



Clackamas Fire District #1

Guide to Recruit Preparation



Provided by the Clackamas Fire Wellness Program

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Clackamas Fire District Recruit Preparation

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PHYSICAL FITNESS IN THE FIRE SERVICE

Firefighting is a physically demanding profession that requires a high level of cardiovascular endurance, muscular strength and muscular endurance. A firefighter recruit is expected to be in top physical condition in order to complete the probationary academy. The following information was developed to assist you with physically preparing to become a firefighter with Clackamas Fire District #1.

Firefighters are expected to perform in a wide variety of settings and situations. Maintaining a high level of all around fitness is necessary to be safe and effective. The following is a list of essential job functions that a firefighter should physically be prepared to do:

- Put on and wear protective equipment (Gear and SCBA weight of 50lb plus)
- Enter smoke filled buildings/rooms with a hose in hand wearing full protective equipment
- Extricate people from automobile
- Pull uncharged hose off a pumper to hydrant
- Systematically search for trapped people
- Safely free and/or lift victim
- Drag charged 1 ¾ inch hose 25 feet unassisted
- Crawl on a floor and feel for the heat of the fire source
- Carry equipment up stairs while wearing full turnout gear and SCBA
- Carry a hose pack up flights of stairs wearing full protective equipment
- Use equipment (ax, sledgehammer, etc.) to make forcible entries
- Drag a victim (150 lbs or more) out of a building unassisted and wearing full turnout gear.
- Climb an aerial ladder to a height of 50 to 75 feet wearing full equipment
- Remove a 24-foot extension ladder from the truck unassisted, position the ladder, and raise the halyard.
- While on ladder, direct water at fire.

All of these duties are on top of working shifts with little or no sleep.



GENERAL TRAINING GUIDELINES



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CARDIOVASCULAR

Cardiovascular endurance is the ability of the cardiovascular and respiratory systems to deliver oxygen to working muscles. Numerous studies have demonstrated the necessity of maintaining a high level of aerobic capacity for fire service activities. Measurements of heart rate response taken during normal firefighting tasks have been shown to be at, or near, maximal levels. For this reason, optimal aerobic capacity is essential for the safety of the firefighter and the performance of their job.

FIT VS. UNFIT

An unfit individual's heart will pump small amounts of blood per beat which in turn requires the heart to beat very rapidly in order to compensate for its poor pumping power. In addition, a poorly fit individual will not have a sufficient amount of oxygen supply to the muscles and will fatigue very quickly. A highly trained individual will be capable of performing more work over a longer period of time than the untrained individual.



The ability to deliver oxygen can be enhanced through physical training. An overload (greater than the body is used to) must be placed on the heart and lungs during exercise in order to improve. Overload can be applied in the following ways:

- Increasing the **intensity** of exercise
- Increasing the **duration** of exercise
- Increasing the **frequency** of exercise

Clackamas Fire expects that recruits start an academy with a high level of cardiovascular fitness. Group physical activities will be held every morning of an academy- with the expectation that every recruit is able to run at least 2.0 miles.

Your aerobic capacity should be geared towards the demands of your upcoming career. Running, biking, rowing, and High Intensity Interval Training (HIIT) should all be a part of your training regimen. Please do not focus on only one type of cardio. Using multiple avenues to train your body will get it more prepared for the rigors of the academy. 3-5 days per week of aerobic conditioning is recommended (2-3 days cross-training/HIIT, and 1-2 days running/biking for duration, not intensity).

HOW TO GET IN THE AEROBIC ZONE

Aerobic exercise gets your lungs and heart pumping to deliver oxygen and muscle cells, which use it to produce energy. You can use your heart rate to find the level of exercise that gets you in the aerobic zone and enhance cardiovascular fitness. Subtract your age from 220 to roughly approximate your maximum heart rate during exercise. Exercising at between 60% and 70% of your estimated maximum heart rate is sufficient to build cardiovascular fitness. If you can gradually condition your way up to 80%, the fitness gains will be even more noticeable. Using a wearable heart rate monitor or fitness tracker can help you stay in the aerobic zone and show the benefits as your fitness improves.



