Syracuse University

SURFACE

Architecture Senior Theses

School of Architecture Dissertations and Theses

Spring 2007

Avalanche: Architecture of Emergency

Joshua M. Lacasse

Follow this and additional works at: https://surface.syr.edu/architecture_theses

 Part of the Architecture Commons

Recommended Citation

Lacasse, Joshua M., "Avalanche: Architecture of Emergency" (2007). *Architecture Senior Theses*. 140.
https://surface.syr.edu/architecture_theses/140

This Thesis, Senior is brought to you for free and open access by the School of Architecture Dissertations and Theses at SURFACE. It has been accepted for inclusion in Architecture Senior Theses by an authorized administrator of SURFACE. For more information, please contact surface@syr.edu.

Arch.
Reading
Room

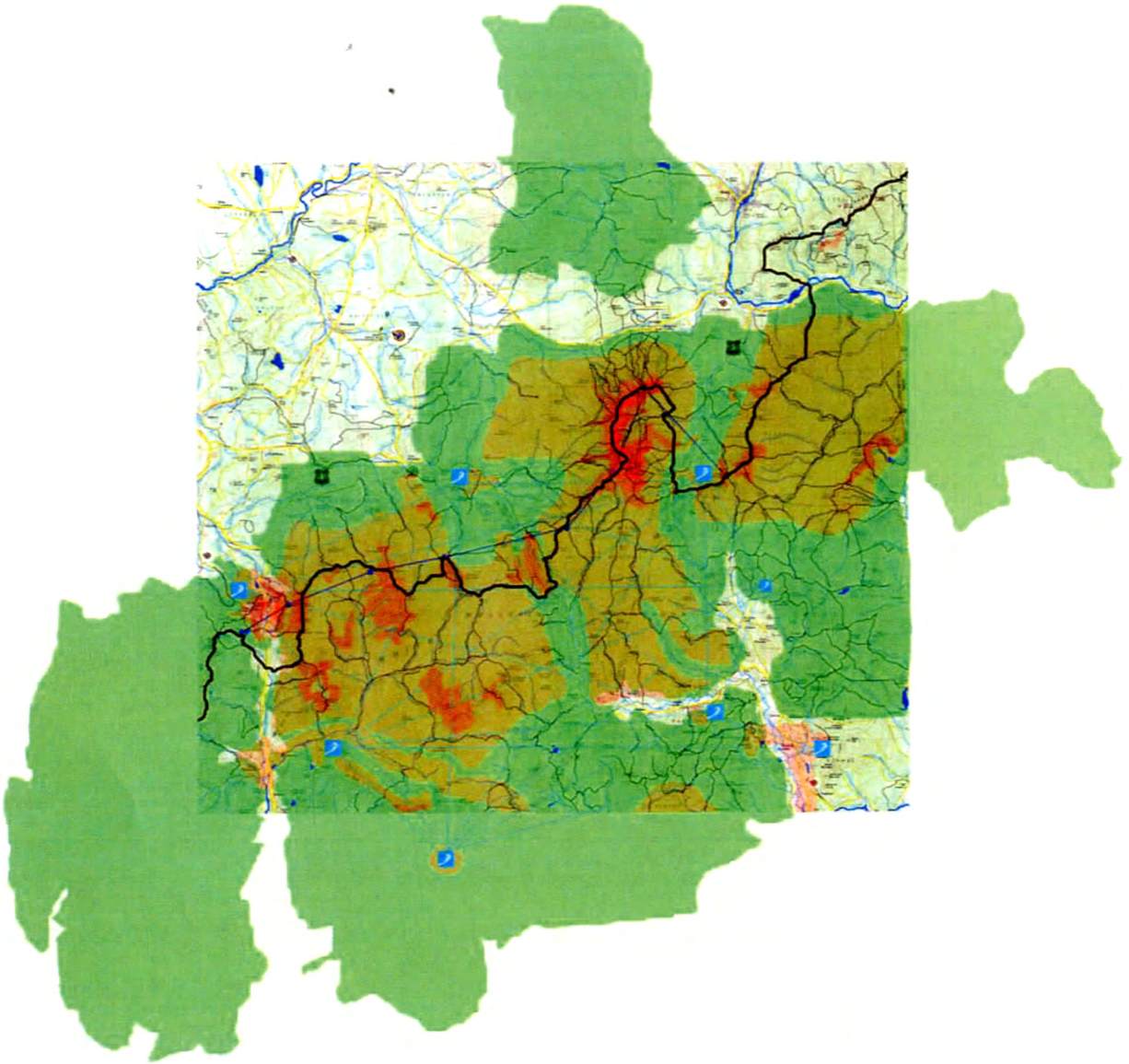
RESTRICTED

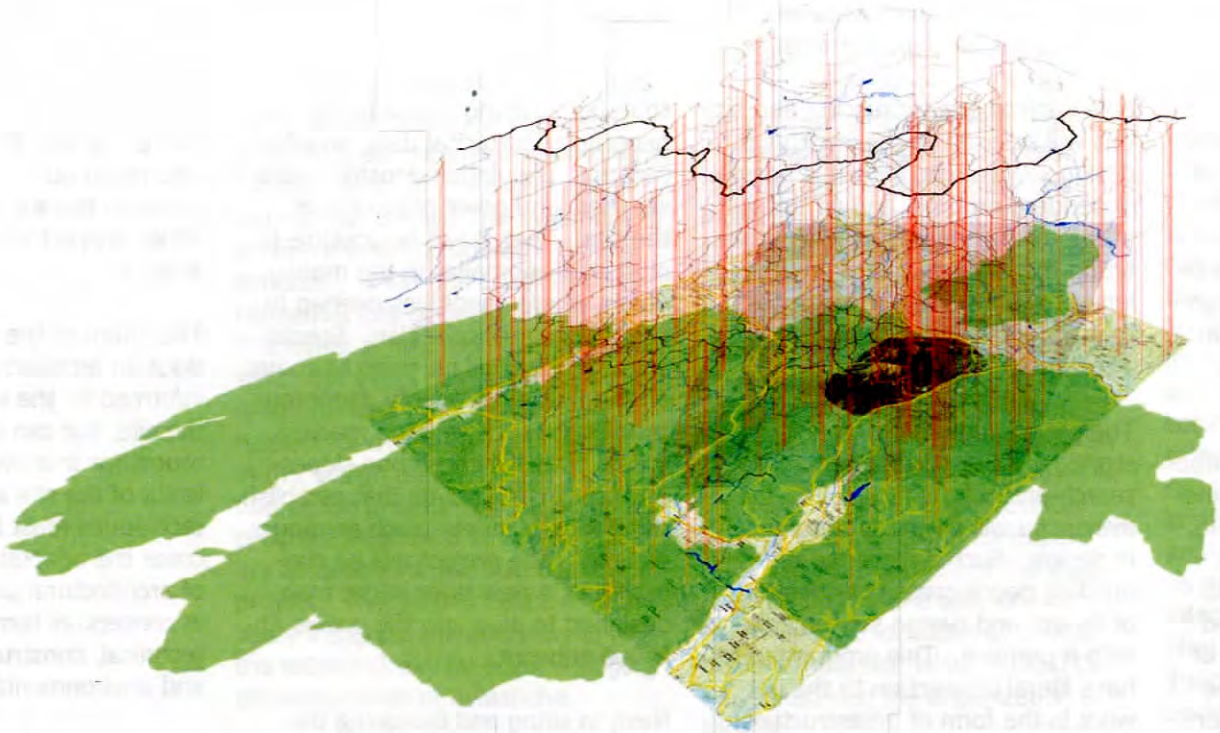
SYRACUSE UNIVERSITY
3 2911 02973773 1

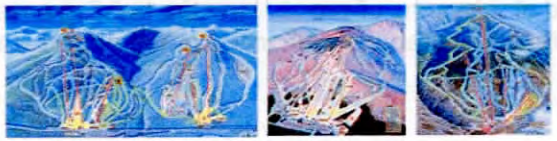
AVALANCHE: Architecture of Emergency

Josh Lacasse
Committee Members:
Michael Carroll
Anne Munly

TABLE OF CONTENTS







JOSH LACASSE

ABSTRACT

AVALANCHE: Architecture of Emergency

A building for rescue must perform its function seamlessly during times of emergency. The consideration of landscape in terms of an event leads to an evocative solution that best accommodates the program of the project Using a thorough investigation of spatial, infrastructural, and conceptual networks on the site, I will design center for avalanche rescue in the White Mountains of New Hampshire.

Inherent in every place is a multifaceted layering of information. Some is apparent and some is intangible, but through careful study, an architect can use this information to his advantage in the planning and design of a project. Some parts of this 'network' are common for the planning of any building and others are program-specific. It is critical to distinguish which layers of information are important to the project, and which have no bearing on the project.

Critical to the research is the analytical investigation of the event. Avalanche is perhaps the most serious emergency, carrying considerable implications for rescue, and so this will be used as the impetus for design. Avalanche rescue is heavily dependent on time, and so this will play into the analysis as well. Analyzing the landscape through this lens allows for a critical response that addresses all of the pressures affecting the project.

The program designed to test this strategy is that of a backcountry search-and-rescue facility, but the avalanche will be the primary focus in design. Such a response-oriented building needs great consideration of its site and design strategies to help it perform. This program must have literal connection to the network in the form of infrastructure: roads, air transportation, trails, and rivers and streams. Also, like the spatial network, the facility will be composed of a layering of programs: hiker shelter and educational facilities will be incorporated into the program as well.

The mode of research includes a thorough investigation into the use, geography, historical data, weather patterns, population density, nearby services, and other pressures of the site. Then it will be possible to study the anomalies in the matrix- points where conditions overlap to create a special condition. Special consideration will be given to points on the map that identify dangerous conditions- such as large roadless areas, or avalanche-prone slopes- and conversely, points that establish conditions of safety- such as ranger stations. The project will be conceived as a new layer in the map, designed to plug into the pre-established network.

Next, in siting and designing the project, the design will take into account the established site pressures. The design does not end at the building envelope; the intent of the project is to engage the 'network' it sits within- the design should encompass a broader scope to accomplish this. The project has potential to be designed to enhance the spatial network of the site- a sort of 'perfect fit' architecture, but also reach out to engage critical points in the surrounding area, to either support the matrix, or to challenge it.

The intent of the project is to produce an architecture that is not only informed by the idiosyncrasies of the site, but can react to its surroundings in a dynamic way. The limits of the site and constructional techniques must be pushed to discover the adaptability of this method of architectural production, not only in conceptual terms, but also in technical, constructional, tectonic, and environmental terms.

This analysis should be conducted with a critical viewpoint; the intention is to use the research as a base for the design of a proposition that tests the thesis idea.

The Event

The event is the lens through which an architect must view the site in order to glean information pertinent for the design of a building responsive to that event. The avalanche is an event with considerable gravity, especially when one considers the consequences of being 'too slow'. The event is that moment in time when the every day becomes the extraordinary. The architectural respect for event may be evident in the design and overall organization of the project- a building of this program must be a highly reactionary assembly for the success of the project. The project needs to seamlessly integrate the everyday and the extraordinary by acknowledging the occurrence of avalanche.

