THIRD EDITION

FIREFIGHTER PRE-ENTRY FITNESS EVALUATION (FPFE)

OPERATIONS MANUAL

A division of CF Morale & Welfare Services
Une division des Services de bien-être et moral des FC

FOREWORD

1. This Operations Manual has been prepared to provide instructions and guidance for conducting the Firefighter Pre-Entry Fitness Evaluation (FPFE). It is to be used when conducting evaluations of Firefighter Applicants for both Canadian Armed Forces (CAF) and Department of National Defence (DND) firefighter positions.

2. The FPFE has been researched and developed for the Canadian Forces Fire Marshall (CFFM). A project led by the Canadian Forces Morale and Welfare Services (CFMWS), Directorate of Fitness, Sports and Health Promotion (DFit) and supported by the University of Alberta.

3. The FPFE was designed to ensure that CAF/DND firefighter applicants are physically capable of carrying out their duties. Based upon the research findings, CFMWS/PSP DFit also developed a comprehensive pre-selection program, consisting of a physical fitness evaluation as well as a comprehensive training program based on the performance-related physical fitness requirements for firefighters. For best evaluation results it is recommended that applicants follow the established training program at https://www.cfmws.com/en/AboutUs/PSP/DFIT/Fitness/Pages/Fire-Fighter.aspx.

4. It is essential that the evaluation protocols and instructions provided in this Operations Manual be adhered to, so to ensure a safe, valid and reliable administration.

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TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

GENERAL

1. The Firefighter Pre-Entry Fitness Evaluation (FPFE) protocol has been designed to evaluate physical fitness of firefighter applicants. It is properly described as a "hybrid" evaluation protocol since it consists of two components: a treadmill component for aerobic fitness and a task-simulation component (six job-related tasks).

2. Each component of the evaluation represents an important aspect of firefighting. In order to achieve an overall pass, the applicant must succeed each individual component. This also means that failing one component results in an overall failure of the FPFE.

3. There is a specific level of performance that is associated with a "passing score". Encourage applicants to do their best in all components of the FPFE.

4. It is essential that you follow the FPFE protocols in this operations manual in order to ensure the evaluation results are valid and reliable. The FPFE should take approximately three hours per applicant.

REQUIREMENT AND RESPONSIBILITY

5. CFMWS/DFit acts as the primary advisor on all matters pertaining to FPFE.

6. Fire Chiefs (FCs) are responsible for programs conducted in accordance with Canadian Forces Fire Marshal (CFFM) policy and Command direction.

7. At all levels, there is a requirement for health care providers to advise the Chain of Command (CoC) on some medical aspects, such as the capability of applicants to participate in the FPFE.

8. Additional requirement and responsibility fall to the following Offices of Primary Interest (OPI) and key stakeholders:

    a. **Chief of Military Personnel Command (CMPC):** The OPI for Canadian Armed Forces (CAF) Physical Fitness Programs.

    b. **CFMWS/DFit:** On behalf of CMPC, acts as the primary advisor on all matters pertaining to CAF physical fitness.

    c. **PSP National Training Centre:** Responsive to DFit. They are responsible for the command and control of the FPFE Qualification Standards. They establish the necessary resources for the training and qualifications of Base/Wing PSP Fitness Staff.

    d. **PSP Senior Manager (Sr Mgr) and Manager Fitness Sports & Recreation (Mgr FS&R) (or equivalent):** Responsive to the needs of their respective Base/Wing CO. They are responsible for:
        i. Delivering future FPFE Qualification Standards.
        ii. Maintaining an up-to-date list of local PSP Fitness Staff qualified as Evaluators to administer the FPFE.

iii. Ensuring protocols as described in the FPFE Operations Manual are being followed accurately.
iv. Ensuring that all Evaluators (local PSP Fitness Staff) remain current on any protocol changes.

e. **Evaluators:** Local PSP Fitness Staff are responsive to their Mgr FS&R to ensure the needs of their respective Base/Wing CO are met by planning, organizing, conducting and evaluating the FPFE.

EVALUATOR RESPONSIBILITIES

9. A FPFE evaluator will be assigned "lead" for every evaluation session.

10. The lead evaluator is responsible to:

    a. Provide direction to all additional evaluators for proper delivery.
    b. Ensure a proper evaluation centre set-up and task calibration.
    c. Ensure all evaluators collect data accurately as per the FPFE Operations Manual.

11. The "lead" evaluator MUST be certified as a Canadian Society for Exercise Physiology Certified Exercise Physiologist (CSEP-CEP).

12. Only the PSP Fitness staff who achieved their Qualification Standard can administer the FPFE.

13. All evaluators are responsible for the completion, accuracy, and management of the FPFE they administer.

14. All evaluators must participate in recertification training every two years. Recertification will be done locally by the Mgr FS&R as well as training on the Defence Learning Network (DLN). This will maintain the accuracy of conduct of the protocol, prevent skill fade, and relay any updates or amendments made to the FPFE.

REFERENCES

15. The following orders and directives are associated with the FPFE:

    a. Fire Marshall Directive 1008- Firefighter Pre-Entry Fitness Evaluation
    b. Occupational Health and Safety Committee. Refer to DOAD 2007-1, General Safety Program

16. If additional orders or directives are created, you can find them on the following website: https://www.cfmws.com/en/AboutUs/PSP/DFIT/Fitness/Pages/Fire-Fighter.aspx

CHAPTER 2
FIREFIGHTER PRE-ENTRY FITNESS EVALUATION SET-UP

1. The set-up for the FPFE is to remain completely standardized to ensure evaluations are fair and impartial regardless of the evaluation location. Mgr FS&R are responsible for ensuring that the following set-up instructions are not modified at their location.

EQUIPMENT FOR THE FPFE

2. The following list represents the minimum equipment required to conduct the FPFE.

a. FPFE Ops Manual 3rd Edition.
b. FPFE DND 2485-E.
c. Measuring tape 15.24 m (50 ft.) or 30.48 m (100 ft.).
d. Clipboards and pens.
e. Blood pressure cuff and stethoscope / automated blood pressure machine.
f. Table and chair with armrest.
g. Borg's scale.
h. Cable tensiometer or luggage scale.
i. Duct tape and marking tape.
j. Carpenter's level.
k. Calculator.
l. Stopwatches (3).
m. Traffic pylons (10).
n. Non-slip rubber mats (5 to 6).
o. Mop and bucket.
p. Heart rate monitor and receiver watch.
q. Firefighting Personal Protective Equipment (PPE):
    i. Bunker jacket and pants (including liners)
    ii. Flash-hood
    iii. Helmet and visor (if available)
    iv. Firefighting rubber boots
    v. Thin leather work gloves (glove must be entirely made of leather)
    vi. 5-point harness
r. 60-minute (min) MSA Self-Contained Breathing Apparatus (SCBA) empty air cylinder.
s. Treadmill with a minimum 15% incline and 7 mph speed.
t. **Task #1: Equipment Carry and Vehicle Extrication.**
    i. One triceps curl bar with plates and collars, loaded to 80 lb (36.4 kg)
    ii. Small spreader tool 44 lb (20 kg)
    iii. Three "targets" must be flat metal discs, (11 cm (4.33 in) in diameter) attached to 19 mm (0.75 in) plywood
u. **Task #2: Charged Hose Advance.**
    i. Three 15.24 m (50 ft.) sections of 44 mm (1.75 in) charged hoses
    ii. Nozzle
    iii. Hose clamp
    iv. Water truck, fire hydrant or garden hose and adaptor
    v. Duct tape
v. **Task #3: Weighted Sled Pull.**

i. Weighted sled
ii. Selection of plate weights
iii. Two 18.29 m (60 ft.) lengths of 16 mm (5/8 in) static rope
iv. Two carabiners

w. **Task #4: Forcible Entry.**
i. One ALCO Forcible Entry Device and hydraulic calibration tool
ii. One 208 L (55 gal.) barrel
iii. 10 lb (4.54 kg) sledgehammer
iv. Two C-clamps
v. Heavy-duty steel stand
vi. Duct tape
vii. Two wrenches (sizes 11/16 or 3/4)
viii. Two 6 ft. lengths of 2″ × 6″ connected with four 2″ × 6″ × 15″ cross braces to form a foot-stop barricade that can be attached to the bottom of the stand

x. **Task #5: Victim Rescue.**
i. Rescue Randy mannequin 176 lb (80 kg)
ii. Coveralls and firefighting boots
iii. 5-point harness

y. **Task #6: Ladder Climb.**
i. Heavy-duty extension ladder 7.32 m (24 ft.)
ii. Auto descender

EVALUATION SET-UP AND CALIBRATION

General set-up

3. Prior to the FPFE, the lead evaluator will complete a facility, equipment and floor surface inspection to eliminate any tripping or slipping hazards, equipment malfunctions, obstacles, inappropriate surfaces and general safety risks. We strongly recommend that you block off the Evaluation area to prevent any interference with the safe and effective administration of the FPFE.

4. We have designed the FPFE so that it can be conducted in National Defence Fire Service fire stations. However, the exact evaluation set-up can vary from one fire station to another as building designs vary. Therefore, it is imperative that the layout of the exact evaluation is determined and sanctioned by the Mgr FS&R or equivalent. If you are unsure, contact the Fitness & Wellness Manager (F&W Mgr) to help determine if the layout is satisfactory.

5. Select a level floor when conducting the treadmill evaluation. It should be isolated from the public eye and evaluators must be able to circulate easily around the treadmill to ensure applicant safety.

6. The job-related evaluation is completed on a smooth clean concrete floor. The amount of effort required for the charged hose advance and weighted sled pull is determined by the surface friction. Carefully calibrate these tasks each evaluation day to ensure consistency between evaluations.

7. The minimum facility requirements are as follows:
   a. An unobstructed distance of approximately 42.67 m (140 ft.) to accommodate the charged hose advance.
   b. A suitable wall to set up and anchor the 7.32 m (24 ft.) extension ladder and a suitable beam to set up the auto descender.
   c. A suitable wall to safely set up the ALCO Forcible Entry Device.

d. A suitable water supply for charging the fire hose.

8. Use rubber mats and pylons as necessary to clearly denote start and stop locations, directions and boundaries.

CALIBRATION

9. The weight of most equipment is not expected to change from day-to-day. However, some equipment can vary (for example, dust on the pistons and brake pads of the Forcible Entry Device) and thus, you should check calibration before each FPFE session. If equipment is borrowed from local fire departments, there may be some variability between sessions (e.g., different spreader tools) and you should verify the weight.

10. Measure the distance for each task daily (or as often as necessary) to ensure accuracy. In some cases, you can place marks on the floor to designate start and stop lines. Unless these are permanent marks, verify the actual distance each time the evaluation is set up. (If a pylon is knocked over during an evaluation, verify the correct location through measurement.)

11. The following information will assist you with set-up and calibration. Pay attention to the use of rubber mats and pylons to identify critical points of the evaluation set-up. These are particularly helpful.

TASK-SPECIFIC SET-UP AND CALIBRATION

TREADMILL EVALUATION

Equipment needed:

- Treadmill
- Accurate measuring tape
- Marking tape (duct tape)
- Stopwatch
- Calculator
- Carpenter's level

12. Refer to **Tool 2: Treadmill Calibration of Speed and Grade** for the treadmill calibration.

13. Cover the treadmill's console clock display so that the applicant is not misled. You will mark the actual time with your stopwatch.

TASK #1 – EQUIPMENT CARRY AND VEHICLE EXTRICATION

Equipment needed:

- One triceps curl bar with plates and collar, loaded to 80 lb (36.4 kg)
- Small spreader tool 44 lb (20 kg)
- Three "targets" must be flat metal discs (11 cm (4.33 in) in diameter) attached to 19 mm (0.75 in) plywood
- Three rigid floor mats

14. Measure a 15.24 m (50 ft.) distance over a flat and hard surface. Mark each end of the 15.24 m (50 ft.) with a rubber mat. (Measure the 15.24 m (50 ft.) from the middle of the first mat to the middle of the second mat).

15. In any direction, measure a straight 7.62 m (25 ft.) distance from the middle of the second mat to the middle of the third mat located in front of the door mock-up, see Figure 1.

16. In the middle of the first mat, place the loaded triceps curl bar 80 lb (36.4 kg) and the small spreader tool 44 lb (20 kg), see Figure 2.

17. In front of the third mat, place the car door mock-up. Use three flat metal discs (11 cm (4.33 in) in diameter) attached to 19 mm (0.75 in) plywood as the "targets", see Figure 3.

18. Use the following door mock-up dimensions:
    a. The first target, located on the left side of the door mock-up, must be 81 cm (31.89 in) from the mat to the middle of the disc.
    b. The second target, directly under the first target, must be 46 cm (18.11 in) from the mat to the middle of the disc.
    c. The third disc, located on the right side of the door mock-up, must be 64 cm (25.2 in) from the mat to the middle of the disc and 100 cm (39.37 in) from the middle of the first disc.

Note: The 100 cm (39.37 in) is not a diagonal measurement from the middle of the first disk to the middle of the third disk, but a horizontal measurement. From the middle of the first disk 81cm (31.89 in), horizontally measure 100cm (39.37 in). From this line, draw a perpendicular line to the floor. From this line, measure 64 cm (25.2 in) from the mat to the middle of the disc.

Figure 1: Course layout

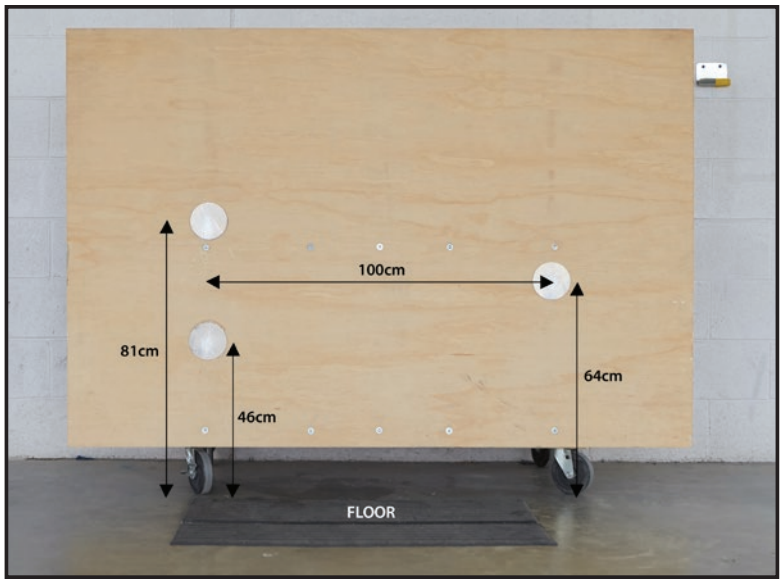


Figure 3: Door mock-up with target distances

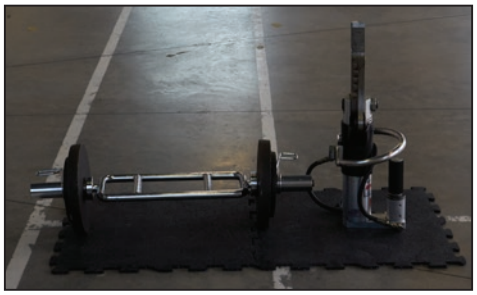


Figure 2: Equipment

TASK #2 – CHARGED HOSE ADVANCE

Equipment needed:

- Three 15.24 m (50 ft.) sections of 44 mm (1.75 in.) charged hoses
- Nozzle
- Hose clamp
- Duct tape or marking tape
- Cable tensiometer or luggage scale

19. Refer to **Tool 17: Cable Tensiometer Instructions.**

20. Measure a 30.48 m (100 ft.) distance over a flat, hard surface (smooth concrete floor, hardwood floor is preferable, however, if necessary asphalt surface can be used if calibrated within acceptable parameters outline below) and identify both the start and finish lines with pylons, see Figure 4.

Note: The distance may vary once the calibration is completed. Adjust the finish line accordingly.

21. Unroll, connect and charge the hose via water truck, fire hydrant or garden hose and adaptor. In order to avoid an accidental discharge of water, secure the nozzle bail in the "off" position with duct tape, see Figure 5A.

22. Use a cable tensiometer or luggage scale to verify the force required to move the hose. Straighten the 30.48 m (100 ft.) of charged hose and attach the cable tensiometer or luggage scale to the end of the extended hose, approximately 30.48 m (100 ft.) from the starting line. See Figure 5B.

23. The force required to move the 30.48 m (100 ft.) length of charged hose should be approximately 90-100 lb (400-450 Newton (N)).

24. When slowly initiating the movement of the charged hose, the cable tensiometer or luggage scale should be no more than 20 to 30 cm (8 to 12 in.) from the floor. Measure the precise moment movement is initiated.

25. If the force registered on the cable tensiometer or luggage scale is above 90-100 lb (400-450 Newton (N)), reduce the water pressure or the distance of the charged hose until the force registered is approximately 90-100 lb (400-450 Newton (N)). Do not reduce the distance more than 6.1 m (20 ft.).

26. If the force registered on the cable tensiometer or luggage scale is below 90-100 lb (400-450 Newton (N)), increase the water pressure or the distance of the charged hose until the force registered is approximately 90-100 lb (400-450 Newton (N)). Do not increase the distance more than 6.1 m (20 ft.).

Note: Once you have calibrated the force needed, pull the charged hose back coiling or snaking it behind the start line. Ensure the hose will not kink or snag when it is being pulled during the evaluation.

Figure 4: Set-up of the Charge Hose Advance

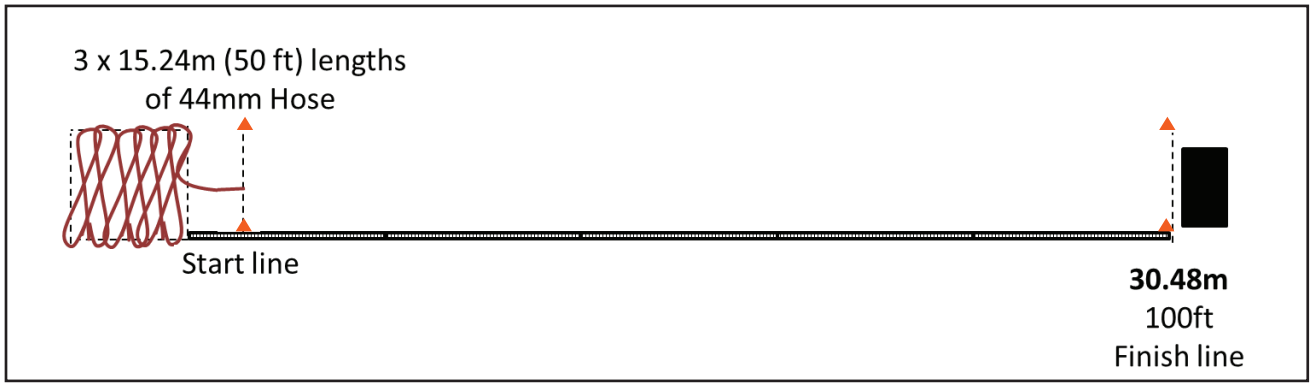


Figure 5A: Start of the Charged Hose Advance

Figure 5B: Calibration of the Charged Hose Advance

TASK #3 WEIGHTED SLED PULL

Equipment needed:

- Marking tape
- Cable tensiometer or luggage scale
- Two pylons
- Weighted sled
- Selection of plate weights
- Two 18.29 m (60 ft.) lengths of 16 mm (5/8 in) static rope
- Two carabiners

27. Place a line of marking tape on the floor and place a pylon over the marking tape to identify the start point.

28. Measure a 15.24 m (50 ft.) distance from the first line and place a second line of marking tape on the floor with a pylon on top of the line.

29. Ensure both floor lines are parallel to each other.

30. The weighted sled should be immediately behind the first line with one rope tied to each anchor. Ensure that the rope extended towards the second line is fully stretched and ready to be pulled from the other side of the 15.24 m (50 ft.) distance, see Figure 6A.

31. Add approximately two 45 lb (20.41 kg) plates to the sled.

32. Use the cable tensiometer or luggage scale to verify the force required to move the sled. Attach the cable tensiometer or the luggage scale to the rope at approximately 15.24 m (50 ft.) from the attachment to the sled.

33. When initiating the movement of the sled, the cable tensiometer or the luggage scale should be no more than 20 to 30 cm (8 to 12 in.) from the floor, see Figure 6B.

34. The force required to initiate movement of the sled should be between 40 to 45 lb (178 and 200 N.).

35. If the force is greater than desired, you must remove weight from the sled. If the force is less than desired, use the plates to add weight to the sled.

