

FIELD TRIP #7 – HARD SNOW

Hard Snow Ice Axe Arrest Test and Snow Travel Techniques

FIELD TRIP #7 HS – HARD SNOW	
Time:	Date: June 3 rd Starting Time: Arrive by 6:30 am and be ready to go by 7:00 am. Duration: Eight to ten hours
Location:	<i>Panorama Point area, Mt Rainier National Park</i> <i>Meet at Paradise upper parking lot, Mt Rainier National Park</i>
Directions:	Go East on SR 512 to SR 7. South on SR 7 to SR 706 in Elbe. East on SR 706 through Ashford to the Nisqually Entrance. Pay entrance fee and continue on to Paradise.
Prerequisites:	<ul style="list-style-type: none"> ▪ Lectures: 2 and 5 ▪ Field Trips: #1 Prep, #1, #2, and #3 ▪ Pass a conditioner hike (2nd year student must also complete a conditioner in the current year prior to this field trip)
Assignments:	<ul style="list-style-type: none"> ▪ Review: <i>Freedom of the Hills, 9th edition</i> Snow Travel and Climbing Ch 16 Glacier Travel Ch 17 ▪ Study: Information contained in this section. Information required for FT #3 (Soft Snow) ▪ Practice: Review and practice the navigation fundamentals (Ch 5) Review and practice the setup of carabiner-ice axe belay.(349-351)
Purpose:	<ul style="list-style-type: none"> ▪ Tested on ability to use ice axe and arrest on hard snow ▪ Practice crampon techniques ▪ Practice & demonstrate ice axe self-belay ▪ Demonstrate proper safe glissading skill ▪ Practice traveling up & down slope with crampons ▪ Practice rope management as a rope team “on a glacier” ▪ Practice ascending/descending techniques ▪ Practice team arrests ▪ Practice belaying team members in/out of camp or near crevasses ▪ Practice set up and utilization of running belay ▪ Tested on ability to use carabiner-ice axe belay ▪ Practice snow anchor construction

EQUIPMENT

See Required Equipment FT 7 on the Equipment Matrix (Lecture 1)

Special Notes & Items	<ul style="list-style-type: none"> ▪ Map: USGS map “Mt Rainier East” ▪ Drivers need a current <i>National Park Pass</i> or pay <i>Park entrance fee</i> ▪ Make a plan to stay overnight Saturday. We have a group site reserved at Longmire Campground, for both Friday and Saturday nights. ▪ Parking is very limited, so please maximize carpools.
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PROCEDURE

Arrive at the Paradise Overnight parking lot by 6:30 AM and be ready to go at 7 AM. Have your bags packed for another day out on the glacier. When everyone is ready we will group up. The field trip leader will give you a rundown of the day, hand out field trip books, and organize the groups before we hike in. We will hike in as a group up the trail to the deadhorse area, and begin the activities for the day.

The objective of this field trip is to demonstrate the snow climbing techniques essential for successful alpine climbing. All testing and practice will likely be done on steeper terrain with harder snow than experienced at Field Trip 3 - the Winter Overnight – these conditions are frequently found on mid to later season Cascade climbs.

You will be tested on your ability to perform the Critical Skill of ice axe arrests, practiced at Field Trip 3 but this time with a pack on in hard snow. Review prior material on the ice axe arrest, keeping in mind that the arrests on hard snow are more difficult than in soft snow.

Other skills such as self-belay with your ice axe, roped glacier travel, cramponing, glissading, team arrests, and snow anchors will be covered. **You will be tested on knowledge and ability to perform these skills as well.**

SNOW ANCHOR AND BELAYS STATION

At this station, you will be building snow anchors and belaying a fellow climber. You should know how to set up each type of anchor or belay, and understand when to use them. You will need to show competency in building the following anchors and belays:

- **Carabiner Ice Axe Belay** - used to provide a top belay to a weak or tired climber whom is ascending or descending a slope and a slip may be more likely. This is not a bomb-proof anchor which would be required if a fall (not slip) is more likely.
- **Running belays** – used when a team need to move quickly or a belay is not necessary. Typically on 4th class rock or steep snow slopes where run out is bad and a slip could be bad or deadly.
- **Snow Bollard** – used typically for emergency rappels when you do not have the right equipment to build an anchor.
- **Pickets:** It is very important to understand how to build picket anchors and to understand when to use each type. Use the following tests to understand the type of picket anchor that should be used with the various snow pack.

