Revised 3/31/2016

FIRE DEPARTMENT • CITY OF NEW YORK

STUDY MATERIAL FOR THE

CONSOLIDATED EXAMINATION F-60 FOR

FIRE GUARD FOR TORCH OPERATIONS

***Note: The F-60 Certificate of Fitness is NOT qualified to serve as a watchperson at construction site. Applicants who applies to be a watchperson should take S-60 Certificate of Fitness test. See the S-60 COF study material for further information.**

***Note: The F-60 Certificate of Fitness is NOT qualified to serve as a fire guard for impairment at construction sites. Applicants who applies to be a fire guard for impairment should take F-01 Certificate of Fitness test. See the F-01 COF study material for further information.**

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NOTICE OF EXAMINATION

Title: Consolidated Examination: Fire Guard for Torch Operations (F-60)

Date of Exam: Written exams are conducted Monday through Friday (except legal holidays) 8:00 AM to 2:30 PM.

REQUIREMENTS FOR WRITTEN EXAM

Applicants who need to take the exam must apply in person and bring the following documents:

REQUIREMENTS FOR WRITTEN EXAM

Applicants who need to take the exam must apply in person and bring the following documents:

1. Applicants must be at least 18 years of age.
2. Applicants must have a reasonable understanding of the English language.
3. Applicant must provide two forms of identifications; at least one form of identification must be government issued photo identification, such as a State-issued Drivers' License or Non Driver's License or a passport.
4. Applicants must present a letter of recommendation from his/her employer. The letter must be on official letterhead, and must state the applicant's full name, experience and the address where the applicant will work. If the applicants are self-employed or the principal of the company, they must submit a notarized letter attesting to their qualifications. For more info:
   - Sample of recommendation letter: http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-samplerec-letter.pdf
   - Sample of self-employed letter: http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-sample-selfrec-letter.pdf
5. Applicants must present a completed application for certificate of fitness (A-20 Form). http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-application-form.pdf
6. Applicants not currently employed may take the exam without the recommendation letter. If the applicants pass the exam, FDNY will issue a temporary letter with picture for the job seeking purpose. The C of F card will not be issued unless the applicants are employed and provide the recommendation letter from his/her employer.
7. Special requirement for the F-60 Certificate of Fitness: None
8. **APPLICATION FEE:**

   Pay the **$25** application fee in person by one of the following methods:
   - Cash
   - Credit card (*American Express, Discover, MasterCard, or Visa*)
   - Debit card (*MasterCard or Visa*)
   - Personal or company check or money order (*made payable to the New York City Fire Department)*

   For fee waivers submit: ***(Only government employees who will use their C of F for their work- related responsibilities are eligible for fee waivers.)***

- A letter requesting fee waiver on the Agency's official letterhead stating applicant full name, exam type and address of premises; ***AND***
- Copy of identification card issued by the agency

A convenience fee of 2.49% will be applied to all credit card payments.

9. **EXAM INFORMATION**

The **F-60** exam will consist of **25** multiple-choice questions, administered on a "touch screen" computer monitor. It is a time-limit exam. Based on the amount of the questions, you will have 38 minutes to complete the test. A passing score of at least 70% is required in order to secure a Certificate of Fitness.

Call (718) 999-1988 for additional information and forms.

Please always check for the latest revised booklet at FDNY website before you take the exam.
http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-f60-noe-study-materials.pdf

10. If all the requirements are meet and pass the exam a certificate will be issued the same day. Applicant who fails the exam will receive a failure report. To retake the exam applicants will need to submit a new application and payment.

RENEWAL REQUIREMENTS

This Certificate of Fitness must be renewed every ***THREE YEARS***. The renewal fee is **$15**. FDNY also reserves the right to require the applicants to take a re-examination upon submission of renewal applications.

You will receive a courtesy notice of renewal 90 days before the expiration date. However, it is your responsibility to renew your Certificate. It is very important to renew your C of F before it expires. Renewals submitted 90 days (up to one year) after the expiration date will incur a $25 penalty in addition to the renewal fee. Certificates expired over one year past expiration date will not be renewed. New exams will be required.

To change a mailing address:

- Submit a letter requesting the change of mailing address and a copy of your C of F with $5.00 fee.

To change a work location,

- Submit a letter from your current employer (on company letterhead) confirming that you are an employee and stating your new work location with a copy of your C of F and a $5.00 fee

To request a replacement certificate:

- Submit a driver's license or passport, social security number, mailing address and a $5.00 fee.

The certificate can be renewed **On-line**, **by Mail** or **in Person**.

•Renewal online

If you are an individual, make sure you have your 12 digit Certificate of Fitness Access ID. This can be found on your Renewal Notice. If you do not have your Renewal Notice, your Access ID is your 8 digit Certificate of Fitness number and the last four digits of your social security number. If you are submitting renewals on behalf of a company's employees, the company must be approved by FDNY and have an 8 digit Company Code. To request approval, email pubrenew@fdny.nyc.gov.

Renewal fee can be paid by one of the following methods:

- Credit card (American Express, Discover, MasterCard, or Visa)
- Debit card (MasterCard or Visa)
- E-check

A fee exempted applicants cannot renew online only by mail or in person.

If all the requirements are met, the certificate of fitness will be mailed out within 10 days.

For online renewal go to: **https://a836-citypay.nyc.gov/citypay/FDNYCOF**

•Renewal by mail

Mail your Renewal Notice (or if you did not receive a Renewal Notice, a copy of your certificate), along with your fee payment, Personal or company check or money order (made payable to the New York City Fire Department)

For fee waivers submit: ***(Only government employees who will use their C of F for their work- related responsibilities are eligible for fee waivers.)***

- A letter requesting fee waiver on the Agency's official letterhead stating applicant full name, exam type and address of premises; ***AND***
- Copy of identification card issued by the agency and if applicable, supporting documents to:

NYC Fire Department (FDNY)
Cashier's Unit
9 MetroTech Center, 1st Floor
Brooklyn, NY 11201

If all the requirements are met, the certificate of fitness will be mailed out within four to six weeks.

•**<u>Renewal in person</u>**

Submit your Renewal Notice (or if you did not receive a Renewal Notice, a copy of your certificate), along with your fee payment by one of the following methods:

- Cash
- Credit card (*American Express, Discover, MasterCard, or Visa*)
- Debit card (*MasterCard or Visa*)
- Personal or company check or money order (*made payable to the New York City Fire Department)*

For fee waivers submit: ***(Only government employees who will use their C of F for his or her work-related responsibilities are eligible for fee waivers.)***

