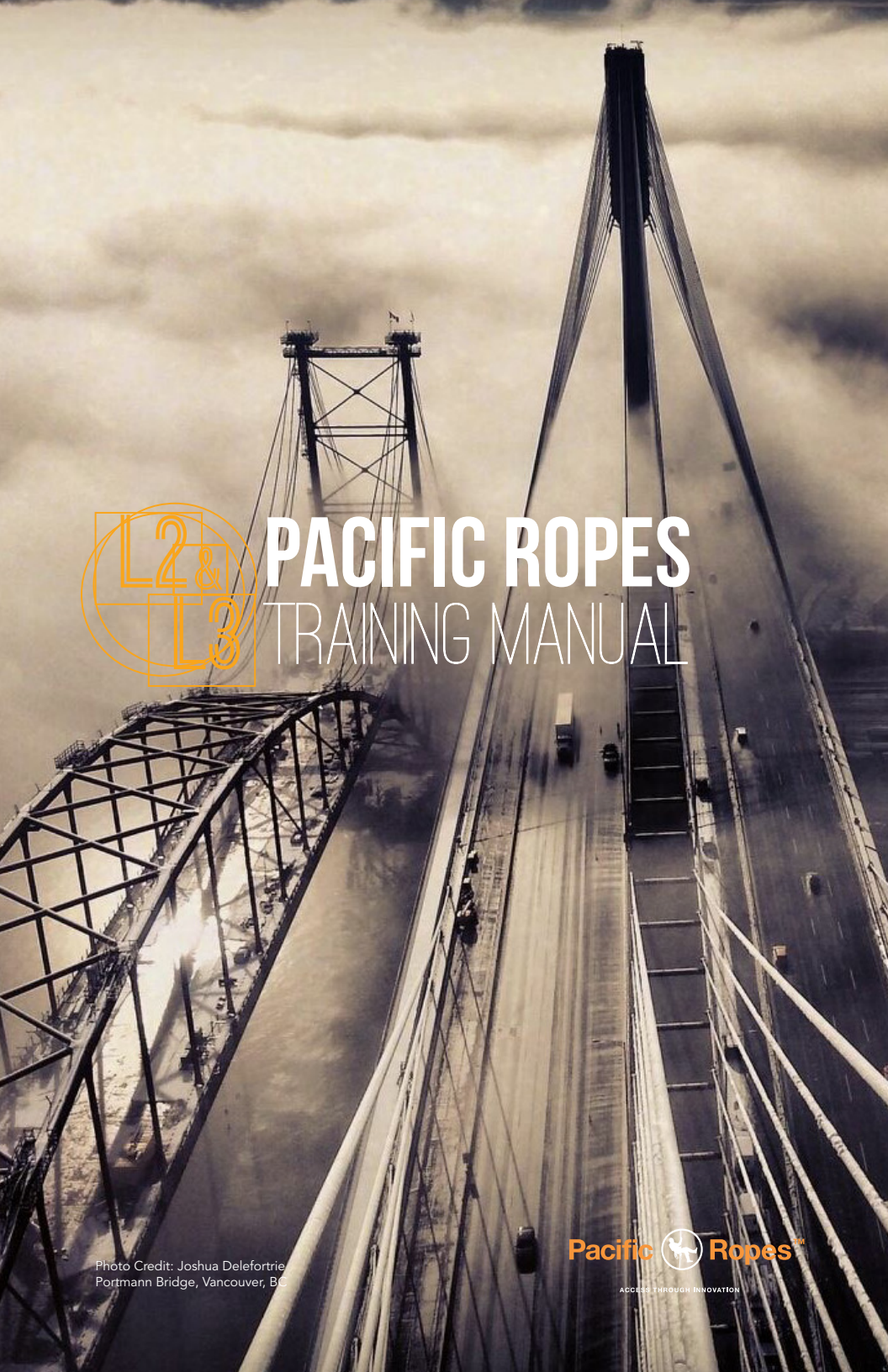


PACIFIC ROPES
TRAINING MANUAL

Photo Credit: Joshua Delefortrie
Portmann Bridge, Vancouver, BC

Pacific Ropes™
ACCESS THROUGH INNOVATION

Name:

Course Date:

DISCLAIMER

The information contained in this rope access training manual does not take precedence over Provincial Occupational Health and Safety acts and regulations. Nor does it take precedence over IRATA or SPRAT standards and regulations.

Where conflict between the manual and Provincial Regulations occurs, Provincial Regulations will be the standard used, except where the standard of our procedure is greater than a specific Provincial Regulation.

Where conflict between the manual and IRATA Regulations occurs, IRATA Regulations will be the standard used.

Where conflict between the manual and SPRAT Regulations occurs, SPRAT Regulations will be the standard used.

WELCOME TO PACIFIC ROPES TRAINING ACADEMY

Congratulations on your decision to re-certify or upgrade your certification! This manual will help guide you towards becoming a SPRAT and/or IRATA level 2 (L2) or level 3 (L3) rope access technician. There's a significant jump in expectations around skill and responsibility at these higher levels. Please be aware that you must be proficient at your current level before attempting this progression.

Pacific Ropes Mission

> Pacific Ropes is committed to leading as pioneers and advocates for Rope Access operations in Canada through innovation, collaboration, safety, and mentorship.

Mentorship is our profession. We believe in implementing high quality training to help guide and harness safe, knowledgeable, and hardworking Rope Access technicians so that they can excel and remain safe in the work place.

Safety is our purpose. Our safety-first culture is exemplified through our training and work environments. When you leave our training centre, we want to make sure you are equipped with all the right safety tools.

Collaboration is our priority. We believe a strong and connected community will help grow the Rope Access industry. Our hope is that our training centre will be one of the many venues for a connected community.

Innovation is our passion. Our training centre offers opportunities to try new things, introduce new ideas, and become a breeding ground of new efficiencies.

This is our commitment to our students at Pacific Ropes.

CONTENTS

This manual is to be used as a supplement to your training at Pacific Ropes Training Academy. This manual must also be used in conjunction with:

- IRATA Code of Practice (ICOP)-Current Edition
- IRATA Training and Assessment Certification Scheme (TACS)-Current Edition
- SPRAT Safe Practices-Current Edition
- Pacific Ropes SPRAT and IRATA Level 1 Training Manual

INTRODUCTION

Photo Credit: PacificRopes
LaFarge Concrete Facility

Risk Assessment and Rescue Plan

Our training centers each have their own risk assessment and rescue plan. It's good practice to review and familiarize yourself with these documents before you start work on any job or training site, so take a moment to do that now. It's crucial that you're aware of all potential hazards so that you can plan accordingly.

If you're certifying as a L3 SPRAT or IRATA rope tech, it will be your responsibility to not only understand but also to create an appropriate and actionable risk assessment for each assigned work site. More information on this will be provided later, but we'd like to immediately shine a light on the responsibility you'll be taking on with this new level of certification (if you're re-certifying, it's good practice to make a habit of reminding yourself of this on a frequent basis).

All rope techs are responsible for reviewing the site risk assessment and rescue plan before starting any work at height!

Attendance

Before we begin each day of training, you'll need to sign our Daily Student Attendance Form. By signing in each day, you affirm that you have gone through our risk assessment and orientation. Relevant orientation information includes everything outlined in this introductory chapter.

Forms, forms, and more forms!

We have a few forms you need to sign before hoping onto the ropes! Make sure you fill and sign:

- Registration form
- Media and Marketing Release
- Waiver and Release form
- Fitness Guidelines/Medical Statement

First Aid and CPR

L3 SPRAT and IRATA candidates must have valid First Aid, CPR, and AED certifications in order to work in the field and supervise. Bring these with you to your first day of training, before an upgrade.

Logbooks

We hope you've been keeping your log book up-to-date! It's mandatory that you bring your logbook with you to your first day of training. We'll be looking at it to ensure its been filled out properly, and that you've satisfied the relevant prerequisites for certification as a L2 or L3 rope tech. Remember that without a properly filled out log book, you will not be allowed to assess! More information on logbooks can be found in 6-6.4 of SPRAT Evaluation Guidelines and/or 4.13 of IRATA TACS.

Fire

In case of fire, leave the classroom/training area and make your way to the muster point at the front of the building.

Smoking

Smoking is only allowed outside, away from any building entrances. Please use the designated can for your cigarette butts and not the ground.

Helmets

Helmets must be worn within the training venue exclusion zone at all times. This will be covered in the risk assessment as well.

Washrooms

Washrooms are located behind the classroom. Please let us know if any toilet paper, soap, or paper towels need re-filling.

First Aid Kit

First aid kits are located on top of the fridge in the kitchen area.

Parking

Please park vehicles respectfully and ensure that your vehicle is not obstructing access to other office parking spots.

Personal Items

We have lockers available to use for your personal items. Please provide your own lock. We are not liable for anything damaged or stolen here.

Schedule

Training will begin at 8am and end around 4pm each day. You'll get a 45 min-1 hr lunch and on Assessment day, Pacific Ropes will provide a lunch for you. Please let us know of any allergies beforehand.

Kitchen

Feel free to make use of any utensils, equipment, supplies, coffee, tea, sugar, etc in our kitchen. Please don't mistake us for your personal dishwashers though! To help maintain a nice clean kitchen for everyone this week, please wash your own dishes.

Course Documents

There is a Student Resources page on our website where you'll find a copy of this training manual, IRATA ICOP, IRATA TACS, SPRAT Safe work Practices, equipment info, and other useful information that you can take home with you. You'll also get a hard copy of this manual. Hard copies of other documents will be provided during the course. However, please make sure you return them prior to the assessment.

Third Parties

Our training space is shared with other departments in our company. There will be other staff, contractors, suppliers, and visitors who may come in and out of the training space. Please be aware of third parties entering and leaving. Make sure you stay within the designated exclusion zones.

Training Equipment

Do not leave our equipment outside of the training center as they may get damaged or stolen. While you are training here, you will help us maintain our equipment and be responsible for anything that you use. You will be liable for any damage sustained to our equipment if you leave it outside.

Unfortunately, due to our insurance requirements, you cannot use your personal rope access equipment. If you notice any damaged or defective equipment, please let us know immediately.

Rope Access Certifications

Please refer to your L1 Training Manual for a short breakdown of the differences between SPRAT and IRATA. Something you should be aware of: if you're re-certifying or upgrading your SPRAT certification, you may have the option of assessing for an equivalent IRATA certification the same week, this will need to be planned ahead of time and approved by IRATA.

Industrial Rope Access Trade Association

Society of Professional Rope Access Technicians

We go over the details of conversion in the following blog post: http://info.pacificropes.com/blog/sprat-to-irata-conversion

It's a big jump from a L1 to L2 tech, and an even bigger jump from L2 to L3. Be prepared. Now that you have the basics down, these higher levels will qualify you for new and exciting opportunities to explore a wide range of rope access operations. You're also going to be given a lot more responsibility.

During training, you will be exposed to both the SPRAT and IRATA curriculums regardless of which certification you're assessing for. This is a strenuous course, so work at your own pace and use proper climbing technique to avoid unnecessary muscle fatigue.

Over the next week, you will be spending a lot of time practicing rescue procedures. In preparation for this, it would be a good idea to re-read the chapter in the ICOP on suspension intolerance (Part 3 Annex G). The technician feigning immobility in a rescue must be diligent in moving their legs and feet, and using appropriate gear (like a foot loop) to ensure that they're properly supported and that circulation isn't compromised at any time.

We want you to feel confident going into assessment day, but remember that there is a definitive difference between being hyper-confident and secure in your knowledge. Over the next few days (and during your assessment) you may be challenged to rethink procedures that you've done correctly. Keep your cool, avoid defensiveness, and do not be afraid to take a pause before responding and eventually recommencing. That pause may help you to avoid the mistakes that are often made when the pressure's on.

Your instructors are highly experienced and are here for your convenience. We will provide you with all the resources you'll need to succeed. After that, it'll be up to you to show up and do your best.

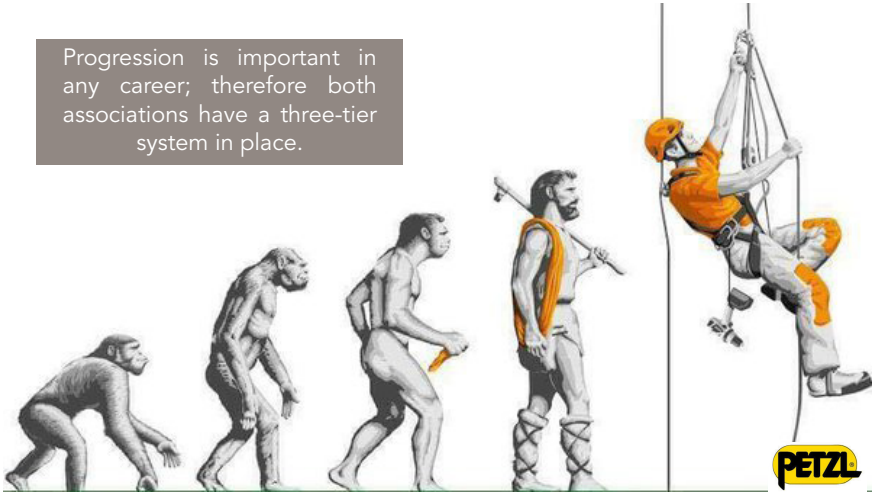
CHAPTER 1
QUALIFICATION

Photo Credit: Pacific Ropes
Vancouver, BC

Rope Access Levels of Certification

Level 1	This is an "apprentice" Rope Access Technician who has the basics to move through each rope maneuver and has a basic rigging understanding.
Level 2	This is an experienced Rope Access technician who has Level 1 skills plus more complex rigging, rescue and Rope Access skills. Level 2 technicians work under the supervision of a Level 3 Rope Access safety supervisor. Note: SPRAT deems the level 2 capable of overseeing a jobsite, but does not have overall responsibility.
Level 3	This is a supervisor, who is capable of complete responsibility for work projects. He/she is conversant with relevant work techniques and legislation and has a comprehensive knowledge of advanced rescue techniques. He/she should be able to demonstrate all the skills and knowledge required of Levels 1 & 2, hold an appropriate first aid certificate, be familiar with the IRATA ICOP and TACS and/or the SPRAT Safe Working Practices and Certification Requirements.

Progression is important in any career; therefore both associations have a three-tier system in place.



As you gain more experience as a Rope Access Technician, you will be encouraged to progress up the ladder. This is not compulsory. It is perfectly acceptable to remain at your preferred/suited level.
If you're interested in progressing but don't know where you stand in regard to proficiency at your current level, ask your supervisor for feedback. (**or come in for a day assessment of your current level and see where you stand.)
Every month (with occasional exceptions) we host open gym nights at our training center where you can practice different maneuvers and brush up on techniques you maybe haven't used in the field for awhile. This would be a great opportunity to test your skills!! We'll share more info on that later in this chapter.

Certification Flow Chart

The following chart shows the requirements of progression through each system from level 1 to level 3. Advancement under the SPRAT system is more lenient and therefore a technician can obtain level 3 status quicker than under IRATA.

Here at Pacific Ropes, we will teach you everything required for both the IRATA and SPRAT syllabuses, regardless of your choice of certification.

In each association's' own words, here are the definitions for each L2 and L3 certification.

IRATA LEVEL 2 DEFINITION

"This is an experienced Rope Access technician who is able to perform more complex tasks under the supervision of a Level 3 rope access safety supervisor. He/she is

- Able to demonstrate the skills and knowledge required of Level 1;
- Capable of more complex rigging, including re-belays, deviations and tensioned lines;
- Able to undertake rescues from a variety of situations;
- Able to assemble and implement hauling systems."

SPRAT LEVEL 2 DEFINITION

"An individual who is responsible for physically conducting rope access operations and/or safety evaluations of rope access operations, including maintenance of associated access equipment and performs all Rope Access Lead Technician duties as assigned in the employer's rope access work program."

IRATA LEVEL 3 DEFINITION

"This is an experienced rope access Technician who is responsible for understanding and implementing the rope access procedures, method statements and associated risk assessments, and:

- Is able to demonstrate the skills and knowledge required of Levels 1 and 2;
- Understands the elements and principles of IRATA International's safe system of work;
- Is conversant with relevant work techniques and legislation;
- Has an extensive knowledge of advanced rope access rigging and rescue techniques;
- Holds an appropriate and current first-aid certificate.
- A level 3 can become a rope access safety supervisor."

SPRAT LEVEL 3 DEFINITION

"An individual who is responsible for the overall rope access work site and performs all Rope Access Supervisor duties as assigned in the employer's rope access work program."

Prerequisites

To get certified as a rope tech, there are some age, medical and fitness pre-requisites you need to satisfy. We went over those in your level 1 manual, but let's quickly do a summary:

AGE

Age: must be at least 18 years old (although, since you need a year's experience to be an IRATA certified L2 tech, the minimum is really 19 years old).

MEDICAL REQUIREMENTS

Super important!!!

Medical requirements: free of any of the contraindications listed in ICOP 2.3.1 (examples include: diabetes, epilepsy, alcohol or drug dependence, psychiatric illness).

FITNESS

It's a physical 4 days coming up!

Must be physically fit – the tasks required of a rope tech require strength (especially core and legs), agility and co-ordination. Endurance is also an asset.

