WORLD CUP MOGULS

WINSPORT, CALGARY

Volunteers Hand Book

Key Safety Points

- **No one is allowed on the course until a major official has inspected the course and relayed the conditions to the volunteers lounge and crew chiefs.**

- **If you missed the morning course condition announcement do not go out onto the course before being given a briefing.**

- **If you see a safety issue or have a safety concern relay it immediately.**

- **Keep the jump table's clean and tidy at all times.**

- **Never throw or slide tools or equipment to someone.**

- **If you get cold come indoors immediately and stay in until you are thoroughly warmed up.**

- **When working on the course and you have to make your way down the hill on foot always come down through the chop then zig zag down through the moguls.**

- **Right and Left (often referred to as skier's right and skier's left), if you are standing at the top of the hill looking downhill, the right side of the course is on your right side. This can be confusing because when you are at the bottom or anywhere else on the course looking uphill the right side is now on your left. This can cause a safety issue if you call to have the wrong lane closed.**

- **Helmets are not yet mandatory but it is a really good idea to wear one when on the hill.**

- **The chopping shovels are very sharp and will easily cut through a snowboard boot or hiking boot, be aware of where your feet and your neighbor's feet are while chopping the landing area.**

Introduction

Calgary has been host to the World Cup Moguls event for a decade now and we have achieved status as the best moguls' event on the World Cup Circuit. The course is considered to be the second most difficult and technically challenging course on the World Cup Circuit. We would likely rank number 1 if it was the full 250 meters long (as are most courses) but we only have about 200 meters to work with. Achieving and maintaining our status as the best takes a tremendous amount of effort and pride in what we do and hopefully this manual will help you to be the best you can be by understanding your role as a volunteer.

Terminology: Throughout this manual moguls will be referred to as moguls and/or bumps…it means the same thing!

Your Team

As a volunteer you are what we call a Minor Official. Minor Officials make up the on and off hill workforce and help to ensure the safety of the athletes and spectators as well as the successful operation of the event.

You will be working directly or indirectly with the Major officials who orchestrate the whole thing. As this is an International event and an excellent opportunity for training, most, if not all of the Major Officials will have an assistant gaining experience in order to become a Major Official themselves. To help familiarize yourself with some of the people you will be working with you can find the names of all the Major Officials and their assistants on the back cover of this booklet.

Whether you are a seasoned volunteer with freestyle or a first timer to the sport you will find a very friendly and welcoming environment that is built on teamwork. Your team will be comprised of parents that have, or had, children in the sport, along with alumni and freestyle fans. You will be working together with people with vastly differing levels of experience from little to no experience to World Cup and Olympic course builders and course crew that have many years of experience.

What to Expect

Expect to have a ridiculous amount of high energy fun in the snow! Freestyle Skiing is a very fast paced and exciting sport to watch and that gets magnified substantially when you are inside the fence line. You will

be dealing first hand with the best freestyle athletes in the world including past and future Olympic medalists and World Champions. Your days will be long and depending on what position you are volunteering for you might be outside from sun up to late in the afternoon or you could be indoors the entire time or a combination of the two. Regardless, you will be working with some really awesome and knowledgeable people.

It may seem a bit overwhelming at first due to the volume of athletes, coaches, support people, and minor and major officials you will be dealing with but don't let it engulf you because like you, everyone you will be dealing with is happy to be there, making for a very pleasant environment. You will have lots of help and support so no single position will be too much for one person to manage. You will be rewarded with some great memories and likely some new friendships.

Check in Procedures

All volunteers must check in at the volunteer desk each morning and check out at the same once done for the day. The smiling face behind the desk greeting you is our volunteer coordinator who helps the major officials coordinate all volunteer work on and off the hill. Please do not assume that if you have been seen by or said hi to the Volunteer Coordinator that you have been automatically checked in. You must actually stop at the desk and go through the short and not at all painful procedure of having your name checked off our list. The volunteer coordinator will be available in the volunteers lounge throughout the day and will be within radio contact at all times.

Upon initial check-in you will receive this hand book that you will want to read carefully (just in case there is a test) and instructions on where to meet your team. Upon daily check-in you will be assigned a radio if it is required for your position. You may also be given specific tools and/or equipment to take with you to your staging area or another area on the course. It is important that you check in and check out at the volunteer desk each day as your assignment may change due to unforeseen circumstances or we may need you to bring tools or equipment from the World Cup trailer. If you are assigned a radio please remember to return it when you check out each day so it can be recharged overnight.

Please arrive in the volunteers lounge a minimum of 15 minutes prior to the time you are required to be on the course and be ready to go at your specified time. There will be a briefing by the Chief of Course or your immediate supervisor that will give you a heads up on any issues that have

to be dealt with to get started building the course or getting the course open for the day. No one is allowed on the course until a major official has inspected the course and relayed the conditions to the volunteers lounge and crew chiefs.

When you check in each day please remember to take water, an energy bar, and hand and/or foot warmers with you, these are available to you at the volunteer check in desk.

Security

We do not have any official form of security for the event other than normal Winsport security. As with most freestyle events you attend the volunteers are the security. You should know everyone you are working with so if you see a strange face on the course or in the volunteers lounge question it immediately. If you see someone skiing or boarding into the course stop them and ensure that they should be there. If you see someone entering the course during competition or training that should not be there call for an immediate course closure.

Equipment

If you are a handy person and familiar with hand tools you will not have any issues with the tools we use. You will likely be using a shovel, landscaping rake, snow shovel, or snow scoop if you are part of the course crew. Other tools you might encounter are cordless drills with auger bits to make 2 inch holes in the snow about a foot deep to put fence poles in **(Pro Tip** – power tools that spin love long hair, long hair does not like getting tangled up with those crazy spinning power tools…..so keep the two away from each other). You will also be using pliers and side cutters for zip-ties, and possibly walkie-talkie style radios. If you are going to be involved with timing or any of the technical or admin positions we will provide specific training and you will be comfortable with what you are doing in no time.

Building The Course

Volunteers that are able to help with the course build will be working with a group of very experienced course builders that have built courses for every type of event from training courses, courses for club level events and World Cup and Olympic courses. You will be given very specific daily roles and will be teamed up with an experienced crew leader that will give

you on the job training. You can expect long hard days with a good leg workout going up and down the hill. A warm lunch in the volunteers lounge will break the day up and allow for everyone to get familiar with the progress being made and what is going to happen in the afternoon. It is important to wear layers and have warm gloves/mitts as there will be some things that have to be done with your bare hands and you will want to be able to warm your fingers back up quickly. Expect to get dirty so don't wear your best clothes. Wear your ski/snowboard boots so you can take the lift up and ski/snowboard over to the hill. It is acceptable to wear winter mountaineering boots as many of us do but plan on a lot of walking. If you are wearing ice climbing crampons you must remove them before getting on the chairlift or going into the volunteers lounge or any of the other buildings at Winsport. All of our equipment and materials for the course build are stored in the World Cup trailer which is situated just northeast of the moguls course in the parking by the large ski jumps.

Getting Started

We typically start our volunteer crew on the course build on the Saturday prior to the event. At this point a small crew has already spent a few days contouring the hill to accommodate the build. The start and jump tables will be in place. They will be relatively flat, level, and square to the course.

The first day typically starts with a brief overview of what the day will bring and the volunteers will be separated into smaller groups to:

1. Inventory equipment and material in the trailer;
2. Chop pine;
3. Sharpen shovels;
4. Staging equipment and materials;
5. Start pushing the course;
6. Etc.

Pine Boughs

Over the three days of training and competition we will go through as many as 12 large garbage bags of chopped up pine boughs. The chopped up pine boughs are used in the landing areas to help with visibility and definition for the athletes and spread over the course as needed to help with visibility and definition in the moguls. In the past this task has used up many volunteer hours.

The boughs come from unused Christmas trees that are donated. The boughs are cut off with a power hedge trimmer, and then they are chopped up into approximately 10 cm long pieces with machetes. In the past this has taken a crew of 2 or 3 people about 3 days to do. For the 2019 World Cup we rented a branch chipper and put the pine trees through this machine, and in a half day 3 people filled 30 bags which was enough for our event plus enough left over for the Canada Winter Games in Red Deer in February and the Canada Cup in Fernie in March. We are anticipating that the tree chipper will be utilized again this year so I will go through the procedure:

1. When setting the chipper up, place it so that a tarp can be hung as a backdrop to keep the discharge of chipped branches localized in one spot;
2. Make sure the chipper is on level ground and that there is no ice surrounding the machine that could cause someone to slip and fall on or into the running machine;
3. Wear safety glasses and hearing protection;
4. Do not wear loose clothing;
5. Do not for any reason reach into the chipper when it is running, even if the chipper is not engaged.

There will be one person operating the chipper and one or two people bagging. Stay out of the way of the discharge when the chipper is running. Do not overfill the bags as they have to be carried down the hill by hand. Chip up all the trees available as any excess will be used for other freestyle events.

Sharpening Shovels

The shovels we use have the edge sharpened to a chisel type edge with the taper on the inside or scoop side of the shovel with the back flat. The shovels are checked and sharpened when necessary with an angle grinder. Be sure to wear eye and hearing protection when sharpening the shovels. We have no vice or means to clamp the shovels so I have found the best way to work is to sit on the back of the trailer with the door open and legs dangling off the back sitting on the shovel with the step or kick edge of the shovel just resting on the edge of the trailer.

This position secures the shovel, gives you a good angle to work at and allows you to work so the grindings and sparks are directed away from you. This only works if you are right handed, those of you that are left handed will have to find a different method of holding the shovel.

Keep a consistent angle when sharpening and make sure you do not over grind any areas making concaves or a wavy bread knife look to the shovel edge. The shovels get used not only for chopping the landing area but for shaping the jumps as well and the jump shapers appreciate a very flat uniformly sharpened shovel.

Shovels are made of a carbon steel and are heat treated when manufactured and further work hardened through use so if you overheat the steel when grinding it you will effectively anneal it and make it very soft. Therefore, when grinding the blade never grind enough that the metal changes colour. If you change the colour of the metal past a very light straw yellow colour you have made a soft spot and if you get the metal red it is now fully annealed and chopping ice will cause it to bend. Without knowing the exact composition of the steel that the shovel is made of you cannot just heat treat the metal again to fix the soft areas you made so go slow and don't overheat the shovel blade.

Staging Equipment

The first day is a day for getting everything inventoried and ready to take out to the hill. One of the most important things to focus on is safety. We are working on a very steep hill and if someone is carrying a bundle of tools or equipment that is poorly secured it has the potential to lose parts while being staged which could slide down the hill injuring someone. We use stretch wrap to secure bundles of fence poles, shovels, event fence, etc.

Loosely wrapped bundles can be a tripping hazard as well. Ensure all bundles are properly wrapped before going out to be staged. The cat operator will drop off a basket near the back of the World Cup trailer which can be filled with everything that needs to go to the hill for staging. The operator will drop it off at the top of the course to be emptied and then skied down to the various spots on the course where needed.

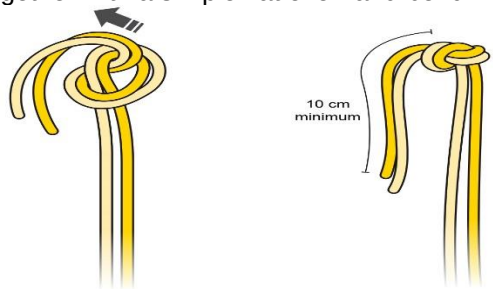
Cookies
(The wooden kind)

The top of the course at COP (Winsport) is probably the windiest spot in Calgary and if you put anything up there that is not secured it will blow away (so of course we stick a giant structure with tarps, tents, and banners up there). In order to ensure a gust of wind doesn't send it all tumbling

down the course we bury things referred to as cookies in the snow to hold everything in place. A cookie is a piece of plywood with a small hole drilled in the center with a rope through the hole to which a ratchet strap can be connected.

Cookies seem to go missing and our supply needs to be replenished every once in a while so to do so, do the following:

1. Find some plywood (minimum 12 mm) and cut squares 30 cm by 30 cm minimum (for you old folks like me that's ½ inch plywood 12 inches by 12 inches)
2. Drill a 12 mm hole in the centre of each cookie.
3. Cut and install enough rope for all of your new cookies.
4. Cut 2 meter long pieces of 3/8 inch poly rope and secure the bitter ends together with a simple flat overhand bend.



5. Put the now looped end of your rope through the hole in the middle of the cookie (the doubled up rope should just fit through the hole snugly)
6. Pull the rope through evenly right to the knot and you are done!

Your new cookies are ready to be planted. To plant the cookies:

1. Dig a hole in the snow just big enough to put the cookie in about 50 cm deep (1½ feet).
2. Put the cookie, knot side down, in the hole and fill the hole with snow packing it down as you go making sure to hold the looped rope tight.
3. Once the hole is filled with snow you should have a small loop of rope above the surface that you can secure a ratchet strap to hold something in place;
4. A small amount of water can be added to help freeze the cookie in place but within about 12 hours the cookie will be very secure with or without water.

