

Bayham Firefighter Physical / Emotional Demands Analysis

Description of Duties

The Fire Department is a Volunteer or Composite (combination of Volunteer and Career Firefighters) fire service lead by a Fire Chief. The primary responsibility of firefighting personnel performing these functions and tasks is to the Suppression Division. In addition the Department may encompass one or more of the following positions; Deputy Fire Chief, Station Chiefs, District Chiefs, Fire Prevention Officer and/or Administrative Assistant/Secretary et al. Volunteer Firefighters do not work a regular shift schedule. Firefighters are each issued a pager and are notified of an alarm with the paging system. Firefighters in the Suppression Division are responsible for responding to and controlling calls related to fire, medical, rescue and public service emergencies. Firefighters must be physically and psychologically prepared to respond to do so. Firefighters require high levels of upper and lower body strength and anaerobic power.

This position can be broken down into emergency and non-emergency tasks and duties.

NON-EMERGENCY TASKS:

In the fire hall the tasks of the Firefighter include drill for up to 3 hours. This includes familiarization with emergency protocols, training/retraining on pieces of equipment e.g. pump operations, familiarization with new or unusual buildings in the station's area (to understand quickest access, location of stand pipes etc...), familiarization with streets and roads under construction. Drill is completed on average two to three times monthly. Firefighters also complete full maintenance/safety check of vehicle and equipment. This consists primarily of a testing and operation check. Firefighters conduct station duties on a daily, weekly or monthly basis as assigned. This involves house-cleaning of the hall, stoking of supplies, etc. Seasonal functions for Firefighters may include shovelling of snow and some landscaping duties as may be required. Firefighters conduct testing operations on all pumping apparatus and hoses. Firefighters are also involved in fire prevention, public education and public relations activities both on and off site.

Upon returning from an emergency incident Firefighters are required to complete additional servicing and maintenance tasks on all equipment utilized at an incident scene. This may include cleaning, scrubbing (if required) and testing for proper operation of hoses, breathing apparatus, personal protective equipment, and other firefighting equipment utilized for the task(s) required at the incident.

EMERGENCY RESPONSE DUTIES:

Outside of the hall, duties at the incident scene include firefighting, overhaul, emergency medical treatment and rescue, and management of hazardous materials, property conservation, environmental conservation, securing an emergency scene for the safety of the public and Firefighters.

The fire alarm indicates the change of priorities to emergency response duties. This requires immediate response from current actions to moving quickly to the apparatus, incident scene or fire station, as appropriate. Response may involve navigating a flight of stairs or a ladder to ground level, followed by driving of a personal motor vehicle and/or fire service apparatus. When donning their assigned personal protective equipment the Firefighter will begin by slipping off his/her shoes, bending over and grip the handles on his/her boots and slips them on while pulling up the bunker pants. The jacket is generally hung at chest height or folded in a compartment on the apparatus and donned just prior to climbing into the truck, if attending the fire station prior to arriving at the incident location. Firefighters proceeding directly to the incident location will don their personal protective equipment in the same manner at the emergency incident scene. A Firefighter responding to the incident location on the apparatus opens the door of the truck and climbs up the steps, turns and positions himself/herself into the seat and dons the seatbelt. The truck starts moving and the crew must maintain their upright posture while the truck is turning and moving often at high speeds. If responding

to a fire, while en route the Firefighter may don Self Contained Breathing Apparatus, if it is stored in the backrests of their seat. This involves reaching behind them and unhooking their masks, and moving beside them while sitting and fitting shoulder straps on to support the weight of the tank. The straps are then connected at the waist and chest level and mask is prepared. The Firefighter dons their hood and helmet.

The position involves working in extreme temperatures of hot/cold depending upon the time of year. In active fire situations the Firefighters can be exposed to temperatures of 500-600 degrees Celsius. Firefighters are exposed to wet conditions from the hose spray, exposure to wet and cold environments occur simultaneously. The same personal protective equipment is used throughout the year. A Firefighter may become dehydrated as a result of exposure to heat from fires or from the combination of personal protective equipment and summer heat.