FIRST AID

As mentioned in the introduction, if you're a certifying L3 tech, you'll also need to have valid First Aid, CPR, and AED certifications in order to be assessed. If you do not have these certifications, we'll need to get you rebooked for when you do.

IF YOU ARE RE-CERTIFYING

SPRAT and IRATA certifications are both good for 3 years. Both associations give you the option of re-certifying up to 6 months before expiry. Your new certificate would then start from the new date, so in theory, your revalidation could last up to 3 years, 6 months.

You must revalidate before your current certification has expired – that means on assessment day, your certification must still be valid.

Expired L1 IRATA technicians are NOT eligible for upgrading to level 2.

Expired L1 SPRAT technicians are eligible for upgrading to level 2 as long as their 500 required working hours were obtained while their L1 was still valid, and are accounted for in a log.

On that note; hopefully you've remembered to bring your logbook with you this morning!

Refresher Training

If you hold a SPRAT or IRATA certification, but haven't been engaged in rope access activities for 6 months or more, you are required to attend refresher training before recommencing your work as a rope tech.

If it's been less than 6 months, but still a good chunk of time since you were last engaged in rope access activities, your supervisor should evaluate your competence before getting you back out on the ropes. Depending on how you perform, you may also be asked to attend refresher training.

Rope access activities include any work that you've appropriately been able to log in your log book. Work done exclusively in fall arrest is not considered a loggable rope access activity.

The duration of your refresher training will depend on your demonstrated skill level. It could be as little as 1 day, or as much as a full 4-day training course (minus the assessment). If you're a L1 rope tech, you'll be going over all the techniques covered in your original training; if you're a L2 rope tech, you'll be focusing on rigging and rescue procedures.

Rope access operations require a certain level of aptitude and mental conditioning (when working at height and under pressure, you will always revert to the level of your training), so it's important to stay sharp. These regulations are in place for your safety!

We have two blog posts on logbooks! What to do when you lose them and how to fill them out properly. Check it out @ http://pacificropes.com/rope-access-logbooks/

Supervisor Responsibilities

As a certified L3 technician, you will be eligible to supervise a rope access job site. Here's a summary of what some of your responsibilities will include. Don't turn the page level 2s, this will soon apply to you as well, and you are now a lead technician in your team, it is important that you understand where your level 3s are coming from.

Keeping your team accountable and informed

Your entire team (rope techs and other personnel) will be doing their work according to the work procedures, method statement and associated risk assessment that has been specifically created for the job site. You must ensure that everyone is clear on the contents of each of these documents. Your goal is always; no accidents, no waste, and no defects (this is known as zero targeting).

Taking on a leadership role

The safety of the rope techs on your team, the public, and the job site is your responsibility. Your team will expect you to be a sturdy authority that they can trust to make the best decision in every given circumstance. Confidence will be important, but also an awareness of the limitations in your knowledge. *Stay humble.* Ultimately you are still part of a team!

Different access tasks will require different supervisory skills. Adjust accordingly. The level of supervision should be appropriate for the number of rope techs on your team, their skill-level and the type of tasks being performed.

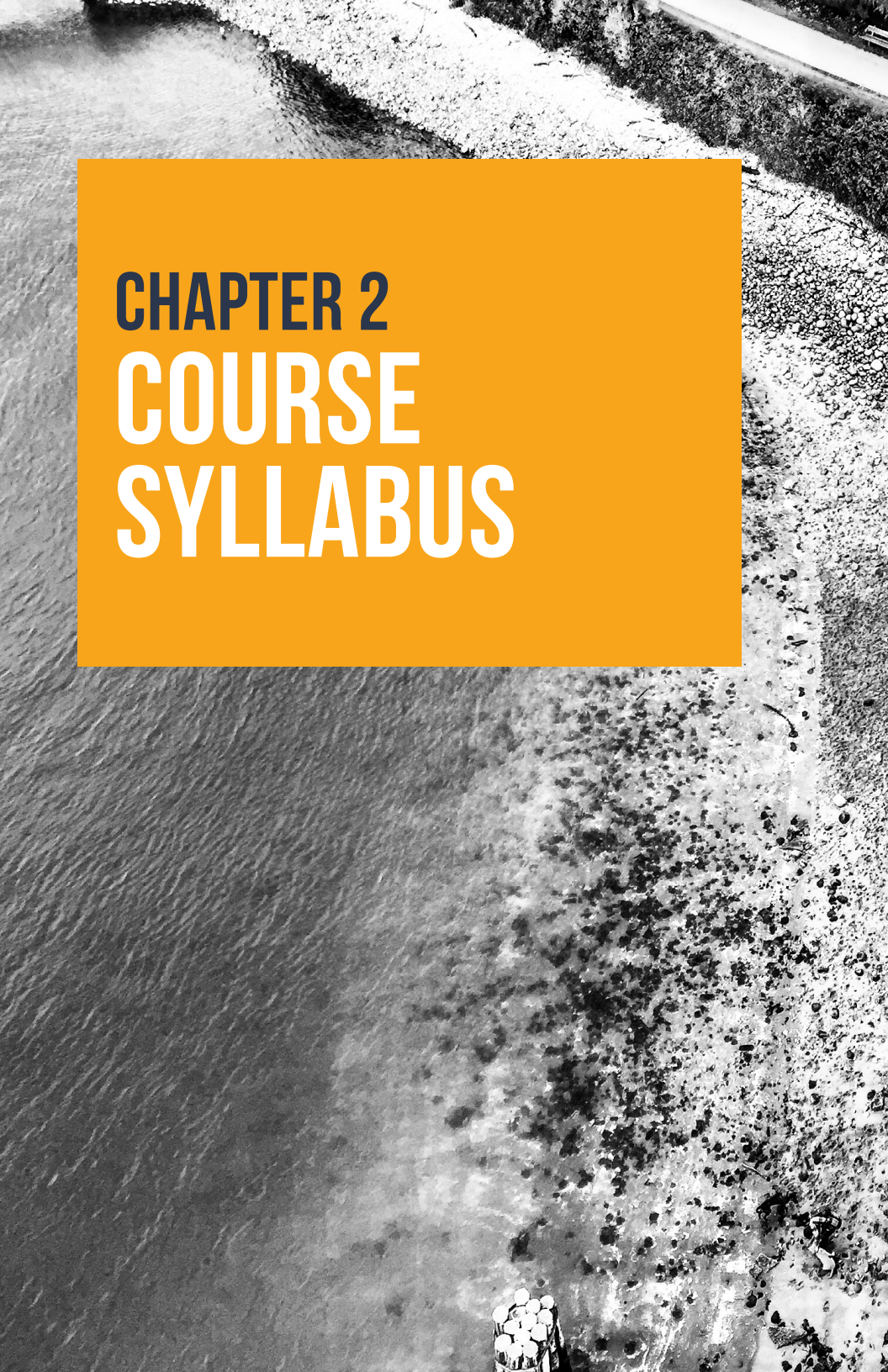
Supervising your team

Your team has been hired to do a job. Make sure that job is being done well by ensuring that all operational tasks are being done efficiently, safely, and to a specific standard of excellence.

Throughout the project, you'll also need to manage day-to-day problems as they occur on site. This could include changes in weather conditions, or issues with staff competence. You'll also be monitoring the equipment that is being used, withdrawing from service anything that has become either inappropriate or unsafe.

Performing a rescue operation

If a rescue is ever necessary, you will not necessarily be responsible for carrying out the rescue personally, but you'll either physically do the rescue yourself, or supervise another competent rope tech as it's carried out. In either case you, as the Level 3, will be rescue lead and all necessary direction should come directly from you. Either through radio or voice commanding.



CHAPTER 2
COURSE SYLLABUS

Pacific Ropes℠

PROGRESS THROUGH INNOVATION

Photo Credit: Joshua Delefortrie
Burrard Bridge, Vancouver, BC

The level 2 course is about demonstrating skill and proficiency in rope access (you're becoming a master at your trade), and the L3 course is about developing the confidence, breadth of knowledge, and skill-level necessary for supervising other rope techs and managing a safe and efficient work environment. Running complex rescue operations will also be a large part of the L3 curriculum. During training you will be developing three areas of competence.

Knowledge

You won't be on the ropes the whole time. There will be some classroom based lessons delivered by your trainer to develop your theory-based knowledge (especially applicable to L3's), However, the bulk of the responsibility will be on you to become proficient in theoretical aspects of rope access laid out by the ICOP and TACS, or SPRAT SWP and Certification Requirements. You will be assessed in this area through a written and oral examination, and through observation. While you're on the ropes, we'll be asking you questions based on the decisions you make. 'Why did you do that?' Is a question you may hear a lot, even if you did something correctly. *(Being able to explain and defend your choices coherently will be an asset on assessment day.)*

Skills

We'll demo and guide you through all the new skills and maneuvers covered in your syllabus, but the real learning will take place when you're on the ropes, practicing them under our supervision. Unfortunately, there is so much to cover in both the L2 and L3 curriculum, that you won't have time to practice most maneuvers more than a couple of times during training. Take detailed notes of any mistakes you make (so you can learn from them) and of any specifics you want to bring home to commit to memory before assessment day (important steps involved in a rescue procedure, for example). Mental rehearsal will help with this.

Attitude

Don't underestimate the importance of this. You'll demonstrate a good attitude through your respect for the work and its safety measures, and through your ability to take personal responsibility for all actions while in suspension and on the ground.

Assessment/Evaluation

Your assessment/evaluation will involve a theory test which will consist of 30 multiple choice questions for IRATA (L3's will have a combination of L2 and L3 questions) and 40 multiple choice questions for SPRAT, followed by a practical demonstration on the ropes.

The practical component makes up the majority of your evaluation.

Examinations are a nervous affair for all of us, regardless of what's at stake. 'Fail' is a word we don't like to use, let alone put in our training manual. However, it is a reality and something you need to be aware of as a potential outcome of your assessment/ evaluation.

What happens if I don't pass?

If you do not pass your assessment, you do have the option of re-assessing. This must be done within 60 days of your original assessment – miss that deadline, and you'll have to take another full 4-day training course.

What if I'm re-certifying?

If you do not pass your re-certification (as opposed to upgrade), you could lose your certification at your current level. All is not lost! Depending on how you did, you may still have the option of re-assessing at a lower level (you will again have you 60 days to do this, but can likely carry on the same day, situationally dependant). Please note that there is a possibility that failing your upgrade or revalidation assessment could result in your certification being revoked. These regulation are all in place for your safety.

A little over 80% of rope techs pass their L2 and L3 assessment -- as a registered TMC (training member company) it is our goal to have all our students pass. We will do everything we can to get you ready for assessment day, but please do recognize that there is a lot at stake in a rope access career, and we cannot be easy on you. You will need to bring your A game.

(Level 3 technicians can be asked to do any variation of rescue or rigging that is practiced during the week at the discretion of the assessor. You will need to be able to adapt your skill set in often creative and different ways than what is practiced during the week.)

Time for the 'nitty gritty', here's what we need to learn over the next 4 days.

There are some major differences between level 2 and level 3 techs (for both SPRAT and IRATA), but we're including them all in the same manual because, as you'll see, there's a lot of overlap.

At the end of each chapter breakdown, you'll find a short summary of all the L1 maneuvers you'll be responsible for demonstrating competence with on assessment day, but which aren't revisited in this manual. The first half of Day 1 of your training has been set aside to give you chance to practice L1 maneuvers, but that's all you'll get. You should already be fully comfortable and familiar with the L1 curriculum before the first day of training (if you're upgrading to or re-certifying as a L3 tech, this applies to the L1 and L2 curriculums).

PRACTICAL STUFF

The EQUIPMENT

L2 & L3:

Pre-use Checking of Equipment

Functional, visual and tactile pre-use checks of all ropes and rigging equipment.

L3:

Equipment Selection

- Identifying appropriate gear needed for different situations.
- Marking and Storage Procedures
- Detailed and Interim Inspections
- Inspection Reports
- Understanding the limits of your competence

Your Equipment – an even more detailed look.

- Helmets
- Descenders
- Ascending Equipment
- Backup Devices
- Security Attachments
- Karabiners
- Mallion Rapides
- Industrial Seats

Refer to Chapter 4, Personal Protective Equipment, in your L1 manual to refresh your base-line knowledge here, as only new information is included in this manual.

The MANEUVERS

L2 and L3:

Wide re-anchor (> 1.5 m)

- Back-Up Devices

Long Line descent on two descending devices.

*Descent, ascent, changeovers, descent using ascending devices, ascent using a descending device, deviations, rope-to-rope transfers, re-anchors (<1.5m), edge obstructions at the top, use of work seats (comfort seats), and passing mid-rope protection are all covered in your L1 manual.

The RIGGING

L2 & L3:

- Rigging at Height (Any and all rope maneuvers)
- Knots and Rope Handling
- The Effects of Choking slings
- Large Y-Hangs (> 1.5m)
- Retrievable Rigging
- Work Restraint Lines
- Temporary Fall Arrest System
- Tensioned Lines (at any positional angle)

L3:

- Anchor selection (L2's must show awareness)

* Basic anchor system, Hazard Avoidance and Risk Assessment, Vertical Fall Arrest System, Y-hangs, Deviations and the basics of hazard avoidance and rope protection are all covered in your L1 manual.
Review the strengths, applications, and limitations of the following knots (from your L1 manual): figure-of-eight on a bight, double figure-of-eight on a bight ('bunny' knot). figure-of-nine on a bight, alpine butterfly, scaffold or 'barrel' knot, stopper knot.

The RIGGING FOR RESCUE

L2 & L3

- Hauling Systems (3 types)
- Cross Haul
- Rig to Lower

L3

- Complex rescue systems (planning and rigging)
- Hauling through Knots

The CLIMBING TECHNIQUES

L2 & L3

Vertical Aid Climbing

*Horizontal aid climbing and climbing with fall arrest equipment are both covered in L1 manual.

The ROPE RESCUES

L2 & L3

- Rescue from ascent mode
- Passing a deviation with a casualty
- Rope-to-rope transfer with a casualty
- Passing a small re-anchor with a casualty
- Passing mid rope knots with a casualty (SPRAT only)
- Aid Climb rescue w/Rope to Rope (SPRAT only)

L3

- Mid-transfer rescue
- Passing mid-rope knots with a casualty
- Large Re-anchor rescue
- Use of tensioned ropes for rescue

*Rescue from descent mode is covered in your L1 manual.

The CLIMBING RESCUES

L2 & L3

- Rescue from an aid climb
- Rescue from fall arrest equipment

L3

- Rescue from an aid climb – short connection

THEORY STUFF

As a level 3 rope tech, you'll be responsible for supervising a job site, and ensuring the safety of all the rope techs you're working with. It can be stressful work. It will be your role to not only understand but implement method statements and associated risk assessments. You will need to demonstrate in open discussion and in a written test that you can competently run a job site. This is what you'll need to know.

L2 rope techs: you will still need to demonstrate awareness of all of the components listed under L3 in the below breakdown. Refresh your memory by revisiting your L1 manual, but also familiarize yourself with the new information listed here.