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INTERVAL TRAINING

Firefighting tasks are not always steady-state in nature; therefore, cardiovascular training needs reflect this. Studies of blood lactate levels following the most physically demanding firefighting operations indicate substantial involvement of the anaerobic system.

Interval training is a great way to improve both anaerobic and aerobic endurance. This type of training involves a repeated series of exercise activities interspersed with rest or relief periods. This helps to condition your heart in two ways—to be efficient in the work phase, and also to recover quicker during the rest periods. To get the cardiac boost from interval training, you have to be willing to push yourself close to your limits—at least briefly. In referring to the heart rate information above, this would typically be a heart rate at 85% or higher.

Interval training should be rotated with steady-state aerobic training in order to prevent overtraining. Interval training can be incorporated into traditional cardio (running, etc.), or in the form of HIIT workout (multiple exercises, moving quickly between the movements, and taking short breaks so your heart rate stays elevated for an extended period of time.

Interval Program:

1. Figure out your Maximum Heart Rate: $220 - \text{age} = \text{MHR}$
2. Figure out your Zone 1, Zone 2 and Zone 3 Heart Rates.

Zone 1	Recovery		Heart Rate = 60-75% MHR
Zone 2	Anaerobic Threshold		Heart Rate = 76-85% MHR
Zone 3	Peak /Interval		Heart Rate = 86-90% MHR

Medium Intensity Progression:



High Intensity Progression



Page 6 is an example of a typical academy morning interval training circuit.



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RECRUIT ACADEMY FITNESS

Bodyweight Strength Circuit + Tabata Cardio

- Complete each exercise for 45 seconds, then rest for 15 seconds.
- After completing the full circuit once, complete a cardio tabata.
- Then repeat the circuit 2 more times with a cardio tabata in between.

Strength Circuit

1. Alternating Lunge

Stand with hands on hips and feet hip-width apart. Step the right leg forward and slowly lower your body until the right knee is close to or touching the floor and bent at least 90 degrees. Return to the starting position and repeat with the left leg.

2. Push-Ups

With hands shoulder-width apart, keep the feet flexed at hip distance, and tighten the core. Bend the elbows until they are bent at least 90 degrees, then push back up.

3. Body Weight Squats

Stand with the feet parallel about should-width apart. Slowly start to crouch by bending the hips and knees until the thighs are at least parallel to the floor. Make sure the heels do not rise off the floor. Press through the heels to return to a standing position.

4. Plank

On toes and elbows, engage core and stay flat through back and hips.

5. Sumo Squats

Stand with a wider-than-shoulder width stance and toes slightly pointed out. Keeping straight posture and weight back on heels, lower until thighs are slightly below parallel with the floor. Press through the heels to return to a standing position.

6. Tricep Push-Ups

Regular push-up with hands positioned close together. Make sure to keep elbows close to body.

7. Alternating Curtsy Lunges

When lunging, step the left leg back behind the right, bending the knees and lowering the hips until the right thigh is almost parallel to the floor. Keep torso upright and hips square.

8. Calf Raises

From a standing position, slowly rise up on the toes, keeping the knees straight and heels off the floor. Hold briefly, then come back down.

Cardio Tabata

Do 20 seconds maximum effort followed by 10 seconds of recovery for 4 rounds.

1st Round: Jump Squats

2nd Round: High Knees

3rd Round: Burpees



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MUSCULAR STRENGTH

Muscular strength is defined as the maximal force that a specific muscle or muscle group can generate. The demands of a firefighter require above average strength. Job analysis shows that the weight of equipment used by a single firefighter on the job is in excess of 100lbs. Low levels of muscular strength most likely contribute to the high incidence of sprains, strains and back injuries among firefighters. A strong and function core can help increase performance and decrease injury.



A strong athletic foundation is necessary before the body can work up to doing specific training. It's strongly recommended that those pursuing firefighting are actively involved with a muscular strength and endurance program.