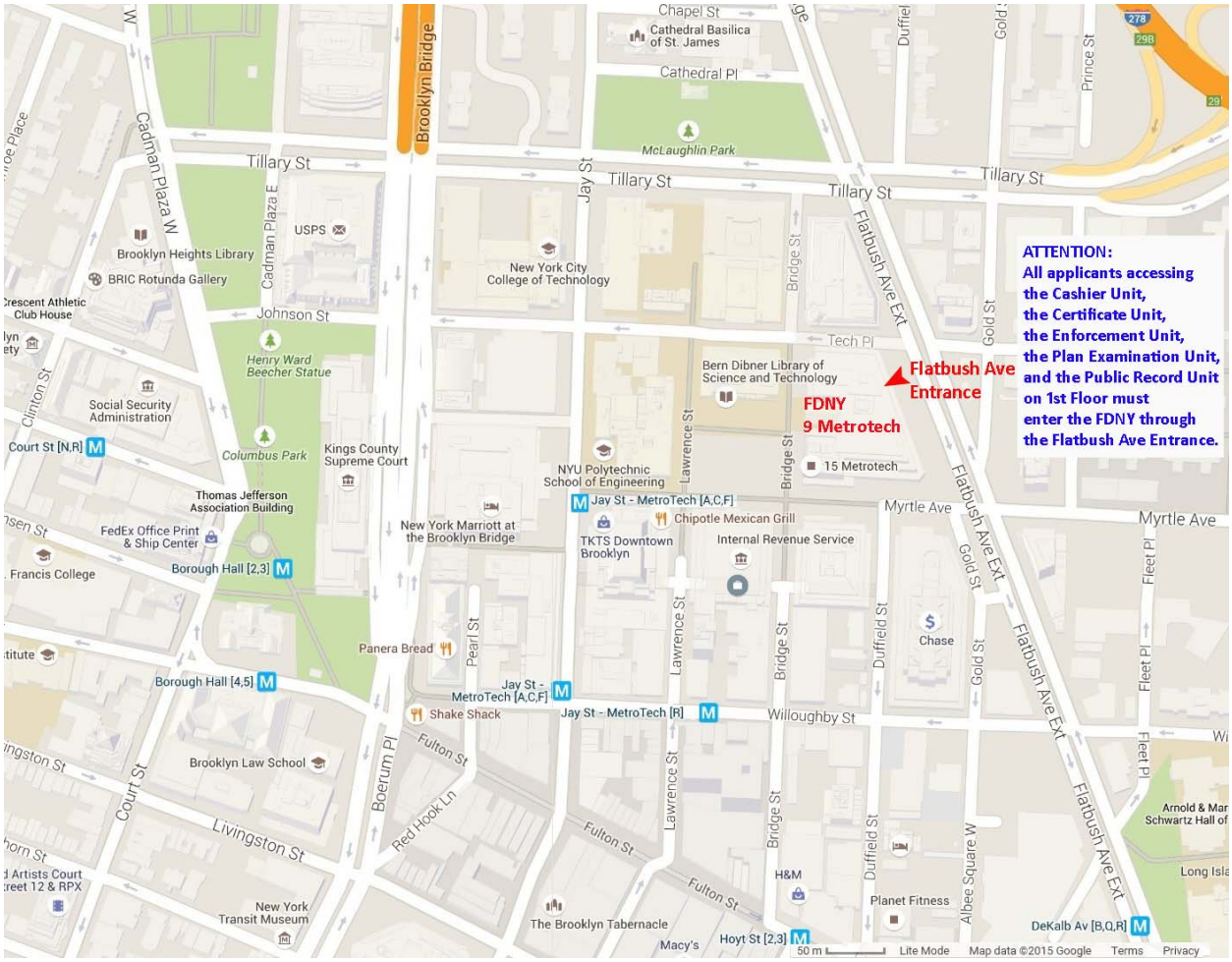
- A letter requesting fee waiver on the Agency's official letterhead stating applicant full name, exam type and address of premises; ***AND***
- Copy of identification card issued by the agency and if applicable, your supporting documents to:

NYC Fire Department (FDNY)
Cashier's Unit
9 MetroTech Center, 1st Floor
Brooklyn, NY 11201

If all the requirements are met, the certificate of fitness will be issued the same day.

A convenience fee of 2.49% will be applied to all credit card payments for original or renewal certificates.

EXAM SITE: **FDNY Headquarters,** 9 MetroTech Center, Brooklyn, NY. Enter through the **Flatbush Avenue entrance (between Myrtle Avenue and Tech Place)**.



STUDY MATERIAL AND TEST DECRIPTION

About the Study Material

This study material will help you prepare for the examination for the Certificate of Fitness for fire guard for torch operations. The study material includes information taken from the Fire Prevention Code of the Bureau of Fire Prevention. This study material consists of 3 parts. The exam covers the entire booklet and any tables. **It will not be provided to you during the test. It is critical that you read and understand this booklet to help increase your chance of passing this exam.** The study material does not contain all of the information you need to know to work as a fire guard. It is your responsibility to become familiar with all applicable rules and regulations of the City of New York, even if they are not covered in this study material. You need to be familiar with the National Fire Protection Association (NFPA) 51B, and Fire Code Chapter 26, which regulate the duties of fire guards for performing fire watch for torch operations in order to adequately prepare for the exam.

About the Test

25 questions on the F-60 Certificate of Fitness examination are of the multiple choice type with four alternative answers to each question. Only one answer is most correct for each question. If you do not answer a question, or if you mark more than one alternative your answer will be scored as incorrect. A score of 70% is required on the examination in order to qualify for the Certificate of Fitness. Read each question carefully before marking your answer. There is no penalty for guessing.

Sample Questions

1. Which of the following are allowed to be used/displayed while taking a Certificate of Fitness examination at 9 Metro Tech Center?

I. cellular phone
II. study material booklet
III. reference material provided by the FDNY
IV. mp3 player

A. III only
B. I, II, and III
C. II and IV
D. I only

Only reference material provided by the FDNY is allowed to be used during Certificate of Fitness examinations. Therefore, the correct answer would be A. You would touch "A" on the computer terminal screen.

2. If you do not know the answer to a question while taking an examination, who should you ask for help?

A. the person next to you
B. the firefighters
C. the examiner in the testing room

D. you should not ask about test questions since FDNY staff cannot assist applicants

You should not ask about examination questions or answers since FDNY staff cannot assist applicants with their tests. Therefore, the correct answer would be D. You would touch "D" on the computer terminal screen.

3. If the screen on your computer terminal freezes during your examination, who should you ask for help?

A. the person next to you
B. the firefighters
C. the examiner in the testing room
D. the computer help desk

If you have a computer related question, you should ask the examiner in the testing room. Therefore, the correct answer would be C. You would touch "C" on the computer terminal screen.

INTRODUCTION

This document outlines New York City Fire Department regulations for fire guard for hot work operations. Fire guards are required to reduce the threat of fires.

Certificate of Fitness
The fire watch for torch operations conducted at the following three locations shall be conducted by at least one F-60 fire guard:

(1) Construction sites.
(2) In any building or structure, when the torch operation is conducted by a person holding a citywide permit for torch operations.
(3) On any rooftop, or in connection with any torch-applied roofing system operation.

The Certificate of Fitness holder must keep the Certificates of Fitness upon his or her person, or otherwise readily available for inspection by any representative of the Department, at all times while conducting or supervising the material, operation or facility for which the certificate is required.

The F-60 Certificate of Fitness holder is required to comply with the following FDNY code and rule sections:

- Welding and Other Hot Work: **[FC Chapter 26]**
- Fire Prevention During Welding, Cutting and Other Hot Work: **[NFPA 51B, 2003 edition]**
- Liquefied Petroleum Gases: **[Rule 3809-01]**
- Compressed Natural Gas **[Rule 3507-01]**

FDNY Permit
Permits issued by the FDNY are required to conduct the following hot work:
(1) storing, using or handling oxygen and a flammable gas,
or
(2) storing, using or handling any flammable gas (e.g. LPG or CNG or acetylene) in excess of 400 SCF.
or
(3) storing, using or handling any oxidizing gas (e.g. oxygen) in excess of 504 SCF

For LPG, 400 SCF is approximately 47 lbs. The following table lists the number of LPG containers for the storage, use, handling or transportation, requiring a permit. This permit will be issued by the Fire Commissioner after the location has been inspected and approved as acceptable for such practices.

LPG Container Capacity	Number of Containers Requiring Permit
14.1 oz	54
16.4 oz	46
20 lbs	3
33.5 lbs	2
40 lbs	2
100 lbs	1

Portable **LPG** containers that are more than **16.4 oz** and **CNG** containers with a capacity greater than **8.7 SCF** must NOT stored, handled, or used indoors/roof in the following

occupancies (as defined in the Building code): residential occupancies, factory and industrial occupancies; educational occupancies; institutional occupancies, except as the commissioner may authorize by rule.

Use of LPG/Propane on an occupied roof requires an affidavit from a licensed professional (Architect or Engineer) stating the roof is constructed of non-combustible material(s).

Any single standard portable LPG container must not exceed 100 lbs in weight. Any single CNG container must not exceed 381 SCF.

A LPG/CNG permit will not be issued by the FDNY for a stationary LPG/CNG installation located in an area where access to piped natural gas from a public utility is available.