PLANNING AND MANAGEMENT

L2 & L3

- Exclusion Zones

L3:

- IRATA International system
- Legal Framework
- Hazard Identification and risk assessment
- Selection of Access Method
  - When to use mobile elevating platforms
  - When to use work restraint or fall arrest systems
- Choosing a Competent Rope Access Team
- Writing a Safety Method Statement
- Evacuation and Rescue Plans

*first aid and suspension intolerance are both covered in your L1 manual

The DOCUMENT

- IRATA International Code of Practice – ICOP
- IRATA Training and Certification Scheme – TACS
- SPRAT Safe Practices for Rope Access Work
- SPRAT Certification Requirements for Rope Access Work
- This AWESOME Pacific Ropes Training manual

The LEGISLATION

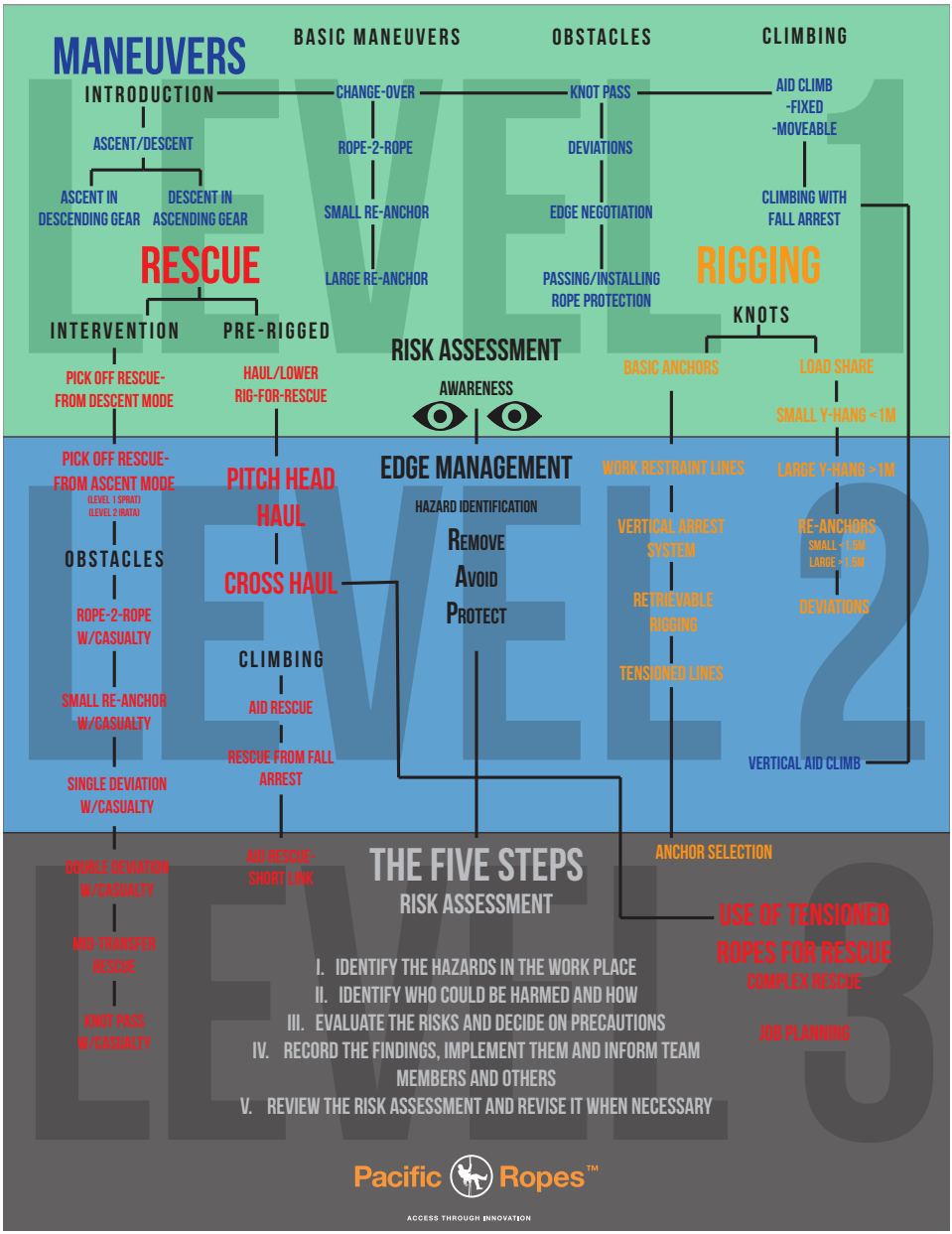
- Occupational Health Standards – OHS
- WorkSafe BC – part 11 and part 34
- WorkSafe Alberta – part 41

The STANDARDS

- Canadian Standards Agency – CSA
- American National Standards Institute – ANSI
- The European Committee for Standardization – EN

Useful websites:

- IRATA-www.irata.org
- SPRAT-www.sprat.org
- OHS-www.worksafebc.com
- Petzl-www.petzl.com


LEVEL 1
LEVEL 2
LEVEL 3
MANEUVERS
INTRODUCTION
ASCENT/DESCENT
ASCENT IN DESCENDING GEAR
DESCENT IN ASCENDING GEAR
RESCUE
INTERVENTION
PRE-RIGGED
PICK OFF RESCUE-FROM DESCENT MODE
HAUL/LOWER RIG-FOR-RESCUE
PICK OFF RESCUE-FROM ASCENT MODE
(LEVEL 1 SPRAT)
(LEVEL 2 IRATA)
OBSTACLES
ROPE-2-ROPE W/CASUALTY
SMALL RE-ANCHOR W/CASUALTY
SINGLE DEVIATION W/CASUALTY
DOUBLE DEVIATION W/CASUALTY
MID-TRANSFER RESCUE
KNOT PASS W/CASUALTY
BASIC MANEUVERS
CHANGE-OVER
ROPE-2-ROPE
SMALL RE-ANCHOR
LARGE RE-ANCHOR
PITCH HEAD HAUL
CROSS HAUL
CLIMBING
AID RESCUE
RESCUE FROM FALL ARREST
AID RESCUE SHORT LINK
OBSTACLES
KNOT PASS
DEVIATIONS
EDGE NEGOTIATION
PASSING/INSTALLING ROPE PROTECTION
CLIMBING
AID CLIMB
-FIXED
-MOVEABLE
CLIMBING WITH FALL ARREST
RIGGING
KNOTS
BASIC ANCHORS
LOAD SHARE
SMALL Y-HANG < 1M
LARGE Y-HANG > 1M
RE-ANCHORS
SMALL < 1.5M
LARGE > 1.5M
DEVIATIONS
VERTICAL AID CLIMB
RISK ASSESSMENT
AWARENESS
EDGE MANAGEMENT
HAZARD IDENTIFICATION
REMOVE
AVOID
PROTECT
WORK RESTRAINT LINES
VERTICAL ARREST SYSTEM
RETRIEVABLE RIGGING
TENSIONED LINES
ANCHOR SELECTION
THE FIVE STEPS
RISK ASSESSMENT
I. IDENTIFY THE HAZARDS IN THE WORK PLACE
II. IDENTIFY WHO COULD BE HARMED AND HOW
III. EVALUATE THE RISKS AND DECIDE ON PRECAUTIONS
IV. RECORD THE FINDINGS, IMPLEMENT THEM AND INFORM TEAM MEMBERS AND OTHERS
V. REVIEW THE RISK ASSESSMENT AND REVISE IT WHEN NECESSARY
USE OF TENSIONED ROPES FOR RESCUE
COMPLEX RESCUE
JOB PLANNING
Pacific Ropes™
ACCESS THROUGH INNOVATION

Personal Notes/Things to remember:

Photo Credit: Joshua Delefortrie
Pulp Mill, Castlegaar BC

PLANNING AND MANAGEMENT CHAPTER 3

All work at height should have a goal of no accidents, incidents or dangerous occurrences. It is essential, therefore, that the entire work project is operated as a "safe system of work".

IRATA ICOP 2.1.1

Legal Framework

All candidates should be aware of the legal framework of their operating country, and how it relates to IRATA's safe system of work. This is especially relevant for L3 candidates, who will need to demonstrate their familiarity with these frameworks and their role in ensuring the health and safety of all those present in the workspace.

WorksafeBC regulations and Alberta OHS code are summarized in chapter 7 of this Training Manual.

Part 4 of the ICOP is all UK based, but there is a relative comparison to their standards in every country. COSHH, for example, is WHMIS in North America. As long as you're able to identify the equivalent legal framework in the country you're working in, you'll be on the right track. Be aware however that IRATA is an international certification, so traveling for work will mean needing an awareness of local legislations all over the world. This will really expand your reading materials...

Rope Access Method Statement

A method statement outlines the sequence of procedures necessary for the overall safe execution of a task -- the full contracted scope of what you'll be doing. It should also include required equipment, team members and a rescue plan (this is a not a comprehensive list, could require more information based on the job scope or location).

Zero targeting refers to every project's goal of no accidents, no waste, and no defects.

All candidates must be aware of the role of this document and its importance in ensuring a safe system of work.

Level 3 candidates are responsible for its implementation, briefing their team, identifying when the statement needs to be revised and the procedures to follow throughout that revision process.

The same method statement could be used for more than one job if they're similar/basically identical. But FIRST review the hazard identification document, and verify that there's nothing that should be freshly considered – for example, the architecture of the building (sharp corners?), or the type of tools needed to complete the task. If hazardous tools such as welding torches, flame cutters, or abrasive wheels are being used, a more detailed safety method statement is necessary.

What sort of information is included in a Rope Access Method Statement?

Contact Info, Dates, and Tracking

- The Document Title ('Access Method Statement' is an appropriate title).
- Company details (name, address, telephone number(s), email address).
- Author of the Document (if you're the supervising L3 tech, this is you).
- The name and phone number of the health and safety contact person.
- Document Traceability Details (number, issue date, revision date, revision number).
- Address of the work site, and the contact details of your onsite contact.
- Emergency contacts.
- Start date and projected completion date.

Permissions and Arrangments

- Work permits.
- Arrangements that've been made for temporary services (like for electricity).
- Transportation arrangements (how equipment is getting to the site).
- Plan for disposing of waste or of any hazardous substances. Precautions that will protect techs from exposure to harmful substances.
- How site authorities and the principal contractor have been briefed on what to expect from rope access work.
- A comparison of how this task is similar and different from other work completed by that same team/company - a notable difference might include the need for a special type of equipment.
- If there's more than one company working onsite to complete a task simultaneously, management approval and clarification on how techs will coexist in the workspace – this has to be done for every work procedure.
- Each site will have their own specific rules for work (for example, the regulators might say at 10ft, you're considered to be "working at height" while another might say 4ft. You always follow the higher standard. These rules and procedures must be conformed to.
- Exclusion zones. How the safety of anyone on the ground, below the rope tech's work environment, is being ensured.

"The primary objective behind the planning and management of Rope Access projects is to create a work environment that maximizes safety and minimizes the risk of error, possible incidents and injury, i.e. to provide a safe system of work."

IRATA ICOP 2.2.1

What sort of information is included in a Rope Access Method Statement?

Team

- Information about the rope techs hired for the project, including their qualifications, level of competency, training requirements, and team structures, names of the people responsible for coordinating and controlling safety arrangements. Check and maintain up to date logbooks for each technician.
- Scheduled toolbox or tailgate talks – how often techs will be brought together for a recap/review of the safety method statement and risk assessment.
- Emergency considerations. This includes an evacuation plan (in case of fire) and a primary rescue plan (for if a rope tech is injured).
- First aid (all L3 techs must have their first aid, and a fully stocked first aid kit must be present on site at all times).
- Welfare - a warm, dry place with an accessible toilet where rope techs can take their breaks.

Tools and Machinery

- Isolation of machinery and services
- Record of any special equipment, plant or machinery being used, their safety requirements, and the relevant certification that approves their use.
- Safe handling specifications (for tools, any hazardous substances, other equipment) -- anything over 10 kgs should be attached to a separate line, and not the worker.
- Which personal protective equipment must be worn onsite.

The Worksite

- If site boundaries need to be crossed temporarily during critical aspects of the work, the details/plan on how this will be done safely.
- Plan in the case of limiting weather conditions, such as rain, wind, or extremely high/low temperatures. This might include the use of additional equipment, or an executive decision to stall work until conditions change/ improve.

- Worksite access and egress requirements – how the job site will be prepared for rope access work, and dismantled/ cleaned up afterwards.
- Based on the hazard identification and risk control measures, the sequence of procedures which will allow a task to be carried out safely.
- List of Rope access equipment to be utilized and tracked.
- Access and Rigging Methods

Procedures for revising this document

The responsibilities of a rope team might change during a work assignment. If this happens, the safety method statement will need to be revisited and amended to highlight adjustments that've been made to the project's scope, and which new hazards arise out of these changes.

All members of the team must be briefed on these changes, and management approval must be received before work is resumed.

Often this recognition of change comes from a debrief toolbox talk, or morning meeting. This is where communicating with your team to determine what went well and what went wrong and how to adjust the plan accordingly.

Refer to ICOP 2.2.5 and ICOP Annex B.2.2 for more information.

Hazard Identification and Risk Assessment

This is a more daily-specific version of the method statements, which identifies any hazards that could cause harm to those in or around the work area, and the precautions which will prevent an undesirable scenario from taking place. It is used in conjunction with the Method Statement.

All rope techs must show awareness of these documents, and how they inform the adjustments they may need to make to their rope access work.

L3 rope tech are responsible for putting the risk assessment together. If you're a L3 candidate, you must be capable of identifying the hazards connected with the rope access work you'll be supervising.

For your assessment, you'll be asked to complete a hazard identification exercise. You may be asked to demonstrate your knowledge in this area by filling out IRATA form 061 (Job planning), or through a more practical demonstration.

What Constitutes a Hazard vs. Risk

A hazard is very simply anything that could cause harm. The risk is the likelihood of contacting that hazard. Hazards might include or be caused by:

Equipment

- The repetitive use of tools or other equipment.
- The tools being used.
- Unusual loads – if your rope team is required to move or carry heavy machinery, tools, or other equipment.
- Equipment failure – anchor or gear failure, etc.

Working at Height

- Other personnel working on the ground where debris, tools or other equipment could be dropped.
- Falls from height (when choosing fall arrest placement and method, fall factors and clearance distance must be taken into account. Rope stretch should also be taken into account).

The Physical Workspace

- Power cables that pose a high risk of electric shock.
- Sharp or rough edges which could cause the anchor lines to be cut or abraded.
- Uneven ground or walkways.
- Tools or other debris that could cause a slip or trip.
- Hot surfaces (potentially caused by weather conditions) which could cause damage to anchor lines or injury to a rope tech/other personnel.

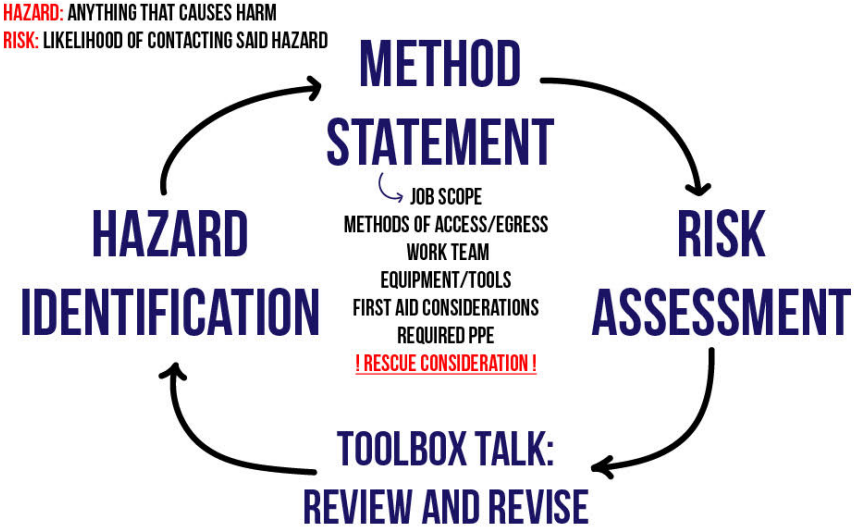
Other Site Specific Considerations

- The presence of hazardous substances, such as toxic gases, acids, and/or asbestos.
- The presence of radio waves or radiation.
- The presence of other trades or general population.
- Weather! Don't underestimate the effects of inclimate weather. (see ICOP Part 3 Annex O)

Considerations When Writing a RISK ASSESSMENT.

The best way to deal with assessing risk is to think of every worst case scenario, and limit the chance of coming into contact with that scenario.

It's beneficial to include every possible hazard and risk you can think of, and continue to be aware of new hazards as they arise. The detail included in a risk assessment, should be in proportion to the level of risk posed by a job site.



WORK TEAMS

Keep your team informed!
Every job site is unique. A new hazard identification and risk assessment must be completed whenever there's a change in the work environment. Changing factors like weather will also need to be reviewed regularly with your team. These documents must be easily accessible to everyone who's working onsite (in case they want to do a private review, which would be a fantastic habit to adopt!).

Selection of Access Method

All rope techs should be aware of how to identify when rope access is the best method for completing a task, and when it isn't.

Level 3 rope techs must have the ability to do a pre-work analysis. You could be responsible for assessing a site, and deciding when rope access should be used, and when an elevating platform (MEWPS) or a fall restraint or fall arrest system would be a more efficient/safe option. During your assessment, you'll be given a few different scenarios to assess in this way – this will be done either verbally, or in a desk-based exercise.

Pre-Work Analysis

When completing this analysis, there are some questions you could ask yourself. Some examples are:

1. What is the best and safest way to access and exit the work area?
2. How safely and easily will a rope tech be able to use their tools while in suspension?
3. Is there a risk that loose materials or equipment might fall onto personnel or pedestrians below?
4. How long will the rope tech be working in a location, and is there a chance prolonged exposure to any risk factor (such as the weather) could cause them harm?
5. Taking into account a range of potential positions/scenarios, how quickly could an injured rope tech be rescued?

Rope access is good for a lot of things, but it's not perfect for everything. If an unavoidable hazard could be mitigated with a different method (like a boom lift), then that method should be employed.

Refer to ICOP Part 2, 2.2.3 for more information.

Exclusion Zones

Both L2 and L3 will need to demonstrate competence in this area. You should understand how to create an exclusion zone (size requirements), and how to enforce it (policing and barriers). You should also understand the permit to work system.

There are a few different hazards, exclusion zones work to eliminate. First, they eliminate the possibility that something (tools or debris) could fall on someone. Second, they discourage and obstruct the impulse of any curious passerby or other contractors working in the area to mess or tamper with the rope system. They also prevent a third party working in the same area from inadvertently coming into contact with the ropes. Third, they can prevent the possibility of anyone not attached to a safety line getting too close to the edge of a work area and falling.

Exclusion Zones continued...

An exclusion zone is an established work area that is barred from access – unless you're wearing the appropriate equipment. These zones are set up below the work area, and around the anchoring systems.
The exclusion zone that's set up on the ground level should be a 1:4 ratio to the height of the suspended rope tech. That's a 90° angle. A falling item may not follow a perfectly vertical trajectory, so this zone should also take into consideration factors like wind, or a nearby structure (tree or building) that could cause a bounce.
There are other precautions that could be put into place to protect personnel on the ground. These include temporary roof structures and containment nets. Warning signs, barriers, and alarms can be used as an obstruction to this area, and any doors leading into the zone should be monitored.

Anchor Area Exclusion Zone

This exclusion zone is set up at the top of the structure that's being accessed. It creates a barrier to the anchor points and prevents any unsupervised personnel from accessing the working edge.