The Landscape

The site provides a grounds for investigation of a topic pertinent to the concept of the project. Fundamental to the site in this case is landscape. A project like this interacts with the landscape in critical ways, not the least of which describes its attitude towards the event. There are intangible networks on the site which influence the organization of services, transportation, utilities, and program distribution of a given area, and an understanding of these networks is the base for a thorough development of programs and concepts. After the development of the map used to analyze the site, one can determine the locations of critical nodes on the site which should be integrated into the organization of the site.

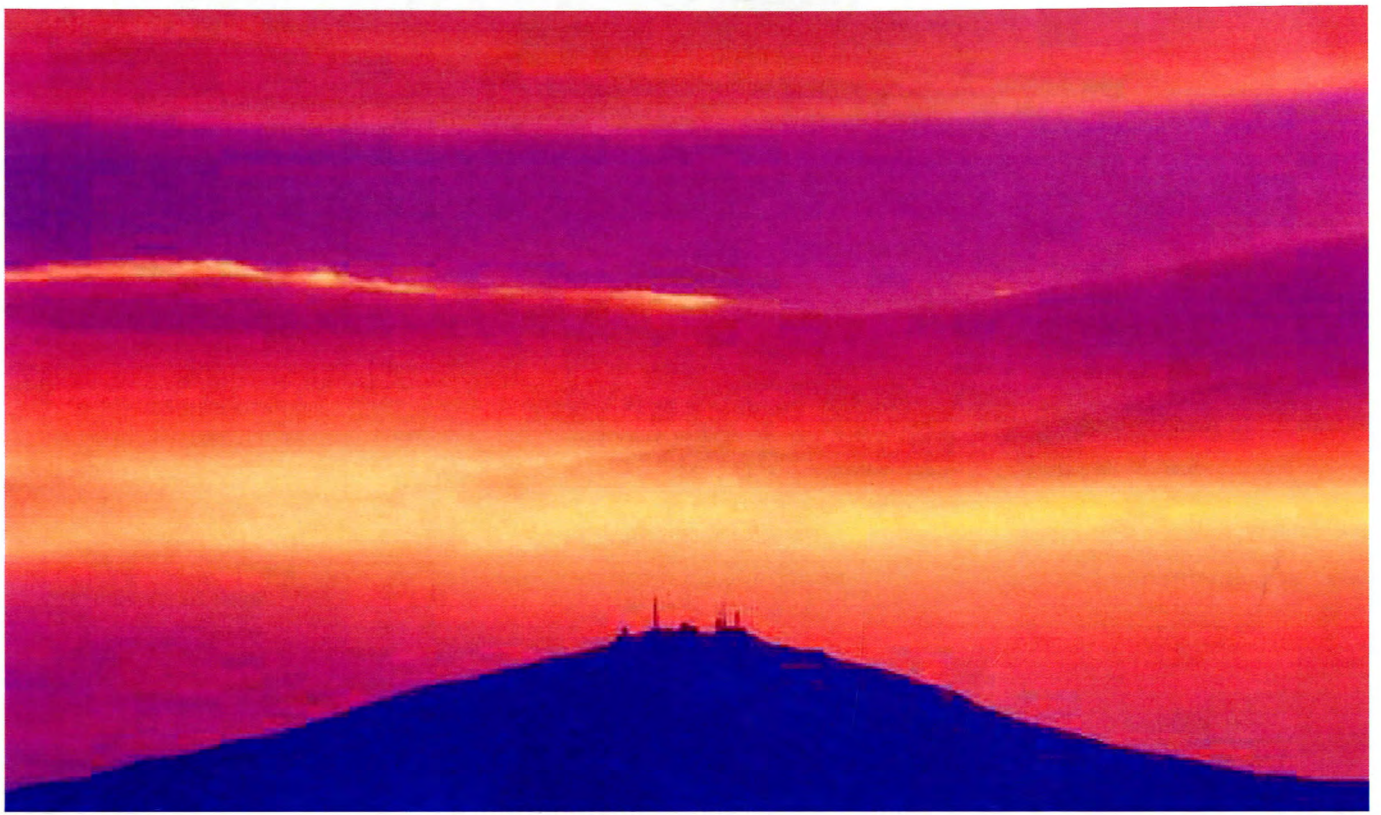
The Response

The architectural response should manifest itself in many different ways. It must be integrated into the network of information using tools like technology, tectonics, and spatial strategies. These additions can put the project at an advantage when it comes to function. To respond to an unexpected and indeterminate set of circumstances, architecture must be flexible and coherent. Technology allows us to be dynamic in our perception of space, events, and the boundary of architecture in the landscape. The analysis should focus on the site as the inspiration for the complete integration of the project- the mapping of the spatial network is an important step in the process of understanding the site.

EXPECTATION OF RESULT

The end result of the project should be a building that, in every sense, is most optimally suited to facilitate response and prevention of backcountry emergencies.

The style, organization, and spaces are of lesser importance but still not insignificant. Also, some thought should be put into the feasibility, cost, and constructability of the project. The scheme should have a considerable investment in the analysis of site and surroundings- and the newly investigated 'spatial network,' as this has been the driving principle of the contention. Technology and transportation infrastructure are also important parts of the program since they enhance the ability of the project and its inhabitants to respond in many senses of the word. These are essential additions to the map of the greater site, and will become a part of the spatial matrix at the completion of the project.



EVALUATION CRITERIA

"A program is a determinate set of expected occurrences, a list of required utilities, often based on social behaviour, habit, or custom. In contrast, events occur as an indeterminate set of unexpected outcomes."

-Bernard Tschumi

The end product of the project being devoted to function leaves the evaluation up to the method of coming about this function. If the project achieves its goals by following the method that has been established to accomplish them, it will be a success. If not, there should be some discussion as to why, and how the project could be brought back into its own self-defined scope. The evaluation should not lose track of the fact that the thesis began from a suspicion about the nature of architecture, and may begin to shift focus with subsequent research. Still, the project should emerge with a clear contention, and a clear, creative solution, in terms of architecture, construction, and feasibility. To be slightly more ambiguous, the project should embody 'extremeness'.

PROGRAM

The selected program is that of a backcountry search and rescue center. The architectural idea is pushed to its limit here by the idea of event. The project becomes, at that point, a means to an end, which- in this scenario- is saving lives; a building of this nature should become invisible during catastrophic events. That is to say, it performs so well that it is not seen as a hindrance. The relationship to site is critical, and the productive influence of this project on the personnel involved in rescue effort should be a top priority. The use of technology should also take a high priority, since this implicates the addition of a new layer to the "spatial network" analyzed in the site research phase. The other layer to be added is of a more human disposition. This is probably the hardest to predict, but perhaps the most important. Architecture alone cannot perform the task this building is designed for, but it should put people in a better position to do it.

A large part of the program should be dedicated to the monitoring and dispatch to emergencies. But the facility will also require a public face- this will ensure a proactive approach to backcountry emergencies as well; educate the public and the chances of a problem decrease dramatically. Along with these high profile pieces of program come more standard pieces as well- pieces for the accommodation of crew members and storage of gear, food, tools, and supplies. In order to make this arrangement work these everyday pieces of program must be highly considered in relation to the more specialized components.

Sustainable systems also will be given consideration, as the site and landscape dictate the need for a somewhat delicate impact. Also, the public profile of a project like this requires the need to demonstrate responsible building practice as the site is located on pristine forest land. Elements like rainwater cisterns, active and passive solar heating, and geothermal energy will be under consideration. Local materials and sustainable construction techniques also improve the project's impact in the landscape.

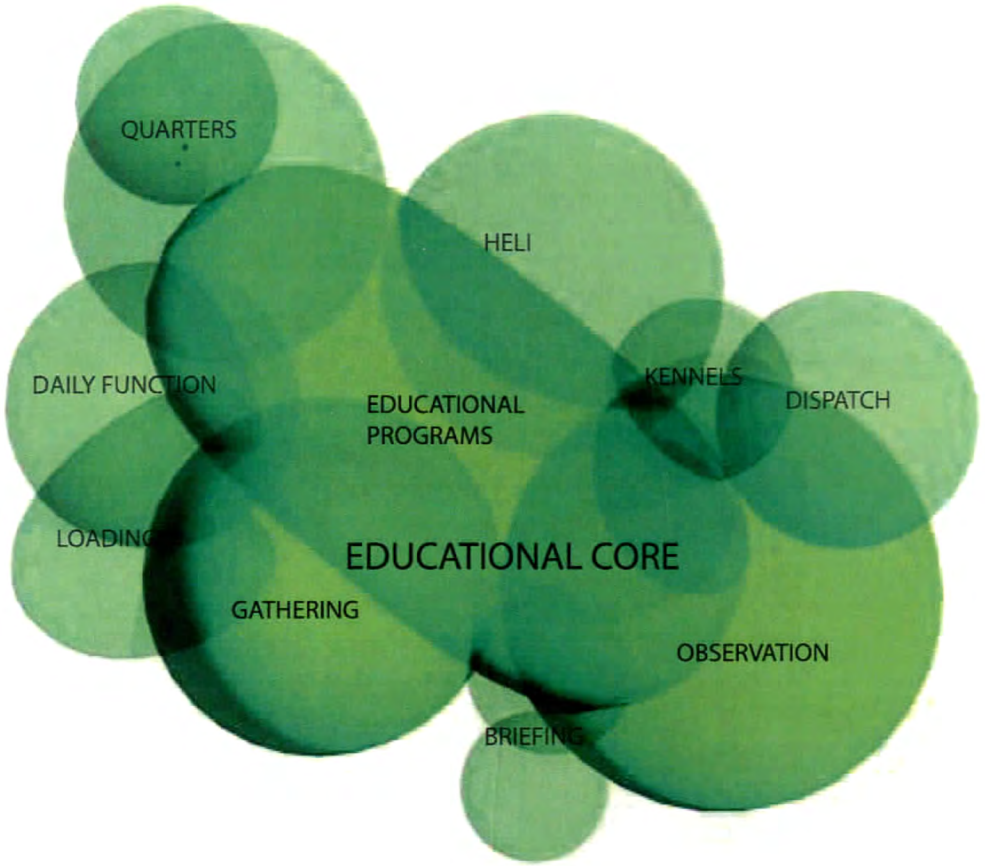
PROGRAM

Quarters for staff	8 @ 250 sf ea
Kitchen	200 sf
Living area	450 sf
Equipment maintenance	500 sf
Shelter for public	250 sf
Radio Dispatch	80 sf
Gear Room	250 s.f.
Supply room	combined w/ gear room
Helipad	1600-2000 sf
Vehicle Loading/parking	1000 sf
Observation deck	500 sf
Environmental equipment	n/a
Educational program	included w/ public space
Hiker safety	
Environmental education	
Public gathering area	800 sf
Basic medical facilities	150 sf
Kennels	5 @ 40 sf ea + 150 communal space
Briefing room	350 sf
Training area	combined w/ briefing
Bathroom/public	2 @ 56 sf
Bathroom/private with shower	2 @ 90 sf
SUBTOTAL	6872-7322 sf
CIRCULATION ADD 15-20%	
TOTAL BUILDING AREA	7903-8786 sf