When securing structures at the top of the course use more cookies and tie down straps than you think you will possibly need to avoid having to try and re-secure something as it is attempting to make its way to Saskatchewan!

Setting Up and Using The Transit

The transit is used to help ensure our course is perfectly square and parallel and it is used to do the initial placing of the course on the slope as well as set the fence lines, check the guide rope is running parallel when pushing the course, and to set the control gates. The transit-level runs not only sideways but also up and down. This enables you to determine whether something is perfectly plumb. The transit-level also allows you to run straight lines and to measure vertical angles. The following instruction by Paulo Kapronczai will run you through the setup and use procedures specific to building our course with a transit-level.

The setup of the Transit is done on the top of the counter slope. The counter slope is the smaller hill directly in line with the course and directly across from the finish area and chair lift.

First one must sight in the skiers left fence line, this is a trial and error process to try to get as close to the skiers left light standard in the finish bowl as possible. A provisional finish line pole is placed at the bottom of the course and poles are placed on each of the jump tables and finish area. The transit position is marked with a peg or a dot of red paint to indicate the center of the transit. Then a compass reading (degree) is taken at the start line and used to replicate the same reading (degree) on the counter slope using the transit position marking as the starting point. The transit should be moved along this line in order to facilitate the lining up of the mogul bump lines to be sighted in.

The next step is to move 22 meters to the skiers Right in order to create the skiers right fence line. Once guide poles are placed on the air tables and breakover the transit can be set up to shoot the first bump line. Once the first mogul line is measured off of the skiers right fence line and poles are placed at the top and bottom of the course the same measurement of 5.8 meters is measured along the transit line from the skiers right fence line transit mark. The transit location is then adjusted so that it lines up with the top and bottom poles indicating the first mogul line to be pushed. Once fine adjustments are made then poles can be put in place and a mogul bump marking rope can be placed with the use of the transit all the way down the course. This procedure is repeated using same principles

and measurements as outlined in “Pushing the Course” section until all the mogul lines are complete. Make sure to fence off the area that contains the line that was created for the transit so it does not get destroyed by normal cast grooming.

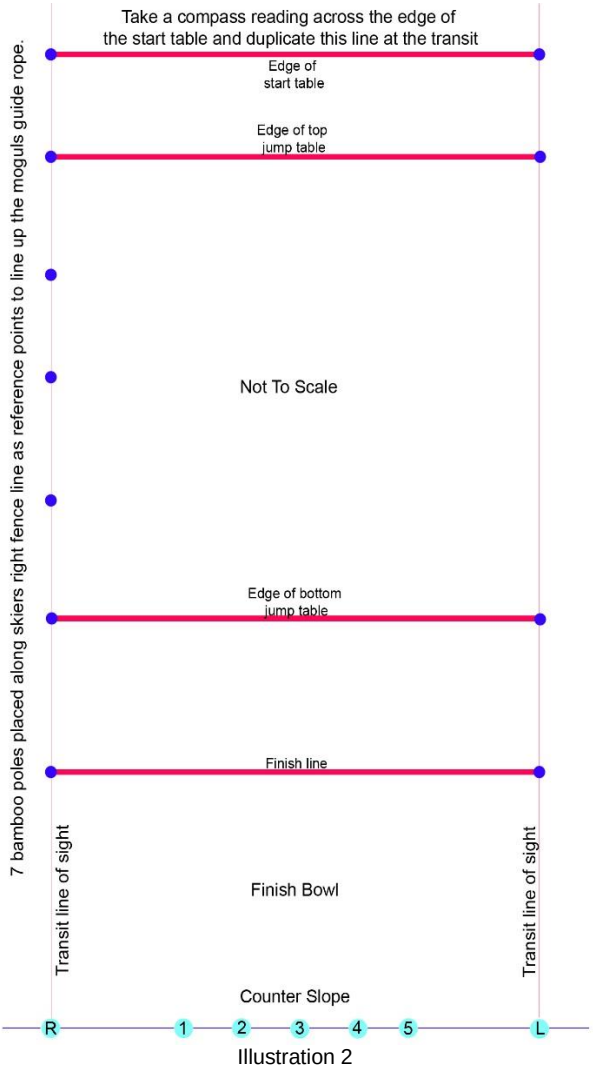


Illustration 2

The blue line at the bottom of the above illustration 2 depicts a rope line placed at the same compass reading as the start table to align your transit positioning marks. Once the skier’s left fence position (L) has been determined mark the centre of transit position with paint or a stake.

Measure across 22 meters and place another stake or paint mark to depict the skier's right ® fence line position for the transit. Measure 5.8 meters from the skiers right transit mark and place a stake or paint mark for the first push line (1), 8.3 meters for the second (2), 10.8 meters for the third (3), 13.3 meters for the fourth (4), and 15.8 meters for the fifth (5).

Setting The Guide Rope Up
This task requires 2 people and one of them will almost certainly be the chief of course.

The guide rope should already be flagged from last year's event. As our course is very similar in dimension year to year you should be able to just take the spool of guide rope to the top of the course and get started.

We have, however, in the past had a build rope go missing so I will go over the making and placing of it (just in case):

1. To begin place a couple of bamboo poles on the start table to secure the spool (garden hose reel with our build rope on it).
2. Have your partner ski the rope down to the bottom of the course past the finish line by 10 meters or so while you keep the spool from freewheeling and getting tangled.
3. Your partner can now cycle back up to the top of the course and help set up the rope.
4. Start by squaring the top of the course with a rope line at the edge of the top table. To do this put a bamboo pole in at the edge of the jump table in line with the right fence line and another one 3 meters down the fence line (ensure these two bamboo poles are perfectly lined up);
5. Next measure 4 meters in toward center of course from the edge of table bamboo pole and measure 5 meters from the lower bamboo to the edge of course;
6. The spot where the two measurements intersect is perpendicular to the fence line and perpendicular to where the parallel mogul lines will be, place a bamboo pole here;
7. Next run a rope line across the edge of your start table using the two bamboo poles as your reference. This rope will be used as a reference for placing the guide rope as well as a guide to cut a straight edge for the table line.
8. Now place a bamboo pole 5.8 meters in from the right fence line along the edge of table rope and tie your guide rope off to it.

You are now ready to start setting your alternating coloured ribbons every 3.5 meters (for this description we will pretend our ribbons are blue and pink):

1. When tying the ribbons on twist the rope and push it together to separate the braids and put your ribbon through the rope before tying it on to keep it from slipping;
2. Your last ribbon before the top jump table needs to be between 4 and 5 meters from the base of the jumps. If this does not naturally happen you can adjust your spacing between ribbons to as much as 4.0 meters instead of 3.5 meters;
3. Once the top of the guide rope is all nicely “ribboned” up you will need to make a provision in the rope so that it can be used for years to come without having to change the positioning of the ribbons. The easiest way to do this is to add a simple flat overhand bend (or if you are a rock climber go with an alpine butterfly loop) to your rope utilizing about 3 meters of rope to make the loop, this makes your rope adjustable in length in case tables are positioned differently from year to year;
4. Next measure 14 meters down from the edge of the jump table and place your next ribbon making sure it is not the same colour as the last one on the top section.
5. Continue down the course placing an alternating coloured ribbon every 3.5 meters apart until you get to the bottom jump table where you do the same thing that you did at the top jump table.
6. Make sure to put another overhand bend in the rope to keep it adjustable and this time measure down 15 meters from the lip of the bottom jump table to place your first ribbon making sure it is not the same colour as the one you ended with before the bottom jump table;
7. Continue placing the alternating coloured ribbons in the rope until you are at the finish line, the last ribbon should be no closer than 2 meters form the finish line.

You are now ready to align your guide rope and start pushing the course in. Once you are done pushing the course and you roll up the guide rope remember to remove the flat overhand bend or the alpine butterfly loop so the rope does not get tangled. This way, when it is used for the next year, it can easily be adjusted to fit the new course by adding or removing a ribbon and adjusting the length at both jump tables to suit the contour of the next course.

Pushing The Course
This task requires 7 people to align the guide rope.

The start of the course build begins with measuring the slope to determine where the course will be placed once all contouring has been completed. This is done prior to the Saturday so that the moguls can be pushed into place early Saturday and they can be shaped Saturday afternoon.

If you are on the crew pushing the moguls be sure to dress very warmly as most of what you will be doing is standing on the sidelines and waiting for the cat to go up and down the hill because for safety reasons you cannot be on the course when the cat is running.

You will be helping to place the guide rope for the winch cat to ensure the lines of moguls are perfectly straight and properly spaced. The guide rope has alternating coloured ribbon spaced 3.5 meters apart denoting where the middle of the bump should be. Our snow in Calgary is almost 100% machine made snow and because of this we have determined that the most effective way to push the moguls into place is to start by pushing half the snow required for each bump up from the bottom and then push the same line again from the top down, adding the other half of the required snow for each bump.

The cat pushes a full line of bumps from bottom of course to the top of course approximately 5 meters wide, 2 meters deep and ½ meter high. The spacing between bumps is approximately 7 meters.

On the second and subsequent pushes half of the bump on the previous push is cut away with the blade and used to help form the bumps in the next line half way between the previous line of bumps as shown in illustrations 3 through 8.

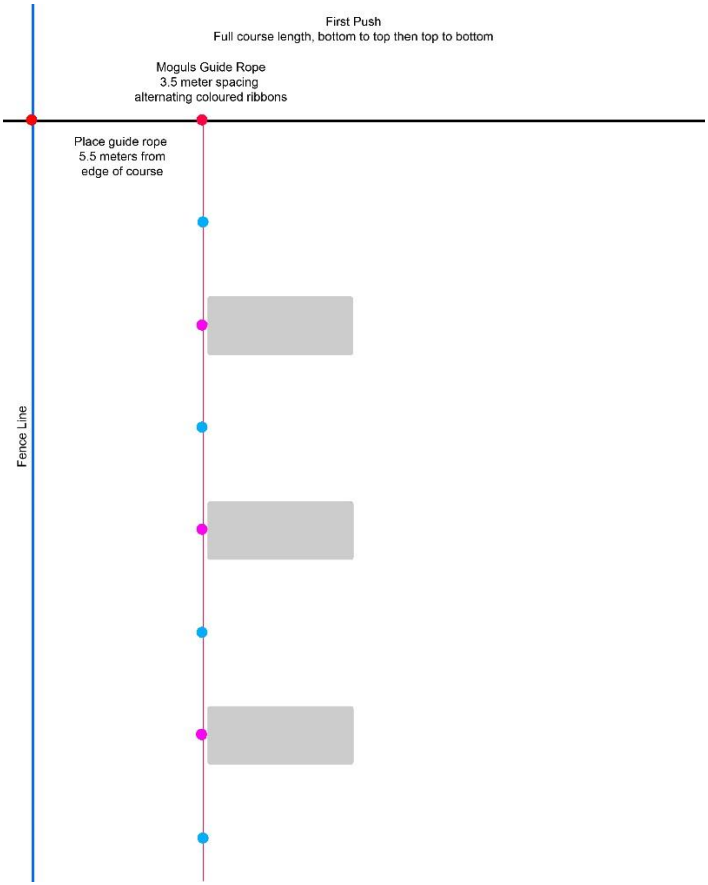
In 2018 new safety measures were implemented by Freestyle Canada and Winsport to ensure the course would be wide enough to accommodate the sides of the course being groomed each day. In 2019 for the first time we were able to build a 22 meter wide course to accommodate a winch cat grooming the area between the fence and outside of the moguls.

To begin the push, a transom is used to determine the skiers' right fence line. Once lined up, place a bamboo pole at the start of the course, the finish line, the edge of each jump table and 3 more evenly spaced between the two jump tables. These bamboo poles are put into place to help align the moguls' guide rope.

The edge of the first mogul should be 6 meters from the edge of the course and to achieve this place the moguls' guide rope 5.5 meters from your fence line. This gives the cat operator a 50 centimeter cushion to work with so the rope does not get caught on the cat or get pushed over by the buildup of snow for the bumps.

Once the guide rope is in place the first push can be started, pushing ½ the required volume of snow up to the pink ribbon on the guide rope then driving over the bump being careful to not spin the tracks.

Once the entire line has been pushed from the bottom up the operator now comes down the hill and pushes ½ of the volume of snow required for the bump down to the pink ribbon and then lifts the blade and drives over the bump leaving a nicely rounded bump approximately 5 meters wide by 2 meters deep and ½ meter high.