Working Edge Hazard Zone

Inside of the anchor exclusion zone there is another exclusion area called the working edge hazard zone. WorkSafe BC classifies this area as being 6 feet from an exposed edge -- refer to your local legislation to find out if this is relevant to you. Absolutely no one should be allowed to enter this zone without being attached to an anchored safety line. Suitable barriers to this zone might include handrails or grating that deliberately need to be lifted to get through.

Permits to Work

If work is being carried out near or over a public place, you may need to have a permit to work - this permit will include specifications on which areas you have permission to access.

Where this is most prevlant on a daily basis is in a big refinery - where there are other contractors and where it's a dangerous environment and they don't want people working everywhere all willy-nilly. They need methods of controlling access to certain areas, and control over which tasks take place in which areas. This is for all kinds of reasons including but not limited to; hot work in potentially explosive environments, conflicting work scopes from different contractors etc. etc. It is also a way for big sites to maintain an awareness of where people are working on site and what they are doing.

Permits ensure that all contractors remain safe regardless of communication with each other or which environment work is taking place.
In the morning you get a permit from the permit office, at the end of the day close it off so they know you aren't working anymore. This will be a daily practice.

Selection of Personnel and Competence

A good rope tech will be equipped with an appropriate attitude, aptitude, physical capability and training. It's the responsibility of the supervising L3 tech to ensure that all members of their team satisfy these requirements, and that if a techs level of competence changes (this could include a change to their physical or mental condition – maybe relating to consumption of drugs or alcohol), appropriate action is taken.

Every individual rope tech should take responsibility for informing their supervisor of any changes to their physical or mental condition. A distracted tech is just as unfit for work as an intoxicated tech.

L3 techs will need to demonstrate their ability to choose a suitable team. You'll be given a scenario, and will need to specify how many techs you'll need, their levels of competence, and the roles (need a tech with a specialized skill?) they'll be performing.

A typical work team generally includes 3 rope techs (one of these techs is a L3). IRATA requires a team to have a minimum of 2 techs, but this minimum should only be considered if both parties are capable of carrying out all the rescues specified in the site's risk assessment without additional help.

In some cases, a worksite may require more than one L3 rope access safety supervisor to be on duty. This will be the case if the safety method statement is complex and requires a higher level of competence, if the conditions are demanding (weather) and techs will need closer supervision to ensure their safety, or if there is more than one discrete working area being used (can't be two places at once!). In summary, the number of techs per supervisor will change depending of the scope of work, complexity of rescue, and rescue abilities of the rest of the team.

*Note that IRATA requires their L3 techs to be harnessed and ready to go if the need arises, whereas SPRAT L3 techs are responsible only for supervision and their L2 techs are authorized to perform all rescue operations.

Refer to ICOP Part 2, 2.3 and 2.11.6 for more information.

In Case of Emergency – Procedures and Arrangements

L3 techs need to be able to prepare and implement evacuation and rescue plans – please see the section on risk assessments for how you'll be assessed in this area. The following is also very relevant to L2 techs, who should be able to carry out most rescues, with supervision.

The safety method statement put together for a worksite will include a detailed rescue plan for a variety of possible scenarios. Part of a L3's job, is identifying what could go wrong, how a rescue would be carried out, and then rigging the site to make every potential rescue as easy to execute as possible – this may include the use of releasable anchor systems and pre-rigged rescue kits.

Additional assessments of the worksite must also be performed regularly – specifically when there's a change in the environmental conditions or the task being performed, as these could impact the previously outlined rescue plan. Your team will need to be briefed on all these changes, and the resulting adjustments – changes to the risk assessment and rescue plan – which are made.

Suspension Intolerance

If a tech becomes injured or immobile while on the ropes, it is crucial that they are rescued and given first aid as quickly as possible. If a tech were to pass out while on the ropes, their harness would act like a tourniquet, and could result in brain damage or death if they're not brought to the ground in 20 minutes or less.

This is referred to as suspension intolerance (aka suspension trauma, syncope or harness induced pathology).

Learn more in Part 3, Annex G of the ICOP.

List some hazards that are present in the adjacent picture?

Answer:

The Rescue Plan

A rescue plan should include the following:

- Designated anchor points for the tech(s) performing the rescue.
- The required equipment – should be easy to access and ready for immediate deployment.
- Team Requirements (see section on selection of personnel and competence).
- Supervision arrangements (if someone other than the supervising L3 is carrying out the rescue).
- A reliable communication system (see adjacent).
- Step-by-step procedures for rescue.
- This Includes:

1. A clearly defined leader (the supervising L3 tech – if there is more than one supervisor, one will be identified)
2. The names of the competent rope access technicians who can carry out a rescue.
3. Practiced techniques appropriate to the worksite – which rescue procedures will be used for the different scenarios.

- First Aid Provisions – a kit and someone competent at first aid (L3 tech) should be present on the work site at all times.
- Contingency plan covering all possible complications.

If a rescue operation is necessary, you will have to drop everything you were doing and move.

Remember: Under pressure you do not rise to the occasion, you sink to the level of your training. So practice regularly and be familiar with your plan.

One important point to remember: a rescue will involve higher loads, and may require additional points of contact.

Refresher training is always an option if at any point you feel you need more practice in this area. You can also attend our open gym nights (ask your trainer for more info on this).

A Reliable Communication System

It may be loud on the job site. Every rope team needs a reliable method of communication that takes into account potential disturbances like weather, a competing communication system (from another team working in the same area), radio interference, and/or just general noise.

Many teams utilize a walky-talky system, but hand or voice signals are another tool that should be used – specifically a sign signaling 'help' should be agreed on. These signals must be well-rehearsed before starting work, to ensure they're properly executed and understood by all members of the team.

Other Site Emergencies

If working on a nuclear site, offshore platform, or refinery, clear instructions should be given (and accessible for personal review) to all the rope techs on your team, regarding the procedures to follow if an emergency occurs in these specialized and higher risk environments. These procedures will be provided by your onsite contact.

Refer to ICOP Part 2, 2.11.11 for more information.

Reporting an Accident

It is your legal responsibility to keep an accurate record of all accidents or near misses that occur while at work. This record must be promptly provided to IRATA when requested, and will almost definitely be required by the site. IRATA International uses the statistics gathered from this information to highlight the industry's safety record, in order to support the use of rope access methods. This information is also used to learn from mistakes, and to create systems which protect against the re-occurrence of a similar incident.

There is a safety reporting committee with SPRAT. They don't have an official incident reporting page on their site at the time this is being printed, but keep an eye out for that in the future.

IRATA has a place on their website to report incidents:

https://irata.org/page/incident-reporting

irata International
Industrial Rope Access Trade Association

www.irata.org

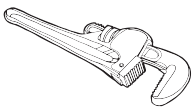
PREVENT DROP

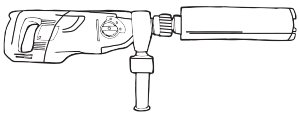
SOMEONE'S LIFE M

⚠ IDENTIFY THE TOOLS OR OBJECTS THAT CAN

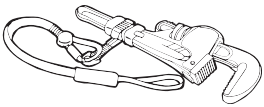
HIERARCHY

01. IDENTIFY & ELIMINATE (WHERE POSSIBLE)





02. PRIMARY CONTROLS (ENGINEERED)



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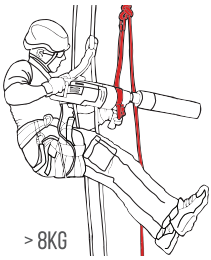

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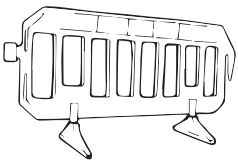
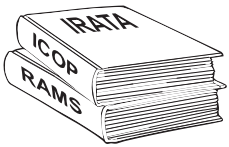
03. ADDITIONAL CONTROLS (ADMINISTRATIVE)





04. PERSONAL PROTECTIVE EQUIPMENT (PPE)

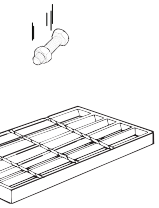
- CHECK IF THE LEVEL OF PROTECTION IS APPR
- FOR DETAILED INFORMATION SEE ICOP:
  - 1.4.2.6 AND 2.11.8, EXCLUSION ZONES
  - 2.2.3, PRE-WORK ANALYSIS
  - 2.2.4 AND ANNEX A, RISK ASSESSMENT

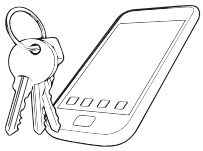
ICOP ANNEX M 1.3 'WHERE TOOLS AND EQUIPMENT ARE CARRIED BY THE ROPE ACCESS TECHNICIAN, APPROPRIATE STEPS SH

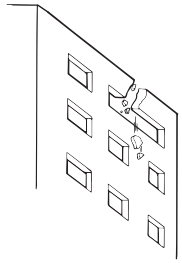
PPED OBJECTS

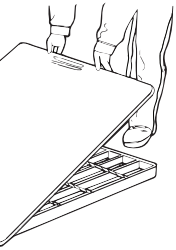
AY DEPEND ON IT

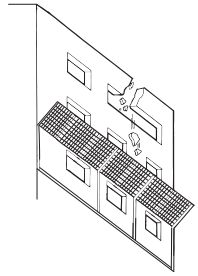
BE DROPPED OR CAN FALL

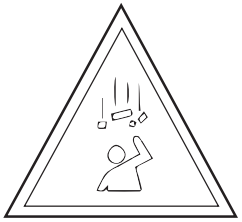












OPRIATE AND ROBUST. IF NOT, DO NOT PROCEED.

- 2.2.5 AND ANNEX B, SAFETY METHOD STATEMENTS
- ANNEX M, USE OF TOOLS AND OTHER WORK EQUIPMENT

OULD BE TAKEN TO PREVENT THEM BEING DROPPED OR FALLING ON TO PEOPLE BELOW'

CHAPTER 4
PERSONAL PROTECTIVE EQUIPMENT

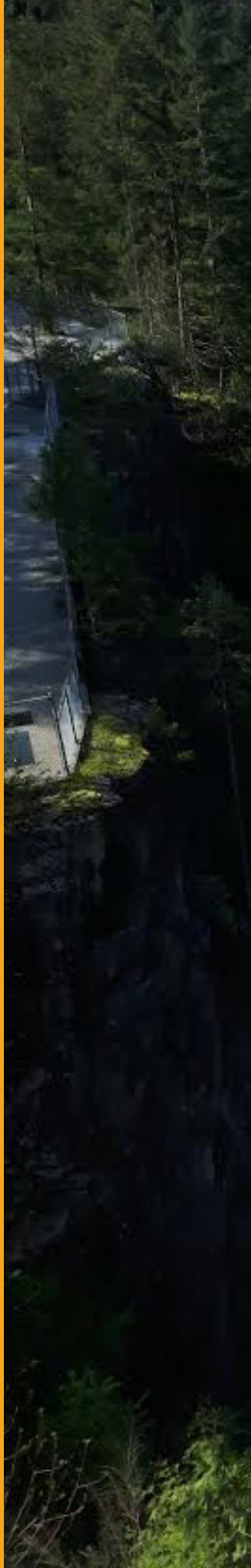


Photo Credit: Aaron Purdey
Cleveland Dam, North Vancouver

Knowing what you know about gear from the L1 manual, it's time to understand standards and how to read a technical spec. We're particularly interested in standards as they relate to the following equipment: helmets, descenders, ascenders, backup devices, attachment connectors, karabiners, mallion rapides, and industrial seats.

What is a Standard?

A standard is a document that outlines a set of rules and guidelines that have been established and agreed on by a governing body, to ensure the maximum level of order and/or safety of the consumer.

Standards Relevant to Rope Access

For the Testing of Equipment

CE – Referred to as the CE Mark, but originally was an abbreviation of Conformité Européene (fr). Translation: European Conformity.

This standard is mandatory for equipment being used in the European Union, and shows that a product is in compliance with their health and safety requirements. Other countries (like Canada) also recognize it.

UL – Underwriters Laboratory

They are an American safety consulting and certification company. They've been approved by OSHA (Occupational Safety and Health Administration) to perform safety testing.

Governing Bodies & Regulatory Standards

EN – European Standards (aka European Norms)

They've partnered with 34 different countries to make this a national standard that supersedes any other conflicting or equivalent standard. Canada is one of CEN-CENELEC member countries they've partnered with.

CSA Group – Canadian Standards Association

Accredited by the Standards Council of Canada, they perform testing and certification based on internationally recognized criteria and procedures.

ANSI – American National Standards Institute

The governing body for US standards, they also accredit and assess other organizations for compliance with their norms and guidelines.

NFPA – National Fire Protection Agency

A global nonprofit organization with 300 codes and standards aimed at protecting against loss due to fire, electrical shock, and related hazards. They're also involved in research, training, education, outreach, and advocacy.

...and so on.

Where to Find Standards

The relevant standards will be listed on each piece of equipment. You should know where to look to find this information for each piece of gear. We'll go over that with you. For the purpose of the following exercise, there are two additional places you can look.

1. In Chapter 4 of your L1 Manual (Personal Protective Equipment). We've listed the standards for each piece of gear on the exercise page, next to their description.

2. In the ICOP Annex C, there is a comprehensive list of how the standards apply to different types of equipment.

3. By going to petzl.com. Here are the steps for finding that information

- Once on their homepage, click professional.
- Then verticality to see a selection of all their products.
- Choose the category (helmets, ascenders, etc.) and then select the product that you're using.
- Click see all technical content.
- And then download the technical notice.
- EN, CSA, ANSI, and NFPA could each have their own separate technical notice, depending on how specific the requirements are for said standard.

Inside the technical notice, you'll find information on how to clean the equipment, instructions and precautions for use, how to inspect it, the length of its guarantee, etc. All important information, but for this exercise you're going to add and zero in on the standards. These can be found on the first page of the technical notice, in the top left hand corner. (also check out :ICOP Annexes H,I,J)

Some things you need to know!

- If a piece of equipment doesn't have a CSA standard, we can go by EN. A piece of equipment could also have both. In that case, we go by the relevant standard for the country of our operations.
- Different standards from different governing bodies could have different criteria. While a single piece of equipment can hold two standards from the same governing body, they are not necessarily identical standards.
- A piece of equipment could meet two different standards with the same association, each of these standards would relate to a different use of said equipment.

Example of How to Interpret the Standards on a Piece of Equipment

We'll be using the Avao Bod Croll Fast (International Version) for this example, because its been approved with a long list of standard. Next it will be your turn.

HARNESSES-ASTRO BOD FAST INTERNATIONAL VERSION

Standards

- ANSI Z359.11
- EN361
- CSA Z259.10
- CE EN 361
- CE EN 358
- CE EN 813
- CE EN 12841 type B

PETZL

What are the Specific Requirements laid out by each Standard?

ANSI Z359.11 [2014] – in compliance with their safety requirements for a full body harness. Recognizes the harnesses use for fall arrest, positioning, travel restraint, suspension, and/or rescue applications for users between 130-310 pounds.

EN361 – in compliance with their safety requirements for equipment that protects against falls from height. In that category, this standard is specific to full body harnesses. EN 358, EN 813, and EN 1497 can also be incorporated into this standard.

CSA Z259.10-12 CLASS A/P/D/L
Each class reflects that this piece of equipment is approved to be used in a variety of different ways. Here's a breakdown:

- Class A: Personal Fall Arrest
- Class P: Work Positioning
- Class D: Suspension and Controlled Descent
- Class L: Ladder Climbing – specifies that this harness has been designed to be used with fall restrict systems involving the use of a fall arrester that travels on a vertical lifeline or rail.

CE EN 361: 2002 – in compliance with their standard for a full body harness, used to hold the user in one place and to spread the load in the case of a fall.

CE EN 358: 1999 and CE EN 813: 2008 – in compliance with their standard for work positioning/ sit harnesses that are used for positioning and restraint in abseiling or rope access. Also applicable for additional attachments.

CE EN 12841: 2006 – in compliance with their standard for personal fall protection equipment. In that category, this standard is specific to rope adjustment devices for rope access systems.

HELMETS- PETZL VERTEX BEST-CANADIAN VERSION

"Helmet for work at height and rescue
With its strong chinstrap, the VERTEX BEST helmet sets the standard in head protection for workers at height. Its unventilated shell protects against electrical hazards and molten metal splash. Its six-point textile suspension ensures maximum comfort, and its CenterFit adjustment system adjusts the headband and keeps the helmet centered on the head. The VERTEX BEST is designed for optimal attachment of a headlamp, protective shield and hearing protection".

The OHS Regulation Guidelines, Part 8, tells us that safety headgear must be worn by a worker in any area where there is a danger of head injury from falling, flying, thrown objects or other harmful contacts. Safety headgear must meet the requirements of:

Which standards does this piece of equipment reflect?

What are the Specific uses laid out by each Standard?

List the primary function/features. How is the Canada version different?

List the proper Handling and Use:

Inspect for function:

Inspect for Wear. Bonus: Which helmet is the hardest colour to inspect?

DESCENDING DEVICE-PETZL RIG

"RIG is a compact self-braking descender designed for experienced rope access workers. It has an ergonomic handle that allows comfortable descent control. The AUTO-LOCK system allows users to easily position themselves at the work station without having to manipulate the handle or tie off the device. Once locked, the rope can be taken up without having to manipulate the handle. The safety gate allows the rope to be installed with the device remaining connected to the harness, facilitating passage of intermediate anchors. The stainless steel wear plate improves durability by reinforcing the rope friction zone."

