Municipal Fire Fighters'

Medical Standards and Essential Functions

Commonwealth of Massachusetts | Public Employee Retirement Administration Commission

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This is not the official version of the Municipal Fire Fighters' Medical Standards and Essential Functions. The official version is found in the guide, *Physician's Guide Initial-Hire Medical Standards* (effective July 2005), issued by the Human Resources Division (HRD) of the Commonwealth of Massachusetts. You may access the guide on the HRD Web site, www.state.ma.us/hrd/employment/EM_PAT/Physicians_Guide.doc.

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Municipal Fire Fighters' Medical Standards

(1)* Medical Evaluation[1] :

Each municipal fire department shall establish and implement a pre-placement medical evaluation for candidates. During the medical evaluation, the physician shall evaluate each individual to ascertain the presence of any medical conditions listed in these standards, or any medical conditions not listed which would prevent the individual from performing the essential job functions without posing significant risk. It is our intent to encourage the use of professional judgment regarding medical conditions which are not specifically listed. A candidate shall not be certified as meeting the medical requirements of these standards if the physician determines that the candidate has any Category A medical condition specified in these standards. Furthermore, a candidate shall not be certified as meeting the medical requirements of these standards if the physician determines that the candidate has a Category B medical condition that is of sufficient severity to prevent the candidate from performing the essential functions of a fire fighter without posing a significant risk to the safety and health of him/herself or others.

(2)* The medical evaluation shall minimally include the following:

(a) a comprehensive medical history,
a baseline (pre-placement) occupational history, including significant past exposures and training and experience with personal protection equipment,
(b) height and weight,
(c) vital signs: pulse, respiration, blood pressure, and, if indicated, temperature,
(d) dermatological system,
(e) ears, eyes, nose, mouth, throat,
(f) cardiovascular system,
(g) respiratory system,
(h) gastrointestinal system,
(i) genitourinary system,
(j) endocrine and metabolic systems,
(k) musculoskeletal system,
(l) neurological system,

[1]Physicians are also advised to ascertain the presence of any medical conditions listed in the National Fire Protection Association's (NFPA) 1582, Medical Requirements for Fire Fighters, which would prevent the individual from performing the essential job functions without posing a significant risk.

(m) mental status evaluation. Based on the severity, diagnosis, and impairment of any identified behavior or condition, the initial examiner is encouraged to consider referral of the applicant to a doctoral level mental health professional for further evaluation. In general, the current or recent use of psychotropic medications shall be reviewed by a Board certified psychiatrist.

(n) audiometry. Audiograms should be performed in an ANSI approved "soundproof" booth (ANSI S3.1-1977) with equipment calibrated to ANSI standards (ANSI S3.6-1973). If a booth is unavailable, the test room sound pressure levels should not exceed those specified in the Federal OSHA noise regulations (29 CFR 1910.25),

(o) visual acuity and peripheral vision testing,

(p) pulmonary function testing. A baseline test should be administered by an experienced individual. Only a spirogram that is technically acceptable and demonstrates the best efforts by an individual should be used to calculate the Forced Vital Capacity (FVC) and Forced Expiratory Volume in one second (FEV1.0),

(q) review of hepatitis B immunization status including hepatitis B surface antibody titer if immunized, offer of hepatitis B vaccine if not fully immunized or HbgAb titer less than 10 and documentation of declination if vaccination refused by examinee,

(r) a Purified Protein Derivitive (PPD) test for tuberculosis, based on individual departmental infection control plans, and,

(s) other diagnostic testing where indicated.

(3)* The medical evaluation process should also include:

(a) a review of tetanus immunization status.

(4)* All medical information collected as part of a medical evaluation shall be considered confidential medical information, and shall be released by the physician only with the specific written consent of the candidate.

The physician shall report the results of the medical evaluation to the candidate, including any medical condition(s) disclosed during the medical evaluation, and the recommendation whether the candidate is medically certified to perform as a fire fighter. The physician shall inform the fire department only whether or not the candidate is medically certified to perform as a fire fighter. The specific written consent of the candidate shall be required to release confidential medical information to the fire department, following guidelines set forth under the Americans With Disabilities Act (ADA) and other relevant policies.

(5) Category A and Category B Medical Conditions:

(a) A Category A Medical Condition is a medical condition that would preclude an individual from performing the essential job functions of a municipal fire fighter in a training or emergency operational environment, or present a significant risk to the safety and health of that individual or others.

(b) A Category B Medical Condition is a medical condition that, based on its severity or degree, may or may not preclude an individual from performing the essential job functions of a municipal fire fighter in a training or emergency operational environment, or present a significant risk to the safety and health of that individual or others.

(6) The following biological systems shall be components of the Initial Medical Standards for fire fighters:

A. Musculoskeletal

1. Head and Skull
   a. Category A medical conditions shall include:
      i. none.
   b. Category B medical conditions shall include:
      i. deformities of the skull or loss or congenital absence of the bony substance of the skull which limit the ability to wear a mask and/or protective breathing apparatus,
      ii. thoracic outlet syndrome sufficient to compromise required activity,
      iii. congenital cysts, chronic draining fistulas, or similar lesions,
      iv. any other head condition that results in an individual not being able to perform the job of fire fighter.

2. Neck and Cervical Spine
   a. Category A medical conditions shall include:
      i. none.
   b. Category B medical conditions shall include:
      i. cervical arthrodesis/fusion/instability,
      ii. cervical canal stenosis,
      iii. cervical radiculopathy or myelopathy,
      iv. herniated disc,
      v. degenerative disc disease,
      vi. abnormal chronic contraction of neck muscles,
      vii. any other neck condition that results in an individual not being able to perform the job of municipal fire fighter

3. Thoracic/lumbar/sacral Spine
   a. Category A medical conditions shall include:
      i. symptomatic spondylolisthesis, whether or not surgically corrected.
   b. Category B medical conditions shall include:
      i. lumbar laminectomy or discectomy, with or without fusion,
      ii. degenerative disease/spondylolysis/pars defect,
      iii. structural abnormality, fracture, or dislocation,
      iv. degenerative disk disease,
      v. herniated disk/sciatica/radiculopathy,

vi. spinal stenosis,
vii. spinal surgery not covered in Category A,
viii. any other spinal condition that results in an individual not being able to perform the job of fire fighter.