Example of LPG container with a capacity of 20 lbs	Example of LPG container with a capacity of 100 lbs

Types of FDNY Permits

(1) Site-specific permit

Such permit authorizes the permit holder to store, handle, or use flammable gases, or conduct a torch operation at a specific premises or location. A site-specific permit may be a permanent permit or a temporary permit. Permanent permits are valid for 12 months only. Every permits or renewal shall require an inspection and shall expire after twelve months. Temporary permit may be valid from one day to 12 months depends on the construction /operation need. For example, a one-week temporary permit may be issued to a construction job which only takes one week. Normally, a hot work operation (e.g. construction site or hot work repair) is issued a temporary permit.

Example of a permanent FDNY permit

FIRE DEPARTMENT, CITY OF NEW YORK [redacted] BUREAU OF FIRE PREVENTION

ACCOUNT NUMBER	TYPE	A.P.	D.O.	ADM. CO.	ISSUANCE DATE	PERMIT EXPIRES
77777777	10	P	12	E284	01/28/10	01/11

PREMISES ADDRESS	ACCOUNT NAME
1111 YORK ST STATEN ISLAND NY 11111	CARI & RENO

ITEM CODE	SUB CODE	QTY	DESCRIPTION	FLOOR NO.	FEE
345	00	1	COMPRESSED GASES ONLY STR/USE	1	PAID

PERMIT TYPE: 1

1=REGULAR
2=SUPPLEMENTAL
3=DUPLICATE

CARI & RENO
1111 YORK ST
STATEN ISLAND NY 11111

ANNUAL FEE PAID

20 11012938

BY ORDER OF THE COMMISSIONER

Example of a temporary FDNY permit

D.O.	COMPANY	BORO	ACCOUNT NO.	TOTAL FEE
01		MNH	3333333	$525.00 02 24 11

Expiration Date 11 01 11

THE CITY OF NEW YORK
FIRE DEPARTMENT

Bureau of Fire Prevention
9 Metro Tech Center Brooklyn, N.Y. 11201-3857

F 02872

FIRE DEPARTMENT PERMIT

Postal Address of Permit Holder or Agent:
KIRLIN PIPING INDUST.
347 REM WAY
WIDING RIVER, N.Y., 11792

Occupancy for which this Permit is issued and at which it must be displayed:
1310 WEST 11 STREET
NEW YORK, N.Y., 10011

New York MANHATTAN

Pursuant to the provisions of the administration Code and the regulations made thereunder, the above permittee is hereby authorized by the Fire Commissioner to store and use HAZARDOUS MATERIALS in the quantity specified.

This permit is revocable at the pleasure of the Commissioner, and is issued with the express understanding that the articles herein named are to be stored and kept in accordance with the provisions of the law; that the permittee will use all possible care to avoid accidents; that it is only available for the location and permittee named.

Salvatore Jacobs
Fire Commissioner

PERMIT COVERS

CODE NO.	
345	OXYGEN STORAGE AT A CONSTRUCTION SITE
346	ACETYLENE STORAGE AT A CONSTRUCTION SITE
347	USE OXYGEN AND ACETYLENE TORCH AT A CONSTRUCTION SITE
	NOTE: 4 OXYGEN AND 4 ACETYLENE CYLINDERS SEPARATELY STORED IN APPROVED CAGES AT GROUND LEVEL

This temporary permit is valid for 7 months.

RF-101 (1/01) 93-111-R25-0470

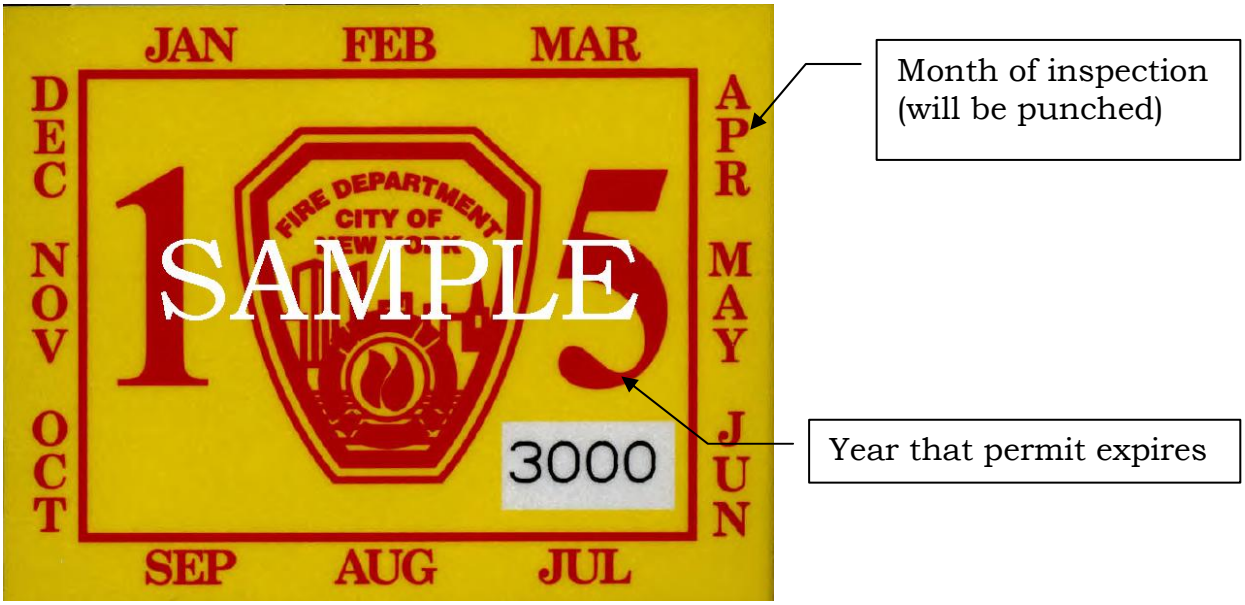
CASHIER'S COPY

(2) Citywide permit
Such permit authorizes the permit holder to store, handle, use or sell hazardous materials, or conduct an operation on a citywide basis. A citywide permit is valid to temporarily store, handle, use or sell hazardous materials or to conduct an operation at one or more locations subject to the following restrictions:

- The duration of such activity at any individual location does not exceed **30 calendar days** and **all hazardous materials associated with such activity are removed from the location at the end of the workday**. Periods of activity in excess of 30 calendar days at any one location shall require a site-specific permit.
- The quantity of hazardous materials being temporarily stored and used does not exceed 5 gallons of gasoline, or 250 gallons of any other flammable liquid, and 300 gallons of any combustible liquid. Storage or use of hazardous materials in quantities exceeding these amounts requires a site-specific permit for each location at which such storage or use occurs.

(3) Transportation permit
Such permit authorizes the permit holder to transport, pick up and deliver hazardous materials. Any person who transports any hazardous material in the quantity of requiring a FDNY permit has to apply for a FDNY transportation permit. The FDNY transportation permit (sticker) must be displayed on the vehicle.

Example of a FDNY transportation permit (a sticker)



All permits are not transferable, and any change in occupancy, operation, tenancy or ownership requires that a new permit be issued. The Certificate of Fitness holder is responsible for making sure that all fire safety regulations and procedures are obeyed on the premises. **Permits shall be readily available on the premise for inspection by Fire Department representatives.**

Hot Work Authorization (Hot Work Program Permit)
A hot work program authorization is required for any project conducted on premises involving hot work operations. Hot work program authorization is NOT issued by the FDNY, it must be signed and issued by the **responsible person**, and it must be available for

inspection by any representative of the Fire Department during the performance of the work, and for **48 hours after the work is complete**.

An authorization for hot work operations shall not be issued unless the individuals conducting such operations are capable of performing such operations safely.

HOT WORK AUTHORIZATION PERMIT

Note: This authorization applies only to this job, and in the area specified during the date and time noted.