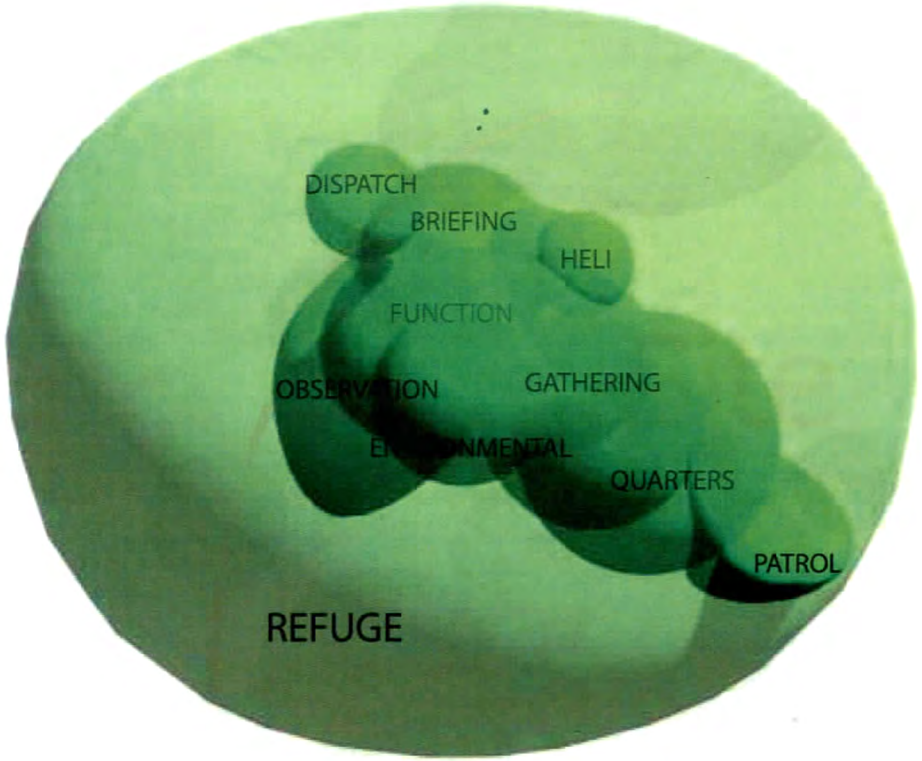
PROGRAM- MODES OF OPERATION

DAY-TO-DAY

The function of the facility on a daily basis (that is to say, times of 'non-emergency') will be a proactive one. The project opens to the outside world, providing educational programs to hikers, and information and sign-in services for skiiers and backcountry travellers. Supporting programs overlap the educational ones, transforming the entire project into a learning module. The idea is for the bulk of the program to become educational, overlapping function and education.



PROGRAM- MODES OF OPERATION



REFUGE

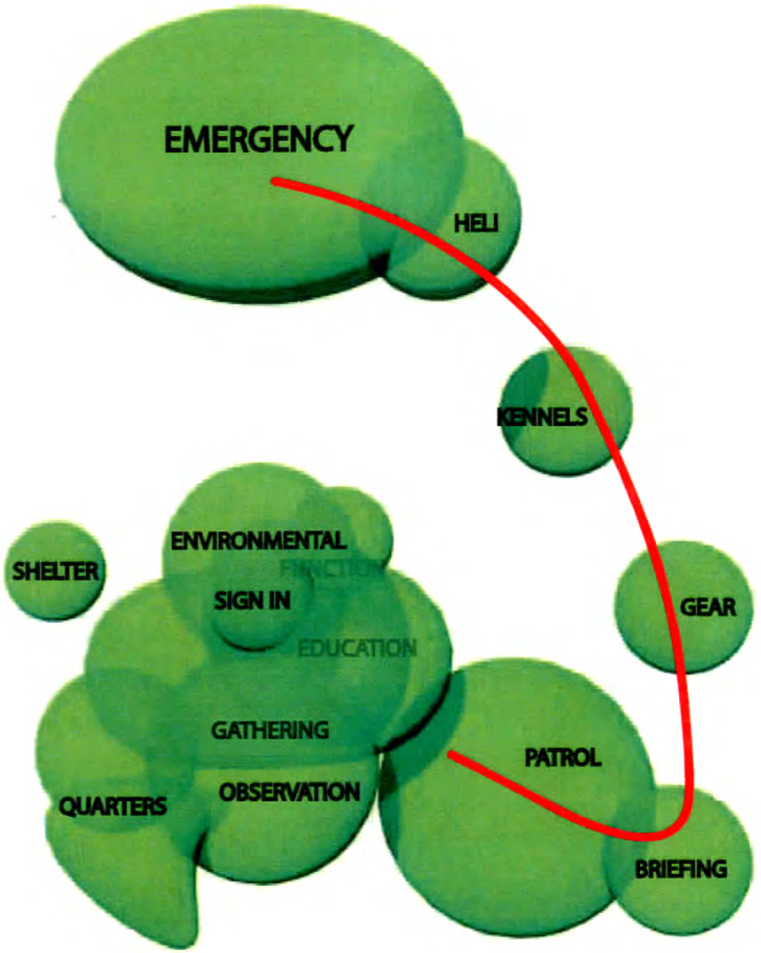
This occurs when the area is hit with bad weather. The main programs all work together under the umbrella of a shelter for hikers unfortunate enough to be caught in the storm. Primarily, the purpose of the project at this point becomes protection from the elements, and all the programs within this function must perform and work together to be successful. The one program that might possibly extend beyond the boundaries of the project is that of the patrol. This could be extremely important in bad weather when there is likely to be someone trapped in the storm.

PROGRAM- MODES OF OPERATION

EMERGENCY

Of course, the most critical moment in the operation of this facility is the event of an emergency. Such an occurrence would force the project to react dynamically to provide support for those involved in rescue. Out of the jumble of overlapping programs would evolve a legitimate sequence, providing an outlet for response.

Here, the idea of dynamic program changes from one of uncertainty to one of utter reliability. The sequence should provide an outlet for any situation likely to arise during downtime.



Site

SITE

Architectural situation here becomes of the utmost importance. But the broader, overall site is something to be less concerned about. The focus is on the exploration of networks that exist on any site; the uncovering of data and relationships that are not immediately obvious- the general location is less of a priority. Locating the project within a certain area is more important. The area I have chosen is located in New Hampshire's White Mountain National Forest. From my knowledge and experience, this area is one that could benefit from a facility such as this; locals are familiar with the fact that the area boasts some of the worst weather in the world. The WMNF encompasses the Presidential mountain range- which, topping out at about 6000', is hardly jaw dropping. But Mount Washington, the range's highest, holds the worlds fastest wind speed record- 231 miles per hour, clocked in 1934. The weather here can literally change in an instant, skiing runs into July, and that is bad news for safety.

Located within an easy day's travel of about 80 million people, the range is enticing for backcountry experts, but also families- with children. This creates yet another layer on the spatial network, user types, one that is incredibly difficult to map.

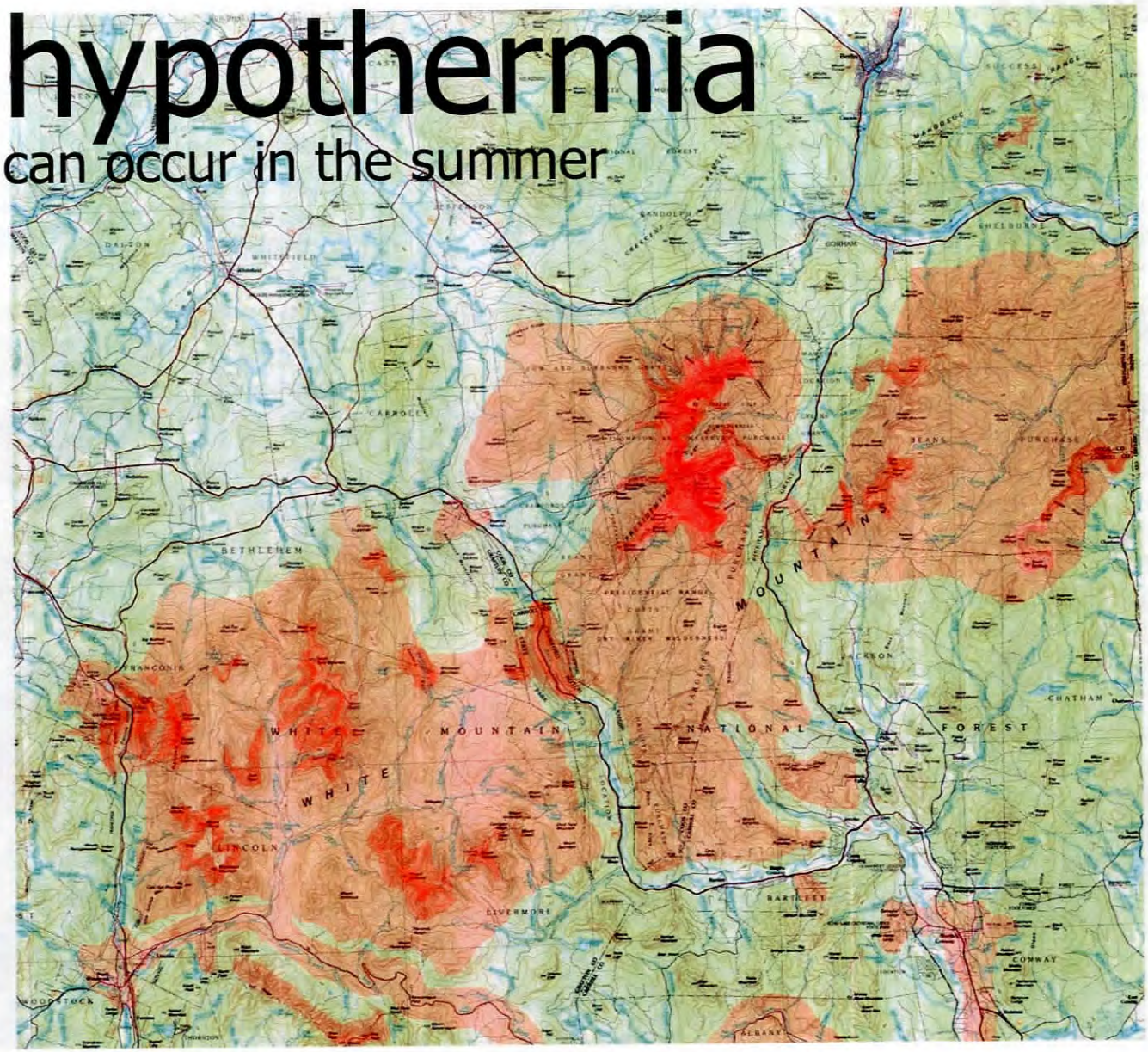
The history of the region, like the history of much of New Hampshire after its settlement and infancy, starts with logging. The state started selling off public land in 1810, and didn't stop; by the late 1800's much of the state wildlands had been sold to logging companies and by 1890 there were 832 sawmills in operation and 17 logging railroads across the state. The state began reacquiring land in 1914 with a 7,000 acre purchase, and today the park encompasses 800,000 acres stretching across NH and into Maine.

