The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

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The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach

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Fall 2009
Spring 2010

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The Architecture of Terroir
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Part one
Introduction
Key Terms:

- **Consciousness**: the state of being conscious/aware of the present
- **Environment**: [environ: surroundings/ment:mind] a place when inhabited by humans
- **Experience**: the apprehension of an object, thought or emotion
- **Perception**: the process, act or faculty of perceiving/interpretation of sensory stimuli
- **Phenomenology**: a philosophy based on the premise that reality is perceived through human consciousness
- **Place**: a space that has become personal to humans through an intervention/experience
- **Sensuous**: relating to the senses [sight, smell, hearing, touch, taste, intuition, equilibrium]
- **Space**: any extension that can be occupied
- **Temporality**: the quality of being temporary/specific to a moment in time
- **Well-Being**: balance between mind and body
The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

The process of winemaking is a complex one that engages all the senses. Grapes are harvested at their optimal point for making wine. This is determined by the human touching of the grape still on the vine. In fermentation, the temperature of the room is critical in determining the quality of the wine produced. While aging, the smell and color engage the senses in testing the wine’s development. Tasting is not only a final step but also one that occurs throughout the winemaking process. In most instances, the sensory experience associated with winemaking is exclusive to the winemaker. I am proposing that aspects of this experience can be extended to the visitor of the winery.

In this project, I propose a phenomenological approach to the design process that will emphasize the engagement of the senses in the experience of the building and the site. The interest in a phenomenological enhanced architecture derives from the potential for the landscape and the processes of winemaking to heighten the experience of the built environment. Although the effects on individuals cannot be preordained, creating the basis for an enhanced phenomenological experience of the building and the site offers the opportunity for one to be more aware of ‘self’ and the environment. The sense of sight can be engaged through a controlled sensitivity of light, views and orientation. The sense of touch that is present in the tactile experience of glass and bottle can be brought to the materials of construction through the experience of the whole body. The time of year or use of materials in the built environment easily affect the perception of sound. The smell that is so much a part of the wine tasting can inform the creation of the sequence of approach.

The principal sensory experience of winemaking for the visitor is typically a visual one. This can and should be extended to include all of the senses. The design process should be informed by this objective. Rather than accommodating the process in generic rooms, the architecture should be dictated by the processes of winemaking. Acknowledging an appreciation for all of the senses within the experience of the built environment is a desirable condition. Because the process of winemaking involves the senses, a winery is a good building type to explore this possibility. The same intensity of engagement of the senses that is present in the process of making wine can be translated to the experience of the architecture of wineries; in other words, the goal of an enhanced phenomenological experience can inform architecture in significant ways.

In a similar fashion, these sensory objectives can be used for developing the landscape of a site-specific architecture complementing the process of winemaking. The different stages of the process relate to the site in several ways. This relationship changes as soil, sky, sun and water take on different intensities throughout the course winemaking. Minerals come out of the earth to feed the grapes. Wood is used to make the barrels that age the wine. The relationship to the terroir determines the wine that is made. In a similar manner, the architecture of the winery should be a result of its ‘architectural terroir’.

Here, ‘architectural terroir’ is intended to mean that the architecture of the winery is one that emerges from the ground in the same way that the wine comes from the earth. The nature and potential of the site can inform the making of the building as it does the making of the wine. In this way, the earth, sky and water are seen as generative sources.
We live a fast-paced life where efficiency is rewarded. With the rapid increase in technology available for design, the visual has become predominant in architecture today. Creating an image is a common goal of many architects as virtually all forms can be created and society tends to value this. In this condition, the interior becomes a result of strictly cost-efficient programmatic requirements and is separate from the façade. The transition from room to room easily disregards sensitive lighting and our pupils are rarely stimulated. There is little attention paid to the particular use of spaces and their temporal programmatic qualities. There is minimal care to the surrounding landscape and the way the building sits in and engages the site. These characteristics lead to an ‘impersonal experience’.

The standards of design detach us from a holistic experience where there is nothing that causes a break from an impersonal experience. The sameness of several architectural environments minimizes our ability to use our senses on a daily basis. As architects, we should aim to build distinctive places rather than muted spaces. A distinctive place is one that registers in the user’s memory, one where the senses are engaged and the user is brought to as much of a conscious experience as the architecture could promote. Being aware of our sensations is likely to lead to a consciousness of our existence and an increase in the quality of architectural experience.