GENERAL INFORMATION

Hot Work Performed By: ☐ Employee ☐ Contractor | ☐ Off-hours	Authorization #
Employee /	Contractors Name:
Supervisor / Foreman Name:	Supervisor / Foreman - On-site emergency contact phone number:
Location: Building address, room # and/or area of work . _____ _____ _____	Start Date: _____ Permit Start Time: _____ Stop Date: _____ Permit Stop Time: _____ Comments: _____ _____

HOT WORK ACTIVITY

☐ ARC WELDING	☐ SOLDERING	☐ GRINDING	☐ BRAZING	☐ **USING OXYGEN AND A FLAMMABLE GAS (FDNY PERMIT)**
☐ MAPP WELDING	☐ WELDING	☐ CUTTING	☐ NON-FIRE WORK	☐ OTHER:_____

Torch operations using oxygen and a flammable gas, and any torch operation for torch-applied roofing systems, shall be performed by a certificate of fitness holder. Certificate holders shall be responsible for keeping such certificate upon his/her person or otherwise readily available for inspection.

Torch Operator:	Certificate #:	Exp Date:
Fire Guard:	Certificate #:	Exp Date:

ACCEPTANCE BY THE RESPONSIBLE PERSON FOR HOT WORK

I certify that all applicable codes, procedures, regulations, rules, pre-checks and safety precautions will be followed for as long as the hot work authorization is effective.

Name: _____ ☐ Employee ☐ Contractor	Signature: _____	Date:

DESIGNATED TO AUTHORIZE THE PERFORMANCE OF HOT WORK

Name:	Signature:	Time:	Date:

Fire alarm precautions taken ☐ YES ☐ N/A Type: _____ _____	Pre-hot work check completed: ☐ YES FDNY permit required to conduct hot work? ☐ YES ☐ N/A

This authorization shall be available for inspection by any representative of the fire department during the performance of the work and for 48 hours after the work is complete.

DEFINITIONS

FIRE GUARD: A person holding a Certificate of Fitness for such purposes, who is trained in and responsible for maintaining a fire watch and performing such fire safety duties as may be prescribed by the commissioner.

FIRE WATCH: A temporary measure intended to ensure continuous and systematic surveillance of a building or portion thereof by one or more qualified individuals for the purposes of identifying and controlling fire hazards, detecting early signs of fire, raising an alarm of fire, and notifying the department.

HOT WORK: Cutting, welding, thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, cadwelding, installation of torch-applied system, or any other similar operation or activity.

HOT WORK AREA: The area exposed to sparks, hot slag, radiant heat, or convective heat as a result of hot work.

HOT WORK EQUIPMENT. Electric or gas welding or cutting equipment used for hot work.

HOT WORK PROGRAM. A program, implemented by a responsible person designated by the owner of a building or structure in or on which hot work is being performed, to oversee and issue authorizations for such hot work for the purpose of preventing fire and fire spread.

HOT WORK PROGRAM AUTHORIZATIONS. Authorizations issued by the responsible person under a hot work program allowing welding or other hot work to be performed at the premises.

NFPA: National Fire Protection Association. The world's leading advocate of fire prevention and an authoritative source on public safety. NFPA develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks.

RESPONSIBLE PERSON: A person trained in the fire safety hazards associated with hot work, and in the necessary and appropriate measures to minimize those hazards, who is designated by the owner of a premises to authorize the performance of hot work at the premises.

TORCH-APPLIED ROOF SYSTEM: Bituminous roofing systems using membranes that are adhered by heating with a torch and melting asphalt back coating instead of mopping hot asphalt for adhesion.

PART 1. HOT WORK OPERATION AND FIRE WATCH

A high temperature flame is needed to perform hot work operations. However, usually it is not the flame that causes a fire. Instead, it is the thousands of sparks and pieces of hot metal that are generated when using the torch. The sparks and pieces of hot metal are all possible sources of ignition. In fact, sparks and pieces of hot metal are the source of ignition in about 60% of all fires in industrial occupancies. This number is greatly reduced when the operators are trained to use the equipment correctly.

Fire History Summary

Date	Fire Summary	Lessons Learned	
Nov. 2010	Chinese city of Shanghai construction fire Sparks from welding equipment set a light nylon construction netting and bamboo scaffolding that nearly covered the building. 58 people died and 56 still missing, and more than 120 are injured.	There should be a safe distance between the combustible materials (in this case the bamboo scaffolding) the hot work operations area, or there should be a fire guard watching for sparks.	
July 2009	Throgs Neck construction fire, Queens, NY At 5 a.m. a fire started near scaffolding and flammable construction materials on the Queens-side bridge approach by a construction worker's blow torch.	Although still under investigation, the cause reflects a lack of fire safety at the construction site.	
June 2009	5-story apartment construction fire, Renton, WA Several spot fires from a roof torch had fallen into the void between the insulation, ceiling, and roof assembly, and a breeze provided enough air for a fire to flare up early hours later. The fire spread rapidly through the wooden construction. $12 million damage estimate in this fire.	Sheetrock had not yet been installed to protect the wood framing. There should be a fire guard watching for sparks.	

Date	Fire Summary	Lessons Learned	
Mar. 2009	Casino Fire, Joliet, IL A fire sparked by a construction worker welded a kitchen hood in an area of the casino. The fire caused heavy damage to sections of the Empress Casino and firefighters had to truck in water to contain the blaze. $340 million damage estimate in this fire.	There should be a fire guard watching for sparks.	
Dec. 2000	Dongdu Commercial Building construction, Luoyang, China Construction workers in the basement dropped molten metal on flannel rags and wooden furniture. The welders fled without warning, and workers on 2nd and 3rd floor, as well as 200 guests at an illegal party, were trapped. 309 people died.	Only 60 escaped the fire, as construction material and merchandise blocked exits. Firefighters used cranes to attempt rescues, and the fire took 3 hours to extinguish. The welders who started the fire were performing unlicensed renovation work.	

Sources

Arnold, Jim. "Large Building Fires and Subsequent Code Changes". April 7, 2005.
FDNY: Worker's blow torch started Throgs Neck fire. (2009, July 13). *Newsday*.
Small Fire causes damage at hospital construction site. (2010, February 16). *Daily Sound*.
Stephen G. Badger. "US Large-Loss Fires in 2009". (2010, November/ December). *NFPA Journal*.

1.1 Responsible Person and Pre-Hot Work Check

For hot work operation with citywide permit, the owner of the premises of the hot work operation areas must be notified in writing by the citywide permit holder **at least 48 hours before** the hot work is to be started.

For all hot work operations, the owner of the hot work operation areas must designate a responsible person. The responsible person must ensure that the hot work is performed in compliance with the terms and conditions of the permit. The person should inspect the hot work site prior to issuing the hot work authorization (hot work program authorization) to ensure that it is a fire safe area. He/she also need to periodically monitor the work as it is being performed to ensure there are no fire safety hazards. Hot work operations must be conducted under the general supervision of the responsible person.

Before hot work is authorized and at least once per day while the authorization is in effect, the hot work area shall be inspected by the responsible person to ensure that it is a fire safe area.