The local vernacular, obviously, is one that relies heavily on timber and stone, but there are gems in the region that one might not expect. The Mount Washington hotel is a ~~~~~~ room hotel designed in Spanish renaissance style. It is one of the few surviving Grand Hotels in new Hampshire. Local flavor includes covered bridges and mountain lodges-familiar feel in much of the local architecture. In translating this to a new thinking on the subject of local design, there should be a heavy respect for craft, and a reliance on local materials and procurement methods. Albeit respectful, the intention here is to creatively adapt these ideals into a new vernacular.

RISK

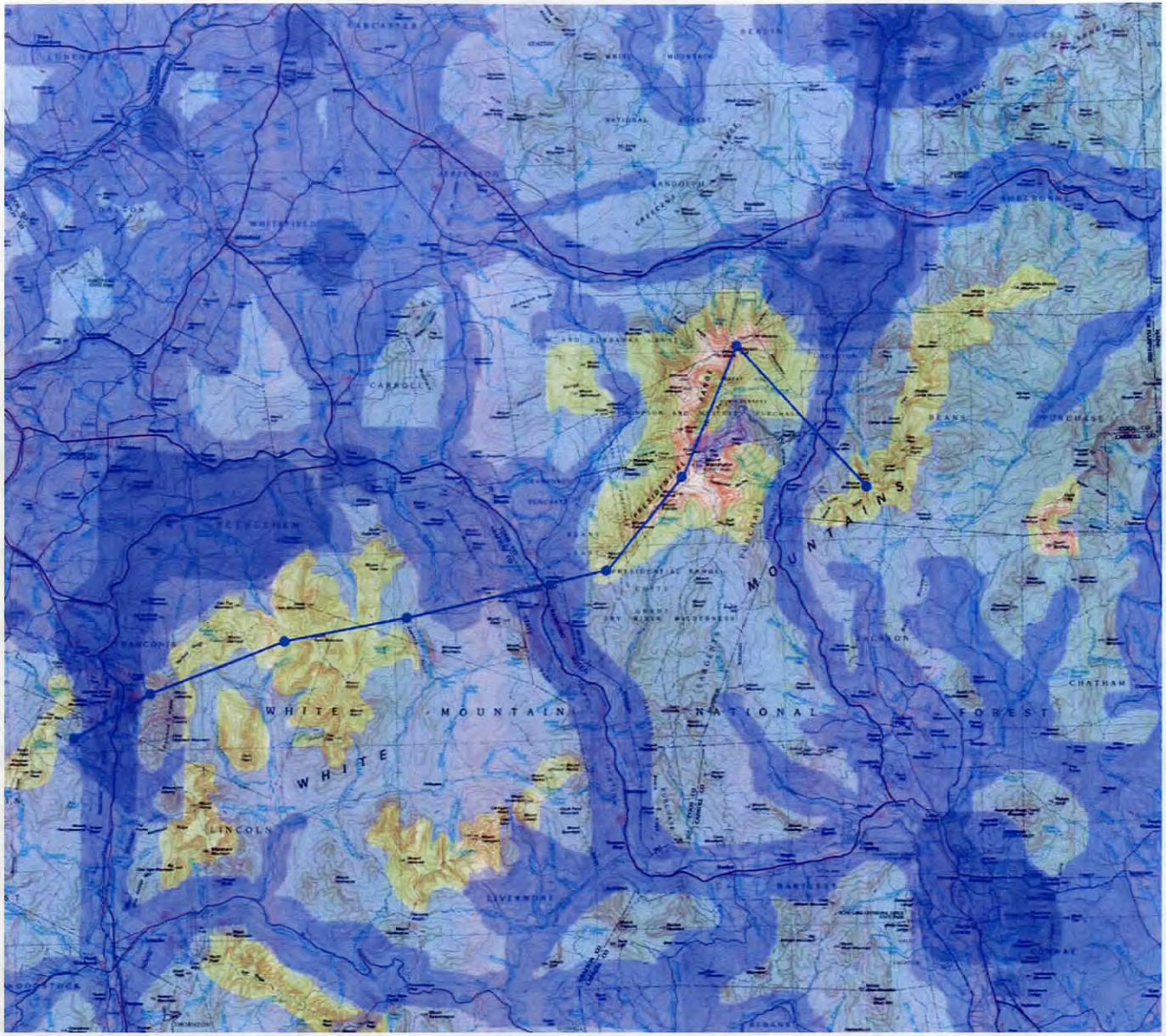
This image shows a composite of areas on the site determined to have high accident risk factors. The darkest reds are the areas with the highest risk. The image was made by overlaying a variety of factors create the composite. The factors include higher elevations, major roadless areas, cliffs and ravines, and concentrations of potentially dangerous activities.

Some emergencies that often occur in the White Mountains are:
Avalanche
Hypothermia
Falls, trauma injuries
Plane crashes
Lightning strikes
Lost hikers



SAFETY

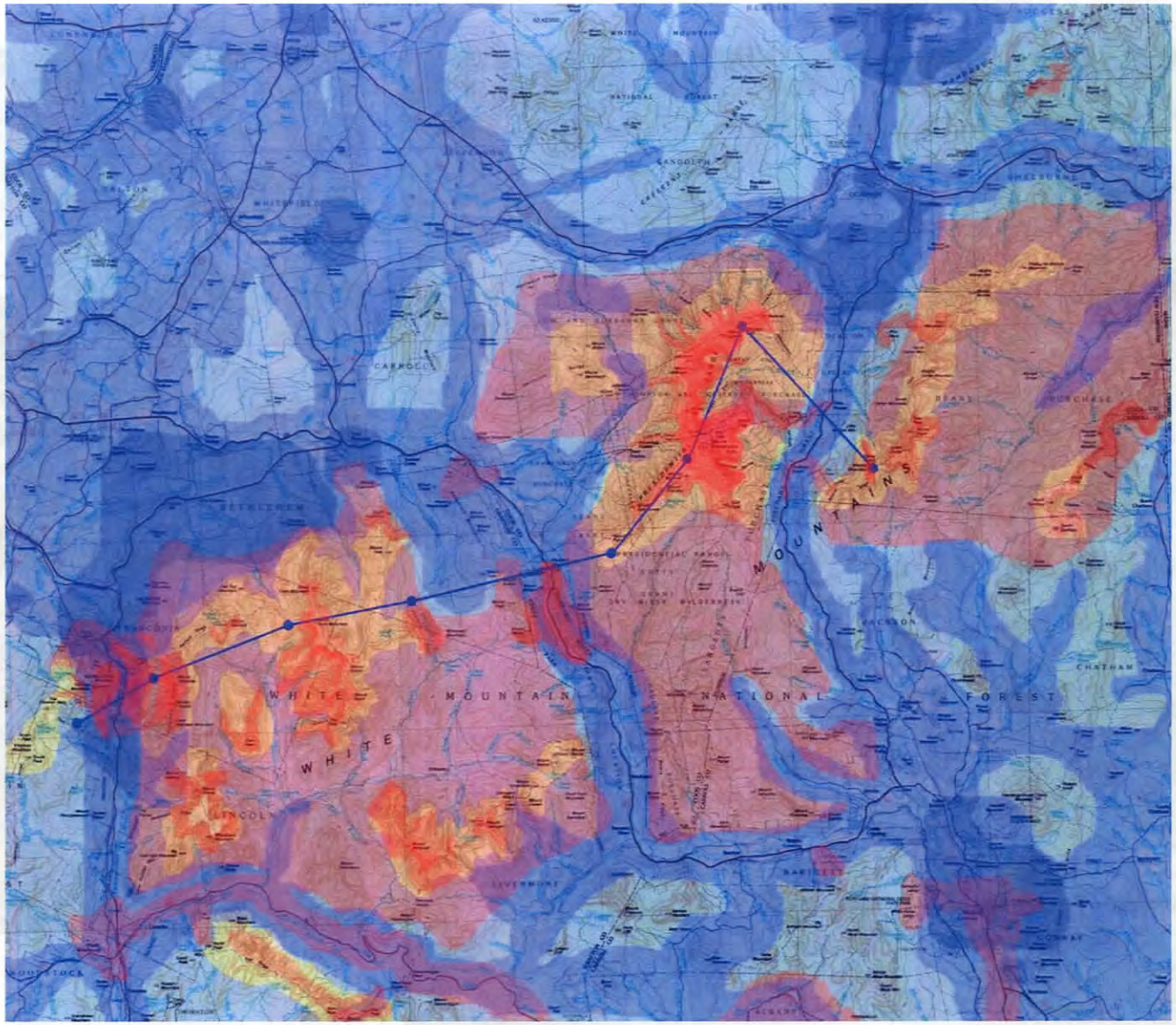
The diagram representing safe areas on the site is composed of many different factors, including, proximity to roads, towns, airports, and services like ranger stations. Areas of lower elevation also contribute to the safety factor of the area. The darkest blue areas represent the safest places. In the summer there is much more activity in the area so it is safer because of the amount of people around. The series of dots connected by a blue line represents the system of huts in the White Mountains- this system is an important one to consider because the huts can be invaluable in providing shelter and acting as waypoints for backcountry travelers.



THE BIG PICTURE

Composite image showing risk and safe areas on the site. The risk factors are represented in red, while the safety factors are represented in blue. In both cases, the darker colors indicate more intense areas of safety or risk. Purple colors indicate areas with both risks and safety associated with them. The edges- the places where the colors meet, are particularly intersting; they represent the frontier, the place where one moves between safety and danger. The interface between these two zones is of critical importance in the the design of the facility.

Average range of a Bell 206L 4 rescue helicopter (600k-700k)



MOUNTAIN INFRASTRUCTURE

Auto road and Cog Railway

In 1854 a railroad was built from Montreal to Portland Maine, passing through Gorham, NH. This effectively opened the tourist trade to the peaks region. The decision was made to build a road to the top of Mount Washington, and work began in 1854. By 1861, the road was operational, providing a (relatively) safe route for the passage of carriages to the top of the mountain. Business doubled every year until 1869, which brought the completion of the Cog Railroad, on the opposite side of the mountain. Customers preferred the shorter trip and enclosed cars of the railroad to the open coaches of the road.

These two pieces infrastructure are still in use today, providing links for everyone to the top of Mount Washington.

With winter comes the closure of both to the public, but sno-cats still regularly make the trek to the top on the road, connecting the rugged winter outpost of the Mount Washington observatory to the base of the mountain. It is entirely conceivable to imagine a new addition to the structures at the top of the mountain or along the length of one of these lines. The accessibility provided by the road, as well as the proximity to the danger zones on the mountain suggests that this is an ideal strategy in siting the project.