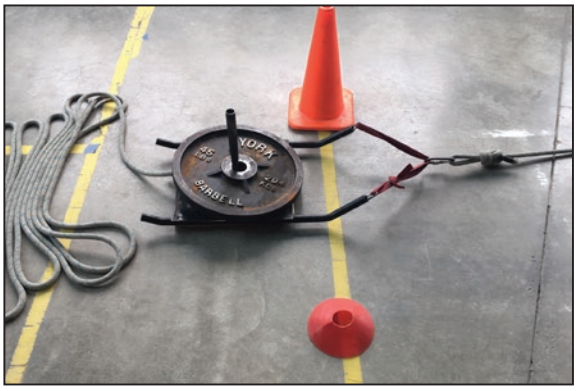


Figure 6A: Set-up of the sled's anchors with rope attached behind the starting line

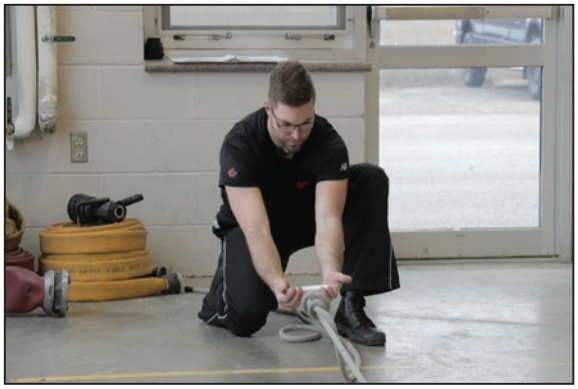


Figure 6B: Calibration of weighted sled pull

TASK #4 FORCIBLE ENTRY

Equipment needed:

- One ALCO Forcible Entry Device and hydraulic calibration tool
- One 208 L (55 gal.) barrel
- 10 lb (4.54 kg) sledgehammer
- Two C-clamps
- Duct tape or marking tape
- Two wrenches (sizes 11/16 or 3/4)
- Heavy duty steel stand
- Two 6 ft. lengths of 2" × 6" connected together with four 2" × 6" × 15" cross braces to form a foot stop barricade that can be attached to the bottom of the stand, see Figure 7A.

36. Use the hydraulic calibration tool supplied with the Forcible Entry Device to verify the pressure required to move the target, see Figure 7B.

37. The force required to move the target should be between 850 and 900 pounds per square inch (psi).

38. If the force is greater than above, loosen the four springs equally, controlling the braking force. If the force is less than above, tighten the four springs equally in an "X" pattern. Ensure that when tightening the nuts you are not standing directly in front of the nuts, see Figure 7C.

39. a. Place a strip of marking tape 25 cm (9.84 in.) above the head of the sledgehammer.
    b. Place the sledgehammer on the ground in front of the Forcible Entry Device.

40. You can find additional information on the Forcible Entry Device, and its set-up, maintenance and calibration in **Tool 3: Forcible Entry Device Set-up and Calibration.**

Figure 7A: View of the set-up for the ALCO Forcible Entry Device task

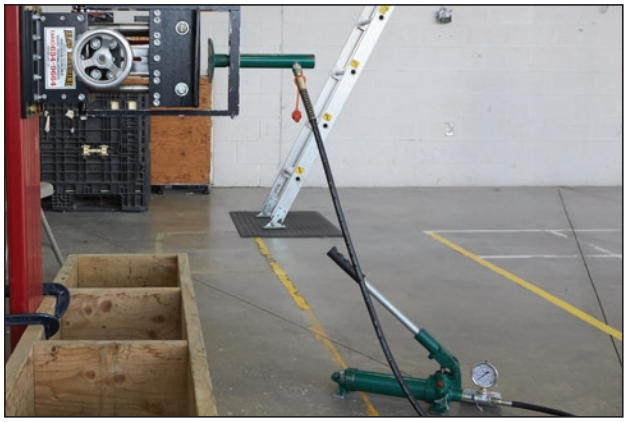


Figure 7B: Forcible Entry calibration set-up

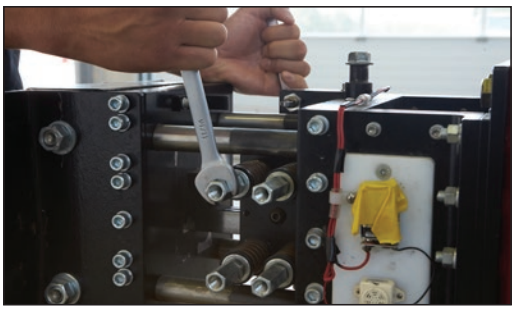


Figure 7C: Forcible Entry spring calibration

TASK #5 – VICTIM RESCUE

Equipment needed:

- Rescue Randy mannequin 176 lb (80 kg)
- Coveralls and firefighting boots
- 5-point harness
- Five pylons

41. Measure a 15.24 m (50 ft.) distance over a flat, hard surface. Indicate each end with pylons. Place a pylon at the following distances on your 15.24 m (50 ft.) course:
    - Pylon 1: 3.81 m (12.6 ft.)
    - Pylon 2: 7.62 m (25 ft.)
    - Pylon 3: 11.43 m (37.6 ft.)

42. You must offset pylons 1 and 3 by 0.4 m to the right and offset pylon 2 by 0.4 m to the left. Reference the start and finish line pylons, see Figure 8.

43. Place the mannequin 0.5 m behind the start line. Its head must point towards the course, see Figure 9.

44. Ensure the mannequin is wearing coveralls and firefighting boots to prevent undue wear and tear. Fit a 5-point harness to the mannequin so that applicants can grasp and drag the victim. If the weight of the mannequin is less than 176 lb (80 kg), increase its total weight to the appropriate weight. No more than 60% of the weight must be in the upper body. You can tie the mannequin's arms together as well as its legs to facilitate the victim rescue.

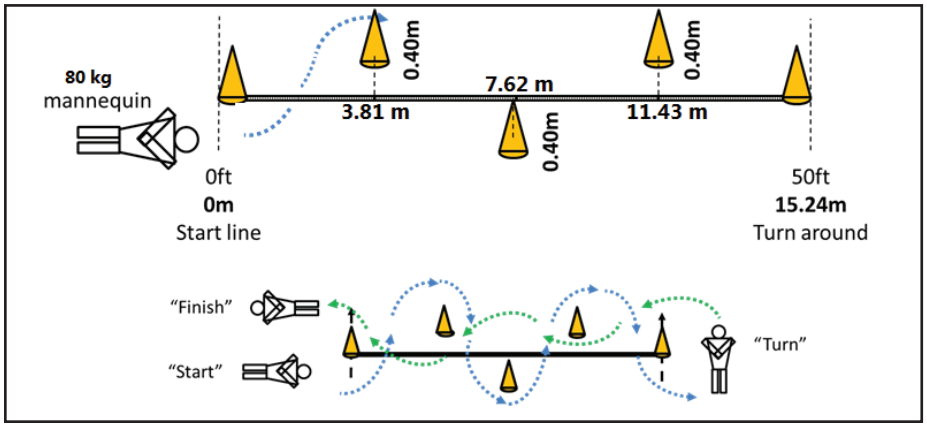


Figure 8: View of the course

Figure 9: Victim Rescue start position

TASK #6 – LADDER CLIMB

Equipment needed:

- Heavy-duty extension ladder 7.32 m (24 ft.)
- Auto descender
- Strap
- Eye-bolt

45. You can use a single fly ladder, but remember that the applicant climbs to the 10th rung, so the actual length of the ladder must extend at least 2 m past the 10th rung.

46. Set the ladder up against a secure wall, see Figure 10A. If a wall is not available, you may use an approved 24' anchor point to secure the ladder, see Figure 10B and 10C.

47. Place the base of the ladder on a non-slip rubber mat, see Figure 11.

48. Tie off the top of the ladder.

49. Use a strap to secure the 10th rung to an eye-bolt on the wall if possible, see Figure 12. This serves two purposes:

    a. The ladder is more secure.
    b. The applicant has a visual target at the 10thrung.

50. Attach an auto descender over the ladder, see Figure 13.

51. The anchor point for this device must be able to sustain the standard 4,000 lb (1,814.37 kg) under federal standards.

52. The descent rate will vary between 0.5 metre/second (m/s) and 2 m/s depending on the weight of the applicant. If the applicant is light weighted, expect a slower descent.

53. The auto descender is capable of multiple deployments, as long as it is sent back to the manufacturer for calibration on the two-year cycle, as stipulated in the instructions (**Tool 4: Auto descender Calibration Instructions**).

Figure 10A: Ladder climb using a wall

Figure 10B: Ladder climb using a 24' ancher point

Figure 10c: Close up of the 24' anchor point

Figure 11: Close-up of the mat at the bottom of the ladder

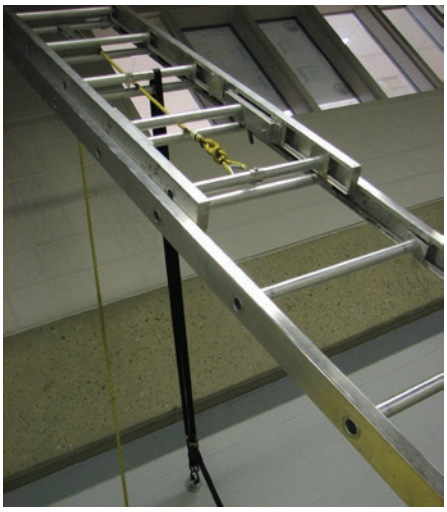


Figure 12: Eye-bolt on the wall attaching the ladder to the wall

Figure 13: Auto descender over the ladder

SAFETY PROCEDURES

54. When you properly administer the FPFE, there is minimal risk to the applicant. Nevertheless, an appropriate emergency protocol will be developed in conjunction with the local Emergency Respond Team.

55. Mgr FS&R or equivalent will ensure that:

    a. The "lead" evaluator MUST be certified as a Canadian Society for Exercise Physiology Certified Exercise Physiologist (CSEP-CEP).

    b. All Evaluators are First Aid and Cardio-Pulmonary Resuscitation qualified.

c. Evaluators brief all applicants on safety requirements and local emergency procedures prior to the start of the FPFE.
d. Prior to the administration of the FPFE, all evaluators shall identify the location of the closest available Automated External Defibrillator (AED).
e. All evaluators must also be familiar with signs and symptoms of cardiovascular and musculo-skeletal distress and heat stress. As we must make the FPFE protocol as realistic as possible, applicants must wear firefighting protective clothing that traps heat.

Note: In the event of a physical incident, implement the procedures of your local Occupational Health and Safety Committee. Refer to DOAD 2007-1, General Safety Program for more information.

PRE-EVALUATION INSTRUCTIONS AND RESPONSIBILITIES FOR APPLICANTS

56. A minimum of three months prior to the FPFE, the FCs, Recruiting Centres or the evaluators should give the applicants:

    a. The Medical Clearance Form for Civilians (**Tool 5: Medical Clearance Form**)
    b. The Applicant booklet (https://www.cfmws.com/en/AboutUs/PSP/DFIT/Fitness/Pages/Fire-Fighter.aspx).
    c. Description of the evaluation (**Tool 6: FPFE Information, Instruction and Evaluation Description**).

57. A minimum of 48 hours prior to the evaluation FCs, Recruiting Centres or evaluators will advise applicants of the following guidelines:

58. Applicants should not:

    a. Exercise six hours (6 hrs) prior to the FPFE.
    b. Consume alcohol for at least six hours (6 hrs) prior to the FPFE.
    c. Eat, smoke, chew tobacco, or take stimulants (tea, coffee, energy drinks, pharmaceuticals, etc.) for at least two hours (2 hrs) prior to the FPFE.

Note: Non-compliance with the above instructions does not necessarily mean FPFE postponement, however, you must inform applicants that it may have a negative effect on their results.

59. Dress requirement for the FPFE:

    a. Shorts
    b. Two T-shirts
    c. Running shoes
    d. Extra socks (thick and thin)
    e. Warm-up clothing
    f. Personal Protective Equipment (PPE) including boots (can be issued prior to the evaluation)

60. Civilian applicants will arrive with their medical clearance form (**Tool 5: Medical Clearance Form**) properly filled out, Government issued photo ID and payment.

61. Military members will arrive with their Government issued photo ID.

CHAPTER 3
F P F E

PART I: PRE-EVALUATION ADMINISTRATION

EVALUATION SCHEDULE

1. The evaluation schedule will vary based on the location and numbers of applicant. Refer to **Tool 7: Sample Evaluation Schedule and Crew Organization** and **Tool 8: Sample Timeline for Completion of the FPFE Protocol** for more information. Applicants or FCs looking to register for the FPFE must contact local PSP Fitness staff.

INTRODUCTION TO THE FPFE

2. All applicants should be aware of the importance of the FPFE, and the standardized procedures and protocols. **Tool 6: FPFE Information, Instruction and Description** provides a concise summary of information all applicants should be familiar with before registering for the FPFE.

EVALUATION REGISTRATION

3. In preparation for the evaluation registration, each applicant should have their own file folder with the following forms:

    - **Tool 9: FPFE Reporting Form – DND 2485-E**
    - **Tool 10: FPFE – Informed Consent Form**
    - **Tool 16: Treadmill Data Form** (Ensure applicant's particulars are added)

Note: The 'lead' evaluator will carry the identified applicant's folder.

DND 2485- E: SECTION A –APPLICANT'S PARTICULARS

4. The FPFE reporting form (DND 2485-E), **Tool 9: FPFE Reporting Form – DND 2485-E**) is a **Protected B** document once completed.

5. Firmly and legibly fill out all applicant particulars and information in the boxes located on the FPFE Reporting Form (DND 2485-E).

6. Verify Government issued photo ID and the accuracy of the applicant information in Section A-Applicant's particulars, and check the box indicating this has been done, see Figure 14.

Figure 14: Section A- Applicant's particulars

Section A: Applicant's particulars

Last name		First name	SN / AN	Telephone
DOB *(yyyy-mm-dd)*	Age	Gender ☐ Male ☐ Female	Emergency contact	Fire station / Recruiting centre	☐ CAF applicant ☐ CIV applicant
☐ Photo ID		☐ Informed consent form		☐ Medical clearance form *(civ. only)*	☐ Payment *(civ. only)*

7. Have the applicant read and sign the Informed Consent form (**Tool 10 –Informed Consent Form**). Collect and ensure it is properly signed. The evaluator must also sign the form and return it to the file folder. Check the appropriate box in Section A.

8. Collect the Medical Clearance form, civilians only (**Tool 5: Medical Clearance Form**) and check the appropriate box in Section A of the DND 2485-E. Carefully read the form to ensure that the following has been done and add it to the file folder:

    a. The applicant's physician has correctly filled out and signed the form.
    b. Has the physician provided any comments about medication or limitations to exercise?
    c. If some limitations are specified, we advise you to delay the evaluation until all questions about medical clearance have been addressed.

9. The Medical Clearance form will be valid for a maximum of three (3) months unless a shorter period is stated.

10. Collect payment from civilian applicants only. Check the **Payment** box to indicate this has been done or is not applicable. Follow Non-Public Funds (NPF) Financial Accounting Procedures for deposits and expenditures of funds.

DND 2485-E: SECTION B – HEALTH APPRAISAL QUESTIONNAIRE

11. Prior to attempting the FPFE, all applicants must complete Section B - Health appraisal questionnaire, by selecting the appropriate **Yes** or **No** boxes, see Figure 15.

12. The health appraisal questionnaire consists of nine questions for civilian applicants and ten questions for CAF applicants. The applicant must read carefully and answer honestly. This procedure is necessary to identify potential issues that require a medical consultation prior to an evaluation. See the steps listed below to refer an applicant to a physician, as required.

13. If the civilian applicant answers 'No' to all the first nine questions, you can proceed to Section C.

14. If the CAF applicant answers 'No' to the first nine questions and 'Yes' to question number 10, you can proceed to Section C and will not require a Blood Pressure or Heart Rate measurement.

15. If the applicant (military or civilian) answers 'Yes' to any of the first nine questions, you can complete Section D - Vital signs, and refer the applicant to their physician or their Medical Officer (MO).

Figure 15: Section B – Health appraisal questionnaire

Section B: Health appraisal questionnaire

This questionnaire is a screening device to identify personnel for whom fitness evaluations and physical activity might be inappropriate at this time.

To the best of your knowledge:	Yes	No
1. Do you have a medical condition which restricts you from participating in a fitness evaluation or a progressive training program?	☐	☐
2. Do you have bone or joint problem that could made worst by becoming more physically active or which may prevent you from participating in a fitness evaluation or a progressive training program?	☐	☐
3. Do you experience pain, tightness, squeezing or heaviness in your chest when you exercise?	☐	☐
4. Do you ever get dizzy or faint when you exercise?	☐	☐
5. Have you ever had a heart attack, a stroke or other heart-related problems?	☐	☐
6. Do you suffer from such things as asthma, bronchitis, emphysema, diabetes, hypoglycemia, epilepsy, high blood pressure or cancer?	☐	☐
7. Are you pregnant or do you believe that you might be?	☐	☐
8. Are you taking medication *(prescribed or otherwise)* that could affect your ability to undertake a fitness evaluation?	☐	☐
9. Is there any other reason you would like to talk to a physician prior to your fitness evaluation or training program?	☐	☐
10. Military only: Do you have a valid Periodic Health Assessment (PHA)? *(If no, proceed with blood pressure measurement)*	☐	☐

Periodic Health Assessment (PHA) for CAF Applicants only

16. The PHA is valid for five years for CAF personnel under 40, and two years for CAF personnel over 40 for all Military Occupation Structure Identification (MOSID) unless otherwise specified.

17. When a PHA is performed between the ages of 35 and 40, it will be valid for a maximum period of five years, but not beyond age 42, see Figure 16.

Figure 16: Periodic Health Assessment (PHA) Validation Period

Age	PHA Validation Period
Less than 40 years of age	5 years
More than 40 years of age	2 years
Between 35-40 years of age	5 years but not beyond age 42

18. If the CAF personnel has a valid PHA, they will check the **Yes** box to this health appraisal question and will proceed to Section C of the FPFE Reporting Form.

19. If the CAF personnel has an expired PHA or a medical chit for Blood Pressure (BP), the CAF personnel will check the **No** box to this health appraisal question and will have their BP measured.

20. Follow the guidelines outlined in **Tool 11: Blood Pressure Procedure** to measure their BP using an automatic BP machine, or a stethoscope and sphygmomanometer.

DND 2485-E: SECTION C – EVALUATOR'S OBSERVATIONS

21. Although the Health Appraisal Questionnaire in Section B identifies most concerns for which a fitness evaluation would be inappropriate for the applicant, you must also make some general observations, see Figure 17.

22. Do not proceed with the evaluation if one of the following applies to the applicant:
    a. Demonstrates difficulty breathing at rest.
    b. Coughs persistently.
    c. Has lower-extremity swelling.

d. Has another reason, which you believe would predispose them to unnecessary discomfort or risk ('other').

23. You are obligated and authorized to deny the FPFE if you assess that the applicant would be at risk (based on your observations) if they were to attempt the FPFE.

24. You will confirm that the applicant has followed the Pre-Evaluation Instructions. If the applicant did not adhere to the instructions, you must advise the applicant that the results of the evaluation may be negatively affected. If you have no concerns from what you have observed, you may proceed to Section D.

Figure 17: Section C: Evaluator's observations

Section C: Evaluator's observation

Difficulty breathing at rest	☐ Yes	☐ No	Lower extremity swelling	☐ Yes	☐ No
Persistent cough	☐ Yes	☐ No	Followed preliminary instructions	☐ Yes	☐ No

Other: _____

DND 2485-E: SECTION D – VITAL SIGNS

25. You will measure the applicant's resting heart rate (HR) to verify that it is within the pre-screening measurement limits. You will place two fingers on the radial artery and apply slight pressure on the inside of the wrist just below the thumb.

26. You will use a 15-second count in order to determine the resting HR. Count the first beat as "zero". You will multiply the total number of beats counted in the 15 seconds by four to establish the value in "beats per minute" (bpm).

27. In order to proceed with the evaluation, the applicant`s resting HR should be under 100 bpm. If the applicant`s resting HR is below 100 bpm, proceed with the Blood Pressure Measurement.

28. If the resting HR exceeds 100 bpm, wait an additional 5 minutes and repeat the procedure. Should the applicant`s resting HR still exceed 100 bpm on the second reading, refer the applicant to an MO or family physician. The applicant shall not perform the evaluation until appropriate medical clearance is received.

29. You will then measure the applicant's blood pressure to verify that it is within the pre-screening measurement limits. You must follow the BP measurement protocols outlined in **Tool 11: Blood Pressure Measurement.**

Note: The applicant's pre-screening BP measurement must be less than or equal to 144/94 mmHg.

30. Once measured, you will record the BP in Section D, under **resting blood pressure measurement**, see Figure 18.

31. If the BP meets the pre-screening criteria (less than or equal to 144/94 mmHg), the applicant is cleared and can proceed with the FPFE.

