half inches, and shall project not more than three and one half inches into the required stair width.

(1) Stairs more than eighty-eight inches wide shall have intermediate handrails dividing the stairway into widths that maintain the nominal multiples of twenty-two inches, but the widths shall not be greater than eighty-eight inches nor less than forty-four inches.

(2) The height of handrails above the nosing of treads shall be not more than thirty-four inches nor less than thirty inches.

(3) Handrails shall be returned to walls and posts when terminated, except in one and two-family dwellings.

(4) Handrails shall be designed to support loads in compliance with the requirements of subchapter nine of this chapter.

(5) Handrails in all stairs shall be of materials having a flame-spread rating not exceeding one hundred fifty.

(g) **Stair doors.** - Doors providing access to stairs shall comply with the requirements of subdivision (a) of section 27-342 of article five of subchapter five of this chapter and subdivision (e) of section 27-371 of this article. The swing of stair doors shall not block stairs or stair landings, nor shall any door at any point of its swing reduce the effective width of the landing or stair to less than seventy-five percent of the required width of the landing or stair, or to less than the width of the door opening on them. The width of doors from a stair shall not be less than the number of units of exit width required for the capacity of the stair, but in no case shall the door width be less than required by subdivision (e) of section 27-371 of this article.

(h) **Stair construction.** -

Risers, treads, stringers, landings, platforms, and guards, exclusive of handrails, shall be built of noncombustible materials except that interior stairs in buildings of construction group II may be built of combustible materials in buildings classified in occupancy group B-

2, C, D or E when the buildings are two stories in height or less, and in buildings classified in occupancy group J-2 or J-3 when the buildings are not more than three stories in height, and in the case of J-2 occupancy group, when occupied by not more than three families. Interior stairs shall have solid treads. All risers shall be closed except as otherwise provided in subdivision (i) of this section. When of combustible construction, the soffit of interior stairs shall be fire protected by material having a minimum fire resistive rating of one hour or five-eighths inches gypsum wall board or equivalent, or the space beneath shall be enclosed without openings by material having a one hour fire resistance rating unless permitted to have open risers by subdivision (I) of this section. Where two separate interior stairs are contained within the same enclosure (so called "scissor stairs"), each stair shall be separated from the other by noncombustible construction having a fire resistance rating equal to that required for the stair enclosure. Stairs, platforms, and landings shall be designed to support all loads in compliance with the requirements of subchapter nine of this chapter. Treads and landings shall be built of or surfaced with nonskid materials.

(i) Stair enclosures. -

(1) Interior stairs shall be enclosed with construction complying with the requirements of Table 3-4 except that:

a. In buildings three stories or less in height excluding those classified in occupancy group J-1 or J-2 combustible construction group II, the enclosing construction may have a one hour fire resistant rating.

b. Stairs in buildings or spaces classified in occupancy group J-3 and not more than three stories in height, need not be enclosed except as otherwise required in subdivision (a) of section 27-341 of article five of subchapter five of this chapter. Stairs may have open risers in one family dwellings and group homes.

c. Unenclosed stairs in buildings classified in assembly occupancy group F may be permitted as provided in subchapter eight of this chapter.

d. Stairs from floors or mezzanines may be unenclosed, with open or closed risers.

e. In buildings classified in occupancy group J-2 occupied exclusively by not more than one family on each story without boarders, roomers or lodgers and not more than three stories in height, the enclosing construction may have a one hour fire-resistance rating which may be constructed of combustible material provided that the stair enclosure is protected with an automatic sprinkler system complying with the construction provisions of subchapter seventeen of this chapter.

f. In buildings classified in occupancy group J-1 or J-2 not more than two stories in height of combustible construction group II, the enclosing construction may have a one hour fire-resistance rating which may be constructed of combustible material; however, where only one vertical exit is provided the

stair enclosure shall be protected throughout with an automatic sprinkler system constructed in accordance with the provisions of subchapter seventeen of this chapter.

g. Except as provided in subparagraphs (a), (c) and (f) of this paragraph, in all buildings or spaces classified in occupancy group J-1 or J-2, the enclosing construction shall be of masonry or an approved equivalent material having at least a two hour fire-resistant rating.