4. Extremities
   a. Category A medical conditions shall include:
      i. hemipelvectomy,
      ii. hip disarticulation,
      iii. above-the-ankle amputation,
      iv. upper extremity amputation at or above the wrist,

   b. Category B medical conditions shall include:
      i. severe limitation of motion of a joint, fibrosis, or arthrodesis,
      ii. other amputations not covered in Category A,
      iii. total joint arthroplasty:
         i. shoulder
         ii. elbow
         iii. wrist
         iv. hip
         v. knee.
      iv. deformity or dislocation of a joint or limb,
      v. joint reconstruction, ligamentous instability, or joint replacement not covered in (iii),
      vi. chronic osteoarthritis or traumatic arthritis,
      vii. inflammatory arthritis,
      viii. osteomyelitis,
      ix. compressive neuropathies including carpal tunnel syndrome or ulnar nerve palsy,
      x. required use of stabilizing orthopedic braces,
      xi. any other extremity condition that results in an individual not being able to perform the job of fire fighter.

B. Eyes and Vision

The medical evaluation shall minimally include visual acuity (Snellen) and peripheral vision testing using a Titmus or Optec Vision Screener or other similar standardized testing device. Contact lenses are not permitted to meet the uncorrected standard. X-chrom contact lens use is not permitted to meet the color standard. When the candidate is being tested, he/she must present without wearing contact lenses for at least 24 hours, so that uncorrected vision can be accurately tested.

1. Category A medical conditions shall include:
   a. uncorrected vision worse than 20/100 in either eye,
   b. corrected vision worse than 20/20 in the better eye UNLESS - the vision in the good eye alone is at least 20/25 AND the vision with both eyes together is 20/20 or better,
   c. peripheral vision of less than 70 degrees temporally and 45 degrees

nasally in either eye AND/OR any history of conditions limiting field of vision will necessitate additional assessment by an eye care professional who will use a Goldmann-type perimeter to determine if the binocular visual field is 140 degrees (at least 70 degrees temporally in each eye) with a III4e isopter.

2. Category B medical conditions shall include:
   a. diseases of the eye such as cataracts, retinal detachment, progressive retinopathy, or optic neuritis,
   b. ophthalmological procedures such as radial keratotomy or repair of retinal detachment, any other vision disorder or eye condition that results in an individual not being able to perform the essential functions of a fire fighter.

C. Ears and Hearing

The medical evaluation shall minimally include audiograms performed in an ANSI approved sound-treated booth (ANSI S3.1-1999) with equipment calibrated to the ANSI S3.6-1996, or current, standard. If a booth is unavailable, the test room sound pressure levels should not exceed those specified in the Federal OSHA noise regulations (29 CFR 1910.95 Appendix D).

1a. Category A (Failure of general standard):
Hearing deficit in pure tone thresholds in both ears, the deficit in each ear averaging 35 dB HL or worse at 500, 1000, 2000, and 3000 Hz,

1b. Category A:
Candidates failing the Category A standard and who still wish to be considered for appointment will be required to have follow-up examinations that include:

Full audiological examination, including speech reception threshold (SRT) and speech discrimination testing (NU-6 word lists) in both ears,
Full otological examination,

In order to pass:
Pure tone thresholds in better ear indicating average hearing levels at 500, 1000, 2000, and 3000 Hz to be lower than 35 dB HL,
AND
Performance score of 80% or better on the speech discrimination test in the better ear.

2. Category B medical conditions shall include:
   a. perforated tympanum,

b. auditory canal - atresia, severe stenosis, or tumor,
c. severe external otitis,
d. auricle - severe agenesis or traumatic deformity,
e. mastoid - severe mastoiditis or surgical deformity,
f. Meniere's disease, labyrinthitis or any disorder of equilibrium,
g. otitis media,
h. any other hearing disorder or ear condition that results in an individual not being able to perform the essential functions of a fire fighter.

Hearing Aids:
Non-implantable hearing aids are not permitted; must pass above-described standards unaided, or pass with the use of implantable hearing aids based on sound field-testing.

D. Dental

1. Category A medical conditions shall include:
   a. dental, jaw structural, or other abnormalities which preclude the ability to be fitted for and safely use protective equipment.

2. Category B medical conditions shall include:
   a. diseases of the jaws or associated tissues,
   b. orthodontic appliances,
   c. oral tissues, extensive loss,
   d. any other dental condition that results in an individual not being able to perform as a fire fighter.

E. Nose, Mouth, and Throat

1. Category A medical conditions shall include:
   a. tracheostomy,
   b. aphonia,
   c. congenital or acquired deformities which interfere with wearing a face mask or other required protective equipment.

2. Category B medical conditions shall include:
   a. congenital or acquired deformities not covered in Category A,
   b. defects of articulation that materially interfere with verbal communication,
   c. defects of rate (stuttering, stammering, or cluttering) that interfere with verbal communication,
   d. chronic severe rhinitis,
   e. any other nose, oropharynx, trachea, esophagus, or larynx condition that interferes with breathing or speech or otherwise results in an individual not being able to perform as a police officer or to communicate effectively.

F. Respiratory

1. Category A medical conditions shall include:
    a. lung abscess or empyema,
    b. active tuberculosis,
    c. pneumothorax,
    d. interstitial disease with abnormal exercise oxygen desaturation,
    e. moderate to severe obstructive pulmonary disease, using the following criteria:
        i. frequent exacerbation of symptoms (>1-2 times per week),
        ii. cough and low grade wheezing between exacerbations,
        iii. diminished exercise tolerance,
        iv. signs of airway obstruction using spirometry,
        v. regular drug therapy required.