MOUNTAIN INFRASTRUCTURE

Mount Washington Observatory

The Mount Washington Observatory is located at the summit of Mount Washington, and is a scientific and educational facility dedicated to studying the weather, climate, and natural phenomena of the summit region. The station has evolved since its inception in 1870 as a small outpost, and now includes educational programs and a retail store for visitors. In total, the summit includes a few different scientific buildings as well as a visitor's center with cafeteria and restrooms, train station, television and radio towers, and parking lots for the auto road. Also on the summit is the Tip-Top House, the 1853 hotel built at the top of the mountain, which has recently been restored.

The public cannot access the weather station or visitors center during winter months, due to the brutal weather atop the mountain. In 1934 the station experienced wind speeds of 231 mph, still the fastest ever recorded on the earths surface. The winter months are long and cold, and the building is constructed to stand up to the challenging environment in which it is constructed.

Designing a project on mount Washington means acknowledging these existing facilities and drawing cues from them in terms of construction and their relationship to infrastructure on the site. The auto road and rail line are two important pieces that allow a connection between the mountain top and lower elevations.

JOSH LACASSE

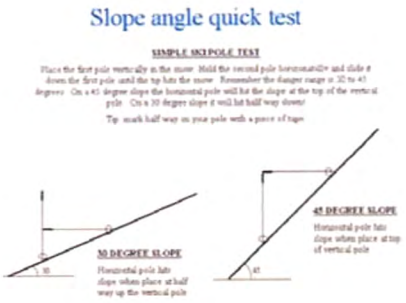
RAVINES!

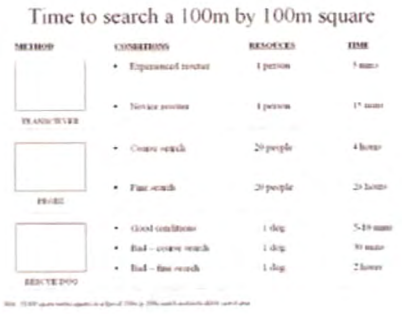
Tuckerman and Huntington ravines are two of the areas in the WMNF where avalanches would be most likely to occur, as well as two areas where an avalanche would be most threatening to backcountry travelers, due to their popularity. These areas host the countless skiers who attempt their steep slopes, often well into the month of June. They are located on the eastern flank of Mount Washington and are therefore extremely well-traveled. These ravines feature slopes that approaching 55 degrees and usually fill with dozens of feet of windblown snow. Crevasses, avalanches, falling ice, and snow undermining occur here and all put people in danger.

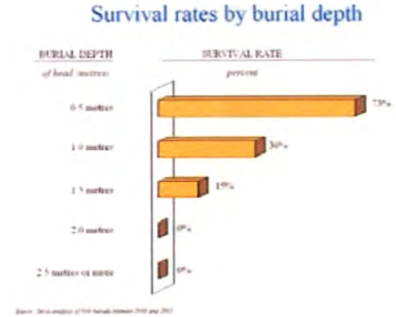
AVALANCHE

Event in the project is important in driving the site research and design, and the critical event is an avalanche. The avalanche is a temporal occurrence: the time and conditions must be right for an avalanche to occur, and the response is under a definite constraint. After 35 minutes of burial in avalanche debris, the average survival rate for victims drops to 30%. This means the rescue team must move quickly, and the facility must perform its function flawlessly to limit the time wasted inside. Proximity to the site and convenience in gathering gear, dogs, and information are all important factors in designing the facility. Like a fire station, the priority is expediting the responders as quickly as possible.

There are safety measures in avoiding accidents as well; critical pieces of backcountry gear should be used in avalanche prone areas. These include transceivers- devices that act as homing beacons should a group member become buried, probes to feel under the snow, and- most rudimentary of all- shovels. There are also specialized pieces of equipment that can expel exhaled air behind the buried victim- reducing the chances of ice forming around the nose and mouth. Also, there are a multitude of unproven techniques of 'riding out an avalanche' akin to swimming on the surface, but these seem slightly far fetched. In the end, nothing can replace hasty response.



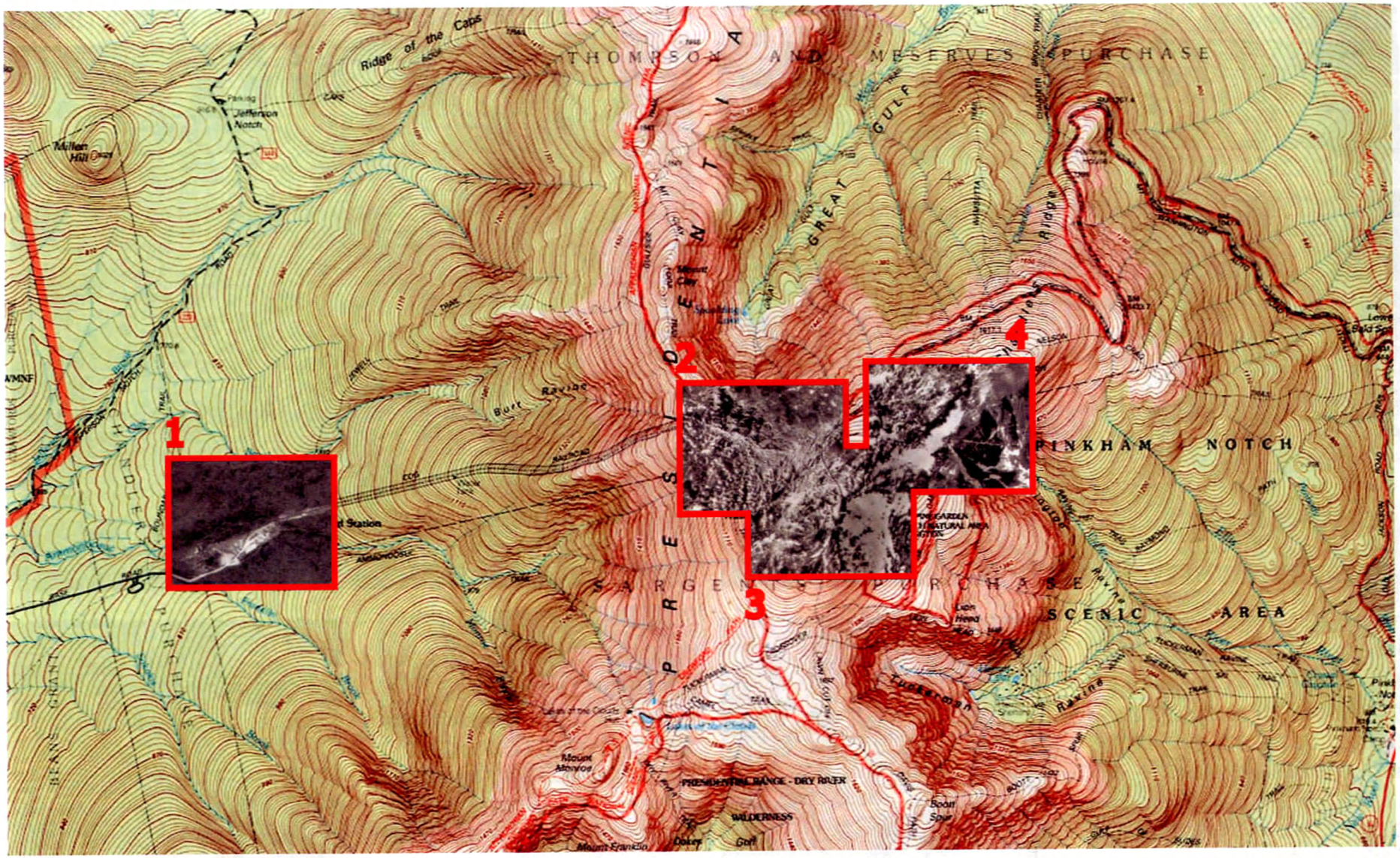




Avalanche probing

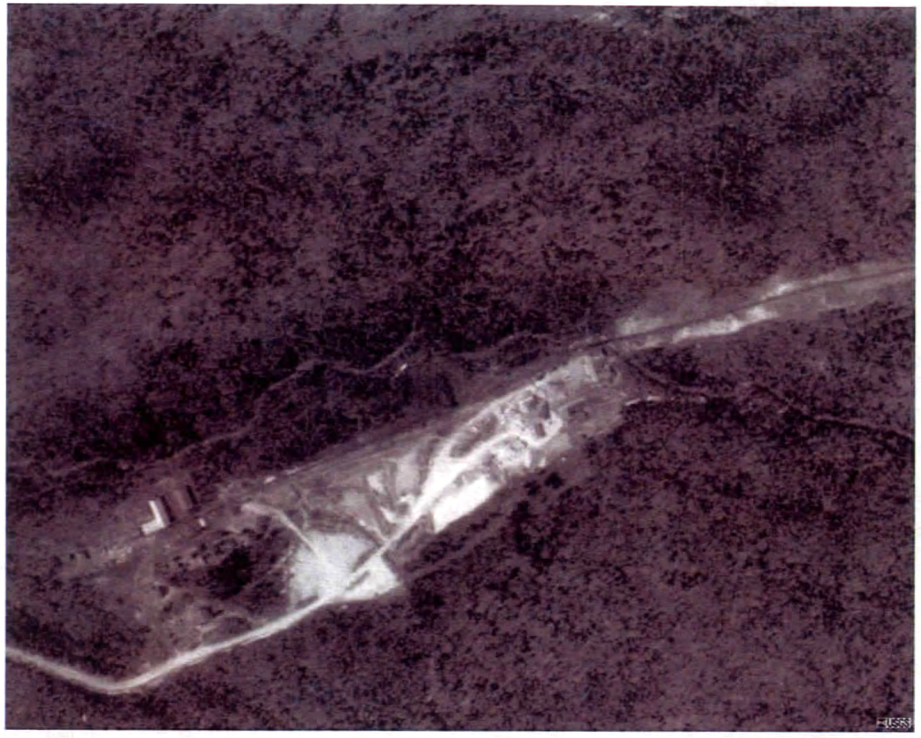
Site Evaluation

SITE SELECTION



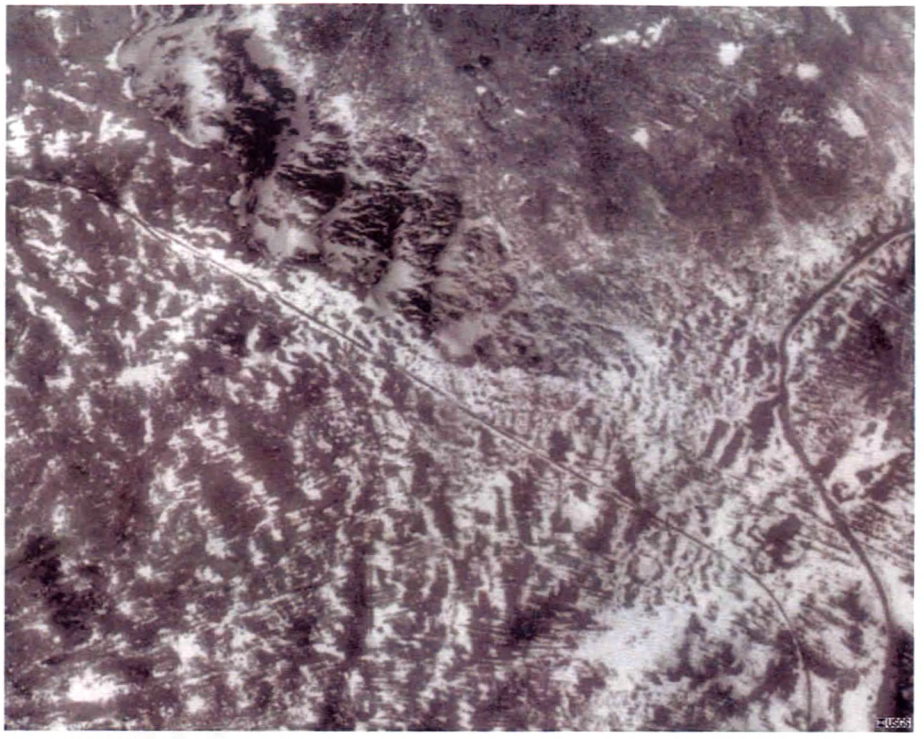
PRELIMINARY SITE OPTIONS

MARSHFIELD STATION, WEST FLANK



The lowest in elevation and probably the most connected to area infrastructure. This site is located at the bottom of the cog railway and at the top of the access road leading to the station. The drawback is that it is disconnected from the danger zones on the greater site.

