

NYC FIRE CODE TRAINING



CUNY SOLAR + STORAGE INSTALLERS WORKSHOP 2024

ROOFTOP ACCESS

March 20, 2024 John Ingenito





OVERVIEW



- 1. Firematics & Operations
- 2. 2022 NYC Fire Code: Sections FC504.4, FC504.5 & FC512

3. Common Non-Compliant Installations, Solutions and How to File







FIREMATICS & OPERATIONS



NEW YORK'S BRAVEST







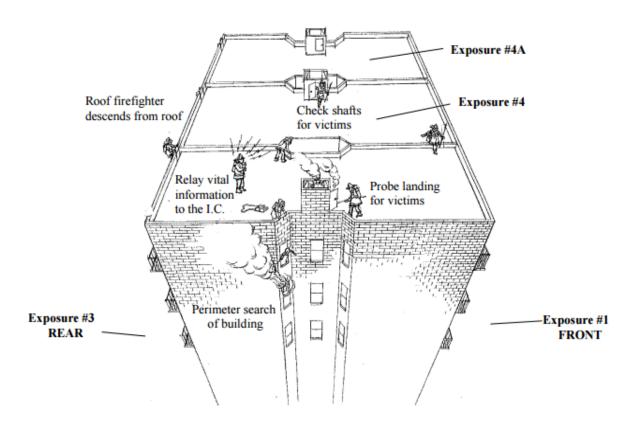
NOTHING SHALL DETER THE MEMBERS ASSIGNED THE ROOF POSITION FROM CARRYING OUT THE ASSIGNED DUTIES.

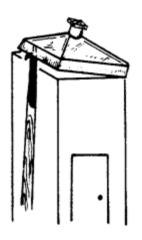


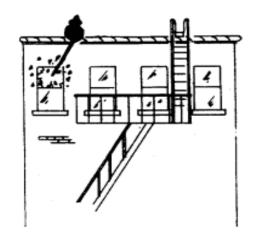
ROOF POSITION REQUIREMENTS



- A **perimeter search** shall include the sides, rear and shafts of the building.
- •Transmitting **vital information** to the Incident Commander.







•Roof **ventilation** Via opening bulkhead doors, breaking upper level windows and skylights, opening hatches, cutting the rooftop etc.

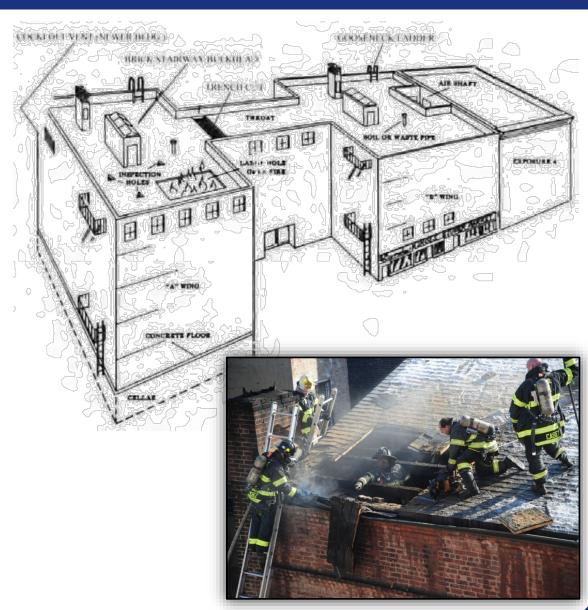


VENTING AND TRENCH CUTS



Rooftop Venting is Key in the early stages of the Fire Operations and is critical for:

- Relieving the upper portions of the building of heat, smoke and gases
- Increasing survival time of evacuating, trapped or unconscious victims.
- Making Search and Rescue operations more efficient and effective
- Increasing efficiency and effectiveness of hose operations and extinguishment
- Limiting horizontal spread







2022 NYC FIRE CODE: SECTIONS FC504.4

ROOFTOP ACCESS AND OBSTRUCTIONS

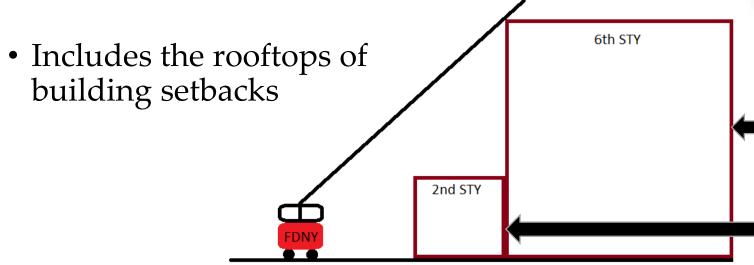


OVERVIEW OF FC504.4



• 2022 Fire Code effective as of April 15, 2022

• Rooftops that are 100 feet or less in height and have a slope of 20 degrees or less





All Rooftop Levels 100' and under must comply with the requirements of FC504.4



PERIMETER ACCESS OPENINGS

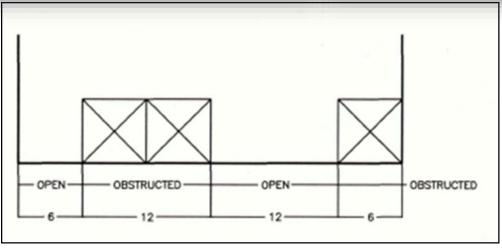


FC504.4.1

- Every 12 FEET of frontage width requires 6 FEET open
- Pattern depends on building size
- Must be calculated for all apparatus accessible exposure
 - ➤ Includes side streets, parking lots and exposures where a truck can drive







