



National Défense
Defence nationale

B-GL-392-003/FP-001

MILITARY TRAINING

RAPPELLING TECHNIQUES AND PROCEDURES

(ENGLISH)

(Supersedes B-GL-392-003/FP-001 dated 1999-09-01)

WARNING

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Issued on Authority of the Chief of the Land Staff

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FOREWORD

1. B-GL-392-003/FP-001, *Rappelling Techniques and Procedures* is issued on authority of the Chief of the Land Staff.
2. This publication is effective upon receipt and supersedes B-GL-392-003/FP-001, *Rappelling from CH146 Helicopters* dated 01 August 1999 in its entirety.
3. The French version of this publication is B-GL-392-003/FP-002, *Les techniques et procédures de faire les descentes en rappel*.
4. Suggested amendments should be forwarded through normal channels to the Directorate of Army Training (DAT) of the Land Force Doctrine and Training System (LFDTS).
5. Unless otherwise noted, masculine pronouns contained herein refer to both genders.
6. This publication is available electronically on both the Defence Information Network (DIN) and the World Wide Web in the Army Electronic Library. Keyword—Army Electronic Library.

PREFACE

AIM

1. The aim of this manual is to provide the information required to train soldiers to rappel from towers and helicopters.

SCOPE

2. This manual deals with procedures for rappelling from the CH146 helicopter and the rappel tower. As the requirement to rappel from other helicopters arises, additional chapters will be promulgated.

NOTE

The training described in this manual shall be conducted under the supervision of qualified instructors using authorized equipment that is in good working order.

TABLE OF CONTENTS

FOREWORD I

PREFACE III

 Aim iii

 Scope iii

CHAPTER 1 INTRODUCTION

SECTION 1 GENERAL 1

 Definition 1

 Military Applications 1

SECTION 2 SPECIFICATIONS AND LIMITATIONS 2

 The CH146 Helicopter 2

 Limitations to Rappelling 3

SECTION 3 CONDUCT OF TRAINING 3

 Rappel Training 3

 Refresher Training 4

 Rappel Master Training 4

SECTION 4 SPECIAL CONDITIONS 4

 Winter 4

 Rappelling By Night 5

CHAPTER 2 EQUIPMENT AND INITIAL TRAINING

SECTION 1 INTRODUCTION 7

 General 7

SECTION 2 CABIN RIGGING AND RAPPEL MASTER EQUIPMENT 7

 Rope Specifications 7

 The Carabiner 7

 The Ring Fitting and Slotted Stud 8

 Installation of the Anchor System 9

The Safety Harness.....	11
The Radio Headset	11
Knife.....	11
SECTION 3 INDIVIDUAL EQUIPMENT	11
General	11
Helmet	12
Gloves.....	12
Sling Rope and Carabiner.....	12
The Swiss Seat.....	12
SECTION 4 THE RAPPELLING ROPE.....	16
Specifications	16
Knots	17
Care of Ropes	17
Inspection of the Ropes	18
Preparation of the Ropes	18
Stowing the Rappel Rope in a Sandbag.....	18
Placing the Rappel Rope in a Carabiner	20
SECTION 5 PREPARATION OF PERSONAL WEAPONS AND EQUIPMENT	21
General	21
Fighting Order and Weapons.....	22
Rucksack and Weapons.....	23
Snowshoes	26
Toboggan.....	27
Bundles.....	28
CHAPTER 3 TRAINING TECHNIQUES AND PROCEDURES	
SECTION 1 INTRODUCTION.....	31
Braking	31

SECTION 2 PROCEDURES BEFORE FLIGHT	32
Inspection	32
Boarding	33
SECTION 3 IN-FLIGHT PROCEDURES	35
GET READY	35
DROP ROPES	35
POSITIONS	35
GO	36
On Landing.....	36
Dropping Toboggans and/or Bundles by Rappel.....	36
Commands and Signals	37
SECTION 4 EMERGENCY SITUATION PROCEDURES	39
General	39
Helicopter Power Failure.....	39
Inadvertent Rope Drop	39
Knotted Rope.....	39
Entangled Rappel Rope	40
Rappeller in Difficulty.....	40
CHAPTER 4 DUTIES OF THE RAPPEL MASTER	
SECTION 1 INTRODUCTION	41
SECTION 2 INSPECTION AND PREPARATION OF THE HELICOPTER.....	41
SECTION 3 PREPARATION OF THE RAPPELLERS	42
General	42
Inspection of Rappellers	43
Boarding the Helicopter.....	44
SECTION 4 WORDS OF COMMAND, SIGNALS AND RAPPEL MASTER DUTIES IN FLIGHT.....	45
General	45

Words of Command and Signals	45
Dispatching Toboggans and/or Bundles	48
CHAPTER 5 RAPPEL TOWER TRAINING	
SECTION 1 INTRODUCTION.....	49
Description	49
Inspection	49
Safety Factors	50
SECTION 2 DUTIES AND RESPONSIBILITIES	51
Rappel Master.....	51
Rappel Master Assistant	52
SECTION 3 RAPPELLING FROM THE LOW AND HIGH WALL	53
Introduction	53
Procedures Before Training.....	53
Rappelling from the low Wall	53
Rappelling from the High Wall	55
SECTION 4 RAPPELLING FROM A FREE-RAPPEL SITE (SKID).....	58
Introduction	58
Operation, Safety Checks and Proper Sequence for Dispatching Rappellers from a Free-Rappel Site	58
SECTION 5 RAPPELLING AN EQUIPMENT LOAD	61
Introduction	61
ANNEX A WORDS OF COMMAND AND ACTIONS TO BE TAKEN.....	63
Sequence of Commands	63
ANNEX B RAPPEL MASTER EQUIPMENT CHECKLIST	65
ANNEX C CHART FOR ROPE LENGTHS.....	67

ANNEX D

**RAPPEL MASTER AND AIRCREW
COORDINATION BRIEFING 69**

LIST OF FIGURES

Figure 2-1: Steel Screw-gate Locking Carabiner Oval Type	8
Figure 2-2: Ring Fitting	8
Figure 2-3: Slotted Stud	9
Figure 2-4: Floor Ring Placement.....	10
Figure 2-5: Rappel Anchor System.....	10
Figure 2-6: Swiss Seat Bight.....	13
Figure 2-7: Swiss Seat Double Wrap	13
Figure 2-8: Swiss Seat Rope Path.....	14
Figure 2-9: Swiss Seat Locking Bight.....	14
Figure 2-10: Swiss Seat Square Knot Secured.....	15
Figure 2-11: Swiss Seat Rope Stowage.....	15
Figure 2-12: Attachment of Carabiner to Swiss Seat.....	16
Figure 2-13: Double Figure-Eight Knot.....	18
Figure 2-14: Rope Stowing—Step 1	19
Figure 2-15: Rat Nesting Rappel Rope in a Sandbag.....	20
Figure 2-16: Rappel Rope in Carabiner	21
Figure 2-17: Slings the Rifle Wearing Fighting Order	22
Fig 2-18: Slings the 84 mm Carl Gustav	23
Figure 2-19: Slings the Rifle Wearing a Rucksack.....	24
Figure 2-20: Slings the C6 Wearing a Rucksack.....	25
Figure 2-21: Slings the 84 mm Carl Gustav Wearing a Rucksack.....	26
Figure 2-22: Snowshoes Fixed to the Rucksack	27
Figure 2-23: Toboggan Ready for Rappel.....	28
Figure 2-24: Bundle of Two Water Cans	28
Figure 2-25: Bundle of Two Water Cans Ready for Rappel.....	29
Figure 3-1: Sandbag Position	34
Figure 3-2: Positions of the Rappellers on the Skids	36
Figure 3-3: Get Ready Signal.....	37
Figure 3-4: Drop Ropes Signal	38
Figure 3-5: Positions Signal.....	38

CHAPTER 1 INTRODUCTION

SECTION 1 GENERAL

DEFINITION

1. To rappel is to descend by means of a rope passed around the body in such a way as to allow a rapid but controlled descent. Modifications to this technique have resulted in the procedures described in this manual.

MILITARY APPLICATIONS

2. Rappelling increases the mobility and flexibility of forces and also permits maximum use to be made of helicopters. The following are some applications of this technique:
- a. insertion of personnel into a potential landing zone (LZ) to clear or improve a suitable landing site;
 - b. insertion of reconnaissance parties near a suitable LZ to confirm that it is clear of enemy and safe for a helicopter landing site;
 - c. clandestine insertion of patrols;
 - d. insertion of forward observation officer (FOO) parties or artillery reconnaissance parties;
 - e. positioning of radio rebroadcast personnel and equipment in otherwise inaccessible areas; and
 - f. insertion of medical rescue parties.