(2) Access stairs connecting not more than two stories which do not serve as a required exit may be constructed without an enclosure in buildings classified in other than occupancy group H-2. Such stairs shall be additional to and shall not obstruct or interfere with required exit facilities. When the first story below grade is served by an interior, unenclosed access stair, it shall be sprinklered in accordance with the construction provisions of subchapter seventeen of this chapter.

(3) The interior finish of interior stair enclosures shall be in accordance with the requirements of table 5-4.

(4) Stair enclosures shall be vented in accordance with the requirements for shafts in subdivision (d) of section 27-344 of article five of subchapter five of this chapter except that stair enclosures for buildings or spaces classified in occupancy group J-1 or J-2 shall be vented as follows:

a. In occupancy group J-2 buildings three stories in height and with not more than one dwelling unit per story or two stories in height with not more than two dwelling units per story, shall be provided with a skylight at least nine square feet in area, glazed with plain glass with a wire screen over and under and provided with fixed or movable ventilators having a minimum open area of forty square inches.

b. In occupancy group J-1 or J-2 buildings two stories in height with more than two dwelling units per story shall be provided with a skylight of at least twenty square feet in area, glazed with plain glass, with a wire screen over and under and provided with fixed or movable ventilators having a minimum open area of forty square inches.

c. In occupancy group J-1 buildings exceeding two stories in height and in occupancy group J-2 buildings three stories in height with more than one dwelling unit per story or exceeding three stories in height shall be provided with a skylight at least twenty square feet in area, glazed with plain glass with a wire screen over and under and provided with fixed or movable ventilators having a minimum open area of one hundred forty-four square inches. In lieu of the skylight and ventilators a window of equal area may be provided with fixed louvers having a minimum open area of one hundred forty-four square inches installed in or immediately adjacent to the window.

(5) When dwelling units are located over a space classified in occupancy group C or E on the street floor, they shall be provided with a separate enclosed interior stair, or with an exterior stair.

(j) Openings and obstructions to stair enclosures.- No piping of any kind, with the exception of piping

required or permitted in subchapter seventeen of this code, shall be permitted within a stair enclosure. No openings of any kind, other than windows, fire department access panels, exit doors and openings specifically authorized in reference standard RS 5-18 shall be permitted within a stair enclosure. Pipes required or permitted by such subchapter seventeen and protected in accordance therewith which do not reduce the required clearances of the enclosure may be permitted. Ducts protected in accordance with the requirements of subchapter thirteen of this chapter, which do not reduce the required clearances of the enclosure, may be permitted. In addition, in buildings in occupancy group J-2, which are three stories or less in height and occupied by not more than two families on each story, a door from an apartment may open directly into a stair, and the door may swing into the apartment.

(k) Roof access. -

(1) Except as otherwise provided for in paragraphs two and three of this subdivision, in buildings or in building sections more than three stories or forty feet high with roofs having a slope of less than twenty degrees, access to the roof shall be provided by at least one interior stair, except that access to setback roof areas may be through a door or window opening to the roof. Interior stairs extending to roofs shall be enclosed in bulkheads of fire-resistant construction meeting the requirements of subchapter five of this chapter.

(2) In buildings or in building sections classified in occupancy group J-1 or J-2 more than two stories in height, except as otherwise provided for in paragraph three of this subdivision, with roofs having a slope of fifteen degrees or less all interior stairs, except those terminating at a level of a setback roof, shall extend to the roof and shall be enclosed in bulkheads of fire-resistive construction meeting the requirements of subchapter five of this chapter. Stairs terminating at the level of a setback shall provide access to the setback roof areas through a door except where the setback is less than four feet in width, measured from the inside of the parapet wall, and less than ten feet in length.

(3) In buildings or in building sections classified in occupancy group J-1 or J-2 two stories in height and in occupancy group J-2 three stories in height with not more than one dwelling unit per story with roofs having a slope of fifteen degrees or less, access to the roof shall be provided through a scuttle at least twenty-one inches in width and twenty-eight inches in length and shall comply with subdivision (c) of section 27-338 of article four of subchapter five of this chapter. Scuttles shall be located within each stair enclosure with a stationary iron ladder leading thereto.