2. Category B medical conditions shall include:
    a. lobectomy or pneumonectomy,
    b. obstructive disease not meeting Category A criteria,
    c. chronic bronchitis,
    d. emphysema,
    e. bronchiectasis,
    f. history of bronchiectasis, bronchitis, fibrous pleuritis, fibrosis, cystic disease, tuberculosis, mycotic lung disease, or pneumothorax,
    g. interstitial disease with normal exercise oxygen saturation,
    h. any other respiratory condition that results in an individual not being able to perform as a fire fighter.

G. Cardiovascular

1. Heart
    a. Category A medical conditions shall include:
        i. current diagnosis of angina pectoris,
        ii. congestive heart failure,
        iii. aneurysm,
        iv. acute or chronic pericarditis, endocarditis, or myocarditis. Endocarditis with resultant significant valvular lesions, or myocarditis leading to myocardial insufficiency,
        v. cardiac or multi-organ transplant or left ventricular assist device,
        vi. third degree AV block without cardiac pacemaker,
        vii. coronary artery disease, cardiac hypertrophy, or other cardiac condition without evidence of a functional capacity greater than 9 METs,
        viii. recurrent syncope,
        ix. history of sudden cardiac death syndrome,
        x. hemodynamically significant valvular heart disease,
        xi. current diagnosis of embolism or thrombophlebitis,
        xii. automatic implantable cardioverter defibrillator (AICD).
    b. Category B medical conditions shall include:
        i. coronary artery disease not covered in Category A,

ii. significant arrhythmias,
iii. cardiac hypertrophy,
iv. history of myocardial infarction, coronary artery bypass, coronary angioplasty, stent placement, or atherectomy,
v. congenital abnormality,
vi. cardiac pacemaker,
vii. any other cardiac condition that results in an individual not being able to perform as a fire fighter.

2. Vascular System
   a. Category A medical conditions shall include:
      i. congenital or acquired lesions of the aorta and major vessels,
      ii. marked circulatory instability as indicated by orthostatic hypotension, persistent tachycardia, and severe peripheral vasomotor disturbances,
      iii. aneurysm of a major vessel, congenital or acquired,
      iv. untreated persistent hypertension (systolic blood pressure of 160 mmHg or greater or diastolic blood pressure of 100 mmHg or greater).
   b. Category B medical conditions shall include:
      i. persistent hypertension controlled through medication (systolic blood pressure less than 160 mmHg and diastolic blood pressure less than 100 mmHg),
      ii. peripheral vascular disease, including intermittent claudication and Raynaud's phenomenon,
      iii. thrombophlebitis,
      iv. chronic lymphedema,
      v. severe varicose veins,
      vi. any other vascular condition that results in an individual not being able to perform as a fire fighter.

H. Gastrointestinal

1. Category A medical conditions shall include:
   a. liver or multi-organ transplantation,
   b. active gastrointestinal bleeding.

2. Category B medical conditions shall include:
   a. cholecystitis,
   b. gastritis,
   c. chronic or acute hepatitis,
   d. hernia,
   e. inflammatory bowel disease,
   f. intestinal obstruction,
   g. pancreatitis,
   h. bowel resection,
   i. gastrointestinal ulcer,

j. cirrhosis,
k. diverticulitis,
l. any other gastrointestinal condition that results in an individual not being able to perform as a fire fighter.

I. Reproductive

1. Category A medical conditions shall include:
   a. none.

2. Category B medical conditions shall include:
   a. pregnancy, for its duration. Any appointee who is pregnant shall be evaluated based on the appointee's ability to perform as a fire fighter in a training or emergency operational environment. Furthermore, a pregnant appointee shall be informed of the potential risks to her fetus due to possible exposures during fire fighter duties,
   b. any other reproductive condition that results in an individual not being able to perform as a fire fighter.

J. Genitourinary

1. Category A medical conditions shall include:
   a. renal disease requiring dialysis,
   b. renal or multi-organ transplantation.

2. Category B medical conditions shall include:
   a. any other renal, urinary, or genital condition that results in an individual not being able to perform as a fire fighter.

K. Neurological

1. Category A medical conditions shall include:
   a. ataxia,
   b. cerebral arteriosclerosis as evidenced by documented episodes of neurological impairment, including cerebrovascular accidents (CVAs) and transient ischemic attacks (TIAs),
   c. multiple sclerosis with activity or evidence of progression within previous three (3) years,
   d. muscular dystrophy,
   e. myasthenia gravis,
   f. ALS,
   g. all seizure disorders and choreoathetosis to include psychomotor, focal, petit mal, or grand mal seizures other than for those with:
      i. complete control during previous five (5) years with either no medication or a constant dose of the same medication,
      ii. normal neurological examination, and
      iii. definitive statement from qualified neurological specialist,
   h. dementia,
   i. any disorder affecting equilibrium which is acute, episodic, chronic, or

recurrent.

2. Category B medical conditions shall include:
    a. congenital conditions and malformations,
    b. migraines,
    c. clinical disorders with paresis, paralysis, loss of coordination, abnormal motor function, or abnormalities of sensation,
    d. history of subdural, subarachnoid, or intracerebral hemorrhage,
    e. recent severe head contusion or concussion,
    f. any other neurological condition that results in an individual not being able to perform as a fire fighter.

L. Skin

1. Category A medical conditions shall include:
    a. none.

2. Category B medical conditions shall include:
    a. non-localized, i.e., widespread, skin disease,
    b. extensive skin grafts,
    c. any other dermatologic condition that results in an individual not being able to perform as a fire fighter.

M. Hematopoietic and Lymphatic

1. Category A medical conditions shall include:
    a. hemorrhagic states requiring replacement therapy, including hemophilia,
    b. sickle cell disease (homozygous).

2. Category B medical conditions shall include:
    a. anemia, leukopenia, or thrombocythemia or chronic anticoagulation therapy,
    b. polycythemia vera,
    c. splenomegaly,
    d. history of thromboembolic disease,
    e. any other hematological condition that results in an individual not being able to perform as a fire fighter.