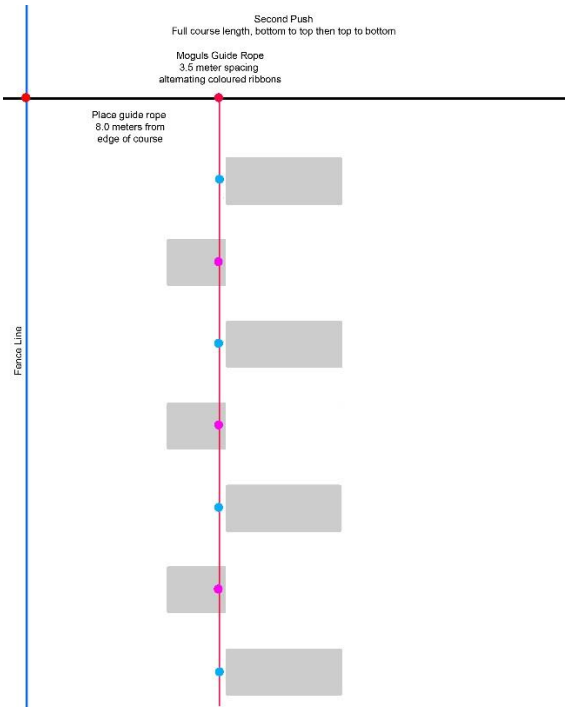
Once the first line of bumps has been pushed and the cat is on the bottom of the hill the operator will slack the cable off and it is time to move the guide rope over 2.5 meters to mark the second line of bumps. Be sure to measure from your guide poles at the top and bottom of the course as well as the two air table markers and the 3 mid-course markers.

The second measurement should be 8.0 meters from your fence line markers which again gives the cat operator a 50 centimeter cushion.

Once the guide rope is in place the second push can be started utilizing the blue coloured ribbon as a guide which places the second row of bumps 3½ meters apart from the bumps in the first row.

Continue pushing ½ the required volume of snow up to the blue ribbon on the guide rope.

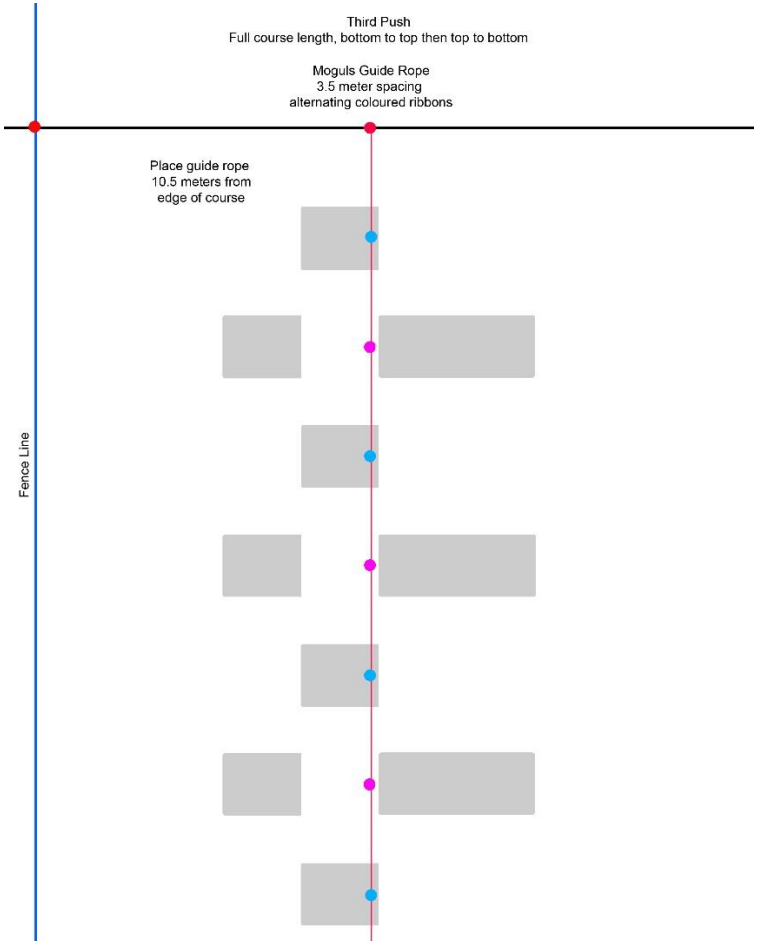
Once the entire line has been pushed from the bottom up the operator now comes down the hill and pushes ½ of the volume of snow required for the bump down to the blue ribbon and then lifts the blade and drives over the bump leaving a nicely rounded bump approximately 5 meters wide by 2 meters deep and ½ meter high.



Once the second line of bumps has been pushed and the cat is on the bottom of the hill the operator will slack the cable off and it is time to move the guide rope over another 2.5 meters to mark the third line of bumps. This third measurement should be 10.5 meters from your fence line markers which gives the cat operator a 50 centimeter cushion to work with.

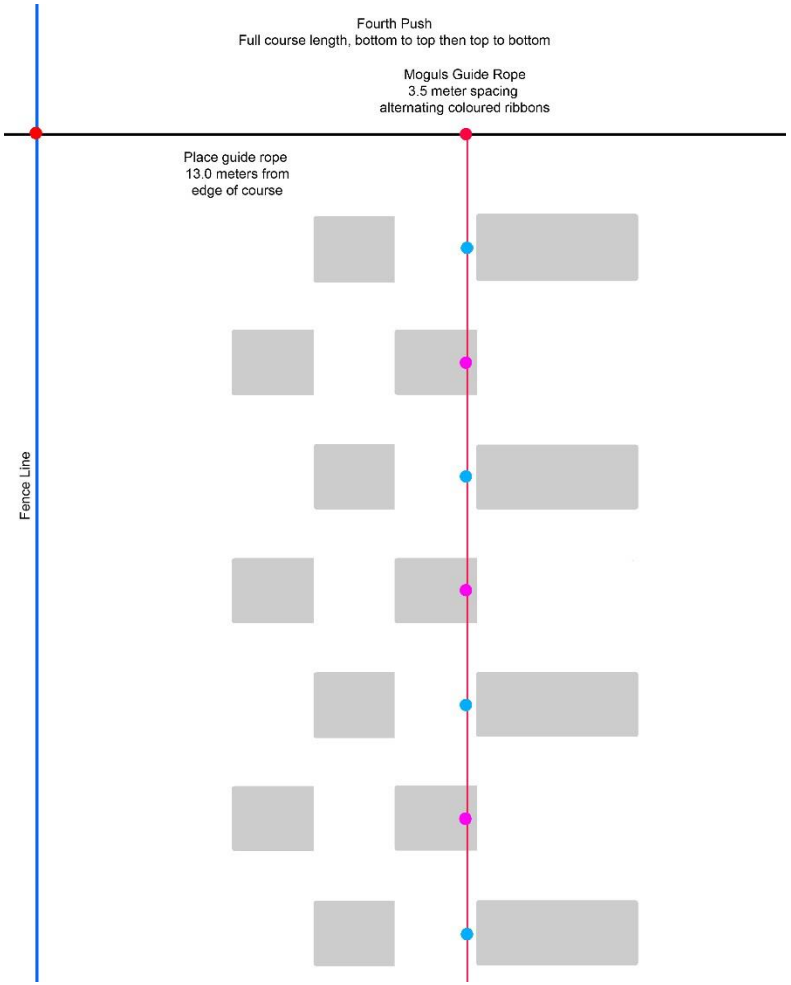
Once the entire line has been pushed from the bottom up and the cat is on the start table the operator may need to move the cable over to a new anchor position closer to the left side of the course so that the cable does not interfere with the mogul guide rope.

The operator now comes down the hill and pushes ½ of the volume of snow required for the bump down to the pink ribbon.



Once the third line of bumps has been pushed and the cat is on the bottom of the hill the operator will slack the cable off and it is time to move the guide rope over another 2.5 meters to mark the fourth line of bumps. This fourth measurement should be 13.0 meters from your fence line markers which gives the cat operator a 50 centimeter cushion to work with

Once the entire line has been pushed from the bottom up the operator now comes down the hill and pushes ½ of the volume of snow required for the bump down to the blue ribbon.



Once all four lines are pushed move the guide rope over 2.5 meters one last time to trim the fourth line of bumps to a uniform 2.5 meter width.

This fifth measurement should be 15.5 meters from your fence line markers which gives the cat operator a 50 centimeter cushion to work with. See illustrations 7 & 8.

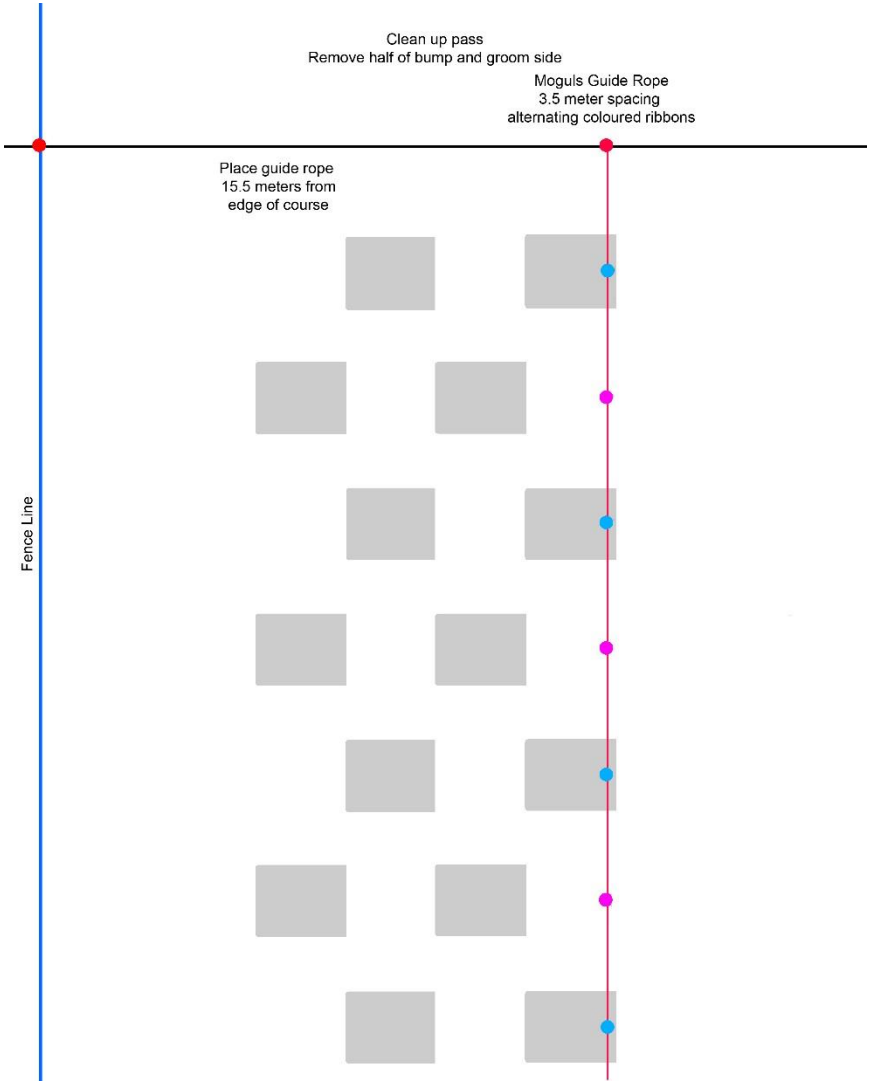


Illustration 7

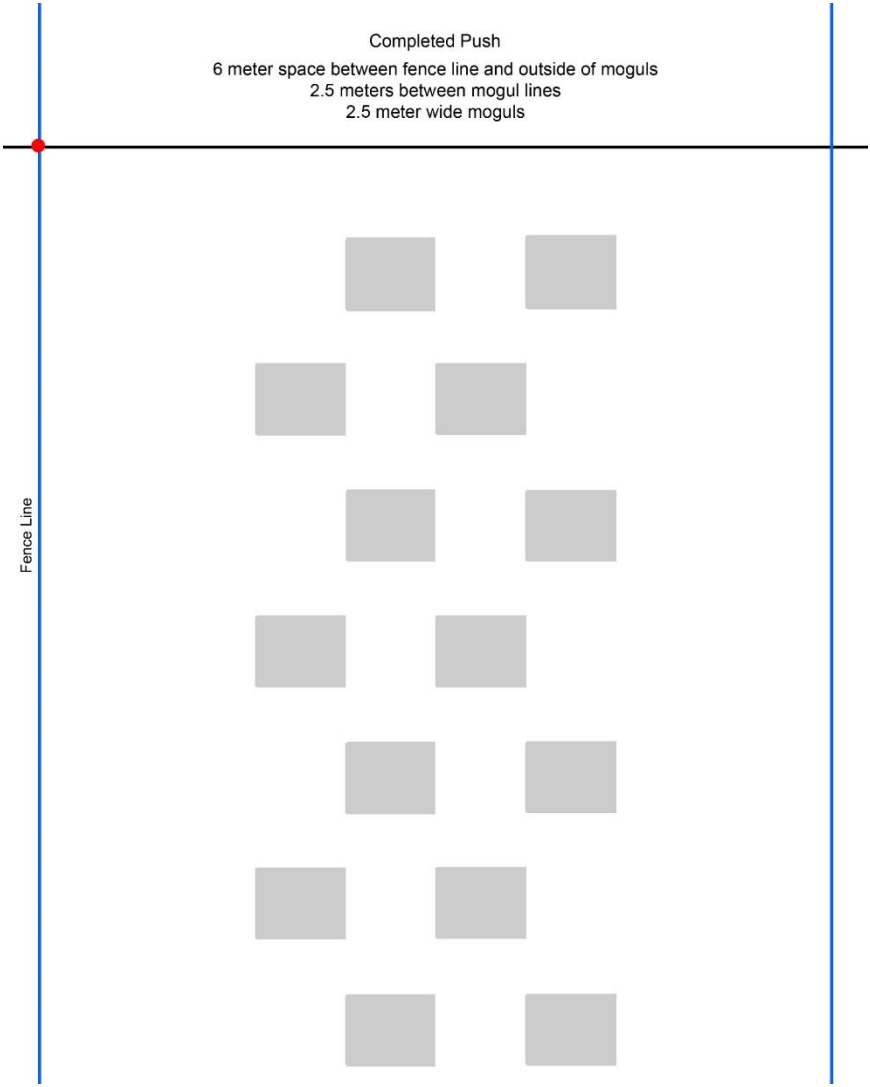


Illustration 8

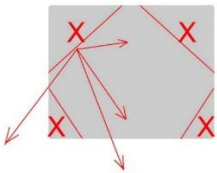
Shovel Shaping the Moguls
The shaping crew should consist of a minimum of 9 people and ideally 12.