**SECTION 2
SPECIFICATIONS AND LIMITATIONS**

THE CH146 HELICOPTER

3. In a clean configuration with a mission fuel load and without troop seats and other mission kits, the CH146 helicopter can carry up to six fully equipped rappellers. If the time of flight to the rappel area is long, or if the rappel will be done at high altitude (mountain terrain), it may be necessary to reduce the number of rappellers and/or the aircraft load. The table below provides an overview of recommended configurations for the CH146 helicopter with different numbers of rappellers:

PERS	EQUIPMENT	AIRCRAFT CONFIGURATION
8	No equipment	Cargo door and hinged panel removed
8	Webbing and weapon	" "
6	Rucksack, webbing and weapon	" "
6	No equipment	Cargo door open and pinned/off
6	Webbing and weapon	" "
6	Rucksack, webbing and weapon	" "
4	Toboggan and equipment	Any configuration

4. Under ideal conditions, the CH146 helicopter may be used to place rappellers into an area of approximately 20 feet (6 m). For example, rappellers may be placed onto the top of a building or into heavily wooded areas if it is apparent the rappellers can penetrate the tree canopy and execute a safe rappel to the ground.

LIMITATIONS TO RAPPELLING

5. If the aircraft commander feels that he cannot maintain position or altitude due to wind gusts or turbulence, rappelling will not be permitted. Visibility must permit the aircraft commander to see the ground at all times. Rappelling is not permitted when the helicopter is fitted with skis. The area immediately in front of the helicopter must be clear of any equipment and obstacles to permit an emergency landing.

NOTE

Wind speed for training in rappelling from the CH146 helicopter shall not exceed 40 km/h (22 knots).

SECTION 3 CONDUCT OF TRAINING

RAPPEL TRAINING

6. Operational policy directives detail the extent that rappel training is to be conducted by units of Land Force Command and specify the equipment required to support it. Training shall progress through the following phases:

- a. initial training;
- b. helicopter training on the ground; and
- c. rappelling from the helicopter.

7. Initial training includes the care and handling of ropes and equipment used in helicopter rappelling, knots and the rigging and carriage of all personal equipment. Prior to helicopter training, rappel tower training must be completed, which must include the wall and free rappel site.

8. Helicopter training on the ground permits the rappellers to practice aircraft drills under strictly controlled static conditions prior

Rappelling Techniques and Procedures

to flight. The helicopter is rigged for rappelling, and all rappellers complete their preparations and drills, including boarding the aircraft. Details on this training are given in Chapter 3.

9. The rappellers can commence rappelling from the helicopter immediately following the ground training.

RAPPEL MASTER TRAINING

10. The training plan for rappel masters outlines the number and types of dispatches that a candidate must perform to obtain the qualification. Rappel master training may be conducted at unit level. On successful completion of the course, rappel masters are qualified to conduct unit rappel training, which includes tower and helicopter rappelling only. Duties of the rappel master are outlined in Chapter 4.

REFRESHER TRAINING

11. Refresher training shall also be done prior to helicopter rappelling if the personnel have not rappelled within the past six months. A rappel master who is not current shall conduct refresher training with another qualified rappel master who is current IAW LFCO 24-12 Annex A.

SECTION 4 SPECIAL CONDITIONS

WINTER

12. Helicopter rappelling may be conducted in very cold weather conditions. However, wind chill factors and training necessity must be considered. Very high wind chill conditions exist underneath the helicopter in the rotor downwash and affect the ability of the brake personnel to effectively do their job.

13. The rappel master and aircraft commander also discuss and determine the requirement for the aircraft doors to be open or closed. The requirement for any transit time and the cold temperature determine if the doors should be closed. If doors are closed, masking

of the helicopter door ledge is not possible. The method used to insert rappellers in winter conditions with their tent group equipment is described in Chapter 2.

RAPPELLING BY NIGHT

14. The governing factor on whether or not helicopter rappelling at night is possible is the pilot's ability to see the ground or a reference point that will enable him to maintain a stationary hover. Under normal conditions, the aircrew uses night vision devices (NVDs) during night rappelling to aid in their ability to see adequate ground references. The requirement for the rappel area to be lit during the exercise must be discussed between the aircraft commander and the rappel master. If required, the aircraft landing light can be used to light the area immediately beneath the aircraft.

15. For night operations the rappel master shall conduct all safety checks prior to take-off. In the event of a sustained flight, the rappel master shall ensure that the aircrew are briefed and that the aircraft has a blackout curtain installed.

NOTE

Only green filtered light is permitted in the cabin area during night operations.

CHAPTER 2 EQUIPMENT AND INITIAL TRAINING

SECTION 1 INTRODUCTION

GENERAL

1. The equipment specified in Section 2 is available on demand through the supply system or local purchase. It is the standard equipment used in helicopter rappelling.

SECTION 2 CABIN RIGGING AND RAPPEL MASTER EQUIPMENT

ROPE SPECIFICATIONS

2. The rope used to construct the helicopter anchor system is 12 mm kernmantle **static** rope that must be locally procured.

3. The rope used to rappel from helicopters is 11 mm or 12 mm hawser-laid nylon that is available through the Canadian Forces Supply System.

THE CARABINER

4. The only carabiner authorized for use is the steel screw-gate locking carabiner oval type with a tensile strength of 2270 kg (5000 lbs), NSN 8465-21-896-8280 (Figure 2-1).

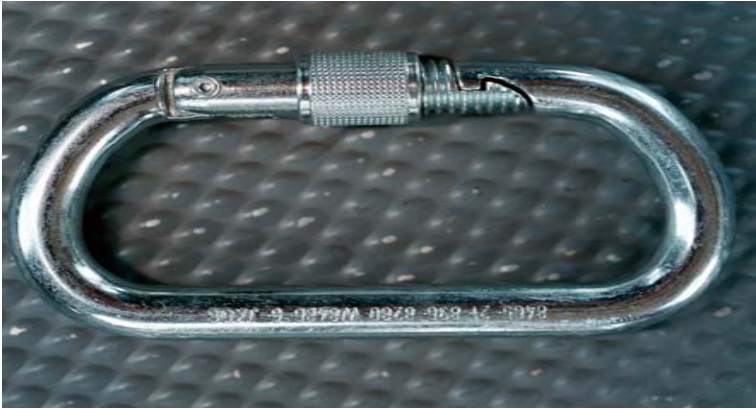


Figure 2-1: Steel Screw-gate Locking Carabiner Oval Type

THE RING FITTING AND SLOTTED STUD

5. The ring fitting is rated to 565 kg (1250 lbs) and is part of all tactical helicopter aircraft equipment. The ring fitting (Figure 2-2) can only be installed on the slotted floorboard stud (Figure 2-3).



Figure 2-2: Ring Fitting

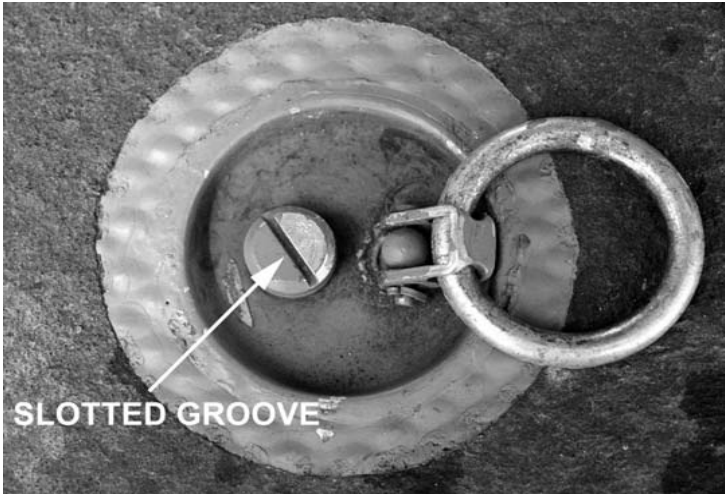


Figure 2-3: Slotted Stud

INSTALLATION OF THE ANCHOR SYSTEM

6. The following sequence is to be used for installing the anchor system in the helicopter:
 - a. Place the ten ring fittings into the slotted floorboard studs. Lay the fixed cable on the floor with the fixed end toward the pylon.
 - b. Place four carabiners through the ring fitting, the floor ring and around the cable, ensuring the screw gates are closed, facing up and toward the centre, as per Figure 2-4.

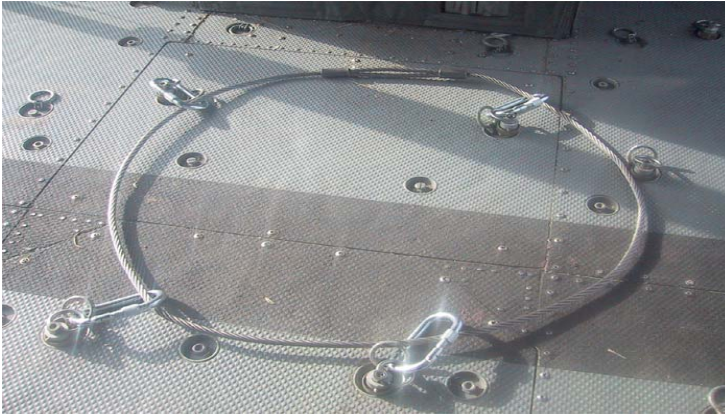


Figure 2-4: Floor Ring Placement

- c. For port side, place carabiners through both the floor ring and the ring fitting, ensuring that they are facing upward and inward towards the centre (Figure 2-5).