(l) Spiral stairs. - Spiral stairs may serve as access stairs between two floors or levels in accordance with the provisions of paragraph two of subdivision (i) of this section. Such stairs may not serve as required exits, except that unenclosed spiral stairs when built of noncombustible materials and having a tread length of

at least thirty inches may serve as exits from mezzanines or balconies having an occupant load not exceeding twenty-five persons.

TABLE 6-4 MAXIMUM RISER HEIGHT AND MINIMUM TREAD WIDTH

Occupancy Group Classification of Building	Maximum Riser Height (in.)	Minimum Tread ¹ Width (in.)
Residential J-3 (with closed risers)...	8 ¼	9 plus 1 ¼ nosing
Residential J-3 (with open risers)...	8 ¼	9 plus ½ nosing
Residential J-2 (with only three dwelling units).....	8 ¼	9 plus 1 ¼ nosing 9 ½ plus nosing
Assembly F.....	7 ½	10 plus nosing
Institutional H-2.....	7	9 ½ plus nosing
All others ²	7 ¾	nosing

Notes for TABLE 6-4:

¹Treads may be undercut a distance equal to the nosing. A nosing shall not be required when tread width is eleven inches or wider.

²The proportions and dimensions of treads and risers may be adjusted in buildings classified in occupancy group G to suit the age of occupants, subject to the approval of the commissioner.

§[C26-604.9] 27-376 Exterior stairs. -

Exterior stairs may be used as exits in lieu of interior stairs provided they comply with all of the requirements for interior stairs, except enclosure, and except as modified below:

(a) Capacity. -The capacity of exterior stairs shall be as listed in Table 6-1.

(b) Height limitation. - No exterior stair shall exceed seventy-five feet or six stories in height.

(c) Construction. - Exterior stairs shall be constructed entirely of non-combustible materials, except that in buildings classified in occupancy groups other than G, F, or H, or construction group II, located outside the fire districts, exterior stairs may be built of combustible materials when the buildings are two stories or thirty feet in height or less and have an occupant load not exceeding forty persons per floor above the street below. Exterior stairs shall be roofed, and shall be protected along their outer sides as required for exterior corridors in subdivision (f) of section 27-369 of this article. Treads, landings, and platforms shall be solid and unperforated. Risers may be partially open to permit water and snow to drain.

(d) Opening protective. - In buildings four stories or fifty feet in height or more, there shall be no openings

in the building walls adjoining exterior stairs other than one-quarter* hour self-closing swinging fire doors, and no openings nearer than ten feet to the stair (measured horizontally) that are not provided with three-quarter hour opening protectives.

(e) **Location** - No exterior stair shall be located nearer than ten feet to an interior lot line.

(f) **Discharge**- Exterior stairs shall extend continuously to grade.

**As enacted but "three-quarter hour" probably intended.*

§[C26-604.10] 27-377 Ramps. -

Interior or exterior ramps may be used as exits in lieu of interior or exterior stairs provided they comply with the applicable requirements for interior stairs in section 27-375 of this article or exterior stairs in section, 27-376 of this article respectively, and with the following:

(a) **Capacity**- The capacity of ramps shall be as listed in Table 6-1.

(b) **Maximum grade**. - Ramps shall not have a slope steeper than 1 in 8, except that in buildings classified in occupancy group H the slope shall not exceed 1 in 12, and except as provided in subchapter eight of this chapter for places of assembly.

(c) **Design**-

(1) **CHANGES IN DIRECTION**.- Ramps shall be straight, with changes in direction being made at level platforms or landings, except that ramps having a slope not greater than 1 in 12 at any place, may be curved.

(2) **LENGTH**.- The sloping portion of ramps shall be at least three feet but not more than thirty feet long between level platforms or landings.

(3) **PLATFORMS** - Level platforms or landings, at least as wide as the ramp, shall be provided at the bottom, at intermediate levels where required, and at the top of all ramps. Level platforms shall be provided on each side of door openings into or from ramps having a minimum length in the direction of exit travel of three feet, and when a door swings on the platform or landing a minimum length of five feet.

(4) **DOORS**. - Door openings into or from ramps shall comply with the requirements for stairs in subdivision (g) of section 27-375 of this article. No door shall swing over the sloping portion of a ramp.