N. Endocrine and Metabolic

1. Category A medical conditions shall include:
    a. uncontrolled diabetes mellitus.

2. Category B medical conditions shall include:
    a. diseases of the adrenal gland, pituitary gland, parathyroid gland, or thyroid gland of clinical significance,
    b. nutritional deficiency disease or metabolic disorder,
    c. diabetes mellitus not covered in Category A,
    d. any other endocrine or metabolic condition that results in an

individual not being able to perform as a fire fighter.

O. Tumors and Malignant Disease

1. Category A medical conditions shall include:
    a. none.

2. Category B medical conditions shall include:
    a. malignant disease which is newly diagnosed,
    b. untreated, or currently being treated. The medical evaluation of any appointee with malignant disease which is newly diagnosed, untreated, or currently being treated shall be deferred until treatment has been completed. Treated malignant disease shall be evaluated based on that individual's current physical condition and on the likelihood of that individual's disease to recur or progress.
    c. any other tumor or malignancy that results in an individual not being able to perform as a fire fighter.

P. Psychiatric

1. Category A medical conditions shall include:
    a. none.

2. Category B medical conditions shall include:
    a. a history of any psychiatric condition, behavior disorder, or substance abuse problem not covered in Category A. Such history shall be evaluated based on that individual's history, current status, prognosis, and ability to respond to the stressors of the job,
    b. any other psychiatric condition that results in an individual not being able to perform as a fire fighter.

Q. Conditions Not Otherwise Covered

1. Category A medical conditions shall include:
    a. none.

2. Category B medical conditions shall include:
    a. connective tissue and autoimmune diseases, including dermatomyositis, lupus erythematosis, scleroderma, and rheumatoid arthritis,
    b. history of heat stroke, frostbite, or other thermal injury,
    c. potentially transmissible infectious disease, including HIV and AIDS,
    d. any other systemic condition that results in an individual not being able to perform as a fire fighter.

R. Chemicals, Drugs, and Medications

1. Category A medical conditions shall include:
    a. active alcoholism or substance abuse.

2. Category B medical conditions shall include the regular use of various chemicals and drugs, including – but not limited to – the following

categories:

a. anticoagulant agents,
b. cardiovascular agents,
c. narcotics,
d. sedative-hypnotics,
e. stimulants,
f. psychoactive agents,
g. systemic steroids,
h. any other chemical, drug, or medication that results in an individual not being able to perform as a fire fighter.

* Special Notations:

This is the amended version of the Commonwealth of Massachusetts Human Resource Division's (HRD) Initial Hire Medical Standards for Municipal Fire Fighters.

In amending this document, HRD adopted the 1997 edition of NFPA 1582, Standard on Medical Requirements for Firefighters as the basis for its regulations. Also, per agreement with the NFPA in acknowledgement and appreciation for the prior work performed by the NFPA in the development of these standards, HRD is presenting its medical standards for fire fighters in the enclosed format.

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An asterisk (*) following the number or letter designating a paragraph indicates portions of NFPA 1582 that have been adopted.

Municipal Fire Fighters' Essential Functions

1. EMERGENCY SCENE RESPONSE

A. Initial Response To Incidents:

- Tasks occurring between the receipt of an alarm and initial fire fighting or emergency scene activities.
- Dons protective turnout gear and equipment before and at emergency scenes.
- Proceeds to assigned apparatus upon receipt of call for service.
- Makes preliminary evaluation of incident based on alarm information received (e.g., alarm type, structure type, etc.).

B. Watch Duties:

- Stands watch to receive incoming alarms and information, answers phones, and monitors access to the station house.
- Provides alarm communiqué to equipment operators/officers.
- Tests alarms and dispatch equipment.
- Notifies station personnel (over public address or through use of signals) of incoming alarms and required response (e.g., everybody goes, truck only, engine only, etc.).
- Receives notification of multiple alarms, downtown alarms, and other significant emergencies through the Fire Alarm Office.
- Records administrative and general information messages that come in over the computer dispatch.
- Answers department and outside phone.
- Opens and closes fire house doors to allow apparatus or Chief's car to depart/return to house.

C. Driving:

- Drives apparatus to and from, and positions apparatus at, emergency scene.
- Drives apparatus safely to designated place.
- Selects most direct and expeditious route to alarm site.
- Maneuvers and positions apparatus at incident scene.
- Obtains knowledge of most direct and expeditious routes and studies them prior to incident response.
- Obtains knowledge of traffic laws and street conditions in order to operate the apparatus safely and expeditiously.
- Plans route and position based on anticipated actions (e.g., arrival routes) of other companies when driving to multiple alarm calls.

D. Pump Operations:

- Connects or hooks up apparatus to fire hydrant and operates pumps to supply water in appropriate pressure and volume—using hydrant wrenches, couplings, hoses, spanner wrenches, and other tools.
- Engages pumps.
- Fills hose with water by hydrant pressure.
- Connects and lays feeder line to supply water to fire.
- Pumps sprinkler system and wet or dry standpipe systems.
- Connects suction hose between hydrant and engine.
- Monitors control panel (e.g., water temperature, oil pressure gauge, fuel gauge, hydrant pressure).
- Pumps pre-connect hose-line.
- Pumps master stream (e.g., aerial ladders).
- Hooks up to ladder pipe to supply water during aerial ladder operations.
- Notifies officer of any problems which occur while pumping.
- Adjusts water pressure (by rule-of-thumb, according to pressure chart, and/or Rules and Regulations) in response to calls for more or less pressure.
- Pumps specialty nozzles (e.g. drive-in, cellar distributor).
- Implements cold weather procedures (e.g., tank circulation) when necessary.
- Maintains pressure by adjusting pressure relief valve or automatic pressure governor.
- Transfers from pressure stage to volume stage.
- Pumps booster lines.
- Opens and flushes hydrant to ensure it is functional.
- Shuts down pump when ordered to by officer.
- Checks hydrant for proper drainage.