PETZL

Descending devices are used to descend or 'abseil' down a rope. The device relies on friction for a controlled descent or lower. Standards for descending devices are:

? Which standards does this piece of equipment reflect?

A

? What are the Specific uses laid out by each Standard?

A

List primary function/features. What new features does this device have?

List proper handling and use:

Inspect for Function:

Inspect for Wear:

FALL ARREST DEVICES & LANYARDS - Petzl ASAP Lock & Petzl ASAP'SORBER AXESS

"Mobile fall arrester with locking function. In normal use, the device moves freely along the rope without any manual intervention and accompanies the user in all his movements. In case of shock or sudden movement, the fall arrester locks on the rope and stops the user. The ASAP LOCK's integrated locking function allows the user to immobilize the device to reduce the length of a fall. The ASAP LOCK is used with an energy absorbing lanyard to work at a distance from the rope."

PETZL

Which standards does this piece of equipment reflect?

What are the Specific uses laid out by each Standard?

List primary function/features. What is different about this new shock pack?

List proper handling and use:

Inspect for Function:

Inspect for Wear:

ASCENDERS

"Handled rope clamp is designed for rope ascents and features an overmolded grip and ergonomic upper part for a comfortable and powerful grip when pulling with one or two hands. The ASCENSION handled rope clamp has a wide lower hole for easily attaching two carabiners for a lanyard and footloop. Rope compatibility: 8 to 13 mm."

PETZL

Ascenders are used to climb up a working rope and should be easily attachable and be of a design that is adjustable while staying attached to the rope. The teeth that grip the rope should detach easily on upward movement so that damage to the rope is avoided. On no account should a dynamic load be placed on the ascenders, as severe damage to the working rope and the ascenders will ensue.

CROLL

Chest ascender is designed for rope access and rescue professionals, the CROLL chest rope clamp is very compact and lightweight. The rope channel is reinforced with stainless steel for greater durability.

? Which standards does this piece of equipment reflect?

What are the Specific uses laid out by each Standard?

List primary function/features.

List proper handling and use:

Inspect for Function:

Inspect for Wear:

GRILLONS

"The GRILLON adjustable lanyard is used to make work positioning systems, to complement a fall-arrest system. Its length can be very easily and precisely adjusted as necessary for comfortable positioning at the work station. Depending on the configuration, it can be used in single or double mode. GRILLON is available in two colors and seven lengths (2, 3, 4, 5, 10, 15 and 20 m)."

Which standards does this piece of equipment reflect?

What are the Specific uses laid out by each Standard?

List primary function/features.

List proper handling and use:

Inspect for Function:

Inspect for Wear:

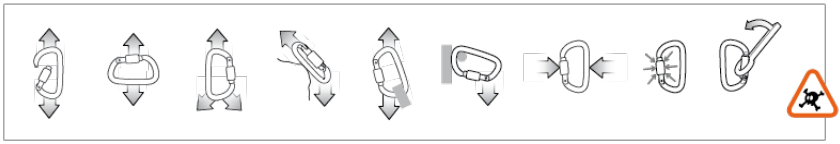
CONNECTORS

The Am'D lightweight asymmetrical carabiner is made of aluminum. It has a D shape particularly suited for connection to diverse equipment such as descenders or positioning lanyards. Its fluid interior design and Keylock system facilitate handling. The Am'D carabiner is available in three locking systems: automatic TRIACT-LOCK or BALL-LOCK system, or the manual SCREW-LOCK system.

Minimum accepted strengths:

- IRATA – screw link connector along major axis with gate closed/locked will be 25KN
- SPRAT – screw link connector along major axis with gate closed/locked will be 22KN or 5000lbs

Examples of dangerous carabiner loading!!



Which standards does this piece of equipment reflect?

What are the Specific uses laid out by each Standard?

List primary function/features.

List proper handling and use:

Inspect for Function:

Inspect for Wear:

ROPES – LOW STRETCH/SEMI-STATIC ROPE (Working & Safety ropes)

Both low stretch and dynamic ropes are of kernmantel construction. The kern, or core, is the inner part of the rope and this is where the bulk of a rope's strength lies. The mantel, or sheath, is the outer part and is there to protect the core. The greater absorbing capability of Dynamic rope comes from the twisted construction of the fibers in the manufacturing phase – the stretch is basically the fibers trying to untwist.

Which standards does this piece of equipment reflect?

What are the Specific uses laid out by each Standard?

List primary function/features.

List proper handling and use:

Inspect for Function:

Inspect for Wear:

How to Track a Piece of Equipment

Gear can become damaged with time and use, so it's really important that you have the ability to track and control the personal protective equipment being used by your team.

Every piece of gear has a marking that identifies information like the manufacturer and the model/type/class of equipment. This allows us to easily connect each piece of gear with its respective documents (such as certificates of conformity, examination, and inspection reports), and gives us the ability to isolate a whole batch of equipment if the need arises (like in the event of a recall). These markings also help us to ensure that all pieces of gear meet our national regulations.

Most pieces of gear will already have an identifier (like a serial number), but if it doesn't you can place a mark on it yourself. Care must be taken to ensure that the method of affixing the identifier doesn't compromise the integrity of the gear.

A detailed breakdown of how different pieces of equipment can be marked can be found in ICOP Part 2, 2.8

What You'll be Tested on in Regards to Equipment

L2 & L3
You'll need to demonstrate….
- Functional, visual, and tactile pre-use checks of all ropes and rigging equipment.
- Your knowledge of how to fit and assemble a variety of personal rope access equipment for yourself and others.

L3:
You'll need to demonstrate…
- Your ability to select suitable equipment for different scenarios.
- Your knowledge of the appropriate marking and storage procedures for each piece of rope access equipment.
- that you understand the limits of your competency in carrying out detailed Inspections.

IRATA FORM 019
On assessment day, you'll be presented with a selection of worn or damaged equipment. You'll fill out an inspection report, identifying their faults and summarizing their condition and whether or not they should be retired.

Keeping a Record

You'll then need to update and manage a record of all the pieces of equipment being used by your team – this includes hired or sub-contractors' equipment.

This record should include the following
(taken from ICOP Part 2, 2.9)

- Name of the manufacturer
- Name of the model, type or class of the equipment
- Purchase date
- Date of entry into service
- Obsolescence date
- Serial number or batch marking from manufacturer (for traceability)
- Instructions for use
- Safe working load
- Any certificate or conformity (standard)
- Duration of active use
- Current location and where it is normally stored
- Conditions it's being used in (exposure to chemicals, unusual loads?)
- Has it been used for work material retrieval?
- Date and result of inspections, type of inspection carried out (detailed or interim) and the date the next inspection is due.
- Details of servicing, repairs, or modifications

This record will help you to identify when it's time for a piece of gear to be quarantined or retired.

*Inspection records should be kept until a subsequent comparable inspection is performed (we've outlined the 4 different types of inspections in your L1 manual). In some cases, local legislation may require you to keep those records for longer.

Everyone on your team should be able to access these records at their discretion.

More information on inspection, care, and maintenance of equipment can be found in ICOP Part 2, 2.10.

In Part 3 of the ICOP, you'll find the following:

- Annex H: A detailed equipment inspection checklist
- Annex I: List of information to be recorded following a detailed inspection of rope access equipment.
- Annex J: Resistance to chemicals and other properties of some of the man-made fibres used in the manufacture of rope access equipment.

CHAPTER 5
RIGGING

Rigging

In a lot of ways, the jump from IRATA 1 to 2 is more demanding than the jump from SPRAT 1 to 2. During your assessment, you will be expected to do a number of different rescue exercises through a variety of level one rope maneuvers as well as a hauling exercise, but the main focus for level 2 is rigging.

Assessors are interested in seeing that you will be a competent rigger out in the field for your level 3 supervisors. Under direct supervision this level makes you a lead technician in rigging and bestows a responsibility to watch out for your level ones. Without mention of your level one skills that you may also be tested on, the new rigging skills covered in IRATA 2 are as follows:

What You'll be Tested on in Regards to Rigging

L2 & L3

You'll need to demonstrate rigging…

- A Y-hang between wider anchor points (>1m IRATA, 2m SPRAT) at height – considering the potential failure of equipment or tools, ie. double anchor protection on each side.
- A re-anchor at height
    - L2: offset greater than 1.5m
    - L3: any distance apart
- A pull-through from both the ground and from the anchor points.
- A temporary fall arrest system to protect a vertical climb
- Tensioned lines at any positional angle.
- Work restraint lines
- Single or double-anchor deviation (with an awareness of the vector forces and critical angles and distance required to achieve repositioning and ease of use when passing in both ascent and descent modes.)
    - L2: type of deviation will be specified
- Rig to lower system

You'll also need to demonstrate…

- Appropriate rope joining knots, choking of ropes and sling. Explain their applications, strengths, and limitations.
- How to select suitable structural elements for rope access anchors (L2's only need to show awareness).
- Your knowledge of common hazards. Select and implement appropriate methods of rigging or protection.

L3

You'll need to…

- Identify, isolate, and pass minor damage in a rope w/ a casualty by tying appropriate knots (damage may be simulated by using marker tape).
- Join ropes using appropriate knots

(Please note, that this makes rescues more difficult. Although you should know how to do it, it should be avoided whenever possible).

- Demonstrate familiarity with a range of backup devices and alternative systems.
- Choose the appropriate type of deviation for a given situation.

General

Rigging must be unquestionably reliable. To ensure this, the following must be considered:

- The type of anchor and where it's located.
- How the rope will be positioned during the commissioned task.
- How a tech could either "rescue" themselves, or be rescued by a third party.
- How hazards (sharp edges, heat sources, etc) will be avoided, and how anchor lines and other equipment will be protected.
- Angle loading.

A pre-descent and ascent check will help verify that an anchor line is safe to use, and must be carried out by a L3 supervisor. If techs will be attaching or detaching from an anchor line mid-height, the lines need to be carefully checked for any slack build up (that could release suddenly) between the anchor and attachment point.

*It should not be assumed that a L3 tech is competent to install or inspect eyebolts or other specialist anchor systems. All aspects of installation, placement and use, should follow the manufacturer's instructions.

Rigging at Height

When working at height, a bag can be suspended below the techncian to contain the anchor line, protecting it from damage (caused by falling debris) and from getting tangled during a descent (this is especially beneficial on 45 degree slopes on mountain terrain). Risk assess to ensure that the attachment points on the bag will not fail if subjected to unanticipated loads.

Some points to be aware of:
Choosing the correct form of work at height;

- Fall arrest.
- Work Restraint
- Work suspension

Re-Anchor

- L2: offset less than 1.5 m
- L3: any distance apart (but likely more than 1.5 m).

When it's time to re-anchor an anchor line (in order to change the path of ropes, or to avoid abrasion to the rope system), take care to install or place the anchors so that load is shared whenever possible.

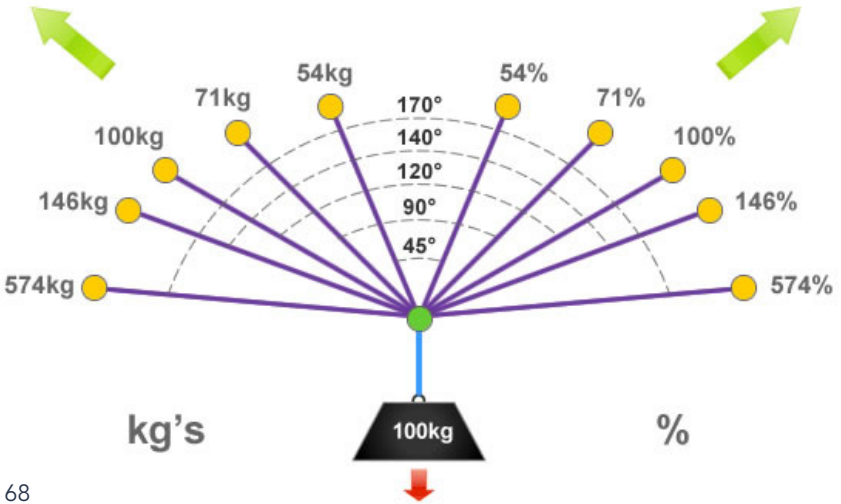
Some additional points to consider:

- A shallow re-anchor loop will make access and rescue difficult, especially if the offset is more than 1.5m.
- The TACS states that any re-anchor should be at least 3.5m off the floor.
- Assessors may ask you to rescue through a rope maneuver you have rigged, so bear that in mind as you rig.

Large Y Hang

Large angles should be avoided whenever possible. The preferred max angle is 90° and should only exceed 120° if consideration of load ratings and safety factors on each piece of equipment is the main concern. But there are exceptions to every rule.

When rigging a y-hang that exceeds 120°, a flexible horizontal anchor line system should be used. These anchors require special expertise to set up and use safely. Taking careful consideration of load sharing to minimize the magnification of forces on any one piece of equipment.



Retrievable Rigging

This temporary rigging system (aka a 'pull-through') will give you the option of installing or retrieving your ropes remotely. Best used for access and/or egress. Not suitable for a rescue operation, or prolonged suspended work.
There are many different ways to rig retrievable anchors, but all of them must consider:

- Protecting ropes from sharp edges.
- Not cross loading or side loading karabiners.
- Easy retrieval, including removing stopper knots before attempting retrieval.

Work Restraint Lines

Used in conjunction with the techs fall protection equipment, the work restraint lines prevent workers from entering a fall hazard zone. This is not a suspension technique. The line restrains workers to an area where they're supported by (ie. are walking around on) the structure.

A work restraint line can be rigged in a variety of ways. Some options for rigging include:

- A fixed-length of rope anchored to a single anchor, used as a travel line at which point no part of the swing ratio could expose you to a fall.
- An adjustable lanyard that runs along a horizontal line that's been anchored at both ends.

When installing the anchors, consider the possibility of rope stretch (especially if the work restraint line is long).

Vertical Fall Arrest System

This temporary system protects techs during a vertical climb (like on a fixed ladder). When rigging this system, be aware of clearance distance, and the number of users permitted by the manufacturer. Anchor must be full strength according to relevant legislation. Rescue will be treated like a fall arrest rescue from a ladder.

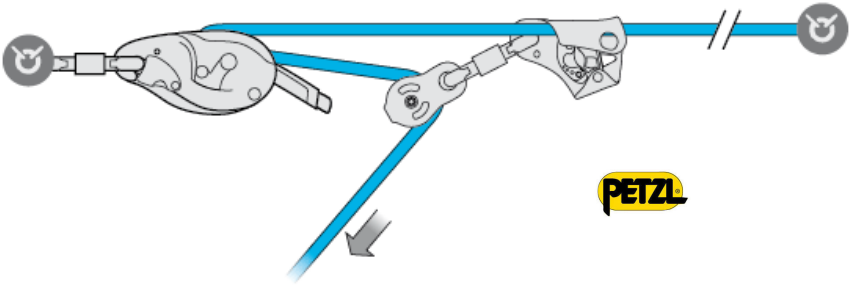
Tensioned Lines

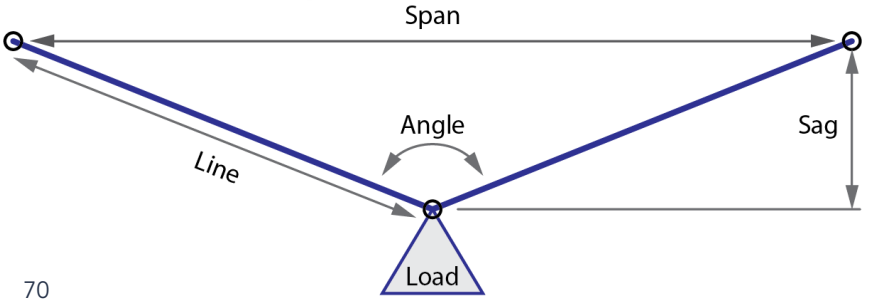
In a horizontal or diagonally positioned anchor line system, ropes are tensioned to facilitate movement along the line. A variety of rigging methods are acceptable, but be aware that this technique will increase the systems load at the anchor points exponentially.

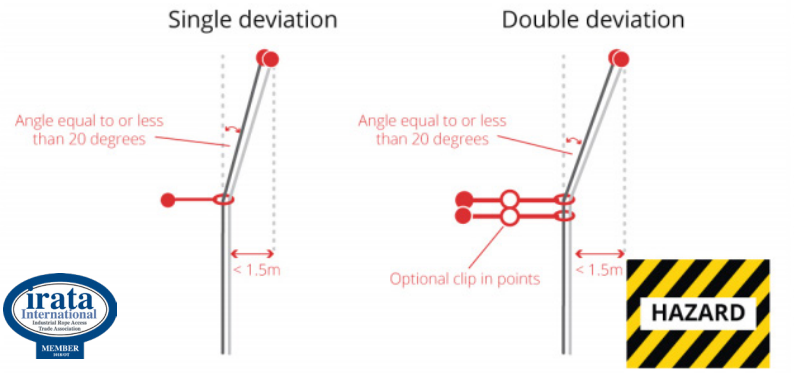
The loads resulting from an incorrectly tensioned system could be catastrophic (we've got videos to scare you with).