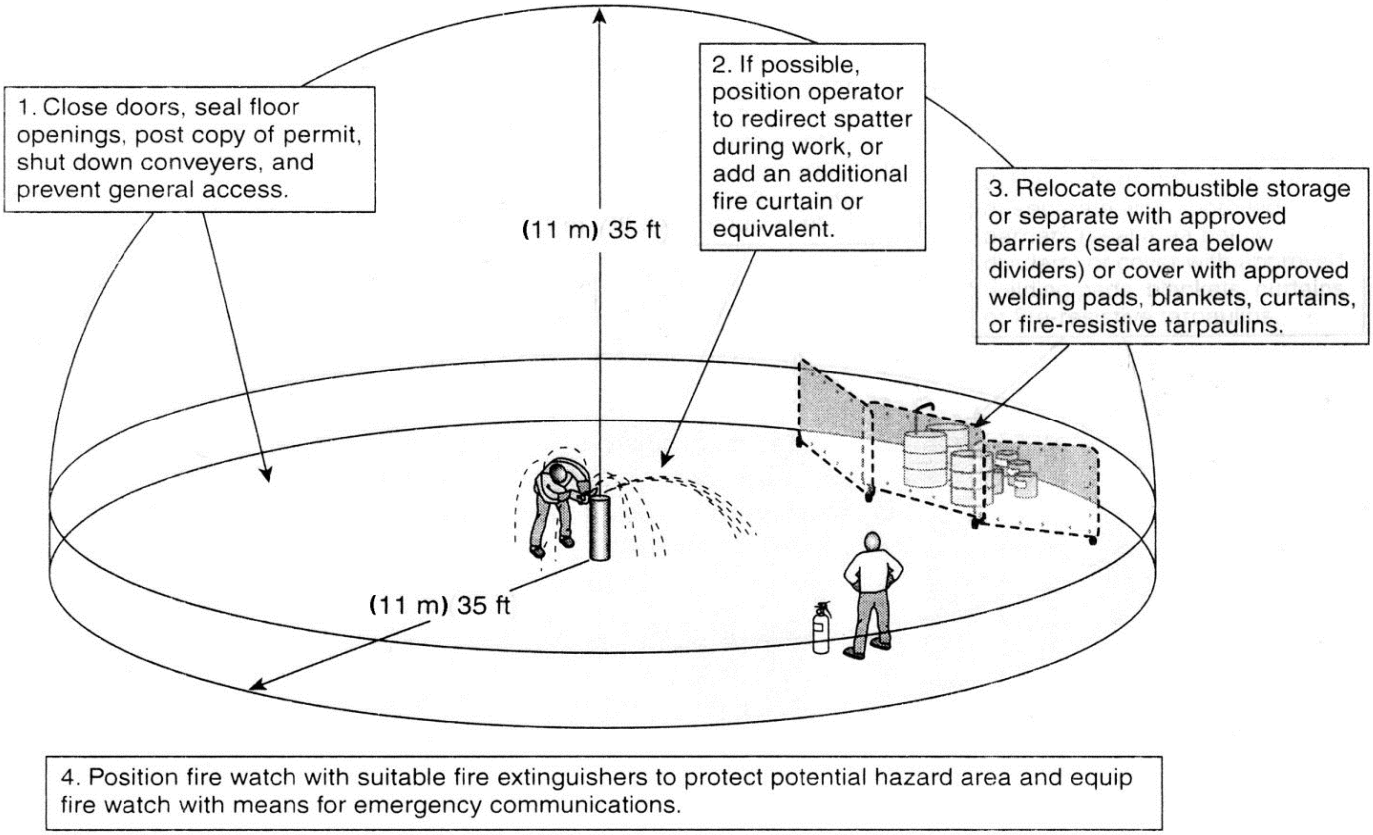
The pre-hot work check must be conducted by the responsible person before hot work is authorized and at least once per day. The check reports must be kept at the work site during the work, made available for inspection by a representative of the FDNY, and **maintained on the premises for a minimum of 48 hours after work is complete**.

A pre-hot work check must be conducted at least once per day and must verify the following:

1. The hot work equipment is in good working order.
2. The hot work area is clear of combustibles and flammable solids.
   (1) 35 feet rule for cutting or welding operation
   Hot work operations involving cutting or welding shall be conducted at least 35 feet from combustible materials and combustible waste or shall be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles.

   (2) 25 feet rule for other hot work operation
   All other hot work operations shall be conducted at least 25 feet from combustible materials and combustible waste or shall be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles.

The 2009 edition of National Fire Protection Association 51B shows the 35-ft. rule in a 3-D perspective. Detail information refer to Chapter 5 of NFPA 51B, 2009.



3. Exposed construction is of noncombustible materials or, if combustible, is protected.
4. Openings are protected.

5. Hot work area floors are clear of combustible waste accumulation.
6. Fire watch personnel, where required, are assigned.
7. Approved actions have been taken to prevent accidental activation of fire extinguishing systems and detection equipment.
   (1) Sprinkler protection.
   Sprinkler system protection **must not be shut off or impaired** while hot work is performed. Where hot work is performed close to sprinklers, noncombustible barriers or damp cloth guards shall shield the individual sprinkler heads and shall be removed when the work is completed. If the work extends over several days, the shields shall be removed at the end of each workday.
   (2) Fire detection systems.
   Approved precautionary measures shall be taken to avoid accidental operation of automatic fire detection systems. For example, the fire alarm system (e.g. smoke detectors) may need to be taken out of service during the hot work operation to avoid unwarranted alarms. The date and time the alarm system was taken off-line, the reason for such action, the name and operator number of the person notified at the central station (or other evidence of notification satisfactory to the Department), and the date and time the system was restored to service, must be entered in the alarm log book in each such circumstance. Fire watch for impairment must be provided when the alarm system is off-line.

9. Portable fire extinguishers and fire hoses (where provided) are operable and available.
10. All persons performing hot work possess certificates of fitness, where such certificates are required.
   (1) G-60 certificates of fitness is required for torch operations using oxygen and a flammable gas
   (2) G-60 or G-41 or G-42 certificates of fitness is required for torch applied roof system.
   (3) F-60 certificates of fitness fire guard is required to perform the fire watch for torch operations at (a) construction sites, (b) on any rooftop, or (c) in any building or structure, when the torch operation is conducted by a person holding a citywide permit for torch operations
11. All persons performing hot work requiring a permit possess a site-specific permit or citywide permit, authorizing such work.

1.2 Fire Safety Requirements

1.2.1. Gas Torch Operation Precautions

Each person must operate only one torch at a time and such torch must not be left unattended while ignited.

The torch equipment should only be used for purposes for which it was intended. It should not be used for any kind of tricks or stunts. This could result in serious or fatal injuries.

1.2.2. Protection of Combustibles

Areas designed for hot work operations shall have floors with noncombustible surfaces. Paper, wood shavings, straw and fabric are examples of combustible materials. Hot work operations involving cutting or welding shall be conducted at least 35 feet from combustible materials and combustible waste or shall be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles.

All other hot work operations shall be conducted at least 25 feet from combustible materials and combustible waste or shall be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles.

Combustible waste shall not be allowed to accumulate on floors and other surfaces within the hot work area. Hot work areas shall be regularly cleaned and combustible waste removed and disposed of lawfully.

If possible, the combustible materials should be moved to a safe location. If relocation of the combustible materials is impractical, combustibles, openings or cracks in walls, floors, ducts or shafts within 35 feet of the hot work area must be tightly covered to prevent the passage of sparks to adjacent combustible areas, or shielded by metal or fire-retardant guards, or provided with curtains to prevent passage of sparks or slag. They may also be wetted down as an added precaution. Ducts and conveyor systems that are capable of carry sparks to distant combustibles must be shielded, or shut down, or both. If hot work is done near walls, partitions, ceilings, or roofs, ignition of combustibles on the other side must be prevented.

It is prohibited to perform welding or cutting when supported by or resting on any compressed gas containers. Hot work shall not be performed on a container or equipment that contains or has contained a flammable solid, flammable liquid or flammable gas until the container or equipment has been thoroughly cleaned and purged. Hot work involving cutting, welding or heating of any flammable solid in any form shall be conducted only with an approval of the FDNY.

Partitions segregating hot work areas from other areas of the building shall be of noncombustible construction. In fixed hot work areas, the partitions shall be securely connected to the floor such that no gap exists between the floor and the partition. Partitions shall prevent the passage of sparks, slag, and heat from the hot work area.

Special requirement for a repair garage:
The use of a torch within a repair garage located on a property upon which a motor-fuel dispensing facility is situated must be conducted within a fire-rated enclosure (approved by the Building Department). All doors of such enclosure shall be fireproof and self-closing.

In a repair garage with a capacity for more than one vehicle, hot work shall be conducted within a fire-rated enclosure or behind a noncombustible screen that is positioned and of sufficient size to prevent the passage of sparks, slag and heat from the hot work area.

1.2.3. Signage

Where the hot work area is accessible to persons other than the operator of the hot work equipment, visible hazard identification signs must be posted in a conspicuous location to warn others before they enter the hot work area. An example warning sign is shown below.

A copy of the FDNY permit and hot work authorization are to be kept by the fire guard or the person who performs the fire watch. Copies of completed permits will be maintained in the project files. All hot work authorizations must be returned to the responsible person upon completion of work for the day to confirm that work in the area has been concluded. This returned authorization must be filed with the FDNY hot work permit section with the appropriate original.