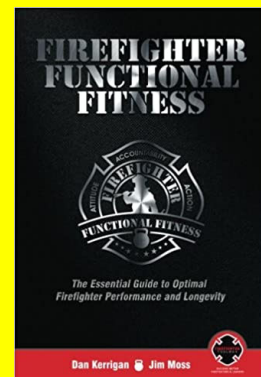
The following is a list of weights for equipment that can be expected to be lifted by recruits. The lists are approximate weights due to the varying type and brand of firefighting equipment utilized by Clackamas Fire District #1.

Equipment	Weight
1 3/4" 50 feet of hose	20 lbs
2 1/2" 50 feet of hose	35 lbs
3" 25 feet of hose	30 lbs
4" 100 feet of hose	110 lbs
14 ft Roof Ladder	45 lbs
24 ft Extension Ladder	75 lbs
SCBA	29 lbs
PPV Fan- gas	90 lbs
High Rise Pack	55 lbs
Gurney	90 lbs
Master Stream	60 lbs
Fellow Firefighter	140-260 lbs

Remember it is probable that you will experience multiple repetitions with all of these weights and recruit candidates should be able to sustain and have the endurance to accomplish tasks over long duration incidents.

Firefighter Functional Fitness: The Essential Guide to Optimal Firefighter Performance and Longevity by Dan Kerrigan and Jim Moss is an excellent reference in your preparation for academy!

***Available on Amazon





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MUSCULAR ENDURANCE

Muscular endurance is the ability of a muscle group to perform repeated contractions. Low levels of muscular endurance contribute to many preventable fire service injuries. For example, core muscle endurance is necessary to stabilize the torso and support the lower back during exertion. When preparing for the upcoming academy, cardiovascular and resistance training are important– but the foundation to all movement is core muscular endurance. Many injuries take place when excessive force is put on the extremities if the core is de-conditioned.



The primary purpose of core endurance is to develop muscular control of forces acting on the body. Firefighters must be able keep their bodies in the optimal postures for performance, even as gravity, terrain and obstacles fight against them. Add a load to this equation, such as an axe or an injured firefighter, and the balance and stability demands go through the roof. If a firefighter cannot control their body weight, they cannot expect to do well with a load on their back.

A great basic core endurance exercise to start with is the plank. Start with 30 seconds, and gradually work your way up to two minutes. Stop if your back starts to tighten up or get sore! We like to see firefighters be able to hold a plank for at least two minutes. If a firefighter is not able to hold a plank for at least two minutes, we worry about potential future injury caused by muscle compensation due to poor core strength/endurance.

Firefighters should also be able to hold a side plank for at least 45 seconds, and perform at least 20 push-ups.

For additional firefighter fitness and workout resources, check out: <https://www.555fitness.org/workouts-1>

FLEXIBILITY and MOBILITY

The leading line-of-duty injury for a firefighter is sprain and strain. In addition, back injuries have been the most prevalent fire service injury leading to premature departure from the fire service. Low levels of flexibility and mobility may contribute to this. When a joint lacks flexibility and/or mobility, it is unable to move safely through a normal range of motion. Once this occurs, other surrounding joints must compensate in order to perform essential tasks, a biomechanical compromise which can lead to injuries.

Flexibility and mobility are often used synonymously, although they are quite different. Flexibility is the lengthening of the muscle, allowing for greater range of motion. Range of motion is the distance and direction the joint can move, while mobility is the ability to move without restriction. A good level of mobility allows a person to perform movements without restriction, while a person with good flexibility may not have the strength, coordination, or balance to execute the same movement. Good flexibility does not always denote good mobility.

Though maintaining flexibility is important, flexibility alone cannot prevent injuries. A person can be very flexible, but lack mobility or stability within a joint. Rather than consider one more important than the other, think of flexibility and mobility as equal partners in creating sound movement patterns.

A foam roller is an excellent tool to help massage away restrictions found in normal soft tissue. This is called self-myofascial release (SMR). It is a \$20 investment that may be priceless to assist in your recovery.