There are some points to be aware of when rigging a tensioned line:

- If the line is rigged with a wide-angle, loads will be even higher. The ropes should be placed under a lighter degree of tension to balance this.
- If the tensioned lines are diagonal, you will need to rig some additional working and safety lines to control movement.
- A shorter back-up lanyard will reduce the fall distance and impact load in the event of equipment failure.
- In this system, releasable rigging at one or both ends of the tension line could be helpful during a rescue.
- It is important to share the load on both ends of the system in order to cut the load in half on each independant anchor. This means bunny ears or basic load share on the anchored end, and both I'D's shared, ideally on a rigging plate.
- Also pulling equal tension in both lines and attaching to both lines simultaneously will ensure that the load is evenly distributed throughout the system.







Single Deviation

A single-anchor deviation is used to change the direction of the rope (or the working line alone) by, generally, less than 20 °. This type of deviation is rigged as a single-anchor system. The angle is not the only consideration however, it is important that the failure of a single anchor deviation does not result in failure of any part of the rope system.

IMPORTANT – this deviation should not be used if a risk assessment shows that an out-of-control swing or contact with a sharp edge could result if the anchor fails.

Double Deviation

A double-anchor deviation is used to change the direction of the ropes to avoid a hazard. The double-anchor system (with its related anchors and connection components) eliminates (or at least greatly minimizes) the risk of the hazards that would have made the single-anchor deviation unusable, by protecting against the failure of any one item.

"The horizontal distance between top anchor and deviation connectors should be less than 1.5m. This is to enable a suspended technician to reach the deviation without swinging. The vertical angle formed between the deviation and top anchor should not be more than 20 degrees. Therefore, a typical deviation of 1m deflection should not be rigged less than 3m below the anchor."

Choosing an Appropriate Anchor

We use everything from purpose-engineered steel work and eye bolts, to temporary ground anchor, weight boxes, and even trees for anchors. If there is any doubt about the adequacy of an anchor, an engineer is required to make an assessment.

Here's some guidance on choosing the right anchor for the job:

Types of Anchors

Anchor devices generally fall into two categories:

- Anchors that are installed into the structure or natural feature
- Anchors that are placed without installation into the structure or natural feature.

Refer to Annex F (Safety considerations when installing or placing anchor devices for use in rope access) for more detailed information, but here's a summary of what you need to know.

Please note: you might have one anchor line attached to an eyebolt, and another attached to an anchor sling. Anchor devices do not need to be the same, they just need to be safe and positioned at an appropriate angle.

Installed Anchors

Anchor Rails

IRATA ICOP F.2.2

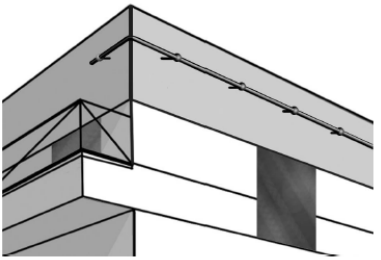


Figure F.3 — Example of an anchor rail

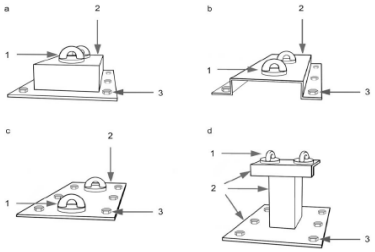
Metal tubing and brackets that have been permanently fitted to a structure, and allow for several ascents and descents to be made from the same plane at the same time. Techs are attached to the rail using two anchor slings. An appropriate connector independently links both anchor slings to the working line and safety line.

Mobile anchor points (travelers) might also be fitted to the anchor rails. These will also be independently connected to the working and safety lines. Common uses: for washing windows or performing a similar task on a high rise with a long row of features that could be tackled by team simultaneously.

Paired Anchor Device

Two anchor points fixed to a single platform using base elements. In one design, the base element looks like a box with eyebolts attached for use as anchor points.

Common uses: often installed to flat roof structure made of concrete. Might use if working on this type of structure.



Key

a Box paired anchor device
b Saddle paired anchor device
c Flat plate paired anchor device
d Pedestal paired anchor device

1 Anchor point
2 Base element
3 Fixing

Figure F.4 — Examples of paired anchor devices

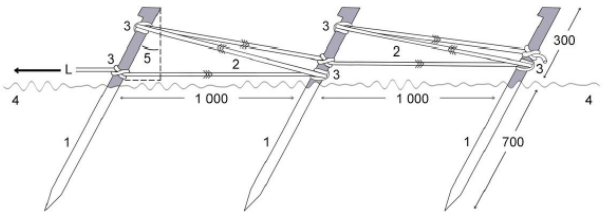
IRATA ICOP F.2.3

Ground Anchors

A metal stake made from aluminum alloy or steel that's been driven or embedded into the ground with a number of additional elements, linked together for load sharing purposes – ensuring that the anchor is strong and reliable. Anchor lines connect to the anchor either directly or indirectly (care must be taken to ensure connecting and anchor lines are in the correct orientation to prevent unequal loading).

*Before installation, make sure there is nothing in the ground (gas or sewer pipes, electric cables) that could be damaged by the anchor.

Common uses: when there are no other viable anchor alternatives.



Dimensions are in mm and are approximate

Key

1 Ground anchor element
2 Connecting line (arrows show direction of fitting to ground anchor elements)
3 Clove hitch
4 Ground level
5 Angle of insertion of ground anchor element into ground (10° to 15° off vertical)
L Load

Figure F.5 — Example of length, depth, spacing and angles of installation of ground anchor elements

IRATA ICOP F.2.4

"CAUTION! Anchor devices should only be placed by competent persons, who should have the experience or have been trained in the placement of each type of anchor device they intend to place."

IRATA ICOP F.3

Placed Anchors

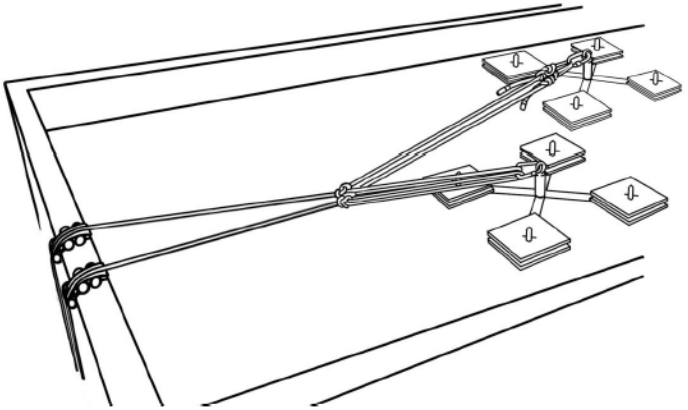


Figure F.8 — Example of two deadweight anchor devices sharing the load

Deadweight Anchors

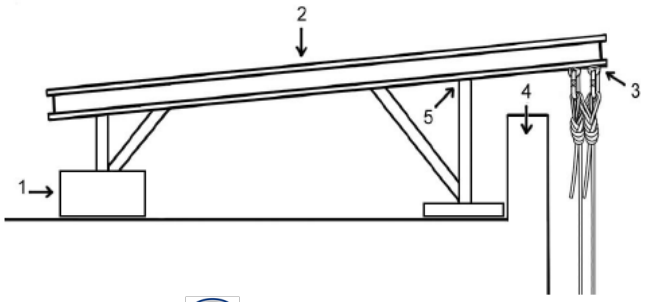
A weighted metal base with an anchor point attached to an anchor line. Works through friction that's produced between the anchor device and the surface of the structure, keeping it in position. It's crucial that a sufficient amount of friction is maintained, otherwise this anchor loses its ability to protect someone during a fall or even during repetitive routine movements.

Common uses: when working on a roof, where there are no other appropriate anchor points.

Counter Weight Anchors

A metal base loaded with weights and an attached arm (that projects over the side of the building) with a support that provides a pivot point. If the angle dictated by the pivot point is exceeded, the arm loses its source of support and will lift from the roof's surface.
Additional counterweight anchors should be installed in case of a rescue situation, where an additional person's body weight will need to be supported.

Common uses: when working on a roof, where there are no other appropriate anchor points.



IRATA ICOP F.3.4

Key

1 Counterweight
2 Arm
3 Anchor points
4 Roof parapet
5 Pivot point

Figure F.9 — Example of a single counterweight anchor device being used as an anchor device for two anchor lines

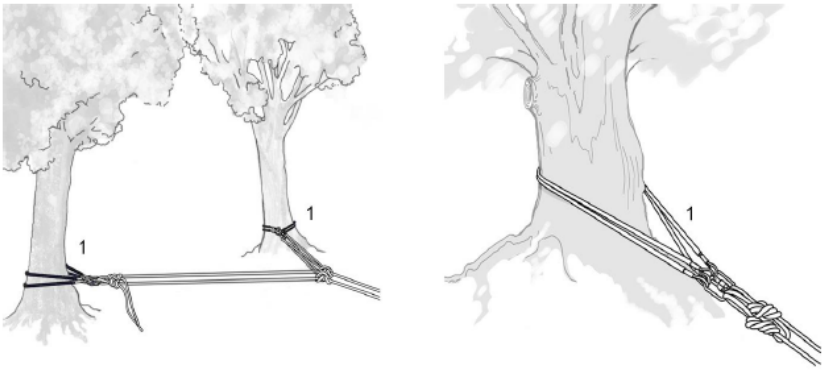
"Consideration should be given to any potential rescue scenario, where the weight of two persons might have to be taken into account. This is likely to require the use of an additional deadweight anchor."

IRATA ICOP F.3.3.6

Natural Anchors

This might include a tree or rock feature (such as spikes or bollards). There's no simple repeatable formula for assessing the strength of a natural anchor. Safely placing an anchor sling on a natural structure requires a lot of judgement, and will be reliant on your experience (in certain scenarios, bringing in an engineer to assess the work site is recommended).

Common uses: when working in a natural environment.



a) Two small trees

b) One large tree

Key

1 Two anchor slings, each with its own connector

Figure F.11 — Examples of trees being used as anchorages

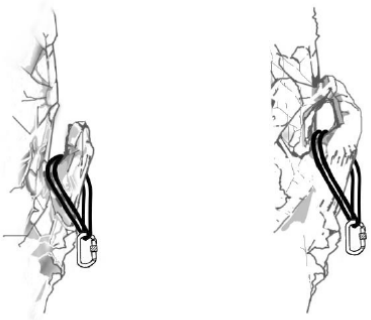


Figure F.12 — Examples of rock features being used as anchorages

"There is no simple formula for assessing the strength of natural anchors. Use of these types of anchor relies on the experience of users and, sometimes, assessment by an engineer and/or other specialists. The selection of suitable natural anchors, such as trees, see Figure F.11, or rock features, e.g. spikes or bollards, see Figure F.12, for the placement of anchor slings requires a large amount of judgement, particularly in terms of their stability."

Choking of ropes and slings

An anchor sling is almost exclusively used when there are no other suitable anchors for the ropes to be directly attached. If more than one anchor sling is being used in the anchor system, you must ensure that their intended position is maintained at all times and that there is no danger of either sling sliding out of place (vertically or horizontally) when loaded. Sliding can be prevented by creating friction using a webbing sling choked around a structure or a rope wrapped several times around the structure. A slide could also be prevented by linking the slings to another opposing anchor.

Minimum Anchor Requirements:
- SPRAT & WorkSafe BC - 22kN
- IRATA - 15kN

Lark's footing (aka choking) refers to anchor slings which have been built with the intention of looping through themselves. They should be avoided unless the sling, structure, and natural feature are suitable and can withstand the weakening effect which results. The weakening effect of a larks foot can reduce the overall strength by 30-50% depending on the orientation. This means a 22kN Fabric sling, once choked, no longer meets the minimum requirement for an anchor in BC. BE CAREFUL. *Make good choices.*

Common uses: while working on a natural feature (like a tree – where it would be attached to a stable branch) or an anchor rail.

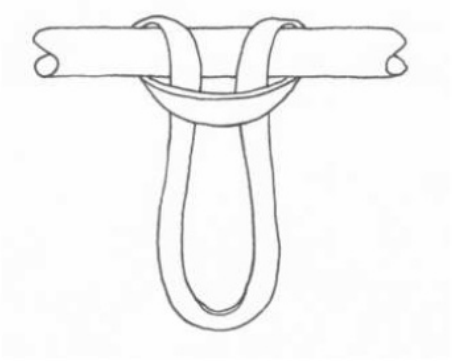


Figure 2.7 — Example of a lark's-footed (choked) sling

Hazard Avoidance and Rope Protection

Ideally, you want anchor lines to hang free from their anchors, but when this is not possible, they'll need to be protected from hazards (sharp edges, hot surfaces, and anything that could cause harm to the ropes/ other PPE).

THE HIERARCHICAL APPROACH TO ROPE PROTECTION – do what you can to Remove or Avoid any hazards before selecting a rigging or rope-protection technique.

There are many different methods for Protecting the ropes. You may opt for a specifically engineered solution (like a scaffolding barrier, made from smooth undamaged tubing that blankets and directs the anchor line), an edge protector (equipped with a method for maintaining its position), or an anchor line protector.

You may also need to use more than one method. For example, a canvas rope protector will prevent the rope from contacting abrasive surfaces, but not from coming into a contact with a sharp edge. If a sharp edge was an additional hazard, an edge protector or steel edge roller would need to be used in conjunction.

The elongation of the safety line may also warrant the use of several edge and anchor line protectors, or attaching the rope protector to the structure to ensure that it stays in place, when possible.

At your assessment, the assessor will be checking to make sure the method you've chosen has adequately protected the ropes – be aware that ropes may need separate and unique forms of protection.

Additional Resources

- ICOP 2.7.10 for advice on choosing the appropriate anchor-line protector
- ICOP 2.11.1 for information on double protection
- ICOP Annex P for recommended actions for protecting anchor lines
- Information about the hierarchical approach can also be found in ICOP 2.7, 2.11, and Annex P.

PREVENT DAMAGE TO ANCHOR LINES

YOUR LIFE DEPENDS ON IT

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HIERARCHY

01. IDENTIFY
THE HAZARD

IDENTIFY ALL HAZARDS IN THE ANCHOR LINE PATH. EXAMPLES OF HAZARDS:

- SHARP
- HOT
- TOOLS
- ENTANGLEMENT
- ABRASIVE
- CORROSIVE
- WIND
- ENTRAPMENT

02. REMOVE
THE HAZARD

EXAMPLES:
- REMOVE SHARP EDGE
- REMOVE HEAT SOURCE
- REMOVE SOURCE OF ENTANGLEMENT

03. AVOID
THE HAZARD

3a

EXAMPLES: ALTERNATIVE ANCHOR, Y HANG

3b

BARRIER, DEVIATION, RE-ANCHOR

04. PROTECT
AGAINST THE HAZARD

- FOR **EDGES**, USE AN APPROPRIATE **EDGE PROTECTOR**
- FOR OTHER **SURFACE HAZARDS**, USE AN APPROPRIATE **ANCHOR LINE PROTECTOR**
- EACH ANCHOR LINE SHOULD BE INDEPENDENTLY PROTECTED

P - PROTECT!

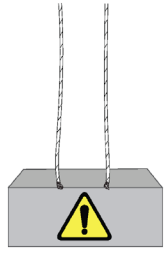
05. VERIFY

- CHECK THE LEVEL OF PROTECTION IS APPROPRIATE AND ROBUST
- IF NOT, DO NOT PROCEED
- **FOR DETAILED INFORMATION SEE: ICOP 2.7.10, 2.11.3 AND ANNEX P**

NOTE: ONLY ONE ANCHOR LINE AND ONE ANCHOR SHOWN FOR CLARITY

KEY: 3a, 3b. SEE ANNEX P, TABLE P.1

VERSION 7 - 2 NOVEMBER 2016



"IT IS ESSENTIAL THAT PRECAUTIONS ARE TAKEN TO PREVENT DAMAGE TO ANCHOR LINES"

ICOP 2.11.3.2.1

CHAPTER 6
MANEUVERS CLIMBING & RESCUE

Pacific Ropes™

ACCESS THROUGH INNOVATION

Photo Credit: Pacific Ropes
Terrace, BC

What You'll be Tested on in Regards to Maneuvers and Climbing

L2 & L3
You'll need to…

- Demonstrate vertical aid climbing, progressing primarily in suspension in an upward direction (distance will be a minimum of 3 m).

L3
You'll need to…

- Assess the suitability of the method of climbing for a variety of different scenarios and structures.

Covered in your L1 manual (revisit as needed):

Horizontal aid climbing and climbing with fall arrest equipment.

Descent, ascent, changeovers, descent using ascending devices, ascent using a descending device, deviations, rope-to-rope transfers, re-anchors, edge obstructions at the top, use of work seats (comfort seats), passing mid-rope protection.

Vertical Aid Climbing

Aid climbing is a technique that gives rope techs the ability to move in any direction on a structure (like a steel lattice tower, or while moving along a series of bolt anchors in a wall) while in suspension or tension. Climbing in aid vertically though is a new level 2 and 3 skill. You must have a minimum of two independent points of attachment connecting you to the structure at all times, and a third to allow you to progress vertically up or down the work environment.

Considerations for the Safety Method Statement

If this technique is required, you will need to consider the possibility that the rope tech may experience fatigue, how abrasive edges and surfaces can be avoided, and how a rescue will be performed – especially if the distance between the rope tech and the structure makes rescue lifting methods difficult.