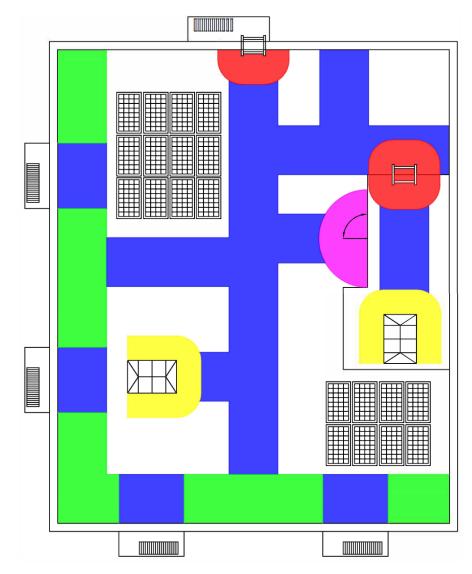


PERIMETER ACCESS OPENINGS



FC504.4.3

- Perimeter access location shall be a min. of 6' in each direction, with a clearance height of 9 feet above the parapet and rooftop.
- All landings will connect to the clear path.
- Fence shall not obstruct access landing and shall provide access to clear path via gate.
- Gates
 - ≥3′ wide, inward swinging
 - May be secured by padlock and chain that are cuttable by standard bolt cutter



Clear Path

Perimeter Access



LANDING AREA MEASUREMENTS



- Measurements are taken from inside face of parapet wall
- When filing with the Rooftop Unit:
 - ➤ Indicate height of all Raised/Decorative Parapets
 - ➤ Clearly indicate if parapets are sloped, decorative, peaked or flat toped.





LANDING AREA MEASUREMENTS



SLOPED PARAPETS: "Usable" Rooftop Perimeter Access Landing Area begins where slope meets flat portion of roof.





<u>DECORATIVE CORNICES:</u> Not considered "usable" as part of the Perimeter Access Landing Areas. Calculations must begin on the main rooftop level and after the termination of the façade wall.



PERIMETER ACCESS OBSTRUCTIONS



FC504.4.1[5]

Structures affixed to an exterior building wall below the roof line shall not obstruct fire apparatus aerial ladder access to the rooftop perimeter access locations. Including but not limited to:

- Sun Control Devices
- Awnings
- Solar Panels
- Fire Escapes







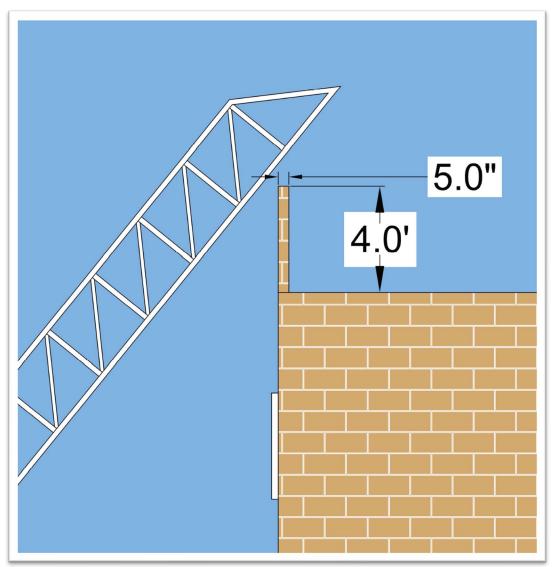


PERIMETER ACCESS OBSTRUCTIONS



FC504.4.1[7]

- Parapets or protective barriers with a height of 4 feet (48 inches) or less above the landing area are not considered to cause an obstruction to the landing area.
- All parapets, railings or protective barriers constructed after the effective date of this code section:
 - ➤ Must be able to support 350 pounds (159kg)
 - ➤ Have a level surface
 - ➤ Must be a minimum 5 inches wide at the top.





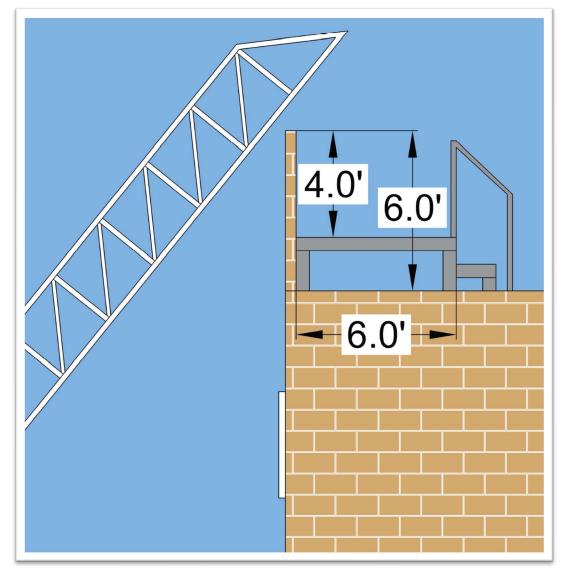
PERIMETER ACCESS OBSTRUCTIONS



FC504.4.1[7] continued

- That are more than 4 feet (48 inches) are considered to obstruct the perimeter access in that area.
- You will be required to provide a FDNY approved landing platform designed so that the elevation difference is between 42" and 48"

NOTE: THIS WILL REQUIRE THAT
YOU FILE WITH THE FDNYS
ROOFTOP ACCESS UNIT TO
RECEIVE APPROVAL ON
YOUR DESIGN.





SCAFFOLDING & SIGNAGE



FC504.4.1[6]

- Existing scaffolding modified to provide access onto rooftop
- New scaffolding be designed to provide secure landings onto rooftop