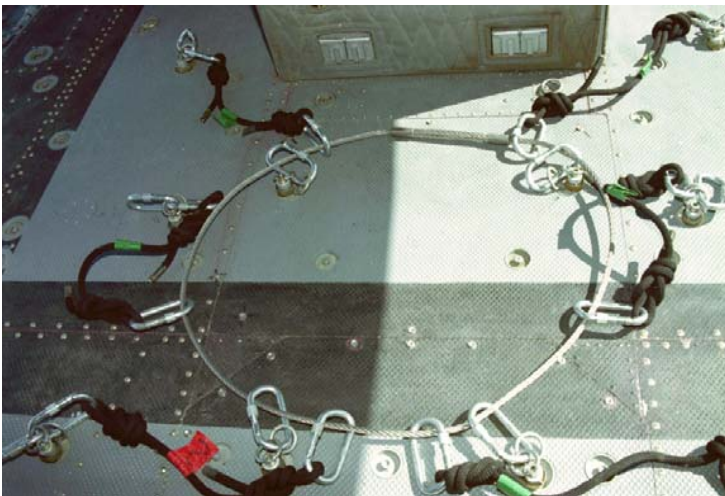


Figure 2-5: Rappel Anchor System

- d. Tie a double figure-eight knot in the end of each attachment rope.
- e. Attach each anchor rope to the primary anchor ensuring the screw gates face up and close the carabiner.

- f. Place a carabiner on the other figure-eight and attach to cable as shown in Figure 2-5.
- g. The process is repeated for the starboard side.
- h. Once all rigging is complete, ensure all carabiners are closed.

THE SAFETY HARNESS

7. The rappel master is required to wear a safety harness when dispatching rappellers. The harness used is the standard safety harness, NSN 1670-21-869-1377.

THE RADIO HEADSET

8. The rappel master wears a radio headset while engaged in his duties. The headset provides the rappel master with communications to the aircrew through the intercommunication system.

KNIFE

9. The rappel master carries a sheath knife capable of cutting 12 mm rope while engaged in his duties.

SECTION 3 INDIVIDUAL EQUIPMENT

GENERAL

10. The individual equipment required for the helicopter rappelling consists of the following items:

- a. soldier's helmet;
- b. gloves with liner;
- c. sling rope, NSN 4020-21-879-9586; and

Rappelling Techniques and Procedures

- d. steel screw-gate locking carabiner oval type, NSN 8465-21-896-8280.

11. Combat and arctic clothing, including the white camouflage, may be worn when rappelling. The rappeller must ensure that drawstrings and loose material are not exposed in such a manner as to cause entanglement with the rappel rope as it passes through the carabiner.

HELMET

12. The soldier's helmet shall be worn when rappelling. It shall be fitted properly and fastened snugly.

GLOVES

13. Either leather gloves with liner or arctic mittens, if climatic conditions dictate, may be worn when rappelling.

SLING ROPE AND CARABINER

14. The sling rope is a 4.6 m (15-foot) length of 11 mm or 12 mm hawser-laid nylon with each end taped and burned. As described in Section 2, the only carabiner authorized for use is the steel screw-gate locking carabiner oval type with a tensile strength of 2270 kg (5000 lbs), NSN 8465-21-896-8280 (Figure 2-1). The sling rope and a carabiner are used to make a Swiss seat.

THE SWISS SEAT

15. The Swiss seat is made as follows:
 - a. Place the centre of the sling rope over the left hip (Figure 2-6).



Figure 2-6: Swiss Seat Bight

- b. Bring the rope around the waist and tie two wraps (Figure 2-7).



Figure 2-7: Swiss Seat Double Wrap

- c. Pass the ends of the rope between the legs from front to rear and pass both ends under the rope encircling the waist at the hips (Figure 2-8).



Figure 2-8: Swiss Seat Rope Path

- d. Pass the running ends behind and under the rope coming from between the legs to form a locking bight (Figure 2-9).



Figure 2-9: Swiss Seat Locking Bight

- e. Bring both ends around the waist and tie over the left hip with a square knot and one half-hitch around both

ropes on either side of the square knot with the running ends routed towards the pocket (Figure 2-10).



Figure 2-10: Swiss Seat Square Knot Secured

- f. Tuck any surplus rope from the running ends in the left lower pants pocket or shirt pocket (Figure 2-11).



Figure 2-11: Swiss Seat Rope Stowage

Rappelling Techniques and Procedures

- g. Take a carabiner with the screw-gate up, hinges towards the centre of the body, and, with a backward motion, engage both ropes into the carabiner (Figure 2-12).



Figure 2-12: Attachment of Carabiner to Swiss Seat

- h. Complete the rotation until the screw-gate is in the upward position again with the screw-gate up and out. This completes the Swiss seat.

16. Rappelling requires no great manual dexterity on the part of the individual. For this reason, all rappellers perform the necessary actions right handed. The problem of left-handed rappellers is compounded by the fact that the right-hand lay of the rope increases the possibility of entanglement.

SECTION 4 THE RAPPELLING ROPE

SPECIFICATIONS

17. The standard length of a rappel rope is 240 feet (73.2 m). The rappel rope is 11 mm or 12 mm hawser-laid nylon rope, NSN-4020-21-879-9586.

KNOTS

18. The knots used in rappelling are the square knot, double figure-eight, and the half-hitch. These knots shall be taught or reviewed as part of the ground training.

CARE OF ROPES

19. In order to ensure safety and to prolong the life of the rope, the following common sense rules shall be followed:

- a. Do not drag ropes on the ground, as particles of dirt will be trapped between the strands and gradually wear them down.
- b. Pad or tape any sharp edges or corners with which the rope may come in contact.
- c. Keep ropes as dry as possible. If they become wet, dry them thoroughly as soon as possible. Avoid contact with direct heat sources when drying. Do not store wet ropes.
- d. Do not leave a rope tightly knotted or under tension any longer than necessary.
- e. Do not hang ropes on nails or sharp projections. Lay them out loosely coiled or hang them on wooden pegs.
- f. Do not allow ropes to come in contact with gasoline, oil, fuel or hydraulic fluid. If any portion of a rope becomes saturated with these fluids, the entire rope must not be used for rappelling.
- g. To prevent fraying, the ends of rope must be taped and burned.
- h. Ropes should be rat-nested in a sandbag for carrying.

Rappelling Techniques and Procedures

- i. Rappel ropes shall not be used for any other purpose.

INSPECTION OF THE ROPES

20. All ropes shall be stretched to full length and carefully inspected before and after each use. The rope shall be twisted open in five or six places along its length to allow inspection of the inside strands.

PREPARATION OF THE ROPES

21. Rappelling ropes for helicopters and those for the tower are prepared in the same manner. After the rope is inspected, it is stretched to ensure that there are no twists or kinks. A double figure-eight is tied in the middle of the rope. The loop shall be only large enough to enable a carabiner to be placed through the opening (Figure 2-13).



Figure 2-13: Double Figure-Eight Knot

STOWING THE RAPPEL ROPE IN A SANDBAG

22. Once the rope has been laid out on the ground, inspected and prepared, it shall be rat nested inside a sandbag by a two-man team so

that the rope may be easily handled and will fall freely when dropped from the helicopter or tower. The rope shall be stowed in a sandbag as follows:

- a. 25 cm of running end will be threaded through a hole in the bottom corner of the sandbag, while the rest of the rope is rat nested on the ground (Figure 2-14).



Figure 2-14: Rope Stowing—Step 1

- b. While the number two holds the sandbag, the remainder of the rope shall be rat nested into the sandbag (Figure 2-15).



Figure 2-15: Rat Nesting Rappel Rope in a Sandbag

- c. Every so often the number two man is to shake the sandbag, allowing the rope to fit more compacted. The double figure-eight is to hang out of the opening of the sandbag slightly.

