

**GARIBALDI AT SQUAMISH  
PROJECT  
CASP Master Plan  
EAO Additional Information  
Requirements  
Mountain Master Plan  
DRAFT**

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# **I. INTRODUCTION**

## **A. BACKGROUND**

Garibaldi Resort has been proposed for development as a new 21st Century mountain community designed to add variety to the tourism product mix for the regional, destination and international destination market attracted to Sea to Sky Country. A key ingredient in the design and development of Garibaldi Resort will be active community involvement in all aspects of the resort. Architecturally, Garibaldi Resort will showcase local history and the traditional imagery of Pacific Northwest Coast aboriginal culture.

The mountain resort's village centre will be situated, slope side, on a southwest facing plateau at an elevation of 1,000 metres. Access will be via a newly constructed 10-kilometre resort access road, which will connect to the Sea to Sky Highway approximately 13 kilometres north of downtown Squamish. A day skier base and mountain portal will be located along the resort access road at the 650-metre elevation. The top of the highest proposed lift will be at 1,865 metres elevation. The vertical drop of the mountain recreation area will be 1,215 metres.

As proposed, the Garibaldi Resort mountain recreation area will consist of 1,850 hectares of Crown Land within a 4,900-hectare parent parcel. The mountain development will offer recreational activities during all seasons, including approximately 130 ski/snowboard trails, 25 lifts, a network of multi-use trails, and 3 on-mountain guest service facilities. According to industry standards, this terrain has been estimated to support a Comfortable Carrying Capacity (CCC) of 15,250 skiers/riders at one time.

This Mountain Master Plan responds to the following Master Plan Terms of Reference as set forth in the Commercial Alpine Ski Policy Master Plan Terms of Reference for The Garibaldi Alpen Resorts (1996) Ltd. Garibaldi at Squamish Project (April 2002) document prepared by Land and Water British Columbia Inc.:

### **II.2.4 Site Mapping**

The recently created 5 metre contour interval mapping of the GAS study area is ideal for all of the mountain analyses and site plans. The Master Plan should contain copies of the full size mountain plans, at a scale of either 1:5,000 or 1:10,000 utilising the 5-metre contour interval mapping. The Master Plan should also contain copies of reduced legible copies within the text, sized to the appropriate measurable scale.

## **II.2.7 Site Inventory**

The site inventory is the collection of all information of the entire study area and adjacent lands. Tied directly to the site mapping, the existing physical character of the land, its current use, current zoning and status must be fully described and illustrated. The mountain lands site inventory must be completed utilising the 5 metre contour interval site mapping to illustrate built structures historic sites, roads, vegetation, streams, falls, water bodies hydro lines, glaciers, and any other outstanding features and uses. In addition, all property and legal boundaries, and existing use tenures must be included.

*It should be noted that the EA Project Report Specifications requirements for:*

- *Existing Tenure management and agreements*
- *Garibaldi Provincial Park*

*should be utilised as key baseline information for the refinement of the mountain and base area facilities plans.*

All Site Inventory information should be summarised as an Existing Conditions Map.

## **II.2.10 Site Analysis**

### **The Mountain**

All of the data assembled as part of the Master Plan Site Inventory and Environmental Audit provide the baseline to complete the project specific Site Analyses which in turn will provide the foundation for the planning of the mountain and base area facilities. The various analyses should be completed utilising the 5-metre contour interval mapping, presented at a scale of 1:5,000 or 1:10,000. These will act as the upgrade of information to detailed planning in the refinement of the Mountain Master Plan. As per the Guidelines this should include the following in a descriptive and graphic form:

- Elevation Analysis
- Slope Analysis
- Fall-line Analysis
- Solar and Aspect Analysis

All Site Inventory, Environmental Audit Information, and Site Analysis Information should be summarised as a Mountain Opportunities and Constraints Plan.

## **II.2.11 The Mountain Plan**

The Mountain Plan will be a refined version of the already existing proposed layout. It should take into account all of the refined information developed as part of the Inventory, Audit and Analysis as well as coinciding with the information responding to the EA Project Report Specification requirements (Section 2.1). At build out the Mountain Plan must reflect the agreed upon CCC of 12,000± skiers per day.

Utilising the 5 metre contour interval mapping as a base, the Mountain Plan must graphically and verbally describe the location of the following:

- Ski lifts and ski trails
- Base area village buildings and facilities
- Maintenance buildings and facilities
- Roads and parking lots
- Residential / overnight accommodation developments
- Recreation facilities
- Infrastructure, institution, community or utility needs such as a liquid or solid waste facilities, fire halls, schools and hydroelectric rights of ways.
- Summer use facilities and plans
- All other resort features and uses.

In addition to the need to refine the CCC, the analysis of the current Mountain Plan showed that the following issues should be resolved:

1. In several locations, the Proponent's ski trail classifications have lower classification trails that are only accessed by higher classification trails. A lower trail classification must remain consistent from the top of a lift to the bottom of a lift and cannot suddenly change to a higher classification. In such cases, trails must take the higher classification. For example, Pod L cannot be rated as a novice through low intermediate pod, as the only trails accessing this area are intermediate. As such Pod L must be rated as intermediate.
2. Pods G and H offer consistent expert skiing, however, both pods fall within avalanche zones. The ski trails can be controlled, however, the placement of the ski lifts must be carefully considered. Lift G may be unsafe and susceptible to avalanche damage due to its alignment across the slope in the direct path of potential avalanches. Although Lift H partially follows a ridge, it could also be subject to avalanche damage. Detailed avalanche assessment must be an integral component of any further study.
3. The placements of many of the lifts are such that there is no escape route in the event of mechanical failure. These lifts include Lifts D, H, I, G and K. This situation could be easily rectified for Lifts H and I by placing the bottom stations at the same elevation. Similarly, if Lift F has mechanical failure, there is no way to get back to the Village from Pods, F, P, Q and R.

This Mountain Master Plan also responds to the following EAO report specifications as set forth in the Terms of Reference dated July 1998 and amended November 1999:

## **2.1 Resort Capacity and Project Design Implications**

1. Describe any change(s) to the *Application* required to accommodate the downward adjustment of CCC and bed unit totals. The proposed sites (or site options) for individual project components must be located with enough precision to enable an impact assessment of each individual project component. This applies to facilities to be located within the primary resort development area, as well as off-site (in the case of any required off-site infrastructure).

2. Provide an update of any changes to the project phasing information presented in the *Application* and indicate the scheduling for each component of the overall development within the 20(+) year development schedule. Any project components for which scheduling is optional or uncertain must also be identified. The scheduling information must be integrated into a single system of phases for the entire project, covering all on-mountain, base area and infrastructure development, and significant related service demand.

**Figure I-1: Area Location Map**

## B. GOALS AND OBJECTIVES

As a supporter of recreational development within the Province of British Columbia, the Ministry of Lands, Environment and Parks adopted and subsequently amended the *Commercial Alpine Skiing Policy* (CASP). CASP is intended to “provide for orderly, rational development and use of Crown land for commercial alpine ski purposes.” CASP sets forth the procedure a proponent or prospective applicant must follow to receive approval from the Ministry to proceed in the development of a recreational resort on Crown land. The policy is further supported by *Guidelines to Alpine Ski Area Development in British Columbia* (the Guidelines), a document that details acceptable standards for designing and balancing recreational and resort functions in a winter-oriented resort community.

The intent of this project is to create a year-round destination recreational resort community on Brohm Ridge near Mount Garibaldi to be known as Garibaldi at Squamish (Garibaldi Resort). Throughout the process, the proponent’s design team has and continues to use the Province’s CASP document and associated Guidelines, together with aesthetic and environmentally sensitive design philosophies, in creating and testing the concepts, master plans and infrastructure designs prepared for Garibaldi Resort. The calculations and subsequent numbers contained in this document are derived from the planning parameters provided in the Ministry’s Policy and Guidelines.

### *Meeting CASP and GASAD Requirements*

Garibaldi Resort meets the criteria for a Destination Resort as defined in the CASP Guidelines, Section I.7.5, documents as follows:

1. Garibaldi Resort is intended to serve local, regional and destination skiers with emphasis on catering to destination needs and services through its range of year-round recreational opportunities, visitor amenities and accommodations;
2. Garibaldi Resort will offer a unique and truly special skiing experience, not only because of the majesty of its natural terrain and long distance views of Howe Sound, but also because the Proponent intends to provide high speed, high capacity lifts in order to offer guests the optimum recreational experience (short lift lines, fast lift trips). At the same time Garibaldi Resort will be at the forefront of the industry in lift and trail management.
3. Garibaldi Resort is proposing a CCC of 15,250. The Guidelines indicates that a destination resort requires a CCC of “+/- 5,000 to 12,000 plus skiers per day” as

stated in Section I.7.5. Hence the proposed Garibaldi Resort CCC is above the requirement for a destination resort.

4. Garibaldi Resort is proposing to install lifts ranging from fixed grip double chairs to high-speed surface lifts, high-speed detachable chairlifts, and detachable gondolas, representing the full range of lift types appropriate for a destination resort.
5. The area proposed to encompass the skiing/snowboarding terrain covers 1,850 hectares within a parent parcel totaling 4,900 hectares as stipulated in the guidelines (Section I.7.5).
6. Total vertical drop from the top of Lift Q (highest elevation) to the base of Lift A is 1,215 metres (3,986 feet), which is within the range suggested in the guidelines (“+/- 700 to 1,500 metres plus,” Section I.7.5).
7. Garibaldi Resort is approximately one hour from Vancouver, British Columbia, and approximately four hours from Seattle, Washington, which puts the resort well within the suggested driving distances from its user markets. (The Guidelines, Section I.7.5 indicates a driving time from the market for destination resorts of from 2 to 6 hours.)
8. Vancouver International Airport is an hour and a half from Garibaldi Resort, and consequently, well within the CASP Guidelines (2 to 3 hours as indicated in the Guidelines, Section I.7.5).
9. Over the proposed fifteen-year project development, Garibaldi Resort will construct accommodations totaling 22,846 bed units.



## **II. MOUNTAIN DEVELOPMENT ANALYSIS**

### **A. INTRODUCTION**

The objective of the Mountain Development Analysis is to identify the full potential of the study area to support ski<sup>1</sup> resort development, and to make sure that the optimal mix of skiing terrain is established and that sufficient land is set aside for the necessary support facilities (e.g., access roads, skier drop-off areas, parking, day lodges, village development, other recreational amenities, etc.). The following analyses are based on evaluation of 1:5,000 scale mapping (with a 5-metre contour interval); review of project documentation and reports; aerial reconnaissance of the project area; and on-the-ground field reconnaissance and ground truthing of the site.

### **B. SITE INVENTORY**

The Mountain Development Study Area (where developed skiing and associated facilities will occur) is located in the northeast sector of the overall project study area (see Figure II-1a). The mountain development will encompass approximately 1,850 hectares (4,570 acres) of Crown Land within the Garibaldi Resort Controlled Recreation Area. The study area is bounded on the north and east sides by Garibaldi Provincial Park. The mountain terrain is defined by Brohm Ridge, which runs east west from the eastern edge of the study area, and its North, Central and South ridges which branch out from the main ridgeline. These secondary ridges create 2 primary 'bowl' areas, the North Bowl (between the North and Central ridges) and South Bowl (between Central and South). The highest point of the study area, located at the east end of Brohm Ridge, is 1,875 metres (6,152 feet).

The steep slopes to the north and south of Brohm Ridge drain into Culliton Creek (north side) and Cheekye River (south side). The North Bowl drains into Brohm River and the South Bowl drains into a non-fish bearing tributary of Brohm River. The land flattens out at the base of North Bowl, and there are also a number of flat benches at the base of South Bowl. These areas are suitable for base area development.

The study area is bounded to the southwest by Highway 99. Existing logging roads provide access from Highway 99 into both bowls as well as up onto Brohm Ridge.

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<sup>1</sup> Throughout this report, the term "ski" or "skiing" is used to represent all of the various types of snow sliding (e.g., alpine skiing, telemark skiing, snowboarding, ski-boarding, etc.).

**Figure II-1: Existing Conditions Map**

**Figure II-1a: Project Study Area**

## **C. ELEVATION ANALYSIS**

The Garibaldi Resort study area's elevation analysis graphically depicts the range of elevations found within the proposed mountain development area and illustrates the general flow of the natural topography. As shown in Figure II-2, elevations range from the 650-metre elevation (2,132-foot elevation) at the base of the proposed ski area to an elevation of 1,865 metres (6,119 feet) at the northeast corner of the project area.

Slopes above the 1,125-metre elevation (3,691-foot elevation) receive consistent, abundant, high-quality snow. From the 850-metre elevation (2,789-foot elevation) to the 1,125-metre elevation, the snowpack is not as consistent as the upper elevations, and the snow quality is not as good. The snowpack below the 850-metre elevation is very unreliable during the beginning and end of the ski season.

Figure II-2 illustrates a vertical drop of over 1,215 metres (3,986 feet) and topographic relief, which is favorable for the development of alpine skiing terrain.

**Figure II-2: Elevation Analysis**

## D. SLOPE GRADIENT ANALYSIS

The study area's slope gradients range from zero percent to greater than 100 percent. The slope gradient analysis indicates that the study area is dominated by moderate terrain, suitable for intermediate-level skiers (i.e., gradients of 25 to 45 percent). In general, the lands at the base of the study area have gentle slopes, ranging from zero to 25 percent. These gradients are appropriate for residential and commercial development, as well as beginner and novice terrain. The ridge top areas (i.e., upper Brohm Ridge, North Ridge, Central Ridge and South Ridge) also consist of gentle terrain – gradients appropriate for beginners and novices. The north and south facing flanks of upper Brohm Ridge, and isolated bands at mid-mountain, are characterized by steep terrain (i.e., gradients in excess of 45 percent), which is desirable for advanced intermediate and expert skiers.

The study area's slope gradient analysis is illustrated in Figure II-3. The full range of skiable slope gradients has been color coded to represent the universal terrain designations (i.e., easier, more difficult, most difficult, and experts only). The color designations are described below.

- **White** - Slope gradients between zero and eight percent (0 to 5 degrees) are too flat for skiing and snowboarding, but are ideal for up-mountain support facilities, base area facilities, resort real estate, and golf course development.
- **Green** - Slope gradients between nine and 25 percent (5 to 15 degrees) are ideal for beginner skiers and snowboarders, and are suitable for some up-mountain support facilities, base area facilities, resort real estate, and golf course development.
- **Blue** - Slope gradients between 26 and 45 percent (15 to 24 degrees) are ideal for intermediate skiers and snowboarders, and are suitable for limited types of resort real estate development.
- **Black** - Slope gradients between 46 and 80 percent (24 to 40 degrees) are ideal for expert skiers and snowboarders, but can pose intermittent avalanche hazards and are typically too steep for resort real estate development.
- **Red** - Slope gradients greater than 80 percent (greater than 40 degrees) are too steep for most skiers and snowboarders (must have the skills associated with extreme skiers and snowboarders) and any type of development and are likely avalanche paths.

Slopes in the study area's higher and middle elevations include a variety of terrain suitable for advanced skier ability levels. Terrain for intermediate-level skiers is dispersed throughout the site, and slopes desirable for beginner and novice skiers occur in the base area, the North and South Summit areas. Careful placement of lifts and trails across the mountain should enable a distribution of ability levels which matches the ability profile of Garibaldi Resort's local, regional, and destination markets.

**Figure II-3: Slope Gradient Analysis**



## **E. FALL-LINE ANALYSIS**

Fall-line represents the path an object would take as it descends a slope under the sole influence of gravity (i.e., a ball rolling down a smooth slope would follow a fall-line path). Terrain with consistent fall-lines has the greatest potential for providing a quality trail network. Consequently, a mountain with consistent fall-lines usually has more development potential than a mountain with non-uniform fall-lines. In addition to better recreational potential, a mountain with naturally consistent fall-lines will yield high quality trails with a smaller amount of earthwork – a factor that yields environmental and “bottom-line” dividends. While the development of off fall-line trails are at times necessary in the development of connections, consistent fall-line terrain should constitute the majority of a resort’s trail network.

A fall-line analysis captures a study area’s prominent ridges, prominent drainages, fall-lines, and areas of convergence. The fall-line analysis (Figure II-4) identifies the natural flow of descents – from Garibaldi Resort’s higher elevation ridges to the valley and basin floors. It also helps differentiate pods of terrain and helps illustrate development potential.

As Figure II-4 demonstrates, Garibaldi Resort’s geomorphology creates consistent and lengthy fall-lines throughout the study area. With careful lift and trail planning, it has been feasible to design well-integrated and efficient lift and trail networks, with a reasonable amount of earthwork.

**Figure II-4: Fall-Line Analysis**

## F. SLOPE ASPECT ANALYSIS

Slope aspects are categorized according to the eight, cardinal directions of the compass. The prevailing characteristics for each of the eight exposures are as follows:

- *North-facing* - best for snow quality; minimal wind scour and sun exposure.
- *Northeast-facing* - best for snow quality; minimal wind scour and sun exposure.
- *East-facing* - good for snow quality; some wind scour; morning sun exposure.
- *Southeast-facing* - fair for snow quality; moderate wind scour; morning and early afternoon sun exposure.
- *South-facing* - inferior for snow quality; moderate wind scour; full sun exposure.
- *Southwest-facing* - inferior for snow quality; high wind scour; full sun exposure.
- *West-facing* - fair for snow quality; high wind scour; late morning and afternoon sun exposure.
- *Northwest-facing* - good for snow quality; high wind scour; afternoon sun exposure.

Garibaldi Resort is characterized by terrain with widely differing slope aspect. As depicted in Figure II-5, the majority of the study area's terrain faces west, northwest and southwest. While the Garibaldi Resort's north and northwest exposures will provide slopes with high quality snow conditions, the area's south and southwest slopes are less desirable for snow quality and retention. However, Garibaldi Resort's latitude and weather systems create frequent cold temperatures, which make for good-quality snow conditions over these southerly exposures of the mountain. The exception to this is the lower elevations (below 850 metres), where machine-made snow will likely be necessary to augment the natural snowpack.

**Figure II-5: Slope Aspect Analysis**

## **G. CLIMATOLOGICAL ANALYSIS**

The following information is taken directly from Section 3.2.4: Climate, as it appeared in the Garibaldi at Squamish Development: Project Application, Garibaldi Alpen Resorts (1996) Ltd. Document.

### **3.2.4 Climate**

Background Climate Trends Detailed studies of the climate in the vicinity of Brohm Ridge have been prepared by Pacific Meteorology Inc., in 1990 and updated in 1996. In addition, suggestions made in the critique of the formal proposal by Golder & Associates were incorporated into the climate description.

In the Vancouver area, 1960-1991 Climate Normals indicate slight increases or no change in total precipitation at locations such as Vancouver International Airport, Vancouver UBC and Vancouver Capilano.

At Hollyburn Ridge, annual precipitation and snowfall are 2,916 cm and 820 mm respectively (1148 in and 32 in), an insignificant decrease of 38 mm and 30 cm (1.5 in and 12 in) from the 1951-1980 Normals.

At Whistler Roundhouse, mean total precipitation and snowfall data from 1973-1985 were 1,654 mm and 1,187 cm (65 in and 467 in) respectively. For the years 1973-1992, they were 1,621 mm and 1,171 cm (64 in and 461 in). This indicates slight declines which are not significant and are probably a result of the natural variability of annual precipitation.

Climate changes at the Whistler/Alta Lake station are more pronounced. The 1951-1980 Normals for total precipitation and snowfall are 1,415 mm and 657 cm (56 in and 259 in), respectively. Compared to this, the means from 1976-1994 for the new Whistler site are 1,194 mm and 388 cm (47 in and 153 in), representing a 16 percent decrease in total precipitation and 41 percent decrease in snowfall.

It is not known how much of the 16 percent decrease in total precipitation may be attributed to the station relocation or to general climatic variability. The decrease in snowfall however is significant and is likely due to warmer temperatures producing an increase in the proportion of rain compared to snow. The growth of the village to a town and the concomitant increases in the number of buildings may account in part for the local temperature rise and a decrease in snowfall.

#### **3.2.4.1 Wind Speed and Direction**

Although little wind data is available for the area, wind will be constrained by the Cheakamus and Squamish valleys. Prevailing wind directions in Squamish are northerly with wind speeds reaching up to 88 km/h (55 mph).

The strong southerly winds which are present at Brohm Ridge tend to scour the snow from the southwestern edge of the ridge, potentially limiting snow accumulations at some times.

Wind conditions appear to be comparable to those found at other ski resorts in southwestern B.C.

#### **3.2.4.2 Humidity**

The nearest data available for relative humidity is that from the Alta Lake (Whistler townsite) climate monitoring station, with data presented in the Canadian Climatic Norms (Environment Canada, 1990).

For the summer, this data indicates very high relative humidity (i.e., in the range of 75 to 90 percent in the early morning and late at night). Lower relative humidity readings of 45 to 65 percent occur in the early and late afternoon.