(5) **GUARDS AND RAILINGS** - Guards and railings of ramps shall comply with the applicable requirements of subdivision (f) of section 27-375 of this article except that only ramps having a slope steeper than 1 in 12 need comply with the requirements for handrails and intermediate handrails shall not be required.

(6) **SURFACE**. - Interior ramps exceeding a slope of 1 in 10 and all exterior ramps shall be provided with nonslip surfaces.

**(7) Ramps for people having physical disabilities shall additionally comply with the requirements of reference standard RS 4-6.

***Local Law 58-1987.*

§[C26-604.11] 27-378 Escalators. -

Escalators may be used as exits in lieu of interior stairs provided they comply with all of the requirements of subchapter eighteen of this chapter and with the applicable requirements for enclosed interior stairs, except as modified below:

(a) **Capacity**. - The capacity of escalators as listed in table 6-1 shall be based on the following:

MINIMUM WIDTH (IN.) AT:

Step	Balustrade ¹	Enclosure ²	Units of Exit
			Width
24	32	52	1 ½
40	48	68	2

Notes:

¹ Measured twenty-seven inches above front edge of tread.

² Clear width above handrails.

(b) **Acceptable exits**. -

Only escalators moving in the direction of exit travel may be credited as exits, except that any escalator may be credited when it is connected to an automatic fire detection system that will cause it to stop simultaneously with the detection of fire. The detection system shall comply with the construction provisions of subchapter seventeen of this chapter. Where an escalator provides exit facilities from only one floor of a building, the automatic detection system shall be located on that floor. Where escalators provide exit facilities from more than one floor, the detection system shall be located on all floors so served, and shall cause escalators on all floors of the section of the building that they serve to stop operating. The stopping mechanism shall operate to bring the escalator to a gradual, rather than an abrupt stop.

(c) **Escalators not used as exits**. - Escalators that do not serve as exits, and that connect more than two stories of a building, shall be completely enclosed with noncombustible construction having a three-quarter hour fire-resistance rating, except that in buildings completely protected by an automatic sprinkler system complying with the construction requirements of subchapter seventeen of this chapter, such escalators may, alternatively, be protected by one of the methods specified in subchapter eighteen of this chapter.

§[C26-604.12] 27-379 Moving walkways. -

Pedestrian walkways consisting of conveyor belts shall be considered as exit passageways if level, or as ramps if inclined, and shall be acceptable as exits if they comply with the applicable requirements for exit passageways or ramps, and with the following:

(a) **Capacity** - The capacity shall be as listed under exit passageways or ramps, as the case may be, in table 6-1.

(b) **Acceptable exits**- Only walkways moving in the direction of exit travel may be credited as exits, except that any moving walkway may be credited when it is connected to an automatic fire detection system that

will cause it to stop simultaneously with the detection of fire on the floor it serves. Such detection system shall comply with the construction provisions of subchapter seventeen of this chapter.

(c) **Design and construction.** - Walkways shall comply with the requirements of subchapter eighteen of this chapter.

(d) **Enclosure.** - Walkways that do not serve as exits, but are inclined so as to require an opening in any floor, shall be enclosed as required for escalators in subdivision (c) of section 27-378 of this article.

§[C26-604.13] 27-380 Fire escapes. -

Fire escapes constructed on existing buildings when altered or as a second means of egress for group homes as permitted by section 27-368 of this article shall comply with the following:

(a) **Capacity.** - The capacity of fire escapes shall be as listed in table 6-1 for stairs.

(b) **Stairs.** - The minimum width of fire escape stairs shall be twenty-two inches. Treads shall have a minimum width of eight inches, exclusive of a required one inch nosing. The maximum height of risers shall be eight inches. No flight of stairs shall exceed twelve feet in height between landings.

(c) **Landings.** - Landings shall be provided at each story served by fire escapes. The minimum width of landings shall be three feet, and the minimum length shall be four feet six inches. Floor openings in landings shall be at least twenty-two inches by twenty-eight inches.