You will also have to consider how to combine this technique with the use of safety lines and lead climbing method.

What do you think is the most important consideration when vertically aid climbing? What would be the most suitable lanyard for your "short connection"?

Answer:

What You'll be Tested on in Regards to Rescues

L2 & L3

You'll need to demonstrate

- Rigging a lowering system
- Rigging all three hauling systems
- A cross haul of a casualty between two points.
- A descent rescue using the casualty's own ropes
- A mid-rope rescue of an 'unconscious' casualty while suspended on ascending devices.
- Descending with a casualty through a deviation
    - L2: single-anchor
    - L3: double-anchor
- Transferring, with a casualty, from one set of ropes to another set of ropes rigged more than 3m apart.
- Descending with a casualty (located above the re-anchor) through a small re-anchor, with an offset less than 1.5m
- A rescue from an aid climb, where casualty is suspended by work-positioning lanyards.
- The rescue of a casualty suspended by a temporary or permanent fall arrest system, or by twin-tailed fall arrest lanyards

L3

You'll need to demonstrate

- Planning and rigging a complex rope access system, and then carrying out the associated team exercise.
    - The system should allow evacuation of a casualty around three-dimensional obstacles.
- A mid-transfer rescue, rescuing the 'unconscious' casualty:
    - at any point during a wide (>3m apart) rope-to-rope transfer
    - whilst crossing a wide re-anchor, aka loop (>1.5m offset)
- Descending with a casualty passing a set of mid-rope knots
- Rescuing a casualty from an aid climb, where they're directly attached by a short connection and there are no higher anchors.
- The use of tensioned ropes for rescue purposes

Covered in your L1 manual (revisit as needed):
Lowering systems, rescue from descent mode

There are two different rescue systems that can be used, each with their own pros and cons. They are:

1. Rig-for-rescue – where the casualty is rescued using a pre-rigged lowering or hauling system.

2. Intervention rescues – where the tech accompanies/assists the casualty through an ascent or descent, passing any obstructions along the way.

A rig-for-rescue system should generally be your first choice, if feasible. It's quick, efficient, prevents the need for a two-person load (which puts added stress on your rope access system), and also reduces the need for the rescuer to comprise their own safety. If this is not an option, your team can pre-plan for an intervention rescue – this will involve setting aside the necessary equipment (ready for quick deployment), and potentially rigging an additional set of ropes, reserved for rescue purposes.

Some rescue plans may require a combination of both systems. The safety method statement will detail everything you need to know regarding the rescues that have been pre-planned on your job site.

Some other things to be aware of (failure to observe these points will result in a discrepancy):

- Careful management of devices to reduce the potential for high dynamic loads (your equipment and body weight plus the casualty's equipment and body weight could reduce the safety factor on equipment strength).
- Maintaining an effective backup system to prevent an out-of-control swing caused by equipment failure.
- Minimizing tangles and rope-against-rope abrasion
- Avoiding an excess build-up of slack in the safety line
- With all IRATA rescues, two independent safety attachments must be maintained at all times.

IMPORTANT: As we practice the following rescue maneuvers this week, you'll be playing two roles: rescuer and casualty. If you're the tech feigning immobility, it is essential that you regularly move your lower limbs while suspended to protect yourself against suspension intolerance, and wear a podium! If you have any questions about this, ASK US!

Rigged for Rescue

Lowering System

Allows you to quickly evacuate a casualty with an unimpeded lower.

To be aware of:
- Careful control of both ropes as you're bringing the tech safely to the ground.

Hauling System

If you can only access the structure from above, you can lift the casualty (also, tools and/or materials) up onto the platform using one of three types of hauling systems:
1. A lowering system, plus extra equipment
2. A complete system used throughout to lower, suspend and lift the casualty
3. A system that can be added to existing rigged ropes using a third rope and extra equipment, which will be pre-placed so the lift can be performed quickly.

This operation may involve lifting the casualty over safety barriers, and using a tag line. We'll show you how to do this.

Some of what we'll be watching for:
- Your understanding of mechanical advantages and loads on the equipment.

Please note: You'll only need to demonstrate one of these 3 hauls on assessment day, but it will be up to your assessor which one.

Cross Haul

A Cross Haul allows you to move a casualty around or through a three-dimensional obstacle. In this operation, two (or more) sets of haul/lower ropes and back-up systems will be rigged and connected to the casualty. You'll horizontally transfer them using both systems.

Some of what we'll be watching for:
- If there's more than one tech involved in the rescue, that communication is being maintained.

Intervention Rescues

Rescuing from ascent mode

This rescue involves ascending or descending to a casualty, de-weighting them, and then descending with them to the ground. You can either do this from a separate set of ropes, or using the casualty's own set of ropes – the assessor will specify which one they want you to demonstrate.

Passing a deviation with a casualty

Deviations may not be always be compatible with the lowering system that's been pre-rigged as part of your rescue plan. You'll have to pass it manually if your casualty is positioned above the deviation.

Some of what we'll be watching for:

- keeping slack out of the safety line
- a safe and efficient passage through the deviation

Rope-to-rope transfer with a casualty

In this rescue you'll be transferring from one set of ropes to another (rigged >3 m apart) with a casualty. On the job site, you may have to use this manoeuvre in order to avoid an obstruction or to return to an access point that's under a bridge, platform, etc.

Some of what we'll be watching for:

- Good casualty management
- Appropriate points of attachment
- Usage of casualty's PPE

Rescue

Passing mid-rope knots with a casualty

Knots that have been made to isolate small areas of damage can complicate a rescue. You can minimize those complications with proper planning.

This is a challenging maneuver. Arguably could be one of the most difficult rescues you perform depending on the type of knot used for isolation, and the casualty's position in relation to the knots themselves. Your instructor will go over the different variations of this maneuver.

Some of what we'll be watching for:

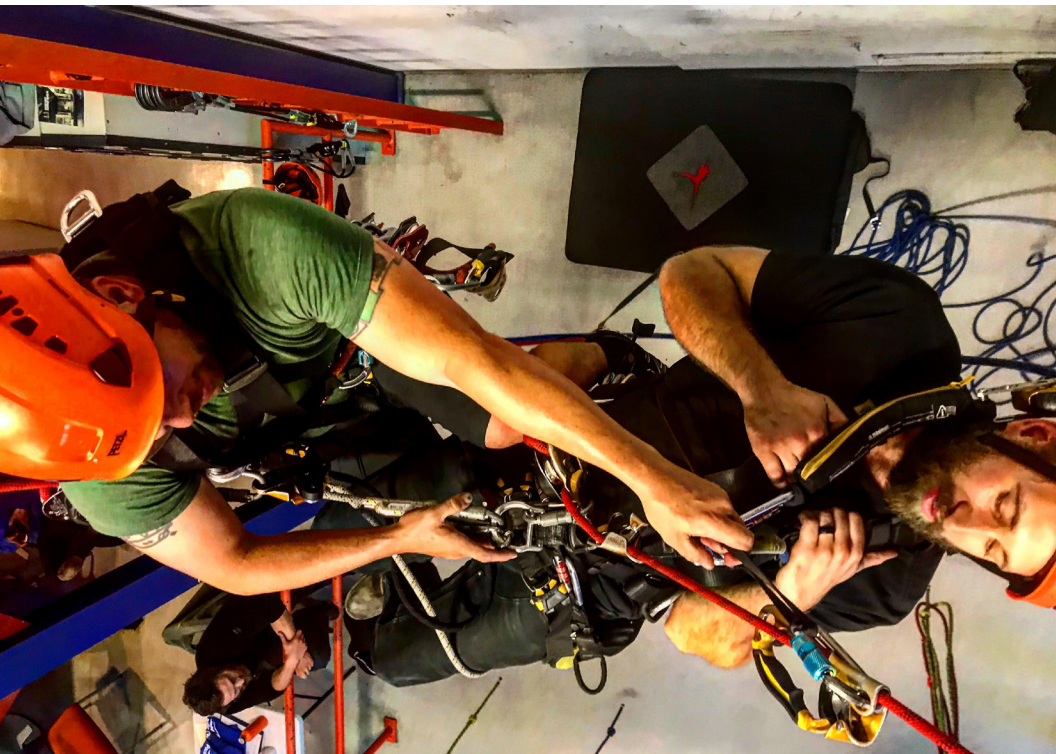
- Your effective use of the casualty's PPE

Passing a re-anchor with a casualty

Just like deviations, re-anchors (aka re-belays) might not be compatible with the lowering system that's part of your rescue plan. This rescue involves finding a way of working around the re-anchor.

Some of what we'll be watching for:

- Your avoidance of tangles with the re-anchor loops.



Climbing Rescues

For climbing rescues you'll be climbing to the casualty with the necessary equipment and ropes, which will have been set aside (ready for quick deployment) in a pre-rigged kit. After getting to the casualty you'll either rig the ropes to descend with them to the ground, or stay on the structure as you lower them to the ground on their own. Because of this added weight, you'll need to be aware of high dynamic loads.

You'll only need to demonstrate one of these climbing rescues at your assessment.

Rescue from an aid climb

In the real world, when planning this rescue, you'll need to be aware of the location of your team in relation to one another. This will be important for a speedy rescue. Aid climbing intrinsically puts you in difficult to reach situations so a rescue plan and choosing the correct gear will also make this rescue more timely.

Some of what we'll be watching for:

- Your speed, and how quickly you can get to the casualty and complete the maneuver.

Rescue from fall arrest equipment

There's a greater risk of injury with fall arrest systems because of the longer potential fall distance. So if fall arrest is used for your system of work, a related rescue will always be planned.

For this maneuver, you'll rescue a casualty who's either suspended by a temporary or permanent fall arrest system, or by twin-tailed fall arrest lanyards.

Rescue from an aid climb – short connection (L3 only)

In this scenario, you'll be rescuing a casualty who is directly attached to the anchor points with a short connection – either a two-connector attachment into a bolt anchor, or a one-connector attachment into a short wire-strop anchor. It's a hypothetical situation we actually try to avoid happening at all, but if it does happen you will need to climb up towards the casualty and get them out.

Some of what we'll be watching for:

- This is a recognizably difficult maneuver. The main thing we'll be watching for is that the rescue is carried out safely.

Complex Rescue

Getting your casualty to safety may involve a rescue system that incorporates several of the different operations we've just discussed. In this exercise, you'll have 45-60 minutes to plan and rig a rescue plan, and 15-30 minutes to execute it.

Your assessor may also use this exercise to make sure you've correctly completed IRATA form 061, job planning.

There are a few different points you'll need to be aware of for this exercise:

1. Team Management
- Who's in your team, and what are their skill levels? Use them appropriately.
- Position yourself so you're in a good place to co-ordinate the operation.

2. Communication
- What are your intentions with this rescue? You'll need to clearly communicate the plan with your team, and each tech's role in making it go smoothly.
- Clear instructions should be given to each team member during each stage of the rescue.
- You may also need to consider communication with emergency services and other site personnel.

3. Equipment
- Your selection of suitable and sufficient equipment for the task, using an awareness of the competency of your individual team members.

4. Casualty Management
- What are the casualty's needs? Use best practices, including limiting their time in suspension, keeping them in an upright position, and providing them with a work seat or stretcher for comfort.

Careful planning is required for this exercise, and it may be helpful to read through ICOP 6.2.8 for guidance on planning for emergencies.

"...an effective rescue plan is essential to ensure that, following an incident, a casualty can be removed quickly from the suspended position and cared for in a proper manner. The longer the casualty is suspended without moving, the greater the chances there are of the effects of suspension intolerance developing and the more serious it is likely to be."

IRATA ICOP G.2.2.

Included here is a non-exhaustive breakdown of some of the more 'step heavy' maneuvers and rescues you will be responsible for in level 2 and 3. These breakdowns will describe skills that can be transferred into many different potential rescue scenarios. As a level 3, it will be your job to be able to pull someone out of any potential scenario they could get themselves into on ropes. Having an arsenal of tricks up your sleeve will make you adaptable to different situations, so don't get hung up on the "steps". Try to develop an understanding of what will, and what will not work in any given situation.

Pitch-Head Hauling System

Casualty is suspended on set of ropes near the ground, the objective is to haul the casualty to the anchor points, remove from points of suspension and lower all the way to the floor. Could be combined with diagonal tensioned guideline.

Extra equipment required:

- Length of rope, long enough to reach the ground and then some.
- 2 anchor slings
- 2 hand ascenders, or other types of rope grab.
- 2 pulleys
- I'D S or Rig
- ASAP Lock
- Grillon
- 10x Carabiner
- Ascend Casualties lines or Aid Climb in from above.
- Install your two anchor slings to the structure above, beside the casualty's current anchors. (This will ensure you can separate yourself from the haul and original lines to minimize tangles of rope and clutter.)
- If you're already in aid, stay there.
- If not, get into aid on your newly installed slings.
- On the sling closest to the casualties original lines, install your I'D so it hangs inverted from the anchor.
- On the casualties current back up line anchor, place an inverted ASAP lock. The UP arrow will be pointing towards the casualty. You will also want to install a redirect carabiner above the ASAP in order to keep the ASAP in a good orientation once you start pulling the slack through it.
- If you've planned ahead, your extra rescue rope will be pre-rigged with a stopper knot at the tail end, and a barrel or scaffold knot around a steel carabiner at the load end.
- Invert a handled ascender on the casualties current main line and attach the load end of your extra rope to the top (now, literal bottom) hole of the handled ascender.

- Lower the hand ascender down the casualty's main rope all the way to their point of connection. (Don't skimp on how low you send that rope grab, you will regret it later.)
- Install the new haul line into your inverted I'D. Pay close attention to the loading, your casualty will now be the "anchor" according to the guide pictures on the device.
- Function test I'D, make sure it locks up when pulled towards the casualty.
- Pull all the slack out of the new haul line.
- Build a 3:1 Hauling system with a redirect Carabiner on the tail rope of the I'D. (see mechanical advantage in Manual)
- Double check your system and begin hauling.
- Remember to take up the slack through the backup line, don't let the casualty's backup fall below factor one.
- Once you get the casualty as high as they will go, break down your hauling system and install a "friction" carabiner on the tail rope of the I'D.
- Attach the casualty to a separate anchor than their original anchors with your extra Grillon. This will ensure your casualty maintains two independent points while you adjust their system.
- With the third connection point on the casualty, you can now remove their original backup and pull the remainder of the slack through the inverted ASAP lock. Make sure the ASAP's lock function is not engaged.
- Tie the end of the backup rope to the casualty's sternal connection, with a barrel knot or follow through figure of 8.
- Now the casualty is back on three points.
- Carefully lower the casualty off the hauling I'D until their original main connections come loose and they are suspended on the Grillon.
- Remove them.
- The casualty's original main line should now be completely free.
- Attach your extra haul line directly to the casualties sternal, and LOCK your I'D.
- You can now lower the casualty off the Grillon, transferring the load to lower line through the I'D.
- With extra friction, lower the casualty to the ground, being sure to mind the loop created by the excess slack through the ASAP lock, don't hang your rescue up in it.
- Once casualty is safely on the ground, break down the system and descend the lines.

Rescue from Ascending Equipment (Pick-off Ascent/Descent)

Casualty is suspended in their ascending equipment, CROLL/Hand Ascender and Backup device, on a set of ropes.

- Ascend the casualty's backup line, and back yourself up to the main line below the casualty's CROLL, with your KONG/DUCK backup.
- Be sure that the ropes are not tangled around each other above to ensure no clutter and good rope management.
- As you approach the casualty, keep an eye on your back-up device to make sure you don't climb above fall factor 1.
- When your KONG/DUCK backup is directly under the casualty's CROLL, install your ASAP lock above the casualty's ascending gear, nice and high, and REMOVE your KONG/DUCK.
- Continue to ascend until you are as high under you casualty's backup as possible (without getting jammed up) and then;
- CHANGE-OVER. (Be sure that your I'D Carabiner is oriented correctly, with the gate facing you and positioned for easy escape.)
- Now in descent, you can climb your descending device in order to get yourself into the highest position possible.
- From this position, we combat rope stretch in the system by changing the casualty into their descender.
- Install the casualties descender below the CROLL.
- To un-weight the casualty from the CROLL, there are many methods, which we will discuss on the next page. >>>

- Now you are ready to start making connections to your casualty.
- Make your first connection of two linked Carabiners, from YOUR I'D Carabiner spine, to the casualty's sternal connection. (This will ensure they are positioned upright during the descent)
- The second connection will be the Casualties 30cm KONG/ DUCK lanyard, also from their sternal, to your ventral D-ring.
- Now you have two points to the casualty, you can REMOVE their Backup from above your gear. (Be sure not to remove your own)
- Now the casualty is left on just their Descender, all you need to do is lower them off the Descender until they are suspended on your sytem.
- Once the casualty is successfully hanging on your system, install a friction Carabiner on a low point to your harness (Front side of the I'D 'biner, Ventral or Lateral D-ring) This will offer added control and weight distribution for the I'D.
- Lower to the ground, using the friction 'biner by holding your hand high.
- If your I'D biner is still orientated correctly, you should now be able to leave your casualty suspended on your I'D and "escape" the system to better offer first aid, this step only works when at ground level.