A Sensory Architecture

“Instead of experiencing our being in the world, we behold it from outside as spectators of images projected on the surface of the retina.”

Juhani Pallasmaa

Painting by Nicholas Poussin, 1648: “Landscape with the Ashes of Phocion”

Phenomenology as a point of departure

As humans we always experience space. This experience can be purely physical or phenomenological. Phenomenology has been described as the study of consciousness in the field of philosophy. In applying this term to the spatial world, we can distinguish an experience of space by determining whether or not there is a conscious engagement of the mind. In the man-made environment, I believe that in some cases, built form can trigger the change from the usual unconscious experience of place, to a higher order of perception, whether one of self-consciousness, self-awareness or temporal awareness among others.
Steven Holl, Juhani Pallasmaa, and Alberto Perez-Gomez write a series of essays about phenomenology and its relationship to architecture. Pallasmaa states that “instead of experiencing our being in the world, we behold it from outside as spectators of images projected on the surface of the retina.” Architecture is becoming more of a visual art and in the fast-paced life of the technological world, images are the quickest and seemingly most efficient way to convey a message or idea. In a similar way, the architecture of the eye has become the most talked about in recent years. Pallasmaa is suggesting is that architecture should be experienced through the senses as a whole rather than purely through the visual. A wall may appear in a certain manner but the texture should become part of its overall perception. Engaging in an architecture that awakens all of the senses can make for a holistic experience, which Rilke describes as “a matter of becoming as fully conscious as possible of our existence”. The authors talk about architecture’s effect of acting as a type of ‘phenomenological lens’. In this way, architecture has the ability to set up grounds for a phenomenological experience. Water is one of the examples the authors set as a means to transforming the perception of a space. Due to the power of refraction, spatial reversal or the transformation of the rays of light, water can act as a phenomenological lens in architecture.

‘Questions of Perception: Phenomenology of Architecture’


Architecture and Phenomenology

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“architecture is a sensitive container for the rhythm of footsteps on the floor, for the concentration of work, for the silence of sleep.”

Peter Zumthor
the architectural experience. Anything that can make one more aware of the senses and their experience in architecture, is, according to the authors, a successful application of architecture created for the human. The authors also argue that “the current over-emphasis on the intellectual and conceptual dimensions of architecture further contributes to a disappearance of the physical, sensual and embodied essence of architecture”. In order for architecture to be more phenomenological, there is a suggestion to return to the basic senses and the qualities of light, sound and texture. Zumthor talks about the ambiguous qualities of architecture and although these cannot be measured in individuals, a building can “possess subtle qualities which, at certain moments, permit us to understand something that we were never able to understand in quite this way before”. Holl writes that “a single work of architecture is rarely experienced in its totality but as a series of partial views and synthesized experiences. Questions of meaning and understanding lie between the generating ideas, forms and the nature and quality of perception”. 

Phenomenology and the Senses
Technology in place-making

The rapid increase in technology has led to a specific condition in architecture where there is a muting of the senses. Automatic sensors detect the heat of a room and make the temperature constant. New types of glass make surfaces completely uniform as building parts become homogeneous. It is much easier than ever before to acquire materials overseas, and explore uses of new technologies in innovative ways. This quest for efficiency has not only led to a negative impact in our sensory perception of spaces but it has negative consequences for the environment as local materials are no longer the preferred. The use of technology throughout the world does not always take the uniqueness of places into account. By using local materials that relate to the site context and history, a sense of place is enhanced and it is easier to make connections to the site. On the other hand, embracing the new possibilities technology has brought is essential for a contemporary architecture. It will be in the scope of this project to look at the advances of technology in a new light. The possible applications are endless and should be used along with the senses to enhance the sensorial perception of place rather than create a homogeneous and visually emphasized space.