1.3 Fire Watch Requirements

1.3.1. Fire watch

A fire watch must be maintained during any hot work operation. The fire watch shall observe the entire hot work area. Hot work conducted in areas with vertical or horizontal fire exposures that are not observable by a single individual shall have additional personnel assigned to ensure that exposed areas are monitored.

Persons conducting a fire watch shall keep constant watch for fires with respect to the areas being monitored in connection with hot work operations. **The persons conducting a fire watch shall not have other duties.**

Where hose lines are required, they shall be connected, charged and ready for operation. At least one portable fire extinguisher with a minimum **2-A:20-B:C** rating shall be provided and readily accessible within a **30 feet** travel distance of the location where hot work is performed and where the fire guards are positioned.

Exception: **There shall be not less than one multi-purpose portable fire extinguisher with a minimum 3-A 40-B:C rating for roofing operations utilizing heat-producing systems or other ignition sources.**

1.3.2. Fire guard

The fire watch for torch operations conducted at the following three locations shall be conducted by at least one F-60 fire guard:

(1) Construction sites.

(2) In any building or structure, when the torch operation is conducted by a person holding a citywide permit for torch operations.

(3) On any rooftop, or in connection with any torch-applied roofing system operation.

It is important to understand the code-required distinction between a fire watch and a fire guard. Not all individuals responsible to maintain a fire watch must possess an F-60 certificate of fitness.

1.3.3. Fire guard for construction sites and torch-applied roofing systems

It shall be unlawful to install any roofing material using a torch on a roof of combustible construction, or otherwise engage in roofing operations on roofs of combustible construction using hot work equipment.

A torch-applied roof system is a bituminous roofing system using membranes that are adhered by heating with a torch and melting asphalt back coating instead of mopping hot asphalt for adhesion. It is widely used in US, torch-applied operations can be hazardous to roofers and the public. Improper torch use or careless fire watch has caused many rooftop fires. Fire guards must be on continuous duty during all torch operations on the roof of a building.

At a construction site and torch-applied roofing system operation, every torch operator must also have a person performing fire watch by a F-60 fire guard.

Exception:

The single fire guard may be designated to conduct a fire watch for more than one torch operation on the same floor or level if each torch operation is not more than 50 feet from the fire guard, as measured by the actual path of travel, and the field of view of such fire guard encompasses all of the horizontal fire exposures of such torch operations.

Fire watch on floors below: Additional F-60 fire guard is required to perform fire watch on floor below if the torch operation is being conducted at or near the edge of an unenclosed floor of a building, or near a floor opening, or other location where sparks and slag may travel to one or more lower floors or levels.

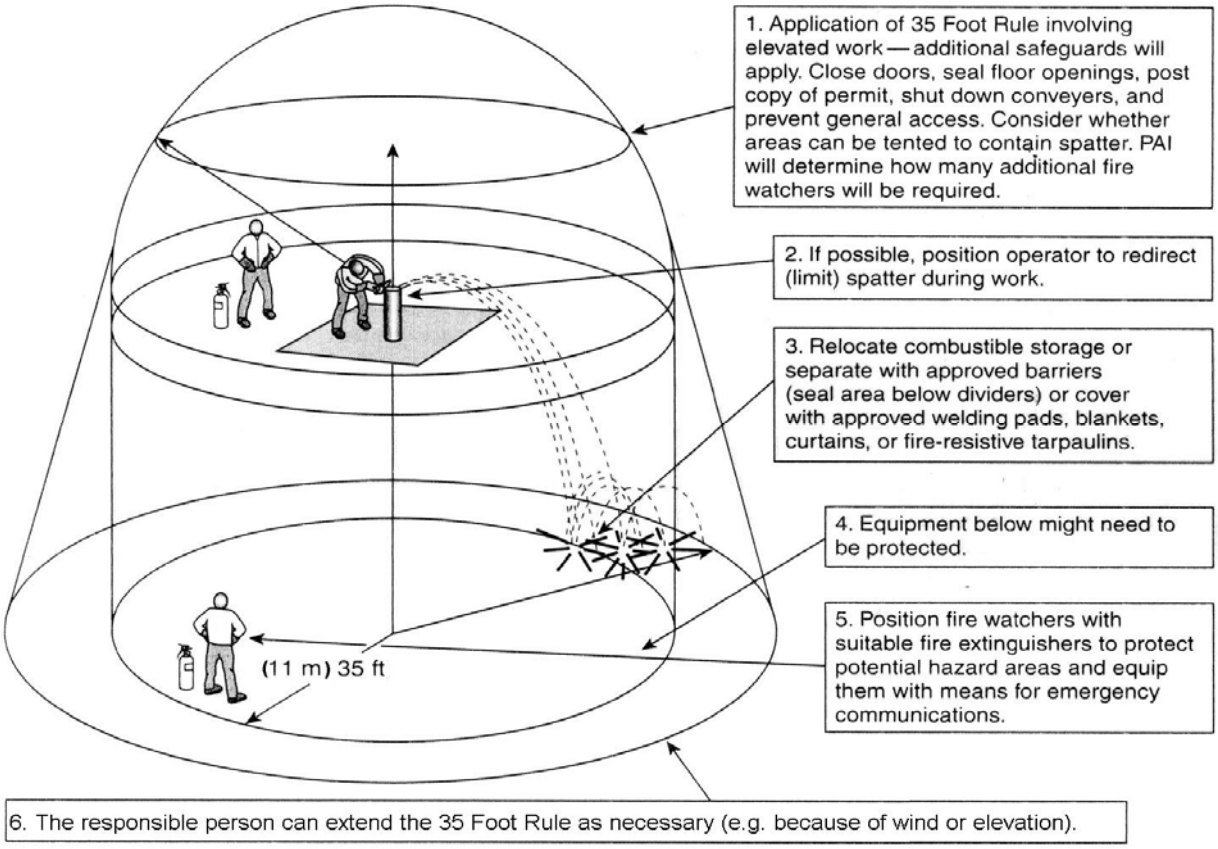
Fire watch is required for adjoining areas and below to make sure that sparks do not cause a fire on the adjoining areas.

This additional fire guard must conduct a fire watch on each lower floor or level containing combustible surfaces or materials within 35 feet of the area of such floor or level that potentially would be exposed to such sparks or slag. Prior to commencement of the torch operation, the fire safety manager or responsible person shall inspect the lower floors or levels and take all necessary and appropriate precautions to protect any combustible surfaces and materials that potentially would be exposed to sparks and slag from the torch operation. A certification to that effect must be made on the hot work authorization.

Exception:

1. A fire watch is not required on the floors/levels below a torch operation on a construction site when ALL the following conditions are met:
    - 1.1. the torch operation is not being conducted at or near the edge of an unenclosed floor of a building;
    - 1.2. the floor upon which the torch operation is being conducted is of noncombustible construction;
    - 1.3. there are no floor or exterior building openings within 35 feet of the torch operation; AND
    - 1.4. prior to commencement of the torch operation, the fire safety manager or responsible person conducts an inspection and takes the precautions to protect any combustible surfaces and materials that potentially would be exposed to sparks and slag from the torch operation.
2. Notwithstanding the foregoing exception, if sparks or slag generated by the torch operation are observed to extend beyond 35 feet, thereby potentially exposing lower floors or levels, the torch operation shall be immediately discontinued, and the floors or levels below shall be inspected for any fire condition. If there is any potential exposure surfaces or materials on the floors below from such sparks and slag, noncombustible barriers shall be provided and any other necessary or appropriate precautions shall be taken. If such barriers and precautions fail to block the passage of sparks and slag, a fire watch shall be established on the floors or levels below.

The 2009 edition of National Fire Protection Association 51B shows the 35-ft. rule in a 3-D perspective to account for multiple fire watchers. Detail information refer to Chapter 5 of NFPA 51B, 2009 .



1.3.4. Time and Recordkeeping requirement

A fire watch must be maintained during any hot work operation. The fire watch must continue for a minimum of 30 minutes after the conclusion of the work. The commissioner, or the responsible person implementing a hot work program, may extend the duration of the fire watch based on the hazards or work being performed.