In the winter months of January through March, and November through December, humidity ranges reach between 75 and 90 percent throughout the day.

#### **3.2.4.3 Temperature and Freezing Level**

Temperature analysis for the proposed GARIBALDI AT SQUAMISH resort development focused primarily on times when temperatures are below the freezing level of 0°C (32°F).

For the month of November, the average maximum temperature would be 2.7°C (37°F), and the average minimum temperature would be -3.6°C (26°F). The average temperature drops in December to a maximum daily temperature of 0°C (32°F) and a minimum temperature of 4.1°C (39°F). It is estimated that the mean temperatures on two out of three days would be in the range of -1.0 to -5.0°C (30 to 23°F).

Freezing levels were estimated from the nearest radiosonde station located in Port Hardy, B.C. Based on the data recorded at this station, it was noted that freezing levels in January, February and March were relatively similar, located approximately at a mean elevation of 700 m through 900 m (2297 ft through 2953 ft). Freezing levels in December rose slightly to 1,100 m (3609 ft) and

continued to rise in April and November up to 1,500 metres (4921 ft). In May and October, the freezing levels range from 2,000 m to 2,200 m (6562 ft to 7218 ft), and in June and September they peak at 2,600 m to 3,200 m (8530 ft to 10,497 ft).

#### **3.2.4.4 Snow Pack**

Snow pack data for the periods of record for stations located within the vicinity and at similar elevations as the proposed GARIBALDI at Squamish project (1,100 m {3,609 ft}) at the proposed village site and 1,850 m (6,070 ft: at the top of the highest run), was obtained from the Ministry of Environment, Lands & Parks Resource Inventory and Data Management Branch.

Information was collected from the following locations:

- Grouse Mountain (1,100 m {3,609 ft})
- Hollyburn (1,100 m {3,609 ft})
- Mount Seymour (1,070 m {3,510 ft})
- Stave Lake (1,210 m {3,670 ft})
- Diamond Head (1,420 m {4,649 ft})
- Whistler Mountain (1,450 m {4,757 ft})

In addition, as per the recommendations of the previous critique of the previous “Formal Proposal” submission (Golder Associates, 1996), GARIBALDI has acquired snowpack data from Diamond Head (1977-1996) which has been used to supplement previous comparisons of snowpack made by Pacific Meteorology. The Garibaldi Lake snowpack gradient to the Diamond Head snowcourse (1977-1996) at 1,420 metres has also been used to assess the variability in seasonal snowpack down to the lowest lift at approximately 915 m asl (Exhibit 3-9).

#### **Exhibit 3-9 Estimate Of Seasonal Progression Of Snowpack At 1,020 M Elevation**

**Table 3-22 Snow Pack Data In The Vicinity Of The Proposed GARIBALDI AT SQUAMISH Resort Development.**

Station & Elevation	Period Of Record	Jan 01	Feb 01	Mar 01	April 01	May 01	June 01	June 15
Whistler Mtn (1,450 m asl)	1970-1990	49-157 112*	38-216 144*	66-270 171*	89-310 187*	32-259 135*	1-224 NA	0-175 37*
Diamond Head (1,420 m asl)	1977-1996	ND	101-222	166-405 315*	228-436 354*	170-385 293*	87-231 NA	42-145 NA
Grouse Mtn. (1,100 m asl)	1936-1996	13-223 127*	20-373 200*	39-490 250*	11-721 283*	104-323 NA	208	ND
Hollyburn (1,100 m asl)	1945-1987	99-268 NA	160-332 NA	57-615 NA	155-630 NA	163	100-230 NA	ND
Mt. Seymour (1,070 m asl)	1960-1989	25-288 197*	30-429 248*	55-579 316*	80-620 353*	0-566 297*	0-498 228*	0-401 144*
Stave Lake (1,210 m asl)	1967-1996	43-258 NA	56-429 276*	123-554 346*	142-566 379*	472	127-427 NA	371

\*Mean

Based on information in Table 3-22, the average monthly snow depth (as measured on the first day of each month) from January 01- June 01 for the periods of record ranges from:

- 112-187 cm (44-74 in) on Whistler Mountain
- 293-354 cm (115-139 in) on Diamond Head
- 127-283 cm (50-111 in) on Grouse Mountain
- 197-353 cm (78-139 in) on Mount Seymour
- 276-379 cm (109-149 in) at Stave Lake

Snow depth generally increases from late November, early December, through April and declines from May-mid June.

It should be noted that the average monthly snow depths (127-353 cm {50-139 in}) measured at the top of Grouse Mountain and Mount Seymour are at an elevation equal to the bottom of the proposed base village site, and approximately 775 m (2543 ft) lower than the top of the proposed highest ski run (Pod H).

The Whistler townsite typically receives less than 100 cm (39 in) on average per winter. The average monthly snow depth (112-354 cm {44-139 in}) information for both Whistler Mountain and Diamond Head are at an elevation (1,420-1,450 m {4659-4757 ft}) equal to mid-mountain at the proposed GARIBALDI at Squamish mountain resort. Diamond Head, which receives up to an average maximum of 436 cm (172 in) of snow by April 1, is less than 5 km (3 miles) from the proposed development.



Pacific Meteorology estimated the mean snow depth at elevation 1,100 m (3609 ft) (village site) for the GARIBALDI at Squamish project and compared these estimates to Diamond Head at 1,420 m (4659 ft), approximately 320 m (1050 ft) higher (Exhibit 3-10).

Snow depth at GARIBALDI and Diamond Head were similar although there was an approximate 320 m (1050 ft) difference in elevation. Total snow accumulations were estimated at the GARIBALDI base village site (elevation 1,100 m {3609 ft}) of 1,335 cm (526 in) and at the upper hotel site (elevation 1,310 m {4298 ft}) at 1,685 cm (663 in). Snow depth of 50 cm (20 in) is reached at Hollyburn and Grouse by the end of November and at Whistler at the end of December. The proposed resort development area is estimated to reach a depth of 50 cm (20 in) by the third week of November.

An evaluation of available data indicates that snow depth at the proposed resort development will be greater than 65 cm (26 in) for 75 percent of the time by the end of November. These same conditions do not generally apply to Grouse and Hollyburn until the end of December and at the Whistler townsite until the end of January.

### **Exhibit 3-10 Estimated Cumulative Snowfall and Snowdepth at 1,100 m Elevation**

In addition to the analysis conducted by Pacific Meteorology Inc., C. Stethem & Associates (letter dated November 13, 1997) reviewed the conclusions of the Pacific Meteorology assessment and concluded the following:

- The BC Environment snow survey data from Diamond Head is the most relevant information for the assessment of the potential snowpack at the GARIBALDI resort. The terrain at Brohm Ridge is probably subject to very similar snowfall.
- The regional snow survey information does show that Diamond Head tends to have a deeper snowpack than the Whistler area at the same elevation. The blocking effect of Diamond Head as the first mountain barrier to many storms is the probable cause of the greater level of precipitation on that mountain.
- The increased precipitation at Diamond Head also points to the potential for an increased amount of cloud to produce the precipitation and hence a potential for more restricted visibility. Visibility however, can be a very localized phenomenon and on site observation is really the only way to confirm the extent and location of restrictions in visibility.
- The desirable early season snowpack for commencement of operations is closer to 90 cm than 50 cm described above. An early season snowpack of 90 cm will

probably compact to 30-40 cm on a ski run. A 50 cm snowpack will compact to 15-20 cm which is less than desirable for a durable ski run.

- In the Whistler valley analysis, the winters of 1951-1980 are compared to the winters of 1976-1994, implying a 41 percent decrease in snowfall in the latter. This compares the former period which had several above average winters with the latter, which had several below average winters. It remains to be seen if the long term record will support the conclusion that the below average winters are a long term trend.
- The effects of freezing level on snowpack accumulation will be much the same at GARIBALDI as at Diamond Head. Fluctuations in the freezing level above and below the 1,100 m level will probably result in a reduced snowpack at 1,100 m (GARIBALDI village) compared to Diamond Head at 1,400 m. This can only really be confirmed by on site observations.

To this end, GARIBALDI has initiated a winter snow and weather observation study for the 1997/1998 winter. This study combines a network of manual observation sites and chart recording weather stations. A total of 3 snow plots with a total snowpack stake and an interval board have been installed at the base village, upper hotel and treeline sites. In addition, 2 weather stations each with Stevenson Screens containing a set of maximum and minimum thermometers and a hygrothermograph have been installed at the base village and treeline. See Section 12 for more details.

- In terms of commencement of the season, the Whistler ski areas are generally operational at mid-mountain in mid to late November. This is similar elevation to the upper hotel site at the GARIBALDI site and is reasonable to assume similar start up dates.
- Golder Associates applied the Garibaldi Lake snowpack gradient to the Diamond Head snowcourse at 1,420 m to assess the variability in seasonal snowpack down to the lowest lift at approximately 915 m. The results of their analysis indicated that the years of average or above average snowpack will probably have enough snow to ski to this lower elevation, at least after January. However, in the low snow years the snowpack will likely be thin and late at this lower elevation.

C. Stethem suggests that it should also be noted that both Whistler and Blackcomb now rely on snowmaking to ensure successful early season opening. This is a common trend in modern ski operations.

GARIBALDI has acknowledged this and has included costs for snow making equipment and requirements for water during the November and December period.

## **H. MOUNTAIN OPPORTUNITIES AND CONSTRAINTS**

The following opportunities and constraints have been delineated and/or were taken into account during the generation of the Mountain Master Plan:

- Existing Conditions – study area boundary, legal boundaries, land use, roads, prominent landforms and drainages, vegetation.
- Vehicular Access Points.
- Snow Line – Slopes above the 850-metre elevation receive consistent, abundant, high-quality snow. The snowpack below the 850-metre elevation is very unreliable during the beginning and end of the ski season.
- Slopes greater than 80 percent, which are too steep for skiing.
- Base Area Village Development – slopes between 0 and 10 percent (unlimited development) and 10 and 20 percent (upper limits to high-density, commercial village development).
- Predominant Wind Direction – Prevailing wind directions in Squamish with wind speeds reaching up to 88 km/h (55mph). There are strong southerly winds on Brohm Ridge that tend to scour the snow from the southwestern edge of the ridge, potentially limiting snow accumulations at some times.
- Solar orientation.
- Good views of the surrounding lands.
- Ski Development Pods – Delineating areas of potential alpine skiing development.
- Potential Lift Alignments.
- Base Area Portals – Potential base area focal points, located at the base of potential lift alignments.
- Comfortable Walking Distance – This is the distance from a destination – typically a lift terminal – that is comfortable to walk while wearing ski boots. The distance is decreased 100 metres for every 10-metre change in elevation, to compensate for the added difficulty of walking uphill. The areas within the comfortable walking distance zones define the most valuable base area lands.

- Sensitive Fish & Wildlife Habitat – For example, fish bearing sections of Brohm, Cheekye, Swift and Culliton waterways; sensitive wetlands; mountain goat critical winter habitat; etc.
- Potential Avalanche Zones – Areas of the mountain (based on slope only) that are commonly considered to fall within the range of the majority of avalanche activity. These areas contain slopes between 30 and 60 degrees (58 to 173 percent). Other factors (not considered) including aspect, ground cover, tree cover, snow compaction, wind loading, weather patterns and elevation, will contribute to the degree of avalanche hazard within these areas. For example, an area of thick tree cover at 50 degrees is typically not an avalanche zone. Areas defined as potential avalanche zones need to be monitored and controlled if conditions warrant.

Figure II-6 graphically summarizes the mountain opportunities and constraints for Garibaldi Resort. Potential Avalanche Zones are illustrated on Figure II-7.

**Figure II-6: Mountain Opportunities and Constraints**

**Figure II-7: Potential Avalanche Zones**

### **III. DESIGN GUIDELINES**

#### **A. INTRODUCTION**

The upgrading and expansion of a ski area is influenced by a variety of ski facility design criteria that help to create a quality ski experience. This section will briefly discuss these factors as they apply to Garibaldi Resort.

#### **B. LIFT NETWORK DESIGN**

Lift alignments should be oriented to take maximum advantage of the terrain while creating a complete area interconnection. In accordance with CASP Guidelines, ski lifts should be aligned to serve the available ski terrain in the most efficient manner possible, while taking the following factors into consideration:

- Create a balance between uphill lift capacity and downhill terrain capacity.
- Attempt to avoid areas that are adversely affected by prevailing and storm winds.
- Provide sufficient out-of-base staging capacity that will prevent long, morning lift-lines.
- Align lifts to create enjoyable repeat skiing opportunities while satisfying access and circulation requirements.
- Orient lifts to optimize skiing for each of the six skier ability levels (beginner through expert).
- Locate lift terminals on flat sites that are of sufficient size to accommodate the terminal structure, circulation and milling space, lift line mazes, and loading/off-loading space.
- Locate lift terminals on terrain where the following design features can be met: 1) provide a 0 to 1 percent slope down from the maze area to the lower lift terminal loading platform; and 2) provide a 5 to 10 percent slope down from the upper lift terminal unload platform to the surrounding milling area.

Additionally, it should be understood that the vertical rise and length of ski lifts for a particular mountain are the primary measures of overall attractiveness and marketability of a ski area.

## **C. SKI TERRAIN**

The following points summarize the salient features for a successful trail network.

- The natural configuration of the land should be utilized to its greatest potential to support the optimum capacity of the site, while creating a pleasurable skiing experience.
- A variety of slopes, ranging in gradient from 10 to 80 percent, should be incorporated into the trail network in order to provide a distribution of terrain (by ability levels) that matches the skier market profile as closely as possible.
- The ski trail alignments should allow a variety of trail widths, which will be designed in response to topographic conditions, the calibre of skier for whom they are intended, exposure to the sun and prevailing wind currents.
- A network of skiways ideally should be designed to allow the novice level skier to travel throughout the ski area. The network of skiways makes it possible to ski from any point on the mountain back to the base area, without the need to ride a lift. Lower ability trails should not be accessed by trails with higher ability classifications.
- The trail layout should be designed to minimize cross-traffic occurrences and bottleneck convergence zones.
- The trail network should be configured to follow the natural fall-line, thus creating trails that are more enjoyable to ski.
- The ski trails should be aligned to avoid potential avalanche hazards or be located in areas where known slide hazards can be controlled.

## **D. SKI TERRAIN CAPACITY**

Ski terrain capacity is a function of the acceptable, skiers-per-hectare density ratio, which is rated by skier skill class. These density figures account for the skiers that are actually populating the ski trails and do not account for other guests, who are either waiting in lift lines, are riding the lifts, or are using the milling areas and support facilities.

The range of acceptable densities for the ski trails by skill class is summarized below. Typically, urban ski areas will fall within the high end of this range and destination areas will be at the low end.



**Garibaldi Resort Mountain Master Plan  
Table III-1  
Skier Density Ratios by Ability Level**

Ability Level	CASP Guidelines For Skier Density Ratios
Beginner	35 – 75 Skiers/hectare
Novice	30 – 60 Skiers/hectare
Low Intermediate	20 – 50 Skiers/hectare
Intermediate	15 – 35 Skiers/hectare
Advanced Intermediate	10 – 25 Skiers/hectare
Expert	5 – 15 Skiers/hectare

Source: CASP GUIDELINES

## **E. SKIER SKILL CLASS**

The skier marketplace is divided into skill classes ranging from beginner to expert. The following gradients should be used to determine the skier ability level of the mountain terrain:

**Garibaldi Resort Mountain Master Plan  
Table III-2  
Acceptable Terrain Gradients**

Ability Level	CASP Guidelines for Slope Gradient
Beginner	8 to 12%
Novice	to 25% (short pitches to 30%)
Low Intermediate	to 30% (short pitches to 35%)
Intermediate	to 40% (short pitches to 45%)
Advanced Intermediate	to 50% (short pitches to 55%)
Expert	over 50% (maximum of 80%)

Source: CASP GUIDELINES

The ability level distribution of the developed ski trails (as defined by the skier capacity for each skill level) should generally match the distribution within the skier marketplace, accounting for the type of ski area in question (urban, regional, regional/destination, destination). The CASP Guidelines skill level distribution outlined below reflects the destination-oriented marketplace's expectations for resorts in Western Canada. The design criteria used by SE GROUP are based on recent trends that indicate lower percentages of advanced and expert skiers in the market place.

**Garibaldi Resort Mountain Master Plan**  
**Table III-3**  
**Ability Level Distribution of the Marketplace**

Ability Level	SE GROUP Guidelines For Ability Level Distribution	CASP Guidelines For Ability Level Distribution
Beginner	5 percent	2 – 6 percent
Novice	15 percent	11 – 15 percent
Low Intermediate	25 percent	18 – 22 percent
Intermediate	35 percent	33 – 37 percent
Advanced Intermediate	15 percent	18 – 22 percent
Expert	5 percent	8 – 12 percent

Source: SE GROUP, CASP GUIDELINES

## **F. VERTICAL DEMAND**

Vertical demand is a critical parameter for calculating a resort’s aggregate daily lift capacity (which is used to define a resort’s “Comfortable Carrying Capacity” as described below). The amount of vertical that the average skier is anticipated to ski over the course of a day increases as skier ability level increases. The vertical demand is estimated on a lift-by-lift basis and can be calculated as a function of the skiers’ “round-trip interval” on each lift. Round-trip interval is the amount of time it takes to make one complete circuit on a lift (i.e., waiting in the lift line, riding the lift, and then skiing one run). The amount of time it takes to make one round-trip is used to determine the total number of runs that can be made over the course of the day, which is then multiplied by the total vertical of the lift to derive the total vertical demand. For example, if the round-trip interval on a lift is estimated to be 30 minutes, and the average skier is actively skiing for five hours over the course of the day, then that skier will complete ten runs (two runs per hour over five hours). If the lift has a vertical rise of 300 metres, then the skier will consume 3,000 metres over the course of the day (ten runs at 300 metres per run).

The CASP Guidelines acceptable range of vertical demand values are outlined below, by skier skill class.

**Garibaldi Resort Mountain Master Plan**  
**Table III-4**  
**Vertical Demand by Skier Ability Level**

Ability Level	SE GROUP Guidelines For Vertical Demand	CASP Guidelines For Vertical Demand
Beginner	1,000 metres	500 – 750 metres
Novice	2,500 metres	750 – 1,500 metres
Low Intermediate	3,500 metres	1,500 – 2,250 metres
Intermediate	4,500 metres	2,250 – 3,000 metres
Advanced Intermediate	7,500 metres	3,000 – 5,500 metres
Expert	9,000 metres	5,500 – 7,500 metres

Source: SE GROUP, CASP GUIDELINES

SE GROUP’s guidelines for vertical demand are slightly higher than the CASP Guidelines to account for ski areas – like Garibaldi Resort – that have higher than average vertical rise for a given length. This allows skiers to consume a higher than average amount of vertical per day. The higher numbers also account for ski areas that keep lift lines at a minimum, allowing for more runs per hour and more vertical skied. A higher vertical demand results in a lower Comfortable Carrying Capacity. Therefore, using a higher vertical demand will result in less crowded conditions.

## **G. WEIGHTED VERTICAL DEMAND**

To determine the weighted vertical demand, all trails serviced by each lift are inventoried and the vertical demand for each lift is weighted by percentage of ability levels served.

## **H. COMFORTABLE CARRYING CAPACITY (CCC)**

By definition, Comfortable Carrying Capacity (CCC) is the optimum number of guests accommodated by a mountain facility, at any one time, which affords a high-quality recreational experience and helps ensure sound stewardship of the land. In essence, CCC is a daily guest population, which is serviceable by the resort (i.e., an attendance level where operations remain functional and optimal). CCC is calculated based upon a resort’s daily lift capacity. Once the CCC is calculated (based upon the proposed lift network), other resort facilities are sized to create a balance with the CCC. If certain components of the proposed development can not be balanced with the CCC (e.g., parking lots, resort access, utilities infrastructure, real estate development, etc.) due to physical, environmental, and/or economic constraints, then the lift network and CCC must be down-sized to account for identified limitations. In summary, CCC is a *planning parameter* that is used as the basis for designing a balanced resort development. The

CCC should not be considered as an absolute figure that defines or limits resort visitation but should be considered a dynamic number.

The CCC for each lift system is calculated using the following formula:

$$\text{CCC} = \frac{\text{Vertical Rise of the lift} \times \text{Hourly Capacity of the lift} \times \text{Operating Hours of the lift} \times \text{Loading Efficiency of the lift}}{\text{Weighted Vertical Demand of the ski trails associated with the lift}}$$

The resort CCC is the sum of the CCC calculations of each lift system.

## **I. SKIERS AT ONE TIME (SAOT)**

At any one time, the aggregate skier population is dispersed throughout the resort, either at guest services buildings and milling areas, waiting in lift mazes, riding lifts, or skiing on the trails. SAOT represents the proportion of skiers that will be using the trail network at any given time, based upon the CCC calculation. Once the SAOT is estimated, it can be compared to the estimated *capacity* of the ski terrain to determine if a sufficient amount of terrain has been proposed to balance trail capacity with the SAOT.