PLACING THE RAPPEL ROPE IN A CARABINER

23. To obtain the maximum braking effect from the friction between the rope and the carabiner, the rappel rope shall be placed in the carabiner in the correct manner. If the rope is placed in the carabiner incorrectly, the rappeller has very little control over his rate of descent and could be injured when hitting the ground. Place the rappel rope in the carabiner as follows:

- a. with the running end of the rope in the brake hand (right hand), bring the standing end directly across the front of the body and place it through the carabiner (Figure 2-16);

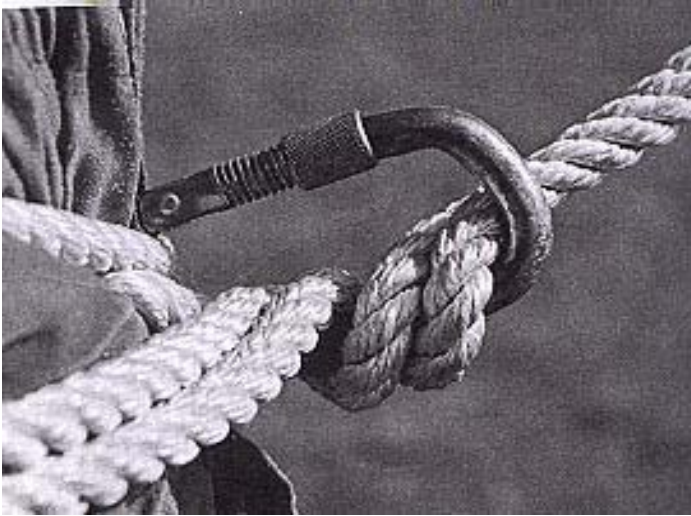


Figure 2-16: Rappel Rope in Carabiner

- b. keeping the running end in the brake hand, bring the standing end under the carabiner and form a loop towards the brake hand;
- c. pass the top of the loop into the carabiner; and
- d. with brake hand applied, pull standing ends tight and lock the screw gate.

SECTION 5 PREPARATION OF PERSONAL WEAPONS AND EQUIPMENT

GENERAL

24. Troops must be capable of rappelling with their personal weapons and equipment under any climatic condition. This section describes the various methods of preparing personal equipment.

FIGHTING ORDER AND WEAPONS

25. Fighting order may be worn over the Swiss seat. The rappeller shall ensure that his equipment is worn in such a manner that no item will interfere with the actions of his braking hand.
26. When wearing fighting order, the C7 and C9 are slung over the right shoulder and under the left arm with the butt down and to the left diagonally across the back (Figure 2-17).



Figure 2-17: Slinging the Rifle Wearing Fighting Order

27. When wearing fighting order, the C6 is slung over the right shoulder and under the left arm with the butt down and to the left, diagonally across the back as for the C7 and C9.

28. The 84 mm Carl Gustav shall be slung with the sling over the right shoulder and under the left arm. It shall be positioned diagonally across the back with the venturi down and to the left (Figure 2-18).



Figure 2-18: Slinging the 84 mm Carl Gustav

RUCKSACK AND WEAPONS

29. The rucksack shall be worn in the normal manner, except that the waistband is not to be used to avoid being caught in the carabiner.

30. The C7 and C9 rifles shall be slung with the sling under both arms when a rucksack is worn. The rifle shall be positioned parallel

Rappelling Techniques and Procedures

down the left side of the body with the butt down and barrel up. Bungee cord can be fixed to the rucksack to assist in holding the rifle from sliding to the front of the body when wearing the rucksack (Figure 2-19).



Figure 2-19: Slinging the Rifle Wearing a Rucksack

31. The C6 shall have the barrel removed and tied to the receiver group with 550 cord. When a rucksack is worn, the C6 is slung with the sling over the right shoulder. The gun shall be positioned diagonally across the back over the rucksack with the butt down. Bungee cord can be fixed to the rucksack to assist in holding the gun from excess movement (Figure 2-20).



Figure 2-20: Slinging the C6 Wearing a Rucksack

32. The 84 mm Carl Gustav shall be slung with the sling over the right shoulder and under the left arm. It shall be positioned diagonally across the back over the rucksack with the venturi down and to the left (Figure 2-21).



Figure 2-21: Slinging the 84 mm Carl Gustav Wearing a Rucksack

33. In order to preclude the possibility of the weapon becoming caught on the skid of the CH146 helicopter, weapons shall always be rigged with the muzzles up.

SNOWSHOES

34. Snowshoes are fixed to the back of the rucksack with the trails facing up. They are fastened to the rucksack with bungee cord (Figure 2-22).



Figure 2-22: Snowshoes Fixed to the Rucksack

TOBOGGAN

35. The 90 kg (200 lbs) toboggan shall be loaded and lashed in the normal manner for winter operations, except that the steering bar shall be tied down with A7A straps. The carabiner is placed on the U-bolt of the toboggan at the hinged handle end. This method is used to allow the toboggan to be lowered in an upright position. Running ends of the straps shall be rolled and taped or tied off (Figure 2-23).



Figure 2-23: Toboggan Ready for Rappel

BUNDLES

36. A bundle is any configuration of equipment, required for an operation. Bundles can consist of two water cans, ammo and rations. The total weight of an individual bundle shall not exceed 115 kg (250 lbs). For water cans or rations, only two A7P straps and a D-ring are required (Figures 2-24 and 2-25).



Figure 2-24: Bundle of Two Water Cans



Figure 2-25: Bundle of Two Water Cans Ready for Rappel

CHAPTER 3 TRAINING TECHNIQUES AND PROCEDURES

SECTION 1 INTRODUCTION

BRAKING

1. The essential skill to be mastered in rappelling is braking. The free hand (left hand) known as the guide hand holds the standing end of the rope with a very loose grip. The purpose of this (left) hand is merely to maintain the rappeller's upright position on the rope. The right hand is the brake hand. The brake hand grasps the running end of the rope. If the brake hand carries the rope behind the body to the area of the small of the back, the rappeller will come to a complete stop. If the brake hand carries the rope to a position forward of the body, the rappeller will fall, virtually free. Intermediate positions of the brake hand between the two described above, slow or increase the rappeller's rate of descent. In short, the rappeller's rate of descent is controlled entirely by the position of his brake hand.

CAUTION

Any attempt to control the rate of descent by tightly clenching either or both hands will result in **severe rope burns**. At no time shall the rappeller's brake hand go forward of his right hip, thus inducing free fall.

2. A brakeman shall be placed at the bottom of a rappel rope for all rappellers. When required he can assist in the rappeller's descent. By placing two hands on the rope and walking away from the rappeller, the brakeman can apply friction to the rope, slowing the rappeller's rate of descent. Once the rappeller is on the ground, the brakeman may assist the rappeller in clearing the rope from the carabiner by grasping the rope in front of the rappeller and holding it while the rappeller walks backwards with his hands in front of the body.

**SECTION 2
PROCEDURES BEFORE FLIGHT**

INSPECTION

3. Before boarding the helicopter, the rappellers shall be inspected. In order to do so, the rappel master shall line up the rappellers and do a systematic inspection of the following:
- a. the general condition of each rappeller;
 - b. each rappeller's dress, ensuring he is dressed with proper environmental clothing and has gloves with liners;
 - c. each rappeller's helmet, ensuring it is fitted snugly and securely;
 - d. the right rear side-locking loop of each rappeller's Swiss seat, ensuring it is rigged correctly;
 - e. the carabiner screw-gate, ensuring it functions properly (give the gate a flick and turn the screw);
 - f. the carabiner opening, ensuring it is facing up and out and is around both harness ropes;
 - g. the rappel rope, ensuring it is routed properly through the carabiner;
 - h. the square knot, ensuring it is tied properly on the rappellers left side with two half-hitches routed down towards pocket and the excess running end of rope is tucked into shirt or pant pocket;
 - i. the left rear side locking loop of each rappeller's Swiss seat, ensuring it is rigged correctly; and
 - j. the rigging of any toboggans or bundles.

BOARDING

4. When all the rappellers have been inspected, the rappel master shall organize the rappellers into a single file with the third or fourth port side rappeller leading off and the third or fourth starboard side rappeller following immediately after the first port side rappeller. The rappel master shall then place the rappellers in the kneeling position at the twelve o'clock position 30 metres from the helicopter. The rappel master shall give a thumbs-up signal to the aircraft commander to indicate that rappellers are ready to board.

5. When the aircraft commander responds with a thumbs-up signal, the rappel master shall order the rappellers to approach the helicopter. The helicopter shall be approached directly in the twelve o'clock position with all personnel keeping a low silhouette under the main rotor. Once the rappel master is 3 metres from the nose of the aircraft, he shall approach around the port side with the port side rappellers following, and the starboard side rappellers will break off and approach around the starboard side of the aircraft.

CAUTION

There are two pitot tubes on the nose of the aircraft that, if hit, may cause personnel injury or aircraft damage. Avoid this hazard at all times.

6. The rappel master shall board the helicopter first and secure his safety harness. He will then hook each rappeller to his/her respective anchor point starting from number three and order them to rotate in a clockwise position and sit down.

7. Without further orders, the rappellers shall sit down, place the sandbag firmly on their legs and fasten their seat belts over top of the sandbag containing the rope (Figure 3-1).



Figure 3-1: Sandbag Position

8. When all rappellers are seated with their seat belts secured, the rappel master shall do a systematic inspection of the following:
 - a. The bight on the double figure-eight of each rappel rope is secured onto the anchor system with a screw-gate carabiner that has its gate closed and locked.
 - b. Each rope is traced from the carabiner around the left side of the rappeller to the carabiner on his Swiss Seat ensuring the rope is routed properly and the screw-gate is done up.
 - c. The rappellers sandbag of rope is under the seatbelt and secured.
 - d. The running end of the rope is traced from each rappeller's carabiner to ensure all slack is taken up and that the rappeller has his brake hand on the rope and that the brake is applied.