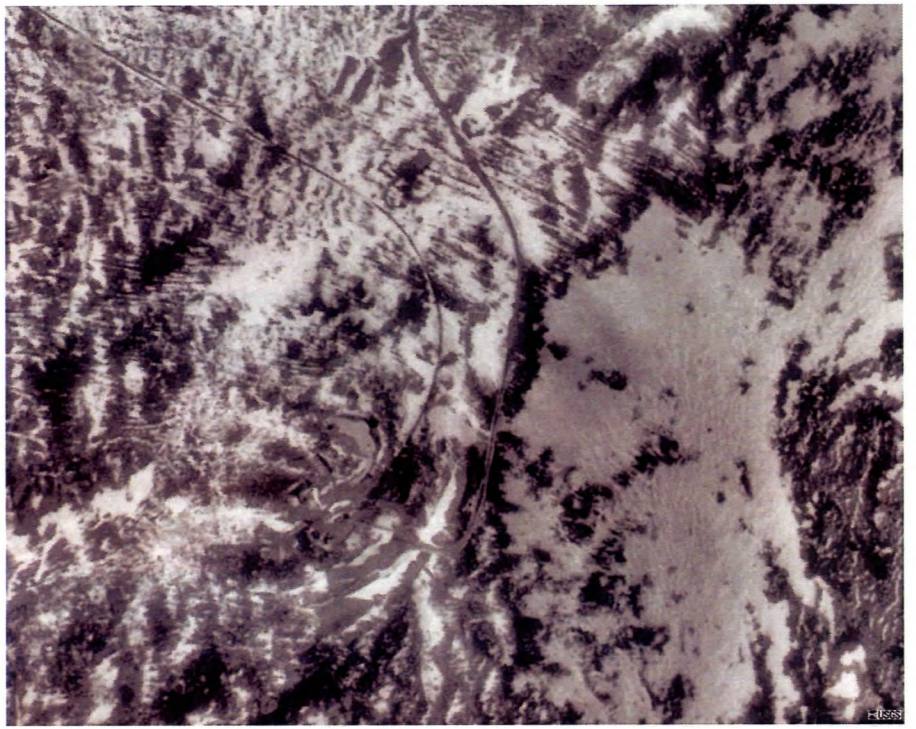
RAIL LINE, NORTHWEST RIDGE



Developing this site would entail inventive appropriation of the rail line to facilitate access. It is high on the shoulder of Mt Washington but would be easy to integrate into the larger context because of its reliance on rail infrastructure and proximity to trails (including the Appalachian Trail).

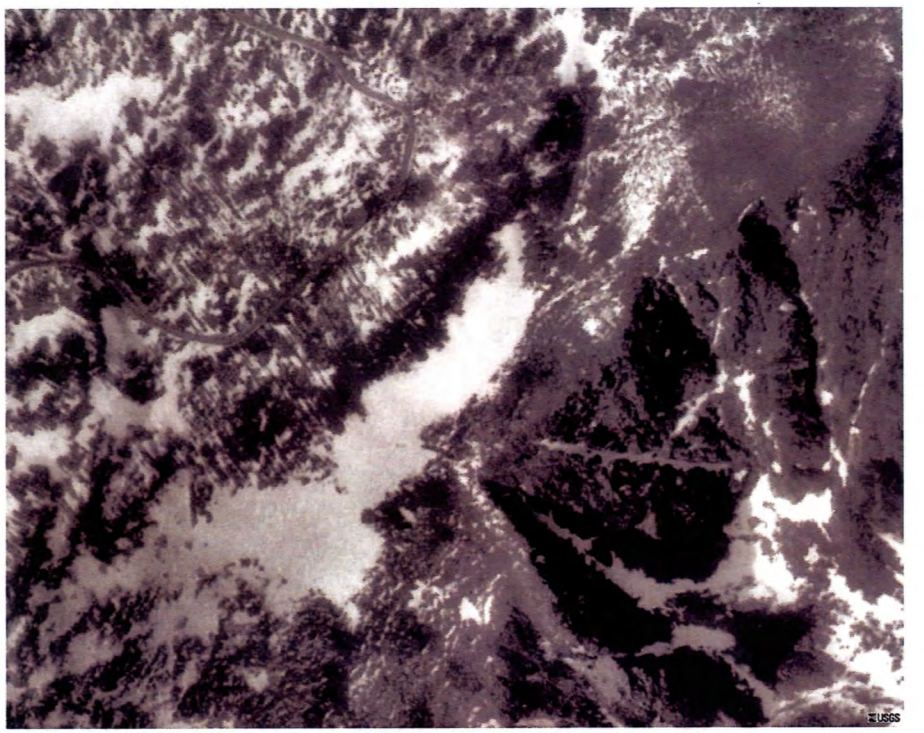
PRELIMINARY SITE OPTIONS

SUMMIT CAMPUS



One of the few choices in the area that includes other buildings, this mountaintop site carries the notion of prominence or omnipotence to an extent, and the design would need to take the 'campus' into account.

HUNTINGTON RAVINE/AUTO ROAD, EAST FLANK



This is without a doubt the most extreme site in terms of terrain. The Mount Washington auto road takes a turn near the edge of Huntington Ravine, and this creates a condition of access in close proximity to risk; perhaps the best opportunity for integrating risk and protection.

FINAL SITE SELECTION

The final choice in selecting a site was based upon prior research and the proximity to one of the most popular areas of the forest, the Tuckerman Ravine ski area. With significant views to both the east and west, (images 3,4, next page) this site lies in the relative shelter of the surrounding ravine, which protects it from winds coming over the top of the lip from the west. One of the most popular trails to the summit of mount Washington passes through the site, allowing ample opportunity for public visibility and information distribution.

An existing first aid supply shed on the site will be replaced by the fully equipped rescue center.

The site (circled in red) sits within the bowl of Tuckerman Ravine, accessible by trail and sno-cat. The summit campus of Mount Washington lies approximately 3/4 mile to the northwest.