Of the total skier population, 15 to 40 percent of each lift's capacity will be using guest service facilities or milling areas at any one time (i.e., over the course of the day, skiers will be actively skiing 60 to 85 percent of the time – the equivalent of 4 to 6 hours). Thus 15 to 40 percent of the skier population is the resort's inactive population. The remaining 60 to 85 percent of visitors at the resort make up the active skier population who are either in lift lines, on lifts, or on trails. As set forth in the CASP Guidelines, 25 to 60 percent of the resort's active skier population will be on the slopes while the remaining skiers will be riding the lifts or waiting in lift lines. The number of skiers waiting in line at each lift is a function of the uphill hourly capacity of the lift and the assumed length of wait time at each lift. The number of guests riding on each lift is the product of the number of carriers on the uphill line and the capacity of the lift's carriers. The remainder of the skier/snowboarder population (i.e., the CCC minus the number of guests using guest facilities, milling in areas near the resort portals, waiting in lift mazes, and actually riding lifts) is assumed to be skiing.

## J. ADDITIONAL GUESTS

In addition to skiing guests, there are typically guests who use the mountain's guest service facilities but do not ski. For example, parents may bring their children to the mountain, and spend the day in the lodge reading or watching the children ski. These additional guests must be accommodated for when determining guest service space that they may utilize during the day (e.g., restaurant seating, rest room, retail). As a ratio of the CCC, the number of additional guests can be estimated as follows:

**Garibaldi Resort Mountain Master Plan**  
**Table III-5**  
**Additional Guests Multipliers**

Type of Ski Area	CASP Guidelines For Additional Guests
Community	1.00 – 1.05
Urban	1.10 – 1.25
Regional	1.05 – 1.10
Regional/Destination	1.10 – 1.20
Destination	1.10 – 1.25

Source: CASP Guidelines

At Garibaldi Resort it is assumed that these non-skiing guests using the mountain facilities equate to an additional 15 percent of the CCC, based on CASP Guidelines for Regional/Destination and Destination areas.

## K. BUILDINGS

Particular consideration should be given to the relationship of the base area to the mountain facilities. Upon arrival at the ski area, skiers should be able to move directly from parking, through ticketing or rentals, to the base of the lifts. Walking distance and vertical differential between the base area facilities and lifts should be minimized, or mechanically assisted, in an effort to move skiers directly onto the mountain. Vehicle, pedestrian, and skier circulation should be coordinated to create an organized and pleasant base area experience.

Guest service facilities should be sized as a function of the mountain CCC. The amount of guest service space in square metres per CCC is as follows:

## Garibaldi Resort Mountain Master Plan

### Table III-6

#### Space Use Multipliers

Type of Ski Area	CASP Guidelines For Space Use
Community	0.4 – 0.6
Urban	1.0 – 1.3
Regional	0.8 – 1.0
Regional/Destination	1.0 – 1.2
Destination	1.5 – 1.8

Source: CASP Guidelines

At Garibaldi Resort the proposed guest service space ranges between 1.30 – 1.59 square metres per CCC, based on CASP Guidelines for Regional/Destination and Destination areas.

The CCC is distributed between facilities according to specific guest service needs:

*Skier Staging Distribution* – This number represents the distribution of the total number of skiers (CCC) between the guest service facilities where guests can access the mountain at the beginning of their day (known as base area portals). This number is used to determine the amount of guest service space needed for staging functions (e.g., tickets, rentals). At Garibaldi Resort all skiing guests stage out of the village, the day skier base area or the base of Lift R.

*All Guests Staging Distribution* – This is similar to skier staging, but includes additional guests who use the mountain facilities but do not ski. This number is used to determine the amount of guest service space needed for functions that may be used by both skiing and non-skiing guests throughout the day (e.g., retail, restaurant seating, rest rooms). At Garibaldi Resort it is assumed that these non-skiing guests equate to an additional 15 percent of the CCC. All non-skiing guest services – as part of the mountain facilities – are located in the village and the day skier base area.

*Ski School Operations Distribution* – This number represents the distribution of the total number of skiers (CCC) between the guest service facilities that provide ski school services. This number is used to determine the amount of guest service space needed for ski school functions (e.g., reservations desk, instructor lockers). At Garibaldi Resort all ski school activities stage out of the village and the day skier base area. In addition, ski school desks will be located in the North and South Summit lodges.

*Lunch Distribution* – This number represents the distribution of the total number of skiers and non-skiers between the guest service facilities where guests can have lunch. This number is used to determine the amount of guest service space needed for food service functions (e.g., restaurant seating, kitchen/scramble). At Garibaldi Resort guests may

have lunch in the village, the day skier base area, the North and South Summit lodges and the North Brohm Ridge lodge.

*Administration/Employee Distribution* – This number represents the distribution of the total number of skiers and non-skiers between the guest service facilities. This number is used to determine the amount of administration and employee space needed in all guest service locations. At Garibaldi Resort all administrative and employee space is located in the village and the day skier base area.

## **L. BALANCE OF FACILITIES**

The mountain master planning process emphasizes the importance of balancing recreational facility development. The size of the skier service functions must be matched to the CCC of the mountain. The future development of a ski area should be designed and coordinated to maintain a balance between skier demand, ski area capacity (lifts and trails), and the supporting equipment and facilities (e.g., grooming machines, day lodge services and facilities, utility infrastructure, access, and parking).

## **IV. MOUNTAIN MASTER PLAN**

### **A. SUMMARY OF MOUNTAIN FACILITIES**

The mountain development will occur entirely on Crown lands. Of the 4,900-hectare (12,112-acre) Garibaldi Resort Controlled Recreation Area, approximately 1,850 hectares (4,571 acres) are required for establishment of the proposed ski area. Total skiable area is estimated to be between 1,000 and 1,200 hectares. The 130 developed ski trails proposed in this master plan account for a total of 675 hectares (1,668 acres). The remaining terrain is made up of open bowls and tree skiing areas. The remaining Garibaldi Resort Controlled Recreation Area will be used for commercial and real estate development as well as other resort recreational amenities (e.g., golf, trail networks, etc.).

Proposed lifts include 2 enclosed gondolas, 1 cabriolet gondola, 12 detachable chairlifts, 5 fixed grip chairlifts, 3 real estate fixed grip access lifts and 2 surface lifts. The proposed lift system will provide a total vertical drop of approximately 1,215 metres (3,986 feet) and will support a comfortable carrying capacity of 15,250 skiers.

In addition to alpine skiing, the mountain development area will be used for Nordic skiing and snowshoeing in the winter, and lift rides, hiking, interpretive trails, site-seeing, mountain biking, horseback riding, dining, festivals and events, etc. during the summer. Trail networks include loops on the top of the mountain, taking advantage of the scenic views and gentle slopes of Brohm Ridge. These trails will be staged from the North Summit at the top of the gondola (Lift L). In addition, more challenging routes are provided up and down the mountain, taking advantage of the mountain work roads network. These trails may be used for hiking, horseback trail riding, and mountain biking. The on-mountain routes are connected to a multi-use trail, which accesses the village and all residential areas.

There will be 2 base area day lodges providing all ski-related guest services. The village facility will be between 8,549 and 10,842 sq. m., and includes a 2,131-seat restaurant. The guest services at the day skier base area will be between 4,480 and 5,688 sq. m., and will include a 343-seat restaurant. A small staging area, providing tickets and rest rooms, will be located at the base of Lift R for the convenience of guests staying in adjacent real estate.



There will also be 3 on-mountain lodges, at North Summit, South Summit and North Brohm Ridge. The lodge at North Summit will include a 1,218-seat restaurant, rest rooms, retail, and a ski school registration desk, and will be between 2,812 and 3,436 sq. m. The lodge at South Summit will include a 984-seat restaurant, rest rooms, retail, and a ski school registration desk, and will be between 2,272 and 2,777 sq. m. The North Brohm Ridge lodge will include a 559-seat restaurant, rest rooms and retail, and will be between 1,432 and 1,810 sq. m.

Garibaldi Resort will have five on-mountain ski patrol facilities. The ski patrol headquarters will be located at North Summit. Duty stations will be located at South Summit, North Brohm Ridge and at the top of Lift K and Lift D. There will be first aid facilities located at the village and the day skier base area.

The build-out plan for Garibaldi Resort's snowmaking system provides coverage for approximately 120 hectares of alpine terrain. The emphasis of the snowmaking program will be coverage for low elevation trails, coverage for critical trails that return to the resort village, high use/critical connections, and coverage for the terrain that provides return routes from each of the mountain top restaurants.

Garibaldi Resort's mountain maintenance facility (1,000 sq. m.) is located near the intersection of trails G12, G14 and B7 (see Figure IV-1), a location with all weather road access and snow frontage. In addition, a 550 sq. m. on-mountain maintenance facility will be located south of trail B7 at the 1,435 m elevation.

Installation and maintenance of most of the lift terminals and all of the on-mountain guest service facilities at Garibaldi Resort will necessitate the construction of access routes. A total of 17.5 km of existing logging roads, providing access to the North and South summits, will be improved and used for construction and on-going maintenance. In addition, 17.9 km of new mountain work roads will be created; 8.4 km of these proposed roads will be along skiways.

The Mountain Master Plan (Figure IV-1) was generated from 1:5,000 scale topographic mapping with a 5-metre contour interval.

**Figure IV-1: Mountain Master Plan**

## **B. ALPINE SKIING AND SNOWBOARDING**

### 1. Lifts

The proposed lift alignments have been oriented to take maximum advantage of the terrain while creating a complete area interconnection. In accordance with CASP Guidelines, the ski lifts have been aligned to serve the available ski terrain in the most efficient manner possible, while taking the following factors into consideration:

- Create a balance between uphill lift capacity and downhill terrain capacity.
- Attempt to avoid areas that are adversely affected by prevailing and storm winds.
- Provide sufficient out-of-base staging capacity and lift redundancy that will prevent long, morning lift-lines.
- Align lifts to create enjoyable repeat skiing opportunities while satisfying access and circulation requirements.
- Orient lifts to optimize skiing for each of the six skier ability levels (beginner through expert).
- Locate lift terminals on flat sites that are of sufficient size to accommodate the terminal structure, circulation and milling space, lift line mazes, and loading/off-loading space.
- Locate lift terminals on terrain where the following design features can be met: 1) provide a 0 to 1 percent slope down from the maze area to the lower lift terminal loading platform; and 2) provide a 5 to 10 percent slope down from the upper lift terminal unload platform to the surrounding milling area.

Following are the preliminary lift specifications of the proposed lift network layout illustrated on the Mountain Master Plan for Garibaldi Resort.

## Garibaldi Resort Mountain Master Plan

### Table IV-1 Lift Specifications

Map Reference	Lift Type	Top Elev. (m.)	Bot. Elev. (m.)	Vert. Rise (m.)	Horiz. Length (m.)	Slope Length (m.)	Avg. Grade (%)	Hourly Capacity (persons/hr)
A	Cabriolet	878	650	227	620	667	37%	2,600
B1	DC6	1,285	880	405	1,987	2,028	20%	2,800
B2	DC6	1,485	1,285	200	1,140	1,157	18%	2,800
C	DC4	1,401	1,133	268	796	854	34%	2,400
D	DC4	1,567	1,142	425	1,111	1,204	38%	2,400
E	DC4	1,728	1,137	591	1,539	1,681	38%	1,800
F	DC6	1,712	1,464	248	1,011	1,073	25%	2,600
G	DC4	1,521	890	631	1,883	2,016	34%	2,400
H	DC4	1,740	1,475	265	1,250	1,278	19%	2,400
I	C3	1,741	1,696	45	353	357	13%	1,800
J	C3	1,733	1,705	29	373	376	8%	1,800
K	DC4	1,782	1,608	175	761	786	23%	2,400
L1	Gondola – Lower	1,480	1,037	443	1,784	1,838	25%	2,800
L2	Gondola – Upper	1,746	1,480	266	1,145	1,175	23%	2,800
M	DC6	1,558	1,011	547	2,187	2,283	25%	2,600
N	C3	1,112	1,044	68	428	438	16%	1,200
O	DC6	1,740	1,475	265	998	1,050	27%	2,600
P	C3	1,481	1,175	306	767	855	40%	1,800
Q	Surface	1,887	1,731	156	1,594	1,619	10%	600
R	DC4	1,556	1,148	408	2,184	2,259	19%	2,400
S	C3	1,726	1,495	230	772	819	30%	1,600
T	C3	1,143	1,038	104	661	678	16%	1,800
U	C3	1,200	1,041	159	436	486	36%	1,800
V	Surface	1,485	1,479	6	54	54	11%	1,800
W	C3	1,282	1,020	262	1,260	1,312	21%	1,800

Source: SE GROUP

## 2. Alpine Terrain

The design for the developed ski trail network is illustrated on the Garibaldi Resort Mountain Master Plan. The following points summarize the salient features of the proposed trail network.

- The natural configuration of the land has been utilized to its greatest potential to support the optimum capacity of the site, while creating a pleasurable skiing experience.
- A variety of slopes, ranging in gradient from 10 to 80 percent, have been incorporated into the trail network in order to provide a distribution of terrain (by ability levels) that matches the skier market profile as closely as possible.

- The ski trail alignments will allow a variety of trail widths which will be designed in response to topographic conditions, the calibre of skier for whom they are intended, and prevailing wind currents.
- A network of skiways allow the novice level skier to travel from the North and South Summit lodges to the base area lodges.
- The trail layout has attempted to minimize cross-traffic occurrences and bottleneck convergence zones. Where cross-traffic occurs, these crossings will be mitigated (i.e., traffic calming banners, offset trail crossings, etc.).
- The ski trails have been aligned to avoid potential avalanche hazards or have been located in areas where known slide hazards can be controlled.

The tables on the following pages outline the terrain specifications of the proposed trail network layout illustrated on the Mountain Master Plan. The ski trail ability levels have been classified using the steepest 100-metre lineal section as the indicator. Following is a summary of the terrain specifications.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-2**  
**Terrain Specifications Summary**

Ability Level	Trail Area (ha.)	Terrain Breakdown
Beginner	18.5	3%
Novice	68.8	10%
Low Intermediate	118.0	17%
Intermediate	232.3	34%
Adv. Intermediate	125.7	19%
Expert	112.0	17%
Total:	675.3	100%

## Garibaldi Resort Mountain Master Plan

### Table IV-3 Terrain Specifications

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
A01*	878	650	228	825	856	50	4.1	4.3	28%	33%	Low Intermediate
B01	1,462	1,370	92	869	885	34.6	3.0	3.1	11%	15%	Novice
B02	1,483	1,322	162	746	767	105.8	7.9	8.1	22%	30%	Low Intermediate
B03	1,475	1,367	109	495	512	62.8	3.1	3.2	22%	33%	Low Intermediate
B04	1,488	1,287	201	1,172	1,199	48.7	5.7	5.8	17%	28%	Low Intermediate
B05	1,435	1,328	106	468	481	44.5	2.1	2.1	23%	26%	Low Intermediate
B06	1,352	1,294	58	390	395	48.9	1.9	1.9	15%	18%	Novice
B07	1,490	880	610	4,192	4,265	38.5	16.1	16.4	14%	25%	Novice
B08	1,301	1,289	12	179	181	82.3	1.5	1.5	7%	10%	Novice
B09	1,385	1,332	53	280	286	47.7	1.3	1.4	19%	24%	Novice
B10	945	883	62	235	245	40.0	0.9	1.0	26%	28%	Low Intermediate
C01	1,400	1,301	99	652	663	59.7	3.9	4.0	15%	21%	Novice
C02	1,399	1,135	263	683	739	51.6	3.5	3.8	39%	51%	Advanced Intermediate
C03	1,239	935	304	962	1,018	42.2	4.1	4.3	32%	45%	Intermediate
C04	1,175	1,134	41	379	382	53.1	2.0	2.0	11%	12%	Advanced Intermediate
C05	1,204	1,135	69	284	293	35.9	1.0	1.1	24%	30%	Advanced Intermediate
C06	1,306	1,192	114	394	411	91.7	3.6	3.8	29%	33%	Advanced Intermediate
C07	1,394	1,136	258	831	880	53.1	4.4	4.7	31%	52%	Advanced Intermediate
C08	1,322	1,162	160	462	496	61.3	2.8	3.0	35%	49%	Advanced Intermediate
C09	1,383	1,130	252	1,766	1,798	25.2	4.5	4.5	14%	22%	Intermediate
C10	1,230	1,147	83	272	285	110.7	3.0	3.2	31%	35%	Intermediate
C11	1,130	1,114	17	259	260	24.1	0.6	0.6	7%	10%	Novice
C12	1,112	1,088	24	240	241	22.9	0.5	0.6	10%	12%	Novice
C13	1,124	1,016	108	1,022	1,034	30.5	3.1	3.1	11%	16%	Novice
D01	1,557	1,377	180	506	562	84.6	4.3	4.8	36%	73%	Expert
D02	1,486	1,352	135	239	279	127.1	3.0	3.5	56%	61%	Expert
D03	1,566	1,160	406	1,461	1,538	44.8	6.5	6.9	28%	45%	Intermediate
D04	1,446	1,143	303	876	945	80.0	7.0	7.6	35%	60%	Expert
D05	1,564	1,440	125	230	266	78.7	1.8	2.1	54%	65%	Expert
D06	1,348	1,154	194	564	600	76.1	4.3	4.6	34%	45%	Intermediate
D07	1,558	1,380	178	400	444	46.1	1.8	2.0	45%	60%	Expert
D08	1,498	1,310	188	536	574	52.9	2.8	3.0	35%	52%	Advanced Intermediate
D09	1,566	1,145	422	1,512	1,589	62.0	9.4	9.9	28%	49%	Advanced Intermediate
E01	1,535	1,299	236	462	522	61.7	2.9	3.2	51%	61%	Expert
E02	1,711	1,138	573	1,610	1,735	65.0	10.5	11.3	36%	69%	Expert
E03	1,463	1,200	263	538	602	49.1	2.6	3.0	49%	60%	Expert
E04	1,714	1,160	555	1,452	1,588	54.9	8.0	8.7	38%	71%	Expert
E05	1,726	1,697	29	181	185	67.9	1.2	1.3	16%	17%	Low Intermediate
E06	1,223	1,154	69	306	316	38.6	1.2	1.2	23%	26%	Expert
E07	1,504	1,140	364	1,024	1,122	50.8	5.2	5.7	36%	75%	Expert
E08	1,539	1,270	268	912	964	49.2	4.5	4.7	29%	53%	Advanced Intermediate
F01	1,715	1,464	251	1,654	1,695	28.9	4.8	4.9	15%	29%	Low Intermediate

**Garibaldi Resort Mountain Master Plan**

**Table IV-3**

**Terrain Specifications**

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
F02	1,709	1,513	196	916	946	57.1	5.2	5.4	21%	35%	Low Intermediate
F03	1,703	1,555	148	592	612	109.3	6.5	6.7	25%	32%	Low Intermediate
G01	1,520	968	552	2,064	2,169	47.8	9.9	10.4	27%	52%	Advanced Intermediate
G02	1,509	1,091	418	1,056	1,144	75.0	7.9	8.6	40%	53%	Advanced Intermediate
G03	1,484	1,079	405	1,032	1,114	76.6	7.9	8.5	39%	52%	Advanced Intermediate
G04	1,525	918	607	2,527	2,626	62.6	15.8	16.4	24%	42%	Intermediate
G05	1,224	1,051	174	392	430	57.8	2.3	2.5	44%	50%	Advanced Intermediate
G06	1,307	1,007	300	762	830	61.6	4.7	5.1	39%	55%	Advanced Intermediate
G07	1,478	906	572	1,690	1,820	70.8	12.0	12.9	34%	55%	Advanced Intermediate
G08	1,355	914	440	1,110	1,210	63.9	7.1	7.7	40%	55%	Advanced Intermediate
G09	1,462	1,139	323	788	866	57.0	4.5	4.9	41%	65%	Expert
G10	1,498	1,190	308	786	858	50.7	4.0	4.4	39%	67%	Expert
G11	1,523	1,021	502	2,124	2,215	50.0	10.6	11.1	24%	55%	Advanced Intermediate
G13	1,225	938	287	816	870	64.1	5.2	5.6	35%	45%	Intermediate
G14	1,014	891	122	1,503	1,522	33.3	5.0	5.1	8%	13%	Novice
G15	1,029	890	139	1,546	1,563	44.4	6.9	6.9	9%	18%	Novice
H01	1,738	1,490	248	1,292	1,323	87.5	11.3	11.6	19%	32%	Low Intermediate
H02	1,610	1,494	116	821	836	81.5	6.7	6.8	14%	22%	Low Intermediate
H03	1,490	1,129	361	915	993	76.7	7.0	7.6	40%	58%	Expert
H04	1,706	1,592	114	324	346	126.8	4.1	4.4	35%	44%	Intermediate
H05	1,520	1,489	31	259	262	45.3	1.2	1.2	12%	15%	Novice
I01	1,743	1,696	47	369	373	70.0	2.6	2.6	12%	12%	Beginner
I02	1,740	1,698	42	351	354	54.3	1.9	1.9	12%	12%	Beginner
J01	1,736	1,703	33	374	377	94.4	3.5	3.6	9%	12%	Beginner
J02	1,730	1,705	25	357	359	80.7	2.9	2.9	7%	11%	Beginner
K01	1,781	1,600	181	807	833	223.8	18.1	18.6	22%	30%	Intermediate
K02	1,723	1,706	17	105	107	66.0	0.7	0.7	16%	20%	Low Intermediate
K03	1,763	1,610	153	928	949	58.3	5.4	5.5	16%	31%	Low Intermediate
K04	1,699	1,616	83	327	338	49.7	1.6	1.7	25%	27%	Low Intermediate
K05	1,732	1,611	121	470	487	56.8	2.7	2.8	26%	30%	Low Intermediate
K06	1,755	1,666	89	387	400	45.8	1.8	1.8	23%	31%	Low Intermediate
K07	1,746	1,644	102	372	388	51.5	1.9	2.0	27%	28%	Low Intermediate
K08	1,781	1,610	170	769	793	60.2	4.6	4.8	22%	29%	Low Intermediate
K09	1,763	1,733	30	254	256	35.9	0.9	0.9	12%	13%	Intermediate
K10	1,766	1,672	94	370	384	102.1	3.8	3.9	25%	33%	Intermediate
K11	1,755	1,654	101	281	307	74.7	2.1	2.3	36%	57%	Advanced Intermediate
L01	1,741	1,129	612	5,078	5,150	39.2	19.9	20.2	12%	25%	Novice
L02	1,742	1,479	264	1,343	1,382	112.8	15.1	15.6	20%	38%	Intermediate
L03	1,741	1,605	136	511	532	174.4	8.9	9.3	27%	38%	Intermediate
L04	1,736	1,683	53	184	192	92.1	1.7	1.8	29%	31%	Intermediate
L05	1,657	1,508	150	656	682	170.4	11.2	11.6	23%	43%	Intermediate
L06	1,599	1,498	101	504	518	112.3	5.7	5.8	20%	32%	Low Intermediate