9. The rappel commands given by the rappel master and repeated by the rappellers are as follows:
 - a. **SEAT BELTS ON;**
 - b. **BRAKE HAND ON;** and

- c. #___OKAY.

CAUTION

From the time the rappellers board the helicopter until the time they have completed their rappel, the rappellers shall never remove their brake hand from their rappel rope.

SECTION 3 IN-FLIGHT PROCEDURES

GET READY

10. Once the helicopter has become stationary over the rappel area, all rappellers shall keep their eyes on the rappel master and remain alert for his commands. On the command **GET READY**, the rappellers shall repeat the command and place their sandbags on their knees holding them securely with their free (left) hand.

DROP ROPES

11. On the command **DROP ROPES**, the rappellers shall repeat the command and throw their sandbags clear of the skid. Each rappeller shall look down to ensure that his rope has reached the ground and that it is under the control of a brakeman. If all is well, he shall give the rappel master a thumbs-up signal and remain looking at him.

POSITIONS

12. On the command **POSITIONS**, the rappellers shall repeat the command, remove their seatbelts and the port and starboard number two positions shall move onto the skids simultaneously, followed in succession by the port and starboard numbers one and three positions. They shall pivot counter-clockwise and reach for the skid with their feet. Once on the skid, the rappellers shall lean back to a 35 degree angle from vertical, knees slightly bent, and await the next command (Figure 3-2).



Figure 3-2: Positions of the Rappellers on the Skids

GO

13. On the command **GO**, the numbers pointed to and ordered shall push away from the skid, easing the brake hand, and shall rappel to the ground, under control. When six men are rappelling, position numbers one and three shall go first, followed by the number two positions. When eight rappellers are rappelling, position numbers one and three shall go first followed by the number two and four positions. In the event of a four-man rappel, the port and starboard number one positions shall rappel, followed by the port and starboard number two positions.

ON LANDING

14. Once the rappeller is on the ground, he shall undo the rope from his carabiner and immediately free himself of the rappel rope. Once the rappeller is free, he shall give the thumbs-up signal to the rappel master. He shall stay clear of the area forward of the helicopter and await further instructions.

DROPPING TOBOGGANS AND/OR BUNDLES BY RAPPEL

15. Once all rappellers are on the ground, the rappel ropes not required for the lowering of equipment shall be dropped. A designated

rappeller, or a brakeman if there is one, shall grasp the equipment rappel rope. Once the toboggan or bundle has been lowered clear of the helicopter skid, the designated rappeller (or brakeman) shall control its rate of descent by applying tension to the rappel rope.

COMMANDS AND SIGNALS

16. As it is difficult to hear verbal commands when conducting helicopter rappelling, the commands are given both verbally and visually by the rappel master and are as follows:

- a. **GET READY**—the arms are bent at the elbow with the hands in front of the breast, palms facing away from the rappel master (Figure 3-3);



Figure 3-3: Get Ready Signal

- b. **DROP ROPES**—the arms are fully extended to the sides, palms facing downwards, and the arms are moved from the shoulders to make a downward motion (Figure 3-4);

Rappelling Techniques and Procedures



Figure 3-4: Drop Ropes Signal

- c. **POSITIONS**—the arms are fully extended, palms facing downwards, pointing to the skids below the helicopter (Figure 3-5); and



Figure 3-5: Positions Signal

- d. **GO**—the rappel master will point, with his arms fully extended, towards each pair of rappellers in turn.

SECTION 4 EMERGENCY SITUATION PROCEDURES

GENERAL

17. The aircraft commander is in command of and responsible for all the personnel aboard the helicopter. In an emergency, the aircraft commander shall issue orders to the rappellers through the rappel master. In the event of an unusual incident while rappelling is in progress, the rappel master shall immediately inform the aircraft commander, who will issue the appropriate orders.

HELICOPTER POWER FAILURE

18. If the helicopter loses power while hovering, the aircraft commander shall attempt to gain sufficient forward momentum to permit a landing in front of the helicopter. For this reason, rappellers on the ground shall remain clear of the area forward of the helicopter. The rappellers who are actually on rappel shall attempt to rappel to the ground and get clear of the ropes as quickly as possible.

INADVERTENT ROPE DROP

19. If a rappel rope is inadvertently dropped in flight, the helicopter shall be maintained in level flight to prevent tail-rotor contact. If practicable, the rope shall be pulled into the cabin area, and the helicopter shall land as soon as possible.

KNOTTED ROPE

20. If a knotted rope cannot be cleared, the following procedure shall take place subject to the approval of the aircraft commander:

- a. Ensure the rappeller is secured with the seatbelt on.
- b. rappel master shall unhook the rope and drop it from the helicopter.

Rappelling Techniques and Procedures

- c. Remaining rappellers are dispatched.
- d. When the rope next to the rappeller without his rope is clear, the rappel master will hook up the rope to the remaining rappeller's carabiner
- e. Normal rappelling sequence will continue.

ENTANGLED RAPPEL ROPE

21. If a rope becomes entangled and cannot be cleared, the rope shall normally be unhooked and dropped from the helicopter and another rope used.

RAPPELLER IN DIFFICULTY

22. A rappeller shall signal that he is in difficulty by stopping his descent and looking up at the rappel master. The helicopter will lower the rappeller to the ground or move to another location to be lowered. Once the rappeller is on the ground, he shall disengage his carabiner from the rappel rope.

23. If rappelling over trees, the helicopter shall be lowered until the rappeller can grasp a solid limb of a tree. After disengaging his carabiner from the rappel rope, the rappeller shall indicate that he is safe by giving the thumbs-up signal to the rappel master. If this procedure proves to be impracticable, the rappeller shall be flown to an open area and lowered to the ground.

CHAPTER 4 DUTIES OF THE RAPPEL MASTER

SECTION 1 INTRODUCTION

1. The rappel master is responsible to the aircraft commander for the safety of the rappellers while they are in the helicopter. He shall ensure that he can communicate with the aircraft commander and the rappellers at all times while in the helicopter. He is also responsible for checking and inspecting that:

- a. The helicopter is properly prepared for rappelling.
- b. Each rappeller is properly prepared for rappelling.
- c. Each rappeller is properly briefed as to his actions in the helicopter, on the ground, and during an emergency drill.
- d. Any toboggans and/or bundles are properly rigged for rappelling.

2. With assistance from the flight engineer, if required, the rappel master shall dispatch toboggans and/or bundles. If toboggans or door bundles are to be dispatched, he shall ensure that there are sufficient brakemen in the rappelling area and that they have been properly briefed on their duties.

SECTION 2 INSPECTION AND PREPARATION OF THE HELICOPTER

3. The rappel master is responsible for the inspection and preparation of the cargo compartment of the helicopter. The rappel master, assisted by the flight engineer, shall prepare the aircraft as follows:

- a. All seats are removed from the cargo compartment.
- b. Both doors are fully opened and pinned.

Rappelling Techniques and Procedures

- c. The main and small cargo doors may be removed.
- d. If multiple rappels are to take place, the edge and all sharp projections on the floor, skid, ground handling wheel lugs, and door latches may be taped.
- e. Sufficient seatbelts are installed for the rappellers for use in summer with doors open and winter with doors closed.
- f. The rappel anchor assembly is installed and checked.
- g. The safety harness and restraining strap are checked and adjusted so that the rappel master can reach any rappeller who may be in difficulty on the skid of the helicopter.
- h. The rappel master's headset is connected to the intercom system.

SECTION 3 PREPARATION OF THE RAPPELLERS

GENERAL

4. The individual rappeller shall be responsible for the provision of the following:

- a. personal equipment;
- b. sling rope; and
- c. carabiner.

5. The section or platoon shall be responsible for the provision of the following:

- a. section/platoon toboggans and bundles;
- b. rappel ropes; and

- c. sandbags.

INSPECTION OF RAPPELLERS

6. The rappel master shall be responsible for checking that the individual rappellers are dressed and equipped properly. He shall also be responsible for checking that any toboggans and/or equipment bundles are rigged correctly. The rappel master shall line up the rappellers and do a systematic inspection of the following:

- a. the general condition of the rappeller;
- b. the rappeller's dress, ensuring he is dressed with proper environmental clothing and has gloves with liners;
- c. the rappeller's helmet, ensuring it is fitted snugly and securely;
- d. the right rear side-locking loop of the rappeller's Swiss seat, ensuring it is rigged correctly;
- e. the carabiner screw-gate, ensuring it functions properly (give the gate a flick and turn the screw);
- f. the carabiner opening, ensuring it is facing up and out and is around both harness ropes;
- g. the rappel rope, ensuring it is routed properly through the carabiner;
- h. the square knot, ensuring it is tied properly on the rappellers left side with two half-hitches routed down towards pocket and the excess running end of rope is tucked into shirt or pant pocket;
- i. the left rear side locking loop of rappeller's Swiss seat, ensuring it is rigged correctly; and
- j. the rigging of any toboggans or bundles.