E. Hose (And Extinguisher) Operations:

- Stretches line or uses extinguisher to deliver water, foam and other extinguishing agents to emergency scene.
- Operates nozzle at front of hose line and sprays water, foam or other agent onto fire or other hazard, or into involved structure, to extinguish, contain and/or control incident.
- Locates seat of fire or other hazard (e.g., gas leak) by observing, smelling or listening for smoke, sound, flames, gas, vapors, etc.
- Advances or assists in advancing hose to seat of fire or other hazard.
- Disconnects hose from bed and attaches to discharge gate.
- Determines type (size) and number of lengths of hose needed for operation.
- Connects to standpipe during high rise incident command.
- Connects hose lines to nozzles.
- Uses extinguisher to extinguish, contain and/or control incident.
- Selects type of extinguisher (e.g., foam, dry-chemical, etc.) needed for incident.
- Feeds hose line to other fire personnel.
- Determines proper nozzle and nozzle setting.
- Operates stang on tower ladder to apply water to structures on fire.
- Pulls hose off hose bed.

- Flakes out or dekinks hose line prior to charging or during extinguishment to ensure proper operations.

F. Mechanical Ladder Operations:

- Stabilizes ladder trucks and elevates and operates aerial ladders and platforms in order to rescue victims, provides access for ventilation, operates master stream devices, etc.
- Climbs mechanical ladders to perform search, rescue and other operations.
- Operates ladder from ground controls or from platform controls, while watching for power lines, trees and other overhead obstructions.
- Elevates, rotates and extends aerial or tower ladder for supported and unsupported operation, while watching for power lines, trees and other overhead obstructions.
- Stabilizes elevating apparatus using wheel chocks, stabilizing pads, stabilizing jacks and outriggers.
- Operates and directs ladder pipe to supply water during aerial ladder operations.

G. Manual Ladder Operations:

- Carries, raises, extends and climbs manual ladders to perform search, rescue and other operations.
- Extends manual (extension) ladders to reach victims.
- Climbs manual ladder to perform search, rescue, and other operations.
- Determines proper placement of manual ladder at scene.
- Determines manual ladder type and size needed at incident scene.
- Anchors and secures manual ladder (i.e., tying off) at scene.
- Raises and positions manual ladder at incident scene.
- Carries manual ladder from apparatus to incident scene.
- Returns manual ladder to apparatus.

H. Forcible Entry:

- Pry open, cuts, or breaks down doors, or otherwise enters structures, vehicles, aircraft and other entrapments in order to search for and rescue vic tims and provide access to the emergency scene—using axes, halligan tools, etc.
- Gains entry into structures using axes, sledge hammers, battering rams, halligan tool and other forcible entry tools.
- Cuts through surfaces using power saws and other power tools.
- Determines best location for forcible entry.
- Pry open doors in structures using pry bars, halligan tools, bolt cutters and other tools.
- Removes locks or hinges from doors using sledgehammers, battering rams, axes or other forcible entry tools.
- Breaks holes in wooden, brick and masonry walls using sledge hammers, battering rams, axes and other tools.

I. Ventilation:

- Opens or breaks windows, chops or cuts holes in roofs, breaches walls or doors, and hangs fans in windows or doors to remove heat, smoke and/or gas from structures or entrapments.
- Determines best location for venting structure based on location of hazard and fire personnel, roof type, and building construction.
- Breaks windows and other points of entry using axes, ladders and other tools, to ventilate structure.
- Cuts open walls, roof and other structures to ventilate structure.
- Opens windows and other points of entry manually or by using pry bars, halligan tools, and other tools, to ventilate structure.
- Hangs fans from ladders and in doors, windows, and holes in roofs or walls.
- Uses fans for positive pressure.

J. Search:

- Searches assigned area in order to locate victims and to obtain further information about incident, following standard search procedures.
- Searches floor or area of fire, or other hazard, for conscious and unconscious victims, sweeping assigned search area with arms, legs or tools.
- Searches floors above and below fire, or other hazard, including stairwells and bulkheads, for inhabitants who need to be moved or rescued.
- Views perimeter of the building to determine if there are victims needing assistance at windows, on ledges, or who have jumped.
- Identifies hazardous conditions in course of search and informs others of the problem.
- Determines search procedure or strategy needed to accomplish objectives.
- Searches structures for seat of fire, or other hazard, and extensions.

K. Rescue:

- Assists, hoists, carries or drags victims from emergency area by means of interior access (stairs, hallways, etc.) or, if necessary, by ladders, fire escapes, platforms, or other means of escape using rescue harnesses, ropes, etc.
- Rescues drowning victims using life-saving techniques.
- Conducts water rescues (i.e., river rescue, using boats) in accordance with established guidelines.
- Evacuates persons from incident scene due to risk of fire, explosion, exposure to hazardous chemicals, etc.
- Moves heavy objects and obstructions in order to free or gain access to trapped victims or bodies, using air bags, chains and hoists, jacks, shoring materials, hurst tools and other hydraulic tools.
- Drags or carries victims from emergency scenes.
- Hoists or lowers victims or fire personnel using ropes, knots and rescue harnesses.
- Pries, breaks or cuts structures, vehicles, and/or aircraft to free victims involved in accidents, cave-ins, collapsed buildings or other entrapments—using door openers, jaws, axes and other manual and

mechanical equipment.
- Instructs persons on upper floors as to appropriate actions (e.g., staying put, ascending to upper floors, descending to lower floors via fire escapes, etc.).
- Digs to free victims trapped in tunnels, pipes, excavations, cave-ins or other entrapments using shovels, picks, spades and other equipment.
- Places victims onto stretchers, backboards, stokes, etc.

L. Salvage:
- Moves and covers furniture, appliances, merchandise and other property; covers holes in structures; stabilizes damaged structural components; and redirects or cleans up water in order to minimize damage—using plastic and canvas covers, etc.
- Tears down or shores up weak and dangerous structural components (e.g, floors, walls, roofs, overhangs and stairs) using hooks, axes, saws and other tools.
- Spreads salvage covers over property.
- Protects the integrity of the incident scene, while performing salvage operations, in case of suspected arson.
- Moves furniture and other objects to protect from water or other damage.
- Removes water from floors using brooms, squeegees, mops, water chutes, catchalls and pumps.