## Garibaldi Resort Mountain Master Plan

### Table IV-3

#### Terrain Specifications

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
L07	1,575	1,485	90	462	475	117.3	5.4	5.6	20%	31%	Low Intermediate
L08	1,494	1,384	110	272	300	53.3	1.5	1.6	40%	52%	Advanced Intermediate
L09	1,536	1,040	496	2,894	2,968	65.5	18.9	19.4	17%	36%	Intermediate
L10	1,399	1,154	245	610	671	63.3	3.9	4.2	40%	73%	Expert
M01	1,557	1,017	541	2,418	2,498	91.0	22.0	22.7	22%	45%	Intermediate
M02	1,232	1,044	189	746	778	83.0	6.2	6.5	25%	43%	Intermediate
M03	1,436	1,133	304	922	975	59.9	5.5	5.8	33%	45%	Intermediate
M04	1,413	1,145	268	738	791	57.6	3.5	3.8	36%	54%	Advanced Intermediate
M05	1,528	1,145	384	1,166	1,255	58.0	6.8	7.3	33%	65%	Expert
M06	1,548	1,275	274	719	781	65.4	4.7	5.1	38%	72%	Expert
N01	1,114	1,046	69	690	693	40.0	5.3	5.4	10%	12%	Beginner
O01	1,736	1,479	255	1,058	1,106	99.0	10.5	10.9	24%	45%	Intermediate
O02	1,709	1,616	93	269	291	171.9	4.6	5.0	35%	45%	Intermediate
O03	1,641	1,478	163	1,249	1,270	59.7	7.5	7.6	13%	35%	Low Intermediate
O04	1,570	1,554	16	102	103	124.0	1.3	1.3	16%	20%	Intermediate
O05	1,662	1,564	97	466	480	107.4	5.0	5.2	21%	31%	Low Intermediate
O06	1,558	1,479	79	170	191	117.5	2.0	2.2	47%	51%	Advanced Intermediate
O07	1,576	1,547	28	240	243	160.2	3.8	3.9	12%	15%	Low Intermediate
O08	1,531	1,500	30	66	73	120.2	0.8	0.9	46%	57%	Expert
Q01	1,702	1,192	510	1,970	2,070	29.2	5.8	6.0	26%	73%	Expert
Q02	1,863	1,186	677	2,737	2,849	30.8	8.4	8.8	25%	47%	Advanced Intermediate
Q03	1,837	1,697	140	246	288	35.0	0.9	1.0	57%	74%	Expert
Q04	1,643	1,342	301	719	792	33.0	2.4	2.6	42%	63%	Expert
Q05	1,439	1,271	167	464	502	33.9	1.6	1.7	36%	59%	Expert
Q06	1,863	1,564	299	825	905	32.0	2.6	2.9	36%	77%	Expert
Q07	1,679	1,276	373	1,243	1,322	32.3	4.0	4.3	30%	43%	Advanced Intermediate
Q08	1,849	1,588	260	2,285	2,326	20.2	4.6	4.7	11%	38%	Intermediate
Q09	1,650	1,185	465	1,024	1,138	31.7	3.2	3.6	45%	63%	Expert
Q10	1,644	1,231	412	824	935	31.3	2.6	2.9	50%	64%	Expert
Q11	1,626	1,165	461	1,047	1,164	31.7	3.3	3.7	44%	73%	Expert
R01	1,555	1,519	36	391	395	54.5	2.1	2.2	9%	11%	Beginner
R02	1,555	1,145	410	2,268	2,332	58.7	13.3	13.7	18%	42%	Intermediate
R03	1,534	1,366	168	911	930	66.0	6.0	6.1	18%	27%	Low Intermediate
R04	1,451	1,147	304	1,305	1,357	70.6	9.2	9.6	23%	36%	Intermediate
R05	1,311	1,149	162	607	634	111.0	6.7	7.0	27%	39%	Intermediate
R06	1,282	1,150	132	556	577	242.2	13.5	14.0	24%	41%	Intermediate
R07	1,268	1,149	119	855	873	33.3	2.8	2.9	14%	25%	Novice



## Garibaldi Resort Mountain Master Plan

### Table IV-3

#### Terrain Specifications

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
S01	1,610	1,495	116	575	590	60.1	3.5	3.5	20%	31%	Low Intermediate
S02	1,557	1,512	46	275	280	97.9	2.7	2.7	17%	18%	Low Intermediate
S03	1,542	1,496	46	255	268	51.0	1.3	1.4	18%	26%	Low Intermediate
<b>Total:</b>					111,426		644.9	675.3			

Source: SE GROUP

\*Trail A01 will be used only for access to day skier parking lots. Therefore the trail is not included in trail capacity calculations.

### 3. Snowboarding

Nearly all modern ski resorts include terrain features and facilities that are designed specifically for snowboard riders. The layout and configuration of terrain parks at Garibaldi will be dependant on current trends and will likely change over time. Accordingly, the design of snowboard terrain parks and half pipes has not been completed for Garibaldi Resort. However, the general slope characteristics and location (near the North Summit Lodge) of the terrain served by upper Lift L, Lift H, and Lift O is ideal for development of snowboard parks. It would also be possible to develop snowboard parks on the lower slopes of Lift M near the village core. The upper-elevation bowls and off-piste terrain at Garibaldi Resort will also be attractive to snowboard riders.

### 4. Ski Terrain Capacity

Ski terrain capacity is a function of the acceptable, skiers-per-hectare density ratio, which is rated by skier ability level. The skier densities that have been used for Garibaldi Resort are lower than the CASP Guidelines (as set forth below) because the majority of skiers at Garibaldi Resort will be destination visitors who expect low density, uncrowded skiing. These density figures account for the skiers that are actually populating the ski trails and do not account for other guests, who are either waiting in lift lines, are riding the lifts, or are using the milling areas and support facilities. The last column in the following table indicates the Skier Density Ratio of guests distributed throughout the mountain facilities (i.e., including those guests that are waiting in lift lines, riding lifts or using milling areas and support facilities). The skier density ratios in this column are used to assess the balance between ski area capacity based on the amount of ski terrain and ski area capacity based on CCC.

**Garibaldi Resort Mountain Master Plan**

**Table IV-4**

**Skier Density Ratios by Ability Level**

Ability Level	Garibaldi Resort Design Criteria Skier Density Ratios (on slopes only)	CASP Guidelines Skier Density Ratios (on slopes only)	Garibaldi Resort Design Criteria Skier Density Ratios <b>(total ski area facility)</b>
Beginner	20 Skiers/hectare	35 – 75 Skiers/hectare	50 Skiers/hectare
Novice	18 Skiers/hectare	30 – 60 Skiers/hectare	45 Skiers/hectare
Low Intermediate	14 Skiers/hectare	20 – 50 Skiers/hectare	35 Skiers/hectare
Intermediate	10 Skiers/hectare	15 – 35 Skiers/hectare	25 Skiers/hectare
Advanced Intermediate	7 Skiers/hectare	10 – 25 Skiers/hectare	17 Skiers/hectare
Expert	4 Skiers/hectare	5 – 15 Skiers/hectare	10 Skiers/hectare

Source: SE GROUP

The following table shows that the trail design for Garibaldi Resort has a terrain capacity of 6,911 skiers, on the slopes, at one time. (As discussed above, the overall ski area capacity includes the terrain capacity (6,911 skiers) as well as the number of skiers waiting in lift lines, riding the lifts, or using visitor service facilities and milling areas.) This *downhill* terrain capacity figure will be compared with the skiers at one time (SAOT) estimate made in Section B.9, which represents the proportion of skiers who are expected to be on the slopes at one time based upon the *uphill* capacity of the lifts. A balance between terrain capacity and SAOT represents a balance between uphill lift capacity and downhill terrain capacity.

**Garibaldi Resort Mountain Master Plan**

**Table IV-5**

**Terrain Capacity**

Ability Level	Trail Area (ha.)	Terrain Capacity (Skiers)
Beginner	18.5	370
Novice	68.8	1,238
Low Intermediate	118	1,652
Intermediate	232.3	2,323
Adv. Intermediate	125.7	880
Expert	112	448
<b>Total:</b>	<b>675.3</b>	<b>6,911</b>

Source: SE GROUP

## 5. Skier Skill Class

The skier marketplace is divided into skill classes ranging from beginner to expert. The ability level distribution of the developed ski trails (as defined by the ski area capacity for each ability level) should generally match the distribution within the skier marketplace. The estimated ability level distribution for the Garibaldi Resort marketplace is given below. This ability level distribution reflects the destination-oriented marketplace's expectations for resorts in Western Canada. The ability level distribution used by SE GROUP is based on recent trends that indicate lower percentages of advanced and expert skiers in the market place compared with the CASP Guidelines and higher percentages of novice and low intermediate skiers.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-6**  
**Estimated Ability Level Distribution of the Marketplace**

Ability Level	Estimated Ability Level Distribution For Garibaldi Resort's Marketplace	CASP Guidelines For Ability Level Distribution
Beginner	5 percent	2 – 6 percent
Novice	15 percent	11 – 15 percent
Low Intermediate	25 percent	18 – 22 percent
Intermediate	35 percent	33 – 37 percent
Advanced Intermediate	15 percent	18 – 22 percent
Expert	5 percent	8 – 12 percent

Source: SE GROUP

The following table shows that the proposed trail design for Garibaldi Resort offers a variety of terrain that is responsive to current trends in the marketplace, which have changed since the development of the CASP Guidelines.

**Garibaldi Resort Mountain Master Plan**

**Table IV-7**

**Ski Area Capacity Distribution by Ability Levels**

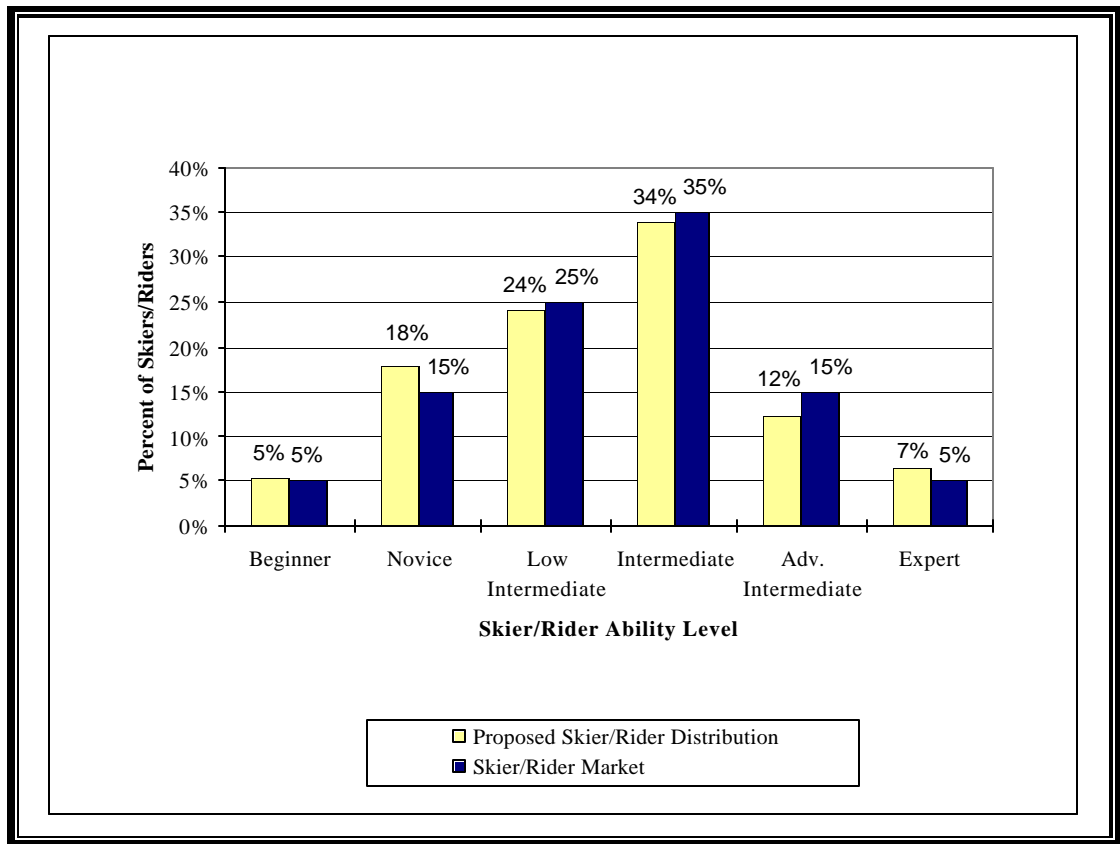
Ability Level	Trail Area (ha.)	Ski Area Capacity (Skiers)	Garibaldi Resort's Skier Capacity Distribution (%)	Garibaldi Resort's Market Distribution (%)	Distribution per CASP Guidelines (%)
Beginner	18.5	924.6	5%	5%	2 – 6%
Novice	68.8	3,096.6	18%	15%	11 – 15%
Low Intermediate	118.0	4,131.1	24%	25%	18 – 22%
Intermediate	232.3	5,806.4	34%	35%	33 – 37%
Adv. Intermediate	125.7	2,137.2	12%	15%	18 – 22%
Expert	112.0	1,120.0	7%	5%	8 – 12%
<b>Total:</b>	<b>675.3</b>	<b>17,216</b>	<b>100%</b>	<b>100%</b>	

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Chart IV-1**

**Terrain Distribution by Ability Level**



## 6. Vertical Demand

Vertical demand is a critical parameter for calculating a resort’s aggregate daily lift capacity (which is used to define a resort’s CCC as described in Section B.8). The amount of vertical that the average skier is anticipated to ski over the course of a day increases as skier ability level increases. The vertical demand is estimated on a lift-by-lift basis and can be calculated as a function of the skiers’ “round-trip interval” on each lift. Round-trip interval is the amount of time it takes to make one complete circuit on a lift (i.e., waiting in the lift line, riding the lift, and then skiing one run). The amount of time it takes to make one round-trip is used to determine the total number of runs that can be made over the course of the day, which is then multiplied by the total vertical of the lift to derive the total vertical demand. For example, if the round-trip interval on a lift is estimated to be 30 minutes, and the average skier is actively skiing for five hours over the course of the day, then that skier will complete ten runs (two runs per hour over five hours). If the lift has a vertical rise of 300 metres, then the skier will consume 3,000 metres over the course of the day (ten runs at 300 metres per run).

The average vertical demand values used for the Garibaldi Resort project are outlined below, by skier ability class.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-8**  
**Vertical Demand by Skier Ability Level**

Ability Level	Garibaldi Resort Design Criteria For Vertical Demand	CASP Guidelines For Vertical Demand
Beginner	1,000 metres	500 – 750 metres
Novice	2,500 metres	750 – 1,500 metres
Low Intermediate	3,500 metres	1,500 – 2,250 metres
Intermediate	4,500 metres	2,250 – 3,000 metres
Advanced Intermediate	7,500 metres	3,000 – 5,500 metres
Expert	9,000 metres	5,500 – 7,500 metres

Source: SE GROUP

The vertical demand figures used for Garibaldi Resort are slightly higher than the values set forth in the CASP Guidelines. This is because most of the proposed lifts at Garibaldi Resort have higher than average vertical rise for a given length, allowing skiers to consume a higher than average amount of vertical per day. Additionally, a goal of management is to keep lift lines at a minimum. This has the effect of increasing vertical demand (i.e., shorter lift lines equates to more runs per hour and more vertical skied).

It should be noted that a higher vertical demand results in a lower CCC. Therefore, using a higher vertical demand will result in less crowded conditions at Garibaldi Resort.

## 7. Weighted Vertical Demand

The trails serviced by each lift have been inventoried and the vertical demand for each lift has been weighted by percentage of ability levels served. The following table is an example of how weighted vertical demand has been calculated for each lift at Garibaldi Resort, using Lift G as the example.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-9**  
**Weighted Vertical Demand for Lift G**

Ability Level	Area (Ha.)	Trail Capacity	Percentage Use	Vertical Demand	Weighted Demand
Beginner	0.0	0	0%	1,000	0
Novice	12.0	540	22.55%	2,500	564
Low Intermediate	0.0	0	0%	3,500	0
Intermediate	22.0	550	22.97%	4,500	1,034
Advanced Intermediate	66.8	1,136	47.42%	7,500	3,557
Expert	16.9	169	7.05%	9,000	635
Total	111.7	2,395			5,765

Source: SE GROUP

## 8. Comfortable Carrying Capacity (CCC)

By definition, CCC is the optimum number of guests accommodated by a mountain facility, at any one time, which affords a high-quality recreational experience and helps ensure sound stewardship of the land. In essence, CCC is a daily guest population, which is serviceable by the facility (i.e., an attendance level where operations remain functional and optimal). CCC is calculated based upon a resort's daily lift capacity. Once the CCC is calculated (based upon the proposed lift network), other resort facilities are sized to create a balance with the CCC. If certain components of the proposed development can not be balanced with the CCC (e.g., parking lots, resort access, utilities infrastructure, real estate development, etc.) due to physical, environmental, and/or economic constraints, then the lift network and CCC must be down-sized to account for identified limitations. In summary, CCC is a *planning parameter* that is used as the basis for designing a balanced resort development. The CCC should not be considered as an absolute figure that defines or limits resort visitation but should be considered a dynamic number.

The CCC for each lift system is calculated using the following formula:

$$\text{CCC} = \frac{\text{Vertical Rise of the lift} \times \text{Hourly Capacity of the lift} \times \text{Operating Hours of the lift} \times \text{Loading Efficiency of the lift}}{\text{Weighted Vertical Demand of the ski trails associated with the lift}}$$

The resort CCC is the sum of the CCC calculations of each lift system. The following table outlines the CCC calculation for the proposed lift network, using assumed hourly lift capacities.