Material in place-making

Materials play a critical role in relating the building to the site and creating place. The materials used for this project should reflect the nature of the winery and the processes that happen within. An understanding of materials and temporal effects are necessary to create an architecture that will continue to have meaning over time. Glass for example, does not really show wearing like a stone does, rather, it is simply replaced when old. Metals change when in contact with water and wood changes shape over time. Since wine has a strong link to the soil from which it comes, local materials coming from the ground may reinforce the sense of place. Water is another key component as it is essential in grape growth. The relationship of building to site will be very significant through the choice of materials and how these come into the building and create relationships outside of the building.
Program Selection

Almost any built form could be used in translating the more theoretical notions of phenomenology to a more tangible realm. Because there is no way of measuring the success of certain experiences, it must be established that by studying patterns in spaces that are known to have phenomenological impact, the common traits could be repeated in a new program. In selecting a building type, it was taken into consideration that certain programs, because of their nature and pre-established associations, might involve an altered sense of perception. When entering a church for example, one’s senses are usually heightened, as there are associations with meditation and silence. The program should promote ways in which each sense can be enhanced both individually and collectively. Well-being can be defined as a healthy balance between the mind and the body. Although a spatial experience will not always be conscious, perhaps by creating an architecture that engages the senses to a heightened degree (unusual in common daily interactions), this new sense of self-awareness could lead to a state of improved well-being.
Why Winery?

The selected program is centered on a vineyard. A winery sees a complex transformation of a seed in the soil to a grape and eventually wine in a glass. The process of wine-making is extremely site specific; sometimes, several types of grape will grow within one vineyard. A site-specific program compliments an architecture that is intimately related to its site.

Rather than a ‘snapshot’ experience of the wine tasting, the program will offer the opportunity to engage in the whole process of wine making. The typology of the vineyard is one of destination-the visitor uses mainly the tasting room and has little opportunity to experience the stages of this elaborate process. This project will propose a new way to experience a winery, from the characteristics of the soil and water, to the smell and taste of the final product.

For these reasons, there will be a housing component where people can stay for a certain amount of time. This will not only inform the process of wine-making but will enhance the appreciation of the final product. By remaining in the site for an extended period of time, the user will hopefully understand it in a more holistic way, approaching a sense of place.

The experience of the vineyard will therefore expand to a sensuous experience of the whole day where the program encourages the user to engage the senses whether bathing, wine tasting or eating. Favoring some senses over others for certain activities will encourage a heightened use of the senses. This new ‘sensuous destination’ would challenge pre-established notions such as that of a visual-based world and offer a new way of perceiving the world through the body-mind balance as a whole.
Site Selection

The Finger Lakes region offers a variety of sites where not only the soils are rich for vineyards but the ground can provide water as well as engage with a rich flora and breath-taking views. In order to respect the natural environment, the buildings should be very integrated with the site and issues of sustainability will be addressed. The relationship of site to built form should be such that the project is inevitably sustainable. There will be strong relationships between the interior and exterior space both physically and sensuously. In choosing a site within the Finger Lakes, several factors were considered. These include adjacent available land for vineyard cultivation, proximity to untouched nature, a relationship to the Lake and strong section [the last two exist together]. The Finger Lakes are long and narrow lakes formed from deep glacial trenches. One of the only fork-shaped lakes in the world is among the several lakes. This fork shape offers a unique site in the middle of the junction. The site selected is at the high point of land before a steep incline to the lake.
Site Selection [cont’d]

It offers views to the water on all sides and the nearby region due to the high altitude. In terms of approach, there is a main axis of approach from the North on a rather flat road. This allows for anticipation of arrival to the radical site and may offer opportunities to manipulate the way one perceives and arrives at the site. The other approach is radically different where one can arrive at the site through a curvy and very steep slope from the South side. Currently, the site has a house in the center. The nearby vineyards are currently in use and produce healthy vines.
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Wine Background
Wine then

After water, wine is the oldest known drink to mankind. For thousands of years, wine has been used for religious ceremonies, for medical purpose and for parties. It is believed that wine was first taken to the Roman Empire in the 6th Century BC by the Greeks. The expansion and popularity in the rest of the continent was fast. In mythology, wine is attributed to different figure by civilization. In the Greek Empire, wine was attributed to Dionisius and in the Roman Empire it was associated with the famous Bacchus, God of wine. The Egyptians kept wine in their tombs for the afterlife with Osiris as the key figure. Vigil wrote that 'Vines love an open hill'. The wine known to our ancestors would probably not be appealing to us today. Due to the lack of control in production, the wine was often mixed with spices and honey in order to improve the taste. Since water was not usually safe to drink, wine was the only storable beverage available to people up to the start of the 17th Century. With the introduction of new drinks around this time, wine took a new direction with the introduction of the glass bottle, the cork and the corkscrew.