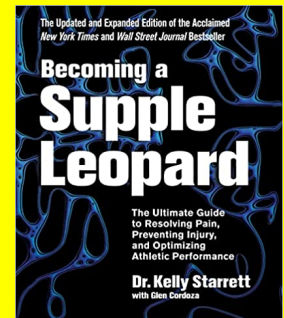
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This QR code will take you to a document with some foam rolling basics for each muscle group.

"Becoming a Supple Leopard" by Dr. Kelly Starrett is a system of movement of mobility exercises to keep a person's soft tissue feeling good with a full range of motion so they can perform at optimal levels.

***Available on Amazon



BALANCE and STABILITY

Good balance and stability are critical in order to perform firefighting tasks safely. Both balance and stability refer to aspects of a person's ability to stay in control of their body's position. Working balance training into your workouts once or twice a week is suggested. Any exercise performed either single-legged, or on an unstable surface (think BOSU ball, balance disc, or even a rolled up yoga mat or towel) will suffice. By making the surface wobbly, your stabilizing muscles will have to work overtime to keep you upright.



These two website links provide some good balance exercises. The first site requires some equipment, the second site is all body weight exercises.

<https://www.acefitness.org/education-and-resources/professional/expert-articles/6524/5-exercises-to-train-balance-in-motion/>

<https://www.runtastic.com/blog/en/how-to-improve-balance-and-stability/>



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ACTIVE WARM-UP AND COOL DOWN

For safety and effectiveness, a warm-up should be the first component of any program. Health related benefits of a warm-up include: increased blood flow to the working muscles and joints, decreased likelihood of injury, lowered risk of low-back pain and improved performance. An active warm-ups consist of multi-joint movements that are functional and put joints through a dynamic range of motion rather than static stretching.

A proper cool-down should be performed after a workout to provide the mind and body with a period of adjustment from exercise to rest. Stretching exercises should be performed within 5 to 10 minutes after an activity to take advantage of increased muscle temperature. The cool-down is the optimal time to improve long-term flexibility.

BODY COMPOSITION

Body composition is a component of overall physical fitness. Although some body fat is considered essential, excess body fat increases the workload and amplifies heat stress by preventing the efficient dissipation of heat when a person exercises. In addition, added body fat elevates the energy cost of weight dependent tasks (climbing ladders), contributes to injuries and increases the risk of developing many chronic diseases.

If weight loss is necessary in order to achieve appropriate body composition, both diet and exercise should play a role. Safe weight loss is 1-2 lbs per week. Weight can be lost more quickly; however, much of the loss will be water and muscle tissue. This could be very unsafe for a firefighter. Adequate calories and carbohydrates are important to fuel the muscles and the brain.

If trying to lose weight, maintaining current muscle mass and shedding fat should be the primary focus.





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PREPARING TO BECOME A CLACKAMAS FIRE RECRUIT

Physical fitness is the responsibility of each recruit firefighter.

Clackamas Fire expects that recruits start an academy with a high level of cardiovascular fitness and strength. The academy is NOT a time to begin your fitness training. You should be entering the academy prepared both physically and mentally for the rigorous experience, and to show that you have committed yourself to becoming an integral part of the Clackamas Fire Family.

As stated earlier in this document, group physical activities will be held every morning of the academy- with the expectation that every recruit is able to run at least 2.0 miles at the beginning of the academy.

Before participating in any exercise program of moderate to high intensity, Clackamas Fire District #1 recommends a complete medical examination. In addition, the following should be taken into consideration:

- Begin each workout with at least 5 minutes of an active warm-up.
- Complete each workout with cool-down and flexibility exercises.
- Always pay attention to how you feel when exercising. If you become faint, dizzy or nauseous, you should stop exercising. If this happens, consult your physician.
- Increase the workload gradually. Increase distance or time spent exercising (not both at once) by no more than 10% each week.
- Rest is necessary to allow recovery and prevent burnout. Take at least one day off per week and at least 48 hours between resistance training for the same muscle group.
- After an injury, only resume training when advised to do so. Continuing exercise could aggravate the injury and hinder performance in the academy.
- Avoid dehydration by drinking plenty of water before, during and after training. Three to four 32 ounce bottles of water per day is an adequate amount for active individuals.