32. If the applicant's BP measurement **is above 144/94 mmHg**, complete the following steps:
    a. Wait five minutes and take their BP a second time.
    b. Record this second measurement in Section D, under Second measurement.
    c. If the applicant's BP is less than or equal to 144/94 mmHg, they can proceed with the evaluation.
    d. If the applicant's BP is above 144/94 mmHg, refer the applicant to their physician and briefly explain to the applicant that the BP readings are slightly out of the range for which the evaluation was designed and that the evaluation will not continue at that time. Tell the applicant that there is no cause for alarm, but that the health appraisal, observations and BP measurements are designed to work as a safety precaution.

Figure 18: Section D: Vital Signs

Section D: Vital signs

☐ Heart rate monitor

Resting heart rate (bpm): ☐☐☐ Resting blood pressure measurement: ☐☐☐/☐☐☐ Second measurement: ☐☐☐/☐☐☐

Applicant		Evaluator	
Signature	Date *(yyyy-mm-dd)*	Signature	Date *(yyyy-mm-dd)*

33. Once Sections A through D are completed, then both you and the applicant need to sign and date the DND 2485-E prior to continuing with the FPFE.

REFERRAL TO A PHYSICIAN

34. Only applicants who answered 'No' to all nine questions of the Health Appraisal Questionnaire, and have met the HR (Less than 100 bpm) and BP criteria (less than or equal to 144/94 mmHg) are cleared to participate in the FPFE.

35. Refer to a physician when any one of the following applies to the applicant:
    a. The applicant answers 'YES' to any of the nine questions of the Health Appraisal Questionnaire on the DND 2485-E (Section B).
    b. Their HR measurement is at or above 100 bpm after two attempts (Section D).
    c. Their BP measurement exceeds 144/94 mmHg after two attempts (Section D).
    d. The applicant develops any symptoms, which in your experience or the applicant's experience, are outside of those normally encountered.
    e. You become concerned about the applicant's safety due to immediate signs of serious distress.

Note: Do not attempt to diagnose or discuss in detail why the applicant had a 'YES' response or why their HR or BP is above the criteria for pre-screening.

Referral Process:

36. If the applicant provides a Physician Referral Report, it will indicate that the attending physician has cleared the applicant for evaluation. In the case of an applicant's BP not meeting the pre-screening criteria, their resting BP at the time of the referral examination will be entered on the form, along with any notes that the physician wishes to convey to you.

37. You will compare the findings of the assessment to those of the examining physician:
    a. If the findings are similar to those explained in the Physician Referral Report, and all other considerations are acceptable, proceed with the evaluation.

    or

    b. If the findings are significantly different from the ones of the examining physician, do **not** proceed with the FPFE at that time.

38. The Physician Referral Report will be valid for a maximum of three (3) months unless a shorter period is stated.

ADDITIONAL REQUIREMENTS

Fit Heart Rate (HR) Monitor

39. Provide an HR monitor and ensure that the applicant is wearing it correctly. Have the applicant wet the sensor and position the HR monitor directly on the skin, just below the sternum. It should be snug enough to stay in place during the evaluation. Ensure that the device is set comfortably as the heavy clothing and SCBA pack will frequently cause the chest strap to move and disrupt transmission if it is loose.

40. Ensure that the HR monitor functions properly prior to the beginning of the evaluation. Once the evaluation has started, you will not be able to tighten the strap or reset the device.

41. You can attach the HR receiver to the SCBA or at a location convenient for you to read while walking beside the applicant, as long as it is at the correct distance for the device and its receptor to transmit the information.

42. You can expect very high (near maximal) HR values during the evaluation period, due in part to the physical exertion and in part to the heat stress that can occur.

43. You can find instructions for proper operation of the device in the heart rate monitor operator's manual.

ISSUE TURNOUT GEAR

44. The combination of protective clothing and SCBA is generally referred to as PPE. At most locations, applicants will be issued gear from the local fire station or provide their own. This gear must be consistent with current safety standards and representative of the type of protective gear the fire department uses.

45. Check the gear to ensure that it fits properly and that all components are present. For example, the suspenders and waist adjustments on the firefighting pants must be complete and functional.

46. Evaluation dress requirements:
    a. Flash-hood
    b. Bunker Jacket (including liner)
    c. Bunker Pants (including liner)
    d. Firefighting rubber boots
    e. Leather work gloves (not firefighting gloves)
    f. Helmet and visor (if available)
    g. SCBA (60-min MSA SCBA air cylinder, emptied)

47. Helmets and SCBA will be issued to the applicant at the evaluation sites (treadmill and job-related); however this could vary depending on the location of the evaluation.

48. Ensure that the jacket collar is fully done up and the helmet visor (if available) is in the down position.

49. Some applicants will have little or no experience with turnout gear and SCBA. You and the other Evaluators must be familiar with PPE to ensure proper fit and correct use. You must always be able to check "at a glance" to make sure that the gear is worn correctly and is in good operating condition.

50. The applicant will wear shorts and a T-shirt under the PPE.

Note: Running shoes are used during the treadmill component. Firefighting boots and a 5-point harness are used only for the job-related tasks, see Figure 19.

Figure 19: Applicant wearing the PPE Front (A) and side (B)

PART II: CONDUCTING THE FPFE

General

51. The FPFE assesses an applicant's ability to successfully complete job tasks related to firefighting. It is comprised of seven tasks that the applicant must successfully meet. The minimum standards are as follow:

Task	Minimum Standard
Treadmill/cardiorespiratory task	Minimum of 13 minutes (5 warm-up + 8 core) + mandatory 5 min cool-down
Equipment Carry/Vehicle Extrication	03:45.0 min or less
Charged Hose Advance	00:27.0 sec or less
Weighted Sled Pull	01:50.0 min or less
Forcible Entry	00:19.0 sec or less
Victim Rescue	00:57.0 sec or less
Ladder Climb	01:37.0 min or less

INFORMATION BRIEFING

52. You will provide a clear explanation of each task using the provided scripts highlighting technical information (see **Tool 12: FPFE – Welcome Script, Tool 13: FPFE – Treadmill Script, Tool 14: FPFE – Familiarization and Job-related Tasks Script**). You will also provide:
    - Overview of the FPFE's objectives
    - General technical information highlighting ideal techniques
    - Mandatory rest requirements
    - Emergency Action Plan (EAP)
    - Opportunity for applicants to ask questions

EVALUATION PROCEDURES

General

53. The following information pertains to all seven tasks:

54. A task is **terminated** when one of the following scenarios occurs:
    a. The applicant successfully completes the task.
    b. The applicant chooses not to continue (reasons for this could be fatigue, pain, injury, etc.).
    c. You become concerned about the applicant's safety or you witness immediate signs of serious distress. In the event of a medical issue, activate Emergency Medical Services.

d. The applicant does not comply with your instructions. It is essential that applicants respect the procedures, rules and equipment throughout the evaluation. Any applicant that is unable/ unwilling to follow the correct protocol in the familiarization phase or in the actual task will be corrected and a warning will be given to re-adjust prior to continuing. The applicant must correct their technique IMMEDIATELY after you have given them a warning. If the applicant does not correct their technique and a second warning is required, you will stop the task.

EXCEPTIONS:

55. If an applicant slips, stumbles or falls during the job-related tasks and it is clearly a minor incident with no safety implications, you should encourage the applicant to keep going. There is no limit on the number of times this can happen during the FPFE. However if there are any concerns about safety, the evaluation should be stopped immediately. If after investigation the applicant is able to continue, the equipment should be reset and the task restarted. A three-minute recovery period should elapse between the time of the incident leading to the interruption of the evaluation and the restart of the task. Restarting a task is only permitted once during the FPFE job-related task component.

Note: If it is obvious that an applicant will not complete a task within the standard, you will allow them to continue until they complete the task. You should also strongly encourage the applicant to complete all tasks within the FPFE in order to provide general information on areas of weakness. You should also give proper training suggestions.

Section I:
TREADMILL COMPONENT PROTOCOL

GENERAL

56. The minimal requirement for passing the treadmill component is the following:
    a. warm-up (5 min).
    b. screening phase (8 min).
    c. cool-down (5 min).

57. If an applicant completes the first 13 minutes of the protocol (5 minutes warm-up and 8 minutes screening phase), then they have passed the treadmill component of the evaluation. However, encourage applicants to go beyond the minimum 8 minute screening phase and continue until exhaustion.

58. At least two evaluators are required to administer the treadmill component.

59. Inform the applicant on the general principles of treadmill safety, correct starting and stopping procedures, communication during the component, and the component end-points, see **Tool 13: FPFE-Treadmill Script** for further information.

60. You should not make assumptions that applicants will know what is expected of them.

61. Prior to the warm-up, explain the rate of perceived exertion (RPE) scale (see **Tool 15: RPE Scale**) and confirm how they will communicate their responses to you during this component. Record the RPE at the end of each minute of exercise. This data provides very useful insight into the fatigue state of the applicant during and after the FPFE.

62. Inform the applicant 15 seconds prior to every upcoming change in speed or grade to which the applicant must verbally acknowledge their willingness to continue. This acknowledgement gives you time to confirm if you will stop or continue the treadmill component, see Figure 20A.

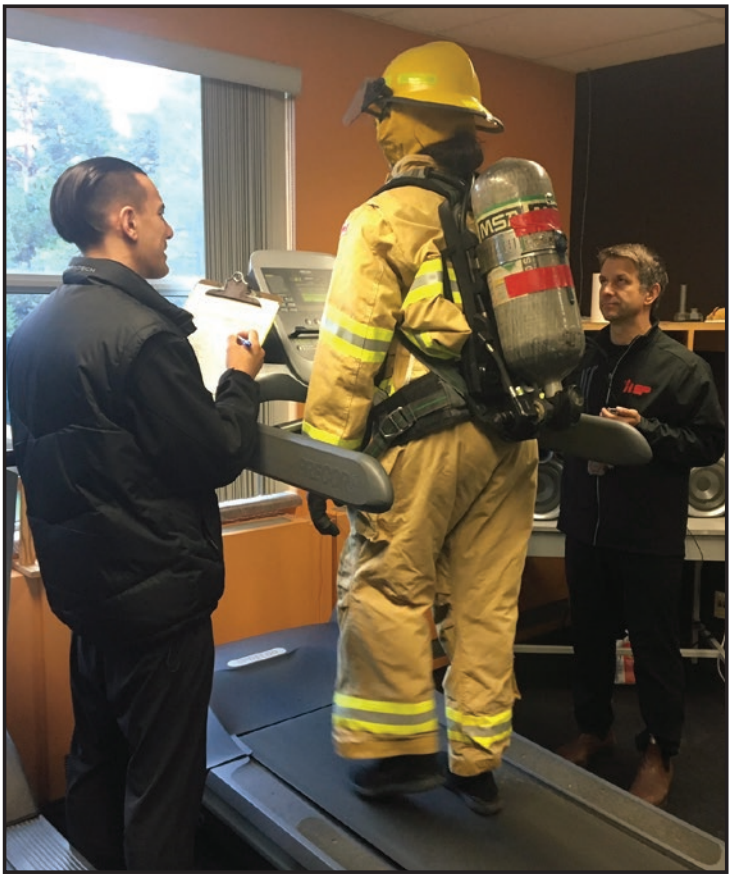


Figure 20A: The treadmill component for aerobic fitness

63. At the end of the treadmill component, the applicant will spend one hour in the recovery area before beginning the familiarization for the job-related tasks component. It is the lead evaluator's responsibility to escort the applicant to the designated recovery area and deliver the clipboard with data sheets to the job-related tasks evaluators.

TREADMILL COMPONENT PROTOCOL

64. The following protocol must be done continuously. There are no breaks between the sections.

65. Use **Tool 16: Treadmill Data Form** to guide the treadmill component of the evaluation, record HR and RPE as well as any pertinent comments, information and abnormalities on the evaluation.

Evaluation Warm-up (5 minutes)

a. While holding the handrails, the applicant straddles the treadmill.
b. Start the treadmill and set the speed to 3.5 mph and 0% grade.
c. Have the applicant step onto the treadmill belt while still holding the handrails.
d. Once they are comfortable with the pace, the applicant can let go of the handrails.
e. Start the evaluation clock as soon as applicant lets go of the handrails.
f. After completing two minutes of walking at 3.5 mph at 0% grade, increase the grade to 2%.
g. After completing one minute of walking at 3.5 mph at 2% grade, increase the grade to 4%.
h. After completing one minute of walking at 3.5 mph at 4% grade, increase the grade to 6%.
i. After completing one minute of walking at 3.5 mph at 6% grade, increase the grade to 10%.

Evaluation Core (Eight minutes or more)

66. Using the HR monitor and the Borg scale, record the applicant's HR and RPE near the end of each minute of the evaluation of this component.

    a. Continue walking at 3.5 mph at 10% grade for eight minutes.
    b. If the applicant is able to continue after the eight minutes, increase the grade by 1% every minute for the next five minutes :
        i. Minute 13, 11% grade
        ii. Minute 14, 12% grade
        iii. Minute 15, 13% grade
        iv. Minute 16, 14% grade
        v. Minute 17, 15% grade

    c. If the applicant is still able to continue, maintain the grade at 15% and increase the speed by 0.5 mph for the following five minutes:
        i. Minute 18, 4.0 mph
        ii. Minute 19, 4.5 mph
        iii. Minute 20, 5.0 mph
        iv. Minute 21, 5.5 mph
        v. Minute 22, 6.0 mph

Component Cool-down (five minutes)

67. Once the applicant can no longer continue, they must perform a mandatory five-minute cool-down at the following pace:
    a. Decrease the speed to 2.0–2.5 mph.
    b. Decrease the grade to 0%.

68. The applicant can use the handrails while the speed and grade are being decreased for the cool-down. They can adjust the speed at their discretion. The applicant may also:
    a. Remove their helmet.
    b. Remove gloves and flash-hood.
    c. Loosen the jacket collar.
    d. Drink water and use a towel if necessary.

69. Do not remove any other gear until the applicant has completed the cool-down phase. If necessary, applicants may remain on the treadmill for longer than five minutes.

60 minutes rest period

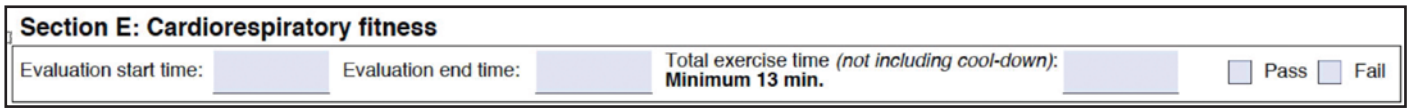
70. During the 60 minutes recovery period, the applicant must continue to wear the heart rate monitor as it is important to monitor their heart rate recovery periodically and ensure that they are not suffering from any adverse effects of training such as nausea, light-headedness or dehydration.

71. The applicant can do the following during the recovery period:
    a. Remove bunker gear.
    b. Change into dry clothes.
    c. Eat small snacks and re-hydrate.
    d. Perform any type of active recovery such as walking, lower body muscular contractions, stretching/mobility.

RESULTS

72. Complete DND 2485-E Section E – Cardiorespiratory Fitness, see Figure 20B using the information recorded on **Tool 16: Treadmill Data Form**. Ensure your Total Exercise Time recorded **does not** include your cool-down. Once completed, sign **Tool 16: Treadmill Data Form**. Place the DND 2485-E and the **Tool 16: Treadmill Data Form** in the applicant's file folder and hand it off to the next Evaluator, if applicable.

Figure 20B: Section E-Cardiorespiratory Fitness



SECTION II - JOB-RELATED TASKS COMPONENT PROTOCOL

GENERAL

73. This component consists of six job-related tasks.

74. The applicant must complete a mandatory familiarization phase before starting the component.

75. During the familiarization of each task, the evaluator will comment in DND 2485-E Section F – Job-related task – 30 minute familiarisation, on the quality of the applicant's task technique, see Figure 29A.

76. There is a three-minute recovery period between each task during which the applicant can:
    a. Walk and stretch (but they should not sit or lie down).
    b. Raise their visor.
    c. Remove gloves.
    d. Drink water.

77. 30 seconds prior to the end of the three-minute recovery period, you must advise the applicant to do the following:
    a. Walk to the start of the next task.
    b. Lower their visor.
    c. Put on gloves.

78. Heart rate and recovery heart rate must be taken immediately after the completion of the task and 10 seconds prior to the start of the next task. These will be recorded along with task completion time and comments about the performance of the task in DND 2485-E Section G – Job-related task – Evaluation results, see Figure 29B.

79. Applicants are not allowed to run at any time during the tasks.

80. The applicant may not leave the evaluation area without permission from you or another evaluator.

81. Time starts on the 'GO' command. Time stops when the applicant has completed the task and reached the designated end-point.

FAMILIARIZATION/PRACTICE

82. Prior to beginning the job-task related component of the evaluation, you must ensure that the applicant undergoes a familiarization/ practice phase, using appropriate techniques at all times. This phase should take about 30 minutes (five minutes of practice per task). The applicant should execute the familiarization phase at a warm-up pace wearing bunker pants, boots and gloves for all tasks and bunker jacket for task # 2 only. Task #6 will also require the harness.

Note: Inform the applicant that the familiarization phase is compulsory, and non-compliance will lead to termination of the evaluation.

For the familiarization phase the evaluator must:

a. Describe and demonstrate every task protocol using the script provided in **Tool 14: FPFE- Familiarization and Job-related Tasks Script.**
b. Provide enough time for the applicant to practice and understand the protocol.
c. Correct and provide technique feedback to the applicant as they practice the task.
d. Repeat the demonstration and extend the practice period if necessary.
e. Ensure the applicant understands the procedures.
f. Allow the applicant to ask questions and provide them with answers.

TASK #1: EQUIPMENT CARRY/VEHICLE EXTRICATION – FAMILIARIZATION

84. For this task the applicant must:
    a. Lift and carry the small spreader tool from the starting point to the 15.24 m (50 ft.) mat, set the tool down on the mat, return to the start.
    b. Practice lifting the triceps curl bar.
    c. Walk back to the 15.24 m (50 ft.) mat, pick up the small spreader tool, and carry it 7.62 m (25 ft.) to the mat in front of the door mock-up.
    d. Place the tool on the mat, practice holding the spreader tool for 10 seconds on each target setting the tool down between each hold. Return the small spreader tool to the start, going initially to the 7.62 m (25 ft.) mat then the 15.24 m (50 ft.) mat.

TASK #2: CHARGED HOSE ADVANCE – FAMILIARIZATION

84. For this task the applicant must:
    a. Wear the jacket in order to perform this familiarization phase.
    b. Execute only two-thirds of the task distance.

TASK #3: WEIGHTED SLED PULL – FAMILIARIZATION

85. For this task the applicant must:
    a. Pull the weighted sled the full distance of 15.24 m (50 ft.) twice trying different pulling techniques (one handed and two handed).
    b. Execute one length of walking in between both pulls.

TASK #4: FORCIBLE ENTRY – FAMILIARIZATION

86. For this task the applicant must:
    a. Execute the full task at a reduced speed in order to hear the buzzer.

TASK #5: VICTIM RESCUE – FAMILIARIZATION

87. For this task the applicant must:
    a. Try both lifting techniques (Arms around the chest and by the harness), choose the preferred method, once comfortable with the technique, travel half the distance back and forth (use a pylon as a turnaround point in the middle).

TASK #6: LADDER CLIMB – FAMILIARIZATION

88. For this task the applicant must:
    a. Execute at least two climbs of the ladder.

Note: The second evaluator or available personnel can stabilize the ladder from behind. A helmet must be worn.

JOB-RELATED TASK COMPONENT PROTOCOLS

89. The following section includes a description of the protocols for each individual task.

90. Prior to the start of the individual task evaluation, the Applicant will don their PPE. Before donning their SCBA, the applicant must secure a five-point-harness on the outside of their jacket and pants.

91. Hold the harness by the O-ring so the harness may be oriented easily to the back of the applicant.

92. Next, separate the shoulder straps of the harness over one of the arms of the applicant ensuring that the straps are not twisting and the O-ring is oriented on the back of the applicant. The applicant will set the strap across the second shoulder and secure the waist buckle on the opposite hip.

93. Finally, the applicant will secure the leg straps using the provided buckles. The applicant should be able to slide 2 fingers under the leg straps in order to ensure that the harness is not too restrictive.

94. Double check that there are no twists in the straps prior to donning the SCBA and that the O-ring is visible and accessible above the SCBA, see Figure 21.

Figure 21- O-ring visible above the SCBA

TASK # 1: EQUIPMENT CARRY/VEHICLE EXTRICATION

95. Facing the course, the applicant stands in an upright position behind the tools. They will remain in this position until you give the "Go" command.

96. You will count aloud "3, 2, 1, Go".

97. Time starts on the "Go" command.

98. The applicant lifts a 44 lb (20 kg) spreader tool, carries it to the mat 15.24 m (50 ft.) away, and then sets it down on the mat.

99. The applicant must execute all lifts in a safe and controlled manner with two hands on the tools.

100. The applicant walks back to the starting line and picks up the 80 lb (36.4 kg) triceps curl bar.

101. The applicant carries the 80 lb (36.4 kg) triceps curl bar to the mat 15.24 m (50 ft.) away and sets it down on the mat.