Wild Eurasian grapevine [Vitis vinifera] was first domesticated by 5500 BCE in the Caucasian Region (in between the Caspian and Black Seas) and in 3000BC wine was already considered a luxury drink. With the Little Ice Age around 1300-1850, temperatures dropped and sweeter wines were produced. The Phylloxera louse that attacks vines became a problem in the 1860’s and the introduction of American hybrid vines was the solution.

Wine History
The perception of wine has changed over the years. According to Ralph Eue, “to be in the wine industry today means to articulate an opinion and [a winery] should be a reflection of one’s relationship to the surrounding landscape. With the help of architecture, a framework has to be found which not only focuses on the wine, its origins and the philosophy of its makers, but also optimally reflects and paraphrases these three factors.”

The surge in wine consumption in the 20th century has brought a new culture of wine as a luxury. With a number of investors choosing wine as a hobby in which to place vast amounts of assets, there is room for experimentation as well as the construction of incredible infrastructure to house the complex process of wine making. While the boundaries of wine production have been eliminated with the fast levels of globalization, it is important for current wine-makers to maintain the individuality of specific location in the outcome of the wine. The final product should be a reflection of the terroir: a term that encompasses all the qualities affecting the earth from which the grape is extracted.
Terroir

One of the most important words in the wine world, terroir is a French term that does not have a direct translation to English. It is a concept that embraces a combination of factors that describe the terrain and influencing factors. An important component in defining a terroir is the soil type. The pH, the drainage, the orientation and the available nutrients can all change the way the grape develops and eventually tastes. The availability of water is also essential as if there is too much water, the grape may not develop a rich taste but with scarce water, the grape will not develop at all. The sunlight is crucial in planting vines as depending on the type of grape, a specific exposure to the site may bring out the best qualities. The reason wine has been able to reach its high level today is that many before have tested terroirs and the best ways to produce specific wines. As the images above show, the conditions of a site may vary making each part more suitable for a specific wine. In order to make the best possible wine, the specific qualities of the terroir must be carefully weighed so that the most suitable grape is produced. The terroir even affects the wine making process after the harvesting of the grapes. The use of wild or ambient yeast in fermentation instead of cultured or laboratory produced yeast is a decision made based on the terroir.
Left: This method is common in less fertile soils—the vines are higher up and more space is left for the sun to warm the soil.

Right: This method is common in more fertile soils where the plant is more exposed to sunlight and the risk of disease.

On Specifics of Wine and Terroir

Some argue against mixing grapes in making wine. Varietal wine is one which is made of 75-85% of the same grape type whereas a blended wine is one that comes from the same vintage (overall production from a vineyard) but from different grape types. Another decision is whether to use oak for aging as some believe that the flavor of the oak can mask the terroir's influence on the characteristics of the wine. The terroir will also determine the method for planting the vines. There are about 40 different species of vines and the most common is Vitis Vinifera of which more than 5000 varieties are known. There are two main vine training systems: the Double Guyot on the left and the Scott Henry on the right. The drawing on the right is a cross-section of the soil in St-Julien, one of the finest soils for wine making in the world. Various layers of well-drained gravel mounds encourage the roots to seek water and other than in times of drought, permits the grape to extract a steady amount of water from the earth. The grapes also pick up nutrients in the same manner. The most important nutrients in this case are nitrogen, phosphorous, and potassium.
Fermentation of the whole red grape prior to pressing draws tannins, color, acids & flavors (flavonoids) out of the skin. Fermentation starts when yeast is added to the juice (inoculation). The yeast converts sugars and other nutrients in the juice into alcohol, CO₂, and heat. Heat is maintained in the range of 85-95°F. Fermentation lasts about 1 to 3 weeks, depending on the grape type and ripeness.

Fermentation of juice from white grapes is performed after pressing and initial settling, with gentler yeast strains, at about 50-60°F, for a period of 1-4 weeks, depending on the grape type and ripeness.

Racking is the process of siphoning wine off the "lees" (settlings) into a new, clean tank or barrel. Racking allows clarification and helps avoid "off-flavors".