FC504.4.2

 Rooftop access signs and marking TBD by Fire Department through plan examination



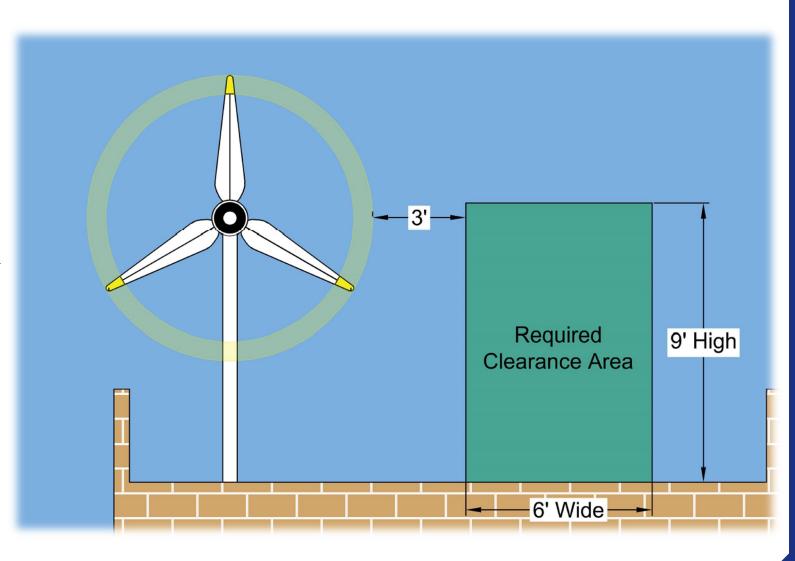
EQUIPMENT WITH MOVING PARTS



FC504.4.1[8]&FC504.4.4[9]

Any equipment with exposed moving parts, such as turbines, must meet the following requirements:

- No part of the equipment may obstruct any required clearances
- Moving parts are not permitted within 3 feet of any required clearance areas.
 Both the vertical and horizontal clearance measurements.
- The tips or end of any moving equipment shall be marked with reflective markings that make the moving equipment clearly visible.
- Signage will be required indicating the hazard.



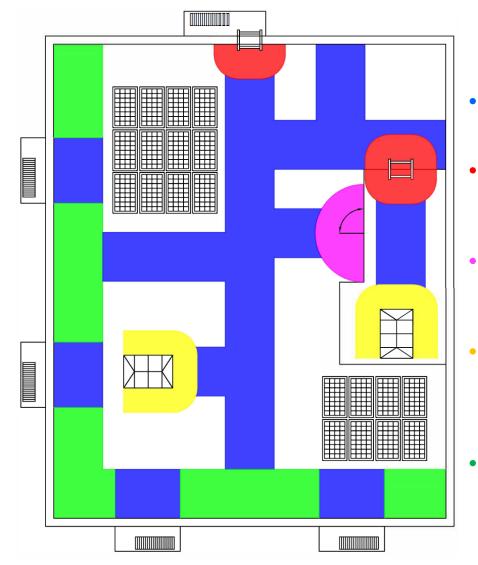


CLEAR PATHS



FC504.4.4

- Shall be 6 feet wide & 9 feet tall
- Traverses front to rear & side to side
- Distinct clear path every 100 linear feet with no more than 100 feet between distinct clear paths.
- Shall connect to all required clearance areas and rooftop energy storage systems.
- Provide access to windowed areas along sides of buildings not accessible by fire apparatus
- Solar panels, glass or other transparent materials may not be used as part of the clear path
- Fences crossing clear path shall provide gate(s) in compliance with FC504.4.4[4]
- Rooftop energy storage systems shall be designed in accordance with FC608. The deflagration zones and exhaust may not enter the clear path or other clearance areas.

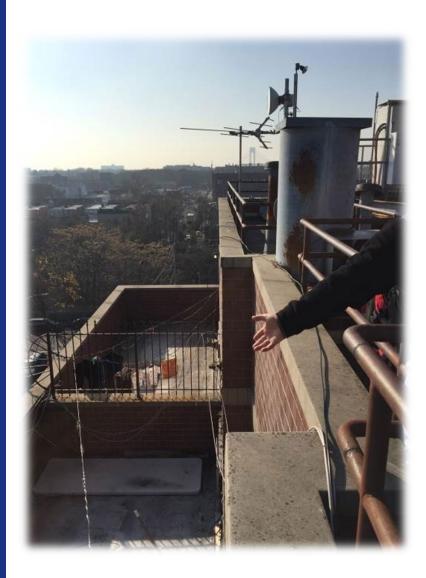


- Clear Path
- Fire Escape/ Ladder
- Door Clearance
- Skylight/ Hatch Clearance
- Perimeter Access



CLEAR PATHS: MULTIPLE ROOF LEVELS

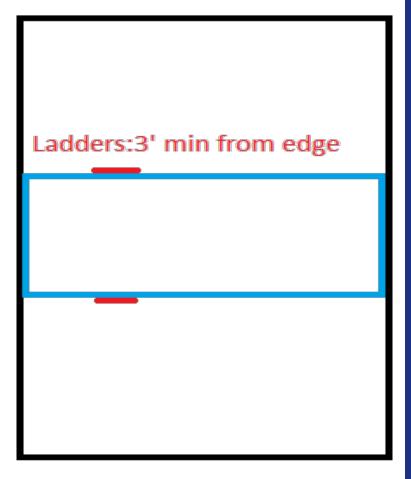




FC504.4.4[5]

Ladders or other approved means must be provided for elevation differences of 16 feet or less

Exception: setback is less than 6' (No ladders)



24' OPEN 123 Front Street

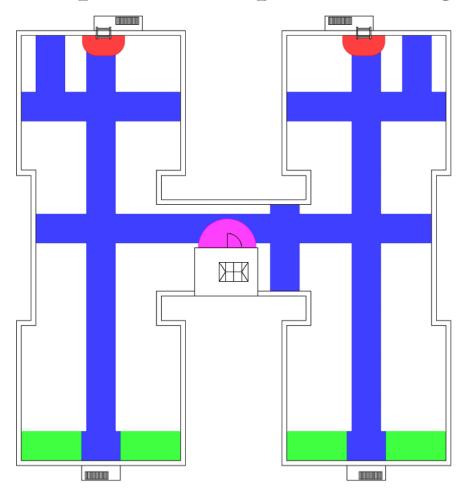


IRREGULAR SHAPED BUILDINGS FC504.4.4[6]



REQUIRE ADDITIONAL CLEAR PATHS

Example: "H" shaped buildings



- Each wing of the building will need its own clear path from front to rear and side.
- Each wing is to be considered separately when calculating required perimeter access.
- All the wings clear paths must connect to each other.
- There must be a clear path that goes across the throat of the building
- The throat of the building must have a path from front to rear and side to side.