(d) **Handrails and guards.** - Handrails having a minimum height of thirty-two inches above the tread nosing shall be provided on both sides of stairs, and guards having a minimum height of thirty-six inches shall be provided on all open sides of landings, openings in guards shall be of such dimensions as to prevent the passage of a five inch dia. ball.

(e) **Construction.** - Fire escapes shall be constructed of noncombustible materials adequately protected against deterioration by corrosion or other effects of exposure to the weather, and shall be designed to comply with the requirements of subchapter nine of this chapter.

(f) **Access** - Access to fire escapes shall be by doors or windows having a minimum clear opening of twenty-four inches in width and thirty inches in height. Such doors or windows shall have a fire protection rating of three-quarters of an hour except in buildings classified in occupancy group J-2.

(g) **Discharge.** - The top landing of fire escapes shall be provided with a stair or gooseneck ladder leading to the roof, except that this requirement shall not apply to buildings having a roof pitch of more than twenty degrees. The lowest landing of fire escapes shall be not more than sixteen feet above grade and shall be provided with a stair to grade, which may be counterbalanced.

ARTICLE 6 EXIT LIGHTING

§[C26-605.1] 27-381 Requirements. -

Corridors and exits shall be provided with artificial lighting facilities, except as otherwise permitted by the provisions of subchapter twelve of this chapter, in accordance with the following:

(a) Illumination of at least two foot candles measured at the floor level shall be maintained continuously, during occupancy, in exits and their access facilities for their full length, at changes in direction in and intersections of corridors, balconies, exit passageways, stairs, ramps, escalators, bridges, tunnels, landings, and platforms, and as provided in subchapter eight of this chapter for places of assembly, except that this requirement shall not apply to dwelling units.

(b) In buildings classified in occupancy groups B-1 and B-2, exit lighting need only be maintained when a section of floor is occupied.

(c) Illumination shall be so arranged that the failure of any one light shall not leave any area in darkness.

(d) Phosphorescent materials shall not be used as a method of providing illumination, nor shall battery operated electric lights or portable lamps or lanterns be used as primary sources of lighting.

* (e) (1) Buildings and existing buildings containing an F-4 place of assembly with an occupant load of three hundred or more persons shall install emergency lighting in each vertical exit serving the floor on which the place of assembly is located so as to provide a continuously lighted passage to the exterior of the building. Such lighting shall be connected to an emergency power source or to storage battery equipment meeting the requirements of the commissioner.

**Local Law 59-1996.*

(2) Existing buildings required to comply with this subdivision shall install the emergency lighting on or before April first, nineteen hundred eighty-seven.

§[C26-605.2] 27-382 Power source. -

*(a) Where a total of more than four lights is required, exit lighting shall be connected to an emergency power source or to storage battery equipment meeting the requirements of the commissioner, provided, however, that in existing buildings, the exit lighting may be on circuits that are separate from the general lighting and power circuits, taken off ahead of the main switch.

(b) Existing high rise buildings classified in occupancy group C, D or H and existing buildings classified in occupancy group E, G or J-1 (except for "residential hotels," as such term is defined by the commissioner pursuant to rules and regulations) shall comply with the requirements of this section on or before April first, nineteen hundred eighty-seven.

**Local Law 59-1996.*

ARTICLE 7 EXIT SIGNS

§[C26-606.1] 27-383 Requirements. -

Except in occupancy groups J-2 and J-3, the location of every exit on every floor and every opening from a room classified in occupancy group J-1 and containing cubicles shall be clearly indicated by exit signs. Such signs shall be placed at an angle with the exit opening if such placement is required for the signs to serve their purpose. In long corridors, in open floor areas, and in all other situations where the location of the exit may not be readily visible or understood, directional signs shall be provided to serve as guides from all portions of the corridor or floor.

§[C26-606.2] 27-384 Power source. -

*(a) Where a total of more than four exit and/or directional signs is required, the signs shall be connected to an emergency power source or to storage battery equipment meeting the requirements of the commissioner, provided, however, that in existing buildings, the signs may be on circuits that are separate from the general lighting and power circuits, taken off ahead of the main switch.

**Local Law 59-1996.*

(b) Existing high rise buildings classified in occupancy group C, D or H and existing buildings classified in occupancy group E, G or J-1 (except for "residential hotels," as such term is defined by the commissioner pursuant to rules and regulations) shall comply with the requirements of this section on or before April first, nineteen hundred eighty-seven.