M. Overhaul:
- Opens up walls and ceilings, cuts or pulls up floors and moves or turns over debris, in order to check for hidden fires which could rekindle or spread—using hooks, axes, saws and pitchforks.
- Opens ceilings, walls, etc., to expose hot spots and other hazardous conditions with axes, pike poles, etc.
- Searches for and extinguishes any hidden fires by looking, feeling or smelling for fire and smoke.
- Checks and searches open areas, walls, open structures for fire extension.
- Removes and neutralizes or disposes of flammable or hazardous materials from buildings.
- Removes and extinguishes burned or smoldering debris from buildings.
- Determines whether a smoke detector was present and functional.

N. Clean-Up/Pick Up:
- Picks up, cleans and returns equipment to vehicle and rolls or folds hose, so that the company can go back in service.
- Controls and cleans up the Fire Department's medical waste products.
- Cleans and returns all tools, equipment, supplies and property in usable condition to appropriate vehicles.
- Shuts down and drains lines at pumps.
- Determines that all hoses used during response to incident are present and accounted for.
- Cleans hoses using hose washers or brooms and brushes.
- Backs lines out of structures.

- Rolls and folds hoses after use and returns them to appropriate vehicle.
- Cleans the apparatus.

O. First Aid:

- Provides direct medical assistance to persons requiring emergency attention or assists others in providing medical assistance.
- Administers CPR if necessary.
- Determines priority of emergency medical treatment for victims.
- Administers first aid other than CPR.
- Operates oxygen and other medical equipment.
- Assists EMS personnel in administering medical treatment.

II. STATION DUTIES AND MAINTENANCE

P. Equipment Maintenance:

- Checks, cleans, and maintains personal gear and equipment to ensure proper and safe operation.
- Checks S.C.B.A. for proper operation and adequate air pressure.
- Checks medical equipment.
- Checks turnout gear for safety and structural integrity.
- Checks the condition of generators, blowers, lights, cords and fans.
- Checks and maintains power equipment.
- Places turnout gear on or near apparatus.
- Checks extension ladders.
- Checks hose on apparatus (proper bedding and amount).
- Checks and performs ordinary maintenance on other portable equipment (e.g., checks oil levels, greases, etc.).
- Cleans, reloads, and tests hoses.
- Recommends that officer call for repairs on equipment.
- Performs annual hose tests.
- Inventories and performs regular maintenance on hand tools (e.g., paints, oils or stencils hand tools).
- Changes over equipment and supplies from one apparatus to another.
- Paints other equipment as needed.

Q. Apparatus Maintenance:

- Checks, cleans, and maintains apparatus to ensure proper and safe operation.
- Checks ability of engine to pump water.
- Checks engine pumper pressure.
- Checks the aerial ladder sections, outriggers.
- Recommends to officer that apparatus be kept out of service due to mechanical problems.
- Performs normal daily apparatus check (e.g., oil, fuel and water levels; proper pressures and lubrications; batteries; lights; sirens; brakes; tires; etc.).
- Recommends that officer call for repairs on apparatus.
- Performs normal weekly apparatus check (e.g., hydraulic fluid levels).

- Equips apparatus with traction devices (e.g., chains) as necessary.
- Notifies officer of electrical or mechanical problems on apparatus.
- Checks with Equipment Operator coming off duty regarding condition of apparatus.
- Performs annual pump test.
- Cleans motor and pump on apparatus.

R. Facility Maintenance:

- Checks, cleans, and maintains house facilities. This includes the performance, or assignment, of routine housekeeping chores.

III. FIRE PREVENTION AND INVESTIGATION

S. Inspection Of Buildings And Fire Protection Devices:

- Inspects buildings for fire prevention/hazardous materials code violations or hazards on a periodic basis or during the course of their activities. Inspects alarms, hydrants, sprinkler systems, etc.
- Recognizes code violations (e.g., blocked exits, improper storage of chemicals, etc.).
- Inspects buildings for code compliance.
- Conducts inspections of schools.
- Inspects buildings upon request of occupants/owners.
- Conducts on-site inspections of fire protection devices (e.g., hydrants, alarms, sprinkler systems, etc.).

T. Pre-Fire Planning:

- Reviews or prepares plans in order to provide information regarding hydrant locations, exposures, hazardous materials and other areas or situations of high risk.
- Conducts site surveys in district.
- Tours buildings in order to identify or verify the presence of an unusual fire hazard or situation.
- Recognizes a target hazard (e.g., a new high-rise or a building with hazardous materials) that may warrant the development of a pre-fire plan.
- Conducts familiarity inspections in district.
- Familiarizes self with layout of first and second alarm districts.

U. Investigations:

- Examines incident scene, conducts interviews, collects and preserves evidence, and reviews forms and reports to help determine the cause of a fire or other emergency.
- Responds to incidents of suspicious or undetermined origin.
- Observes fireground conditions to detect possible arson.

IV. PUBLIC AND COMMUNITY RELATIONS

V. Public Relations:

- Engages in activities which have an impact on the department's image in the community. Such activities include providing information to the media, providing assistance and support to civilians seeking help or information, etc.
- Deals with distressed individuals at emergency scene.
- Meets civilians in the fire station, conducts tours and provides information.
- Makes public presentations and conducts demonstrations of apparatus and equipment on behalf of the Fire Department.

W. Public Training And Education:

- Oversees, develops, conducts and/or evaluates fire prevention and other educational programs for members of the public.

X. Audio-Visual Production:

- Operates audio-visual equipment and develops and produces audio-visual materials for internal use or for public broadcasting.