### Garibaldi Resort Mountain Master Plan

**Table IV-10  
Calculation of CCC**

Map Ref.	Slope Length (m.)	Vert. Rise (m.)	Hourly Capacity (persons/hr.)	Oper. Hours (hrs.)	Up-Mtn. Access Role (%)	Misloading Lift Stop. (%)	Adjusted Hrly. Cap. (persons/hr.)	VTM/Day (000)	Weighted Vertical Demand (m./day)	CCC (Skiers)
A	667	227	2,600	7.00	100	0	-	0	0	-
B1	2,028	405	2,800	7.00	100	0	-	0	0	-
B2	1,157	200	2,800	7.00	10	5	2,380	3,332	3,075	1,080
C	854	268	2,400	7.00	10	5	2,040	3,823	4,914	780
D	1,204	425	2,400	7.00	5	5	2,160	6,431	6,591	980
E	1,681	591	1,800	6.50	0	5	1,710	6,571	8,203	800
F	1,073	248	2,600	6.50	50	5	1,170	1,887	3,500	540
G	2,016	631	2,400	7.00	0	5	2,280	10,070	5,736	1,760
H	1,278	265	2,400	6.50	0	5	2,280	3,927	3,720	1,060
I	357	45	1,800	6.50	15	10	1,350	397	1,000	400
J	376	29	1,800	6.50	5	10	1,530	286	1,000	290
K	786	175	2,400	6.25	0	5	2,280	2,491	4,445	560
L1	1,838	443	2,800	7.00	100	0	-	0	0	-
L2	1,175	266	2,800	7.00	25	5	1,960	3,650	3,962	920
M	2,283	547	2,600	7.00	5	5	2,340	8,954	4,461	2,010
N	438	68	1,200	7.00	0	10	1,080	512	1,000	510
O	1,050	265	2,600	6.75	5	5	2,340	4,180	4,253	980
P	855	306	1,800	6.00	0	5	1,710	3,141	7,613	410
Q	1,619	156	600	6.00	0	10	540	505	7,213	70
R	2,259	408	2,400	7.00	5	5	2,160	6,162	4,172	1,480
S	819	230	1,600	6.50	0	10	1,440	2,157	3,500	620
<b>Total:</b>	<b>25,811</b>		<b>46,600</b>				<b>32,750</b>	<b>68,476</b>		<b>15,250</b>

Source: SE GROUP

As illustrated in the CCC calculation table, the proposed mountain master plan could support a potential CCC of about 15,250 guests.

## 9. Skiers At One Time (SAOT)

At any one time, the aggregate skier population is dispersed throughout the resort, either at guest services buildings and milling areas, waiting in lift mazes, riding lifts, or skiing on the trails. SAOT represents the proportion of skiers that will be using the trail network at any given time, based upon the CCC calculation. Once the SAOT is estimated, it can be compared to the estimated *capacity* of the ski terrain (as determined in Section B.4) to determine if a sufficient amount of terrain has been proposed to balance trail capacity with the SAOT.

Of the total skier population, 15 to 40 percent of each lift's capacity will be using guest service facilities or milling areas at any one time (i.e., over the course of the day, skiers will be actively skiing 60 to 85 percent of the time – the equivalent of 4 to 6 hours). This 15 to 40 percent of the skier population is the resort's inactive population. The remaining 60 to 85 percent of visitors at the resort make up the active skier population who are either in lift lines, on lifts, or on trails. As set forth in the CASP Guidelines, 25 to 60 percent of the resort's active skier population will be on the slopes while the remaining skiers will be riding the lifts or waiting in lift lines. The number of skiers waiting in line at each lift is a function of the uphill hourly capacity of the lift and the assumed length of wait time at each lift. (For purposes of master planning, lift lines at Garibaldi Resort have been estimated to range from one to twelve minutes.) The number of guests riding on each lift is the product of the number of carriers on the uphill line and the capacity of the lift's carriers. The remainder of the skier/snowboarder population (i.e., the CCC minus the number of guests using guest facilities, milling in areas near the resort portals, waiting in lift mazes, and actually riding lifts) is assumed to be enjoying downhill descents.

Based upon an estimated CCC of 15,250 guests, the estimated disbursement of Garibaldi Resort's skiers is illustrated in the following table.



**Garibaldi Resort Mountain Master Plan**  
**Table IV-11**  
**Disbursement of the Skier Population**

Lift Number	Daily Capacity (CCC)	Disbursement of Skier/Rider Population			
		Support Fac./Milling (Skiers)	Lift Lines (Skiers)	On Lift (Skiers)	SAOT (Skiers On Trails Only)
A	0	0	0	0	0
B1	0	0	0	0	0
B2	1,080	270	228	139	443
C	780	195	272	95	218
D	980	245	189	142	404
E	800	200	78	157	365
F	540	135	156	68	181
G	1,760	440	352	250	718
H	1,060	265	133	159	503
I	400	100	101	53	146
J	290	73	13	63	141
K	560	140	38	98	284
L1	0	0	0	0	0
L2	920	230	180	116	394
M	2,010	503	449	291	767
N	510	128	203	52	127
O	980	245	312	134	289
P	410	103	86	160	61
Q	70	18	2	32	18
R	1,480	370	126	266	718
S	620	155	180	129	156
<b>Total:</b>	<b>15,250</b>	<b>3,815</b>	<b>3,098</b>	<b>2,404</b>	<b>5,933</b>

Source: SE GROUP

This table shows that of the total 15,250 CCC, 5,933 skiers (39 percent) are anticipated to be on the ski trails at one time (a proportion that falls within the 25 to 60 percent range set forth in the CASP Guidelines). As calculated in Section B.4, the proposed trail network has an estimated skier *capacity* of 6,911 skiers at one time. This illustrates a trail capacity that is greater than SAOT (i.e., average skier density on trails will be less than the proposed criteria and thus trails will be less crowded).

## **C. FOUR-SEASON RECREATION FACILITIES**

Four-season recreation facilities will be provided on the mountain and throughout the base lands. The following discussion focuses on recreation provided on-mountain; for additional detail on base lands recreation facilities please refer to Volume 3 (Resort Base Master Plan).

It is important that the resort lands and facilities be utilized in an efficient and balanced sense throughout the year. The mountain development area will be used for alpine skiing, Nordic skiing and snowshoeing in the winter, and lift rides, hiking, interpretive trails, site-seeing, mountain biking, horseback riding, dining, festivals and events, etc. during the summer. Trail networks include loops on the top of the mountain, taking advantage of the scenic views and gentle slopes of Brohm Ridge. These trails will be staged from the North Summit at the top of the gondola (Lift L). In addition, more challenging routes are provided up and down the mountain, taking advantage of the mountain work roads network. These trails may be used for hiking, horseback trail riding, and mountain biking. The on-mountain routes are connected to a multi-use trail, which accesses the village and all residential areas. All resort trail networks are illustrated in Figure IV-2.

A major summer component of the Garibaldi Resort Master Plan is golf. Other potential resort activities include: tennis; swimming pool; health club; indoor, recreation center; summer and winter, multi-use recreational trails; sleigh rides; ice skating; snowplay; tubing; tobogganing; dining; fishing; interpretive centers; shopping; festivals and events; etc. Off-site activities that will be staged from the village include: white-water rafting; heli-skiing and heli-hiking; snowcat skiing; boating; shopping and dining in Squamish or Vancouver; etc. These various activities will help draw guests to Garibaldi Resort on a year-round basis.

**Figure IV-2: Alternative Recreation**

## **D. RESORT CARRYING CAPACITY**

In addition to the guests using ski area facilities at Garibaldi Resort, there will be a number of guests visiting the resort that do not use the ski area facilities. At Garibaldi Resort it is assumed that these guests not using the mountain facilities equate to an additional 25 percent of the CCC, based on CASP Guidelines for Regional/Destination and Destination areas. Accordingly, the overall Resort Carrying Capacity is 19,060 (125 percent of CCC).

## **E. GUEST FACILITIES**

The Garibaldi Resort development will cater to regional/destination and destination guests, as defined in the CASP Guidelines. Initially, the market will come from a combination of regional and destination sources, but as the resort matures, the destination market is predicted to strengthen. Consequently, the size and scale of services and facilities has been planned to accommodate both regional/destination and destination guests. Facilities will also be provided for day-use guests.

### **1. Parking**

Parking for the ski area will be provided for two types of users: overnight guests who are staying at the resort, and day-use guests. Overnight guests will be provided parking adjacent to their accommodation either in structured (most commonly underground) or surface parking. Day-use guests at the mountain will be provided surface parking at the day skier base area, as well as in understructure pay parking areas in the village.

The resort is anticipating the need to accommodate approximately 5,600 skiers in day-use parking lots. Other mountain-user guests (as many as 11,928) will arrive either from their on-site accommodations by walking or shuttle bus, via coach bus or other form of mass transportation, or will arrive from nearby Squamish by shuttle bus.

According to CASP Guidelines (average car occupancy is 2.8 to 3 people per car), a total of 1,871 parking spaces will be provided for the estimated 5,600 skiers arriving by car. 1,300 spaces will be provided at the day skier base area; the remaining 571 spaces will be provided in structured (most commonly underground) pay parking areas in the village and potentially at the base of Lift R.

Employee parking will be provided throughout the resort, including the maintenance facility and the village. It is anticipated that 60 percent of employees<sup>2</sup> will park off-site and use an employee shuttle service provided by the resort.

A summary of parking requirements for the ski area is provided below.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-12**  
**Parking Requirements Summary**

	Multiplier	Total
CCC + other guests	15%	17,538
# of guests arriving from off-site	40%	7,015
# of guests arriving by car	80%	5,612
# of guests arriving via off-site bus service	20%	1,403
# of employees arriving by car	40%	488
Required guest car parking spaces	3.00	1,871
Required employee car parking spaces	3.00	163

Source: SE GROUP

## 2. Skier Services Space Use Recommendations

Guest service space requirements for the mountain facilities are a function of the CCC. Space for mountain-user guests have been sized to address needs such as ticket sales, restaurant/cafeteria space, rental shop, ski school, retail, etc. The resort will have approximately 19,797 to 24,870 square metres of space for skier services (1.3 – 1.63 metres per guest), which meets CASP Guidelines.

Guest services will be provided in five main locations: the village, day skier base area, North Summit, South Summit, and North Brohm Ridge. In addition, ticket sales and rest room facilities will be located at the base of Lift R, for the convenience of guests staying in the surrounding ski to/ski from real estate. All staging facilities (tickets/guest services, rental shop, lockers, etc.) will be provided adjacent to lift loading zones at the village and day skier base area locations. Due to the expansive nature of the resort, with its immense vertical drop, restaurants, rest rooms, retail and ski patrol functions will be located at the three on-mountain locations. Ski school desks will be located at the North and South Summit lodges.

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<sup>2</sup> It is estimated that Garibaldi Resort’s mountain facilities will have 1,220 employees (8% of the CCC, as per industry standards).

The recommended sizes of all guest services and operations functions for Garibaldi Resort, by location, are shown in Tables IV-13 through IV-19. Guest service facilities are sized as a function of the full build-out CCC. In addition to the CCC, the resort's guest service facilities have been sized to account for non-skiing guests. The resort is estimating that an additional 15 percent of the CCC will be non-skiing guests. At Garibaldi Resort the proposed guest service space ranges between 1.30-1.63 square metres per CCC, based on CASP Guidelines for Regional/Destination and Destination areas.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-13**  
**Space Use Recommendations – Resort Total**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	353	441
Public Lockers	900	1,099
Rentals/Repair	1,069	1,361
Retail Sales	806	986
Bar/lounge	1,034	1,264
Adult Ski School	574	701
Kid's Ski School	1,033	1,262
Restaurant Seating	5,645	6,900
Kitchen/Scramble	2,199	2,688
Rest rooms	1,409	1,722
Ski Patrol	561	686
Administration	806	986
Employee Lockers/Lounge	323	394
Mechanical	462	657
Storage	771	1,095
Circulation/Waste	1,850	2,627
<b>TOTAL SQUARE METRES</b>	<b>19,797</b>	<b>24,870</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-14**  
**Space Use Recommendations – Village**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	179	218
Public Lockers	529	647
Rentals/Repair	629	801
Retail Sales	446	545
Bar/lounge	609	744
Adult Ski School	373	456
Kid's Ski School	746	912
Restaurant Seating	2,058	2,515
Kitchen/Scramble	802	980
Rest rooms	454	555
Ski Patrol	196	240
Administration	161	197
Employee Lockers/Lounge	65	79
Mechanical	196	293
Storage	326	489
Circulation/Waste	782	1,173
<b>TOTAL SQUARE METRES</b>	<b>8,549</b>	<b>10,842</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-15**  
**Space Use Recommendations – Day Skier Base Area**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	125	153
Public Lockers	370	453
Rentals/Repair	440	560
Retail Sales	282	345
Bar/lounge	426	521
Adult Ski School	143	175
Kid's Ski School	287	351
Restaurant Seating	387	473
Kitchen/Scramble	151	184
Rest rooms	85	104
Ski Patrol	196	240
Administration	645	789
Employee Lockers/Lounge	258	315
Mechanical	103	154
Storage	171	256
Circulation/Waste	410	615
<b>TOTAL SQUARE METRES</b>	<b>4,480</b>	<b>5,688</b>

Source: SE GROUP



**Garibaldi Resort Mountain Master Plan**  
**Table IV-16**  
**Space Use Recommendations – Base Lift R**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	50	70
Public Lockers	0	0
Rentals/Repair	0	0
Retail Sales	0	0
Bar/lounge	0	0
Adult Ski School	0	0
Kid's Ski School	0	0
Restaurant Seating	0	0
Kitchen/Scramble	0	0
Rest rooms	163	199
Ski Patrol	0	0
Administration	0	0
Employee Lockers/Lounge	0	0
Mechanical	6	7
Storage	10	12
Circulation/Waste	23	28
<b>TOTAL SQUARE METRES</b>	<b>251</b>	<b>315</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-17**  
**Space Use Recommendations – North Summit**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	0	0
Public Lockers	0	0
Rentals/Repair	0	0
Retail Sales	26	32
Bar/lounge	0	0
Adult Ski School	34	42
Kid's Ski School	0	0
Restaurant Seating	1,372	1,677
Kitchen/Scramble	535	653
Rest rooms	303	370
Ski Patrol	112	137
Administration	0	0
Employee Lockers/Lounge	0	0
Mechanical	64	79
Storage	107	131
Circulation/Waste	257	315
<b>TOTAL SQUARE METRES</b>	<b>2,812</b>	<b>3,436</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-18**  
**Space Use Recommendations – South Summit**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	0	0
Public Lockers	0	0
Rentals/Repair	0	0
Retail Sales	26	32
Bar/lounge	0	0
Adult Ski School	23	28
Kid's Ski School	0	0
Restaurant Seating	1,109	1,355
Kitchen/Scramble	432	528
Rest rooms	245	299
Ski Patrol	28	34
Administration	0	0
Employee Lockers/Lounge	0	0
Mechanical	61	75
Storage	102	125
Circulation/Waste	246	300
<b>TOTAL SQUARE METRES</b>	<b>2,272</b>	<b>2,777</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-19**

**Space Use Recommendations – North Brohm Ridge**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	0	0
Public Lockers	0	0
Rentals/Repair	0	0
Retail Sales	26	32
Bar/lounge	0	0
Adult Ski School	0	0
Kid's Ski School	0	0
Restaurant Seating	720	880
Kitchen/Scramble	281	343
Rest rooms	159	194
Ski Patrol	28	34
Administration	0	0
Employee Lockers/Lounge	0	0
Mechanical	33	49
Storage	55	82
Circulation/Waste	131	196
<b>TOTAL SQUARE METRES</b>	<b>1,432</b>	<b>1,810</b>

Source: SE GROUP

Destination Space Use Requirements

In addition to the guest service space being developed for mountain facility users, an additional amount of space will be developed to accommodate non-skiing needs. These facilities will include restaurants, shops, and other services. This additional space – located within the village – will amount to an additional 20 to 40 percent of the space use recommendations outlined above as per CASP Guidelines. For additional information regarding this space refer to Volume 3 (Resort Base Master Plan).

3. Guest Service Seating

The following table utilizes the lunchtime distribution of the CCC to determine the number of food service seats recommended at the five guest service facilities.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-20**  
**Seating Recommendations**

	Village	Day Skier Base	North Summit	South Summit	N. Brohm Ridge	Total Resort
Lunchtime Capacity (CCC)	6,392	1,202	4,263	3,444	2,237	17,538
Average Seat Turnover	3	3.5	3.5	3.5	4	
Required Seats	2,131	343	1,218	984	559	5,235

Source: SE GROUP

A key factor in evaluating restaurant capacity is the turnover rate of the seats. That is, the number of times a seat will be utilized in a day. Several factors influence the turnover rate including the ski resorts' climate, market orientation, and the type of food service provided. At Garibaldi Resort a seat turnover rate of 3 has been utilized for the village facility, 3.5 at the day skier base area and the North and South Summit lodges, and 4 at North Brohm Ridge.

Outdoor seats are not considered for this analysis, as climatic conditions indicate that they cannot be used on a regular basis at Garibaldi Resort. However, the ski area will provide a certain amount of outdoor seating for occasions when warmer temperatures prevail.

## **F. OPERATIONS FACILITIES**

### **1. Ski Patrol and First Aid**

To ensure prompt response to reported injuries, Garibaldi Resort will have five on-mountain ski patrol facilities. The ski patrol headquarters will be located at North Summit. Duty stations will be located at South Summit, North Brohm Ridge and at the top of Lift K and Lift D. These smaller facilities will be used principally for the storage of rescue and first aid equipment (e.g., toboggans, backboards, etc.), trail maintenance equipment (e.g., poles, ropes, fencing, closure signs, warning signs, etc.), and to house patrollers during periods of inclement weather (when the lifts are open).

There will be first aid facilities located at the village and the day skier base area at Garibaldi Resort. Upon arrival, the injured guest will receive outpatient medical care. A seriously injured guest will be transferred to a nearby hospital by ground or air ambulance service. The receiving medical facility will be determined by the nature of the injury, weather and road conditions,

and/or patient preference. Garibaldi Resort's clinical services will accommodate the number of guests anticipated at full build-out.

The patrol headquarters and each of the proposed duty stations will be equipped with telephone service to ensure communication with lift operators, as well as ski patrol personnel in the village and day skier base area.

## 2. Snowmaking

One of the most discussed variables in the ski industry is the weather. The amount and timing of natural snowfall, and the degree to which temperatures are cold enough for snowmaking, often dictate the overall success of a resort's winter operation. Compounding the weather risk is the fact that most resorts receive a significant portion of their wintertime visitation during a few, relatively short vacation periods – a factor that exerts extreme pressure on resorts to provide a quality snow product during those important holiday periods. Thus, snowmaking coverage for Garibaldi Resort has been designed to ensure a reliable, high quality snow surface for key portions of the resort.

The following coverage objectives helped determine which trails to include in the snowmaking coverage strategy:

- During years of low natural snowfall, guarantee terrain in time for the *U.S. Thanksgiving holiday* (i.e., terrain appropriate for beginner through advanced levels).
- Provide snowmaking coverage for critical, connector and return trails.
- Provide snowmaking coverage (i.e., maintain acceptable trail surface conditions) for trail segments where high-use negatively impacts trail snow surfaces.
- Provide durable snow cover on trails and slopes where sun or wind exposure wears on the snowpack, or where trails have abnormal subsurface trail conditions.

The build-out plan for Garibaldi Resort's snowmaking system provides coverage for approximately 120 hectares of alpine terrain. The emphasis of the snowmaking program will be coverage for low elevation trails, coverage for critical trails that return to the resort village, high use/critical connections, and coverage for the terrain that provides return routes from each of the mountain top restaurants. In short, the proposed coverage strategy will help ensure a skiable product – during El Niño and other aberrations of weather – for the regions that are absolutely

necessary for the operation of the resort. Trails that merit snowmaking coverage are summarized in Table IV-21. The proposed, resort-wide snowmaking plan is graphically depicted in Figure IV-3.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-21**  
**Snowmaking**

Map Ref	Plan Length (m)	Slope Length (m.)	Avg. Width (m)	Slope Area (hectares)	Skier/Rider Ability Level
B01	869	885	25.0	2.2	Novice
B06	390	395	45.0	1.8	Novice
B07	4,192	4,265	15.0	6.4	Novice
B10	235	245	40.0	1.0	Low Intermediate
C01	652	665	15.0	1.0	Novice
C03	962	1,018	40.0	4.1	Intermediate
C09	1,766	1,798	25.0	4.5	Intermediate
C10	272	285	40.0	1.1	Intermediate
C11	259	260	10.0	0.3	Novice
C12	240	241	10.0	0.2	Novice
C13	1,022	1,034	10.0	1.0	Novice
F01	1,654	1,695	30.0	5.1	Low Intermediate
G04	2,527	2,626	60.0	15.8	Intermediate
G14	1,503	1,522	15.0	2.3	Novice
G15	1,546	1,563	15.0	2.3	Novice
H01	1,292	1,323	87.5	11.6	Low Intermediate
I02	351	354	30.0	1.1	Beginner
L01	5,078	5,150	25.0	12.9	Novice
L07	462	4,75	50.0	2.4	Low Intermediate
L09	2,894	2,968	40.0	11.9	Intermediate
M01	2,418	2,498	50.0	12.5	Intermediate
M02	746	778	50.0	3.9	Intermediate
M03	922	975	50.0	4.9	Intermediate
N01	690	693	40.0	2.8	Beginner
O03	400	402	15.0	0.6	Low Intermediate
R01	391	395	10.0	0.4	Beginner
R03	911	930	65.0	6.0	Low Intermediate
R05	607	634	50.0	3.2	Intermediate
<b>Total:</b>		36,069		123.1	

Source: SE GROUP

The source of Garibaldi Resort’s snowmaking water is discussed in Volume Four. With an average coverage depth of 0.75 metres, the total production requirement will be 900,000 cubic metres of snow per year. According to snowmaking engineers, 1.0 cubic metre of water will

produce 1.86 cubic metres of snow; approximately 500,000 cubic metres of water will be required per year for snowmaking at Garibaldi Resort.