102. The applicant picks up the 44 lb (20 kg) spreader tool and carries it 7.62 m (25 ft.) to the mat in front of the door mock-up and sets it down, see Figure 22.

Figure 22: Applicant carrying the tools: Acceptable carry

103. The applicant picks up the spreader tool and holds the jaws firmly in contact with the top target, parallel to the floor and at a 90° angle to the door mock-up for the duration of the 30 second hold, see Figure 23.

104. The applicant must not:
    a. Touch the door mock-up at any time with their body.
    b. Allow the tool to come into contact with their body at any time during the "hold" phase.

Figure 23: Applicant holding the spreader tool against the door mock-up

105. Once the applicant has correctly completed the 30 seconds hold, they must set the tool down on the floor.

106. The applicant must stand upright before lifting the tool and proceeding to the second (bottom) target.

107. The applicant picks up the spreader tool and holds the jaws firmly in contact with the bottom target, parallel to the floor and at a 90° angle to the door mock-up for the duration of the 30 seconds hold.

108. The applicant will switch sides and repeat this sequence for a third and final time (place the tool

on the floor, stand upright, pick up the tool, proceed to the middle target, hold for 30 seconds and place the tool on the floor once the 30 second hold is completed).

109. Once the applicant has correctly executed the three targets, they will carry the 44 lb (20 kg) spreader tool back to the starting mat by first walking to the 7.62 m (25 ft.) mat, and then continuing to the starting mat 15.24 m (50 ft.) away.

110. The applicant will set the 44 lb (20 kg) spreader tool down on the mat and will walk back 15.24 m (50 ft.) to pick up the 80 lb (36.4 kg) triceps curl bar.

111. Once the applicant has lifted the 80 lb (36.4 kg) triceps curl bar, they will carry it to the starting mat. The applicant can walk through the finish line with the triceps curl bar in their hands.

112. Time stops when the applicant crosses the starting line with both feet.

113. The applicant must complete this task in 03:45 minutes or less.

114. The 3-minute recovery period begins immediately following the conclusion of the task.

115. Record the completion time to the nearest tenth of a second. The pass criteria will be 03:45.0 minutes or less. A time of 03:45.1 minutes or more does not meet the standard.

116. The applicant's post-evaluation heart rate (immediately upon completion of the task) and recovery heart rate (10 seconds prior to the start of the next task) are recorded on the DND-2485-E.

117. You should:
    a. Verbally direct the applicant throughout the evaluation, as the applicant is not expected to memorize the course.
    b. Give proper feedback to the applicant and encourage them to move with a sense of purpose, or urgency when walking. Encourage them to pick up the pace or match your speed so they can successfully complete the task.
    c. Provide feedback at 10 and 20 seconds, and a countdown for the last few seconds of each 30-second hold.
    d. Ensure the applicant switches sides for the last "target".
    e. Monitor the applicant's body position. Give verbal instructions to applicants such as cues for proper positioning. If the applicant cannot maintain proper body positioning or hold the tool in place properly (parallel and 90 degrees) for the full duration of the 30 seconds, one warning will be given without interrupting the hold. If contact with the disk is broken, instruct them to set the tool down and restart the 30-second hold.

TASK # 2: CHARGED HOSE ADVANCE

118. Facing the course, the applicant stands in an upright position next to the hose nozzle. They will remain in this position until you give the "Go" command.

119. You will count aloud "3, 2, 1, Go".

120. Time starts on the "Go" command.

121. The applicant bends and picks up the nozzle located behind the start line.

122. The applicant will secure the nozzle and hose over their preferred shoulder and maintain **two hands on the hose or nozzle** at all times.

123. The applicant should carry the nozzle near waist level, see Figure 24. This allows for a more effective pulling technique and less risk of losing their balance.

124. The applicant advances with the hose from the start line to the finish line, 30.48 (100 ft.) away.

125. Encourage the applicant to move as quickly as possible without running.

126. Remind the applicant to keep their shoulders square with the finish line as the weight of the hose might cause their body to twist and move their body off course.

127. The applicant must cross the finish line with both feet going straight ahead.

Note: Twisting, turning, or backing across the finish line is not permitted.

128. Time stops when both feet cross the finish line.

129. When the applicant has completely crossed the finish line, they must stop, and set the nozzle on the floor. They must not drop the nozzle.

130. The applicant must complete the task in 00:27.0 seconds or less.

131. The 3-minute recovery period begins immediately following the conclusion of the task.

132. Record the completion time to the nearest tenth of a second. The pass criteria is 00:27.0 seconds or less. A time of 00:27.1 seconds or more does not meet the standard.

133. The applicant's post-evaluation heart rate (immediately upon completion of the task) and recovery heart rate (10 seconds prior to the start of the next task) are recorded on the DND-2485-E.

134. You should:
    a. Remind the applicant to use their momentum in order to avoid a stalling phase, as the resistance will increase. The applicant will need to "get low" and "dig in" and "go hard" to maintain momentum.
    b. Advise the applicant in the event that they stall and can no longer move forward, to take two or three steps backward, lean forward and resume walking.

Figure 24: View of the Charged Hose

TASK # 3: WEIGHTED SLED PULL

135. The applicant stands in an upright position at an acceptable distance behind the start line in order to accommodate the weighted sled to fully cross the line.

136. Ensure there is no slack or knots in the rope during the task.

137. You will count aloud "3, 2, 1, Go".

138. Time starts on the "Go" command.

139. The applicant bends and picks up the length of rope attached to the weighted sled.

140. The applicant's feet must remain securely in place and only minimal movement is permitted. The applicant is not allowed to walk or step back while pulling the sled as this could create an advantage.

141. The applicant uses the rope to pull the sled a distance of 15.24 m (50 ft.), see Figure 25.

142. The applicant is allowed to use the pulling technique of their choice (hand on hand or two handed pull).

143. Once the sled has fully crossed the line, instruct the applicant to start **walking** (running is not allowed) to the opposite pylon 15.24 m (50 ft.) and repeat the pull for a second time.

144. When getting into position before the second weighted sled pull, the applicant stands at an acceptable distance behind the start line to accommodate the weighted sled to fully cross the line.

145. Once the applicant has completed the second pull, instruct them to walk back 15.24 m (50 ft.) and repeat the pull for the third and final time.

146. If the applicant starts walking before the sled fully crosses the line, tell them to return behind the line, finish the pull and wait for your signal to proceed to the next step.

147. An evaluator should be at each end of the course to ensure that the weighted sled fully crosses the line. Once the applicant has pulled the weighted sled the required distance, reset the sled immediately behind the line, and the rope should be ready to pull.

148. Time stops once the weighted sled crosses the finish line for the third time.

149. The applicant must complete the task safely in 01:50 minutes or less.

150. The 3-minute recovery period begins immediately following the conclusion of the task.

151. Record the completion time to the nearest tenth of a second. The pass criteria will be 01:50.0 minutes or less. A time of 01:50.1 minutes or more does not meet the standard.

152. The applicant's post-evaluation heart rate (immediately upon completion of the task) and recovery heart rate (10 seconds prior to the start of the next task) are recorded on the DND-2485-E.

153. You should:
    a. Ensure the applicant's feet are not moving in order to create an advantage.
    b. Ensure the applicant waits for the signal to start walking to the other side of the course.
    c. Ensure the ropes are stretched out correctly and no knots are present.
    d. Ensure the sled is positioned correctly at all times before the start of the next pull (in line with the start line).

Figure 25: View of the Sled Pull. The applicant is pulling the sled using the 16 mm (5/8 in) static rope

TASK # 4: FORCIBLE ENTRY

154. The applicant stands in an upright position facing the Forcible Entry Device with their hips perpendicular to the device. The sledgehammer will be in front of them.

155. You will count aloud "3, 2, 1, Go".

156. Time starts on the "Go" command.

157. The applicant picks up the 10 lb (4.54 kg) steel sledgehammer and uses it to strike the mechanically braked target surface of the Forcible Entry Device until the target moves the required distance.

158. The applicant must not move their feet past the front edge of the apparatus. To avoid this, a foot-stop has been added at the base of the apparatus, see Figure 26A.

159. The applicant must use the sledgehammer safely, with two hands in contact with the shaft at all times. The applicant must use the sledgehammer in a swinging motion and not as a battering ram. The applicant is permitted as many hits as required to move the target the full distance.

Figure 26A: View of the Forcible Entry Device with the food stop

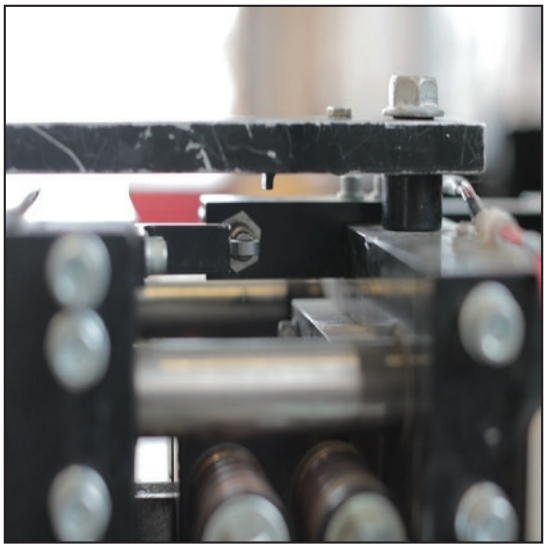


Figure 26B: Initiating contact with the trigger latch

160. The marking tape on the sledgehammer shaft must be visible between the hand and the head of the hammer at all times. The applicant is allowed to move their hands and re-set their grip on the sledgehammer at any time during the task.

162. At the sound of the buzzer, give the "stop" signal to indicate that the task is completed.

Note: Ensure you have a visual of the 'trigger latch' in case the buzzer does not function properly. When the "trigger latch" is engaged you will give the "stop" signal to indicate the task is completed, see Figure 26B.

162. Time stops at the sound of the buzzer or "trigger latch" is engaged.

163. The applicant must place the sledgehammer down on the floor without dropping it.

164. The applicant must complete the task in 00:19.0 seconds or less.

165. The 3-minute recovery period begins immediately following the conclusion of the task.

166. Record the completion time to the nearest tenth of a second. The pass criteria will be 00:19.0 seconds or less. A time of 0:19.1 seconds or more does not meet the standards.

167. The applicant's post-evaluation heart rate (immediately upon completion of the task) and recovery heart rate (10 seconds prior to the start of the next task) are recorded on the DND-2485-E.

168. You should:
    a. Encourage the applicant to hit the target hard and fast while ensuring that the face of the sledgehammer is in full contact with the middle of the target.
    b. Ensure visual contact with the back end of the apparatus in case the buzzer does not sound.
    c. Provide continuous feedback.
    d. Ensure the marking tape on the sledgehammer shaft is visible between the applicant's hands and the head of the sledgehammer at all times.

TASK # 5: VICTIM RESCUE

169. The applicant stands in an upright position, 0.5 m behind the start line, facing the mannequin with their back to the course.

170. You will count aloud "3, 2, 1, Go".

171. Time starts on the "Go" command.

172. The applicant lifts and drags a 176 lb (80 kg) mannequin while walking backwards for a total distance of 30.48 m (100 ft.) in a zigzag fashion around the pylons.

173. If the applicant drops the mannequin at any time during the task, the applicant must pick it up and continue.

174. The applicant has the choice of lifting the rescue mannequin with their arms around its torso or by gripping the harness, see Figures 27A and 27B.

175. Encourage the applicant to walk backwards quickly. However, they must remain under control at all times. Applicant should look over their shoulder, find the pylon and make the turn. This will help avoid touching the pylons, see Figure 27C.

176. Touching a pylon results in a re-evaluation. Bring the mannequin back to the starting line. The applicant must begin the second attempt immediately. If they touch a pylon a second time, the applicant fails this task.

177. Once you have signalled that the mannequin has crossed the line, the applicant may put it down on the floor.

Note: They must not drop the mannequin.

178. Time stops when the mannequin's feet completely cross the finish line.

179. The applicant must complete this task safely in 00:57.0 seconds or less.

180. The 3-minute recovery period begins immediately following the conclusion of the task.

181. Record the completion time to the nearest tenth of a second. For example, the pass criteria will be 00:57.0 seconds or less. A time of 00:57.1 seconds or higher does not meet the standards.

182. The applicant's post-evaluation heart rate (immediately upon completion of the task) and recovery heart rate (10 seconds prior to the start of the next task) are recorded on the DND-2485-E.

183. You should:
    a. Verbally guide applicants through the task, so the pylons are not touched by their own body or by the mannequin.
    b. Provide continuous verbal and visual feedback to the applicant, such as "look over your left shoulder, find the pylon, and make the turn".

Figure 27A: Applicant holding the mannequin's harness

Figure 27B: Applicant holding the mannequin under the arms

Figure 27C: Applicant looking over his shoulder

TASK # 6: LADDER CLIMB

184. Before the end of the 3 minute rest period following the Victim Rescue, the applicant will stand in front of the ladder while you attach the auto belay to the applicant`s harness. Grab the carabiner from the Auto belay attached to the ladder, manually rotate the twist-lock until the opening of the lock is in line with the gate latch. Ensure that you hold the gate firmly against the back end of the carabiner as you hook the carabiner into the O-Ring of the harness. Once the O-Ring is hooked, simply release the gate and ensure that the twist lock is engaged, see Figure 28A.

Figure 28A: View of the Carabiner and O-ring

Note: The second evaluator or available personnel can stabilize the ladder from behind. A helmet must be worn.

185. The applicant stands in an upright position facing the ladder with both feet on the floor, with the auto-belay device securely attached to the harness.

186. You will count aloud "3, 2, 1, Go".

187. Time starts on the "Go" command.

188. The applicant climbs 10 rungs (3.45 m) up a 7.32 m (24 ft.) ladder, firmly places both feet on the 10th rung and climbs down until both feet are firmly on the floor. They must repeat this five times as quickly as possible.

189. The applicant must maintain three-point contact (two feet and one hand, or one foot and two hands) at all times on the ladder, see Figure 28B.

Figure 28B: View of the ladder climb, three points of contact

190. A flight phase (both feet off the ladder at once, or a jump from one rung to the next) is not allowed.

191. Give a warning and instruct the applicant to return to where they were prior to the offence and then continue the task. Non-compliance will result in failure of this task.

192. Call out each rung in this fashion, "one-two-three-four-five-six-seven-eight-nine-ten-FEET TOGETHER (second foot on the 10th rung)" followed by, "ten-nine-eight-seven-six-five-four-three-two-one- FEET TOGETHER (second foot on the floor)".
193. Both feet at the top (10th rung) and bottom (floor) must be weight bearing. If the applicant fails to complete this requirement, instruct them to return to the top or bottom, and properly complete the step.

194. The applicant must remain under control at all times. If the applicant misses a rung or slips, they must stop, go back to the point of error and start again.

195. Stop the clock when both feet are firmly on the floor after the applicant has completed the 5th repetition of the ladder climb.

196. Have the applicant stand still while you remove the auto-belay attachment.

197. The applicant must complete the task safely in 01:37 minutes or less.

198. The 3-minute recovery period begins immediately following the conclusion of the task. All equipment must remain on the applicant unless the safety of the applicant becomes a concern.

199. Record the time to completion to the nearest tenth of a second. For example, the pass criteria will be 01:37.0 minutes or less. A time of 01:37.1 minutes or higher does not meet the standards.

200. The applicant's post-evaluation heart rate (immediately upon completion of the task) and recovery heart rate (10 seconds prior to the start of the next task) are recorded on the DND-2485-E.

201. You should:
    a. Count the steps loud enough so that the applicant can hear your instructions.
    b. Correct the applicant's infraction as soon as it happens.
    c. Ensure the applicant uses three points of contact on the ladder at all time.
    d. Ensure that no flight phase occurs during the task.

202. At the conclusion of the 3-minute recovery period, the FPFE is complete. You will escort the applicant to a designated recovery area.

SECTION III – RECOVERY & COMPLETION OF DND 2485-E

1. Most applicants will need to cool down and re-hydrate. Move the applicant to a comfortable area where they can relax under supervision as required.

2. Ensure that the applicant is not experiencing dizziness, nausea, muscle cramping, etc. If they are, do not leave them unattended. Once in the recovery area, encourage them to re-hydrate.

3. Encourage the applicant to conduct an active recovery such as walking and light stretching as this will help facilitate recovery. Discourage applicants to sit or lie down immediately following the evaluation.

4. Normally, you can release an applicant after approximately 30 minutes of recovery.

SECTION F – JOB-RELATED TASK – 30 MINUTES FAMILIARIZATION (DND 2485-E)

5. Ensure that all sections of **Section F – Job-Related Task – 30 minutes familiarization** have been properly filled out, see Figure 29A.

6. Ensure that a comment is added for each task indicating how the applicant performed.

Figure 29A: Section F- Job-Related Task – 30 minutes familiarization

Section F: Job-related task - 30 minute familiarization

Familiarization start time: _____	Familiarization end time: _____	Familiarization supervised by: _____
1. Equipment carry / VE	3. Weighted sled pull	5. Victim rescue
2. Charged hose advance	4. Forcible entry	6. Ladder climb

SECTION G – JOB-RELATED TASK – EVALUATION RESULTS (DND 2485-E)

7. Ensure that all sections of **Section G – Physical Fitness Evaluation Results** have been properly filled out, time must be indicated in minutes, see Figure 29B.

Figure 29B: Section G- Job-Related Task – Evaluation results

Section G: Job-related task - Evaluation results

Evaluation start time: _____ Evaluation end time: _____ Evaluated by: _____

Job related task - evaluations	Time *(min: sec)*	Standard	Post-Eval HR *(start of 3 min)*	Recovery HR *(end of 3 min)*	Comments	Pass	Fail
Equipment carry / VE		03:45 min or less				☐	☐
Charged hose advance		00:27 sec or less				☐	☐
Weighted sled pull		01:50 min or less				☐	☐
Forcible entry		00:19 sec or less				☐	☐
Victim rescue		00:57 sec or less				☐	☐
Ladder climb		01:37 min or less				☐	☐

	Yes	No
1. Met cardiorespiratory standard?	☐	☐
2. Met job related task standards?	☐	☐
3. Met overall evaluation standards	☐	☐

8. Check the appropriate boxes in this section of the DND 2485-E indicating whether the applicant has successfully met or not met the standard for each component of the evaluation (Cardiorespiratory evaluation, the Job-related Task evaluation and the overall evaluation.

9. The applicant must pass all components of the evaluation to be successful. Discuss the results of the evaluation with the applicant. In case of a failure, a re-test may or may not be possible. A discussion between the Fitness Coordinator and the hiring fire chief or military chain of command will be necessary to determine the way ahead.

SECTION H – POST-EVALUATION RECOVERY (DND 2485-E)

10. After 20 to 30 minutes of recovery, and prior to collecting the HR monitor, measure the applicant's resting HR and BP. Enter both in Section H, see Figure 29C.

11. The applicant's (civilian and CAF member) blood pressure should be ≤ 144/94 mmHg and their heart rate should be <100 bpm before they can leave the evaluation area.

Figure 29C: Section H - Post-evalution recovery.

Section H: Post-evaluation recovery

Resting heart rate (bpm): ☐☐☐ Resting blood pressure: ☐☐☐ / ☐☐☐

12. Ensure that all applicants return the HR monitors and bunker gear at the end of the evaluation.

SECTION I – CERTIFICATION (DND 2485-E)

13. After verifying the results and the information with the applicant (section A to H), both you and the applicant must sign **Section I- Certification**, see Figure 30.