Although infrequently exposed, a Firefighter must be capable of: working in unstable environments, crawling in hot, smoky buildings to search for victims, climbing ladders in hot, cold slippery, icy environments with heavy and awkward personal protective equipment weighing up to 42 kg (dry weight). The weight of the equipment may be increased during wet conditions, particularly if the protective clothing ensemble is wet. A Firefighter must lift, carry and pull hose up to 15 meters in length, up to 4 lengths. Hose can be either charged (full of water) or uncharged. The most physically demanding tasks in firefighting include moving equipment up stairs to the floor of a fire while wearing bunker gear in a building, breaking through a roof while on a ladder, using a pike pole to pull down a ceiling, dragging a charged hose, directing a charged hose for prolonged periods, laying hose to fire sites from a distant water source, rescuing a victim using a ladder, using an axe while on a ladder, using hand and/or power tools in awkward positions to enter a structure or complete a rescue operation. A Firefighter works as part of a crew and always works as part of a team. A Firefighter must follow the instructions of their Captain and the Commanding Officer at the scene.

During overhaul, Firefighters are required to pull down damaged walls, ceilings and other structures to examine for fire. This involves heavy force application, overhead and in awkward positions on unstable surfaces. Additionally they must also remove debris from sites and clean up from firefighting activities. This can involve bending/stooping, shovelling, lifting, carrying, pushing/pulling, reaching and mopping while working in slippery/wet and unstable environments.

Psychological/cognitive demands include exposure to emotional situations, including witnessing people in distress and severe injury or death. Sometimes there is very little recovery/debriefing time after an exposure to such situations due to having to respond to another call. En route to emergency scenes, firefighters must drive through heavy traffic congestion in the presence of unpredictable responses from other drivers.

Firefighters rely heavily upon vision, hearing, speech and touch in their daily duties. Vital information must be communicated in noisy, poor visibility and chaotic environments.

A Firefighter must successfully complete an intensive fire-specific training program prior to becoming an active firefighter.

Note: Exceptional category refers to frequency of occurrence only. It does not reflect whether the task is an essential part of the job e.g. lifting and carrying an adult during a rescue is essential but exceptional because it would be done so infrequently. All tasks are typical unless noted otherwise.

Exceptional Tasks:

Lifting: 36.5kg per person, 14 metre ladder 25kg per person, average adult 46.6kg per person

Strength Demands		Typical				Exceptional				Comments
		Occ	Eff	Force/Weight (kg)		Occ	Eff	Force/Weight (kg)		
				Avg	Max			Avg	Max	
Lifting Composite		1	H	13.2	33	1	H	19.3	46.6	at scene: awkward posture, in bunker gear (22kg), hot, high speed, lifting victims of unknown weight
Lift Ranges	Ground - Knuckle	1	H	13.6	24					1st aid kit, tool kit, hose, fire extinguishers
	Ground - Chest	1	H	14.5	33	1	H	17	46.6	Exceptional: lifting victims (avg weight 46.6 per person-2person lift), ladders, generator, rope bag
	Ground - Above Chest	1	H	6.4	17.1	1	H	20	26	Exceptional: ladders
	Knuckle - Chest	1	H	15	18					fire extinguishers
	Knuckle - Above Chest	1	H	8.1	21.5					hose, ladders
	Above Chest	1	H	9.8	17.1	1	H	26	26	hose clamp, pike pole, extension cord, ladders
Carrying	Unilateral	1	H	8	15.5	1	H	13	27	either arm-medical pack, high rise pack, tools in hot environment while moving quickly
	Bilateral	1	H	13.2	33	2	H	19.3	46.6	tools, SCBA, bunker gear, equipment
Pushing/Pulling		1	H	8.8	15	2	H	50	70	charged/uncharged hose, heavy doors, heavy equipment on pull out platforms; exceptional: pulling victims
Gripping		1	H			1	H			charged/uncharged hose, tools-axe, pike pole, walls during overhaul, with gloves

Mobility Demands		Typical		Exceptional		Comments
		Occ	Eff	Occ	Eff	
Sitting		2	H			in vehicle: neutral posture is difficult to maintain, very little back support, stiff vehicle suspension; at station: intermittent, poor back support
Standing		2	M	3	H	standing at scene and when performing equipment/vehicle checks, stationary standing max 30 minutes on ladders
Walking		2	M	2	H	with heavy awkward PPE equipment, over uneven and unstable surfaces; in station: quickly upon hearing alarm
Running				1	H	at scene of emergency, with full bunker gear plus equipment being carried, in slippery, wet conditions, infrequent
Jumping				1	H	from high steps in vehicle (max measured 26.2")
Climbing		2	M	3	H	stairs in station, into/out of vehicle; Exceptional: in low rise apartments, elevators out of service, uneven slippery surfaces ladders
Reaching	Overhead Unilateral	1	M	2	H	onto truck, during overhaul at scene, to remove building materials overhead, exerting heavy force
	Overhead Bilateral	1	M	2	H	onto truck, during overhaul at scene, to remove building materials overhead, exerting heavy force
	Forward Unilateral	1	M	2	H	SCBA backward and forward reaching
	Forward Bilateral	1	M	2	H	SCBA backward and forward reaching
Neck Movement		1	M	2	H	driving, overhaul overhead work, visual inspections, while wearing heavy and unbalanced helmet
Trunk Twisting		1	M	2	H	using hand tools, donning SCBA, awkward, confined spaces
Bending/Stooping	Static					in confined spaces, hose work
	Dynamic					hose work, axe work
Crouching/Kneeling		1	M	1	H	in searching, assessing buildings/people
Crawling		1	H	2	H	Exceptional: in rescue searching for victims, in wet unstable environments with full gear on
Balancing		1	M	2	H	on ladders, pitched roofs, unstable structures, in truck when driving fast and keeping oneself upright
Computer Input/Fine Finger Dexterity		1	M	2	H	tying knots, administering 1st aid, operating hose
Foot Action				1	L	while driving with safety shoes on