BOARDING THE HELICOPTER

7. When all the rappellers have been inspected, the rappel master shall organize the rappellers into a single file with the third or fourth port side rappeller leading off and the third or fourth starboard side rappeller following immediately after the first port side rappeller. The rappel master shall then place the rappellers in the kneeling position at the twelve o'clock position 30 metres from the helicopter. The rappel master shall give a thumbs-up signal to the aircraft commander to indicate that rappellers are ready to board.

8. When the aircraft commander responds with a thumbs-up signal, the rappel master shall order the rappellers to approach the helicopter. The helicopter shall be approached directly in the twelve o'clock position with all personnel keeping a low silhouette under the main rotor. Once the rappel master is 3 metres from the nose of the aircraft, he shall approach around the port side with the port side rappellers following, and the starboard side rappellers will break off and approach around the starboard side of the aircraft.

CAUTION

There are two pitot tubes on the nose of the aircraft that, if hit, may cause personnel injury or aircraft damage. Avoid this hazard at all times.

9. The rappel master shall board the helicopter first and secure his safety harness. He will then hook each rappeller to his/her respective anchor point starting from number three and order them to rotate in a clockwise position and sit down.

10. When all rappellers are seated with their seat belts secured, the rappel master shall do a systematic inspection of the following:

- a. The bight on the double figure-eight of each rappel rope is secured onto the anchor system with a screw-gate carabiner that has its gate closed and locked.
- b. Each rope is traced from the carabiner around the left side of the rappeller to the carabiner on his

Swiss seat, ensuring the rope is routed properly and the screw-gate is closed and locked.

- c. The rappellers sandbag of rope is under the seatbelt and secured.
- d. The running end of the rope is traced from each rappeller's carabiner to ensure all slack is taken up, the rappeller has his brake hand on the rope and the brake is applied.

11. The rappel commands given by the rappel master and repeated by the rappellers are as follows:

- a. **SEAT BELTS ON;**
- b. **BRAKE HAND ON;** and
- c. **#___OKAY.**

SECTION 4 WORDS OF COMMAND, SIGNALS AND RAPPEL MASTER DUTIES IN FLIGHT

GENERAL

12. To ensure a successful rappelling operation from a CH146 helicopter, clear communication between the rappel master, aircraft commander and flight engineer are essential.

WORDS OF COMMAND AND SIGNALS

13. Before take-off, the rappel master shall confirm that:
- a. the flight engineer will act as a relay between the aircraft commander and the rappel master, if required;
 - b. the rappel master will ensure that at least 6 m of each rappel rope is lying on the ground following

Rappelling Techniques and Procedures

the command to **DROP ROPES** and the aircraft commander will be advised of any necessary corrections in altitude;

- c. the flight engineer will assist the rappel master in dispatching toboggans or bundles, if necessary; and
- d. the flight engineer will assist the rappel master if any critical situations should arise.

14. Prior to take-off, when all the rappellers are seated and their seat belts properly fastened, the rappel master shall inform the aircraft commander by using the following words of command:

RAPPELLERS SECURE.

15. During the flight, the rappel master shall maintain communication with the aircraft commander through the intercom system.

16. When the helicopter is over the rappel site, the aircraft commander will inform the rappel master to commence rappelling by using the words of command **OVER THE AREA, CLEAR TO INSERT**. The rappel master shall reply **CLEAR TO INSERT** then execute the rappel using rappel commands.

CAUTION

The rappel master shall ensure symmetrical, port and starboard, dispatch of rappellers to maintain lateral centre of gravity.

NOTE

Ch146 skid weight limit not to Exceed 920lbs (344kg) per side.

17. The rappel master shall be responsible for giving the following commands to the rappellers both visually and verbally:

- a. **GET READY**—the rappel master shall give this order to the rappellers when the helicopter is over the rappel area and the aircraft commander informs the rappel master to commence rappelling.
- b. **DROP ROPES**—the rappel master shall give this order to the rappellers after ensuring that each rappeller has his sandbag full of rope ready for dropping. Once the ropes have been dropped, the rappel master shall confirm with each rappeller that the rope has reached the ground and is in the hands of the brakeman by receiving a thumbs-up from the rappeller's free (left) hand.
- c. **POSITIONS**—the rappel master shall give this order to the rappellers, at which time the rappellers shall remove their seatbelts and take up their positions as directed by the rappel master.
- d. **GO**—the rappel master shall give this order to the rappellers when they are in position. He will then point at the position numbers and give the order. As soon as they have cleared the skid, he shall repeat the command successively to the next position numbers to rappel.

18. The visual signals, which the rappel master shall make simultaneously with giving the verbal commands, are detailed in Chapter 3, Section 3.

19. When clearing the ropes from the helicopter after dispatching all the rappellers, the rappel master shall inform the aircraft commander that all ropes are clear by using the following words of command; **RAPPEL MASTER SECURE**.

20. In the event of an entangled rappeller, the rappel master shall inform the aircraft commander by using the words of command **HUNG UP RAPPELLER**. The rappel master shall then assess the

Rappelling Techniques and Procedures

situation and discuss with the aircraft commander to determine the best course of action to resolve the situation.

DISPATCHING TOBOGGANS AND/OR BUNDLES

21. If toboggans and/or bundles are to be dispatched, it shall be done as soon as all the rappellers are on the ground. The rappel master shall clear all the rappel ropes, and then the equipment rope that is already rigged to the load shall be dropped. A designated rappeller, or the brakeman, shall hold the rope and indicate that he is ready to brake by giving the thumbs-up signal. The rappel master, assisted by the flight engineer, shall slide the load out of the cabin under control ensuring to clear the skid. The brakeman shall control the rate of descent at which the load is lowered.

22. Once the equipment is on the ground, the rappel master shall get a thumbs-up signal from the brakeman, and then he shall unhook and clear the rappel rope, ensuring that it has cleared the skid. He shall then inform the aircraft commander by using the words of command **RAPPEL MASTER SECURE**.

CHAPTER 5 RAPPEL TOWER TRAINING

SECTION 1 INTRODUCTION

DESCRIPTION

1. Rappel towers in the Canadian Forces are not built the same as one another, but they all have a low-wall rappel station, a high-wall rappel station and a free-rappel station (helicopter skid) in common. Rappel towers vary in height and width. They are normally built of wood and are a freestanding structure with cross members, uprights and base poles. The low wall is approximately 15 feet (4.5 m) and the high wall is approximately 40 feet (12 m) high. Both walls are constructed from wood. The free-rappel station is approximately 40 feet (12 m) high and is constructed with a metal skid to represent a CH146 helicopter skid and is open from the skid to the ground. A series of ladders reach each rappel station, with railings for rappeller's safety. All sites have tie down points, rings and anchor cables or posts to secure ropes.

INSPECTION

2. Prior to the commencement of a training period, a qualified rappel master shall carry out a visual inspection for any indications of damage or undue wear to the following:

- a. the ladders;
- b. the landing areas;
- c. hand railings;
- d. all floors;
- e. all walls;
- f. the skid;

Rappelling Techniques and Procedures

- g. all tie down points and rings;
- h. the tower itself (cross members, uprights and pole bases); and
- i. the free-rappel (helicopter) side—when in use, the anchor cable shall be checked to ensure that it has been mounted correctly.

SAFETY FACTORS

3. While conducting training on the tower, a qualified and current rappel master shall ensure that:
 - a. all personnel are wearing properly secured helmets, snap links and sling ropes are serviceable, and all rappellers have properly fitted leather gloves with liners;
 - b. no personnel are on the tower without an instructor;
 - c. only rappel masters shall supervise the hook up of rappellers;
 - d. personnel acting as brakemen on the rappel ropes are briefed on their responsibilities and are wearing helmets and gloves when working at the bottom of the tower;
 - e. all ropes used are secured to the tower;
 - f. the anchor cable is mounted correctly and secured before rappelling from the free-rappel station;
 - g. no person is dispatched if there is any doubt as to his safety;
 - h. no person is dispatched against his will;
 - i. the rappel tower is secured at all times when not in use;

- j. personnel watch for falling ropes when they are near the free-rappel station;
- k. no one runs up the stairs or leans on the railing;
- l. only the stairs are used to climb the tower;
- m. there is no horseplay at or on the tower;
- n. all injuries are reported to the rappel master or rappel master assistant immediately;
- o. a safety vehicle with a stretcher, blankets and a first aid kit is on site; and
- p. a medical assistant is in attendance at each site during rappel training (ref: B-GL-381-001/TS-001 *Training Safety*, Chapter 1, Section 6)—a medical assistant and ambulance are required if the rappel site is more than 20 minutes driving time from the nearest medical facility.

SECTION 2 DUTIES AND RESPONSIBILITIES

RAPPEL MASTER

- 4. The rappel master shall perform the following duties:
 - a. supervise all training in progress at the rappel tower;
 - b. supervise the hook up of all rappellers by ensuring that:
 - (1) rappellers are properly hooked up to their ropes; and
 - (2) their brake hands are applied properly and guide hands are in place before the rappellers are dispatched from the tower;

Rappelling Techniques and Procedures

- c. remind student rappellers, just before their next rappel, of the faults in their previous performance and detail the corrective action they are to take; and
- d. give all commands required to control rappellers on the rappel tower.