Figure 30: Section I – Certification

Section I: Certification

Applicant		**Evaluator**	
Signature	Date *(yyyy-mm-dd)*	Signature	Date *(yyyy-mm-dd)*

REPORTS AND RETURNS

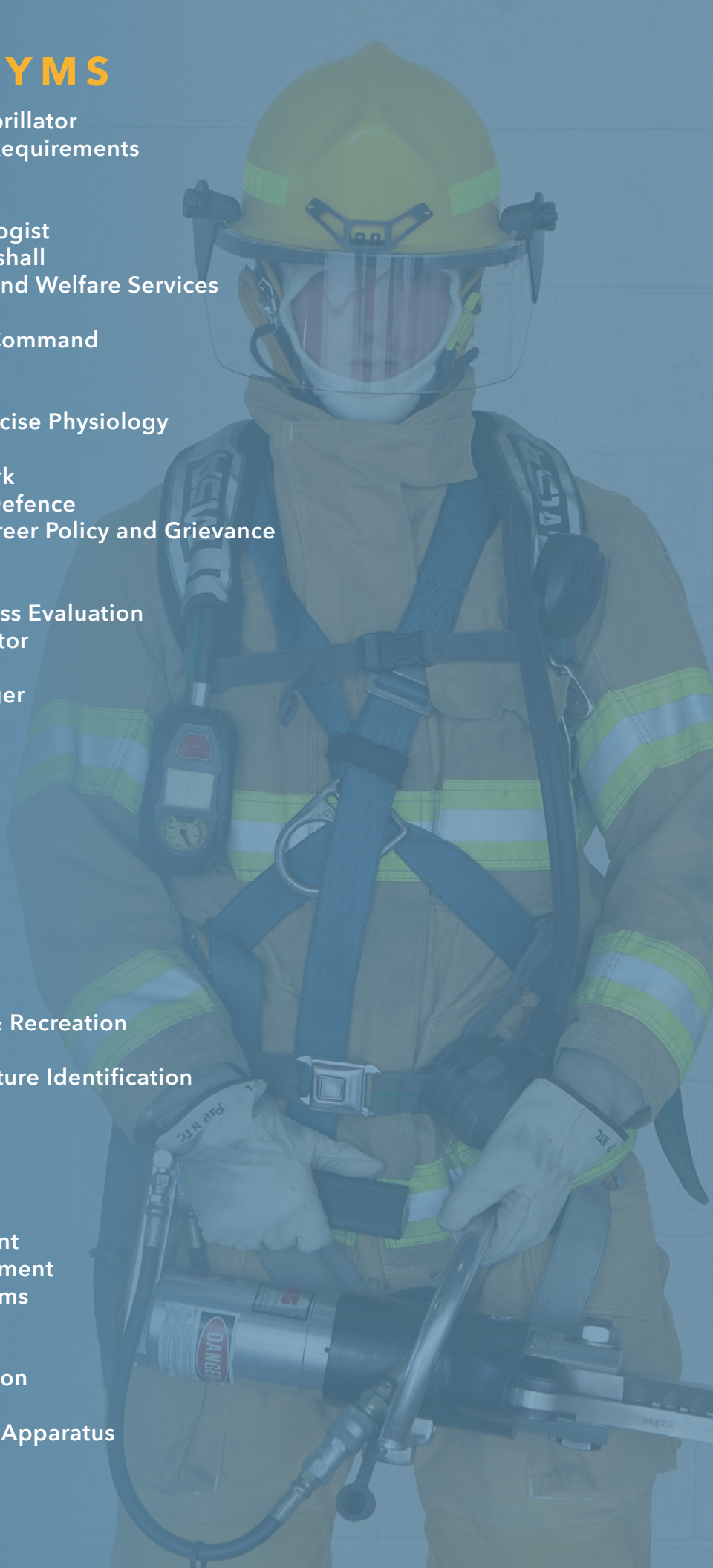
14. Upon completion, distribute the signed copies accordingly. In certain instances, the applicant may be responsible for the proper distribution of copy 2. All copies will be treated as Protected B when completed.

Distribution of DND 2485-E will be as follows:

Copy 1 – Applicant.
Copy 2 – OT/CT OPI or Fire Chief.
Copy 3 – CFMWS/DFit for research purposes.

TOOL 1: ACRONYMS

AED	Automated External Defibrillator
BFORs	Bona Fide Occupational Requirements
BP	Blood Pressure
CAF	Canadian Armed Forces
CEP	Certified Exercise Physiologist
CFFM	Canadian Forces Fire Marshall
CFMWS	Canadian Forces Morale and Welfare Services
cm	Centimetres
CMPC	Chief Military Personnel Command
CO	Commanding Officer
CoC	Chain of Command
CSEP	Canadian Society for Exercise Physiology
DFit	Director of Fitness
DLN	Distance Learning Network
DND	Department of National Defence
DMCPG	Directorate of Military Career Policy and Grievance
EAP	Emergency Action Plan
FCs	Fire Chiefs
FPFE	Firefighter Pre-Entry Fitness Evaluation
FSI	Fitness and Sports Instructor
ft.	Feet
F&W Mgr	Fitness & Wellness Manager
Gal.	Gallon
HR	Heart Rate
in.	Inches
kg	Kilograms
Km/h	Kilometres per hour
L	Litres
lb.	Pounds
m	Meters
min	Minutes
mm	Millimetres
mmHg	Millimetre of Mercury
Mgr FS&R	Manager Fitness, Sports & Recreation
MO	Medical Officer
MOSID	Military Occupation Structure Identification
mph	Miles per hour
m/s	metre/second
N	Newton
NPF	Non-Public Funds
OPI	Office of Primary Interest
PHA	Periodic Health Assessment
PPE	Personal Protective Equipment
PSP	Personnel Support Programs
psi	Pound per Square Inch
rev.	Revolutions
RPE	Rating of Perceived Exertion
sec	Seconds
SCBA	Self-Contained Breathing Apparatus



TOOL 2: TREADMILL CALIBRATION OF SPEED AND GRADE

Treadmill Calibration

General

1. Calibrate the treadmill before each FPFE session to ensure the speed and grade are correct. This is essential since the FPFE requires specific speed and grade settings that can impact the overall results. Allocate enough time for calibration and repairs.

2. This section provides simple guidelines for calibrating the treadmill. Check the treadmill operations manual to see if adjustments are possible. You may need the services of a technician to adjust the treadmill if you cannot fix the problems locally.

3. Alternately, the steps described below allows you to check for calibration errors and compensate for them.

Equipment required to calibrate the speed and grade:

a. Accurate measuring tape.
b. Marking tape or duct tape.
c. Stopwatch.
d. Calculator.
e. Carpenter's level.

Treadmill Speed Calibration

4. The speed of the treadmill is typically reported on the display in miles per hour (mph). If a treadmill display is in kilometres per hour (km/h), see the treadmill's operations manual or visit the manufacturer website to learn how to change the display. If this is not possible, use this calculation to convert the units.

Speed in miles per hour × 26.82 = speed in meters per minute

Speed in kilometers per hour × 0.62 = speed in miles per hour

5. The majority of the treadmill component is completed at 3.5 mph and therefore, this is the most important speed to calibrate. In most cases, if the treadmill is correct at 3.5 mph, then it will also be correct throughout the range between 3.0 and 5.0 mph. You can verify this on an individual basis, if necessary.

6. First, determine the length of the treadmill belt in meters. This may be available from the treadmill's operations manual. If not, use the following protocol:

a. Mark the end of the treadmill belt with a piece of marking tape (indicating the starting position).
b. Place your measuring tape at the start of this marking tape.
c. Extend your measuring tape towards the front of the treadmill, measure and mark this section with a new piece of marking tape.
d. Move the treadmill belt manually until your marked section is at the back of the treadmill.
e. Repeat until you reach the first piece of marking tape.
f. Add all measurements indicating the total length of the treadmill belt.

7. Next, convert mph to meters/ minute (m/ min).

3.5 mph= 93.9m/ min

8. Next, calculate the number of belt revolutions expected at 3.5 mph (93.9 m/min) by dividing 93.9 m/min by the length of your belt in m.

$$\frac{\text{93.9 m/min}}{\text{Length of your belt (m)}} = \text{rev/min}$$

9. For example, if the belt length is 4.3 m, then at 3.5 mph, your calculations will reveal:
    - 21.8 rev/min

10. To find sec/rev. calculate the following:

$$\frac{\text{60 sec}}{\text{rev/min}} = \text{sec/rev}$$

11. For example, if the belt length is 4.3 m, then at 3.5 mph = 21.8 rev/min, your calculations will reveal:
    - 2.75 sec/rev

12. To find seconds needed for 20 revolutions, calculate the following:

20 rev × 2.75 sec/rev = sec

13. For example, if the belt length is 4.3 m, then at 3.5 mph = 21.8 rev/min and 2.75 sec/rev your calculations will reveal:
    - 55 seconds for 20 revolutions

14. Once you have completed these calculations, follow the steps below to verify the calibration:
    a. Place a piece of marking tape on the treadmill belt and a second piece of marking tape on the deck beside the belt, see Figure 31.

    b. Set the treadmill at 3.5 mph and have one Evaluator walk on the belt (this is important as the belt speed is often different when the treadmill is loaded or unloaded).

    c. Measure the elapsed time for 20 revolutions, noting each time the marking tape passes the marking tape on the treadmill deck, see Figure 32.

    d. If the actual elapsed time is the same as the calculated 20 revolutions for the treadmill, the treadmill speed display is accurate and nothing further is required.

    e. If the actual elapsed time differs from the predicted time, then adjust the speed control up or down slightly to compensate for the difference, and repeat the timing procedure to achieve the calculated seconds for 20 revolutions. You may have to do this several times. By performing these steps you have not calibrated the treadmill speed. However, you have checked the speed and taken steps to compensate for any differences between the display on the speed controller and the actual speed of the belt.

f. For example, you may find that when the speed control displays 3.6 mph the belt speed is actually 3.5 mph.

g. If you are required to compensate for more than 1 mph, the treadmill needs to be recalibrated. Contact a technician to calibrate the treadmill properly.

Figure 31: Marking tape on treadmill belt and deck

Figure 32: 2 evaluators ensuring speed calibration

Treadmill Grade Calibration

15. The slope of the treadmill is expressed as percent grade, which is easily calculated by the vertical rise for a given amount of horizontal distance. Typically, we are interested in the amount of vertical "rise" for 1 meter of horizontal distance (or "run"). Therefore, for a 10% grade, the rise will be 10 cm over a run of 100 cm (or 1 m).

16. Follow the steps below:
    a. Turn on the treadmill and set the grade display to "0".
    b. Use the carpenter's level to ensure that the treadmill is level front-to-back and side-to-side. Floors are not always level, so don't be surprised to find that the treadmill is not level. You can make minor adjustments by repositioning the treadmill, adjusting the levelling feet (if applicable) or by using shims.
    c. Carefully measure a one-meter distance along the side of the treadmill and mark with masking tape, see Figure 33.
    d. Adjust the grade display to read 10%.
    e. Measure the distance between the floor and the treadmill deck at each end of the one-meter distance marked out earlier. Use a level to ensure the measuring tape is held plum to the ground, see Figure 34.
    f. If the treadmill grade display is correct, the distance at the front mark (closer to the front of the treadmill) should be exactly 10 cm greater than the distance at the back mark. If so, the grade is correct and no further steps are required, see Figure 35.
    g. If the distance is not correct, adjust the treadmill grade controller up or down as required until the difference is 10 cm. whatever the display reads is actually equivalent to 10%. For example, you may find that when the display reads 11%, the actual grade is 10%. You can then make up a "correction table" with displayed and actual values that you can use during the evaluation.
    h. By performing these steps, you have not calibrated the treadmill grade. However, you have checked the grade and taken steps to compensate for any differences between the display on the grade controller and the actual slope of the belt.
    i. If you are required to compensate the grade by more than 1%, the treadmill needs to be recalibrated. Contact a technician to calibrate the treadmill properly.

Figure 33: 1 m distance on treadmill footrest

Figure 34: Measure the height at each end of the 1 m

Figure 35: Measure the height at each end of the 1 m at a 10% grade

TOOL 3: ALCO FORCIBLE ENTRY DEVICE SET-UP AND CALIBRATION

WARNING: Failure to follow these instructions could lead to improper installation, performance problems, and possible injury.

SET UP THE FORCIBLE ENTRY DEVICE

1. Fasten the Forcible Entry Device against a sturdy wall or steel mounting stand at 78 cm (30.71 in) above the floor, (middle of the target to the floor is 78 cm (30.71 in)). The stand must be capable of withstanding significant horizontal forces exerted by the 10 lb (4.54 kg) sledgehammer used to compress the Forcible Entry Device. If you are building your own stand, follow the dimensions in Figure 36B.

2. Position the base of the stand against a secure wall to prevent it from shifting during use.

3. Counter-balance the stand with one 208 L (55 gal.) barrel or with any other suitable counter-balance method available. Filling a barrel of this size approximately ¾ full of water acts as an effective counter-weight to counterbalance the mass of the Forcible Entry Device.

4. Use six 3″ × 5/8″ high-quality fastening bolts to attach the Forcible Entry Device to the stand. The fastening bolts' diameter must match the diameter of the mounting holes of the Forcible Entry Device.

Important: Do not hammer the bolts into position. This could damage the bolt threads.

5. Slide the bolts through the mounting holes until they extend completely through the stand.

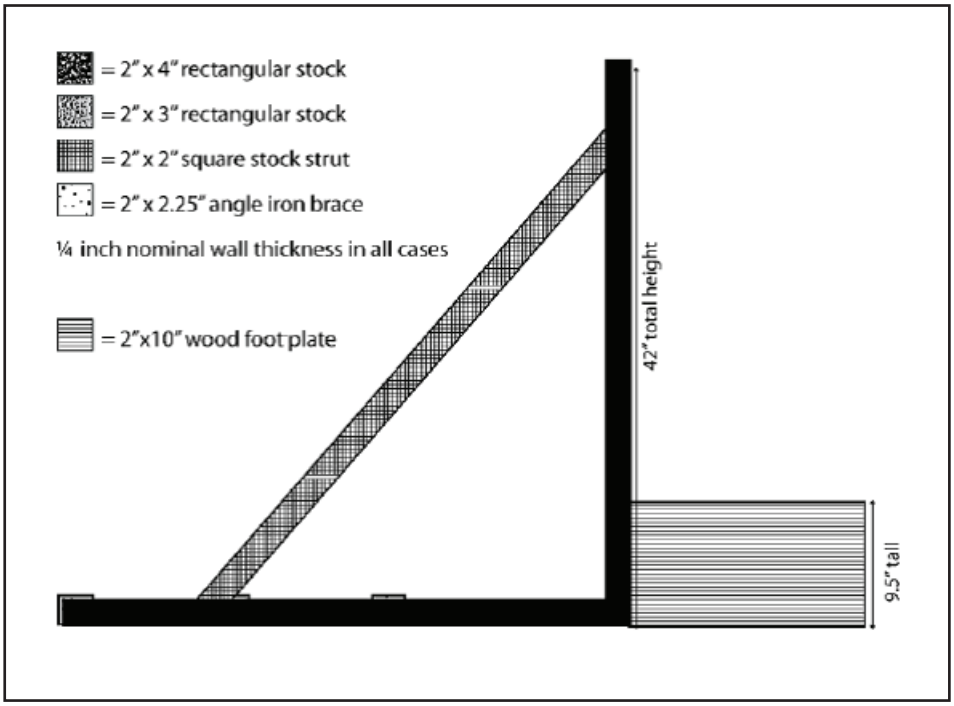
6. Secure the bolts using lock washers and high-quality nuts.

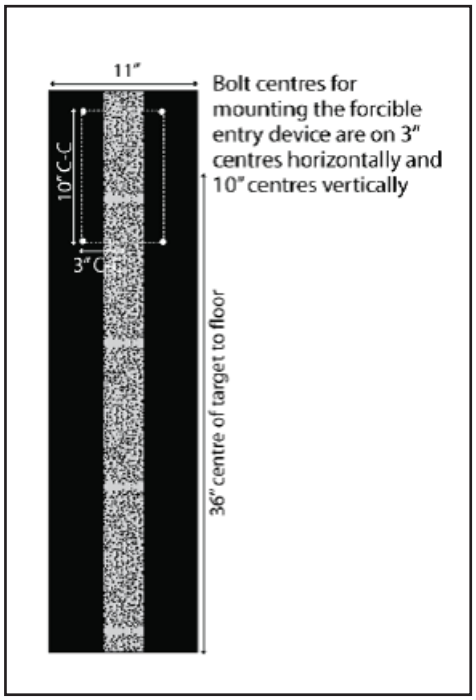
7. Centre and securely attach the wooden footplate, two 6 ft. lengths of 2″ × 6″ connected with four 2″ × 6″ × 15″ cross-braces to form a foot stop barricade, attached to the bottom of the unit with C-clamps, see Figure 36A. The wooden footplate simulates the base of a wall or door.

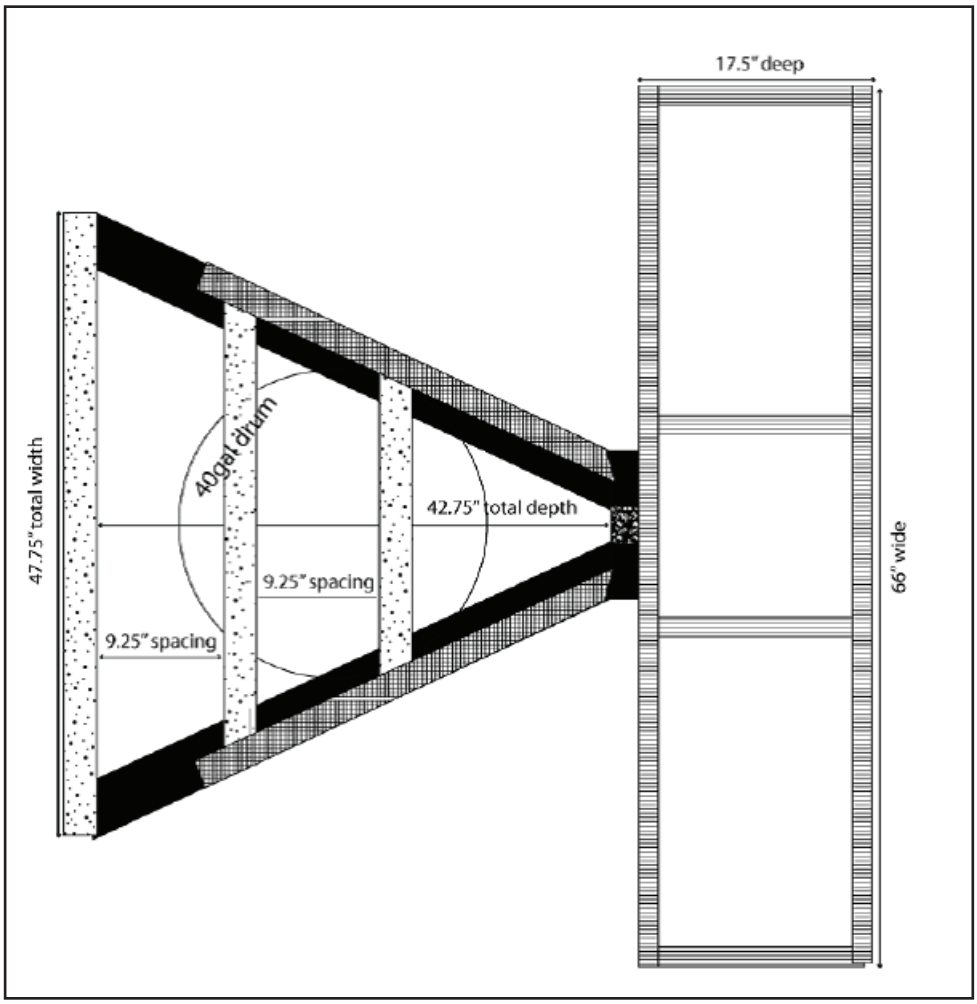
Figure 36A: Wooden footplate

Note: If using the Forcible Entry Device mounting stand through CPAT Distribution, Inc., ensure that when ordering the stand you specify that the bolt holes on the mounting stand need to be adjusted to ensure the middle of the target is at a distance of 78 cm (30.71 in) above the floor (middle of the target to the floor is 78 cm (30.71 in)).

Figure 36 A: Forcible Entry Stand dimensions







USING THE FORCIBLE ENTRY DEVICE

8. The Forcible Entry Device is designed to be struck with the head of a 10-pound sledgehammer on the rubber pad hitting surface. As the hitting surface is struck, the Forcible Entry Device compresses. The amount of force required to compress the Forcible Entry Device depends on the amount of tension in each of the eight springs attached to the brake mechanism. By increasing the spring tension, the force required to compress the Forcible Entry Device increases. Full compression is achieved when the hitting surface engages a switch mounted on the stationary portion of the Forcible Entry Device. The switch is wired to a battery-operated buzzer.

PREPARING THE FORCIBLE ENTRY DEVICE FOR USE

9. Fully extend the hitting surface away from the mounted part of the Forcible Entry Device. If you cannot fully extend the hitting surface, release the brake by turning the hand wheel clockwise.

Note: The Forcible Entry Device is fully extended when you can no longer extend the hitting surface.

10. Engage the brake (designed to restrict compression) by rotating the hand wheel counter-clockwise. The brake is completely engaged when you can freely rotate the hand wheel counter-clockwise. Free counter-clockwise rotation ensures that the brake is under full compression by all eight springs. However, if it is not fully engaged it will take less force to compress the Forcible Entry Device.

CALIBRATING THE FORCIBLE ENTRY DEVICE

11. You must calibrate the Forcible Entry Device before each FPFE session, or between evaluations if you notice a difference in resistance.

TO MEASURE PRESSURE

12. Make sure that the Forcible Entry Device is in the full reset position and that the hand wheel is loosened (locking the target in place).
    a. Turn the hand wheel ¼ to ½ turn clockwise to release the brake pressure on the restriction blade.
    b. Using your hands, pull the Forcible Entry Device back into the starting position.
    c. Once the hitting surface is fully extended, turn the hand wheel counter-clockwise until it is tension- free.