Shaping of the moguls is initiated with shovels and finished by experienced (typically non-competing) athletes who ski the lines in. Shaping the bumps appears to be a matter of simple geometry on the surface but once on the hill you will realize it is more of an art form.

Illustration 9 below shows the basic shape of the bump and where to remove and place snow in order to shape the bump into a skiable mogul:

1. When you cut snow from the top of the hill side of the bump or mogul face do so with your shovel at about a 60 degree angle.
2. Throw most of this snow onto the top and back side of the mogul.
3. When you cut snow from the back or bottom side of the mogul do so with your shovel at about a 45 degree angle.
4. Push any excess snow down to the next bump.

As you progress down the course ensure that your bumps are staying in a straight line both up and down and diagonally in relation to the other lines of bumps. Also make sure your bumps stay a uniform size. Typically the chief of course will be leading the shaping crew with the two or three most experienced/talented shapers coming down last to make any minor adjustments and to ensure we have a very uniform course that will be easily skied in.



Once the moguls are all shaped and have had a bit of time to set up they can be skied in. Any imperfections in the bump shape will be fixed in this process and you will be left with perfectly shaped moguls as shown in illustrations 10 & 11.

Ski Shaping the Moguls
9 athletes is a good number.

Skiing the moguls in needs to be done by Provincial team member level athletes or better. The following description on skiing the moguls in has been supplied by a retired athlete that has competed on this course as well as helped ski it in on many occasions. The description is geared for helping the athlete understand what exactly it is that they are trying to accomplish when skiing the lines in and shaping the moguls.

Safety first – When the athletes are on course they must be aware that they do not have the right of way and must always yield to the workers on course. There will be tools, equipment and materials on course that could pose a safety threat so always stay conscious of your surroundings.

1. Start by stepping in each line, this is done by skiers taking small steps while wearing their skis and exerting pressure on the track so as to form a ski line free of cookies and ridges. Once each line has been stepped approximately 6 times, depending on snow conditions, slipping of the course can begin. Slipping of the course is achieved by sliding down each line with your skies at approximately 70-90 degrees to the line. The goal of slipping is to smoothen out the line and round out the sides of the moguls thus starting to shape each bump. Slipping is done approximately 2 to 3 athletes per line and each line should be slipped 3 times.
2. Skiers should start skiing in the lines at about 50% speed and speeding up as the course allows. The more a line gets skied in the smoother it gets thus allowing for more speed in subsequent laps.
3. At this point the athletes will have a very good idea of where any problem areas might be. For example a single mogul or a few might be a bit large and or out of alignment requiring some shovel work. Chief of course should be contacted and made aware of problem areas so attention can be given to these issues.
4. Once the athletes are satisfied with the condition of the course they can start doing a few faster passes with proper mogul skiing form and some final tweaking.
5. It is important that through each step the athletes are rotating lines and being sure each line gets the same number of runs from each athlete so that one line doesn't become unique to the other lines.

More safety – Be sure to stay as a group when skiing the course in and always check with your coach at the top of the course prior to going down

the course in case the course workers are in the moguls and you need to avoid a specific area.

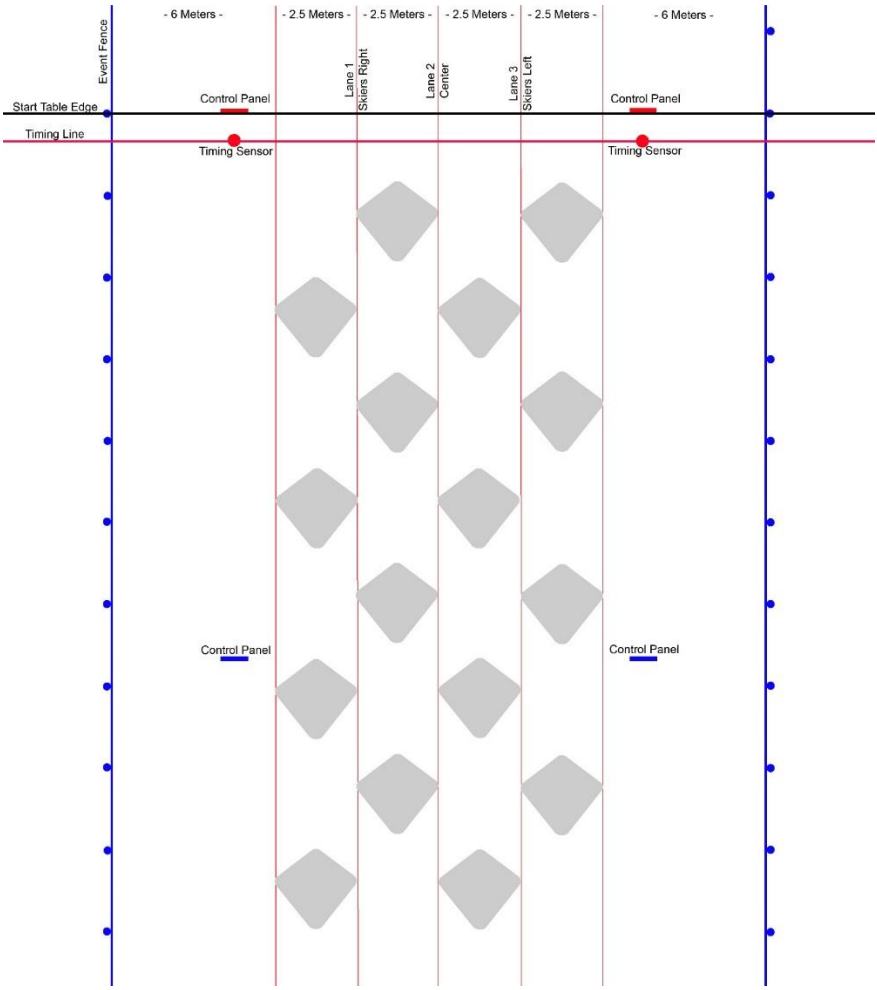


Illustration 10

Illustration 11

Once the moguls have been shaped, skied in, and the 3 lines defined it is time to build the jumps. By this time the fence lines should be in place so we will go through a brief description of setting the fence lines.

Fencing
The fencing crew is made up of 5 people
(We take our fencing very seriously)

We have a surveyor's transom in place at the bottom of the hill and the course has been squared and the mogul lines have been set using this so it is no surprise that the fence lines are placed using the transom as well so that everything is perfectly straight and parallel.

The fencing crew is made up of 5 people, transom operator, driller, measurer, pole carrier, and pole stager:

1. To start, take 2 new straight pieces of bamboo pole and tape them together to make a pole 1½ bamboos long, this is the proper spacing between fence poles
2. Once the transom operator is in place and set up you can start placing poles. Start at the top of the course and work your way down, measure the distance between posts and place the drill bit on the snow, the transom operator will tell the driller to move either in (toward center of course) or out (away from center of course). We strive to have our lines straight (within about ½ centimeter of perfect from top to bottom) and if there is a pole that is outside of this tolerance it really sticks out visually and you will have to fix it, so be sure to strive for perfection;
3. Once the fence poles are all in you can start hanging the event fence. Be sure to keep the fencing tight so there are no sags between poles. Start the fencing from the top of the course and work your way down.
4. When you come to the end of a roll of fencing you need to start a new roll before securing the uphill roll to the last pole. This gives a downhill overlap that has very little chance of snagging an out of control skier or any of their equipment which could cause injury.

As mentioned earlier it gets breezy at the top of the course from time to time so we do a couple of things to help maintain the integrity of our fences:

1. When the fences are hung on the fence posts the fencing above the breakover does not get secured to the bottom of the fence posts;
2. Half way between the posts the fencing is bunched up and secured with a zip tie (see illustration 11).

The fencing can be dropped down and secured quickly with 2 people working each side on their way to the bottom jump table the morning of the competition.

We also zip tie banners to the inside of the fence on the skiers left side from the top of the course down just past the top jump table. This puts a tremendous amount of strain on the fence poles and has, in the past, caused poles to break and pull out of the snow. To combat this we put short pieces of bamboo poles in the snow at about a 60 degree angle away from the fence, 1 meter outside the fence line beside each fence post and then we tie the top of the post to the bamboo anchor.

Jump Building

The squaring of the jump table and setting the forms will require 4 people. Once it is time to start filling the jumps with snow it is advantageous to add 2 or 3 more people to the crew.

Before you can build jumps you need to make sure you are building the jumps square to the course. In order to do this you need to set a line at the edge of your jump table that is perpendicular to the mogul lines. The easiest way to do this is to use the fence line that you know is perfectly straight and parallel to the mogul lines.

If the fence is not in place you will need to have someone on the transom to set your fence line bamboo poles. To do this put a bamboo in at the edge of the jump table in line with the fence line (pole A) and another one 3 meters up the fence line (pole B). Ensure these two bamboo poles are perfectly lined up.

Next step is to measure 4 meters in toward the center of course from the bottom or edge of table bamboo (pole A) and measure 5 meters from the upper bamboo (pole B) to the edge of course. The spot where the two measurements intersect should be perpendicular to the fence line and perpendicular to the parallel mogul lines. Place a bamboo here (pole C).

The next step is to run a rope line across the edge of your jump table (pole D) this will be used to help position your jumps as well as a guide to cut a straight edge for the table. See illustration 12

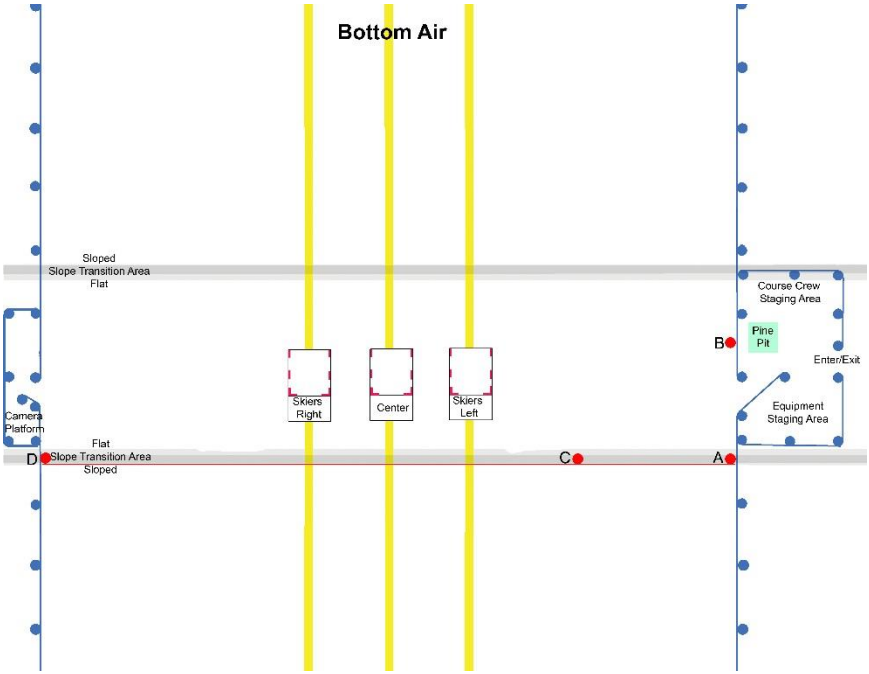


Illustration 12

You are now ready to start lining up your jump forms. Your mogul lines have been skied in and are very well defined so finding the center of the line is relatively easy if the light is good. Have someone take a rope uphill at least 3 moguls high and another person take the other end downhill past the chop and at least 2 moguls downhill.

Once the center of the line has been established a measurement can be made from the edge of table line to position the jump relative to the edge of the jump table and a center mark can be painted onto the jump table.

Once all three jumps are in place, lined up, and leveled they can be secured in place with bamboo and filled with snow. The jumps should all be approximately 2.5 meters apart center to center and the middle jump should be the same distance from each fence line right in the middle of the course (these measurements may vary a little bit as the lines can shift slightly as the course gets pushed, shaped, and skied in).

It is good practice to measure this to ensure that you have truly placed your rope line in the center of the mogul lines. Adverse weather conditions such as fog or extremely flat light can impair your vision enough that you can get a jump placed incorrectly. Although the alignment of the jump table and the jumps will be orchestrated entirely by the chief of course it is

helpful to understand what is being done so you can not only efficiently help out but so you can possibly implement some of the techniques in building courses at your home hill.