RAPPEL MASTER ASSISTANT

5. A rappel master assistant aids the rappel master in conducting rappel training. He is also a qualified and current rappel master. The rappel master assistant shall ensure that:

- a. all brakemen are briefed on their responsibilities before they are employed on the ropes;
- b. each rappeller clears his rope properly and sounds off that he is off rappel;
- c. all students are clear of the tower when the helicopter skid side is used;
- d. all ropes used are touching the ground before the rappeller descends;
- e. the proper procedure for clearing the ropes from the free-rappel station are carried out;
- f. the procedures and drills used for stowing ropes are used on helicopter rappelling;
- g. student rappellers rotate properly around the various stations of the rappel tower so that there is a steady flow of personnel; and
- h. all personnel on rappel training are wearing their helmets.

SECTION 3 RAPPELLING FROM THE LOW AND HIGH WALL

INTRODUCTION

6. Prior to commencing the low and high-wall training, the personnel participating in this training shall receive instruction in, or a review of, constructing a Swiss seat and performing basic rappel techniques. A review of the use of individual equipment will also be conducted if the equipment is part of the training. To operate the tower, at least one rappel master assistant is required to supervise the brakemen and assist the rappel master in controlling the movement of rappellers onto the tower.

PROCEDURES BEFORE TRAINING

7. The rappel master shall ensure that the following procedures take place prior to rappelling from the low wall:

- a. The stores have been requested, rappel tower booked, and safety vehicles are ordered.
- b. On the day of training, the staff meets at the tower with all required equipment and immediately inspects the tower.
- c. The rappel tower and area are set up for training, and at least 10 feet (3 m) of rope must be on the ground.
- d. Once the rappellers have arrived, the staff is introduced. If the rappellers have not received ground training, it shall be conducted prior to rappelling off the low wall.

RAPPELLING FROM THE LOW WALL

8. Once the rappellers have received ground practice and are ready to commence rappelling, the following shall take place:

Rappelling Techniques and Procedures

- a. All rappellers shall be briefed on the safety rules and the conduct of the training.
- b. All rappellers shall line up at the base of the ladder prepared to rappel. They shall be placed in a position to watch rappellers but not interfere with training. The rappel master assistant shall task one of the rappellers in line to act as the brakeman.
- c. The rappel master assistant shall inspect the first two rappellers. He shall also inspect all subsequent rappellers prior to them going onto the tower.
- d. The rappel master shall call up the first rappeller. Under the supervision of the rappel master, the rappeller shall place the rope in his snap link and do up the screw-gate. At this time, the rappel master shall do a visual check on the rappeller's Swiss seat.
- e. The rappeller shall then sound off, # **1 ON RAPPEL**, which the brakeman shall repeat.
- f. The rappel master shall give the rappeller the following tower commands, which the rappeller shall react to:
 - (1) **GET READY**;
 - (2) **POSITION**; and
 - (3) **GO**.
- g. Once the rappeller is on the ground, he shall be assisted off the rappel rope by the brakeman, who moves forward of the rappeller and holds the rope. The rappeller shall then back off the rope, left hand over the snap link, right arm extended to the side for easy rope flow. Once off the rope, the rappeller shall sound off, # **1 OFF RAPPEL** and give a thumbs-up to the rappel master.

- h. The rappeller is critiqued by either the rappel master or the rappel master assistant, after which he then becomes the brakeman. The original brakeman shall move to the back of the line at the ladder, the second rappeller shall hook up, and the rappel master assistant shall send the third man in line up to the low wall. The cycle continues.
 - i. The rappel master shall watch and ensure that all personnel adhere to all safety aspects as well as ensuring smooth operation.
- 9. The rappel training shall be progressive. Rappellers shall descend off the low wall without equipment and weapons first followed by fighting order than marching order.
- 10. All staff have the responsibility to ensure that training is safe. It is important that the rappel master assistant keeps everyone clear from the base of the wall, as this is the area where the rappel master looks to confirm that the rope is free, that there are no obstructions, and that the brakeman is ready before dispatching the next rappeller.

RAPPELLING FROM THE HIGH WALL

- 11. The procedures and drills on the high (40 feet (12 m)) wall are basically the same as the low wall. It is the next step in progressive training in preparing the rappeller for rappelling from the helicopter. At least one rappel master assistant is required to conduct rappelling from the high wall, with the optimum number being two. The rappel master shall control the movement of rappellers from the low wall holding area up to the high wall platform and their dispatch from the tower. The primary rappel master assistant shall supervise the brakemen and the other rappel master assistant shall control the movement of rappellers from the base of the first ladder to the low wall holding area. If only one rappel master assistant is present, he must maintain constant supervision of the brakemen while rappellers are on their ropes, and the rappel master may have to task a non-rappel master qualified NCO to control the movement of rappellers from the base of the first ladder to the low wall waiting area.

Rappelling Techniques and Procedures

12. The preliminary procedures for the high wall are the same as those for the low wall. There shall be at least 10 feet (3 m) of rope on the ground. Once all the preliminary checks have been completed, the following procedures shall take place:

- a. All rappellers line up at the base of the ladder prepared to rappel. They should be in position to watch rappellers but not interfere with training. The rappel master assistant shall task the last rappeller in line to act as the brakeman.
- b. A rappel master assistant shall inspect all rappellers prior to them going on the tower. If only one rappel master assistant is present, he may inspect all rappellers prior to the start of the training. If two rappel master assistants are present, the primary rappel master assistant shall supervise the brakemen at the base of the high wall, and the other rappel master assistant shall control the movement of rappellers from the base of the ladder to the low wall holding area. He will also inspect each rappeller before he goes up the tower.
- c. The rappel master shall then call up the first rappeller. The first rappeller shall proceed to the top of the high wall. The rappel master assistant at the base of the ladder shall then send the next rappeller in line to the low wall holding area where he shall wait to be called up by the rappel master.
- d. The first rappeller shall then proceed, under the supervision of the rappel master, to place the rope in his snap link and do up the screw-gate. At this time, the rappel master shall do a visual check of the rappeller's Swiss seat.
- e. The rappeller then sounds off, **# 1 ON RAPPEL**, which the brakeman repeats.
- f. The rappel master shall then give the rappeller the following tower commands, which the rappeller shall react to:

- (1) **GET READY;**
 - (2) **POSITION;** and
 - (3) **GO.**
- g. The rappel master shall ensure that the rappellers bound down the wall.
- h. Once the rappeller is on the ground, he is assisted off the rappel rope by the brakeman. Once off the rope, the rappeller shall sound off, # **1 OFF RAPPEL** and give a thumbs-up to the rappel master.
- i. The rappeller shall then be critiqued by either the rappel master or the primary rappel master assistant, and he then becomes the brakeman. The original brakeman shall move to the back of the line at the ladder. The rappeller on the low wall shall move up to the high wall and hook himself up. The rappel master assistant at the base of the ladder shall send the third rappeller in line up to the low wall. The cycle continues.
- j. Once the rappellers have completed a minimum of two rappels, they can progress to fighting order and then marching order.

13. All staff have their responsibilities in ensuring training is conducted safely. It is important that the primary rappel master assistant keeps everyone clear from the base of the wall, as this is the area where the rappel master looks to confirm that the rope is free, that there are no obstructions, and that the brakeman is ready before dispatching the next rappeller.

SECTION 4
RAPPELLING FROM A FREE-RAPPEL SITE (SKID)

INTRODUCTION

14. Once the rappellers have become proficient in rappelling from the low and high wall, the rappeller can commence rappelling from a free-rappel site (skid). All actions and drills executed from the rappel master and rappellers are conducted as if they were rappelling from an actual helicopter. The words of command and signals that pass between the rappel master and the aircraft commander will be simulated so that the rappellers become familiar with the procedures used in an actual flight.

OPERATION, SAFETY CHECKS AND PROPER SEQUENCE FOR DISPATCHING RAPPELLERS FROM A FREE-RAPPEL SITE

15. The rappeller is only concerned with the hook up to his primary point. The following actions shall take place to conduct rappelling off the free-rappel station of the tower:

- a. Rappellers shall be taught boarding drills and command and signals on mock-ups prior to commencing.
- b. Rappellers shall form a line at the base of the ladder, prepared to rappel. The rappel master assistant shall task the last three rappellers to act as brakemen under his supervision.
- c. The rappel master assistant shall inspect the first three rappellers. He shall ensure that all rappellers are inspected and, when instructed, proceed up the ladder one at a time.
- d. The rappel master shall supervise the hook up of each rappeller. The rappellers shall then sit down on the edge of the platform.

- e. The rappel master shall inspect each rappeller in turn. Starting at the standing end of the rope, the rappel master shall check both snap links, ensuring that the screw-gates are positioned up and secured. He shall then inspect the rappellers in the following sequence:
 - (1) snap link;
 - (2) seatbelt;
 - (3) brake hand; and
 - (4) number of rappellers.