ROOFTOP CLEAR PATH PROTECTION



FC504.4.5

- Consists of 42" high (measured from roof surface) railing, parapet or barrier.
- Provided for open shafts, building perimeter and/or unprotected elevation differences along the clear path and other clearance areas. (Does not include landing)

Exception:

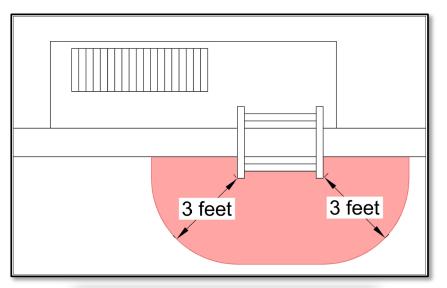
Height differentials of 6 feet or less.

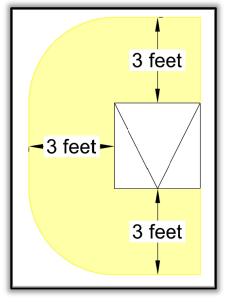




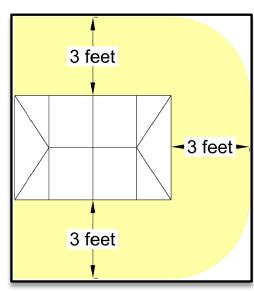
REQUIRED ROOFTOP CLEARANCES







6 feet



FC504.4.4[2] &FC504.4.6

- Fire Escape & Roof Ladders: 3' clear radius from each side of the ladder or landing.
- Roof door: 6' clear radius from hinge
- Scuttle hatches & Skylights: 3feet on 3 sides



CODE INTERPRETATION: CLEARANCE FOR SCUTTLE AND SKYLIGHT "TO THE MAXIMUM EXTENT PRACTICABLE"



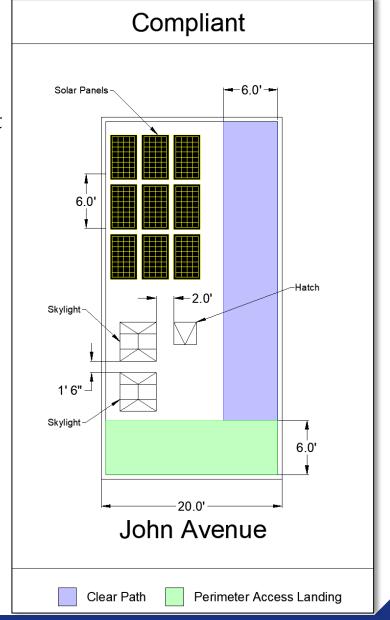
Summary of the guidelines:

For Rooftops constructed pursuant to plans approved by DOB or the FDNY on or before December 31, 2017 Scuttles and Skylights that do not have 3 feet of clearance on 3 sides will be considered to be in compliance with FC504.4 when clearance is limited by any parapet wall or Qualifying Encroachment:

- Attic ventilator
- Chimney
- Plumbing ventilation pipe
- Freestanding HVAC condenser with a capacity of 5 tons or more.

- Bulkhead
- Hatch
- Scuttle
- Skylight

Note: This does not mean that the Rooftop itself is in compliance with FC504.4. Upon alteration to the rooftop any other non compliant features, including obstructions to the required Scuttles and Skylights clearance that are not listed above, will trigger the requirement to file with the FDNY.





CODE INTERPRETATION: CLEARANCE FOR SCUTTLE AND SKYLIGHT "TO THE MAXIMUM EXTENT PRACTICABLE" -FULL TEXT-



Frequently Asked Question #37 of Chapter 5 of the Fire Code Guide for the 2014 Fire Code http://www1.nyc.gov/assets/fdny/downloads/pdf/business/nyc-fire-code-guide.pdf

The skylight and scuttle clearance requirement is intended to provide firefighters access to these building features to allow heat and smoke to be vented from the building during a fire. Such venting facilitates interior firefighting operations and helps control fire spread. Clearance in several directions affords firefighters the maneuverability they need to breach the skylight or open the scuttle, and allows firefighters to remain upwind of the heat and smoke that pours out once they accomplish this task.

By stating "to the maximum extent practicable," the Fire Code recognizes that an owner's ability to provide three feet of clearance around rooftop skylights and scuttles may be constrained by the layout of the rooftop. It would be impossible or impracticable to move parapet walls and other permanent building features that lie within three feet of a skylight or scuttle (including most building features termed "Qualifying Encroachments" in Frequently Asked Question #38 of Chapter 5 of the Fire Code Guide).

Accordingly, the Fire Department interprets the "maximum extent practicable" language of FC504.4.4(2) with respect to skylight/scuttle clearance as follows:

A skylight or scuttle will be deemed in compliance with FC504.4.4(2), even though there is less than three feet of clearance on three of its sides, when:

1.the rooftop was constructed pursuant to plans approved by the Department of Buildings or Fire Department on or before December 31, 2017; and

2.the clearance is limited by any parapet wall or Qualifying Encroachment – attic ventilator, bulkhead, chimney, hatch, plumbing ventilation pipe, scuttle, skylight, or roof-mounted heating/air conditioning equipment (HVAC) – except a freestanding HVAC condenser with a capacity of 5 tons or less.

A solar, telecommunications or other rooftop installation will not be disapproved by the Department of Buildings and/or the Fire Department based on the lack of the required skylight/scuttle clearance, provided it meets the foregoing guidelines.

Newly-designed and constructed buildings should provide such clearance or obtain a modification (variance) from the Fire Department in accordance with FC104.8. An applicant unable to comply with any other requirement of FC504.4.4 also may request a modification.



CONDUITS AND PIPING





FC504.4.7

Conduits, Pipes and Cable Trays shall be:

- Labeled as required
- Considered obstructions to required clearances if greater than 12" height or 24" width.
- Non-combustible crossover will be required to provide clear path over conduits, pipes or cable trays that cause obstructions.