Snowmaking for Phase 1A at Garibaldi Resort will cover approximately 55 hectares of terrain, to an average coverage depth of 0.75 metres. Approximately 250,000 cubic metres of water will be required per year for Phase 1A snowmaking.



**Figure IV-3: Snowmaking Coverage**

### 3. Grooming

Garibaldi Resort's trail network will consist of approximately 675 hectares of lift-served terrain. Garibaldi Resort will maintain a routine grooming schedule, which calls for preparation of 100 percent of the resort's easiest terrain, and 50 percent of the most difficult terrain on a nightly basis. In accordance with this grooming parameter, the resort will strive to groom approximately 350 hectares of named trails on a nightly basis. In addition to the named trails, Garibaldi Resort will regularly maintain the resort's terrain parks, a halfpipe, plus areas associated with surface lift alignments, lift ramps, maze areas, helicopter landings, access ramps, and other miscellaneous areas.

A grooming vehicle will on average be able to groom approximately 1.6 hectares per hour, or approximately 13 hectares over an eight-hour shift (given breaks, vehicle inspections, etc.). A winch-groomer is able to maintain an estimated 0.8 hectares per hour, or 6.5 hectares during an eight-hour shift.

Given these grooming parameters, and assuming two grooming shifts per night, Garibaldi Resort must have 14 vehicles in the field on a regular basis, as demonstrated in Table IV-22.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-22**  
**Upgraded Grooming Vehicle Requirements**

Grooming Statistics Garibaldi Resort	Grooming Assumptions/ Requirements
Regularly Groomed Terrain (hectares)	350
Grooming Rate (hectares per vehicle over two, 8-hour shifts)	26
Number of Grooming Vehicles Needed	14

Source: SE GROUP

### 4. Maintenance

Garibaldi Resort's mountain maintenance facility (1,000 sq. m.) is located near the intersection of trails G12, G14 and B7 (see Figure IV-1), a location with all weather road access and snow frontage. Equipped with 6 work bays, the maintenance facility will be used for vehicle maintenance and welding as well as lift maintenance.

In addition, a 550 sq. m. on-mountain maintenance facility will be located south of trail B7 at the 1,435 m elevation. This maintenance facility will be equipped with 4 work bays.

## G. MOUNTAIN INFRASTRUCTURE CAPACITY REQUIREMENTS

### 1. Domestic Water

Given Garibaldi Resort’s full build-out scenario, the resort’s mountain facilities will have a combined capacity – skiing guests and non-skiing guests – of 17,538 guests. Assuming a consumption factor of 26.5 litres per day (lpd) per guest, Garibaldi Resort will require approximately 464,744 lpd – at full build-out. This water requirement is just for the guests who frequent the mountain facilities and mountain-related buildings (e.g., day lodges, the clinic, daycare facilities, ski patrol, etc.). It does not take into consideration the water requirements associated with proposed overnight accommodations, the proposed four season village (i.e., restaurants, bars, laundry services, etc.), or other resort users.

Table IV-23 summarizes the domestic water requirements at each of the guest service locations.

**Garibaldi Resort Mountain Master Plan**  
**Table IV-23**  
**Domestic Water Requirements**

	Village	Day Skier Base	North Summit	South Summit	North Brohm Ridge	Total Resort
Lunchtime Capacity (CCC and 15% additional guests)	6,392	1,202	4,263	3,444	2,237	17,538
Litres per day (per guest)	26.5	26.5	26.5	26.5	26.5	
Total Requirement	169,388	31,840	112,970	91,266	59,281	464,744

Source: SE GROUP

For details on domestic water supply and distribution, refer to Volume 4.

### 2. Wastewater

At full build-out, Garibaldi Resort’s mountain facilities’ wastewater flow will replicate the facility’s domestic water consumption volume, estimated at 464,744 lpd. The 464,744 lpd estimate accounts for the flow associated with a peak day at the ski-related buildings only, and is not an estimate for the greater resort.

For details on wastewater collection and treatment, refer to Volume 4.

### 3. Power

For details regarding mountain power supply, refer to Volume 4.

### 4. Mountain Work Roads

Installation and maintenance of most of the lift terminals and all of the on-mountain guest service facilities at Garibaldi Resort will necessitate the construction of access routes. These 5 metre wide access routes will provide rubber tire vehicular access to most lift terminals and all on-mountain structures, with the exception of the bottom terminal of Lift P and the top terminal of Lift Q.

A total of 17.5 km of existing logging roads, providing access to the North and South summits, will be improved and used for construction and on-going maintenance. In addition, 17.9 km of new mountain work roads will be created; 8.4 km of these proposed roads will be along skiways (e.g., trails L1, H5, R1, etc.). Refer to Figure IV-4 for the location of existing and proposed Mountain Work Roads.

**Figure IV-4: Mountain Access Roads**

## **H. PHASED DEVELOPMENT PLAN**

Throughout the development process, expansion of the resort must be carefully coordinated to maintain balance among skier demand and the mountain capacity (e.g., lifts and trails). In addition, the development plan must ensure that adequate support equipment and facilities (e.g., day lodge services and facilities, grooming machines, utility infrastructure, and parking) accompany the mountain development at each phase of construction. A carefully balanced mountain and support facility development program will ensure a sustainable resort operation – helping resort management safeguard the financial performance of Garibaldi Resort.

The development schedule summarized in this section represents recommendations for implementation of the major alpine skiing facilities. It is anticipated that Garibaldi Resort would be developed in three initial phases followed by longer-term build-out of the resort. This schedule is predicated upon resort operations that allow for the realization of the resort's visitation and budget projections. Economic constraints, or yet to be identified business development opportunities, may lengthen or accelerate the phasing of improvements. It is most likely that subsequent phases of development will be triggered when the resort achieves a utilization rate ranging from 35 to 40 percent.

The recommended development sequence is designed to maintain a balance among all of the resort's components, while at the same time meeting the future, year-round, recreational needs of the public. Each phase features built-in flexibility, which provides management with the option of extending the implementation period to reflect key market and financial conditions. Accordingly, the components of any particular phase may be completed over a one- to three-year time frame, or longer if necessary. Additionally, certain components of the improvement program may be initiated outside of the proposed phasing sequence.

# PHASE 1A

**Figure IV-5: Phase 1A Mountain Plan**



**Garibaldi Resort Mountain Master Plan**

**Table IV-24**

**Lift Specifications – Phase 1A**

Map Reference	Lift Type	Top Elev. (m.)	Bot. Elev. (m.)	Vert. Rise (m.)	Horiz. Length (m.)	Slope Length (m.)	Avg. Grade (%)	Hourly Capacity (persons/hr)
M	DC6	1,558	1,011	547	5,187	2,283	25%	1,200
N	C3	1,112	1,044	68	428	438	16%	600
O	DC6	1,740	1,475	265	998	1,050	27%	1,500
R	DC4	1,556	1,148	408	2,184	2,259	19%	1,200
W	C3	1,282	1,020	262	1,260	1,312	21%	1,800

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-25**

**Terrain Specifications Summary – Phase 1A**

Ability Level	Trail Area (ha.)	Terrain Breakdown
Beginner	7.5	3%
Novice	23.1	9%
Low Intermediate	40.6	16%
Intermediate	154.2	62%
Adv. Intermediate	7.6	3%
Expert	17.5	7%
<b>Total:</b>	<b>250.6</b>	<b>100%</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-26**

**Terrain Specifications – Phase 1A**

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
H01	1,738	1,579	160	718	741	87.5	6.3	6.5	22%	32%	Low Intermediate
L01	1,741	1,129	612	5,078	5,150	39.2	19.9	20.2	12%	25%	Novice
L02	1,742	1,479	264	1,343	1,382	112.8	15.1	15.6	20%	38%	Intermediate
L03	1,741	1,605	136	511	532	174.4	8.9	9.3	27%	38%	Intermediate
L04	1,736	1,683	53	184	192	92.1	1.7	1.8	29%	31%	Intermediate
L05	1,657	1,508	150	656	682	170.4	11.2	11.6	23%	43%	Intermediate
L06	1,599	1,498	101	504	518	112.3	5.7	5.8	20%	32%	Low Intermediate
L07	1,575	1,485	90	462	475	117.3	5.4	5.6	20%	31%	Low Intermediate
L08	1,494	1,384	110	272	300	53.3	1.5	1.6	40%	52%	Advanced Intermediate
L09	1,536	1,040	496	2,894	2,968	65.5	18.9	19.4	17%	36%	Intermediate
L10	1,399	1,154	245	610	671	63.3	3.9	4.2	40%	73%	Expert
M01	1,557	1,017	541	2,418	2,498	91.0	22.0	22.7	22%	45%	Intermediate
M02	1,232	1,044	189	746	778	83.0	6.2	6.5	25%	43%	Intermediate
M03	1,436	1,133	304	922	975	59.9	5.5	5.8	33%	45%	Intermediate

**Garibaldi Resort Mountain Master Plan**

**Table IV-26**

**Terrain Specifications – Phase 1A**

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
M04	1,413	1,145	268	738	791	47.6	3.5	3.8	36%	54%	Advanced Intermediate
M05	1,528	1,145	384	1,166	1,255	58.0	6.8	7.3	33%	65%	Expert
M06	1,548	1,275	274	719	781	65.4	4.7	5.1	38%	72%	Expert
N01	1,114	1,046	69	690	693	40.0	5.3	5.4	10%	12%	Beginner
O01	1,734	1,479	255	1,058	1,106	99.0	10.5	10.9	24%	45%	Intermediate
O02	1,709	1,616	93	269	291	171.9	4.6	5.0	35%	45%	Intermediate
O03	1,641	1,478	163	1,249	1,270	59.7	7.5	7.6	13%	35%	Low Intermediate
O04	1,570	1,554	16	102	103	124.0	1.3	1.3	16%	20%	Intermediate
O05	1,662	1,564	97	466	480	107.4	5.0	5.2	21%	31%	Low Intermediate
O06	1,558	1,479	79	170	191	117.5	2.0	2.2	47%	51%	Advanced Intermediate
O07	1,576	1,547	28	240	243	160.2	3.8	3.9	12%	15%	Low Intermediate
O08	1,531	1,500	30	66	73	120.2	0.8	0.9	46%	57%	Expert
R01	1,555	1,519	36	391	395	54.5	2.1	2.2	9%	11%	Beginner
R02	1,555	1,145	410	2,268	2,332	58.7	13.3	13.7	18%	42%	Intermediate
R03	1,534	1,366	168	911	930	66.0	6.0	6.1	18%	27%	Low Intermediate
R04	1,451	1,147	304	1,305	1,358	70.6	9.2	9.6	23%	36%	Intermediate
R05	1,311	1,149	162	607	634	111.0	6.7	7.0	27%	39%	Intermediate
R06	1,282	1,150	132	556	577	242.2	13.5	14.0	24%	41%	Intermediate
R07	1,268	1,149	119	855	873	33.3	2.8	2.9	14%	25%	Novice
<b>Total:</b>						32,237		241.6	250.6		

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-27**

**Terrain Capacity – Phase 1A**

Ability Level	Trail Area (ha.)	Skier/Rider Capacity (Skiers)
Beginner	7.5	150
Novice	23.1	415
Low Intermediate	40.6	569
Intermediate	154.2	1,542
Adv. Intermediate	7.6	53
Expert	17.5	70
<b>Total:</b>	<b>250.6</b>	<b>2,800</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-28**

**Skier Capacity Distribution by Ability Levels – Phase 1A**

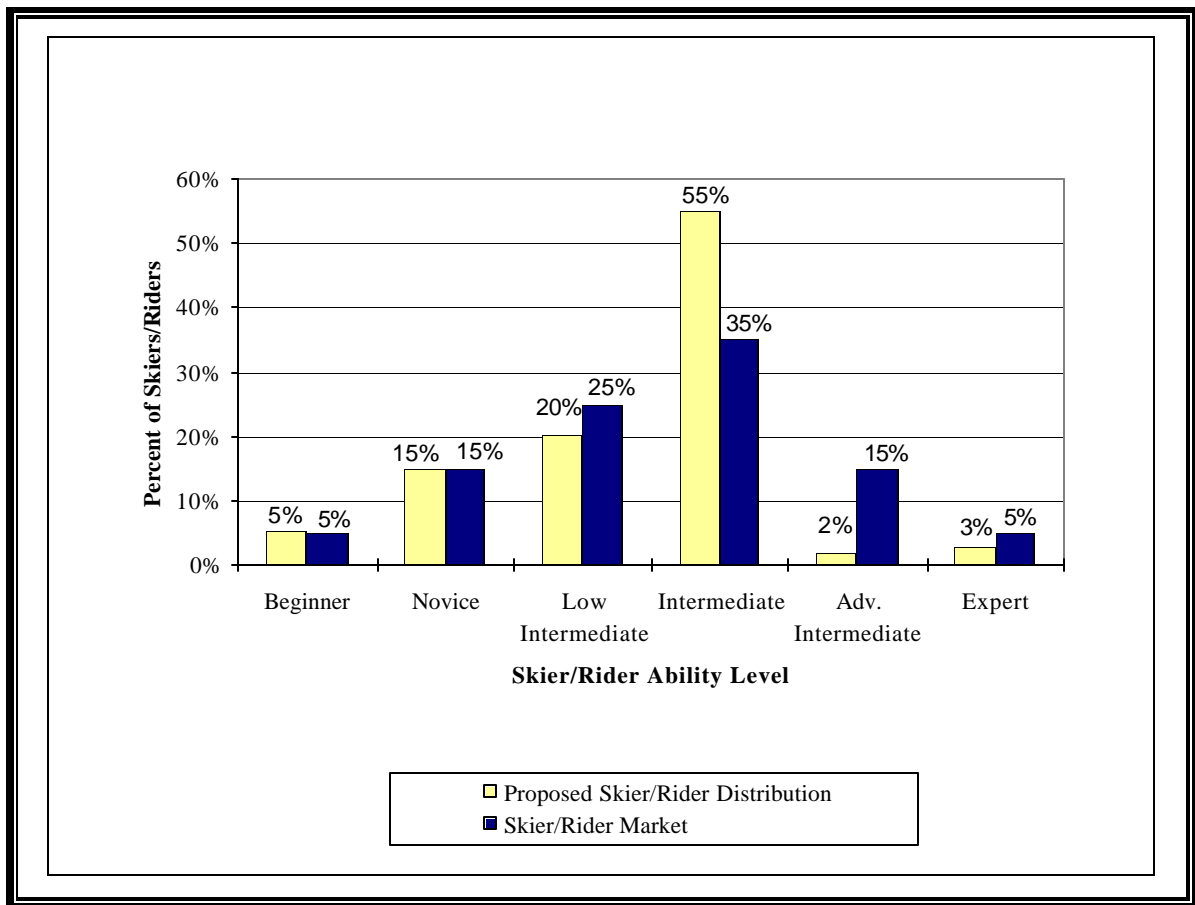
Ability Level	Trail Area (ha.)	Ski Area Capacity (Skiers)	Garibaldi Resort's Skier Capacity Distribution (%)	Garibaldi Resort's Market Distribution (%)	Distribution per CASP Guidelines (%)
Beginner	7.5	375	5%	5%	2 – 6%
Novice	23.1	1,039	15%	15%	11 – 15%
Low Intermediate	40.6	1,423	20%	25%	18 – 22%
Intermediate	154.2	3,85	55%	35%	33 – 37%
Adv. Intermediate	7.6	129	2%	15%	18 – 22%
Expert	17.5	175	3%	5%	8 – 12%
Total:	250.6	6,997	100%	100%	

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Chart IV-2**

**Terrain Distribution by Ability Levels – Phase 1A**



**Garibaldi Resort Mountain Master Plan**

**Table IV-29**

**Calculation of CCC – Phase 1A**

Map Ref.	Slope Length (m.)	Vert. Rise (m.)	Hourly Capacity (persons/hr.)	Oper. Hours (hrs.)	Up-Mtn. Access Role (%)	Misloading Lift Stop. (%)	Adjusted Hrly. Cap. (persons/hr.)	VTM/Day (000)	Weighted Vertical Demand (m./day)	CCC (Skiers)
M	2,283	547	1,200	7.00	5%	5%	1,080	4,133	4,461	930
N	438	68	600	7.00	0	10%	540	256	1,000	260
O	1,050	265	1,500	6.75	5%	5%	1,350	2,411	3,811	630
R	2,259	408	1,200	7.00	5%	5%	1,080	3,081	4,172	740
<b>Total:</b>	<b>6,030</b>		<b>4,200</b>				<b>3,780</b>	<b>9,399</b>		<b>2,560</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-30**

**Disbursement of the Skier Population – Phase 1A**

Lift Number	Daily Capacity (CCC)	Disbursement of Skier/Rider Population			
		Support Fac./Milling (Skiers)	Lift Lines (Skiers)	On Lift (Skiers)	SAOT (Skiers On Trails)
M	930	233	207	134	356
N	260	65	101	26	68
O	630	158	180	77	215
R	740	185	63	133	359
<b>Total:</b>	<b>2,560</b>	<b>641</b>	<b>551</b>	<b>370</b>	<b>998</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-31**

**Snowmaking – Phase 1A**

Map Ref	Plan Length (m)	Slope Length (m.)	Avg. Width (m)	Slope Area (hectares)	Skier/Rider Ability Level
I02	351	354	30.0	1.1	Beginner
L01	5,078	5,150	25.0	12.9	Novice
M01	2,418	2,498	50.0	12.5	Intermediate
N01	690	693	40.0	2.8	Beginner
O03	400	402	15.0	0.6	Low Intermediate
R01	391	395	10.0	0.4	Beginner
R03	911	930	65.0	6.0	Low Intermediate
R05	607	634	50.0	3.2	Intermediate
<b>Total:</b>		<b>10,702</b>		<b>38.4</b>	

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-32**

**Space Use Recommendations – Resort Total (Phase 1A)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	62	75
Public Lockers	36	43
Rentals/Repair	211	269
Retail Sales	135	165
Bar/lounge	102	125
Adult Ski School	96	118
Kid's Ski School	183	224
Restaurant Seating	948	1,158
Kitchen/Scramble	369	451
Rest rooms	355	434
Ski Patrol	94	115
Administration	135	165
Employee Lockers/Lounge	54	66
Mechanical	75	111
Storage	125	185
Circulation/Waste	300	443
<b>TOTAL SQUARE METRES</b>	<b>3,282</b>	<b>4,147</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-33**  
**Space Use Recommendations – Village (Phase 1A)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	12	15
Public Lockers	36	43
Rentals/Repair	211	269
Retail Sales	115	141
Bar/lounge	102	125
Adult Ski School	92	112
Kid's Ski School	183	224
Restaurant Seating	542	662
Kitchen/Scramble	211	258
Rest rooms	120	146
Ski Patrol	47	58
Administration	135	165
Employee Lockers/Lounge	54	66
Mechanical	50	75
Storage	84	126
Circulation/Waste	201	301
<b>TOTAL SQUARE METRES</b>	<b>2,194</b>	<b>2,786</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-34**

**Space Use Recommendations – Base Lift R (Phase 1A)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	50	60
Public Lockers		
Rentals/Repair		
Retail Sales		
Bar/lounge		
Adult Ski School		
Kid's Ski School		
Restaurant Seating		
Kitchen/Scramble		
Rest rooms	146	178
Ski Patrol		
Administration		
Employee Lockers/Lounge		
Mechanical	5	6
Storage	9	11
Circulation/Waste	21	26
<b>TOTAL SQUARE METRES</b>	<b>231</b>	<b>281</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-35**

**Space Use Recommendations – North Brohm Ridge (Phase 1A)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services		
Public Lockers		
Rentals/Repair		
Retail Sales	20	25
Bar/lounge		
Adult Ski School	5	6
Kid's Ski School		
Restaurant Seating	406	496
Kitchen/Scramble	158	193
Rest rooms	90	110
Ski Patrol	5	6
Administration		
Employee Lockers/Lounge		
Mechanical	18	28
Storage	31	46
Circulation/Waste	74	110
<b>TOTAL SQUARE METRES</b>	<b>807</b>	<b>1,019</b>

Source: SE GROUP



**Garibaldi Resort Mountain Master Plan  
Table IV-36  
Seating Requirements – Phase 1A**

	Village	N. Brohm Ridge	Total Resort
Lunchtime Capacity (CCC)	1,683	1,261	2,944
Average Seat Turnover	3	4	
Required Seats	561	315	876

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan  
Table IV-37  
Parking Requirements Summary – Phase 1A**

	Multiplier	Total
CCC + other guests	15%	2,944
# of guests arriving from off-site	75%	2,208
# of guests arriving by car	80%	1,766
# of guests arriving via off-site bus service	20%	442
# of employees arriving by car*	40%	82
Required guest car parking spaces	3.00	589
Required employee car parking spaces	3.00	27