§[C26-606.3] 27-385 Exit sign design. -

Exit signs shall read only "exit" and shall be of the externally lighted, internally lighted, or electroluminescent type, except that they may be nonilluminated in buildings not provided with artificial lighting.

(a) The artificial light source on externally lighted signs shall provide a red light, either by the use of an incandescent colored bulb or other visible red light source, so as to provide at least twenty-five foot candles on the exposed face of the sign. Visibility of the sign shall not be obscured by the location of the light source.

(b) For internally lighted signs, the average initial brightness of the letters shall be at least twenty-five ft. lamberts, and where an illuminated background is used, its average initial brightness shall be at least two hundred fifty ft. lamberts. The light source shall not be modified or changed nor shall lamp life multipliers be used so as to reduce these brightness levels.

(c) The letters of exit signs shall be red. The background of externally lighted signs shall be white. The background of internally lighted signs shall be either stenciled metal with a light gray or white color, or translucent frosted, opal glass, slow-burning plastic, or the plastic edge-glow type with white plastic separators. The letters for internally lighted signs shall be translucent red.

(d) The letters shall be block lettering at least four and one-half inches high with nine-sixteenths inch strokes, except in buildings and spaces classified in occupancy group F and J-1, where they shall be at least eight inches high with the strokes at least three-quarters of an inch wide.

(e) In locations where breakage may occur, exit signs shall be of shock resistant materials, or shall otherwise be protected against breakage.

(f) Except for buildings not provided with artificial lighting and buildings which maintain one or more auxiliary systems for emergency exit lighting in the event of a public utility failure, there shall be either (1) an illuminated exit sign with the background thereon made of an approved phosphorescent material or (2) a material with an opaque text and placed adjacent to or as close as possible to such illuminated sign. The phosphorescent material after exposure to normal lighting conditions shall be capable of remaining visible in total darkness for a period of at least eight hours. The signs shall be washable, non-toxic, non-radioactive and if subjected to fire must be self-extinguishing when the flame is removed.

§[C26-606.4] 27-386 Directional sign design.-

Directional exit signs shall comply with all of the requirements for exit signs in section 27-385 of this article, and shall read "EXIT" with a horizontal arrow or arrows indicating the direction to the exit or exits. However, when the arrow is below the letters, the letters may be three and three-eighths inches high and nine-sixteenths inch strokes, except in buildings and spaces classified in occupancy group F where they shall be at least five inches high with nine-sixteenths inch strokes. The arrow or arrows shall be red.

§[C26-606.5] 27-387 False exits. -

Any door, passageway, stair, or other means of communication that is not an exit or that is not a way to an exit, but is so located as to be mistaken for an exit, shall be identified with a sign reading "NOT AN EXIT," shall be identified by a sign indicating its use or purpose or shall be provided with a directional exit sign.

ARTICLE 8 EXIT SIGNS FOR EXISTING BUILDINGS

§[C26-607.1] 27-388 Retroactive provisions. -

Except as otherwise provided, the provisions of this subchapter are not retroactive except that the provisions of this article and article nine of subchapter six of this chapter for certain existing office buildings are retroactive. Signs required by this article must be installed no later than March sixth, nineteen hundred sixty-nine. Where auxiliary systems for emergency exit lighting are to be provided, the installation must commence no later than May sixth, nineteen hundred sixty-nine.

§C26-60[7.2] 27-389 Designation of required means of egress. -

(a) Except for spaces classified in occupancy J-2 and J-3, the location of each required means of egress on every floor of every structure shall be clearly indicated by exit signs. Such signs shall be placed at an angle with the exit doorway if such placement shall be required for such signs to serve their purpose adequately. These signs shall be of an approved phosphorescent material, which after exposure to normal lighting conditions shall be capable of remaining visible in total darkness for a period of at least eight hours. They shall also be washable, non-toxic, non-radioactive, and if subjected to fire must be self-extinguishing when the flame is removed. Except for illuminated signs, these signs shall have a phosphorescent background and opaque text. Where means of egress were required to be indicated by an illuminated sign, there shall be either (1) an illuminated exit sign with the lettering thereon made of the approved phosphorescent material, or (2) a supplemental exit sign made of the approved phosphorescent material with an opaque text, and placed adjacent to or as close as possible to such illuminated sign.