The next step is every bit as critical as getting the jumps in the right place. Filling the jumps with the proper snow water mixture could mean using as much as 15 gallons of water per jump to ensure that they are still flexible but not soft and not blocks of ice. The amount of water needed is dependent on snow conditions and temperatures. If the core of the jump is even a bit too soft when the more aggressive skiers hit the jump it will cause the surface to pop off in chunks and even with the application of fertilizer you will be repairing the surface of the jumps constantly.

Again the snow mixture is up to the chief of course but it is important to understand what is being done and why it is being done to efficiently help. You may also notice that the water to snow ratio between the top jump table and the bottom jump table could be quite different. That is due to the consistency of the snow at COP varying tremendously in different spots of the hill due to sun and wind. The top of the mogul course typically gets lots of both and the bottom gets very little of either.

There are a variety of methods used to fill the jumps with snow but we will be utilizing what we have found to be the most effective method for our course:

1. Start by having the cat operator push a fresh work pile of snow up to the side of the table. If the work pile is already there and has been sitting long enough to set up you will need to chop the snow up with shovels.
2. Place the snow blower sideways on the uphill side of the jump form about a meter away, transport snow to the snow blower with the big blue snow scoops and use shovels to shovel the snow into the auger of the snow blower.
3. The snow blower operator will direct the snow evenly into the jump forum.
4. The chief of course will determine when to stop filling the jump forum with snow and start to add water, typically this happens 5 or 6 times in the course of filling the jump up with snow.
5. Water is poured evenly over the snow and then gets chopped in with shovels to mix it up quickly before being packed by someone on skis.
6. When the snow is being packed be sure to have someone leaning on the side of the jump form to make sure the sides of the jump get packed without bowing the sides of the jump form out.

7. Once the snow has been packed sufficiently add more snow and repeat the water, mix, and pack procedure until the jump forum is full.
8. Once full, use a bamboo pole to scrape any excess snow off the jump making it conform to the exact shape of the jump forms.

Scraping excess snow away makes the final shaping of the jump easier because all the jumps will be almost exactly the same size and shape and will all be perfectly square and level. When removing the jump forms do not pull the forms away from the jump, instead, bang the sides with your ski boot a bit and lift the form up sliding it to help ensure that no big chunks of snow are pulled off the jump.

The jumps need to set up at least 12 hours and preferably 24 hours before they can be used.

An alternative method of filling the jumps is to use the snow blower to blow a work pile of snow in front of the jump using a piece of plywood or a few scoop shovels as a backstop then adding water to the snow on the ground and mixing it up before using the snow blower again to now blow it into the jump form.

When utilizing this method the snow blower is set in place beside the jump and snow is shoveled into it. The operator directs the blown snow in front of the jump. Once enough snow has been blown in place to fill the jump, use the chopping shovels to separate a windrow of snow about 75% of the width of the opening on the snow blower. Add water to the snow and mix it up quickly with the shovels. Once mixed the snow blower operator walks the machine down the length of the windrow blowing the snow into the jump form.

The consistency of the snow should be ideal for making snowballs. Once through the windrow it is time to pack the snow down by foot and with snow shovels have crew members move enough snow over to the front of the jump again to make another windrow, add water, mix, and blow it into the jump form. Repeat this process until the jump is full.

When using this method do not chop up the snow with shovels once blown into the form. This will actually cause the snow to have air pockets throughout the jump. When using this method the snow does still have to be packed and the best way to pack it is to use someone with snowboard boots to pack it by foot.

If no one is available with snow board boots use your lightest person with ski boots on to do the packing. You will notice that it is very easy to find areas in the jump where the snow may not have the proper water snow mixture which will show up as a soft area when stepped on. Simply shovel this snow out and refill it with freshly mixed and blown snow.

This method gives a very uniform snow mixture throughout the entire jump and eliminates the ice veins that are predominate in the jumps built using the first method discussed. When using this method to fill jumps cut back on the water ratio for the final 5 cm so the surface can be shaped a bit easier.

The Chop
The chop requires everyone to join in and have fun

Chopping of the landing area is probably the most fun you can have with a shovel! This is quite obvious because there are many pictures of course crews from all over the world with shovels in hand and big smiles on their faces, including on the cover of this booklet.

The chop should start approximately 2 meters wider than the outside of the jumps and 15 meters downhill measured from the lip of the jump for the top air table, and 16 meters for the bottom air table.

There will be a marker flag placed on the event fence indicating where down the hill to start the chop. Chop the landing area starting at the bottom and working your way up the hill, the chop should be a minimum of 1.5 shovel blades deep.

Typically the size of the chop should be 3 to 4 inches but is determined by the snow and temperature/weather conditions. Check with your chief as to what he/she wants.

Once the landing area has been chopped it will need to be stepped, which is basically walking down the landing area sideways with your skis on and stomping the snow down crushing the big chunks of snow and lightly compacting the landing area.

During the course build the landing areas will need to be chopped once or twice a day depending on the snow and weather conditions.

Building Camera Platforms
The top platform requires 6 to 8 people

The camera operators require a very specific platform to be built onto the sides of both jump tables. Both camera platforms are built on the skiers' right side of the course and are outside of the fence line.

The platforms are built entirely out of snow. The top platform accommodates a boom camera and the bottom accommodates a chair tripod mounted camera. The elevation of the top platform is approximately 4 feet above the level of the jump table and the elevation of the bottom platform is approximately 1½ feet above the level of the jump table. A third platform is built outside of the finish corral at the bottom of the course.

The top platform is marked out and 4 x 8 framed sheets of plywood are held in place utilizing bamboo, shovels, and people then filled with snow placed by the snow cat and a crew of two or three people using hand shovels (Illustration 13). The finished platform runs parallel to the edge of the course and is approximately 1 meter narrower than the jump table to accommodate access (Illustrations 14 & 15).

Illustration 13

Illustration 14

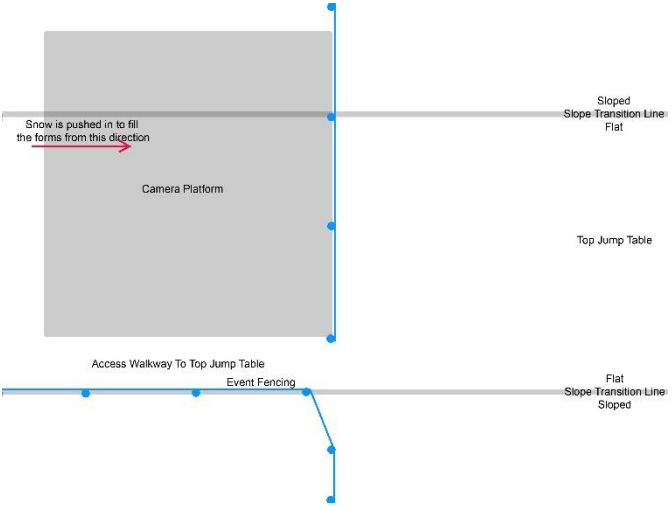


Illustration 15

The platform on the bottom jump table poses an entirely different set of problems due to cat access to the jump table being only from the skiers left side. The snow cat has no access to the bottom once the jumps are in place and the slope is far too steep to just push enough snow that the table can be made wide enough to accommodate the camera platform.

The first step in building the bottom jump table is to have the cat bring a fresh work pile of snow in to the skiers left staging area that can be transported to the platform site via snow scoops.

The platform itself, has to be built in at least two stages as the east side is more than 8 feet high. We have in the past come very close to disaster while building this platform and because of this we are going to be changing the way we hold the forms in place.

In the past we would use 6 to 8 people to hold a form in place while filling and packing snow. One wrong step and the whole thing could come crashing down and slide down the steep embankment. This happened during the 2019 course build prompting us to look into a safer construction method. Fortunately no one was injured and we did realize that we were going about it all wrong and had to make changes.

The major change is the way we will be securing the forms in place. The old method was to pin the bottom of the forms with bamboo and then just physically hold the form in place using enough manpower to hold it all up. Our new method is as follows:

1. Determine where on the slope to start your first fill and where to place the forms.
2. Shovel a flat level ledge in the slope approximately the width of the form.
3. Once you have a ledge cut into the slope you can start placing the forms by hand making sure they are relatively level and square. The forms have 3 holes in the bottom rail and matching ones on the top. Using a fence pole drill bit, drill a hole in the snow through the holes in the bottom rail then slide the three 8 foot long steel poles through the top and bottom holes and down into the snow.
4. Secure the rope on the top of the steel poles to anchors drilled in the jump table at about a 45% angle away from the forms. Once the first form is secured in place put the rest of the forms in using the same method and start filling the forms with snow.

You can use a single anchor for more than one rope but do not use a single anchor for all three on one form. Make sure your anchor points are far enough apart that you can get the scoops through to fill the forms with snow.

Once the first fill has set up you can remove the forms and move them up onto the table you have made and start the process all over again to build the second tier of your camera platform.

It is strongly recommended that the second level is in at least ½ meter from the edge of your first level for stability. Anyone going over the side placing the forms should be wearing a harness and be tied off to a snow anchor. You will be required to view a safety video on the proper use of a safety harness if you are not already certified.

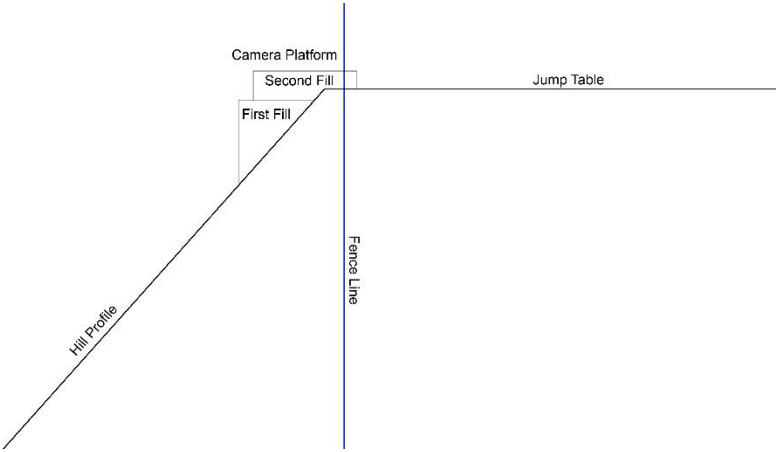


Illustration 16

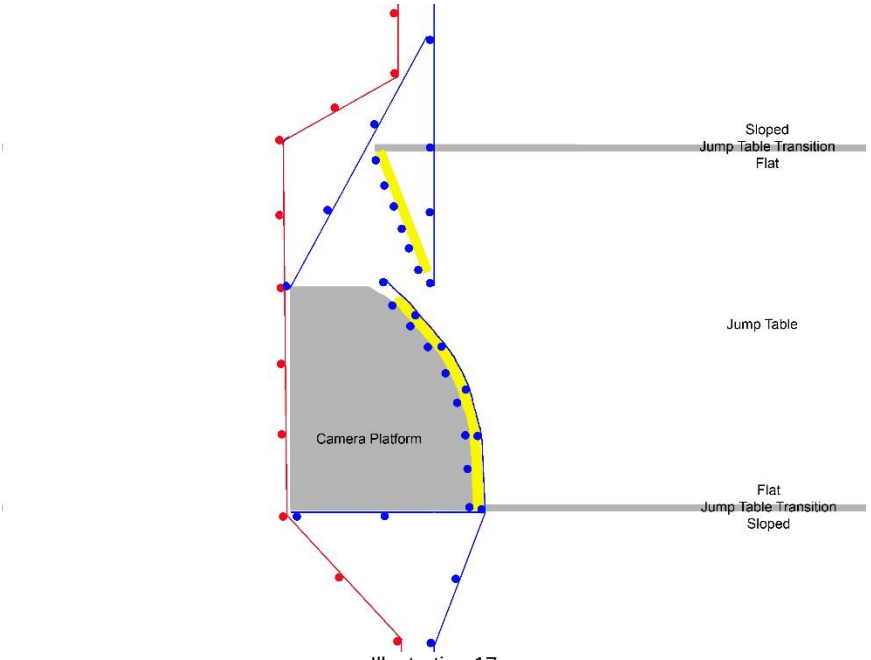


Illustration 17

The camera platform on the bottom jump table will encroach a bit onto the course but this cannot be helped. Therefore a yellow crash mat is placed along the edge of the platform and another one at an angle behind the fence in the staging area as shown in illustrations 17 & 19.

Illustration 18

Illustration 19

The easy one! The camera platform at the finish area is made entirely by the cat operator, no forms or shovels required ☺ although the camera operator does usually borrow a shovel to cut a set of steps into the side.

Illustration 20

Start Table
Leveling – This is usually done with 2 to 3 people.

Initial leveling is done by the cat operator and is done using the horizon and a hand held level as a reference. A final leveling is done utilizing a leveled rope line, squared to the course. The cat operator will now push snow into the low areas and landscaping rakes are used to help level it all out and make the edge sharp and square. A bit of water may be applied to help keep the integrity of the start edge all the way across the start area.