For any CNG or LPG torch operation, **the first inspection shall be conducted 30 minutes after completion of torch operations; the second inspection 1 hour after completion of torch operations.** This is to make sure that there are no smoldering fires in the building. The fire guards must complete a signed inspection report. The fire guards or fire watch personnel must complete a signed inspection report (or the log book). **This report must be submitted to and retained by the person in charge of the torch operations**. The inspection report must be made available to any representative of the Fire Department and should be maintained on the premises for reasonable length of time (e.g. 48 hours) after work is complete.

Example: Fire Guard Daily Log Book for Hot Work

Fire Guard's Daily Log for Hot Work

Date: _____

- Each fire guard monitoring hot work must complete this log daily
- Enter a check for each item after verifying it for compliance in each active hot work area. If an item is not compliant and the competent person designated for this hot work operation or the fire guard cannot correct it, then no hot work may proceed in the area and must be notified.
- Notify personnel of any and all incidents that occur. Fires of all sizes must be reported, even if they are immediately extinguished. If a fire cannot be extinguished immediately, contact emergency services (e.g. 911) directly.
- Report any fires related to hot work operations in the comments section of this log.
- Print your name and sign this log at the end of your shift.

	Before beginning and while performing hot work						*After completing hot work*
WORK AREA	PERMIT	INCIDENT REPORTING	FIRE EXTINGUISHER	COMBUSTIBLES	FLAMMABLES	FIRE GUARD	POST-WORK CHECK
List each active hot work area on the lines below.	Posted by fire guard at work area?	Radio or phone on hand to notify personnel in case of incident?	At least a 2-A:20-B:C rating fire extinguisher in work area? (a minimum 3-A:40-B:C rating fire extinguisher on torch-applied roofing system operations?)	Wood, cardboard, & other combustibles within 35' to work area? Blankets protecting gas bottles in use?	Gas, Fuel, and other flammables no closer than 35' to work area?	Fire guard has an unobstructed line of sight?	Area checked 30 minutes after completion of work?
COMMENTS							

Name: _____ Signature:_____

Fire Guard Certificate of Fitness Number:_____ Expiration Date:_____

1.4 Gas Welding and Cutting Precautions

Oxygen containers and oxygen container valves, regulators, hose and other apparatus and fittings shall be kept free of oil or grease. Oxygen containers, apparatus and fittings shall not be handled with oily hands, oily gloves, or greasy tools or equipment. Oxygen and fuel gas containers shall be located at a distance from the hot work area sufficient to protect such containers from heat, sparks, slag, or misdirection of the torch flame.
The torch valve shall be closed and the gas supply to the torch completely shut off when hot work operations are discontinued for a period of 1 hour or more. Oxygen and fuel gas container valves shall be accessible to the torch operator or fire guard for immediate shutoff of the gas supply in the event of an emergency.

It shall be unlawful to conduct the following hot work operations:
1. Welding or cutting operations supported by or resting on compressed gas containers.
2. Torch-applied roof system operations on roofs constructed of combustible materials.
3. Use of an acetylene generator for hot work operations.

It shall be unlawful to test piping equipment or systems for leaks using a flame. Tests for suspected leaks in piping equipment and systems shall be made using soapy water.

PART 2. EMERGENCY NOTIFICATION, FIRE PROTECTION SYSTEMS, AND FIRE EXTINGUISHERS

2.1 Notification

The fire guard must be familiar with emergency notification procedures. The fire guard can use a wireless phone to make emergency notifications. If a wireless phone is used, it is important to be sure that the battery has enough power to last the entire shift. Notifying the FDNY by phone is the most direct and effective way to make notification of an emergency.

When notifying 911 of a fire or other emergency, the call-taker will need to obtain certain information about the emergency. Obviously the nature of the emergency and address are the most critical pieces of information. They operator may also ask what the nearest cross-street is, and if anyone is in need of medical attention and if so, what are their symptoms. Additionally, if you are responsible for a very large construction site, it is likely that there will be more than one means of entry. Providing information about which entrance would provide the most direct access to the emergency area would be helpful in getting the emergency response personnel to the area of the emergency as quickly as possible. If certain construction site entrances are obstructed with construction equipment or construction materials and are not easily accessible by emergency responders this information should be communicated to the 911 operator. The more information you have available to communicate to the 911 operator, the more efficient they can get the right kind of help to you quickly.

When you call 911, in addition to the information mentioned above, you should be prepared to answer other 911 operator questions, which may include:

- The phone number you are calling from
- The nature of the emergency
- Details about the emergency, such as a physical description of a person who may have committed a crime, a description of any fire that may be burning, or a description of injuries or symptoms being experienced by a person having a medical emergency

Be prepared to follow any instructions the operator gives you. Many 911 operators can tell you exactly what to do to help in an emergency until help arrives.

Finally, do not hang up until the operator instructs you to.

After the FDNY arrives, the fire guard should be sure to meet the emergency responders to provide them with information regarding the nature of the emergency, its location on the construction site and to provide the information that the emergency responders request.

2.2 Fire Protection System

2.2.1 Fire hoses

Where hose lines are required, they shall be connected, charged and ready for operation.

2.2.2 Sprinkler protection

Sprinkler system protection shall not be shut off or impaired while hot work is performed unless approved by the commissioner. Where hot work is performed close to

sprinklers, noncombustible barriers or damp cloth guards shall shield the individual sprinkler heads and shall be removed when the work is completed. If the work extends over several days, the shields shall be removed at the end of each workday.

2.2.3 Fire detection system

Approved precautionary measures shall be taken to avoid accidental operation of automatic fire detection systems. For example, the fire alarm system (e.g. smoke detectors) may need to be taken out of service during the hot work operation to avoid unwarranted alarms. The date and time the alarm system was taken off-line, the reason for such action, the name and operator number of the person notified at the central station (or other evidence of notification satisfactory to the Department), and the date and time the system was restored to service, must be entered in the alarm log book in each such circumstance. **Fire watch for impairment must be provided when the alarm system is off-line.**

2.3 Fire Extinguishers

All persons conducting hot work operations or performing fire watch shall be trained in the use of portable fire extinguishers, and **shall be capable of extinguishing fires when they are limited in size and spread such that they can readily be extinguished using a portable fire extinguisher.**

A portable fire extinguisher with at least a 2-A:20-B:C rating (a minimum 3-A:40-B:C rating fire extinguisher on torch-applied roofing system operations) must be readily accessible within 30 feet of the location where hot work is performed and where the fire guards are positioned. In case of fire, 911 must be called.

In the event of a fire extinguisher has been discharged, a fully charged replacement is required before work can resume. **The C of F holder is recommended to be trained for the use of portable fire extinguisher.** Portable fire extinguishers are important in preventing a small fire from growing into a catastrophic fire, however, they are not intended to fight large or spreading fires. **The trained Certificate of Fitness holders should only consider extinguishing fires when they are limited in size and spread such that they can readily be extinguished using a portable fire extinguisher.** By the time the fire has spread, fire extinguishers, even if used properly, will not be adequate to extinguish the fire. Such fires should be extinguished by the building fire extinguishing systems or trained firefighters only. In case of any fire, FDNY must be notified. Fire extinguishers must be used in accordance with the instructions painted on the side of the extinguisher. They clearly describe how to use the extinguisher in case of an emergency. The Certificate of Fitness holder should be familiar with the use of portable fire extinguishers. When it comes to using a fire-extinguisher just remember the acronym P.A.S.S. to help make sure you use it properly. P.A.S.S. stands for Pull, Aim, Squeeze, Sweep.