Cold stabilization removes crystals of Potassium Bitartrate that might otherwise precipitate out if the wine became too cold in transport or storage. This process also reduces acidity.

Yeast (CO₂ + alcohol) Nutrients-superfood → yeast aggregate Totaric acid (balances grape acids) Metric Biosulphate (kills natural yeast) → naturalizes yeast

Wine Making

Process facts

Only 10% of red wine and 5% of white will age well in a way that there will be a difference from year 1 to 5. A lot of wines lose qualities after 6 months in the bottle. Riesling, common in Finer Lakes can potentially age from 2 to 30 years.

Factors that affect aging:
Amount of water in the grape (the more water the worse aging)
Duration of the maceration of the skin
Ultraviolet rays
Temperature swings

New techniques: micro-oxygenations are among many techniques to age wine. Others are being tested such as radiation or magnetic waves.

Bottle sickness: time to adjust to oxygen exposure in the wine.
Dumb phase: intermediate unidentifiable phase with less taste
Very hard to tell when wine is ready/ at its peak
Sediment indicates wine is mature-needs to be decanted

Protein stabilization reduces the risk of wines becoming hazy or cloudy if subjected to excessive heat in transport or storage.

en.wikipedia.org/wiki/Aging_of_wine
Suitability of terrains

The chart above shows the main factors that influence the wine: all the components that make up the terroir. The soil is the most important, where factors such as the pH, drainage and texture influence the types of grapes that can be grown. In terms of the terrain, the slope is the most important aspect. The slope determines the way the water moves through the soil as well as the way in which the vines can be planted and oriented. If the slope is too steep, there is a chance that the nutrients will be drained too fast with the rain and this would make the soil inappropriate. The climate is the last but also an important factor as some grapes are stronger than others. The number of days that the grape has to grow affects the amount of sugar in the grapes and the taste. On a world map, the best locations for growing wine are between the 30 and 50 degree lines. This applies to both the northern and southern hemispheres although there are some locations near the equator that are also quite suitable.
### Pruning

Usually done by hand in winter. If the vine is an early budding vine, it may be pruned deliberately late in order to minimize frost risk.

### Pruning continues

Mending of the wires and posts if necessary.

### Planting new vines

In the Spring new vines are planted and protected from animals by a small greenhouse around them.

### Malolactic fermentation

This is happening in the cellar in tanks or barrels. Supervision is needed in order to control levels of bacteria and acid.

### Topping up

Filling up the barrel to reduce harmful oxidation. Usually happens every week.

### Bottling of wines

These are those wines that are meant to be drunk young.
Wine Year

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Wine Background

April

Desuckering

Neatens the vines an concentrates energy in young shoots.

May

Spraying against frost

Protects vines if weather gets too cold. Wind machines and portable heaters can also be used.

June

Shoot positioning

Shoots are tied onto wires in a position favorable to the sun movement.

Racking

Moves wine from one container to the next leaving residues behind.

Wine order assembly

Start to be prepared to dispatched before the heat of summer.

Fine wines

These may be racked again before the heat of the summer.
Spraying
Against pest and disease. This can be done by hand or machine.

Veraison
Less ripe grapes are removed so that the others may have a more intense taste.

Harvesting
Most vital operation of the month. The time of harvest is carefully chosen in accordance with good weather.

Bottling of fine wines
This is in happening in the cellar in tanks or barrels. Supervision is needed in order to control levels of bacteria and acid.

In warm regions
The winery prepares for vintage.

Winemaking starts
All necessary equipment assembled and sugar, acid and yeast are put in place.
The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

Wine Background

October

After harvest
Grape vines can still have carbohydrate build up reserves after the grapes are harvested

Punching down
Aerates and mixes the contents in the tanks. Encourages the extraction of color and flavor from the skins.

November

Vine leaves turn yellow
Short after, the leaves fall. This is when crops may be sown.

Fining, or clarification
Whisked egg whites removed remaining solids from wine. First year wines can now be moved from the fermentation vat to the barrels.

December

Vineyard cuttings
Pruning may start.

Early tastings
Decisions may be made on how different lots of wine will be used.
Grapevine Needs:

1. A growing season of sufficient length. The growing season is determined by the number of days between the last 28°F in spring and the fall. At a particular site, the season must be long enough to allow both the fruit and the vegetative parts of the vine to mature.