(b) Except for spaces classified in occupancy groups J-2 and J-3, in long corridors, in open floor areas and in all other situations where the location of the means of egress may not be readily discernible or understood by the occupants, directional signs shall be provided and maintained to serve as guides from all portions of the floor or corridor. These signs shall be of an approved phosphorescent material which after exposure to normal lighting conditions shall be capable of remaining visible in total darkness for a period of at least eight hours. They shall also be washable, non-toxic, non-radioactive, and if subjected to fire must be self-extinguishing when the flame is removed. Except for illuminated signs these signs shall have a phosphorescent background and opaque text. Where a directional sign was required to be illuminated there shall be either (1) an illuminated directional sign with the lettering, indicator, symbol or other device thereon made of the aforesaid phosphorescent material, or (2) a supplemental directional sign with the same lettering, indicator, symbol or device as appears on the illuminated sign, but opaque, on a background made of the aforesaid phosphorescent material and placed adjacent to or as close as possible to such illuminated sign.

(c) Except where otherwise permitted by the provisions of any law, the lettering of exit signs shall be of letters of at least eight inches high.

(d) In those buildings not provided with artificial lighting, in those buildings which maintain one or more auxiliary systems for emergency exit lighting in the event of a public utility failure, and in those buildings for which the installation of one or more such auxiliary systems is commenced on or before August sixth, nineteen hundred sixty-nine, the signs need not be phosphorescent but shall otherwise conform to this section.

ARTICLE 9 STAIR AND ELEVATOR SIGNS

***§[C26-608.1] 27-390 Applicability. -**

This article is applicable to all buildings and existing buildings which have at least one elevator which is subject to periodic inspections pursuant to section 27-998, any existing office building occupied or arranged to be occupied for an occupant load of more than one hundred persons above or below the street level or more than a total of five hundred persons in the entire building.

**Local Law 96-1985, language juxtaposed per Ch. 907-1985.*

§[C26-608.2] 27-391 Signs at elevator landings.-

A sign shall be posted and maintained on every floor at the elevator landing. The sign shall read "IN CASE OF FIRE, USE STAIRS UNLESS OTHERWISE INSTRUCTED." The lettering shall be at least one-half inch block letters in red with white background or as otherwise approved by the commissioner. Such lettering shall be properly spaced to provide good legibility. The sign shall also contain a diagram showing the location where it is posted and the location and letter identification of the stairs on the floor. The sign shall be at least ten inches by twelve inches, located directly above a call button and securely attached to the wall or partition. The top of such sign shall not be above six feet from the floor level. The diagram on such sign may be omitted provided that signs containing such diagram are posted in conspicuous places on the respective floor. In such case, the sign at the elevator landing shall be at least two and one half inches by ten inches and the diagram signs shall be at least eight inches by twelve inches.

§[C26-608.3] 27-392 Floor numbering signs. -

A sign shall be posted and maintained within each stair enclosure on every floor, indicating the number of the floor. The numerals shall be of bold type and at least three inches high. The numerals and background shall be in contrasting colors. The sign shall be securely attached to the stair side of the door.

§[C26-608.4] 27-393 Stair and elevator identification signs. -

Each stair and each bank of elevators shall be identified by an alphabetic letter. A sign indicating the letter of identification for the elevator bank shall be posted and maintained at each elevator landing directly above or as part of the sign specified in section 27-391 of this article. The stair identification sign shall be posted and maintained on the occupancy side of the stair door. The letter on the sign shall be at least three inches high, of bold type and of contrasting color from the background. Such signs shall be securely attached.

§[C26-608.5] 27-394 Stair re-entry signs in office buildings.-

Signs shall be posted and maintained on the stair door at each floor in buildings classified in occupancy group E occupied or arranged to be occupied for an occupant

load of more than one hundred persons above or below the street level or more than a total of five hundred persons in the entire building indicating whether re-entry is provided into the building and the floor where such re-entry is provided. The lettering and numerals of the signs shall be at least one-half inch high of bold type. The lettering and background shall be contrasting colors and the signs shall be securely attached approximately five feet above the floor. The signs shall read as follows and may be either independent or combined with the corresponding sign required by sections 27-392 and 27-393 of this article.