The start tents are secured utilizing cookies and ratchet straps, if there is any chance of a breeze use more cookies than you think you will need.

Transit Pad Fence
This is a 1 person job

I am not going to attempt to explain how to set up, align, and use a transit because I believe it might be magic, but we do have some qualified people able to operate it and a very good setup and operating guide near the beginning of this booklet.

Your interaction with the transit will likely only be for fencing or running the mogul lines unless you are asked to fence the transit area off. When the transit is initially set up the cat operator levels off an area across the bowl from the course at the top of the knoll over there and grooms it.

Once the groomed snow has set up the transit can be placed, once the transit has been placed and the course lines set, the transit operator will have painted red marks on the snow for reference. This area needs to be fenced right away so the cat operator does not come by and groom over the marks.

Typically the transit operator will be with you to show you where to place the fence but, if not, simply locate all the red X's in the snow and put a fence around the group of them leaving approximately 3 meters space between the fence and the marks.

You will need a drill with an auger bit, some zip ties, a roll of fencing, and a bundle of bamboo to use as fence poles. This area is temporary and taken down after the course build and fencing are completed. Therefore, try and use fencing that will not be used on the course.

All Those Little Things
Timing cable – This job requires 2 people, 1 on skis and both with a radio.

Identify the proper cable to be strung and bring it to the top of the course on the right side. At this time the timing stakes should be in place so drill 2 holes in the snow to secure the cable spool with bamboo poles.

Have a skier slowly take the cable down the right fence line while you are controlling the speed that the cable is being spooled out. Be sure you let the skier know over the radio when the cable is coming to the end, you will need to have about an extra 4 meters of cable at the top of the course. Once laid out your helper can cycle back up to the top of the course.

To start placing the cable put a bamboo pole in a bit uphill from the timing stake. Zip tie the cable to the very top of it leaving enough of the end hanging down that it will connect to the timing eye near the bottom of the timing stake.

Put another bamboo on the fence line at the top of the course and zip tie the cable to the top of it making sure there is no sag in the cable. Now run the cable down to the fence looping the cable over every second fence post with the cable draped on the outside of the fence. Once near the top jump table the cable needs to go up on the bamboo again and around the outside (or right side of the camera platform) and across the access walkway before coming back down and being looped over every second fence post with the cable draped to the outside of the course.

When you come to the bottom jump table go around the outside of the camera platform using bamboo and zip ties then back onto the fence as before down to the finish line. The Chief of Timing will take over from here.

Finish Line – 1 person can do this job

Place a bamboo in line with the timing eyes on each side of the course and run a rope across the course making a straight line. Prior to drilling holes in the snow for the bamboo to run a straight line make sure you are aware of where the timing cable is buried and be sure to avoid it. If you have any doubt about the location of the cable do not drill a hole.

An alternative method is to run your rope line from fence line to fence line with a bamboo laying on the snow horizontally between the fence poles at the jut out around the timing eyes. With a sharp chopping shovel cut a line in the snow along your rope straight down about 10 cm (4 inches) deep and as wide as the inside of the bottom control panels. Next step is to scoop a flat ledge out to the 10 cm deep mark leaving a shelf or step all the way across the course. Once done apply red paint to the 10 cm (4 inch) vertical part as it is a reference for the judges. Illustration 20.

Banners – This job requires 3 – 5 people.

This is not really a little thing as the banners cover a fairly large percentage of our fencing that is within camera view. We have a banner guru that knows where to place all the banners on the course and you will be taking instruction from him.

The banners are located in the World Cup trailer and need to be inventoried prior to being staged and hung in their proper places. When

hanging the banners try to have them tight with minimal sagging and the tail end of the zip ties are hidden.

Control Gates – This Job Requires 4 People

The control gates are used as visual reference by the judges and are placed at 10% increments evenly down each side of the course in alternating colours.

If our course is 205 meters long then at the start line there will be a red control gate on each side and 20.5 meters down the course there will be a blue control gate on each side of the course.

To get started you need to know the official length of the course and simply divide that number by 10 to get the distance between control gates.

The next step is to determine where to place the control gates in relation to the center of the course, (typically just on the outside edge of the outside moguls). This positioning will be determined by the chief of course. It is important to ensure the placement is identical on both sides of the course as the control gates also represent the outside of the course and if a competitor skies around the outside of a gate they are disqualified so having one side narrower than the other is unacceptable.

The most accurate method of placing the control gates is to use the transit so get your transit operator in place and lined up:

1. Starting at the top of the course place your first control gate just above the timing stake and timing eye using the transit to align the hole for the inside leg of the control gate.
2. Drill a hole for the outside leg as close to perpendicular as you can but it's not important to be really accurate because you will adjust this positioning when you do the other side. This gate should be red and once in place lift the fabric up as high as possible to help keep the wind from catching the gates and blowing them out and down the hill.
3. Next step is to measure down 20.5 meters (for a 205 meter long course) downhill from the first gate and align your inside hole with the transit again and place a blue gate. Continue alternating colour all the way to the bottom of the course placing your last gate just uphill from the timing eyes at the finish line.

It is a good idea to continue bunching the fabric up toward the top of the gate even at the bottom where the wind has little effect, this is done to stop

the control gate from collecting snow. It is not unusual for a gate to collect a foot or more snow in a couple of days of training on the uphill side causing an unsafe launch pad for an out of control athlete.

The transit operator will now move over to the other side of the course and get lined up while you are on your way to the top of the course to do it all again on the other side of the course.

Once again you are using the transit to line up the inside post of the control gate and starting with a red gate for the top. It is now easy to get the gates perfectly lined up because your inside poles were set with the transit and the distance apart up and down the hill has been measured the same on both sides so simply line up the outside hole to the inside pole and the inside pole on the other side.

This will make the control gate nice and perpendicular to the course. You will now be able to see if the gate on the other side is lined up so correct it if it is not. See illustration 22 below.

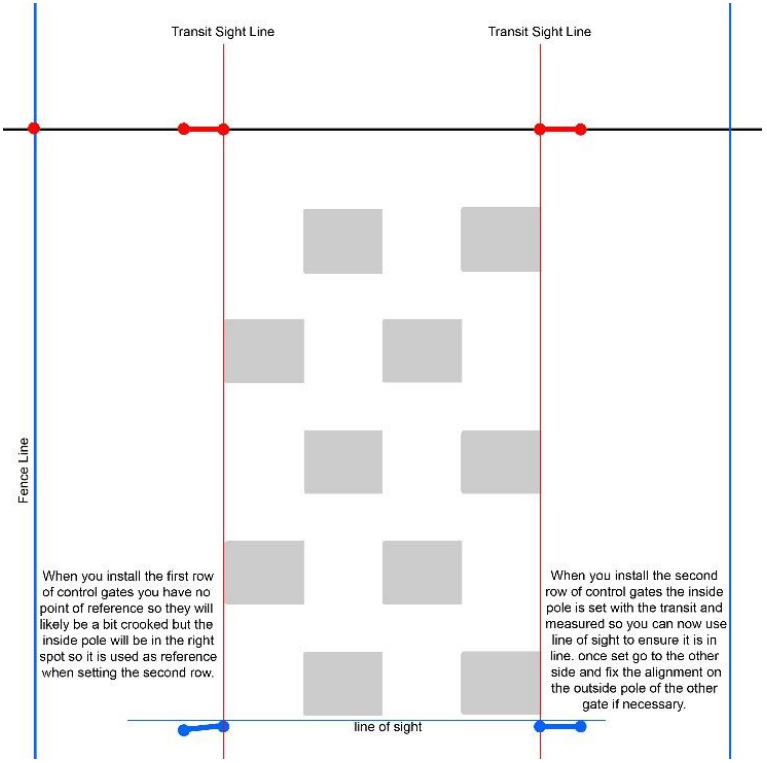


Illustration 22

Event and Training Days - Specific Roles
On Hill Roles
Starter

During training, the starter is responsible for directing the athletes onto the course and making sure a safe distance between athletes is maintained.

In order to maintain a safe distance between athletes you will have to discuss protocol with the coaches and athletes at the start area prior to opening the course for training each morning. If everyone is fully aware of your safety rules you will have a much easier time implementing them.

Once an athlete has passed the landing area on the jump at table 1 and is proceeding on course it is safe to let another athlete on course, just remember there are 3 lines so you can potentially have 1, 2, or 3 athletes starting at the same time so you need to be paying attention at all times.

You will be required to open and close the course or a single line as directed by the Chief of Jump Table 1, Jump Table 2, the Chief of Course, Chief of Comp, Race Director, or TD. It is important to act quickly to close the course off and make an announcement over the radio if there are still athletes on course and skiing into the closed area.

The Starter is responsible for ensuring the start area is clean, raked and all equipment is put away at the end of each day. The Starter also closes off the entrance and brings the paint into a warm area over night.

During competition the starter is responsible for all start protocol on hill and must confirm all protocol with the Head Judge prior to the start of the competition. The Starter must also ensure that the Head Judge and scoring are aware of any changes to the start list. The Starter will receive each athlete from the Assistant Starter, confirm that the athletes are in their designated bib number and start the athlete on course according to protocol.

Assistant Starter

During training the Assistant Starter's role is to help the starter with directing athletes on the course making sure a safe distance between athletes is maintained. They also ensure that the start area stays clean and clear of skis, poles, back packs, and other objects that could potentially slide down the hill and injure someone.

During competition the assistant starter is responsible for the assembly and organization of athletes according to the start list and sends each athlete to the Starter in proper order according to the start list. The Assistant Starter must make sure the Starter is aware of any changes to the start list due to injury, no-show, etc. with as much notice as possible.

The Starter and Assistant can expect a busy day without many breaks. You are stationed at the top of the hill which is typically the windiest area so make sure you have lots of layers, very warm gloves or mitts and a back pack or bag to store extra layers in if they are not needed. Bring water, a snack, and hand and foot warmers with you. These are available to you in the officials' lounge where you check in each day so please use them.

Chief of the Air Table

The Chief leads the course workers stationed at their jump table and works in unison with a Second to keep the jumps and transitions clean and clear of debris and chunks of ice and snow (referred to as cookies) during training and competition.

Typically the Chief and the Second are the only Course Crew on the jump table when athletes are on the course for training with one working skiers left and the other working skiers right and sharing maintenance on the center jump.

Once qualifications and the competition starts absolutely no one is allowed on the course when an athlete is on course. Once the athlete is past your jump table you can proceed onto the course to clear the transition or jump of any debris or cookies that may have come down the course with the athlete. You may also make minor patches to the jump surface but must have the jump table clear of people and equipment prior to the start of the next athlete on course.

If there is an issue with one of the jumps or transitions that cannot be rectified within the normal time allotted between athletes inform the Starter and Head Judge immediately of the situation and work quickly to fix the problem.

The Chief orchestrates all movement and work on the air table and landing area, assesses course condition, and works with the Chief of Course to remedy any issues with the course. The Chief opens and closes the

course for any safety issues or crashes and must be familiar with and implement all event protocol.

The Chief ensures that the air table is clear of all equipment, including skis, at all times that the course is open to athletes. The Chief must have a radio and it is a good idea for the Second to have one as well.

The Chief is responsible for inventorying equipment every morning and after the event each day and to ensure everything is in good working order. The chief makes sure all equipment as freshly charged batteries and brings the paint in out of the cold overnight.

Bring extra water, snacks, and hand and foot warmers with you. These are available to you in the officials' lounge where you check in each day. You will, without doubt, have course crew that forget to bring any of these items so it is a good idea to have extras.

The Chief and Second can expect a very busy day without many breaks. It can be beneficial for the Chief to switch the Second out with the Course Crew to keep everyone involved and warm on a colder day.

During qualifications and competition the chief and course crew must be in the course crew staging area behind the event fence any time there is an athlete on course. On the bottom jump table the second is staged behind the fence on the camera platform side (Illustration 23). This is due to the relatively short amount of time available between runs. Once the athlete has passed, the chief and or second, can come out to inspect the transition and jump surface to ensure no cookies have come down and there is no damage to the jump surface.

During training the cameraman will be doing some testing to ensure his vantage point is good and there is nothing obstructing the camera view. This is a good time for the second to work with the cameraman to ensure that he/she will not be obstructing the cameras view during the competition.