2. Adequate sunlight and heat. There must be adequate sunlight hours to ensure a sufficient supply of carbohydrates are produced by photosynthesis to mature the fruit and vine and to maintain future productive potential.

3. Mineral nutrients. The supply and the availability of essential mineral elements in the rooting zone must neither be inadequate nor excessive. Non-essential mineral elements may also be cause problems if they are toxic to grapevines or consumers.
4. Adequate water supply. A steady and sufficient supply of water is needed to allow the vine to develop properly. However, soil water must not be in excess or grapevine roots- and vine growth - will suffer. Often in cool or cold climate production regions the vines are not irrigated. In that case the soil must retain enough water in the root zone to provide vine needs between rains.

5. Internal soil drainage. The site should not retain excessive moisture that results in ponding or high water tables that restrict root growth and respiration.

6. Air drainage. The site should allow cold, dense air to drain away from the vineyard. Otherwise increased frost injury or winter injury may occur. However, steep slopes can increase the potential for erosion or limit the ability to operate machinery safely.
Wine has been known to have health benefits for many years. In around 1410 AD, a French doctor wrote the earliest known printed book about wine. In the past, it has been used to purge fever, disinfect and dress wounds or as a nutritional supplement. The acids and alcohols in wine can kill or inhibit most pathogens that threaten humans. Wine is also considered a mild tranquilizer and can help to reduce anxiety and tension. Moderate wine consumption can even stimulate the appetite as well as aid in digestion. One significant quality of wine is its supposed contribution to reducing the risk of coronary disease and some forms of cancer. There is a chemical called a catechin which is also known as a flavinoid that is related to the tannins in wine. Tannins are a substance found mainly in the skin of the grape and the most important factor in giving the wine its color and taste. Catechins are most usually associated with the health benefits of wine. These function as anti-oxidants that prevent ‘free-radical’ molecules from doing cell damage.
The Senses and Wine

Smell: The sense of smell can be considered the most important of our senses in appreciating wine. Not only do we smell the wine first but what we know as taste, is composed of 75% olfaction and only 25% gustation (from the tongue).

Taste: The final sense involved in the appreciation of wine. This can generally be separated into four categories: bitter, salty, sweet and sour.

Touch: In the mouth, this sense can distinguish between temperature, alcohol, body, texture and tannins. The body is also the interface between the wine, the glass and the bottle.

Sight: Is used to judge the wine, the color may be an indication of the wine but one can never rely on this sense to judge wine and it is purely a clue.
In his writing on Archetypal Experience of Architecture, Steven Holl writes about his experiences in Japan. He talks about the abstraction of Kyoto and its extreme minimalism and horizontal orthogonality. According to Holl, this abstraction seemed to transcend culture, history, and the limits of time. In a comparable way, Michael Lazarin writes about Japanese architectural excellence being about fragility and ruination rather than permanence. The notion of time in Japan is very different and architects often refer to the narrative of their buildings rather than their structure or form. Rituals celebrate the arrival of different seasons [the rain in the spring for example]. In a Japanese house, the flexibility of spaces change their privacy and determine who has a hierarchical position at a certain depending on who stands where. In Japanese architecture the limits between interior and exterior are much more ambiguous and there are certain “gray areas’ where public and private interpenetrate and stimulate each other”.

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Seasonal Changes and Site Perception

Seasonal changes have great effect of changing the landscape. In the site chosen, the extreme seasons change the site to a great extent. The documentation included is mainly of the site in winter. The trees are bare and there are some leaves on the ground. The trees allow for a view of the lake both from the site and in the sequence of approach, to the site. In summer, the approach is different as the path is lined with dense trees. The foliage blocks some views of the lake and one must move around to get the desired view. In winter, the snow has the effect of making the site more quiet due to its sound-absorbing qualities. Moving around the site in winter one can hear the sound of steps on snow whereas in autumn, the effect is certainly very different when walking over crispy leaves. At the end of the winter, the snow melts and the water is channeled down to the lake in the middle portion of the site, where a smaller valley formed. Summer brings out more intense color in the site. The architecture should be introduced to the site in a way that allows for these seasonal changes to continue to occur. It should also offer a way to observe and make reference to these seasonal changes.
Part three