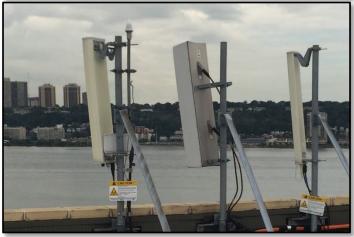
TELECOMMUNICATION INSTALLATIONS



FC504.4.10 [1] & [2]

- Transmitting antennas must be labeled in accordance with FC504.4.10 [1]
 - ➤ If the antennas are enclosed or concealed by a stealth wall or other screen the labeling must be placed on the enclosure/screening.
- Signage must be installed which:
 - ➤ Identifies the installation with a unique ID number .
 - ➤ Identifies what type of equipment is installed.
 - ➤ Provides 24/7 telephone number to contact the owners of the equipment.
 - ➤ Is conspicuously located at rooftop access doors and hatches, by rooftop accessible electrical panels, equipment cabinets etc.







TELECOMMUNICATION INSTALLATIONS





FC504.4.10[3]

- Radio Frequency emissions that exceed the FCC's exposure limits for <u>General Population</u> will be considered to cause an obstruction to any required clearance areas affected including but not limited to:
 - Perimeter Access Landings
 - Rooftop hatch
 - > Skylight

- Clear paths
- > Fire Escape's
- Rooftop accessible Doors
- The FDNY may require the submission of additional documentation certifying that all areas of concern are within FCC guidelines for the general population acceptable exposure limit.
- Must be certified buy licensed professional qualified to assess the exposure levels in relation to the FCC guidelines.



CANTILEVERED BUILDINGS



FC504.4.8

Shall be constructed in such a way that adequately facilitates
Firefighter operations by providing the required vertical clearances:

- A minimum of 12 feet between the cantilever section and the rooftop underneath.
- 9 feet of clearance between the cantilever section and rooftop features below (includes the parapet) must be provided for 25 from the nearest exterior surface of the new building.

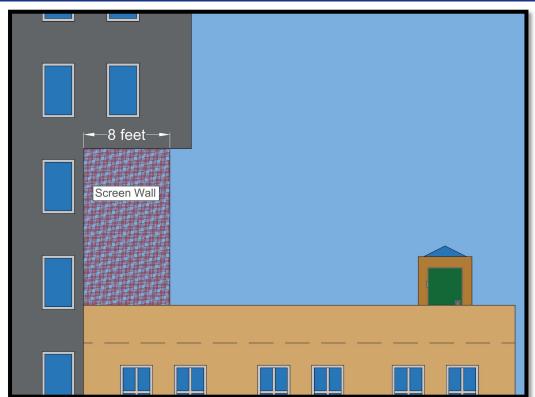


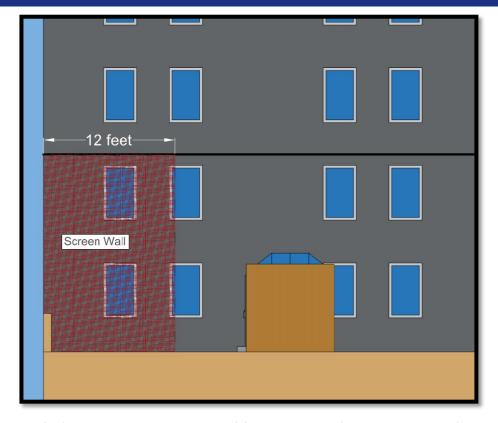
NOTE: YOU WILL BE REQUIRED TO SUBMIT THE FIRE ANALYSIS FIRE DEPARTMENT REVIEW. THIS IS SUBMITTED SEPARATELY FROM THE ROOFTOP VARIANCE APPLICATIONS.



CANTILEVERED BUILDINGS







504.4.8 [1] & [2] shall not apply to non-combustible screen walls or other similar structures installed for zoning compliance under the cantilevered section provided:

- The structure is **necessary** to comply with zoning requirements.
- No more than 8' wide measured from the side of the new building.
- No more than 12' deep measured from the front wall of the new building.



ROOFTOP GARDENS & GREEN ROOFS

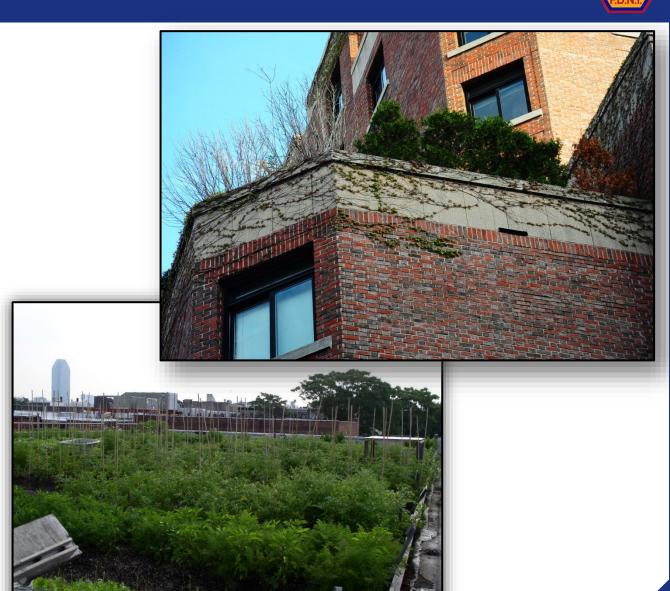


FC504.4.9

- Shall not cause obstruction to required rooftop access, clear path, or rooftop door/fire escape clearances
- Vegetation shall not exceed 12" in height

FC504.4.11.3

• Hose connection to an approved water supply in accordance with FC318 is required for square footage exceeding 250 sq ft





MAINTAIN ROOFTOP FUNCTIONALITY







FC504.4.13

Rooftop installations shall **Not** obstruct or interfere with the normal functions of, maintenance of and access to any rooftop features.