AUTHOR'S ADVENTURE

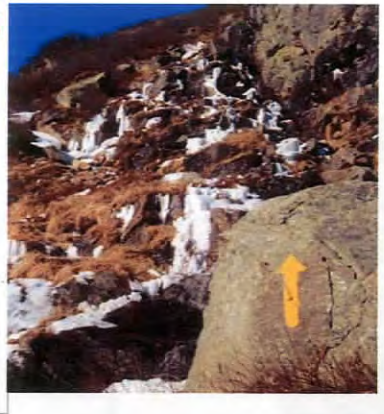

4

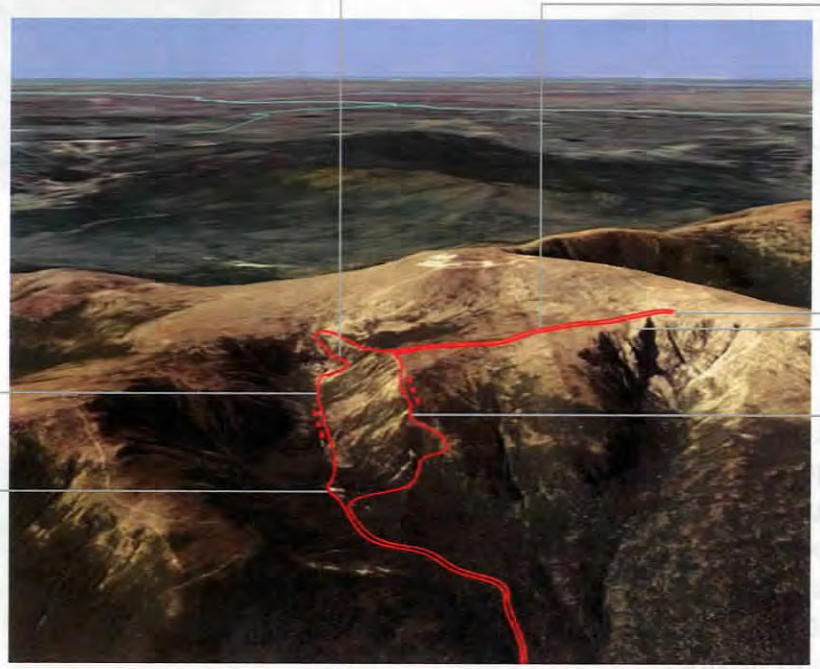

3


2


1


5


6




7


8

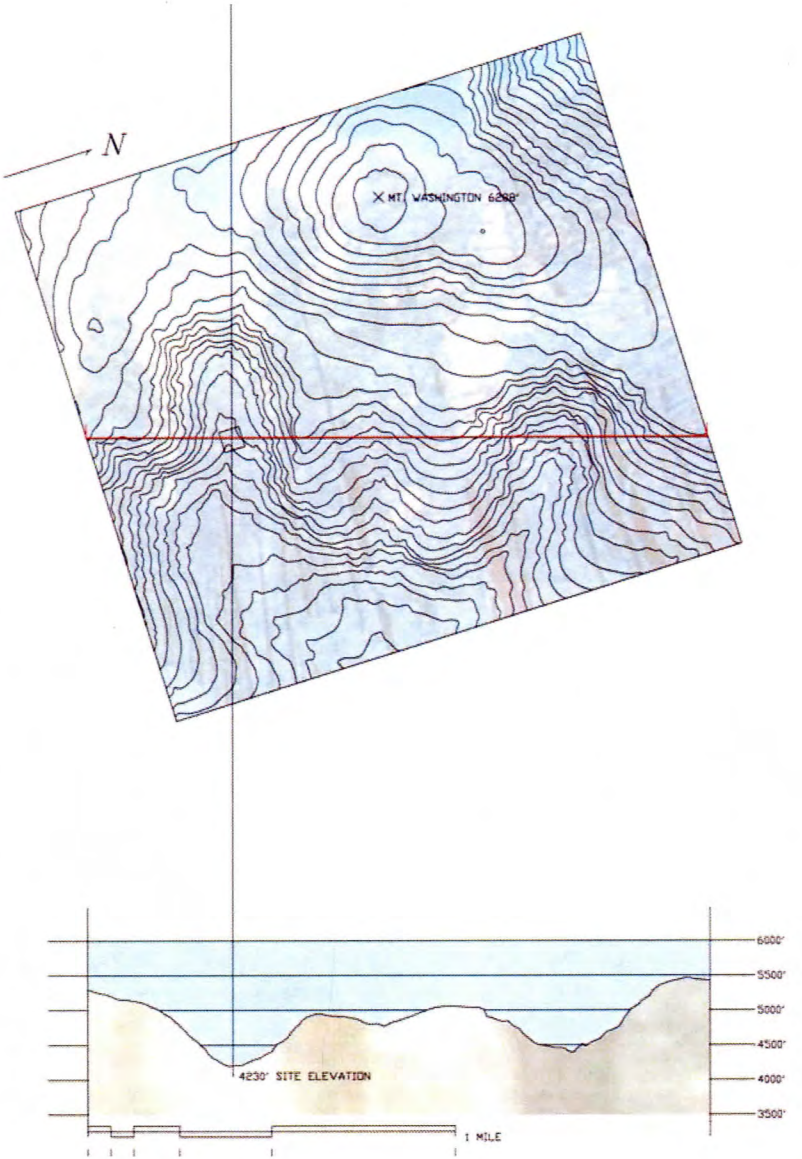

9


10

JOSH LACASSE

SITE DOCUMENTATION

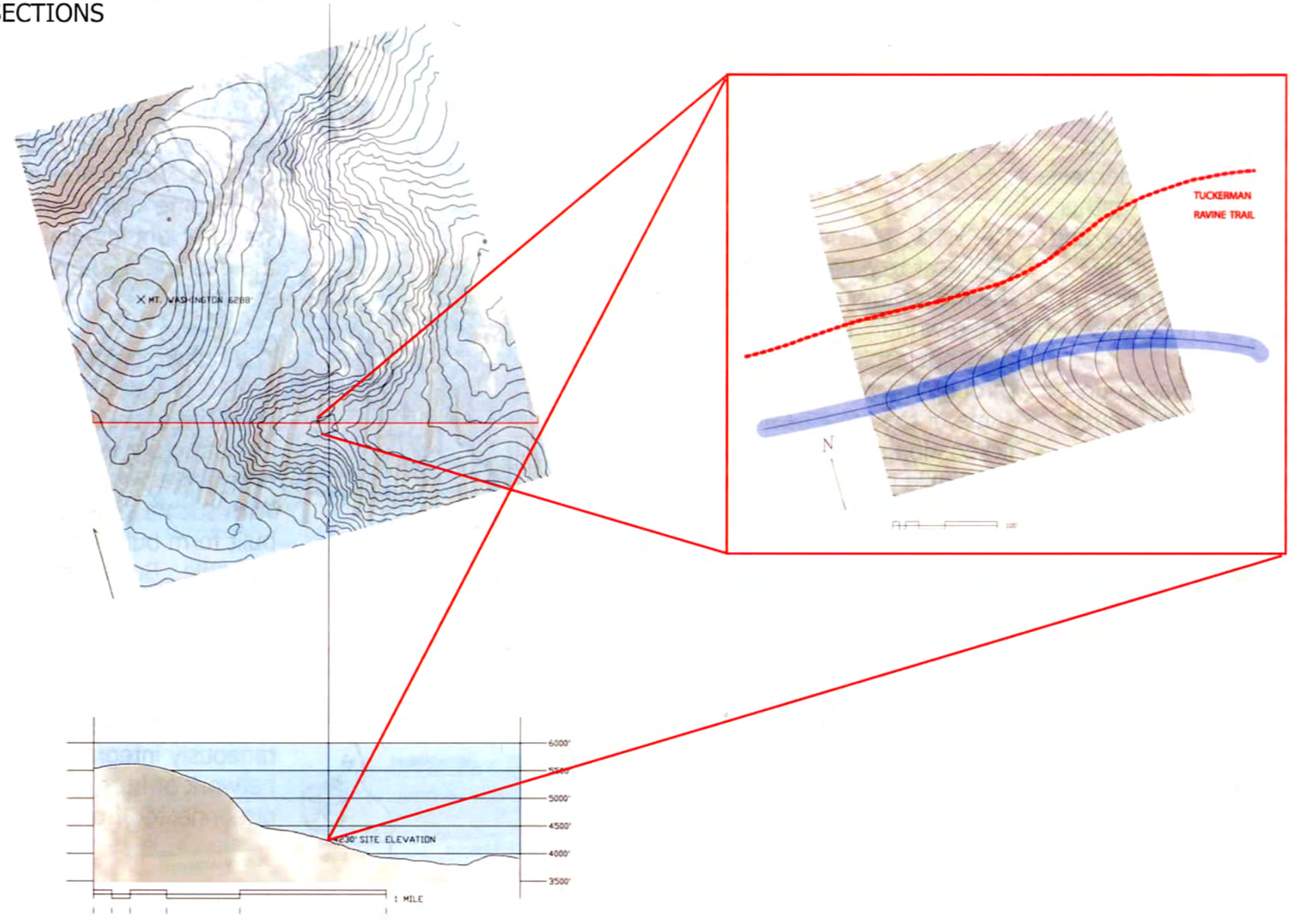
SITE SECTIONS



The site is shown here in the larger sectional context of the mountain. It is located at approximately 4200' above sea level, and is sheltered from wind on three sides by Tuckerman Ravine.

SITE DOCUMENTATION

SITE SECTIONS



HUTS AND THE APPALACHIAN TRAIL

The extensive hut system in the White Mountains is part of the culture and history of the area. Hikers in the area use the huts as refuge, wilderness 'social hubs', places to gather information, destinations, and educational facilities. The huts are an amenity, while a rescue base is a necessity.

Each hut is like a backcountry hotel; most sleep around 70 in bunkrooms and have breakfast and dinner included (during the summer). The idea of the huts is to have a continuous corridor through the range so that a complete traverse can be made. They are located along the Appalachian trail roughly ten miles apart, each span representing a day's travel.

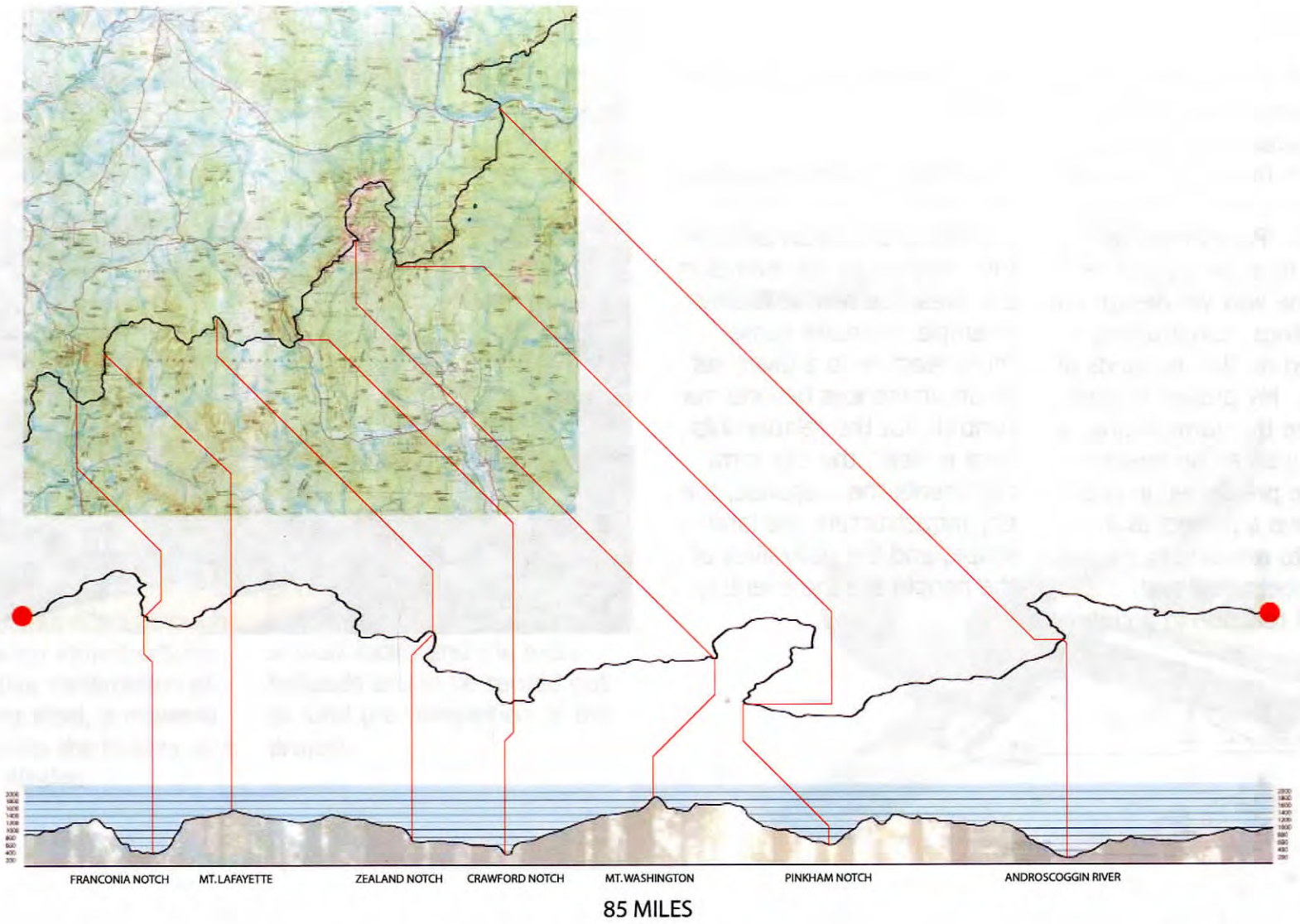
Unlike the AT huts, a rescue center must focus more on reacting to the site- whereas the huts are a static system that users follow along a prescribed path, the rescue facility attempts to respond to unexpected events.

The White Mountains also play host to a part of one of the most famous hiking trails in the world. The section of the Appalachian Trail that runs through New Hampshire is some of the most heavily trafficked along the length of the 2000 mile path. The proximity to Boston, Montreal, and New York mean the range in within a days drive of literally millions of people. The trail is part of the culture of the mountains, establishing a kind of thoroughfare along which is located the region's network of huts. By acknowledging this resource, it is possible to integrate the project into the system in an efficient way. The trail, like many other trails in the area, is significantly less

active in the winter, and the huts cut back on their services and staffing, becoming more personal and intimate shelters. Some huts also have some kind of emergency shelter room integrated into the design for unexpected situations.

The huts' relationship to the project is that of a partnership; the entirety of built infrastructure in the wilderness serves many purposes. With such a small amount of built form buildings must be versatile. But a rescue facility serves as a kind of umbrella program; it assumes the role of observer- a step above that of the mountain hut. The new program becomes simultaneously integrated with the network of huts, but also very disconnected from it.