Snow Hardness Test – This test helps describe the hardness (or compression strength) of the snowpack using your gloved hand for assessment.

- If the layer is not ice, gently push your fist into the layer. If your fist penetrates the layer easily, it is considered Very Soft.

- If your fist doesn't penetrate easily, hold your hand flat and so that the tips of your four fingers are just touching the snow and push gently. If your four fingers penetrate the snow easily, the layer is considered Soft.

- If your four fingers don't penetrate easily, push gently into the snow with the tip of one finger. If one finger penetrates the snow easily, the layer is considered Medium.

- If one finger doesn't penetrate easily, gently push the sharpened end of a pencil into the snow. If the pencil penetrates easily, this layer is considered Hard.

- If the pencil doesn't penetrate easily, gently push the tip of a knife into the snow. If the knife penetrates easily, this layer is considered Very Hard.

Test	Estimated Hardness
Fist	Very Soft
Four Fingers (Tips)	Soft
One Finger (Tip)	Medium
Pencil Point	Hard
Knife	Very Hard
	Ice

Snow Compression Test (aka Snowball Test)- which helps determine if work hardening of the snow will make it stronger.

Try to make a snowball, the snow:

Passes – you can form a solid snowball. This means the snow can be compressed (work hardened) to make a stronger snow anchor.

Fails- you cannot form a solid snowball (i.e. the snowball crumbles or will not compress at all, which occurs when the snow is very cold and dry). Do not attempt to compress the snow before building an anchor, it can actually weaken the anchor.

When to use each type of picket:

Note: If the snow passes the snowball test. Always compress the snow before building an anchor.

- Vertical Top Clip Picket- Best in knife hard snow (you have to use your ice axe to hammer the picket in) and a trench cannot be cut into it. If used in anything less the placement is “iffy.”
- Vertical Mid-Clip Picket (Sierra) – either knife hard snow (that can have a slot cut into it) or compressable snow (passes the snowball test). In the latter, make sure to backfill the trench and compress the snow in front of it.
- Deadman (horizontal mid-clip)- all types:
 - knife hard snow (that can have a slot cut into it)
 - compressable snow (passes the snowball test), make sure to backfill the trench and compress it.
 - Weak (soft) snow that cannot be compressed to make it stronger (typically very cold or wet snow). Do not attempt to work harden the snow, it will make it weaker.

ICE AXE ARREST STATION

At this station, you will be tested on your ability to arrest. You will be expected to perform the skill with little to no hesitation and show proficiency arresting in hard snow. You will get a chance or two at arresting, so if the instructor does not deem the first try sufficient, do not worry you will get another chance (maybe two). You must pass this skill with all S grades in order to pass the field trip. It is likely that this will be your only chance to pass this skill and there will be no retests. Below is a list of the arrests you must perform:

- Feet first, with back on the snow, both with and without a pack
- Head first, with back on the snow, both with and without a pack
- Head first, with stomach on the snow, both with and without a pack
- Feet first, with stomach on the snow, no ice axe, no pack

GLACIER TRAVEL AND SNOW SKILLS

During the field trip, we will also continue to practice snow and glacier travel skills, as you did in Field Trip 3. However, the instructors are expecting you to be knowledgeable and able to perform the following skills when asked.

- Seat Harness prusik belay
- Passing a picket
- Kiwi Coil
- * Rope management/switch-backing/team communication
- * Practice using wands
- * Team Arrest

Ascending/Descending Techniques:

- Rest Step
- Kicking Steps
- Self-belay
- Glissading
- * Traveling in Balance
- * Backing down
- * Plunge Step

Crampon Techniques:

- American (combination)
- French (Flat-footing)
- German (Front pointing)