ROOFTOP SOLAR FC504.4.13





Rooftop solar installations shall be designed, installed, operated and maintained in accordance with FC512





2022 NYC FIRE CODE: SECTION FC504.5

ROOFTOP ACCESS ON ROOFTOPS OVER 100 FEET IN HEIGHT

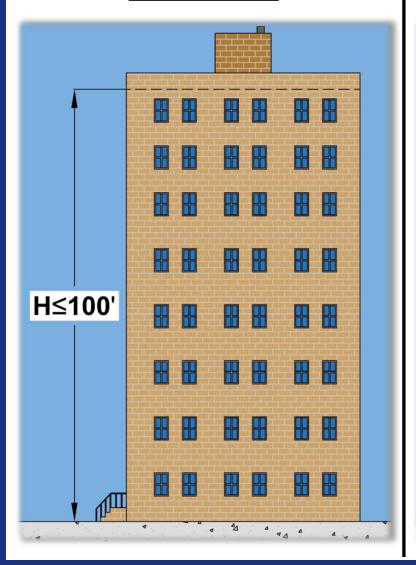
YES, I SAID OVER 100 FEET!!!



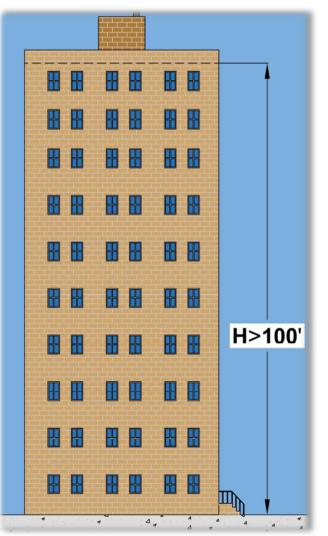
ROOFTOPS OVER 100 FEET



FC504.4



FC504.5



Rooftops over 100 feet must also comply with the clear path requirements found in FC504.4.4, Specifically:

- Clear path must be 6 feet wide.
- Must connect to any side of the building which has windows.
- Must connect to the rooftop bulkhead doors, hatches, ladders or any other points of roof access.
- Clearances around the bulkhead doors, hatches and ladders must comply with FC504.4.4[2] and FC504.4.6.





2022 NYC FIRE CODE: SECTION FC512

ROOFTOP SOLAR PANEL INSTALLATIONS



OVERVIEW OF FC512



Solar Panel on Flat Roofs shall comply with all requirements of <u>FC504.4</u>

Exception to the clear path requirement:

- **Approved** hinged mechanism for **clear path** obstructed by solar panels, NEEDS FD Certificate of Approval, TM-2 App. (FC 512.2[1])
- Acceptable encroachments on the clear path for narrow buildings, 25 feet or less (FC 512.2[2])





CLARIFICATION OF FC512.2[2]



Summary of the guidelines:

<u>FC512.2[2]</u> allows for "Qualifying Encroachments" to encroach upon the clear path to a limited extent and under the following circumstances:

- 1) The building rooftop must be 25 feet or less in width and/or depth
- 2) The design of the solar panel installation necessitates substantial rooftop coverage
- 3) The encroachment does not reduce the width of the clear path beyond the amount approved by the Fire Department. [minimum clear path width of 4 feet]
- 4) Qualifying Encroachments may not limit the perimeter access landing areas or any required rooftop clearances other than the clear path unless otherwise permitted under separate FDNY guidelines.
- 5) Proposed installation must be filed with DOB or the FDNY for full plan review.
 - PROFESSIONAL CERTIFICATION MAY NOT BE USED IN LIEU OF PLAN REVIEW
- 6) Installation must comply with all other requirements of the fire code including those of FC504.4



CLARIFICATION OF FC512.2[2]



Qualifying Encroachments:

- Attic ventilator
- Chimney
- Plumbing ventilation pipe
- Freestanding HVAC condenser with a capacity of 5 tons or more.

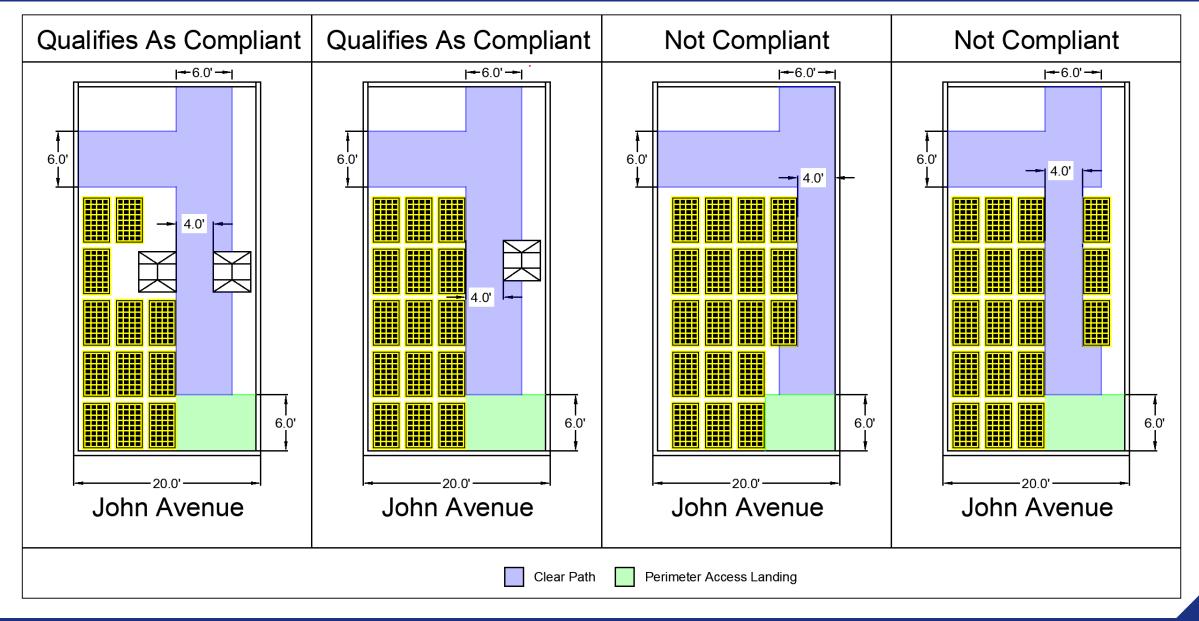
- Bulkhead
- Hatch
- Scuttle
- Skylight

Solar Panels are NOT considered to be a Qualifying Encroachment and may not limit the clear path. However solar panels in conjunction with a qualifying listed above may reduce the clear path to 4 feet.