Sensory Demands	Typical Effort	Exceptional Effort	Comments
Hearing	H		hear vital alarm information, hear vital information at scene with high background noise
Vision	H		visually assess situation at scene, visual inspection of vehicle/equipment, require red-green and figure discrimination
Feeling	H		feel for people, building layout during fires, open/close SCBA on back, vehicle/equipment inspection
Speech	H		must clearly articulate information in loud/non visual environments, using radios/phones

Work Environment Demands		Typical Occurrence	Exceptional Occurrence	Comments
Outside Work		2	3	fire scenes, rescue work
Hot		2	3	fire scenes, outdoors in summer
Cold		2	3	fire scenes, outdoors in winter
Proximity to Moving Objects		2		at station: vehicles; at scene: power tools, firefighting equipment, vehicles, in traffic
Unstable Footing		2	3	at scene: on slippery, unstable surfaces, in wet, icy conditions
Vibration/Jarring	Whole body	1	2	when travelling to and from calls, poor vibration damping in trucks
	Hand/Arm	1	2	using power tools at scene: saws, auto extraction, wet vacs

Conditions/Job Specific Demands	Typical Occurrence	Exceptional Occurrence	Comments
Psychological/Cognitive			
Driving	1	2	
Work Alone	1		in station: when performing routine tasks; on scene: always working with crew
Interact with Public	2	3	at emergency scenes
Sudden/Unpredictable Movement	1	3	Exceptional: high number of calls, in contact with people in need of medical assistance; at scene: explosions, danger requiring quick exit
Shovelling		1	done during overhaul-debris/sand, sometimes required to shovel snow from outside of station in winter
Mopping	1		weekly cleaning of station

Psychological/Cognitive Demands	Demand	Comments
	Intensity	
Degree of Self-supervising Required	2	on scene is fully supervised, in station some time performing unsupervised tasks
Degree of Supervision Exercised	2	may provide work direction to co-worker in buddy system, may provide direction if first on scene and in charge
Deadline Pressures	4	must respond to emergency calls
Attention to Detail Required	4	during safety checks at station and at scene
Performance of Multiple Tasks	4	at scene: must perform multiple tasks with judgement used
Exposure to Environmental Stimuli	4	can be very noisy, dark, smoky, chaotic and distracting
Need to Work Cooperatively with Others	4	must work together with other firefighters, in life or death situations
Exposure to Emotional Situations	4	very frequently exposed to situations where public are very distressed, may be exposed to multiple victim trauma or death
Exposure to Confrontational Situations	3	occasionally exposed to confrontational situations at emergency scenes
Responsibility and Accountability Required	4	errors in judgement can result in loss of life to public, self or co-workers
Reading Literacy	4	reading reports, manuals, training materials
Writing Literacy	2	occasionally types/writes mainly in point form
Numerical Skills	3	calculation of pressure required, flow rates based on vertical and horizontal distances
Communication	3	required to communicate vital information fluently
Memory	3	detailed information: assessment protocols, location of streets, stand pipes
Copying	2	minimal information copied
Computer Literacy	2	minimal use for basic tasks

Tools and Equipment Used: large vehicles, hoses, extinguishers, smoke ejector fans, power and manual tools e.g. axes, pike poles, saws, generators

Personal Protective Equipment Required: bunker suits, fire boots, helmets and face shields, gloves, fire retardant hoods, self contained breathing apparatus (SCBA)

Required Training, Certification, Licensing, etc.: CPR, First Aid, Defibrillation Training, internal firefighter training, D-Z license, SCBA training