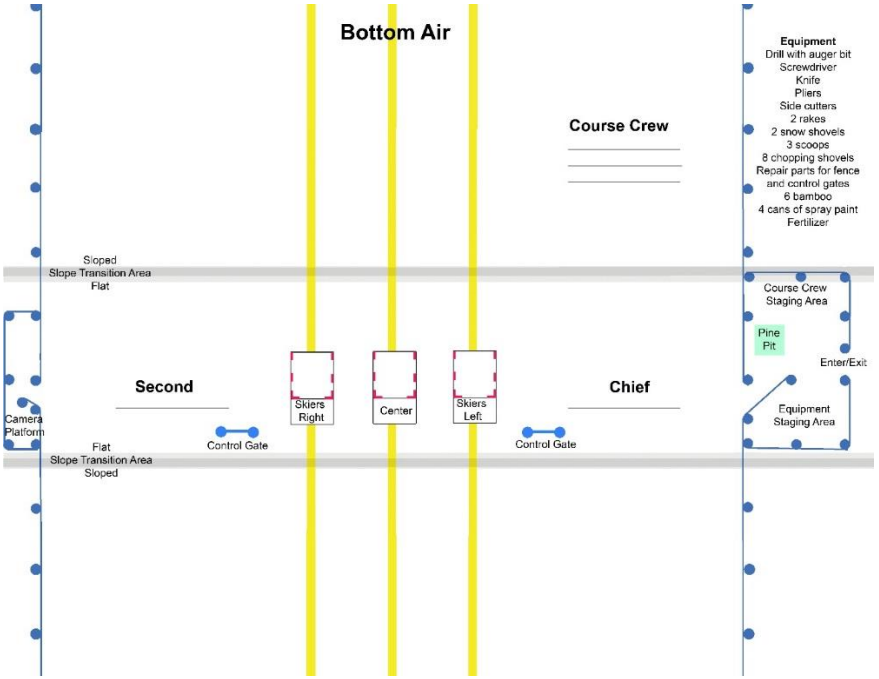


Illustration 23

Course Crew

The role of the Course Crew is to maintain the course to the highest standards possible, keep equipment and the staging area organized, keep pine boughs chopped and available, clear excess snow from jump table during breaks as instructed, chop landing area and fill holes in landing area during breaks as instructed and repair damaged fence and control gates as needed.

At least 1 Course Crew from each air table should have a radio.

Always watch for broken ski poles and not just after a crash. A pole can break anytime & anywhere on the course. If an athlete falls watch to make sure that they leave with all their equipment. You may be required to go up or down the course to repair a control gate or a section of the fence so have your skis and equipment organized at all times so repairs can be made quickly and efficiently.

At the end of each day clean and rake the air table of excess snow. Ten minutes of work at the end of the day will turn into an hour or more by morning once the snow freezes up. On the Chief's instruction, repair any

damage to the jumps, chop the landing area, and close off the jumps with bamboo.

As a part of the course crew you may be required to stop first thing in the morning at the World Cup trailer stationed at the top of the hill by the parking lot and take a drill and auger bit as well as zip ties and pliers and ski the event fence lines repairing any damage and closing off any areas that were opened the night before for grooming.

Everyone including all course crew must be off the course and outside the event fence at all times when athletes are on course during qualifications and finals.

Chopping of the landing area needs to be done every morning prior to athletes training. There will be a marker flag on the event fence indicating where down the hill to start the chop. Chop the landing area starting at the bottom and working your way up the hill. The chop should be a minimum of 1.5 shovel blades deep. Typically the size of the chop should be 3 to 4 inches but is determined by the snow and temperature/weather conditions, check with your chief.

Once the landing area has been chopped it will need to be stepped, which is basically walking down the landing area sideways with your skis on and stomping the snow down crushing the big chunks of snow and lightly compacting the landing area. Once chopped and stepped, the landing area is ready for pine bows and athletes.

During inspection the athletes will step the landing area for you but between training and comp and between athlete groupings the course crew will be responsible for stepping the landing area. Once done you may be required to stop at the bottom of the course to quickly clear cookies before cycling back up to your staging area.

A fair bit of snow will get blown out of the landing area and will go to the sides of the course and down the course, this snow can typically be replaced with snow cleared from the air table or your work pile. Do not over fill holes in the landing area with snow, it is better to go down and shovel any high areas into the low areas or you may end up with extra moguls skied into your landing area that you will not be able to get rid of easily. This problem is more prevalent in the landing area of the top jump table than the bottom.

At the end of the day there is typically another full chop and the size or coarseness of the chop will be determined by the snow conditions and

weather, some days the last chop will be left open to help the individual chunks freeze up and other days it will be stepped so that the integrity stays much the same overnight. If done wrong it can have a very dramatic effect on the condition of the landing area the next day so be sure to get proper instruction prior to completing the end of day chop.

The Course Crew can expect a long day with short periods of hard work followed by long periods of standing watching athletes come down the course. It is important to have layers as you are going to go from sweating with your jacket off to extended periods of doing nothing but enjoying your view of the competition from the best seats in the house. Having a lighter jacket, fleece, or hoodie available or under your winter jacket will help eliminate having a sweat soaked winter jacket that is no longer keeping you warm.

Bring water, a snack, and hand and foot warmers with you, these are available to you in the officials' lounge where you check in each day so please use them.

Hand Timers

The role of the Hand Timers is to help verify the accuracy of the electronic timing system and to take over for it if it should fail. You will be working directly with the Chief of Timing and will receive on-site training if required. It is important to familiarize yourself with the equipment prior to the competition. The Chief of Timing will arrange this with you, typically on the day before the competition, once the timing is all set up.

You can expect a reasonably short but busy day on the hill with a short lunch break. You may be stationed at the bottom of the hill or at the top of the hill which is typically the windiest area so make sure you have lots of layers, very warm gloves or mitts and a back pack or bag to store extra layers in if they are not needed. Bring water, a snack, and hand and foot warmers with you, these are available to you in the officials' lounge where you check in each day so please use them.

Support Roles
Runners

The role of the runner is to deliver whatever is needed to various areas on or off the course. Some of the duties of the runners include delivering lunches to course workers and judges or delivering start sheets to the

starter. You can expect a relatively short but very busy day on and off your skis.

Photographer

The role of the photographer is to capture the event from build to tear down from the perspective of the administrators, course build crew, course crew, athletes, and spectators. This is both an inside and outside position.

VIP Tent

Just as glamourous as it sounds, you get to socialize with the rich and famous. Duties include insuring everyone is having a great time, keeping all areas clean, clear, and safe, and directing foot traffic as necessary.

Judges Assistant

The role of the judging assistant is to assist the Head Judge. Duties may include gathering, organizing and stapling score cards from all judges and provide them to the Head Judge for review and delivering verified scores from the Head Judge to the Scorers. This is an inside job, you can expect a relatively short but very busy day. It is very important to work very quietly, the judges have to communicate between themselves and background noise and chatter can impair their ability to perform their job properly.

Staying Safe - General Safety

Above everything else your priority is to be safe and ensure the safety of your coworkers, the athletes, and spectators. One of the best ways to be safe is to be comfortable with what you are doing so if you find yourself doing something you are not comfortable with ask for assistance or guidance. We are working with some very dangerous equipment on a very unforgiving ski run so please ask for help if you are unsure.

One of the most important and easily accessible safety features we have is the ability to communicate easily, so if you see a safety issue please communicate it immediately.

If your role is an outdoor one you will need to **over dress** for the weather, you can always remove layers if too warm and replace them when you

cool off. Regardless of where on the hill you are stationed, or what you are doing, you are going to get cold feet or hands at some point. This can typically be remedied with a bit of vigorous work or even a short walk.
If you get cold and cannot warm up, get indoors immediately and warm up, make sure you stay there until you feel fully recovered. Wear appropriate clothing for the job you are doing. If you are going to be sitting for extended periods of time outside you will have to dress very warm and have extra hand and foot warmers readily available. If you are cold you cannot be focused on your task, if you cannot be focused on your task you cannot reasonably be expected to be able to keep yourself, your coworkers, the athletes, and spectators' safe…..so stay warm, warm is good.

Stay safe with the equipment you may be around. The three largest and potentially most dangerous pieces of equipment you may encounter are the snow cat, tree chipper, and the snow blower. Typically no one will be on the hill when the snow cats are grooming but you may encounter them for other reasons like staging heavy loads of equipment that cannot be brought up on the chair lift or building camera platforms. If you are working with the snow cat always stay in visual and/or radio contact with the operator so that both you and the operator know what you are doing and where you are.

If the snow cat you are working with is a winch assisted machine and the cable is out stay away at all times when the cable is under tension. Typically no one will be on the hill when the winch cat is working, but if you are needed on the hill the operator will release all tension on the cable and let you know when it is safe to return to the hill, once your task is completed you will clear the course and do a visual and radio check to ensure the entire course is clear prior to giving the cat operator the all clear signal to tension the cable up and continue working. A cable that snaps while under tension has the potential to seriously injure or kill you.

The snow blower is another potentially dangerous machine you may encounter. The snow blower is used to blow snow into the jump forms when making, or possibly repairing, the jumps. The snow blower is typically parked in front of the jump form and snow is shoveled into the auger area and blown into the jump form. Do not feed snow into the snow blower with your hands or feet for any reason, only use a shovel or scoop. It is wise to wear your goggles when working with the snow blower. While ski goggles are not safety rated they will add some eye protection as the snow is being blown at a velocity with the potential to injure you. If there is a large overnight snowfall the snow blower may be used to help speed up the process of clearing snow from the jump tables. If you are operating a

snow blower on the jump table do not get close to the edge of the table, leave this area to be cleared with a scoop or snow shovel. A running snow blower sliding or tumbling down the hill has the potential to seriously injure anyone in its path including the operator that is coming down with it.

The branch chipper is an extremely dangerous piece of equipment and requires your utmost respect. It will treat your arm exactly as it treats a Christmas tree. When setting the chipper up place it so that a tarp can be hung as a backdrop to keep the discharge of chipped branches localized in one spot. Make sure the chipper is on level ground and that there is no ice surrounding the machine that could cause someone to slip and fall on or into the running machine. Wear safety glasses and hearing protection. Do not wear loose clothing. Do not for any reason reach into the chipper when it is running, even if the chipper is not engaged. Stay out of the way of the discharge when the chipper is running. Do not overfill the bags as they have to be carried down the hill by hand.

Other potentially dangerous pieces of equipment that you will be around are the chopping shovels. These shovels have been modified to chop through hard snow and ice by sharpening them to a chisel type edge, and they will cut through snowboard boots or mountaineering boots. Do not ever throw someone one of these shovels, we do not want one of these very sharp shovels sliding down the hill toward course workers, athletes, and spectators.

All of the equipment you use has the potential to injure if it is used incorrectly, irresponsibly or has the opportunity to slide down the hill and hit someone. Always store unused equipment safely and in the designated staging area and be extra careful with anything that slides really well like propane tanks, gas cans, generators, etc. If you keep your work area clean and organized you will help to minimize the potential for accidents.

When athletes are on the course it is important to have everything cleared from the start area, jump tables, and finish area and put away neatly in the staging areas or outside the event fence. This includes coach's skis. During training you might have 3 or 4 coaches at each jump table and they will kick their skis off and leave them for people to have to work around. Pick them up and neatly place them in either the equipment staging area or just outside the event fence.

Last but certainly not least is the hill itself. It is steep and it gets icy. It is also the most dangerous part of our job. In order to safely work on this hill we wear ice climbing crampons on our ski boots or mountaineering boots,

if you are just in snowboard boots or hiking boots without crampons you have no chance of not sliding down the hill if you step off of one of the jump tables outside of the chop. Ski boots without crampons work ok if the hill is not icy and you go down backwards kicking your toes in to secure each step, they also work reasonably well through the moguls but become less effective once you come to the steeper part of the hill past the break over. Use extreme caution if only in ski boots.

Crampons take a fair bit of getting used to and the biggest danger lies in hooking your pant leg and tripping causing you to fall and slide down the hill. There are gators that can be purchased at places like MEC that are designed to deflect an errant crampon spike and not get hung up but they do not stop 100% of accidents and if you do happen to hook a spike in these gators it is hooked really good and will not just tear through like ski pants will. We use clear stretch wrap to wrap tools and equipment for transport and many people use this clear wrap to wrap their ski pants tight to their ski boots eliminating many opportunities for a crampon spike to hook your ski pants and this seems to be very effective. The downside of this method is like with gators, if you do manage to hook a crampon spike it is hooked really well. Also the plastic wrap tends to bunch up with time and becomes less and less effective as the day goes on. Personally I have tried both methods and have gone back to just wearing ski pants, I find that if I am careful and make myself aware of every step I take I do not have any issues and if I do happen to hook a spike in the ski pants it rips free pretty easily turning a fall into a clumsy looking stumble. There is a video available in the volunteers lounge on the proper method of safely using crampons that you will be required to watch.

When working on the course, and you have to make your way down the hill, always come down through the chop then zig zag down through the moguls, if you do fall you have a much better chance of stopping yourself in the moguls than on the flat. Do not ever make your way up or down the hill on the sides unless you are working on the fence. One of the safety procedures that has been recently put in place is that it is mandatory that the sides of the course get groomed each day to keep the ice in check making for a much safer environment for both the athletes and course crew.

Regardless of grooming or any safety measures put in place approach the hill each day assuming it is solid ice until proven otherwise. Be cautious and alert, and if you go out in the morning to find icy dangerous conditions report it immediately so the hill condition can be reassessed and remedied if necessary. When working on the jump tables and specifically the bottom jump table keep your work area as clean as possible in case there is a fall,

a clean table will not further injure someone sliding through like hitting a bunch of skis and equipment will.