Source: SE GROUP

\* Total employees equal 8% of CCC

## PHASE 1B

**Figure IV-6: Phase 1B Mountain Plan**

**Garibaldi Resort Mountain Master Plan**

**Table IV-38**

**Lift Specifications – Phase 1B**

Map Reference	Lift Type	Top Elev. (m.)	Bot. Elev. (m.)	Vert. Rise (m.)	Horiz. Length (m.)	Slope Length (m.)	Avg. Grade (%)	Hourly Capacity (persons/hr)
G	DC4	1,521	890	631	1,883	2,016	34%	1,800
H	DC4	1,740	1,475	265	1,250	1,278	19%	1,800
M	DC6	1,558	1,011	547	2,187	2,283	25%	1,800
N	C3	1,112	1,044	68	428	438	16%	1,200
O	DC6	1,740	1,475	265	998	1,050	27%	2,400
R	DC4	1,556	1,148	408	2,184	2,259	19%	1,800
W	C3	1,282	1,020	262	1,260	1,312	21%	1,800

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-39**

**Terrain Specifications Summary – Phase 1B**

Ability Level	Trail Area (ha.)	Terrain Breakdown
Beginner	9.4	2%
Novice	51.9	13%
Low Intermediate	57.5	14%
Intermediate	180.6	44%
Adv. Intermediate	74.4	18%
Expert	34.4	8%
<b>Total:</b>	<b>408.2</b>	<b>100%</b>

Source: SE GROUP

## Garibaldi Resort Mountain Master Plan

### Table IV-40

### Terrain Specifications – Phase 1B

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
B01	1,462	1,370	92	869	885	34.6	3.0	3.1	11%	15%	Novice
B07	1,370	1,015	355	3,242	3,261	38.5	12.5	12.6	11%	25%	Novice
F01	1,715	1,464	251	1,654	1,695	28.9	4.8	4.9	15%	29%	Low Intermediate
G01	1,520	968	552	2,064	2,169	47.8	9.9	10.4	27%	52%	Advanced Intermediate
G02	1,509	1,091	418	1,056	1,144	75.0	7.9	8.6	40%	53%	Advanced Intermediate
G03	1,484	1,079	405	1,032	1,114	76.6	7.9	8.5	39%	52%	Advanced Intermediate
G04	1,525	918	607	2,527	2,626	62.6	15.8	16.4	24%	42%	Intermediate
G05	1,224	1,051	174	392	430	57.8	2.3	2.5	44%	50%	Advanced Intermediate
G06	1,307	1,007	300	762	830	61.6	4.7	5.1	39%	55%	Advanced Intermediate
G07	1,478	906	572	1,690	1,820	70.8	12.0	12.9	34%	55%	Advanced Intermediate
G08	1,355	914	440	1,110	1,210	63.9	7.1	7.7	40%	55%	Advanced Intermediate
G09	1,462	1,139	323	788	866	57.0	4.5	4.9	41%	65%	Expert
G10	1,498	1,190	308	786	858	50.7	4.0	4.4	39%	67%	Expert
G11	1,523	1,021	502	2,124	2,215	50.0	10.6	11.1	24%	55%	Advanced Intermediate
G13	1,225	938	287	816	870	64.1	5.2	5.6	35%	45%	Intermediate
G14	1,014	891	122	1,503	1,522	33.3	5.0	5.1	8%	13%	Novice
G15	1,029	890	139	1,546	1,563	44.4	6.9	6.9	9%	18%	Novice
H01	1,738	1,490	248	1,292	1,323	87.5	11.3	11.6	19%	32%	Low Intermediate
H02	1,610	1,494	116	821	836	81.5	6.7	6.8	14%	22%	Low Intermediate
H03	1,490	1,129	361	915	993	76.7	7.0	7.6	40%	58%	Expert
H04	1,706	1,592	114	324	346	126.8	4.1	4.4	35%	44%	Intermediate
H05	1,520	1,489	31	259	262	45.3	1.2	1.2	12%	15%	Novice
I02	1,740	1,698	42	351	354	54.3	1.9	1.9	12%	12%	Beginner
L01	1,741	1,129	612	5,078	5,150	39.2	19.9	20.2	12%	25%	Novice
L02	1,742	1,479	264	1,343	1,382	112.8	15.1	15.6	20%	38%	Intermediate
L03	1,741	1,605	136	511	532	174.4	8.9	9.3	27%	38%	Intermediate
L04	1,736	1,683	53	184	192	92.1	1.7	1.8	29%	31%	Intermediate
L05	1,657	1,508	150	656	682	170.4	11.2	11.6	23%	43%	Intermediate
L06	1,599	1,498	101	504	518	112.3	5.7	5.8	20%	32%	Low Intermediate
L07	1,575	1,485	90	462	475	117.3	5.4	5.6	20%	31%	Low Intermediate
L08	1,494	1,384	110	272	300	53.3	1.5	1.6	40%	52%	Advanced Intermediate
L09	1,536	1,040	496	2,894	2,968	65.5	18.9	19.4	17%	36%	Intermediate
L10	1,399	1,154	245	610	671	63.3	3.9	4.2	40%	73%	Expert
M01	1,557	1,017	541	2,418	2,498	91.0	22.0	22.7	22%	45%	Intermediate
M02	1,232	1,044	189	746	778	83.0	6.2	6.5	25%	43%	Intermediate
M03	1,436	1,133	304	922	975	59.9	5.5	5.8	33%	45%	Intermediate
M04	1,413	1,145	268	738	791	47.6	3.5	3.8	36%	54%	Advanced Intermediate
M05	1,528	1,145	384	1,166	1,255	58.0	6.8	7.3	33%	65%	Expert
M06	1,548	1,275	274	719	781	65.4	4.7	5.1	38%	72%	Expert
N01	1,114	1,046	69	690	693	40.0	5.3	5.4	10%	12%	Beginner
O01	1,734	1,479	255	1,058	1,106	99.0	10.5	10.9	24%	45%	Intermediate

**Garibaldi Resort Mountain Master Plan**  
**Table IV-40**  
**Terrain Specifications – Phase 1B**

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
O02	1,709	1,616	93	269	291	171.9	4.6	5.0	35%	45%	Intermediate
O03	1,641	1,478	163	1,249	1,270	59.7	7.5	7.6	13%	35%	Low Intermediate
O04	1,570	1,554	16	102	103	124.0	1.3	1.3	16%	20%	Intermediate
O05	1,662	1,564	97	466	480	107.4	5.0	5.2	21%	31%	Low Intermediate
O06	1,558	1,479	79	170	191	117.5	2.0	2.2	47%	51%	Advanced Intermediate
O07	1,576	1,547	28	240	243	160.2	3.8	3.9	12%	15%	Low Intermediate
O08	1,531	1,500	30	66	73	120.2	0.8	0.9	46%	57%	Expert
R01	1,555	1,519	36	391	395	54.5	2.1	2.2	9%	11%	Beginner
R02	1,555	1,145	410	2,268	2,332	58.7	13.3	13.7	18%	42%	Intermediate
R03	1,534	1,366	168	911	930	66.0	6.0	6.1	18%	27%	Low Intermediate
R04	1,451	1,147	304	1,305	1,358	70.6	9.2	9.6	23%	36%	Intermediate
R05	1,311	1,149	162	607	634	111.0	6.7	7.0	27%	39%	Intermediate
R06	1,282	1,150	132	556	577	242.2	13.5	14.0	24%	41%	Intermediate
R07	1,268	1,149	119	855	873	33.3	2.8	2.9	14%	25%	Novice
<b>Total:</b>					60,688		391.5	408.2			

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-41**  
**Terrain Capacity – Phase 1B**

Ability Level	Trail Area (ha.)	Skier/Rider Capacity (Skiers)
Beginner	9.4	189
Novice	51.9	934
Low Intermediate	57.5	804
Intermediate	180.6	1,806
Adv. Intermediate	74.4	521
Expert	34.4	138
<b>Total:</b>	<b>408.2</b>	<b>4,392</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-42**

**Skier Capacity Distribution by Ability Levels – Phase 1B**

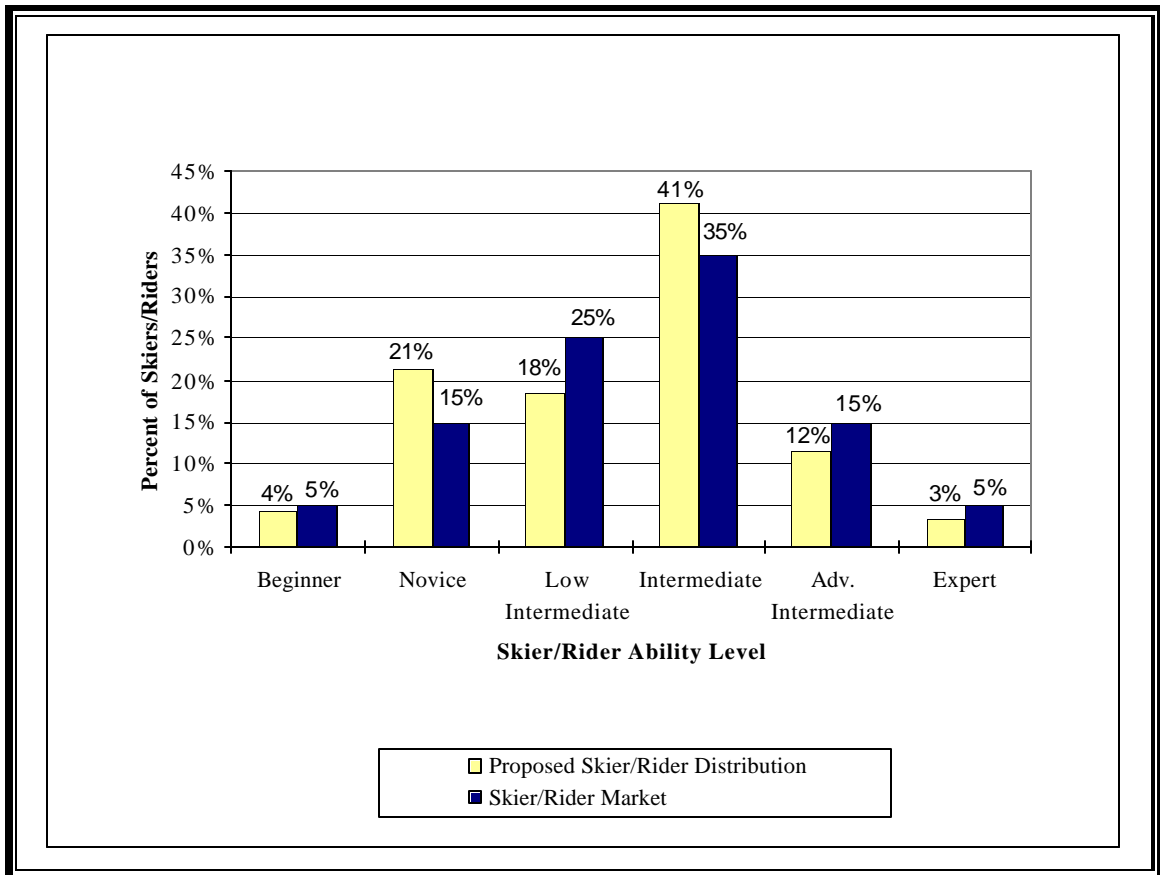
Ability Level	Trail Area (ha.)	Ski Area Capacity (Skiers)	Garibaldi Resort's Skier Capacity Distribution (%)	Garibaldi Resort's Market Distribution (%)	Distribution per CASP Guidelines (%)
Beginner	9.4	471	4%	5%	2 – 6%
Novice	51.9	2,335	21%	15%	11 – 15%
Low Intermediate	57.5	2,011	18%	25%	18 – 22%
Intermediate	180.6	4,516	41%	35%	33 – 37%
Adv. Intermediate	74.4	1,264	12%	15%	18 – 22%
Expert	34.4	344	3%	5%	8 – 12%
<b>Total:</b>	<b>408.2</b>	<b>10,942</b>	<b>100%</b>	<b>100%</b>	

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Chart IV-3**

**Terrain Distribution by Ability Levels – Phase 1B**



**Garibaldi Resort Mountain Master Plan**

**Table IV-43**

**Calculation of CCC – Phase 1B**

Map Ref.	Slope Length (m.)	Vert. Rise (m.)	Hourly Capacity (persons/hr.)	Oper. Hours (hrs.)	Up-Mtn. Access Role (%)	Misloading Lift Stop. (%)	Adjusted Hrly. Cap. (persons/hr.)	VTM/Day (000)	Weighted Vertical Demand (m./day)	CCC (Skiers)
G	2,016	631	1,800	7.00	0	5	1,710	7,553	5,736	1,320
H	1,278	265	1,800	6.50	0	5	1,710	2,945	3,867	760
M	2,283	547	1,800	7.00	5	5	1,620	6,199	4,461	1,390
N	438	68	1,200	7.00	0	10	1,080	512	1,000	510
O	1,050	265	2,400	6.75	5	5	2,160	3,858	3,811	1,010
R	2,259	408	1,800	7.00	5	5	1,620	4,621	4,172	1,110
<b>Total:</b>	<b>9,323</b>		<b>10,800</b>				<b>9,900</b>	<b>25,688</b>		<b>6,100</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-44**

**Disbursement of the Skier Population – Phase 1B**

Lift Number	Daily Capacity (CCC)	Disbursement of Skier/Rider Population			
		Support Fac./Milling (Skiers)	Lift Lines (Skiers)	On Lift (Skiers)	SAOT (Skiers On Trails)
G	1,320	330	264	188	538
H	760	190	100	119	351
M	1,390	348	311	201	530
N	510	128	203	52	127
O	1,010	253	288	124	345
R	1,110	278	95	199	538
<b>Total:</b>	<b>6,100</b>	<b>1,527</b>	<b>1,261</b>	<b>703</b>	<b>2,429</b>

Source: SE GROUP



**Garibaldi Resort Mountain Master Plan**

**Table IV-45**

**Snowmaking – Phase 1B**

Map Ref	Plan Length (m)	Slope Length (m.)	Avg. Width (m)	Slope Area (hectares)	Skier/Rider Ability Level
G04	2,527	2,626	60.0	15.8	Intermediate
G14	1,503	1,522	15.0	2.3	Novice
G15	1,546	1,563	15.0	2.3	Novice
H01	1,292	1,323	87.5	11.6	Low Intermediate
L01	5,078	5,150	25.0	12.9	Novice
L07	462	475	50.0	2.4	Low Intermediate
L09	2,894	2,968	40.0	11.9	Intermediate
M01	2,418	2,498	50.0	12.5	Intermediate
N01	690	693	40.0	2.8	Beginner
O03	400	402	15.0	0.6	Low Intermediate
R01	391	395	10.0	0.4	Beginner
R03	911	930	65.0	6.0	Low Intermediate
R05	607	634	50.0	3.2	Intermediate
<b>Total</b>		<b>21,179</b>		<b>84.7</b>	

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-46**

**Space Use Recommendations – Resort Total (Phase 1B)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	140	170
Public Lockers	267	326
Rentals/Repair	317	404
Retail Sales	306	375
Bar/lounge	307	375
Adult Ski School	230	281
Kid's Ski School	413	505
Restaurant Seating	2,258	2,760
Kitchen/Scramble	880	1,075
Rest rooms	659	805
Ski Patrol	224	274
Administration	323	394
Employee Lockers/Lounge	129	158
Mechanical	174	257
Storage	290	428
Circulation/Waste	697	1026
<b>TOTAL SQUARE METRES</b>	<b>7,614</b>	<b>9,612</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-47**  
**Space Use Recommendations – Village (Phase 1B)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	90	110
Public Lockers	267	326
Rentals/Repair	317	404
Retail Sales	274	335
Bar/lounge	307	375
Adult Ski School	207	252
Kid's Ski School	413	505
Restaurant Seating	1,703	2,081
Kitchen/Scramble	663	811
Rest rooms	376	459
Ski Patrol	168	206
Administration	323	394
Employee Lockers/Lounge	129	158
Mechanical	141	212
Storage	236	353
Circulation/Waste	565	847
<b>TOTAL SQUARE METRES</b>	<b>6,178</b>	<b>7,827</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-48**

**Space Use Recommendations – Base Lift R (Phase 1B)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	50	60
Public Lockers	0	0
Rentals/Repair	0	0
Retail Sales	0	0
Bar/lounge	0	0
Adult Ski School	0	0
Kid's Ski School	0	0
Restaurant Seating	0	0
Kitchen/Scramble	0	0
Rest rooms	160	196
Ski Patrol	0	0
Administration	0	0
Employee Lockers/Lounge	0	0
Mechanical	6	7
Storage	9	12
Circulation/Waste	23	28
<b>TOTAL SQUARE METRES</b>	<b>248</b>	<b>302</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-49**

**Space Use Recommendations – North Summit (Phase 1B)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	0	0
Public Lockers	0	0
Rentals/Repair	0	0
Retail Sales	16	20
Bar/lounge	0	0
Adult Ski School	23	28
Kid's Ski School	0	0
Restaurant Seating	169	206
Kitchen/Scramble	66	80
Rest rooms	37	46
Ski Patrol	45	55
Administration	0	0
Employee Lockers/Lounge	0	0
Mechanical	10	12
Storage	16	20
Circulation/Waste	38	47
<b>TOTAL SQUARE METRES</b>	<b>420</b>	<b>513</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-50**

**Space Use Recommendations – North Brohm Ridge (Phase 1B)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services		
Public Lockers		
Rentals/Repair		
Retail Sales	16	20
Bar/lounge		
Adult Ski School	-	-
Kid's Ski School		
Restaurant Seating	387	473
Kitchen/Scramble	151	184
Rest rooms	85	104
Ski Patrol	11	14
Administration		
Employee Lockers/Lounge		
Mechanical	18	26
Storage	29	44
Circulation/Waste	70	105
<b>TOTAL SQUARE METRES</b>	<b>768</b>	<b>970</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan  
Table IV-51  
Seating Requirements – Phase 1B**

	Village	North Summit	N. Brohm Ridge	Total Resort
Lunchtime Capacity (CCC)	5,289	524	1,202	7,015
Average Seat Turnover	3	3.5	4	
Required Seats	1,763	150	301	2,213

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan  
Table IV-52  
Parking Requirements Summary – Phase 1B**

	Multiplier	Total
CCC + other guests	15%	7,015
# of guests arriving from off-site	60%	4,209
# of guests arriving by car	80%	3,367
# of guests arriving via off-site bus service	20%	842
# of employees arriving by car*	40%	195
Required guest car parking spaces	3.00	1,122
Required employee car parking spaces	3.00	65

Source: SE GROUP

\* Total employees equal 8% of CCC

# PHASE 1C



**Figure IV-7: Phase 1C Mountain Plan**

**Garibaldi Resort Mountain Master Plan**

**Table IV-53**

**Lift Specifications – Phase 1C**

Map Reference	Lift Type	Top Elev. (m.)	Bot. Elev. (m.)	Vert. Rise (m.)	Horiz. Length (m.)	Slope Length (m.)	Avg. Grade (%)	Hourly Capacity (persons/hr)
E	DC4	1,728	1,137	591	1,539	1,681	38%	1,800
G	DC4	1,521	890	631	1,883	2,016	34%	2,400
H	DC4	1,740	1,475	265	1,250	1,278	19%	2,400
K	DC4	1,782	1,608	175	761	786	23%	2,400
M	DC6	1,558	1,011	547	2,187	2,283	25%	2,600
N	C3	1,112	1,044	68	428	438	16%	1,200
O	DC6	1,740	1,475	265	998	1,050	27%	2,600
P	C3	1,481	1,175	306	767	855	40%	1,800
R	DC4	1,556	1,148	408	2,184	2,259	19%	2,400
T	C3	1,143	1,038	104	661	678	16%	1,800
U	C3	1,200	1,041	159	436	486	36%	1,800
W	C3	1,282	1,020	262	1,260	1,312	21%	1,800

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-54**

**Terrain Specifications Summary – Phase 1C**

Ability Level	Trail Area (ha.)	Terrain Breakdown
Beginner	15.9	3%
Novice	51.9	10%
Low Intermediate	96.4	18%
Intermediate	203.2	39%
Adv. Intermediate	81.4	15%
Expert	77.7	16.5%
<b>Total:</b>	<b>526.5</b>	<b>100%</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-55**