13. Attach the two arms of the hydraulic calibrator to the two calibration bolts located on the upper and lower surface of the Forcible Entry Device, see Figure 37A.

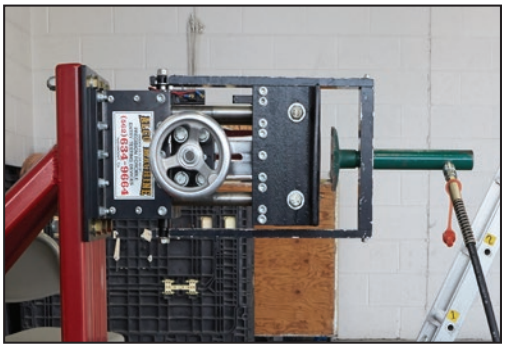


Figure 37A: Close up of the hydraulic calibrator hooked

14. Slide the locking pins in the closed position to secure the hydraulic calibrator to the Forcible Entry Device, see Figure 37B.

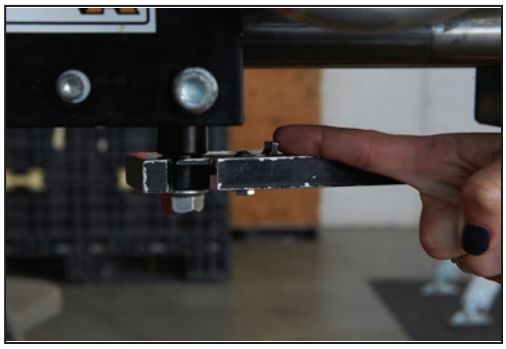


Figure 37B: Locking the calibrator tool in place

15. Use a slow and smooth pumping action to gradually build pressure, moving the calibration gauge towards the target surface.

16. Once the calibration gauge makes contact with the target surface, ensure that the piston's rectangular foot squarely contacts the center of the hitting surface of the Forcible Entry Device.

17. Continue pumping the pressure gauge until the hitting surface triggers the compression buzzer.

18. The pressure required to move the hitting surface must be consistent throughout the full range of motion. The final pressure must be between 850 - 900 psi.

19. To release the pressure, turn the hydraulic calibrator's relief valve counter-clockwise. The hydraulic calibrator piston returns to the start position.

20. Reset the Forcible Entry Device.

TO INCREASE SPRING TENSION

21. If the target surface moves at less than 850 - 900 psi, tighten the four piston nuts equally to add more tension to the braking mechanism's eight springs, see Figure 38.

Note: Hold each bolt head stationary with a wrench or socket while making adjustments to the nut.

a. Tighten each of the four piston nuts clockwise in half-turn clockwise increments.
b. Check the calibration pressure.
c. Repeat steps a and b until the pressure is calibrated to 850 - 900 psi.

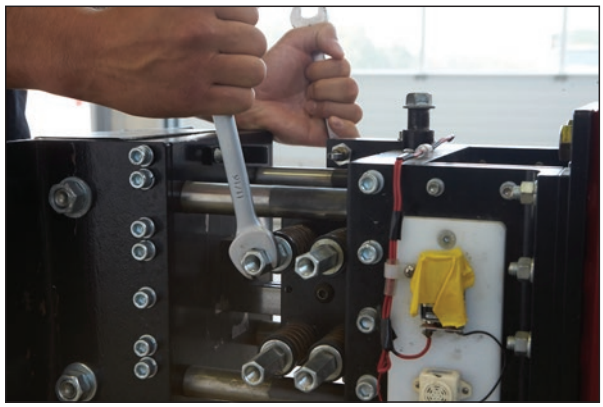


Figure 38: Forcible entry with piston nuts

TO REDUCE SPRING TENSION

22. If the target surface moves at more than 850 - 900 psi, loosen the four nuts equally to remove tension in the braking mechanism's eight springs.

Note: Hold each bolt head stationary with a wrench or socket while making adjustments to the nut.

a. Loosen each of the four piston nuts counter-clockwise in half-turn counter-clockwise increments.
b. Check the calibration pressure.
c. Repeat steps a and b until the pressure is calibrated to 850 - 900 psi.

INCONSISTENT PRESSURE

23. If the pressure to move the hitting surface is inconsistent (±25 psi) over the full range of motion, thoroughly clean the four guide rails. For more details, see "Maintenance Schedule Day to Day" below.

MAINTENANCE SCHEDULE DAY TO DAY

24. At the start of each testing day, inspect, lightly clean, and calibrate (if necessary) the Forcible Entry Device to guarantee consistent results.

a. Inspect the Forcible Entry Device before and after each use for dust, other debris and stability of the unit.
b. Use a dry towel to remove dust and greasy residue from the Forcible Entry Device.

MONTHLY

25. Depending on the volume of use, thoroughly clean the Forcible Entry Device's braking mechanism approximately once a month. The order of the parts is very important. Ensure that when removing a part you place it in a way to remember where it fits on the device.

26. Remove the four nuts and bolts that secure the eight springs to the restriction blade.

27. Slide the restriction pads out of position. The restriction pads provide resistance against the restriction blade.

28. Clean all nuts, bolts, springs, and washers with a dry towel, and then look for wear or other defects. Replace parts as necessary.

29. Apply a light application of low-viscosity grease (if needed) to the four guide rails to ensure friction-free movement.

30. Remove dust and other residue from the restriction pads with a commercially available brake parts cleaning solvent (for example, Brākleen Brake Parts Cleaner).

Note: Let the newly cleaned restriction pads dry overnight to allow all traces of cleaning solvent to evaporate before reassembly and calibration.

TOOL 4: AUTO DESCENDER CALIBRATION INSTRUCTIONS

OPERATIONS MANUAL FOR THE PERFECT DESCENT CLIMBING SYSTEMS, INDOOR MODEL

1. Managers Fitness, Sport & Recreation must ensure that the auto belay is sent for calibration every two years. Managers will register the equipment upon receipt. Managers must ensure that the maintenance program is documented and followed as per the Auto Belay Operations Manual found at the website below.

2. In order to access the most up to date information on the set-up, care and maintenance of your Perfect Descent Climbing Systems, please view the online Operations Manual at this following website: www.perfectdescent.com under “Auto Belay Resources”, “Manuals”.

3. Perfect Descent Climbing Systems purchased by CFMWS HQ in October 2013 and February 2014 must use the “220CR Indoor/Outdoor Manual”.

4. You can also find advisory notices at the following link: http://perfectdescent.com/advisory-notices.

TOOL 5: FIREFIGHTER PRE-ENTRY FITNESS EVALUATION (FPFE) – MEDICAL CLEARANCE FORM

Applicant name: _____

1. This program is designed to **evaluate the physical work capacities of healthy, physically active individuals**. Each task requires a maximal effort. All of the tasks are completed while wearing firefighting personal protective equipment (PPE) that weighs approximately 50 lb (22 kg). This ensemble includes: helmet, flash-hood, gloves, pants, boots, jacket and self-contained breathing apparatus (SCBA). The applicant is not required to breathe from the SCBA, but must carry it. For safety during the treadmill component, running shoes are substituted for firefighting boots. The Firefighter Pre-Entry Fitness Evaluation (FPFE) is administered by qualified fitness evaluators and is **not medically supervised**. The evaluation procedures are described briefly below:

AEROBIC ENDURANCE

2. Maximal work capacity will be measured during a progressive, incremental exercise evaluation to exhaustion on a treadmill. The applicant's heart rate is monitored continuously with a heart rate monitor. Depending on fitness level and motivation, this evaluation normally requires the individual to walk on the treadmill for 13 to 20 minutes. Regardless of the fitness level of the individual, the evaluation normally involves a maximal effort and is terminated when the applicant is too fatigued to continue exercise. Combined with the exercise stress, the weight and heat retention properties of the PPE result in a significant level of fatigue. After completing the Treadmill component, the applicant will rest for 60 minutes before moving on to the job-related tasks component.

JOB-RELATED TASKS EVALUATION

3. Prior to completing the job-related tasks component, the applicant will complete a "walk-through" session where they are allowed to practice each of the tasks. This takes approximately 30 minutes and serves to familiarize the applicant with the evaluation procedures and provides a suitable warm-up for the demanding evaluation that follows. Each task is followed by a rest period of 3 minutes for recovery and hydration. Applicants are not permitted to leave the evaluation area or remove the PPE during the rest periods.

EQUIPMENT CARRY/VEHICLE EXTRICATION

4. The applicant will carry a small vehicle extrication tool (the "Jaws of Life") 44 lb (20 kg) and a weighted triceps bar of 80 lb (36.4 kg) a total distance of 76.2 m (250 ft.). In addition, the applicant will lift and hold the 44 lb (20 kg) tool in specific positions that simulate the work required to remove a vehicle door. The applicant will return the tools to the starting line. This task is designed to evaluate the strength required to lift, carry and use heavy tools in rescue situations. The task is followed by a 3-min rest.

CHARGED HOSE ADVANCE

5. The applicant will drag a charged (full of water) 44 mm (1.75 in.) hose a distance of 30.48 m (100 ft.). Three 15.24 m (50 ft.) lengths of hose are "snaked" behind the starting line. The applicant holds the nozzle over their shoulder and advances to the finish line as quickly as possible. This task assesses lower body strength and anaerobic power. The task is followed by a 3-min rest.

WEIGHTED SLED PULL

6. The applicant will pull a sled weighing approximately 123 lb (56 kg) a distance of 15.24 m (50 ft.) over a smooth concrete floor using a 16 mm (5/8 in.) rope. They will repeat this task three times. During this task, the applicant is stationary and must pull the sled towards them. This task assesses upper body strength, power, and endurance. The task is followed by a 3-min rest.

FORCIBLE ENTRY SIMULATION

7. Using a 10 lb (4.54 kg) sledgehammer, the applicant will strike a mechanically braked target as rapidly as possible until the end-of-task buzzer sounds (a distance of approximately 10 cm). This task assesses muscle strength, power and endurance, particularly in the upper body. The task is followed by a 3-min rest.

VICTIM RESCUE

8. The applicant will drag a mannequin weighing 176 lb (80 kg) a total distance of 30.48 m (100 ft.). The task starts with the mannequin lying "face-up" on the floor and the applicant standing behind the mannequin's head. The applicant lifts the mannequin and walks backwards for 15.24 m (50 ft.), and returns to the start line as quickly as possible while navigating around pylons. This task assesses strength, power, and agility. The task is followed by a 3-min rest.

LADDER CLIMB

9. The applicant will climb a 7.32 m (24 ft.) ladder to the 10th rung and will return to the floor as quickly as possible. They will repeat this task five times. This task assesses muscle strength, endurance, and anaerobic capacity. The task is followed by a 3-min rest.

VERIFICATION OF MEDICAL INFORMATION

Resting heart rate: _____bpm **Resting blood pressure: _____mmHg**

10. Is this individual taking any medication that could affect normal physiological responses to exercise? No___ Yes___ If yes, please explain.

_____

11. Is there any medical reason that this individual should not undertake very strenuous exercise? No___ Yes___ If yes, please explain.

_____

I certify that this applicant has been given a medical examination and is medically fit to undertake the Firefighter Pre-Entry Fitness Evaluation described above.

Physician's name: _____
Date: _____
Address: _____
(or stamp) _____
_____
Telephone: _____
Signature: _____

TOOL 6: FIREFIGHTER PRE-ENTRY FITNESS EVALUATION (FPFE) INFORMATION, INSTRUCTION AND DESCRIPTION

WHAT DO I NEED TO BRING?

MEDICAL CLEARANCE

1. Civilians only: Your physician must complete the Firefighter Pre-Entry Fitness Evaluation (FPFE) Medical Clearance Form (**Tool 5: FPFE – Medical Clearance Form**). Without this tool fully completed by a physician you will not be allowed to perform the FPFE. It provides medical clearance for you to undertake the specific components in this evaluation. Military members will ensure they have a valid Periodic Health Assessment (PHA).

PRE-SCREENING

2. Prior to the beginning of the FPFE you will be asked to complete the Health Appraisal Questionnaire which consists of nine questions in order to assess your general health. Once you have completed the Health Appraisal Questionnaire, the evaluator will measure your Blood Pressure and your Heart Rate. If you are a military members with a valid PHA you will not require your HR or BP to be taken.

INFORMED CONSENT: (Tool 10)

3. You must read and sign the Informed Consent form (**Tool 10**) prior to performing the FPFE.

DRESS REQUIREMENT

4. Bring the following items of clothing with you:

    a. Shorts.
    b. Two T-shirts.
    c. Running shoes.
    d. Extra socks (thick and thin).
    e. Warm-up clothing.
    f. Personal Protective Equipment (PPE) including boots (these can be issued prior to the evaluation).

PRE-EVALUATION INSTRUCTIONS

5. To ensure accurate results in your FPFE, please follow these instructions:

6. You should not:

    a. Exercise six hours (6 hrs) prior to the evaluation.
    b. Consume alcohol for at least six hours (6 hrs) prior to the evaluation.
    c. Eat, smoke, chew tobacco or take stimulants (tea, coffee, energy drinks, pharmaceuticals, etc.) for at least two hours (2 hrs) prior to the evaluation.

Note: Non-compliance with the above instructions does not necessarily mean FPFE postponement, however, this may have a negative effect on your results.

EVALUATION DESCRIPTION

7. This program is designed to **evaluate the physical work capacities of healthy, physically active individuals**. Each task requires a maximal effort. All of the tasks are completed while wearing firefighting personal protective equipment (PPE) that weighs approximately 50 lb (22 kg). This ensemble includes: helmet, flash-hood, gloves, pants, boots, jacket and self-contained breathing apparatus (SCBA). You are not required to breathe from the SCBA, but must carry it. For safety during the treadmill component, running shoes are substituted for firefighting boots. The FPFE is administered by qualified fitness evaluators and is **not medically supervised**. The FPFE procedures are described briefly below:

AEROBIC ENDURANCE

8. Maximal work capacity will be measured during a progressive, incremental exercise evaluation to exhaustion on a treadmill. Your heart rate is monitored continuously with a heart rate monitor. After a standardized 5-minute warm up, you will walk at a speed of 3.5 mph and 10% grade for 8 minutes. After 8 minutes, the speed of the treadmill will remain the same however the grade increases 1% every minute to a maximum of 15%. If you are able to continue, the grade will remain at 15% and the speed will increase 0.5 mph each minute until you can no longer continue. There is a mandatory 5-min cool-down (slow walk on a flat treadmill). In order to pass the treadmill evaluation, you MUST complete the 5-min warm-up, the 8-min constant work rate phase and the 5-minute cool-down (for a total of at least 18 minutes). Regardless of your fitness level, the evaluation normally involves a maximal effort and is terminated when you are too fatigued to continue exercise. Combined with the exercise stress, the weight and heat retention properties of the PPE result in a significant level of fatigue. After completing the treadmill component, you will rest for 60 minutes before moving on to the job-related tasks component.

JOB-RELATED TASKS COMPONENT

9. Prior to completing the job-related tasks component, you will complete a "walk-through" session where you are allowed to practice each of the tasks. This takes approximately 30 minutes and serves to familiarize yourself with the evaluation procedures and provides a suitable warm-up for the demanding evaluation that follows. Each task is followed by a rest period of three minutes for recovery and hydration. You are not permitted to leave the evaluation area or remove the PPE during the rest periods.

EQUIPMENT CARRY/VEHICLE EXTRICATION

10. You will carry a small vehicle extrication tool ("Jaws of Life") of 44 lb (20 kg) and a weighted triceps bar of 80 lb (36.4 kg) and place them in designated places on the floor 15.24 m (50 ft.) away. Next, you will pick up the smaller 44 lb (20 kg) tool, carry it 7.62 m (25ft.) and set it down in front of a vehicle door mock-up. In addition, you will lift and hold the 44 lb (20 kg) tool in a level position at right angles to the door mock-up with the "jaws" in firm contact with each of the three flat metal discs that are similarly oriented to the three "targets" that must be broken to remove a car door. The tool must be held in the correct position for 30 s on each disc. The tool is set down between each hold, and you must stand erect before lifting the tool and moving on to the next point of contact. After this sequence is completed, you will return both tools to the starting point. The total walking distance is 106.68 m (350 ft.). This task is designed to evaluate the strength required to lift, carry and use heavy tools in rescue situations.

CHARGED HOSE ADVANCE

11. You will drag a charged (full of water) 44 mm (1.75 in.) hose a distance of 30.48 m (100 ft.). Three 15.24 m (50 ft.) lengths of hose are "snaked" behind the starting line. You will hold the nozzle and hose securely with two hands over your preferred shoulder and you will advance to the finish line as quickly as possible, running is not permitted. This task assesses lower body strength and anaerobic power for pulling and dragging.

WEIGHTED SLED PULL

12. Keeping your feet securely in place, you will pull a sled weighing approximately 123 lb (56 kg) a distance of 15.24 m (50 ft.) over a smooth concrete floor using 16 mm (5/8 in.) rope. You will then walk 15.24 m (50 ft.). You will repeat this sequence (pull & Walk) a second time and complete a third and final pull. This task assesses upper body strength, power, and endurance for pulling and hoisting.

FORCIBLE ENTRY SIMULATION

13. Using a 10 lb (4.54 kg) sledgehammer, you will strike a mechanically braked target as rapidly as possible until the end-of-task buzzer sounds (a distance of approximately 10 cm). This task assesses muscle strength, power and endurance, particularly in the upper body.

VICTIM RESCUE

14. You will drag a mannequin weighing 176 lb (80 kg) a total distance of 30.48 m (100 ft.). The task starts with the mannequin lying "face-up" on the floor and with you standing behind the mannequin's head. You will lift the mannequin, walk backwards for 15.24 m (50 ft.), and return to the start line as quickly as possible while navigating around pylons. No part of your body or the mannequin may touch the pylons during the task. This task assesses strength, power, and agility for pulling and dragging.

LADDER CLIMB

15. You will climb a 7.32 m (24 ft.) ladder to the 10th rung and return to the floor as quickly as possible. You will repeat this task five times. You must maintain three points of contact on the ladder at all times, and must climb the ladder rung by rung, without missing any of them. This task assesses muscle strength, endurance, and anaerobic capacity for climbing under load.

POST-EVALUATION

16. You will remain in the evaluation area until your post-exercise heart rate has dropped below 100 BPM and your BP less than or equal to 144/94 mmHg.

TASKS REQUIREMENTS

Task	Minimum Standard
Treadmill/Cardiorespiratory	Minimum of 13 minutes (5 warm-up + 8 core) + mandatory 5-minute cool-down
Equipment Carry/ Vehicle Extrication	03:45.0 min or less
Charged Hose Advance	00:27.0 sec or less
Weighted Sled Pull	01:50.0 min or less
Forcible Entry Simulation	00:19.0 sec or less
Victim Rescue	00:57.0 sec or less
Ladder Climb	01:37.0 min or less

TOOL 7: SAMPLE EVALUATION SCHEDULE AND CREW ORGANIZATION

1. The specifics of the evaluation schedule will be determined by factors such as the number of applicants and the number of evaluators. The following schedule is based on 12 applicants per evaluation day.

2. One of the important responsibilities of the evaluators is to keep a smooth flow of applicants through the system. In ideal evaluation conditions, you can schedule applicants to start at 30 minute intervals. However, in order to allow for minor disruptions and delays, insert a slightly longer interval (e.g., 45 minutes) every few evaluations to make the day go smoother.

3. At any given time during the day when all stations are active, a minimum of five evaluators should be present.
    a. Lead Evaluator.
    b. Treadmill Evaluator #2.
    c. Job-related Evaluator #1.
    d. Job-related Evaluator #2.
    e. Job-related Evaluator #3.

4. This information is intended to serve as a guideline. Actual schedules and evaluator allocations are left to individual evaluation sites.

Sample Evaluation Schedule for 12 Applicants

Name	Arrival Time	Treadmill Start Time	Famil. Start Time	Job-Related Task Start Time	Departure Time
1	0800	0830	1000	1030	1130
2	0830	0900	1030	1100	1200
3	0900	0930	1100	1130	1230
4	0945	1015	1145	1215	1315
5	1015	1045	1215	1245	1345
6	1045	1115	1245	1315	1415
7	1130	1200	1330	1400	1500
8	1230	1300	1430	1500	1600
9	1300	1330	1500	1530	1630
10	1330	1400	1530	1600	1700
11	1415	1445	1615	1645	1745
12	1445	1515	1645	1715	1815

Note: You will note on the schedule in some cases both the familiarization start time and job-related start time are conducted simultaneously. When this occurs, ensure that the applicant being evaluated goes before the applicant who is conducting the familiarization, thus only requiring one set of evaluation equipment. Most intervals are 30 minutes. Three appointments were extended to 45 minute intervals, as well as a one hour break to facilitate lunch breaks for evaluators.

TOOL 8: SAMPLE TIMELINE FOR COMPLETION OF THE FPFE

1. The following sequence of events and associated time guidelines are most appropriate for the FPFE Protocol. For the purposes of illustration, assume that the applicant has an appointment scheduled for 0900.