Outside the event fence the entire right side falls off to steep embankments that are littered with obstacles such as trees, fences, a building, and the old Olympic scoreboard. This side is wide open when we start working on the course but once the event fence is in place B-Net (safety netting) is put up making the side less of a hazard. The left side has a fairly substantial drop off at the start area then after the top air table it is long, wide, and steep, and gets icier every day as it does not get groomed so don't go out in the morning expecting the same conditions as the previous day. After the bottom jump table is the steepest part of the course and the area outside of the course gets icy and the cookies that come down the side freeze in place making for a very rough ride. The ski patrol puts event fence along the ridge but if you see someone leaning on it or attempting to climb over it for a better camera vantage point stop them, we did have a spectator lean on the fence a few years back which did not support his weight and down the hill he slid, winning himself a trip to the hospital.

Athlete Injury Procedures

Any time athletes are scheduled to be on the course, ski patrol must be on site, in position, and ready before the athletes are allowed to proceed on course. The chief of competition will typically, over the radio, verify that ski patrol is ready then ask all stations to report in that the course is clear, and once clear will give the course is open call.

In the event of an athlete crashing during training the chief of the nearest jump table will make the call to close the course or the individual ski lane, the individual ski lane and the one next to it or the whole course depending on the severity of the crash and how far their equipment is spread over the course. If ski patrol is required a full course closure must go into effect until ski patrol is off the course and either their replacement has rotated into their position or they have made their way back to their position. Standard course opening protocol must be followed to reopen the course after a full course closure.

During the competition and during qualifications, in the event of an athlete crashing, the chief of the nearest air table will make the decision whether or not to enter the course. The reason for this is that unless the athlete has gone around the outside of a control gate or done something else to disqualify themselves their run is still in progress even if they are down, and entering the course could result in a protest. If the chief feels that it is necessary to assist the athlete the chief will enter the course and attend to the athlete and make a decision whether to ask for assistance from ski

patrol. Some of the course crew may be required to assist the ski patrol in stabilizing the patient and/or loading them into the toboggan. Ensure that all the athlete's equipment is removed from the course and that it is intact, a broken ski pole is a fairly common occurrence and if missed results in a very dangerous piece of debris on the course.

Working Out On The Course

If you are working on the course you may be exposed to harsh conditions for an extended period of time. Some things to remember to bring are;
***** Helmet - while it is not yet mandatory that everyone working on the course wears a CSA approved ski or snowboard helmet it is highly recommended.
***** Sunscreen – apply early and often and remember the bottom of your nose, the suns reflection off the snow will burn you as well.
***** Goggles or sunglasses – sunburnt eyes will ruin your sleep and after a day on the hill you will appreciate your sleep.
***** Buff or Gaiter to keep your neck and bottom part of your face protected from the cold, wind, and sun.
***** Layers – light, waterproof, and windproof are all good qualities. It is better to have extra clothing than not enough, articles can be taken off or added as conditions or exertion levels change.
***** Water – stay hydrated, bottled water is available and free in the volunteers lounge.
***** Snacks – it is important to keep your energy levels up in order to stay sharp and avoid accidents, energy bars are available in the volunteers lounge.
***** A fully charged phone or camera to take pictures with when you have slack time.
***** Common Sense – this is one of the most important things to remember to bring.

Anytime you are on a course when athletes are on course it is imperative that you pay attention to the athletes at all times, they are traveling at a very high rate of speed and can become out of control in a split second and you may have to get out of their way to avoid injury to them, yourself, or both.

Any volunteer accidents or injuries should be reported to your supervisor and the appropriate measures will be taken. Injuries that require assistance or attention should be assessed by ski patrol.

A Few Cool Things (Definitions) To Know

The Breakover – This is one of my favorite things about our course in Calgary and you will hear "the breakover" being referenced often. The breakover is a rapid pitch change in the slope of our course about 55+/- meters (or from the athlete's perspective about 5 seconds) before the bottom jump table. You cannot see the bottom of the course or the bottom jump table prior to reaching the breakover. This is typically the breaking point for most athletes and if they were on the verge of maintaining/losing control before they arrived here they have completely lost it by now, so stay sharp if you are stationed at the bottom jump table.

Muffler Award – You will likely hear talk of the Muffler Award. The Muffler Award, as awesome and awe inspiring as it may sound is not the most sought after or prestigious award around, but it is one of the most anticipated and happily passed up awards anywhere. The award is given to the person that makes the biggest mistake or does something epically accidentally funny so it typically ends up in the hands of one of the major officials as they have the most responsibility, put in the most hours, and have the biggest opportunities for something to go epically wrong. But don't despair, members of our awesome course crew have won in the past and with a little bad luck it could be you this year. ☺ It can be as easy as stepping on a can of spray paint with your crampons on covering you and the jump table with red paint.

World Cup Trailer – I love this place! Located at the northwest end of the parking lot for the ski jumps. Home to everything we need to build our course, all of our tools, equipment, and materials are stored here. The trailer is also a meeting place for socializing and storytelling at the end of each day.

FOP – Field Of Play (the course)

TD – Technical Delegate (Ensures course and event meets FIS standards)

Control Gates – Red and blue panels placed outside the mogul lines at 10% of the course length intervals for judging reference.

Cookies – We normally love cookies! Not so much on a moguls course. Cookies are chunks of hard snow or ice that have been produced by chopping of the landing area or the building of the moguls. Cookies are not only no fun to ski on they are potentially dangerous and could certainly change the outcome of an athletes run so scoop them up or smash them.

Death Cookies – I know…..they sound delicious! Unfortunately not so much, this is what we call cookies once they make their way to the bottom jump table from the top landing area, by this time they are traveling at a fairly high rate of speed (not quite light speed but very close) and they are usually airborne coming off a mogul, a jump, or just off the edge of the jump table and about face high when you are down chopping the landing area, so stay alert.

Even More Cookies – We love cookies so much we make our own out of wood! We bury them in the snow to use as anchors for tents and such. I'm thinking someone should paint them to look like chocolate chip cookies, they are already a tan colour so you would just have to colour in little chocolate chip shaped bits with a brown sharpie…..If you see cookies coloured like this I had nothing to do with it.

Event Fence – Waist high fencing defining the course perimeter. This is the blue fence we put up and it's amazingly straight!

B-Net – Safety fencing, about 2 meters high, this is the red stuff. You must be certified to install this fencing so don't mess with it unless you are certified, Winsport staff will place this fence for you and move it for you if required. It's never straight but it sure works, so we like it just the same. ☺

Decommissioning & After Party

All on hill volunteers are expected to help with the decommissioning of the course. Decommissioning starts once the competition ends and a short wait period has passed to allow for any protest that may result in an athlete or athletes being granted a re-run. The whole process will take less than 2 hours to tear down, pack up, and put away in the World Cup trailer. Just like staging the course when we started the build it is important to group and securely wrap the tools and equipment using the rolls of stretch wrap. Decommissioning involves numerous top to bottom trips picking up control gates, cutting zip ties, removing fence poles, unhooking the timing wire etc. Please be sure to remove all zip ties from fencing and banners and neatly and tightly roll them up and wrap with stretch wrap. You will be placed into groups with specific roles and most will end up lapping around carrying tools and equipment up the lift to the World Cup trailer where there will be 2 people putting everything away in it's proper place. Once done we all meet up for our post-race party where we enjoy some good food and drink, tell a few stories, hear a few speeches, hand out a few 5 or 10 year volunteer plaques, give away some cool swag, and of course announce the recipient of the coveted Muffler Award and naturally the runners up.

Dress Code

Volunteers that meet the minimum time requirements will be provided with an official 2020 Calgary World Cup Moguls winter jacket. It is highly recommended that all volunteers working on hill wear a helmet. Volunteers are encouraged to wear dark or solid coloured pants or snow pants. Your attire must be appropriate, clean, tidy, and respectful. Wear comfortable shoes if working indoors or winter boots, mountaineering boots, or your ski/snowboard boots, if you are working on the hill. On the day of the event everyone is required to wear their jacket, please do not affix any patches or crests to this jacket prior to the event. If you did not meet the time requirements to receive a jacket it would be appreciated if you could wear a jacket without large recognizable branding or logos. Most years there are enough jackets that every volunteer gets one but there have been years (1 or maybe 2 out of 10 years) when we were short and had to give them out based on time spent helping out.

Upcoming Events

If you are interested in learning more or helping out more with local events contact Freestyle Alberta hello@freestylealberta.ski
https://freestylealberta.ski/volunteer/

We have lots of upcoming events here in Calgary at COP.

February 11-16 World Cup Slopestyle and Half Pipe
Contact info@freestylecanada.ski

February 20-23 Noram Moguls & Dual Moguls
Contact Scott Walker perfectmoguls@gmail.com

February 20-23 Noram Half Pipe, Big Air, & Slopestyle
Contact info@freestylecanada.ski

March 6-8 AB Champs Slopestyle, Moguls, & Half Pipe
Contact Freestyle Alberta hello@freestylealberta.ski
https://freestylealberta.ski/volunteer/

Lots of exciting events happening in Red Deer at Canyon as well.

February 6-9 Provincial #2 and Alberta Winter Games Moguls
Contact Freestyle Alberta hello@freestylealberta.ski
https://freestylealberta.ski/volunteer/
infocafsc@gmail.com

March 13-14 Canadian Junior Championships Moguls
Contact Scott Walker perfectmoguls@gmail.com

March 19-22 Canada Cup Moguls & Dual Moguls
Contact Scott Walker perfectmoguls@gmail.com

Other notable events in and around the Province

February 28-March 1 Provincial #3 Sunshine Moguls & Slopestyle
Contact Freestyle Alberta hello@freestylealberta.ski
https://freestylealberta.ski/volunteer/

March 26-29 Canadian Championships Moguls & Dual Moguls
Apex BC
Contact Freestyle BC info@freestylebc.ski

A Brief Message From The Author

This booklet started out as a guide I wrote for the Canada Winter Games in Red Deer in February 2019 and was designed to give the freestyle volunteers direction in their roles as well as cover safety and operational procedures during the games. While writing I couldn't help but think about how valuable an in depth booklet would be to the volunteers that I work with every year at the Calgary World Cup Moguls event.

When I started out volunteering it was at the Calgary World Cup and that was the only event I volunteered at for the first couple of years. I was very eager to learn but information is not readily available unless you know where to look and even then it's not what I had hoped to find. Like many other volunteers after a few years of doing the same thing I had gotten very good at what I was doing but it was easy for things to go wrong because I did not understand why I was doing what I was doing, I was just going from point A to point B and not really understanding the fundamentals of how those two points got there.

One of the things I hear from volunteers every year is "I have been here for (2, 3, 4) years and I really have no idea what I'm doing". I was in the same place when I started so I took the initiative to volunteer for every event I could and learn as much as possible, I took the minor officials level 1 & 2 course (which I highly recommend) and spent a bunch of time volunteering for events which peaked (or so I thought) at a high of almost 500 hours on the snow volunteering during the 2017-2018 season, and then over 700 hours in 2018-2019 but this route is not for everyone (for obvious reasons), so a booklet with all the necessary information seemed like a great alternative to learning the hard way.

The next step was to talk to Larry Bilton and Patrick Breault with Freestyle Canada to see if there was any interest, or objection, in me creating a booklet for our World Cup in Calgary that would be very specific to the building and operation of our event from start to finish. The answer was a unanimous yes so here we are.

A huge shout out goes to Vince at Konika Minolta for sponsoring the printing of these booklets so I don't have to hand fold each individual page and manually staple each booklet together like I did for the Canada Winter Games. Credit and much thanks for contribution to the content of the booklet has to go to Paulo Kapronczai and Julian Kapronczai for their part in writing the parts on operating the transit and skiing in the course. And of course much credit to all those people I learned so much from on the Calgary course and continue to learn from such as Greg Winter, Larry

Bilton, Paulo Kapronczai, Scott McKnight, Kevin Joosten, Mike Barr, Kieran Rouseau, Mike Haid, and the CBC TV crew to mention just a few.

This booklet is designed to be fluid and will likely change over the years to improve pictures, descriptions, and procedures as we improve and continue to be the best course crew in the world, building and hosting the number one moguls event on the World Cup Circuit. If you think there are areas that are not covered well enough or entirely missed please let me know and I will do my best to have it included for the next issue.

As a group we came up with and adopted the name Hot Doggers Bump Crew a number of years ago and have since had a logo as well as embroidered crests and stickers made up.

The first crest is free if you have volunteered multiple times and the stickers are always free. If you would like an extra crest or more stickers just let me know, extra crests are $35.00 each (my cost if I buy 10 at a time) and I usually have 5 to 10 on hand.

Out of respect for our sponsor that is supplying us with our awesome jackets please do not put a crest on the jacket until after the current year's event.

Race Director – Konrad Rotermund

Chief of Competition – Larry Bilton
Assistant Chief of Competition – Paulo Kapronczai

Operations Manager – Scott McKnight
Assistant Operations Manager – Kieran Rousseau

Chief of Course – Greg Winter
Assistant Chief of Course – Travis Lundberg

Technical Delegate (TD) – John Gandolfo

Chief of Top Air – Michael Barr

Chief of Bottom Air – Scott Walker

Head Judge –

Announcer – John Pomeroy

Chief of Timing and Scoring are provided by FIS Data Services