(a) Where no re-entry is provided from the stairs to any floor, the sign shall read "NO RE-ENTRY FROM THIS STAIR" and such sign shall be on the occupancy side of the stair door at each floor. No re-entry sign shall be required on the stair side of the door.

(b) Where re-entry is provided to specified floors:

(1) On the stair side of the door at floors where re-entry is provided, the sign shall read "RE-ENTRY ON THIS FLOOR."

(2) Where no re-entry is provided on that floor, the sign on the stair side of the door shall read "NO RE-ENTRY, NEAREST RE-ENTRY ON THE AND FLOORS" The floor numbers of the nearest re-entry below and the nearest re-entry floor above shall be entered in the blank spaces.

§[C26-608.6] 27-395 Materials for signs. -

Signs required by this article shall be of metal or other durable material.

§[C26-608.7] 27-396 Signs in existing buildings. -

(a) Signs installed prior to the enactment of this article may be accepted by the commissioner, provided that such signs will adequately accomplish the intended purpose.

(b) In buildings existing prior to January eighteenth, nineteen hundred seventy-three, the commissioner may modify the requirements as to location of signs where compliance would cause practical difficulty or undue hardship.

(c) All existing buildings not already subject to the requirements of this article as of January eighteenth, nineteen hundred seventy-three shall comply with the requirements of this article on or before October first, nineteen hundred eighty-five.

ARTICLE 10 SIGNS IN SLEEPING ROOMS

§[C26-609.1] 27-396.1 Applicability. -

This article is applicable to buildings and existing buildings classified in occupancy group J-1.

§[C26-609.2] 27-396.2 Requirements. -

All buildings and existing buildings classified in occupancy group J-1 shall post and maintain a sign on the inside of every door opening onto a public corridor giving access to a sleeping room. The sign shall contain a diagram showing the location where it is posted and the location and letter

identification of the exit stairs on the floor. The diagram shall indicate the number of doors opening onto the public corridor which must be passed to reach each exit stair. The sign shall be at least eight inches by ten inches, located on the inside of the door and securely attached thereto. The top of such sign shall not be more than six feet from the floor level. Such sign shall contain such additional information as the fire department may require.

§[C26-609.3] 27-396.3 Retroactive requirements. -

All existing buildings required to comply with the provisions of this article shall post the requisite signs on or before April first, nineteen hundred eighty-seven. Signs installed prior to such date may be accepted by the commissioner, provided that such signs adequately accomplish the intended purpose.

ARTICLE 11 EMERGENCY POWER

§[C26-610.1] 27-396.4 Requirements. -

Where required by this article or any other provision of this code, an emergency power system shall be provided. The emergency power system shall have a power source and fuel supply sufficient to operate the following equipment in accordance with rules and regulations promulgated by the department, where such equipment is required to be provided by this code:

- (a) Fire pumps and booster pumps.
- (b) At least three elevators at one time, with manual transfer to other elevators.
- (c) Alarm systems.
- (d) Communication systems.
- (e) Emergency lighting, if battery packs are not provided.
- (f) Ventilating systems used for smoke venting or control.
- (g) Stair pressurization.

§[C26-610.2] 27-396.5 Registration. -

Emergency power generation equipment shall be registered with the department of environmental protection, bureau of air resources in accordance with the requirements of section 24-109 of title twenty-four of the administrative code.

§[C26-610.3] 27-396.6 Applicability. -

Emergency power systems meeting the requirements of this article shall be provided in the following buildings and building sections:

- (a) High rise buildings and building sections classified in occupancy group C, E, G or H.
- (b) Buildings and building sections classified in occupancy group E or G which do not exceed seventy-five feet in height but have a gross area of over fifteen thousand square feet per floor or a total gross area of one hundred thousand square feet or more.
- (c) Spaces classified in occupancy group F-4 having an occupant load of three hundred or more persons.
- (d) Buildings and building sections classified in occupancy group J-1.
- (e) Buildings and building sections containing an atrium.