CLARIFICATION OF FC512.2[2]







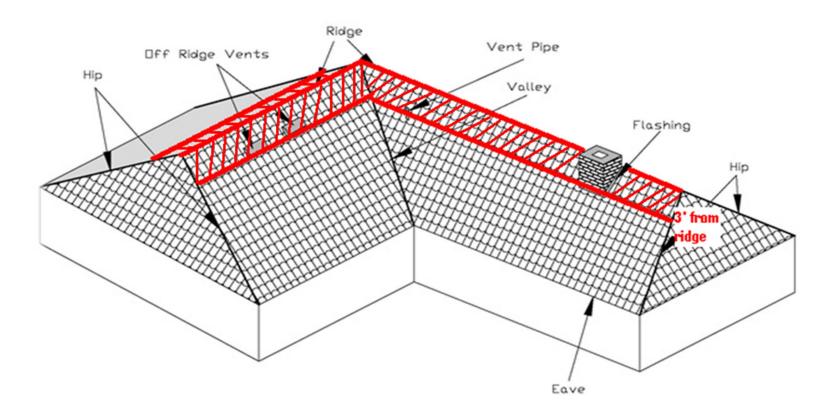
PITCHED ROOFTOPS



FC 512.3.1 & FC 512.3.2

For Solar Panels on Pitched Roofs, greater than 20°

• Provide 3 feet of clearance along BOTH sides of the ridgeline of each roof.





PITCHED ROOFTOPS



FC 512.3.1 & FC 512.3.2 (Continued)

- Conduits, wiring systems and raceways shall be located along dips and valleys away from ridge line (peaked roofs)
- Solar panel equipment shall be labeled:

 "WARNING: PHOTOVOLTAIC POWER SOURCE"

 in white capital letters no less than 3/8" in height on a red background



SHALLOW PITCHED ROOFS ON GROUP R-3 OCCUPANCIES



FC504.4.9

Group R-3 Occupancies whose rooftop has a slope is 9.5 degrees or greater do not have to comply with the requirements <u>FC504.4</u>.

HOWEVER

These rooftops instead must comply with <u>FC512.3</u>. You must provide 3 feet of clearance along BOTH sides of the ridgeline of each roof.

NOTE: SLOPED ROOFTOP FEATURES/ELEMENTS DO NOT QUALIFY.





COMMON NON-COMPLIANT INSTALLATIONS, SOLUTIONS AND HOW TO FILE





EXAMPLES OF NON-COMPLIANCE



















THE STAIR TO NOWHERE!!!!!!





YES!
THIS IS ACTUALLY
SOMETHING WE
FOUND ON A ROOFTOP.







WHAT DOES NOT REQUIRE AN APPLICATION?



- Fully code complaint rooftops.
- Ordinary repair and maintenance on roofs which includes but not limited to:
 - **≻**Reroofing
 - ➤ Repair parapet
 - ➤ Façade repair
 - Like for like replacement of equipment that is **NOT** an upgrade of equipment



WHAT REQUIRES AN APPLICATION?



NON-COMPLIANCE

Proposed

OR

Existing



PROPOSED WORK

- New equipment on a rooftop including: Cell Sites, Solar/PV Arrays, HVAC, Fencing
- Vertical Enlargements (penthouses, bulkheads, new floors)
- Accessory/Incidental use of roof: deck, bar, greenhouse
- Green Roofs, Blue Roofs
- New Building Construction
- Cantilever buildings



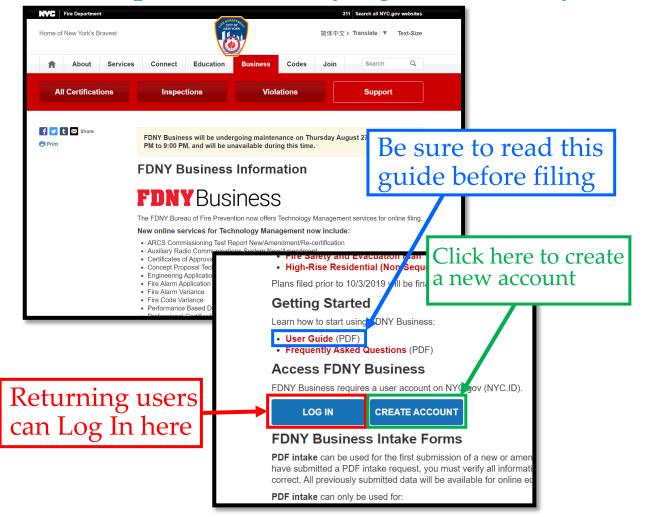


HOW TO FILE A ROOFTOP VARIANCE



Apply through the FDNY Business Portal

https://www1.nyc.gov/site/fdny/business/support/fdny-business.page



Note:

Be sure to follow this Path:

Select "Design and Installation"

Then "Technology Management Application"

Finally select "Rooftop Variance"

DO NOT SELECT FIRE CODE VARIANCE.

FIRE CODE VARIANCE IS NOT
USED FOR ROOFTOP
VARIANCES



HOW TO FILE A ROOFTOP VARIANCE



Application Fees:

- New Application: \$420
- Resubmission Fees: Not required provided that the application is resubmitted within 6 Months of the Letter of Deficiency's issuance date.