Method One

- Disconnect the casualty's cows-tail from their Hand Ascender, but leave the hand ascender on the main working line above casualty. (This will ensure they do not get hung up on it when lowering them onto your system)
- Extend you foot-tape to full length and then;
- Girth hitch or Larks-foot the connection end of the foot-tape around the casualty's sternal connection.
- Install and Carabiner through the top hole of the hand ascender.
- Run the foot-tape from the casualties sternal through the carabiner in a 1:1 fashion.
- Stand up the in the foot-loop to create a counter-balance with your full body weight.
- You will have to pull up on the casualty's harness in order to give that extra bit of lifting power, but once you do your counterbalance will capture the progress and you should be able to remove the casualty's CROLL from the rope.
- Once removed, sit back down but keep pressure on the foot-loop to prevent dropping the casualty on to their Descending device.
- Grip the two strands of the 1:1 together and slowly release them through your hand, removing your foot from the foot-loop so as not to practice your rope access yoga.

Method Two

- This method will be useful if the casualty is much heavier or carrying tools etc. it offers much more control when lowering the casualty on to your system. You will require the use of a Grillon and Fixe Pulley.
- Disconnect the casualties cows-tail from their Hand Ascender, just like in method one.
- Install the body of the Grillon on to the casualty's sternal connection.
- Install the anchoring side of the Grillon to the top hole of the Hand Ascender.
- Use the pulley to create a 3:1 Haul with the tail rope of the Grillon.
- Pull or stand up on the tail rope of the Grillon using your Hand Ascender and Foot-loop.
- This should lift the casualty with ease, and you can now remove the casualty's CROLL.
- Now you can remove the 3:1 from the Grillon and lower the casualty using the Grillon on to their descending device with control.

Rope-to-Rope w/ a Casualty

See previous page, for methods of pick off and then add these steps.

- When planning to move rope-to-rope with a casualty, it is important to bring your transfer lines with you, attached to your harness for easy access once the casualty is suspended on your system.
- Before completing your "pick-off", you will need to steal some gear from your casualty, take their descending device as well as their back-up that should be rated for rescue load. (Preferably the ASAP lock)
- The only difference when moving rope-to-rope with a casualty is that you CANNOT install your own CROLL onto the transfer lines with a casualty.
- Install the casualties stolen I'D through the short rescue connection, as well as your Ventral d-ring, on the side that you wish to transfer to.
- Install the casualties stolen ASAP Lock on your sternal D-ring.
- Install both pieces onto their respective transfer lines, ensure you have a main line and a backup line, in both directions. (4 Point Transfer)
- Pull gentle tension into the new I'D, and ensure both Back-up devices are nice and high.
- Slowly lower (with friction) over to your new set of lines.
- Once fully plumb, you can remove your original I'D and ASAP from your original lines, and begin to lower to the ground on your new set of lines (with friction).

Passing a Double Deviation w/ a Casualty

Casualty is suspended, either in descent or ascent on a set of lines above the double deviation.

- Ascend casualties back up line, back yourself up to their main line.
- Pass the deviation (see level one Pacific Ropes Manual)
- Ensure the retrieval knot is present below the deviation.
- Ascend to casualty, see above for pick off methods.

It is very important that your connections to the casualty do not cross OVER top of the working lines. LIFT the ropes up and connect to your casualty UNDER your working ropes.

- Steal the casualties I'D and ASAP Lock, just like you did in the Rope-to-Rope rescue.
- With rope management in order, lower (with friction) until you are about eye level with the anchors of the deviation slings.

- Pull in on the retrieval knots and grab the ropes from below the deviation.
- Allow yourself to go back to your plumb line while you load up your new system.
- Install your new I'D onto your current BACK-UP line, below the deviation.
- Install your new ASAP Lock onto your current MAIN line, below the deviation.
- Take in as much slack as possible through the new I'D before attempting to lower off the first I'D.
- Once all the slack is pulled through the new I'D, carefully lower (with friction) on your first I'D.
- Once you reach almost plumb under the deviation (being mindful of where your first ASAP is sitting in relation to the deviation. (If you lower too far it could get stuck)
- Now you are sitting mostly on your new I'D, your first ASAP is above the deviation on that same rope.
- Remove your first ASAP from above the deviation, and bump it over to opposite rope ABOVE your first I'D. (This will ensure that when you remove your first I'D, the slack created will not drop your only other back-up into a potential factor 2, in case you have a main line failure in this moment.)
- Remove your first I'D and then move your new ASAP up quickly to combat the slack you've just created.
- Now you should have two solid points below the deviation, you can remove your original ASAP from above the deviation and lower to the ground (with friction).

Passing a Short Re-Anchor w/ a Casualty

Casualty is situated at the top of pre-rigged re-anchor.

- Ascend casualties back up line, back yourself up to their main line.
- Pass the re-anchor (see level one Pacific Ropes Manual)
- Ascend to casualty, see above for pick off methods.
- It is very important that your connections to the casualty do not cross OVER top of the working lines. LIFT the ropes up and connect to your casualty UNDER your working ropes.
- Steal the casualties I'D and ASAP Lock, just like you did in the Rope-to-Rope rescue.
- With rope management in order, lower (with friction) until you are about eye level with the anchors of the re-anchor.
- Move the loop of re-anchored rope off to one side, you will transfer straight back to the standing lines for quick descent after transferring.
- Grab the standing lines and install the casualties stolen I'D and new ASAP.
- Ensure that the I'D and ASAP are installed correctly and that you now have 4 points of contact for transfer.
- Pull gentle tension through new I'D and lower on the original I'D with friction until under the re-anchor anchor.
- Once original I'D come loose, remove it along with the original ASAP
- Bump friction 'biner to new I'D.
- Ensure new ASAP is not locked and lower to the ground with friction.

Large Re-Anchor Rescue (Middle of the Loop)

The casualty is mid-transfer through the large re-anchor. Rescuer approaches casualty on their descender side...

- Ascend the access lines that would situate you on the descender side of the casualty.
- Change over into descent staying on the access, or 'standing' lines.
- *Good rope management here will mean dressing the standing lines off to your left (away from where you will be travelling)*
- Connect to looped ropes with a single carabiner from your ventral d-ring and clip another slightly longer connection to ensure two points while guiding towards the casualty.
- Lower just enough to be able to reach your casualty, (you may have to flip sideways to reach your casualty) you want to stay as high as possible to ensure you won't have to haul the casualty out of the loop.
- As soon as you can reach your casualties i'D, hold the tail rope and unlock the handle.
- Pull the casualties tail rope to move them toward you, at a certain point using your feet and legs to pull the casualty towards you will make this much easier.
- Once as close as possible to the casualty, begin making connections;
- It will be easier to pick off the CROLL if both of your connections (for now) go to the casualties ventral D-ring. Make sure your "short" connection is adjustable (like a GRILLON, or Progress Adjust I) and then a shortened cowstail as your second, longer, connection.
- *DO NOT CLIP YOUR CONNECTIONS OVER THE LOOP!*
- Now that you have two connections to your casualty is a good time to clean up your ropes. You can remove the casualties back up closest to you, and remove the I'D from the rope, but leave it attached to the casualties Ventral D-ring.
- You can also remove your single carabiner and back up connection from the loop that you used as a guide to the casualty.
- The loop side closest to you should now be free or any equipment and not captured by your connections to the casualty.
- Now the fun part; picking the casualty off of their CROLL.
- *Before you do this, it is important to install the casualties I'D to the rope below the croll, as if you are going to "change over" the casualty. (You are going to...)*
- Set up a counterbalance pick on the casualties ascent line (above their CROLL)
- Make sure the casualties back up on their ascent side will not get jammed up (ie, if it's the kong or duck, change it out for their ASAP and make sure it is not in the LOCKED position.)

Now for the pick;

- This can be a difficult pick, or very easy. *The trick is to have good positioning and use your whole body.*
- While facing your casualty, put your foot into the pick strap.
- Use your other knee under the casualties seat.
- Simultaneously kick into the pick strap and pull with your corresponding hand on the pick strap (not the rope!) to assist your foot.
- Push under the casualties seat with your other knee.
- The combination of these three things should lift your casualty off their CROLL with minimal flopping around on your part.
- Remove the casualties CROLL from the rope and let them lower onto their I'D which you previously installed.
- Now is a good time to think of casualty management. Because your initial connections were to the casualties Ventral point, they will be hanging horizontally. Use a carabiner or dog bone connection to raise up your casualty by their sternal.
- Break down your counterbalance pick gear.
- Now you are free to lower yourself and the casualty back to your plumb line under the standing lines. (With friction)
- If you haven't connected over the loop, you should be free to remove the equipment from the loop and lower to the ground on the standing lines, (Again, with friction)
- Congratulations, you just performed one of the most difficult level 3 rescues there is.

Lessons learned, Things to Remember...

CHAPTER 7
LEGISLATION

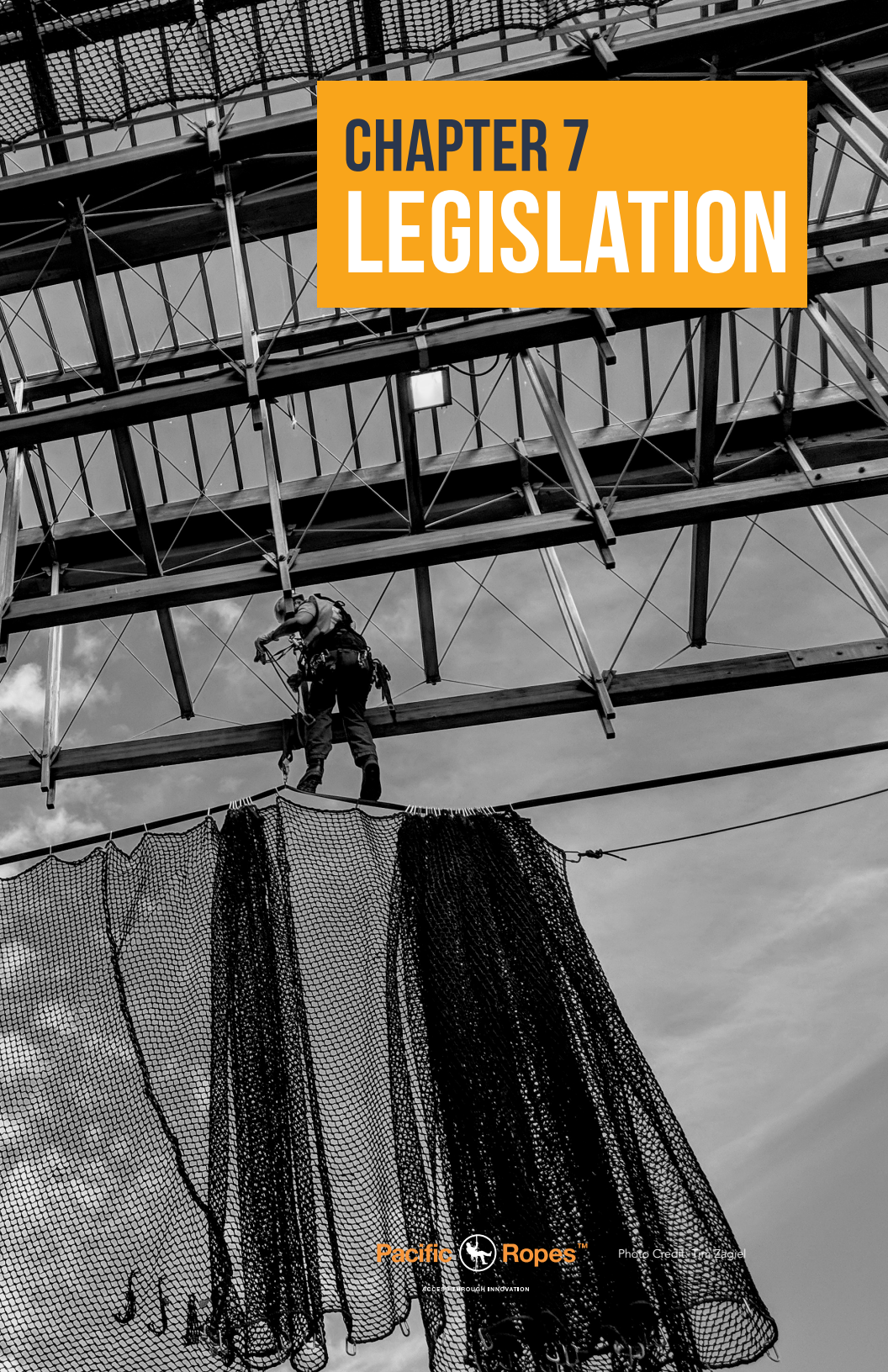


Photo Credit: Tim Zagiel

34.3 - ROPE ACCESS PLAN

(1) Before a rope access system is installed or used in a workplace, a written Rope Access plan must be prepared and be available at the workplace.

34.4 - TRAINING & CERTIFICATION

(1) Before allowing a person to perform rope access, the employer must ensure and document that the person:

- (a) has received training in the safe use of a rope access system, including, as appropriate to the work being done, the safe work practices, skills and practical experience hours described in one of the following groups of publications:
- (i) International Code of Practice (2013) and General requirements for certification of personnel engaged in industrial rope access methods, Edition 6 (June 2009), published by the International Rope Access Trade Association;
- (ii) Safe Practices for Rope Access Work (August 2012) and Certification Requirements for Rope Access Work (November 2012), published by the Society of Professional Rope Access Technicians;

34.7 - PERSONAL LOG

(1) A person who performs Rope Access must maintain a personal log containing a record of the Rope Access performed by the person.

This is not the complete regulation. Please take the time to read all of Part 34 and Part 11 before embarking on your work at height career!

11.2 - OBLIGATION TO USE FALL PROTECTION

(1) Unless elsewhere provided for in this Regulation, an employer must ensure that a fall protection system is used when work is being done at a place

- (a) from which a fall of 3 m (10 ft) or more may occur, or
- (b) where a fall from a height of less than 3 m involves a risk of injury greater than the risk of injury from the impact on a flat surface.

11.3 - FALL PROTECTION PLAN

(1) The employer must have a written fall protection plan for a workplace if (a) work is being done at a location where workers are not protected by permanent guardrails, and from which a fall of 7.5 m (25 ft) or more may occur.

11.6 - ANCHORS

(1) In a temporary fall restraint system, an anchor for a personal fall protection system must have an ultimate load capacity in any direction in which a load may be applied of at least:

- (a) 3.5 kN (800 lbs), or
- (b) four times the weight of the worker to be connected to the system.

(2) Each personal fall protection system that is connected to an anchor must be secured to an independent attachment point.

(3) In a temporary fall arrest system, an anchor for a personal fall protection system must have an ultimate load capacity in any direction required to resist a fall of at least:

- (a) 22 kN (5 000 lbs), or
- (b) two times the maximum arrest force.

(4) A permanent anchor for a personal fall protection system must have an ultimate load capacity in any direction required to resist a fall of at least 22 kN (5 000 lbs).

SECTION 808 - ROPE ACCESS PLAN

An employer must develop an occupational rope access safe work plan for a work site if:

- a worker at the work site could fall 3 meters or more, or
- there is an unusual possibility of injury if a worker falls less than 3 meters.

SECTION 826 - WORKER COMPETENCY

Safe and competent rope access workers require a combination of both training and practical experience hours. Competent workers must be adequately qualified, suitably trained, and have sufficient experience to perform their work safely. Working a minimum number of hours at height helps ensure that workers meet the third component – sufficient experience – of the competency requirement. Documenting those hours in a logbook (see section 827) provides a record to employers of the practical experience hours a worker has gained while working at height.

SECTION 827 - WORKER'S PERSONAL LOGBOOK

Worker logbooks are a mandatory requirement of industrial rope access workers. The logbook concept is an essential component of modern industrial rope access. A worker's logbook should be considered a tool that an employer or prospective employer can use to verify and quantify the work history of the rope access worker. The logbook should clearly indicate the duration and nature of the work performed as well as the access techniques employed by the worker. Given the freelance nature of rope access workers, the logbook accompanies the worker and details the breadth and experience of the worker.

This is not the complete regulation. Please take the time to read all of Part 41 and Part 9 before embarking on your work at height career!

SECTION 139 - GENERAL PROTECTION

At fall heights of 3 meters or more, at lesser heights if there is an unusual possibility of injury, or if the fall is through an opening in a work surface, subsection 139(1) requires that workers be protected from falling, regardless of whether the work area is a temporary or permanent work area.

SECTION 140 - FALL PROTECTION PLAN

A fall protection plan is required if work is performed at a work site at which a fall of 3 meters or more may occur and guardrails do not protect workers. Section 8 of the OHS Regulation requires that the plan be in writing and available to workers. The plan must be available at the work site before work with a risk of falling begins.

11.6 - ANCHORS

Anchors used for attachment of a personal fall arrest system must have a minimum breaking strength of

- at least 16 kN (3600 lbs) per worker attached, in any direction required to resist a fall, or
- two times the maximum arresting force per worker attached, in any direction required to resist a fall.

The anchor to which a personal fall arrest system is attached must not be the same anchor that supports or suspends a platform. Independent anchors are required so that if the anchor supporting or suspending the platform fails, then the worker does not fall along with the platform.

Temporary fall arrest anchors such as wire rope slings, synthetic webbing slings, I-beams sliders, I-beam clamps, etc. must have a minimum breaking strength of:

- at least 16 kN (3600 lbs) per worker attached, in any direction required to resist a fall, or
- two times the maximum arresting(a) 22 kN (5 000 lbs), or
- two times the maximum arrest force.