Name	Arrival Time	Treadmill Start Time
0900	Check-in/Arrival of Applicants	• Fill out Section A through D of DND 2485-E • Collect Medical Clearance form (civilians only) • Informed consent • Payment (civilians only) • Check Government issue ID • Issue or confirm fit of FF clothing • Issue heart rate (HR) monitor
0930	Aerobic Evaluation	• Complete Treadmill evaluation • Fill out Section E of DND 2485-E
1000	Rest Period	• Remove bunker gear and change if necessary • Move to rest area • Re-hydrate • Hand off applicant file to the next evaluator
1100	Familiarization Phase	• Dress in partial PPE • Walk-through job-related tasks component area • Applicant is informed of all evaluation procedures • Applicant practices each task • Applicant asks questions • Fill out Section F
1130	Job-related Tasks Evaluation	• Dress in complete PPE • Equipment Carry/Vehicle Extrication • 3 minute recovery • Charged Hose Advance • 3 minute recovery • Weighted Sled Pull • 3 minute recovery • Forcible Entry • 3 minute recovery • Victim Rescue • 3 minute recovery • Ladder Climb • 3 minute recovery • Fill out Section G of DND 2485-E
1200	Recovery	• Remove PPE, re-hydrate, cool-down under supervision
1230	Check Out	• Resting blood pressure and HR must meet guidelines • Return heart rate monitor • Debrief applicant as appropriate • Fill out Section H and I of DND 2485-E

TOOL 9: FPFE REPORTING FORM - DND 2485-E

National Defence / Défense nationale

PROTECTED B (When completed)

Firefighter Pre-Entry Fitness Evaluation

Section A: Applicant's particulars

Last name	First name	SN / AN	Telephone

DOB *(yyyy-mm-dd)*	Age	Gender ☐ Male ☐ Female	Emergency contact	Fire station / Recruiting centre	☐ CAF applicant ☐ CIV applicant

☐ Photo ID ☐ Informed consent form ☐ Medical clearance form *(civ. only)* ☐ Payment *(civ. only)*

Section B: Health appraisal questionnaire

This questionnaire is a screening device to identify personnel for whom fitness evaluations and physical activity might be inappropriate at this time.

To the best of your knowledge:

	Yes	No
1. Do you have a medical condition which restricts you from participating in a fitness evaluation or a progressive training program?	☐	☐
2. Do you have bone or joint problem that could made worst by becoming more physically active or which may prevent you from participating in a fitness evaluation or a progressive training program?	☐	☐
3. Do you experience pain, tightness, squeezing or heaviness in your chest when you exercise?	☐	☐
4. Do you ever get dizzy or faint when you exercise?	☐	☐
5. Have you ever had a heart attack, a stroke or other heart-related problems?	☐	☐
6. Do you suffer from such things as asthma, bronchitis, emphysema, diabetes, hypoglycemia, epilepsy, high blood pressure or cancer?	☐	☐
7. Are you pregnant or do you believe that you might be?	☐	☐
8. Are you taking medication *(prescribed or otherwise)* that could affect your ability to undertake a fitness evaluation?	☐	☐
9. Is there any other reason you would like to talk to a physician prior to your fitness evaluation or training program?	☐	☐
10. Military only: Do you have a valid Periodic Health Assessment (PHA)? *(If no, proceed with blood pressure measurement)*	☐	☐

Section C: Evaluator's observation

Difficulty breathing at rest ☐ Yes ☐ No — Lower extremity swelling ☐ Yes ☐ No

Persistent cough ☐ Yes ☐ No — Followed preliminary instructions ☐ Yes ☐ No

Other: _____

Section D: Vital signs

☐ Heart rate monitor

Resting heart rate (bpm): ☐☐☐ Resting blood pressure measurement: ☐☐☐/☐☐☐ Second measurement: ☐☐☐/☐☐☐

Applicant		Evaluator	
Signature	Date *(yyyy-mm-dd)*	Signature	Date *(yyyy-mm-dd)*

Section E: Cardiorespiratory fitness

Evaluation start time: _____ Evaluation end time: _____ Total exercise time *(not including cool-down)*: **Minimum 13 min.** _____ ☐ Pass ☐ Fail

Section F: Job-related task - 30 minute familiarization

Familiarization start time: _____ Familiarization end time: _____ Familiarization supervised by: _____

1. Equipment carry / VE	3. Weighted sled pull	5. Victim rescue
2. Charged hose advance	4. Forcible entry	6. Ladder climb

Section G: Job-related task - Evaluation results

Evaluation start time: _____ Evaluation end time: _____ Evaluated by: _____

Job related task - evaluations	Time *(min: sec)*	Standard	Post-Eval HR *(start of 3 min)*	Recovery HR *(end of 3 min)*	Comments	Pass	Fail
Equipment carry / VE		03:45 min or less				☐	☐
Charged hose advance		00:27 sec or less				☐	☐
Weighted sled pull		01:50 min or less				☐	☐
Forcible entry		00:19 sec or less				☐	☐
Victim rescue		00:57 sec or less				☐	☐
Ladder climb		01:37 min or less				☐	☐

	Yes	No
1. Met cardiorespiratory standard?	☐	☐
2. Met job related task standards?	☐	☐
3. Met overall evaluation standards	☐	☐

Section H: Post evaluation recovery

Resting heart rate (bpm): ☐☐☐ Resting blood pressure: ☐☐☐/☐☐☐

Section I: Certification

Applicant		Evaluator	
Signature	Date *(yyyy-mm-dd)*	Signature	Date *(yyyy-mm-dd)*

Formulaire disponible en français - DND 2485-F

DND 2485-E (03-2019) 7530-20-004-0401
Design: Forms Management 613-901-6396 / 613-901-6397

Canada

PROTECTED B (When completed)

Copy 1: Applicant

TOOL 10: FIREFIGHTER PRE-ENTRY FITNESS EVALUATION (FPFE) - INFORMED CONSENT – ADULT (AGE OF MAJORITY)

NAME: _____

The evaluations in this program involve very strenuous exercise and maximal effort. There may be some health risk with this type of exercise. During and after the evaluation it is possible to experience symptoms such as abnormal blood pressure, fainting, light-headedness, muscle cramps or strain, nausea, and in very rare cases, heart rhythm disturbances or heart attack. There is also some risk of musculo-skeletal injury from falling or lifting heavy objects during the job-related tasks. While serious risk to healthy individuals is unlikely, it is important to acknowledge that you have been informed of these possibilities and willfully assume the risks of participation.

Copies of your results will be distributed as follows:
Copy 1 – Applicant
Copy 2 – Fire Chief or Recruiting Centre
Copy 3 – DGPFSS/DFit for research purposes

Before each component of the evaluation, we will provide full instructions on procedures and safety. You will also have the opportunity to practice and perform warm-up exercises before the components. You may ask questions on the evaluation procedures at any time. The tasks are described briefly below:

1. Aerobic Endurance (followed by 60 minutes of recovery)

Maximal work capacity will be measured during a progressive, incremental exercise evaluation to exhaustion on a treadmill. After a standardized 5 minute warm-up, you will walk at 3.5 mph at a 10% grade for 8 minutes. After this phase is completed, the grade (and if necessary, speed) will be increased every minute until you are too tired to continue. Heart rate is monitored continuously with a heart rate monitor. There is also a mandatory cool-down.

2. Equipment Carry/Vehicle Extrication (followed by 3 minutes of recovery)

You will carry a small vehicle extrication tool (the Jaws of Life) 44 lb (20 kg) and a weighted triceps bar of 80 lb (36.4 kg) a total distance of 76.2 m (250 ft.). In addition, you will lift and hold the 44 lb (20 kg) tool in specific positions that simulate the work required to remove a vehicle door. This task is designed to evaluate the strength and endurance required to lift, carry and use heavy tools in rescue situations.

3. Charged Hose Advance (followed by 3 minutes of recovery)

You will drag a charged (full of water) 44 mm (1.75 in.) hose a distance of 30.48 m (100 ft.). Three 15.24 m (50 ft.) lengths of hose are snaked behind the starting line. Hold the nozzle over the shoulder and advance to the finish line as quickly as possible (running is not permitted). This task assesses lower body strength and power.

4. Weighted Sled Pull (followed by 3 minutes of recovery)

You will pull a sled weighing approximately 123 lb (56 kg) a distance of 15.24 m (50 ft.) over a smooth concrete floor using a rope. You will repeat this task three times. During this task, your feet must

remain stationary and you will pull the sled towards you using 16 mm (5/8 in.) rope. This task assesses upper body strength, power, and endurance.

5. Forcible Entry Simulation (followed by 3 minutes of recovery)

Using a 10 lb (4.54 kg) sledgehammer, you will strike a mechanically braked target of the forcible entry apparatus as rapidly as possible until the end-of-task buzzer sounds (a distance of approximately 10 cm). This task assesses upper body strength, power, and endurance.

6. Victim Rescue (followed by 3 minutes of recovery)

You will drag a mannequin weighing 176 lb (80 kg) a total distance of 30.48 m (100 ft.). The task starts with the mannequin lying "face-up" on the floor. You will lift the mannequin and walk backwards for 15.24 m (50 ft.), and return to the start line as quickly as possible while navigating around a series of pylons. This task assesses muscle strength, power and agility.

7. Ladder Climb (followed by 3 minutes of recovery)

You will climb a 7.32 m (24 ft.) ladder to the 10th rung and return to the floor as quickly as possible. You will repeat this task five times. You must step on every rung on the way up and down the ladder. You must maintain 3-point contact with the ladder at all times for safety. This task assesses muscle strength, endurance, and anaerobic capacity.

INFORMED CONSENT

Your signature below confirms that you:

- Voluntarily agree to participate in the fitness evaluation as described.
- Understand that you can ask questions at any time.
- Understand that you can stop the evaluation at any time.
- Understand that the evaluator may stop any section/task of the evaluation at their discretion.
- Understand the risk of this activity.
- Agree to comply with all instructions from the evaluator.
- Are aware of no medical condition that puts you at unusual risk for this activity and that you have discussed any doubts or concerns with a physician.
- Agree to inform the evaluator of any pain, discomfort or unusual fatigue or any other symptoms experienced during or after the evaluation.
- Understand who will have access to your evaluation results.

SIGNATURES

Applicant: _____ Date: _____
Evaluator: _____ Date: _____

TOOL 11: BLOOD PRESSURE PROCEDURE

GENERAL

1.Evaluators must complete the following steps to take a blood pressure measurement:

a. Have the applicant sit for five minutes with their back against the chair rest, feet flat, legs and ankles uncrossed, and their left arm comfortably supported.
b. Ensure the applicant's clothing does not impede blood flow. Ask the applicant to adjust their shirt/shirt sleeve if required.
c. Choose an appropriately sized blood pressure cuff and apply it to the applicant's left arm.
d. Place the cuff around the bare left upper arm with the lower margin two or three centimeters above the antecubital space (bend of the elbow), with the upper edge of the cuff level with the heart.
e. Wrap the cuff evenly around the arm, tightly enough that you can slip two fingertips under the cuff's top edge.

*For automatic BP Procedure, go to section B.

2. Manual BP Procedures for Evaluators:

a. Locate and note the brachial artery in the antecubital space by palpation.
b. Position the stethoscope in your ears with the earpiece pointing forward.
c. Locate the radial artery.
d. Close the valve on the air pump by turning the thumbscrew in a clockwise direction until it is tight.
e. Inflate the cuff quickly until you can no longer feel the radial artery pulse. Continue to inflate the cuff to a level 20 to 30 mmHg above the level of the radial pulse (normally not above 180 mmHg).
f. Quickly position the diaphragm of the stethoscope over the brachial artery. Apply a minimum amount of pressure on the diaphragm of the stethoscope so as not to distort the artery. The diaphragm should be in complete contact with the skin. The stethoscope should not touch the cuff or its tubing.
g. Release the cuff pressure at a rate of approximately 2 mmHg per second.
h. Establish the systolic BP by listening for the first perception of sound (Korotkoff sound).
i. Note the exact numerical line on the scale where you hear this sound.
j. Establish the diastolic BP when the sounds stop their tap-like quality and are fully muffled.
k. Deflate the cuff to zero pressure and remove it from the applicant's arm.
l. Record the BP measurement on the DND 2485-E.

3. Automatic BP Procedures:

a. Instruct the applicant to sit very still and not move their arm, hand, fingers or body during the measurement of their BP. Any movement could produce a false measure of BP or prevent the automatic blood pressure machine from reading BP.
b. Press the button to start the machine.
c. Once the automatic blood pressure machine has finished measuring the applicant's BP, remove the cuff from the applicant's arm.
d. Record the BP measurement on DND 2485-E.

Note: Consult the Automatic BP user manual for any error messages.

TOOL 12: FPFE – WELCOME SCRIPT

Welcome to the Fire Fighter Pre-Entry Fitness Evaluation. If you have any questions during the evaluation, don't hesitate to ask.

In the event of an emergency, please follow an evaluator's instructions and remain calm.

The FPFE will take approximately three hours to complete. You must remain in the evaluation areas, under an evaluator's supervision at all time.

If you have any injuries, please inform an evaluator before you begin the FPFE.

If you injure yourself while performing the FPFE, stop the evaluation you are currently performing and inform an evaluator as soon as possible.

The FPFE is divided into four parts:

a. **Part 1:** The treadmill component, which lasts about 30 minutes.
b. **Part 2:** A 60 minutes mandatory recovery period.
c. **Part 3:** A mandatory 30 minute familiarization phase on the job-related tasks, which will allow you to learn the job-related task protocols and practice each one individually.
d. **Part 4:** The job-related tasks component, which lasts about 30 minutes.

An evaluator will ask you your rate of perceived exertion (RPE) during the treadmill evaluation. RPE reflects how hard you feel you worked on that specific task. This has no bearing on your evaluation; however, it is important that you answer as honestly as possible.

A heart rate monitor will measure your heart rate. We will fit you with one before the treadmill component.

Tasks are terminated for any of the following reasons:

- You successfully completed the task.
- You chose not to continue, reasons for this could be fatigue, pain, injury, etc.
- The evaluator becomes concerned for your safety or if immediate signs of serious distress are witnessed.
- You fail to comply with the evaluator's instructions.

Upon completion of the Fire Fighter Pre-Entry Fitness Evaluation, you must undergo a 30 minute mandatory rest period. During this rest period, you must return all issued equipment. You will be allowed to eat and drink.

Once an evaluator has assessed that your heart rate and blood pressure are back to their pre-evaluation state, the evaluator will review your scores, discuss your results and finalise your paperwork. Once completed, you will be allowed to leave the premises.

Do you have any questions?

TOOL 13: FPFE – TREADMILL SCRIPT

Upon successful completion of the first 13 minutes of the treadmill component, the 5 minute warm-up phase and the 8 minute screening phase, you will have met the standard for the component. However, we encourage that you attempt to put your maximum effort in going beyond the 13 minute standard, until exhaustion.

Prior to the beginning of the evaluation, we will ask you to put on the required equipment, which consists of a heart rate monitor, flash-hood, jacket and pants including liner, leather work gloves (not firefighting gloves), helmet, visor and 60-min MSA SCBA air cylinder that has been emptied. Make sure your jacket collar is fully done up and your helmet visor is in the down position. You will be wearing your running shoes for this task, ensure they are double knotted.

Once you are dressed properly, we will ask you to straddle the treadmill belt and hold the handrail to begin the evaluation.

I will set the speed and grade. Once the treadmill is set, I will instruct you to step onto the treadmill belt. You are allowed to hold the rail until you feel comfortable with the speed.

The evaluation starts when you let go of the handrail.

The evaluation starts with a five minute warm-up at a speed of 3.5 mph for the entire five minutes. The grade starts at 0% for the first two minutes and is increased to 2% at the two-minute mark, followed by an increase to 4% at the three-minute mark and then to 6% at the four-minute mark.

At minute 5, the grade will increase to 10%, while the speed will be maintained at 3.5 mph: this speed and grade is maintained for 8 minutes.

Starting at minute 13, the speed is maintained at 3.5 mph while the grade increases by 1% every minute up to 15% at minute 17.The grade is then maintained at 15% for the remainder of this component of the evaluation.

Starting at minute 18, the speed will increase by 0.5 mph every minute until it reaches 6.0 mph at minute 23, the last minute of the treadmill component of the evaluation.

During the evaluation, I will ask you to rate your rate of perceived exertion or RPE. At the end of each minute, I will show you this scale and you will indicate verbally or with your finger a number from 6 to 20 that corresponds to your perceived exertion. A “6” is equivalent to very, very light activity while a “20” is very very hard activity.

This rating allows us to assess your state of fatigue and ensure your security while performing the evaluation.

There are some important safety points to remember when you are on a treadmill:

- You are only allowed to hold the handrail at the beginning of the evaluation and until you are comfortable with the treadmill speed and grade.
- When you feel like you can only go on for another 30 seconds, we ask that you let us know that you intend to stop, hopefully at the end of the completed minute.
- When you cannot continue the evaluation, grab the handrail with both hands and keep walking.
- You can use the handrail while the speed and grade are being decreased for the mandatory five minutes cool down.

- You will be allowed to remove your helmet, your gloves and your flash-hood.

During these five minutes, the speed will be reduced to 2.5 mph at a grade of 0%. You are allowed to adjust the speed as desired, you do not have to hold onto the handrail for the entire 5 minutes.

When the 5 minute cool-down is over, I will stop the treadmill, and you can then step down and remove your remaining gear.

I will then walk with you towards the designated rest area where you can eat, drink, perform any type of active recovery such as biking, walking and stretching.

The rest period is a mandatory 60 minutes under the supervision of an evaluator.

Do you have any questions?

TOOL 14: FPFE – FAMILIARIZATION AND JOB-RELATED TASKS SCRIPT

The next part of the evaluation is the 30 minute familiarization of the job-related tasks. In this section, I will explain all the protocols and you will have time to practice all the tasks prior to your official evaluation.

The familiarization phase also serves as a specific warm-up to the job-related task component. You will do it at a warm-up pace while wearing your bunker pants and jacket (charged hose advance only). Now is the time to learn the proper techniques and ask questions whenever you need.

If you feel like you are unable to complete the familiarization phase, please advise us as you should not proceed with the evaluation.

You need to complete six tasks and we expect you to give your best effort. Between each task, you will have a three minute rest period and we will notify you 30 seconds before the end of the break. You must be ready to start the next task before the end of the 3 minute rest. During the 3 minute rest, you will be able to raise your visor, remove gloves, drink water, walk and stretch but you should not sit or lie down.

We will measure your heart rate immediately after each task and also about 10 seconds prior to the start of the next task.

For the evaluation, you will be wearing your complete PPE including your rubber boots and SCBA. You will also be wearing a 5-point harness in order for us to secure you to an auto belay device during the ladder climb.

Tasks are terminated for any one of the following reasons:

- You successfully complete the task.
- You choose not to continue, reasons for this could be fatigue, pain, injury, etc.
- I become concerned for your safety or witness immediate signs of serious distress.
- You fail to comply with my instructions.

TASK # 1: EQUIPMENT CARRY/VEHICLE EXTRICATION

You must complete this task in **3 min 45.0 seconds or less**.

For this task you will stand in an upright position behind the tools and face the course. I will count aloud "3, 2, 1, Go". Time starts at the "Go" command. You will then lift the 44 lb (20 kg) spreader tool with both hands, carry it to the mat 15.24 m (50 ft.) away and then set it down on the mat.

You will walk back to the starting line and pick up the 80 lb (36.4 kg) triceps curl bar with both hands.

You will carry the triceps curl bar to the mat 15.24 m (50 ft.) away and set it down on the mat.

You will pick up the spreader tool, carry it 7.62 m (25 ft.) and place it on the mat set in front of the door mock-up.

You will pick up the spreader tool, and for the next 30 seconds, you will hold the jaws firmly in contact with the top target. The tool must be parallel to the floor and at a 90° angle to the door mock-up for the duration of the 30 second hold.

You must not:

- Touch the door mock-up at any time with your body.
- Allow the tool to come into contact with your body at any time during the "hold" phase.

If one of these situations occurs, one warning will be given without interrupting the hold.

If contact with the disk is broken during the hold, ou will be asked to set the tool down and to restart the 30-second hold.

Once you have correctly completed the 30 seconds, you will set the tool down on the floor.

You must stand upright before lifting the tool and proceeding to the second (bottom) target.

You will pick up the spreader tool, and for the next 30 seconds, you will hold the jaws firmly in contact with the bottom target. The tool must be parallel to the floor and at a 90° angle to the door mock-up for the duration of the 30 second hold.

You will move to the third target, switch sides and repeat this sequence for a third and final time, placing the tool on the floor, standing upright, picking up the tool, proceeding to the middle target, holding for 30 seconds and placing the tool on the floor once the 30 seconds hold is completed.