**Terrain Specifications – Phase 1C**

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
B01	1,462	1,370	92	869	885	34.6	3.0	3.1	11%	15%	Novice
B07	1,370	1,015	355	3,242	3,261	38.5	12.5	12.6	11%	25%	Novice
E01	1,535	1,299	236	462	522	61.7	2.9	3.2	51%	61%	Expert
E02	1,711	1,138	573	1,610	1,735	65.0	10.5	11.3	36%	69%	Expert
E03	1,463	1,200	263	538	602	49.1	2.6	3.0	49%	60%	Expert
E04	1,714	1,160	555	1,452	1,588	54.9	8.0	8.7	38%	71%	Expert
E05	1,726	1,697	29	181	185	67.9	1.2	1.3	16%	17%	Low Intermediate
E06	1,223	1,154	69	306	316	38.6	1.2	1.2	23%	26%	Expert
E07	1,504	1,140	364	1,024	1,122	50.8	5.2	5.7	36%	75%	Expert
E08	1,539	1,270	268	912	964	49.2	4.5	4.7	29%	53%	Advanced Intermediate
F01	1,715	1,464	251	1,654	1,695	28.9	4.8	4.9	15%	29%	Low Intermediate
F02	1,709	1,513	196	916	946	57.1	5.2	5.4	21%	35%	Low Intermediate
F03	1,703	1,555	148	592	612	109.3	6.5	6.7	25%	32%	Low Intermediate
G01	1,520	968	552	2,064	2,169	47.8	9.9	10.4	27%	52%	Advanced Intermediate
G02	1,509	1,091	418	1,056	1,144	75.0	7.9	8.6	40%	53%	Advanced Intermediate
G03	1,484	1,079	405	1,032	1,114	76.6	7.9	8.5	39%	52%	Advanced Intermediate
G04	1,525	918	607	2,527	2,626	62.6	15.8	16.4	24%	42%	Intermediate
G05	1,224	1,051	174	392	430	57.8	2.3	2.5	44%	50%	Advanced Intermediate
G06	1,307	1,007	300	762	830	61.6	4.7	5.1	39%	55%	Advanced Intermediate
G07	1,478	906	572	1,690	1,820	70.8	12.0	12.9	34%	55%	Advanced Intermediate
G08	1,355	914	440	1,110	1,210	63.9	7.1	7.7	40%	55%	Advanced Intermediate
G09	1,462	1,139	323	788	866	57.0	4.5	4.9	41%	65%	Expert
G10	1,498	1,190	308	786	858	50.7	4.0	4.4	39%	67%	Expert
G11	1,523	1,021	502	2,124	2,215	50.0	10.6	11.1	24%	55%	Advanced Intermediate
G13	1,225	938	287	816	870	64.1	5.2	5.6	35%	45%	Intermediate
G14	1,014	891	122	1,503	1,522	33.3	5.0	5.1	8%	13%	Novice
G15	1,029	890	139	1,546	1,563	44.4	6.9	6.9	9%	18%	Novice
H01	1,738	1,490	248	1,292	1,323	87.5	11.3	11.6	19%	32%	Low Intermediate
H02	1,610	1,494	116	821	836	81.5	6.7	6.8	14%	22%	Low Intermediate
H03	1,490	1,129	361	915	993	76.7	7.0	7.6	40%	58%	Expert
H04	1,706	1,592	114	324	346	126.8	4.1	4.4	35%	44%	Intermediate
H05	1,520	1,489	31	259	262	45.3	1.2	1.2	12%	15%	Novice
I02	1,740	1,698	42	351	354	54.3	1.9	1.9	12%	12%	Beginner
J01	1,736	1,703	33	374	377	94.4	3.5	3.6	9%	12%	Beginner
J02	1,730	1,705	25	357	359	80.7	2.9	2.9	7%	11%	Beginner
K01	1,781	1,600	181	807	833	223.8	18.1	18.6	22%	30%	Intermediate
K02	1,723	1,706	17	105	107	66.0	0.7	0.7	16%	20%	Low Intermediate
K03	1,763	1,610	153	928	949	58.3	5.4	5.5	16%	31%	Low Intermediate
K04	1,699	1,616	83	327	338	49.7	1.6	1.7	25%	27%	Low Intermediate
K05	1,732	1,611	121	470	487	56.8	2.7	2.8	26%	30%	Low Intermediate
K06	1,755	1,666	89	387	400	45.8	1.8	1.8	23%	31%	Low Intermediate
K07	1,746	1,644	102	372	388	51.5	1.9	2.0	27%	28%	Low Intermediate

**Garibaldi Resort Mountain Master Plan**  
**Table IV-55**  
**Terrain Specifications – Phase 1C**

Map Ref.	Top Elev. (m.)	Bottom Elev. (m.)	Vertical Drop (m.)	Plan Length (m.)	Slope Length (m.)	Avg. Width (m.)	Plan Area (ha.)	Slope Area (ha.)	Avg. Grade (%)	Max. Grade (%)	Ability Level
K08	1,781	1,610	170	769	793	60.2	4.6	4.8	22%	29%	Low Intermediate
K10	1,766	1,672	94	370	384	102.1	3.8	3.9	25%	33%	Intermediate
K11	1,755	1,654	101	281	307	74.7	2.1	2.3	36%	57%	Advanced Intermediate
L01	1,741	1,129	612	5,078	5,150	39.2	19.9	20.2	12%	25%	Novice
L02	1,742	1,479	264	1,343	1,382	112.8	15.1	15.6	20%	38%	Intermediate
L03	1,741	1,605	136	511	532	174.4	8.9	9.3	27%	38%	Intermediate
L04	1,736	1,683	53	184	192	92.1	1.7	1.8	29%	31%	Intermediate
L05	1,657	1,508	150	656	682	170.4	11.2	11.6	23%	43%	Intermediate
L06	1,599	1,498	101	504	518	112.3	5.7	5.8	20%	32%	Low Intermediate
L07	1,575	1,485	90	462	475	117.3	5.4	5.6	20%	31%	Low Intermediate
L08	1,494	1,384	110	272	300	53.3	1.5	1.6	40%	52%	Advanced Intermediate
L09	1,536	1,040	496	2,894	2,968	65.5	18.9	19.4	17%	36%	Intermediate
L10	1,399	1,154	245	610	671	63.3	3.9	4.2	40%	73%	Expert
M01	1,557	1,017	541	2,418	2,498	91.0	22.0	22.7	22%	45%	Intermediate
M02	1,232	1,044	189	746	778	83.0	6.2	6.5	25%	43%	Intermediate
M03	1,436	1,133	304	922	975	59.9	5.5	5.8	33%	45%	Intermediate
M04	1,413	1,145	268	738	791	47.6	3.5	3.8	36%	54%	Advanced Intermediate
M05	1,528	1,145	384	1,166	1,255	58.0	6.8	7.3	33%	65%	Expert
M06	1,548	1,275	274	719	781	65.4	4.7	5.1	38%	72%	Expert
N01	1,114	1,046	69	690	693	40.0	5.3	5.4	10%	12%	Beginner
O01	1,734	1,479	255	1,058	1,106	99.0	10.5	10.9	24%	45%	Intermediate
O02	1,709	1,616	93	269	291	171.9	4.6	5.0	35%	45%	Intermediate
O03	1,641	1,478	163	1,249	1,270	59.7	7.5	7.6	13%	35%	Low Intermediate
O04	1,570	1,554	16	102	103	124.0	1.3	1.3	16%	20%	Intermediate
O05	1,662	1,564	97	466	480	107.4	5.0	5.2	21%	31%	Low Intermediate
O06	1,558	1,479	79	170	191	117.5	2.0	2.2	47%	51%	Advanced Intermediate
O07	1,576	1,547	28	240	243	160.2	3.8	3.9	12%	15%	Low Intermediate
O08	1,531	1,500	30	66	73	120.2	0.8	0.9	46%	57%	Expert
Q09	1,650	1,185	465	1,024	1,138	31.7	3.2	3.6	45%	63%	Expert
Q10	1,644	1,231	412	824	935	31.3	2.6	2.9	50%	64%	Expert
Q11	1,626	1,165	461	1,047	1,164	31.7	3.3	3.7	44%	73%	Expert
R01	1,555	1,519	36	391	395	54.5	2.1	2.2	9%	11%	Beginner
R02	1,555	1,145	410	2,268	2,332	58.7	13.3	13.7	18%	42%	Intermediate
R03	1,534	1,366	168	911	930	66.0	6.0	6.1	18%	27%	Low Intermediate
R04	1,451	1,147	304	1,305	1,358	70.6	9.2	9.6	23%	36%	Intermediate
R05	1,311	1,149	162	607	634	111.0	6.7	7.0	27%	39%	Intermediate
R06	1,282	1,150	132	556	577	242.2	13.5	14.0	24%	41%	Intermediate
R07	1,268	1,149	119	855	873	33.3	2.8	2.9	14%	25%	Novice
S01	1,610	1,495	116	575	590	60.1	3.5	3.5	20%	31%	Low Intermediate
S02	1,557	1,512	46	275	280	97.9	2.7	2.7	17%	18%	Low Intermediate
Total					79,107		503.6	526.5			

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan  
Table IV-56  
Terrain Capacity – Phase 1C**

Ability Level	Trail Area (ha.)	Skier/Rider Capacity (Skiers)
Beginner	15.9	318
Novice	51.9	934
Low Intermediate	96.4	1,349
Intermediate	203.2	2,032
Adv. Intermediate	81.4	570
Expert	77.7	311
<b>Total:</b>	<b>526.5</b>	<b>5,514</b>

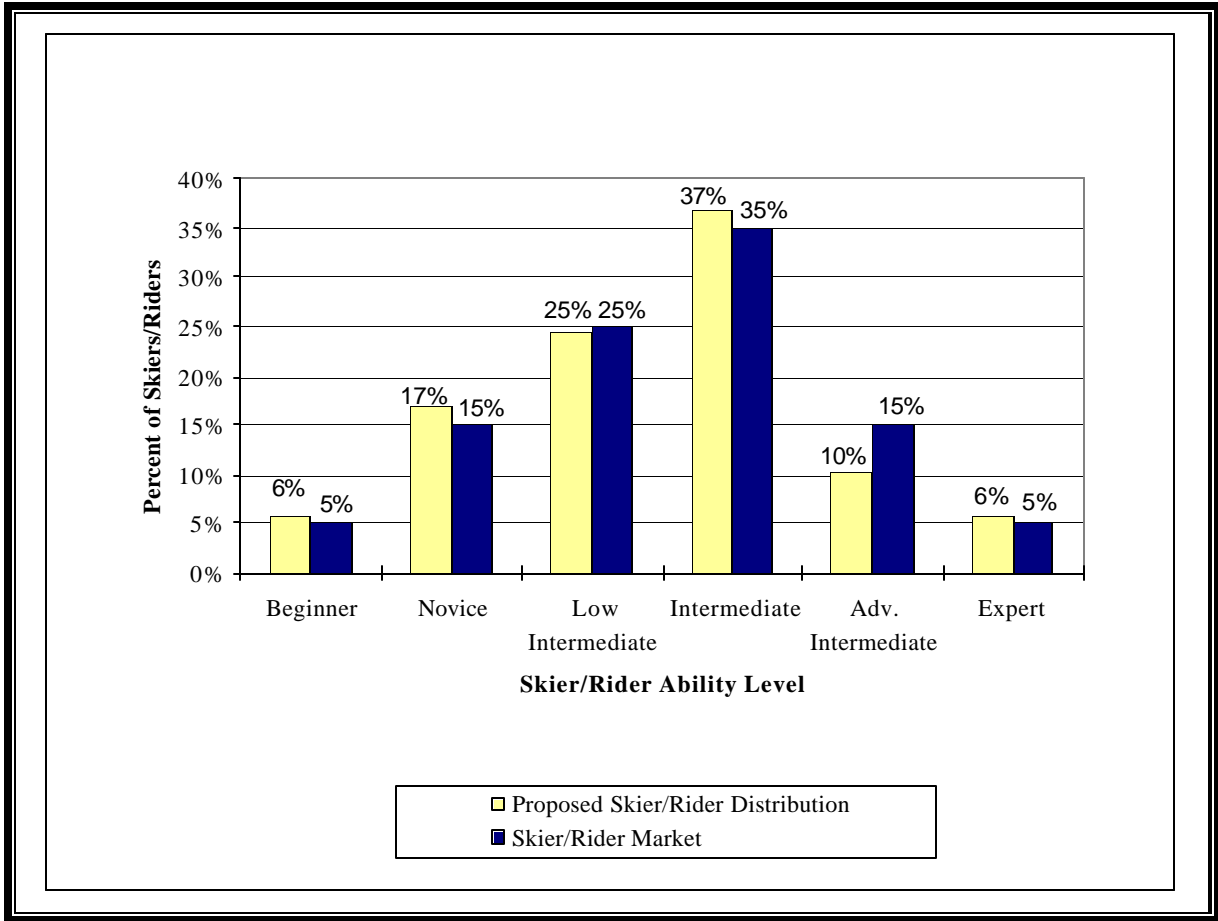
Source: SE GROUP

**Garibaldi Resort Mountain Master  
Table IV-57  
Skier Capacity Distribution by Ability Levels – Phase 1C**

Ability Level	Trail Area (ha.)	Ski Area Capacity (Skiers)	Garibaldi Resort's Skier Capacity Distribution (%)	Garibaldi Resort's Market Distribution (%)	Distribution per CASP Guidelines (%)
Beginner	15.9	794	6%	5%	2 – 6%
Novice	51.9	2335	17%	15%	11 – 15%
Low Intermediate	96.4	3373	25%	25%	18 – 22%
Intermediate	203.2	5080	37%	35%	33 – 37%
Adv. Intermediate	81.4	1384	10%	15%	18 – 22%
Expert	77.7	777	6%	5%	8 – 12%
<b>Total:</b>	<b>526.5</b>	<b>13,743</b>	<b>100%</b>	<b>100%</b>	

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Chart IV-4**  
**Terrain Distribution by Ability Levels – Phase 1C**



**Garibaldi Resort Mountain Master Plan**

**Table IV-58**

**Calculation of CCC – Phase 1C**

Map Ref.	Slope Length (m.)	Vert. Rise (m.)	Hourly Capacity (persons/hr.)	Oper. Hours (hrs.)	Up-Mtn. Access Role (%)	Misloading Lift Stop. (%)	Adjusted Hrly. Cap. (persons/hr.)	VTM/Day (000)	Weighted Vertical Demand (m./day)	CCC (Skiers)
E	1,681	591	1,800	6.50	0	5	1,710	6,571	8,203	800
G	2,016	631	2,400	7.00	0	5	2,280	10,070	5,736	1,760
H	1,278	265	2,400	6.50	0	5	2,280	3,927	3,867	1,020
K	786	175	2,400	6.25	0	5	2,280	2,491	4,190	590
M	2,283	547	2,600	7.00	5	5	2,340	8,954	4,461	2,010
N	438	68	1,200	7.00	0	10	1,080	512	1,000	510
O	1,050	265	2,600	6.75	5	5	2,340	4,180	3,957	1,060
P	855	306	1,800	6.00	0	5	1,710	3,141	9,000	350
R	2,259	408	2,400	7.00	5	5	2,160	6,162	4,172	1,480
<b>Total:</b>	<b>12,645</b>		<b>19,600</b>				<b>18,180</b>	<b>46,008</b>		<b>9,580</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-59**

**Disbursement of the Skier Population – Phase 1C**

Lift Number	Daily Capacity (CCC)	Disbursement of Skier/Rider Population			
		Support Fac./Milling (Skiers)	Lift Lines (Skiers)	On Lift (Skiers)	SAOT (Skiers On Trails)
E	800	200	78	157	365
G	1,760	440	352	250	718
H	1,020	255	133	159	473
K	590	148	38	98	306
M	2,010	503	449	291	767
N	510	128	203	52	127
O	1,060	265	312	134	349
P	350	88	86	160	16
R	1,480	370	126	266	718
<b>Total:</b>	<b>9,580</b>	<b>2,397</b>	<b>1,777</b>	<b>1,567</b>	<b>3,839</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-60**

**Snowmaking – Phase 1C**

Map Ref	Plan Length (m)	Slope Length (m.)	Avg. Width (m)	Slope Area (hectares)	Skier/Rider Ability Level
B01	869	885	25.0	2.2	Novice
B07	4,192	4,265	15.0	6.4	Novice
F01	1,654	1,695	30.0	5.1	Low Intermediate
G04	2,527	2,626	60.0	15.8	Intermediate
G14	1,503	1,522	15.0	2.3	Novice
G15	1,546	1,563	15.0	2.3	Novice
H01	1,292	1,323	87.5	11.6	Low Intermediate
I02	351	354	30.0	1.1	Beginner
L01	5,078	5,150	25.0	12.9	Novice
L07	462	475	50.0	2.4	Low Intermediate
L09	2,894	2,968	40.0	11.9	Intermediate
M01	2,418	2,498	50.0	12.5	Intermediate
M02	746	778	50.0	3.9	Intermediate
M03	922	975	50.0	4.9	Intermediate
N01	690	693	40.0	2.8	Beginner
O03	400	402	15.0	0.6	Low Intermediate
R01	391	395	10.0	0.4	Beginner
R03	911	930	65.0	6.0	Low Intermediate
R05	607	634	50.0	3.2	Intermediate
<b>Total</b>		<b>30,130</b>		<b>108.1</b>	

Source: SE GROUP



**Garibaldi Resort Mountain Master Plan**

**Table IV-61**

**Space Use Recommendations – Resort Total (Phase 1C)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	223	271
Public Lockers	512	626
Rentals/Repair	609	775
Retail Sales	456	557
Bar/lounge	589	720
Adult Ski School	360	441
Kid's Ski School	649	793
Restaurant Seating	3,546	4,334
Kitchen/Scramble	1,382	1,689
Rest rooms	940	1,148
Ski Patrol	352	431
Administration	507	619
Employee Lockers/Lounge	203	248
Mechanical	279	400
Storage	465	667
Circulation/Waste	1,115	1,601
<b>TOTAL SQUARE METRES</b>	<b>12,185</b>	<b>15,318</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-62**  
**Space Use Recommendations – Village (Phase 1C)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	173	211
Public Lockers	512	626
Rentals/Repair	609	775
Retail Sales	405	495
Bar/lounge	589	720
Adult Ski School	324	396
Kid's Ski School	649	793
Restaurant Seating	1,907	2,331
Kitchen/Scramble	743	908
Rest rooms	421	515
Ski Patrol	247	302
Administration	507	619
Employee Lockers/Lounge	203	248
Mechanical	197	295
Storage	328	492
Circulation/Waste	787	1,180
<b>TOTAL SQUARE METRES</b>	<b>8,600</b>	<b>10,904</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-63**

**Space Use Recommendations – Base Lift R (Phase 1C)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	50	60
Public Lockers	0	0
Rentals/Repair	0	0
Retail Sales	0	0
Bar/lounge	0	0
Adult Ski School	0	0
Kid's Ski School	0	0
Restaurant Seating	0	0
Kitchen/Scramble	0	0
Rest rooms	157	191
Ski Patrol	0	0
Administration	0	0
Employee Lockers/Lounge	0	0
Mechanical	6	7
Storage	9	11
Circulation/Waste	22	27
<b>TOTAL SQUARE METRES</b>	<b>244</b>	<b>297</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**

**Table IV-64**

**Space Use Recommendations – North Summit (Phase 1C)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services	0	0
Public Lockers	0	0
Rentals/Repair	0	0
Retail Sales	25	31
Bar/lounge	0	0
Adult Ski School	36	44
Kid's Ski School	0	0
Restaurant Seating	1,251	1,529
Kitchen/Scramble	487	596
Rest rooms	276	338
Ski Patrol	88	108
Administration	0	0
Employee Lockers/Lounge	0	0
Mechanical	58	71
Storage	97	119
Circulation/Waste	234	286
<b>TOTAL SQUARE METRES</b>	<b>2,553</b>	<b>3,121</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan**  
**Table IV-65**  
**Space Use Recommendations – North Brohm Ridge (Phase 1C)**

Service Function	Recommended Range	
	Recommended Low Range	Recommended High Range
Ticket Sales/Guest Services		
Public Lockers		
Rentals/Repair		
Retail Sales	25	31
Bar/lounge		
Adult Ski School	5	6
Kid's Ski School		
Restaurant Seating	388	474
Kitchen/Scramble	151	185
Rest rooms	86	105
Ski Patrol	18	22
Administration		
Employee Lockers/Lounge		
Mechanical	18	27
Storage	30	45
Circulation/Waste	72	108
<b>TOTAL SQUARE METRES</b>	<b>788</b>	<b>996</b>

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan  
Table IV-66  
Seating Requirements – Phase 1C**

	Village	North Summit	N. Brohm Ridge	Total Resort
Lunchtime Capacity (CCC)	5,925	3,886	1,206	11,017
Average Seat Turnover	3	3.5	4	
Required Seats	1,975	1,110	302	3,387

Source: SE GROUP

**Garibaldi Resort Mountain Master Plan  
Table IV-67  
Parking Requirements Summary – Phase 1C**

	Multiplier	Total
CCC + other guests	15%	11,017
# of guests arriving from off-site	50%	5,509
# of guests arriving by car	80%	4,407
# of guests arriving via off-site bus service	20%	1,102
# of employees arriving by car*	40%	307
Required guest car parking spaces	3.00	1,469
Required employee car parking spaces	3.00	102

Source: SE GROUP

\* Total employees equal 8% of CCC