THE A.T. IN NH

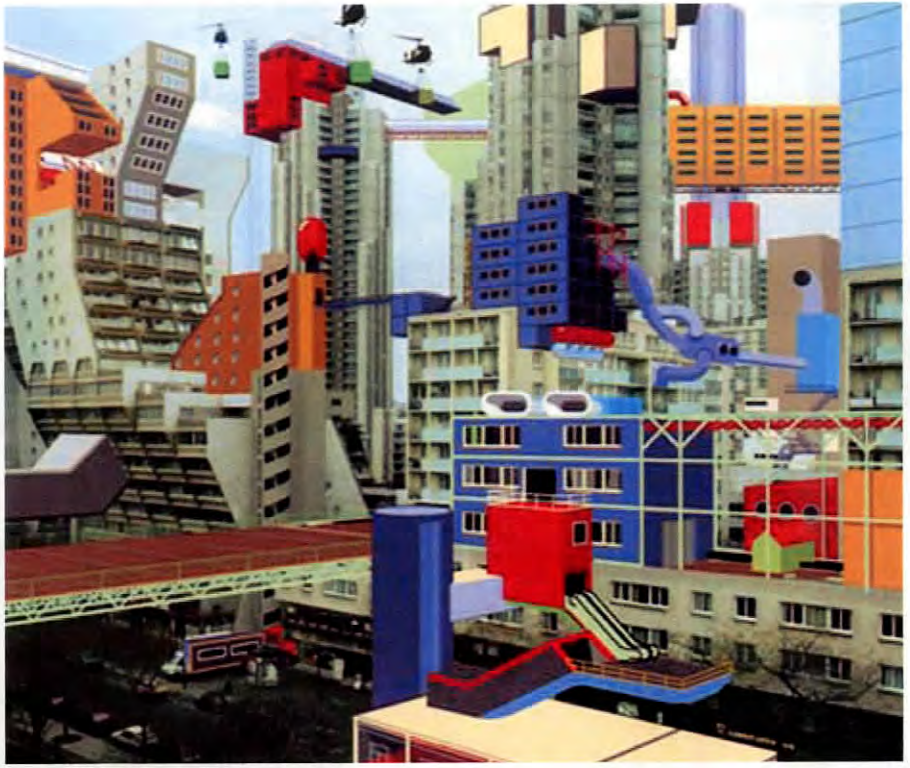

FRANCONIA NOTCH
MT. LAFAYETTE
ZEALAND NOTCH
CRAWFORD NOTCH
MT. WASHINGTON
PINKHAM NOTCH
ANDROSCOGGIN RIVER
85 MILES

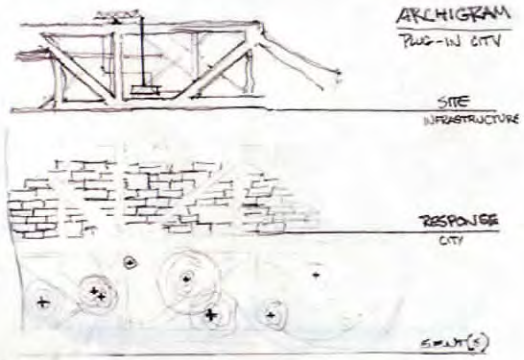
PRECEDENTS

Plug-In City

Archigram's hypothetical Plug-In city demonstrates one of the core ideas of the White Mountains Rescue facility: the dynamic reaction to the lives of people. Plug-In city attempted to allow some freedom in the way we design our surroundings, constructing a city based on the demands of the time. My project intends to analyze the surroundings in order to gain an understanding of the pressures, in order to conceive a project in a position to respond to events. Both projects deal with the aspect of reaction in architecture, both to site and human event.

The difference between the two is that while Archigram intends to create an architecture reactive to the events in our lives, the rescue facility attempts to create something reactive to a given set of circumstances beyond our control. But the relationship here is clear; the city form represents the response, the city infrastructure the landscape, and the daily lives of the people are the event(s).



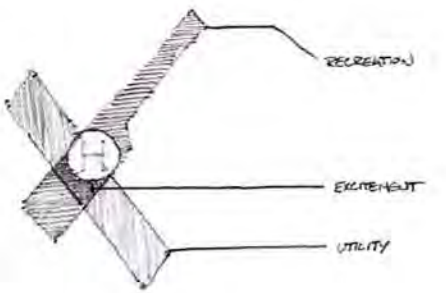


PRECEDENTS

Wind River Lodge, Lindy Roy

Lindy Roy's unique combination of the recreation based heli-skiing industry, and the ultra functional nature of a helicopter landing pad makes for an interesting disjunction. She plays off this disjunction by emphasizing it, creating a combination bar, command center, and observation deck at the intersection of the main programmatic pieces within the building. Interestingly, despite its extremely remote location in the Chugach mountains of Alaska, the project is extremely connected to its location through transportation infrastructure and inventive reclamation of shipbuilding steel, a material that embodies the history and culture of Alaska.

The project also serves as a model for constructional thought as well. To be completed in three phases, the project has a rationality all too uncommon today; the helipads are to be built first, followed by the control tower and hotel enclosure, followed lastly by the prefabricated hotel room units. Roy clearly put significant thought into the construction, not only in terms of architecture, but also in terms of economics and sustainability as well. The primary materials are relatively local (in Alaska, nothing is truly local) and the extra helipads are to be rented out to fund the completion of the project.



PRECEDENTS

Blur Building, Diller and Scofidio

This building was a pavilion for the Swiss Expo of 2002. The Blur in the name is the product of the 13000 fog nozzles found in the building which envelop it in a mist as it floats above a Swiss lake. It is a complex technological accomplishment bridging the gap between architecture and social interaction. 'Event' in this building is meant to be constructed, with occupants decked out in technical, smart raincoats that analyze personality profiles to determine compatibility. In this way, the Blur building takes cues from its surroundings, or its occupants, and reacts to those cues.

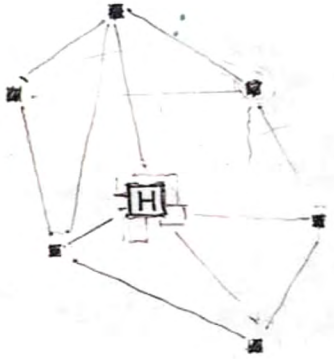
The blur building is also an architectural expression of response, which becomes apparent on a few different levels in the project. On one hand, visual and auditory environments are erased by swirling mist, but the intention is to create a theater for interaction. On a technological level, the pavilion reacts to its own environment by using sophisticated computers to control the mist based on wind direction, wind speed, temperature, and humidity.

PRECEDENTS

Ski Haus, Richard Horden

This modular shelter was designed to house skiers in the backcountry in case of foul weather or just for periods of rest. It is designed to be helilifted onto the site and rests very gently on the ground. Temporarily installation is one of the goals of the project, and it can be set in place relatively quickly.

This kind of intervention would be useful in the current project because the rescue center is designed to lock into the site network and a light, mobile unit like the Ski Haus would be useful for engaging critical points throughout the site. It would also be mobile in case of changes in the site network and critical pressures. The lightness and mobility of this project predicate that it will have a minimum impact on the site, and so it would be well suited to the fragile alpine environment above treeline in the White Mountains.



PRECEDENTS

Fire Station Number Four,
Robert Venturi

Programmatically, the fire-house is perhaps most similiar to the rescue base project. The objective is to expedite rescue activities . The fire pole is a literal representation of the idea of programmatic alignment in the event of an emergency. The secondary programs arranged around it are simply skewered by the element. A similar concept will be at play in this project; the alignment of program during the catalyst of an emergency is critical to rapid response.

In the setting of the mountains, the adaptability of the program becomes even more critical. The remoteness of the facility necessitates that the program be adaptable to accomplish its goals, both during emergencies, and during the everyday. This compounds the situation, and allows for complex program intricacies.

Bibliography

BIBLIOGRAPHY

Allen, Kai-Uwe. "Avalanche Terrain and Conditions in the Presidential Range, New Hampshire, US." Nov 7, 2006; On-line source: http://www.tuckerman.org/avalanche/terrainandconditions.htm

Barth, Arne, ed. Architecture and Competitions. Bauten fur Polizei und Rettungsdienste (Buildings for Police and Rescue Services). Stuttgart: Karl Kramer, 2006.

Cereghini, Mario. Building in the Mountains. Milan: Edizioni del Milione, 1957.

Daniell, Gene; Burroughs, Jon, eds. White Mountain Guide: 26th Edition. Boston: Appalachian Mountain Club, 1998.

Eakin, Julie Sinclair. "Unnatural Phenomena." Architecture Magazine Mapping Featurette. Oct. 2006: p 38-43.

Girot, Christophe. "4 Trace Concepts in Landscape Architecture." From Recovering Landscape. Corner, James, ed. Princeton: Princeton Architectural Press, 1999

"Human Problems in Major Disasters." National Institute of Public Health. Rockville, MD: US Dept. of Health and Human Services, 1987.

Karam, Nadim. VOYAGE: Nadim Karam and Atelier Hapsitus. London: Booth-Clibborn Editions, 2000.

Lagro Jr., James A. Site Analysis: Linking Program and Concept in Land Planning and Design. New York: John Wiley and Sons, Inc, 2001.

Leatherbarrow, David. Uncommon Ground: Architecture, Technology, and Topography. Cambridge: MIT Press, 2000.

Lootsma, Bart. "Intelligent Regions." Topos. 2005, n 52: p. 78-80.

Miessen, Markus; Basar, Shumon. Did Someone Say Participate? An Atlas of Spatial Practice. Cambridge: MIT Press, 2006.

Mau, Bruce. Massive Change. New York: Phaidon, 2004.

Mountain Rescue: Training Handbook for Royal Air Force Mountain Rescue Teams. Ministry of Defence. Royal Air Force. London: Her Majesty's Stationary Office, 1979.

Pelkonen, Eeva Liisa. "Bernard Tschumis Ereignisraum (Bernard Tschumi's Event Space). Daidalos 67 (1998): 82-85).

Pistoi, Sergio. "Fighting the White Death: Scientists Turn to Satellites for Help in Predicting Avalanches." Scientific American. Feb 2004.

"Prevention and Control of Stress Among Emergency Workers." National Institute of Public Health. Rockville, MD: US Dept. of Health and Human Services, 1987.

Schaal, Hans Dieter. Landscape as Inspiration. London: The Academy Group, 1994.

Synnes, Kristine. Roy: Architecture of Risk. Ann Arbor: University of Michigan Press, 2004

Tabor, Philip. "Structures of Organisation." Architectural Design. May 1971 v 41.: 315-319.

Teton County Search and Rescue Volunteers. TCSAR Avalanche Rescue Operational Pre-Plan and Manual of Acceptable Practice. Jackson, WY, 2001.

Tschumi, Bernard. Architecture In/of Motion. Rotterdam: NAi Publishers, 1997.

Tschumi, Bernard. Event Cities II. Cambridge: MIT Press, 2001.

Tschumi, Bernard. "Sequences." Princeton Journal v. 1 (1983): 29-37.