Once you have successfully completed all three holds, you will carry the spreader tool back to the starting mat by first walking to the 7.62 m (25 ft.) mat and then continuing to the starting mat 15.24 m (50 ft.) away.

You will place the spreader tool on the mat and you will walk back 15.24 m (50 ft.) to pick up the triceps curl bar.

Once you have lifted the triceps curl bar, you will carry it to the starting mat. You can walk through the finish line with the triceps curl bar in your hands.

Time stops when you cross the starting line.

You will then have a three minute recovery period.

For the familiarization phase you need to:

- Practice the sequence for correct procedures, lift and carry the small spreader tool from the starting point to the 15.24 m (50 ft.) mat, place the small tool on the mat and return to the start.
- Practice lifting the triceps curl bar.
- Walk back to the 15.24 m (50 ft.) mat, pick up the small spreader tool, and carry it 7.62 m (25 ft.) to the mat in front of the door mock-up.
- Place the tool on the mat, practice holding the spreader tool for 10 seconds on each target.
- Return the small spreader tool to the start 7.62 m (25 ft.) mat then the 15.24 m (50 ft.) mat.

Do you have any questions?

TASK # 2: CHARGED HOSE ADVANCE

You must complete this task in **00:27.0 seconds or less**.

For this task you will be standing in an upright position next to the nozzle of the hose facing the course. I will count aloud "3, 2, 1, Go". The time starts on the "Go" command.

Once you hear the Go command, you will pick up the nozzle located behind the start line. You will secure the nozzle and hose over your preferred shoulder ensuring that **two hands are on the hose or nozzle** at all times.

Carry the nozzle at waist level, this allows for a more effective pull and less risk of losing your balance.

Once you are in a comfortable position, you will start walking from the start line to the finish line a distance of 30.48 m (100 ft.) away. You should move as quickly as possible without running.

Keep your shoulders square with the finish line as the weight of the hose might cause your body to twist and change your body off course. You will need to "get low" and "dig in" and "go hard" to maintain momentum.

If you stall and can no longer move forward, you should take two or three steps back, lean forward and resume walking.

You must cross the finish line with both feet, moving straight ahead. Twisting, turning, or backing across the finish line is not permitted.

Time stops when both your feet cross the finish line.

When you are completely across the finish line, you must stop and set the nozzle on the floor. You must not drop the nozzle.

You will then have a three minute recovery period.

For the familiarization phase you need to:

- Wear the jacket in order to perform this task as the hose could hurt your shoulder or neck.
- Execute only two-thirds of the task distance in order to get a better feel for the resistance.

Do you have any questions?

TASK # 3: WEIGHTED SLED PULL

You must complete this task safely in **1 min 50.0 sec or less**.

For this task you will be standing in an upright position at an acceptable distance behind the start line to accommodate the weighted sled to fully cross the line. I will count aloud "3, 2, 1, Go". Time starts on the "Go" command.

You will pick up the rope attached to the weighted sled.

Keep your feet securely in place. Only minimal movement of the foot positioning is tolerated. You are not allowed to walk or step back while pulling the sled as that will create an advantage.

Use the rope to pull the sled a distance of 15.24 m (50 ft.). You are allowed to use the pulling technique of your choice.

Once the sled is fully across the line, you will be given the signal to start walking to the opposite pylons 15.24 m (50 ft.) away. Running is not allowed.

You will repeat the pull a second time. When getting into position on the other side before the second weighted sled pull, position yourself at an acceptable distance behind the start line in order to allow the weighted sled to fully cross the line.

Once completed, you will be given the signal to walk back the 15.24 m (50 ft.) and repeat the pull for the third and final time.

If you start walking before the sled fully crosses the line, you will need to return behind the line, finish the pull and wait for my signal, to proceed to the next step.

Time stops when the weighted sled fully crosses the finish line for the third time.

You will then have a three minute recovery period.

For the familiarization phase you need to:

- Pull the weighted sled twice the full distance of 15.24 m (50 ft.) trying different pulling techniques like one handed or two handed.
- Execute one length of walking in between both sled pull.

Do you have any questions?

TASK # 4: FORCIBLE ENTRY

You must complete this task in **00:19.0 seconds or less**.

For this task you will be standing in an upright position facing the Forcible Entry Device. I will count aloud "3, 2, 1, Go". Time starts on the "Go" command.

You will pick up the 10 lb (4.54 kg) steel sledgehammer and use it to strike the mechanically braked target surface of the Forcible Entry Device until the target moves the required distance.

Your feet must not move past the front edge of the foot-stop at the base of the unit.

You must use the sledgehammer safely with two hands in contact with the shaft at all times. You must also use the sledgehammer in a swinging motion and not as a battering ram. You can perform as many hits as required to move the target the full distance.

At all times I should be able to see the marking tape on the sledgehammer shaft between your hands and the head of the hammer which is 25 cm (9.84 in.) from the head of the sledgehammer. You are allowed to move your hands and re-set your grip on the sledgehammer at any time during the evaluation.

I encourage you to hit the target hard and fast ensuring that the face of the sledgehammer makes full contact with the target. Once the buzzer sounds, or if I give the "stop" signal, you have completed the task.

After I've given the stop signal, you will put the sledgehammer down on the floor. You must not drop it.

You will then have a three minute recovery period.

For the familiarization phase you need to:

- Execute the full task at a slow pace.

Do you have any questions?

TASK # 5: VICTIM RESCUE

You must complete this task safely in **00:57.0 seconds or less**.

For this task you will be standing in an upright position 0.5 m behind the start line, facing the mannequin with your back to the course. I will count aloud "3, 2, 1, Go". I will start the clock on the "Go" command.

You will lift and drag a 176 lb (80 kg) mannequin while walking backwards in a zig-zag fashion around the pylons for a total distance of 30.48 m (100 ft.).

If you drop the mannequin at any time during the task, you must pick it up and continue.

You have the choice of lifting the mannequin with your arms around the mannequin's torso or by gripping the harness.

I encourage you to walk backwards quickly, but you must remain under control at all times. Look over your shoulder, find the pylon, make the turn, this will help avoid touching the pylons.

You cannot touch the pylons with your own body or the mannequin.

If you touch a pylon, I will stop the evaluation and you will need to redo this task from the beginning. I will bring the mannequin back to the starting line and you must begin the second attempt immediately. If you touch a pylon a second time, you will fail this task.

Once the mannequin has crossed the line, you can set the mannequin on the floor, but you must not drop it.

Time stops when the mannequin's feet completely cross the finish line.

You will then have a three minute recovery period.

For the familiarization phase you need to:

- Execute half the distance out and back (ensure you practice zig-zaging around at least 2 pylons), while practicing both drag techniques (arms around the chest or by the harness).

Do you have any questions?

TASK # 6: LADDER CLIMB

You must complete this task safely in **1 min and 37.0 seconds or less**.

For this task you will be standing in an upright position facing the ladder with both feet on the floor. The auto-belay device will be securely attached to your harness. I will count aloud "3, 2, 1, Go". Time starts on the "Go" command.

You will climb 10 rungs of the ladder, firmly place both feet on the 10th rung and climb down until both feet are firmly on the floor. You will repeat this five times as quickly as possible while adhering to the proper technique.

You must maintain three points of contact (two feet and one hand, or one foot and two hands) on the ladder at all times.

A flight phase, where both of your feet are off the ladder at the same time or you jump from one rung to the next, is not allowed.

If at any point you do not have three points of contact on the ladder, or if a flight phase occurs, or if you did not put both feet at the top or the bottom, you will be warned and instructed to return to where you were prior to the offence before proceeding with the task.

If you do not comply, the task will be terminated.

I will call out each step in this fashion, "one-two-three-four-five-six-seven-eight-nine-ten- FEET

TOGETHER," followed by, "ten-nine-eight-seven-six-five-four-three-two-one- FEET TOGETHER".

You must remain under control at all times. If you miss a rung or slip, you will then go back to the point of error and resume from that point.

Time stops when both your feet are firmly on the floor after you have completed the 5th repetition.

After you have completed the task, I will remove the auto-belay.

You will then have a three minute recovery period.

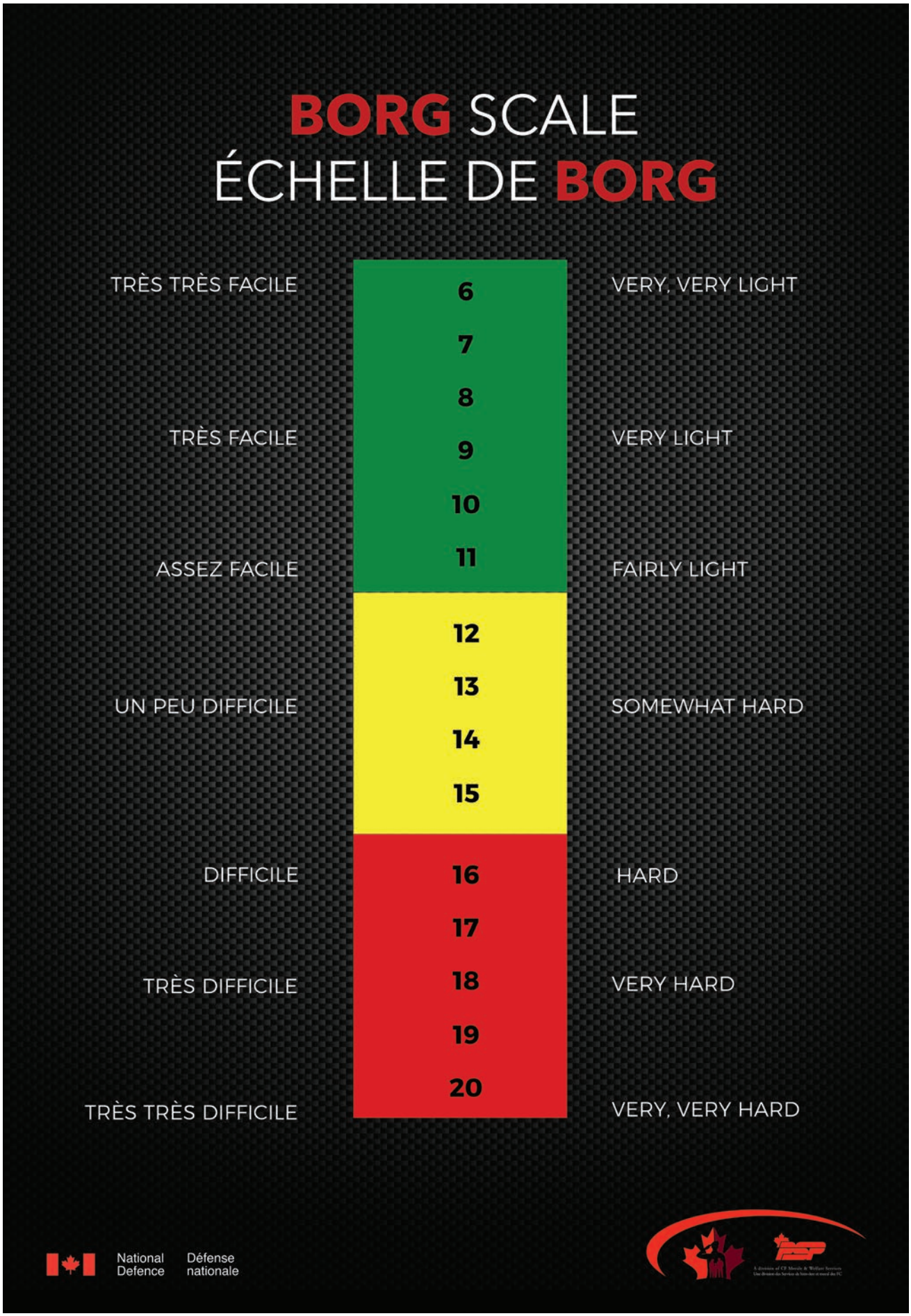
For the familiarization phase you need to:

- Execute at least two climbs of the ladder.

This marks the end of the evaluation. You can remove your PPE. I will escort you to a designated recovery area where you will need to stay for approximately 30 minutes. During this rest period, I strongly suggest that you keep walking and that you stretch. You can drink water or any sports drink. However, you should not sit or lie down as walking and stretching will help with your recovery.

Do you have any questions?

TOOL 15 – RATE OF PERCEIVED EXERTION



TOOL 16 - TREADMILL DATA FORM

Name_____ Date_____

Evaluation start time_____ Evaluation End Time_____

Time	Speed (mph)	Grade %	HR (bpm)	RPE	Comments
0-1	3.5	0			
1-2	3.5	0			
2-3	3.5	2			
3-4	3.5	4			
4-5	3.5	6			
5-6	3.5	10			
6-7	3.5	10			
7-8	3.5	10			
8-9	3.5	10			
9-10	3.5	10			
10-11	3.5	10			
11-12	3.5	10			
12-13	3.5	10			
13-14	3.5	11			
14-15	3.5	12			
15-16	3.5	13			
16-17	3.5	14			
17-18	3.5	15			
18-19	4.0	15			
19-20	4.5	15			
20-21	5.0	15			
21-22	5.5	15			
22-23	6.0	15			
Cool-down	Cool-down	Cool-down			
0-1	2.0 - 2.5	0			
1-2	2.0 - 2.5	0			
2-3	2.0 - 2.5	0			
3-4	2.0 - 2.5	0			
4-5	2.0 - 2.5	0			

HR max _____

Total Exercise Time (not including cool-down) _____ (min: sec)

Treadmill evaluator_____

Comments:

Tool 17 – CABLE TENSIOMETER INSTRUCTION

General Information

In your kit you will find the following items, see Figure 39:

a. tensiometer.
b. risers.
c. tool to measure the size of your cable.
d. tensiometer Calibration card.

Figure 39: View of the tensiometer kit

Initial set up

Before using the tensiometer to calibrate the Charged Hose Advance or the Sled Pull, you must first determine the size of your cable and the accompanying riser you will need to use.

Figure 40: Tool to measure the size of your cable

a. Measure the size of your cable, see Figure 40.

b. Consult the Calibration Card on the inside of your tensiometer box, for tension range, cable size and proper riser, see Figure 41.

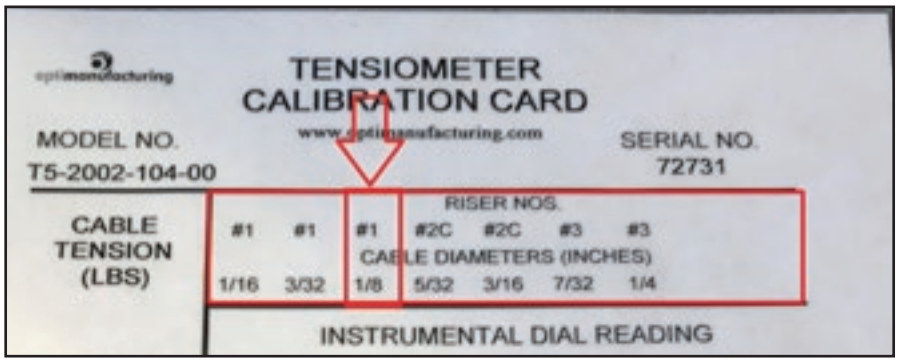


Figure 41: Calibration card, view of the cable size and corresponding riser

Example: if your cable is 1/8, you must use riser #1.

c. There are different size of risers. The #1 riser would be used with the 1/8 cable, see Figure 42.

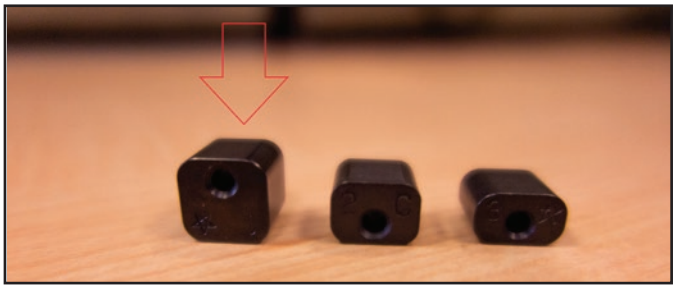


Figure 42: Optional risers – #1, #2C or #3

d. Once you have determined which riser you must use with your cable, Insert the riser on the pin at the upper center of the instrument, see Figure 43.

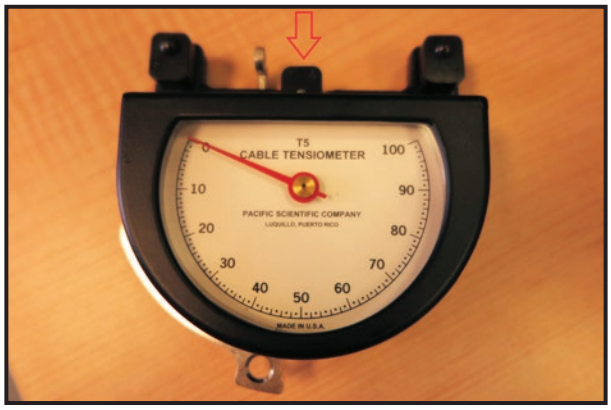


Figure 43: Riser on the pin at the upper center of the instrument

Note: The correct riser must be used for the corresponding cable size, otherwise false readings or damage to the instrument will result.

Tensiometer

The Indicator Dial is an arbitrary scale reading from 0 to 100, see Figure 44. The tensions which can be measured on the different sizes of cable are clearly shown on the Calibration Chart which is attached to the carrying case, see Figure 45. This involves the conversion of the dial readings into pounds by means of the Conversion Table previously mentioned.

Figure 44: Arbitrary scale reading from 0 to 100

TENSIOMETER CALIBRATION CARD

MODEL NO.
T5-2002-104-00

www.optimanufacturing.com

CABLE TENSION (LBS)	RISER NOS.						
	#1	#1	#1	#2C	#2C	#3	#3
	CABLE DIAMETERS (INCHES)						
	1/16	3/32	1/8	3/32	3/16	7/32	1/4
	INSTRUMENTAL DIAL READIN						
30	10	13	15	11	15	16	22
40	13	17	20	14	18	20	24
50	17	21	25	17	21	23	28
60	20	25	30	20	24	26	32
70	24	29	34	22	28	28	35
80	28	33	39	25	31	31	39
90	31	36	42	28	34	34	43
100	34	40	46	31	38	36	46
110	37	43	50	34	41	38	50
120	40	46	53	37	44	41	54
130	43	50	57	40	47	44	57
140	46	54	62	42	50	46	60
150	49	57	66	45	52	49	62
160	52	61	70	48	55	52	65
170	54	64	73	50	58	54	67
180	56	66	76	52	60	56	70
190	59	68	80	53	63	59	72
200	61	71	83	55	66	61	74
220	0	0	0	59	70	65	79
240	0	0	0	64	75	70	84
260	0	0	0	68	80	74	89
280	0	0	0	72	84	78	94
300	0	0	0	75	87	80	96

Figure 45: Conversion of the dial readings into pounds

Example: if you are using a 1/8 cable with the #1 riser and you are looking for a force of 90 to 100lbs, the required force for Charged Hose Drag, you would need to have a 42-46 on your tensiometer gage.

To Take a Reading

1. Once the tensiometer has the correct cable and riser, attach the cable to the end of the nozzle or rope from the sled, open the Trigger- by moving it away from the case of the instrument and place the instrument on the steel cable, see Figures 46 and 47.

2. Close the Trigger, pull the end of the cable from the tensiometer, slowly initiating movement of the charged hose or the weighted sled, the cable tensiometer should be no more than 20 to 30 cm (8 to 12 in.) from the floor. Measure the precise moment movement is initiated, note the reading on the scale, see Figure 48.

3. Convert the scale reading into pounds by referring to the Calibration Table. The tensiometer reading is given in the column headed by the size cable being tested and the corresponding pounds is given in the column headed “Tension”, reading across, see Figure 45. Reset the gage and take two or three readings.

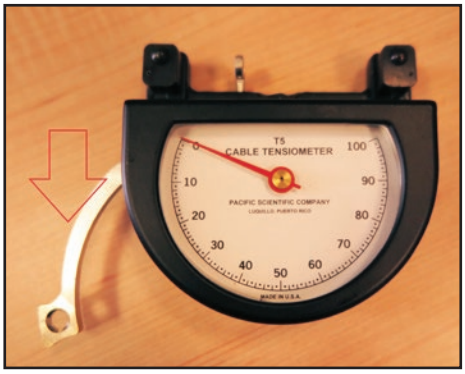


Figure 46: Tensiometer with the open trigger

Figure 47: Cable installed properly with trigger closed

Figure 48: Hose nozzle attached to straps and tensiometer, ready to pull

4. Remove the instrument from the cable by opening the Trigger.

Maintenance

It is recommended that tensiometers be calibrated annually to ensure proper functioning of the device. In testing or calibrating the instrument, a known weight arrangement is always accurate and preferable. However, this may be done in a testing machine against a hydraulic gauge or other measuring device. In this case it is important that the reading of the check gauge or scale be taken after the test load of the tensiometer is applied.