Required Docs:

- TM-5 Application
- 11"x17" plans original seal & signature
- Narrative for scope of work
- Photographs of current conditions on rooftop
- All other relevant docs such as determinations form other city agencies, FDNY summonses, etc.

NOTE: ALL DOCS MUST BE IN PDF FORMAT



TM-5 APPLICATION





TM-5, rev 07/15

NEW YORK CITY FIRE DEPARTMENT BUREAU OF FIRE PREVENTION

9 METROTECH CENTER, BROOKLYN, NY 11201-3857

TM-5: APPLICATION FOR ROOFTOP ACCESS VARIANCE/PLAN REVIEW

- . FDNY TM-5 must be typewritten, submitted with supporting documentation including a narrative (see Item 8 below), signed and sealed 11"X17" plan set for review, and photographs of the existing/proposed conditions on the rooftop.
- · Section 11 must be signed by the owner.
- . Fee for Plan Examination: \$420 made in money order or check, payable to NYC Fire Department.
- . Submit completed application in person at Window #8 on the first floor of FDNY Headquarters, 9 METROTECH

	CENTER, BROOKLYN, NY 11201-3857. Consult the FDNY Technology Management Bulletin #2/2011 for specific plan preparation instructions.								
1	Filing Status (required)	or all applicat	tions):						
Vari	ance Sought for: Propo	sed and/or	Existing Co	ondition(s)					
	Initial Filing	Resubmissi FPIMS No(oreviously a	ssigned FPIMS nur	mber, and att	ach copy	of objection letter):	
2	Premises Information	(required for	all applicatio	ns):					
House No(s): Stree					et Name:				
Borough: ZIP:			1		Block:		Lot:		
BIN:					Affected Floors:				
3	Applicant Information	1 (required fo	r all application	ons):					
Last Name: First Name:						Middle	Middle Initial:		
Busi	ness Name:					Business Tel:			
Business Address:				City:		State:		ZIP:	
E-Mail:						License	License No:		
Cho	ose One: P.E	R.A							
4	Owner Information (r	equired for all	applications):						
Last Name: First Name:				:			Middle Initial:		
Business Name:					Business Tel:				
Business Address:			City:		State:		ZIP:		
E-Mail:						Mobile	Mobile Tel:		
5	Filing Representative	(if applicable	2):						
Last Name: First Name:			:			Middle Initial:			
Business Name:						Busines	s Tel:		
Business Address:				City:		State:		ZIP:	
E-Mail:						Expeditor Registration No:			

Occupiable Roof	ck staurant/Bar	ole):			
Rooftop De	ck staurant/Bar				
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Other (if needed	<i>t</i>):	Rooftop Restaurant/Bar			
A and Certificate of Occ	upancy attached	?			
8h Annend the senarat	e narrative to w	our submission nacket			
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of modifying the code or	rule requiremen	t. Include all measures			
montioned property law	diesto oithor EDII	Mo No/s) or EDIN/s) and			
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tion specifically for Post	fton Assass/Ohe	terretione3			
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tion		Disposition			
ures (required for all appli	ications):				
	_	klered			
	Partially Sp	orinklered			
):	Non-Sprin	nklered			
Roof? YES NO Standpipe					
toof? YES NO	Fire Alarm				
ed in this application is t	rue, to the best	of my knowledge.			
Date:					
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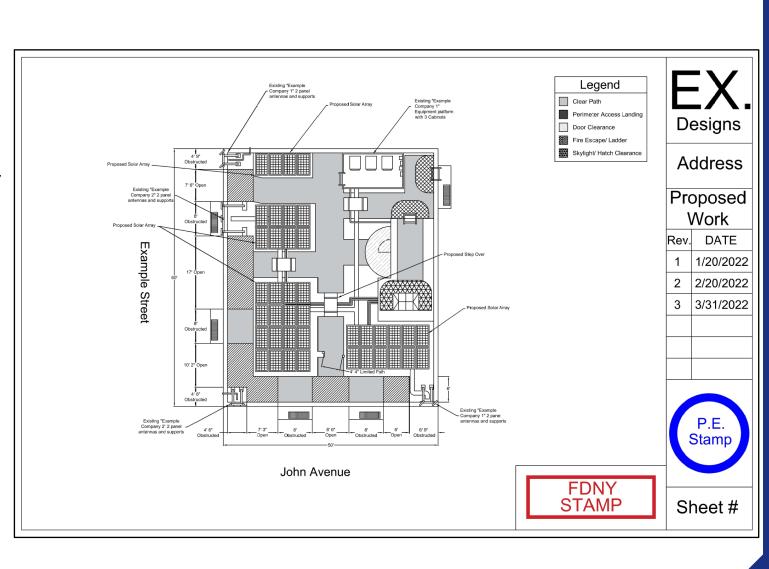


SAMPLE PLAN - FLAT ROOF



Include on 11x17 plans

- Entire rooftop, not only area of work proposed
- Label all existing building features
- Label all proposed work as "Proposed"
- Label all apparatus accessible exposures including parking lots
- Demonstrating compliance, showing required clearances
- State areas of non-compliance
- Proposed mitigation for noncompliance
- All submitted plans must have an original signature and PE/RA stamp
- Plans must have a 1.5"x3.5" clear box for FDNY Stamps





ADDITIONAL RESOURCES



- <u>Fire Code Section FC504, FC504.5 and Section FC512:</u> in the NYC Fire Code, specifically regarding rooftop access and clear path.
- New York City Fire Code Guide (Formerly FAQs): posted on the Fire Department's web site in response to many of the industry's questions. (Note: Not all information found in the Guide may apply to the 2022 code. An updated version will be released at a future date)
- Office of Technology Management Bulletin #2/2011 (Rev. 4/2016): This is a guidance document for the convenience of the public. It does not substitute for any applicable laws, rules or regulations. (Note: This bulletin applies to 2014 code, a new one will be issued for the 2022 code)



UNIT CONTACT INFORMATION



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THANK YOU FOR YOUR ATTENTION