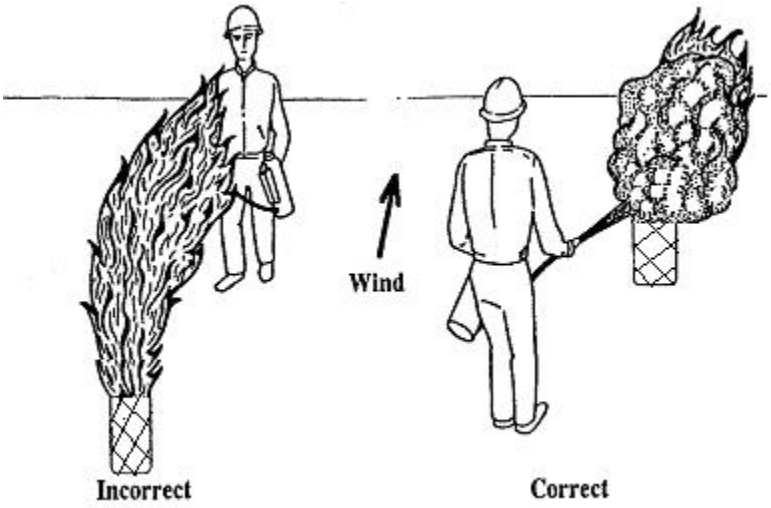
All fire extinguishers must be installed so that the top of the extinguisher is not more than 5 ft above the floor and the clearance between the bottom of the extinguisher and the floor is not less than 4 in. In other words, **no fire extinguisher is allowed to put on floor.**

Fire extinguisher in a construction site.

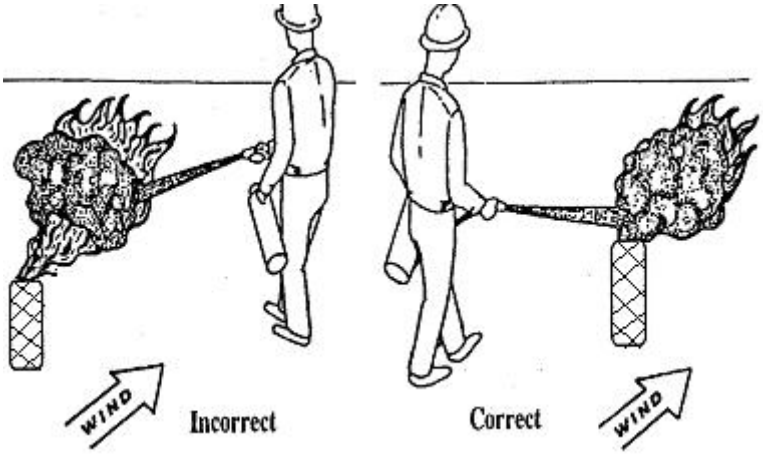
Improper floor placement of Fire Extinguisher.

2.3.1 Operation Instructions for a Fire Extinguisher

Special care must be taken when extinguishing a gas fire caused by a leak. The easiest way to extinguish the fire is to shut off by using the Emergency Shut Off valve until the flame is extinguished. **In case of any fire, Fire Department must be notified.** The flame must be approached from an upwind direction. This will prevent the Certificate of Fitness holder from being burned by the flames. **Never approach a fire from a downwind direction.** The correct ways to approach a fire are shown below.



The dry chemical stream must be directed toward the point where the flame begins. **Do not direct the chemical stream at the center of the flame.** This will not extinguish the fire. The correct way to direct the dry chemical stream is shown below.



For the piped gas, the gas supply must be shut off first and then call 911. This is safer than allowing the flammable gas (e.g. acetylene or LPG) to leak out. A flammable gas leak could result in a serious explosion if it were ignited. **Never attempt to extinguish the flame unless the gas supply shut. When it is not possible to shut off the gas supply (e.g. the fire is near the control valve or the shut-off valve) and the gas supply is limited (e.g. it is from a cylinder), allow the flame to burn itself out and call 911.** In the meantime, you should try to control the scene and prevent the fire spreading to the surrounding materials. **The trained Certificate of Fitness holders should only consider extinguishing fires when they are limited in size and spread such that they can readily be extinguished using a portable fire extinguisher.** By the time the fire has spread, fire extinguishers, even if used properly, will not be adequate to extinguish the fire. Such fires should be extinguished by the building fire extinguishing systems or trained firefighters only.

2.3.2 Fire Extinguishers Types

The Certificate of Fitness holder must be familiar with the different types of fire extinguishers available at the work site. The Certificate of Fitness holder must know how to operate the extinguishers in a safe and efficient manner. The Certificate of Fitness holder must also know the difference between the various types of extinguishers and when they may be used. A description of the classes of fires and the appropriate extinguishers are described below.

Class A fires are caused by ordinary combustible materials (such as wood, paper, and cloth). To extinguish a Class A fire, these extinguishers utilize either the heat-absorbing effects of water or the coating effects of certain dry chemicals.

Class B fires are caused by flammable or combustible liquids and gases such as oil, gasoline, etc. To extinguish a Class B fire, the blanketing-smothering effect of oxygen-excluding media such as CO_2, dry chemical or foam is most effective.

Class C fires involve electrical equipment. These fires must be fought with fire extinguishers that do not conduct electricity. Foam and water type extinguishers must not be used to extinguish electrical fires. After shutting off the electrical equipment, extinguishers for Class A or B fires may be used.

Class D fires are caused by ignitable metals, such as magnesium, titanium, and metallic sodium, or metals that are combustible under certain conditions, such as calcium, zinc, and aluminum. Generally, water should not be used to extinguish these fires.

A multi-purpose dry chemical fire extinguisher may be used to extinguish more than 2 Classes fires. Examples of some fire extinguishers are shown below.

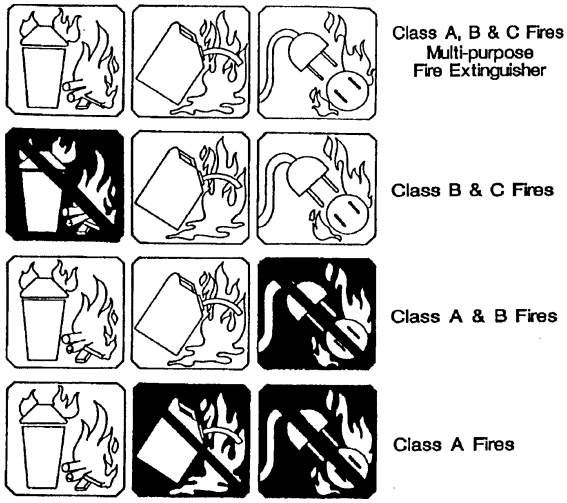
Examples of fire extinguishers

10-B:C (10BC)	3-A:40-B:C(3A40BC)	3-A:40-B:C(3A40BC), wheeled

2.3.3 Typical Fire Extinguishers

Symbols may also be painted on the extinguisher. The symbols indicate what kind of fires the extinguisher may be used on. Examples of these symbols are shown below.

CLASSES OF FIRES	TYPES OF FIRES	PICTURE SYMBOL
A	Wood, paper, cloth, trash & other ordinary materials.	
B	Gasoline, oil, paint and other flammable liquids.	
C	May be used on fires involving live electrical equipment without danger to the operator.	
D	Combustible metals and combustible metal alloys.	D
K	Cooking media (Vegetable or Animal Oils and Fats)	



Fire Extinguisher Identification Symbols

The symbol with the shaded background and the slash indicates when the extinguisher must not be used. The Certificate of Fitness holder must understand these symbols. All fire extinguishers should be kept in good working order at all times.

2.3.4 Fire Extinguisher Inspections

The extinguishers are required to be inspected monthly. The owner of the premises is responsible to designate a person to perform a monthly inspection. This inspection is a "quick check" that a fire extinguisher is available and will operate. It is intended to give reasonable assurance that the fire extinguisher is fully charged and operable. This is done by verifying that it is in its designated place, that it has not been actuated or tampered with, and that there is no obvious or physical damage or condition to prevent its operation. The information of the monthly inspection record must include the date the inspection was performed, the person performing the inspection, and those portable fire extinguishers found to require corrective action. Such recordkeeping must be either attached to the extinguisher or on an inspection checklist maintained on file. Labels or markings indicating fire extinguisher use, or classification, or both shall be placed on the front of the fire extinguisher. At least once per year, all fire extinguishers must be maintained by a FDNY approved company and a W-96 Certificate of Fitness holder.

Monthly inspection tag.