- f. The rappel commands given by the rappel master and repeated by the rappellers are as follows:
 - (1) **SEAT BELTS ON;**
 - (2) **BRAKE HAND ON;** and
 - (3) **# ___ OKAY.**

- g. When all the rappellers are seated and their seat belts properly fastened, the rappel master shall inform the aircraft commander by reporting, **RAPPEL MASTER SECURE**. The aircraft commander will acknowledge.

- h. The aircraft commander shall inform the rappel master to commence rappelling by using the words of command, **OVER THE AREA, CLEAR TO INSERT**. The rappel master shall reply, **ROGER, CLEAR TO INSERT**.

- i. The rappel master shall then get the attention of all rappellers and command them to **GET READY**. The rappellers shall repeat the word of command, take the sandbag from between their knees and place it on them, holding it with their free (left) hand and ensuring their brake-hand remains applied.

Rappelling Techniques and Procedures

- j. The rappel master shall give the command **DROP ROPES** to the rappellers. The hand signal for drop ropes will be indicated at this time.
- k. Using their free (left) hand, the rappellers shall throw their sandbag out and over the skid. If all is correct, they will turn around and give a thumbs-up to the rappel master. The rappel master shall then visually check to ensure that the ropes are out over the skid and there is sufficient rope on the ground.
- l. The rappel master shall give the command **POSITIONS** to the rappellers. The rappellers shall repeat the command, remove their seatbelts, and, successively, numbers two port and starboard followed by numbers one and three port and starboard shall pivot anti-clockwise and reach for the skid with their feet. Once on the skid, the rappellers shall lean back to a 35 degree angle from vertical, knees slightly bent, and await the next command.
- m. The rappel master shall then indicate and command, **NUMBERS _s AND __s, GO**. On the command **GO**, the numbers ordered and pointed to shall repeat **GO**, push away from the skid, ease the brake hand and rappel to the ground under control, ensuring they are looking over their brake-hand shoulder. Once the rappeller is on the ground, he shall undo the rope from his carabiner. Once the rappeller is free of the rappel rope, he shall immediately signify by giving a thumbs-up signal to the rappel master. In the event of a four-person rappel, the numbers one port and starboard shall rappel, followed by the numbers two port and starboard.
- n. Once the rappel master has ensured that all rappellers are off the ropes and the area below is clear, he shall open the snap links and release the rappel ropes from the snap links, ensuring the ropes clear the skid when he tosses them down.

- o. After the dispatch of all rappellers, the rappel master once seated shall inform the aircraft commander that all ropes are clear by using the following words of command: **RAPPEL MASTER SECURE**. The aircraft commander shall acknowledge with **ROGER**. The next three rappellers shall move up to the free rappel station. The original three-brakemen, once relieved, shall return to the end of the line at the ladder. The rappel master assistant shall debrief the three rappellers and the cycle continues.

SECTION 5 RAPPELLING AN EQUIPMENT LOAD

INTRODUCTION

16. When rappelling a bundle or a toboggan, the rappel master shall ensure it is properly packed and rigged. To achieve this aim, the rappel master shall conduct the following:
 - a. Take the appropriate rappel rope and hook it into the snap link on the toboggan or bundle. Place the rope on top of the toboggan or bundle. Task and brief one rappeller to carry out the duties as a brakeman.
 - b. Secure the toboggan or bundles with either a sling rope or seat belt to the floor of the helicopter directly behind the pilots.
 - c. Once all the rappellers' ropes have been cleared, the following steps shall be taken:
 - (1) Once the rappel rope is out and over the skid and in the grasp of the brakeman, the rappel master shall unhook either the seatbelt or sling rope that is securing the load.
 - (2) He will then position the load over the skid by using the sling rope.

Rappelling Techniques and Procedures

- (3) The rappel master shall then remove the sling rope from the D-ring of the bundle or, in the case of the toboggan from the U-bolt, by letting go of one of the running ends and then pulling the sling rope back into the helicopter.
- (4) Once the rappel master has ensured the load is on the ground and the area is clear, he shall drop rope.
- (5) After clearing the rope as previously discussed, the rappel master shall then sit down and report, **RAPPEL MASTER SECURE**.

CAUTION:

It is essential that all rappellers that are dispatched and on the ground observe the lowering of the toboggan or bundle to ensure that they are not in the path of the descending load.

ANNEX A
WORDS OF COMMAND AND ACTIONS TO BE TAKEN

1. Upon boarding the helicopter and prior to giving the words of command **RAPPELLERS SECURE**, the rappel master shall ensure that:
 - a. all rappellers' ropes are secured to the anchor cable assembly;
 - b. the rappellers are properly seated and their seatbelts are secure;
 - c. the sandbags full of rope are being securely held in the correct position; and
 - d. he has communications with the aircraft commander.

SEQUENCE OF COMMANDS

	INITIATING ORDER	RESPONSE	COMMANDS, SIGNALS AND ACTIONS OF RAPPEL MASTER	ACTIONS OF RAPPELLERS
1	Rappel Master: RAPPELLERS SECURE	Pilot: ROGER		
2	Pilot: OVER AREA	Rappel Master: ROGER		
3	Pilot: CLEAR TO INSERT	Rappel Master: CLEAR TO INSERT	GET READY —the rappel master bends his arms at the elbows with the hands in front of the breast, palms facing forwards.	The rappellers repeat the command. They place their sandbags on their knees and hold them securely with their free hands, keeping their brake applied.

Rappelling Techniques and Procedures

	INITIATING ORDER	RESPONSE	COMMANDS, SIGNALS AND ACTIONS OF RAPPEL MASTER	ACTIONS OF RAPPELLERS
4			DROP ROPES —the rappel master extends his arms full to his sides, his palms facing downward and moves his arms from his shoulders to make a downward motion.	The rappellers repeat the command and with their free hand, throw the sandbag outside of the skids.
5			POSITIONS —the rappel master extends his arms fully, hands clenched except for the forefingers, which point to the skids below the helicopter.	The rappellers repeat the word of command; undo their seatbelts and pivot into the rope at the same time that they move onto the skids. Once their feet are on the skids, they lean back at a 35 degree angle with knees slightly bent.
6			GO —the rappel master fully extends his arms, hands clenched except for the forefingers and points to each pair of numbers who are to begin rappelling.	The rappellers repeat the command and leave the skids as indicated.
7			Before he drops the ropes, the rappel master shall ensure that the personnel on the ground are clear. When dropping the ropes, he shall ensure that they clear the skids.	
8	Rappel Master: RAPPEL MASTER SECURE	Pilot: ROGER	The rappel master shall be seated, with his seat belt secure.	

ANNEX B
RAPPEL MASTER EQUIPMENT CHECKLIST

1. The following equipment is required to rig the anchor system for the CH146 helicopter:
 - a. 6 x 1 m long 10.5 or 11 mm static kermantle rope;
 - b. 10 x Heli-Dyne ring fittings, NSN 5365-21-259-5027;
 - c. 22 oval steel gate carabineers, NSN 8465-21-896-8280;
and
 - d. 1 3/8" steel cable (oval).

2. Normally, the helicopter will arrive at the pick-up point complete with the following essential items for rappelling:
 - a. a standard safety harness, NSN 1670-21-869-1377,
for use by the rappel master;
 - b. a radio headset for use by the rappel master;
 - c. sufficient seatbelts for rappellers; and
 - d. skid tube lug covers, if available.

**ANNEX C
CHART FOR ROPE LENGTHS**

ROPE TYPE	USE	ROPE LENGTH
11 mm or 12 mm hawser-laid nylon	Ground Training	Note 1
11 mm or 12 mm hawser-laid nylon	Low Wall	Note 1
11 mm or 12 mm hawser-laid nylon	High Wall	Note 1
11 mm or 12 mm hawser-laid nylon	Free Rappel Site	Note 1
11 mm or 12 mm hawser-laid nylon	CH146 Helicopter	240 Feet (73 m); Note 2
12 mm STATIC kermantle	Helicopter Anchor System	1 m

NOTE 1

Due to different tower configurations, rappel masters are to ensure that a minimum of 10 feet (3m) of rope is on the ground prior to conducting rappel training.

NOTE 2

Cut rope in a single strand at 240 feet (73 m) long. Locate the centre of this rope and tie a double figure-eight knot. Finished length once doubled will be 120 feet (36 m) long.

ANNEX D
RAPPEL MASTER AND AIRCREW COORDINATION
BRIEFING

1. The rappel master, aircraft commander and flight engineer will cover the following points during their coordination briefing prior to conducting helicopter rappelling:

- a. aircraft configuration;
- b. number of lifts;
- c. equipment carried;
- d. formations;
- e. insertion point;
- f. alternate plan;
- g. emergency procedures; and
- h. Go/No Go criteria.

2. For night operations, the following points shall also be discussed:

- a. blackout curtain;
- b. green filtered light; and
- c. spot light required over insertion point.