V. PROFESSIONAL DEVELOPMENT

Y.Professional Development:

- Participates in training drills and classes to enhance job-related skills and abilities. Reads internal memos and bulletins to keep apprised of new developments in departmental operations and procedures.
- Maintains knowledge of chemicals and other hazardous materials.
- Maintains knowledge of building structures related to fire control.
- Attends specialized training sessions (e.g., CPR certification, special schools (e.g., Foam, ICS), etc.).
- Attends routine training drills and sessions.
- Maintains knowledge of latest firefighting equipment and techniques.
- Attends "live-incident" training drills.
- Attends external seminars/workshops and college courses to be aware of current developments in the fire service.
- Observes training videotapes.
- Participates in external agencies and societies (e.g., NFPA).
- Acts as a superior officer.
- Receives training in superior's work activities.
- Reviews internal Massachusetts Fire Department bulletins, memos, etc., to remain aware of departmental updates.
- Reads professional journals and publications (e.g., Fire Command) to be aware of current developments in the fire service.

Z. Other Duties

- Carries hose, tools and other equipment to and from emergency scenes.

- Operates generator to supply electricity to the emergency scene.
- Sets up electrical cords and lights.
- Serves on special project committees to which he/she is assigned (e.g., Awards Committee, Hydrant Inspection, etc.).

Municipal Fire Fighters' Physical Abilities Test

Fire Fighter Events

Event 1: Stair Climb

Physiological demands are placed on the cardiovascular and respiratory systems. These demands include:

- increased demand on the lungs to facilitate a greater respiratory rate
- increased exchange of oxygen and carbon dioxide between the blood and alveoli in the lung
- increased transport of oxygen and carbon dioxide in the blood
- more blood pumped through the body from the heart to the lungs and skeletal muscles
- increased exchange of oxygen and carbon dioxide from the blood to the active skeletal musculature
- increased generation of energy in the form of adenosine triphosphate (ATP) in the muscle cells
- greater demand for removal and buffering of hydrogen ions generated during the production and utilization of energy in the muscle
- greater need to maintain thermal balance through decreased vasoconstriction and increased vasodilation of sweat glands in the skin resulting in an increased sweating rate

Activation of the skeletal system to generate muscular strength and endurance, which requires:

- contraction of the abdominal muscles (rectus abdominous, external obliques, internal obliques, serratus and erector spinae)
- contraction of the lower body and leg muscles (adductor longus, rectus femoris, vastus lateralis, vastus medialis, soleus, gastrocnemius, semitendinosus, semimembranosus, biceps femoris, gluteus maximus, gluteus medius)
- generation of ATP to facilitate muscle contraction and force generation
- removal and buffering of hydrogen ions generated during the production and utilization of energy in the contracting muscle

Event 2: Ladder Event

Physiological demands are placed on the cardiovascular and respiratory systems, which include:

- increased demand on the lungs to facilitate a greater respiratory rate
- increased exchange of oxygen and carbon dioxide between the blood and alveoli in the lung

- increased transport of oxygen and carbon dioxide in the blood
- more blood pumped through the body from the heart to the lungs and skeletal muscles
- increased exchange of oxygen and carbon dioxide from the blood to the active skeletal musculature
- increased generation of energy in the form of ATP in the muscle cells
- greater demand for removal and buffering of hydrogen ions generated during the production and utilization of energy in the muscle
- greater need to maintain thermal balance through decreased vasoconstriction and increased vasodilation of sweat glands in the skin resulting in an increased sweating rate

Physiological requirements also include muscular strength, anaerobic power and flexibility, which require:

- primarily contraction of the lower body and leg muscles (adductor longus, rectus femoris, vastus lateralis, vastus medialis, soleus, gastrocnemius, semitendinosus, semimembranosus, biceps femoris, gluteus maximus, gluteus medius)
- generation of ATP to facilitate muscle contraction and force generation
- buffering and removal of hydrogen ions generated during the production and utilization of energy in the contracting muscle
- ability of joints and muscles of the legs, back, and trunk to complete the required range of motion

Event 3: Hose Advance

Physiological requirements include muscular strength, anaerobic power, muscular endurance and flexibility, which require:

- the muscle cells to respond to neural impulses in the form of action potentials that signal the proteins in the muscle cell to interact and generate force
- requires the muscle cells to generate energy for contraction from stored ATP and phosphocreatine and through conversion of glycogen to lactate in the muscle cell
- requires the muscles and blood to buffer the increased acidity (lactic acid and hydrogen ions) resulting from muscle work
- requires the joints and muscles of the legs, back, and trunk to complete the required range of motion

Event 4. Forcible Entry

Physiological requirements primarily include muscular strength and coordination and require:

- the muscle cells to respond to neural impulses in the form of action potentials that signal the proteins in the muscle cell to interact and generate force

- the muscle cells to generate energy for contraction from stored ATP and phosphocreatine and through conversion of glycogen to lactate in the muscle cell
- the muscles and blood to buffer the increased acidity (lactic acid and hydrogen ions) resulting from muscle work
- the muscles of the chest, back, and arms (deltoid, pectoralis major, supraspinatus, latissimus dorsi, teres major, biceps brachii, brachialis, triceps brachii and brachioradialis) to generate force
- sensory input from the cerebellum and upper brain to coordinate the physical action and neural generation of a signal for muscle contraction.

Event 5: Search

Physiological requirements include muscle flexibility, proprioception and kinesthetic sense, which require:

- the joints and muscles of the legs, back, and trunk to complete the required range of motion
- requires input from the motor cortex, corticospinal tract and brain stem to control reticular and vestibular movement

Event 6: Rescue

Physiological requirements include muscular strength, anaerobic power, muscular endurance and flexibility, which require:

- the muscle cells to respond to neural impulses in the form of action potentials that signal the proteins in the muscle cell to interact and generate force
- the muscle cells to generate energy for contraction from stored ATP and phosphocreatine and through conversion of glycogen to lactate in the muscle cell
- the muscles and blood to buffer the increased acidity (lactic acid and hydrogen ions) resulting from muscle work
- the joints and muscles of the legs, back, and trunk to complete the required range of motion

Event 7: Ceiling Hook (Pike Pole)

Physiological requirements include muscular strength, anaerobic power, muscular endurance and flexibility, which require:

- the muscle cells to generate energy for contraction through stored ATP and phosphocreatine and through conversion of glycogen to lactate in the muscle cell
- the muscles and blood to buffer the increased acidity (lactic acid and hydrogen ions) resulting from muscle work
- the joints and muscles of the legs, back, arms, hands and trunk to complete the required range of motion

Linkage of PAT Events with Essential Tasks from the Job Task Analysis

Fire Fighter Events

Event 1: Stair Climb

Essential Job Functions (from surveys):
- Lays feeder line
- Advances or assists in advancing hose to seat of fire or other hazard
- Carries hose to and from emergency scenes
- Searches (multi-floor) structure for seat of fire, or other hazards
- Searches floors above and below fire, or other hazard, including stairwells and bulkheads, for inhabitants who need to be moved or rescued

Event 2: Ladder Event

Essential Job Functions (from surveys):
- Extends manual extension ladders to reach victims
- Places ladder at scene
- Raises and positions manual ladder at scene
- Carries manual ladder from apparatus to incident scene
- Returns manual ladder to apparatus

Event 3: Hose Advance

Essential Job Functions (from surveys):
- Lays feeder line from supply water to fire
- Advances or assists in advancing hose to seat of fire or other hazard
- Pulls hose off hose bed
- Carries hose to and from emergency scenes

Event 4: Forcible Entry

Essential Job Functions (from surveys):
- Gains entry into structures using axes, sledge hammers, etc.
- Breaks holes in wooden, brick, and masonary walls using sledge hammers

Event 5: Search

Essential Job Functions (from surveys):
- Searches floor or area of fire for victims
- Searches floors above and below fire for inhabitants who need to be moved

Event 6: Rescue

Essential Job Functions (from surveys):
- Evacuates persons from incident scene due to risk
- Drags or carries victims from emergency scenes

Event 7: Ceiling Hook (Pike Pole)

Essential Job Functions (from surveys):
- Tears down weak and dangerous structural components
- Opens ceilings, walls, etc. to expose hot spots and other hazardous conditions

Municipal Fire Fighters' Physical Fitness Standards Test

Physical Fitness Standards Test Course for Fire Fighters/ Physical Ability Test (PAT) Events

(1) General Description: The Physical Fitness Standards Test for Fire Fighter consists of 7 events that require each candidate to perform simulations of activities that are part of the fire fighter's job. These events require cardiovascular fitness, muscle strength, muscular endurance and flexibility. Each event will be timed. During all events, the candidate will wear a weighted vest which approximates the weight of the clothing, equipment and breathing apparatus that a fire fighter normally wears during these types of activities. The events are described below. They will be performed in the order listed.

(a) Stair Climb: This event simulates continuous stair climbing, an activity that fire fighters may perform when getting to a fire at an incident scene. For this event, the candidate will be required to step on a rotating stair case (also known as a stepmill) at a pre-determined stepping pace for a specific period of time. There is a five minute rest period after the stair climb event.

(b) Ladder Event: This event simulates various activities related to using extension ladders. The candidate will be required to remove a ladder from a rack, carry it some distance, raise a weight of approximately 45 lbs. attached to a rope that simulates the raising of an extension ladder, lower that weight and return the ladder to the rack from which it was taken. The event ends when the ladder is back in the rack. This event will be timed.

(c) Hose Advance: This event simulates the actions necessary to manipulate a fully charged fire hose. The candidate will be required to pull 50 feet of hose through a U-shaped course with several turns. There will be a ceiling on the U-shaped course to prevent the candidate from standing upright. This event will be timed.

(d) Forcible Entry: This event simulates breaking down a door to gain entry to a burning structure or an incident scene. For this event the candidate will be required to strike a rubber pad mounted on a moveable post. The candidate will use a 12 lb. sledge hammer to move the post a set distance. The post and structure are weighted to simulate the force one would need to exert on a door in order to gain entrance. The candidate's score will be based on the time it takes to

move the post the required distance.

(e) Search: This event simulates the actions necessary to enter and search a smoke-filled structure. Candidates crawl through a dark wooden tunnel with obstructions and turns. The tunnel is approximately 65 feet long. The tunnel is 4 feet high and 4 feet wide. At one location in the tunnel there is an obstacle on the floor and at one location there is an obstacle from the ceiling. In addition, at two locations, the tunnel is reduced from 4 feet to 3 feet in width. This event will be timed.

(f) Rescue Through a Doorway: This event simulates the actions necessary to drag an unconscious victim through a doorway to get the victim to safety. Individuals drag a 125 pound dummy approximately 60 feet along a zigzag course to a designated area at the end of the course. In this event, there is a low ceiling over the course to prevent candidates from standing upright. This event will be timed.

(g) Ceiling Hook: (Pike Pole) This event simulates the use of a pike pole or ceiling hook. A pike pole or ceiling hook is a fire fighting tool used to tear down ceilings or open walls while looking for hidden fires. This event requires the candidate to take a pike pole, tipped with an industrial hammer head, and thrust it upward at a metal plate in an 8 foot ceiling. The metal plate weighs approximately 60 lbs. and must be lifted six inches in order for the strike to count. The candidate then steps over to the next part of the event, where a pike pole handle is suspended from a ceiling height. The pole is attached to a counter balance that weighs approximately 80 lbs. The candidate must pull the pole down six inches in order for the pull to count. The candidate must perform one push and five pulls in a sequence. The event will require the candidate to perform four one-minute periods of work, in which he/she will try to do as many push-pull sequences as possible. Only completed sequences will count in the scoring of this event. Each work period will be followed by a 30 second rest period.

(2) Specifications for these test events are on file at HRD.

Scoring of the Physical Fitness Standards Test Course for Fire Fighters

(1) The scoring will be as follows:

TABLE OF CUT SCORES

Stepmill	200.00	seconds
Ladder	35.56	seconds
Hose Advance	20.00	seconds
Forcible Entry	13.91	seconds
Search	39.00	seconds

Rescue	36.00	seconds
Ceiling Hook	25	repetitions

(2) In order to pass the Physical Fitness Standards Test successfully, a candidate must pass every sub-test by achieving at least the passing score indicated on the above chart. If upon examination, a candidate does not pass the test, then that candidate will be required to retake the entire test (all the sub-tests) during the re-examination.

Notes

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