Site Analysis
A map of the Finger Lakes with Keuka Lake in the center.
A map with the local topography and the main roads that lead to the site.
Landscapes

According to Joan Nogué i Font, there are four types of landscapes. These are based on the five characteristics of a landscape according to Norberg-Schultz (thing, order, character, light and time)

**Romantic**: one in which forces work vigorously. There are marked seasonal changes and an indefinite multitude of places [ex: Norwegian forest]

**Cosmic**: dissipated and eternal and where order is hardly distributed by time. There are no individual places but continuous neutral spaces [ex: the desert]

**Classical**: are between environmental homogeneity and variety. These are distinct individual places [Bergen]

**Complex**: combines previous three types [ex: Naples, Venice]
Cultivated vs Natural

The Vineyard Landscape is one of cultivation, of specific dimensions and direction. This contrasts with the natural landscape that is a result of random events. In choosing a site that lies in a radical landscape, there are two opposing geometries, on the north side, the geometric lines of the cultivated landscape regulate the plateau, on the other, the irregular nature and topography offer a break in order. The site, between these two conditions must mediate between the regular and the irregular, negotiating the tension offered by these two opposing conditions.
Contour Lines

contour lines every 20 m

1:15000
Sectional Opportunities

The section provides opportunity to engage the landscape in several ways. The approach can be manipulated or favored [on one hand, the flat approach from the north is very linear and fast/on the other hand, approach from the south is steep and curvy]. The architecture can serve as a framing device of both the surrounding nature as well as the distant views. The relationship of the landscape to the water also offers the opportunity to create a connection down to the Lake.
Terrain views

Left top: View to the South

Left bottom: View to the North

Bottom: Position, altitude and depth of Keuka Lake
Site Pictures

Top:
View to the North of the site. Currently there is a house near the entrance to the site. The path goes around the house and will bring the visitor down to the site.

Bottom:
The view to the Keuka Lake and the surrounding land
Approach to the site

A-The main approach to the site is by Skyline Dr from the North of the site. After driving along the plateau for a few miles, the visitor leaves the car at the top of the hill and proceeds by foot.

B-The path down to the site is by foot. It is not too steep as it cuts almost perpendicular to the main slope. The site is also accessible by car if it were required by a guest. This also applies to the harvest season as the trucks must be able to bring the grapes to the crush pad area.

C-The site overlooks Keuka Lake and has a gradient of from 15 to 20%. It is adjacent to the southern part of Skyline Dr but raised higher. The site is limited on all sides by the trees that become denser.
Sequence Segment A:

Clockwise from top left:
1. Typical view on the way to the site: vineyards on both side of the plateau.
2. Skyline Dr view toward the site: a small road with little daily traffic.
3. Arrival at the start of sequence: car will be dropped off here.
4. The first view of the lake from the site: can be covered or revealed in the sequence of approach.
Sequence Segment B:

Clockwise from top left:
1-Sequence starts bordering the private residence: this is done preferably by foot.
2-At this point there are no more signs of man-made construction: the retaining wall for the house is left behind.
3-The trees get denser reaching the sight.
4-Only view to the lake is through dense trees.
Sequence Segment C:

Clockwise from top left:
1-Visitor leaves the path to enter the site
2-First view of the site.
3-View up form the bottom of the site.
4-Privileged view of the lake: possibly revealed after the sequence of approach.
Characteristics of the Site

The most common type of tree is the Oak tree. As we see in December, the trees are left bare. There are some Evergreens on site but these are not common. The site is appropriate for planting vines although it is not too deep. It can be used for construction because there is a hard bed of stone a few feet down throughout the site.

In the images on the right, we see the view overlooking the southern part of Skyline Dr. By simply putting up a small wall, the sight could be covered. In the center image we see the valley shape in the center of the site. This will become the path through which water will flow down the site when the snow melts in the Spring. The last image on the right shows how some parts of the site are very steep. This allows for an architecture that can at times emerge from the ground and vice-versa.
Climate:
Macro-climate:
The region tends to be cloudy and this avoids extreme high and low temperatures due to the insulating effect. This also reduces the number of radiation freezes in the spring and gives cooler maximum temperatures in the summer.

Mesoclimate:
This is more specific to a smaller region than the macro-climate (a range of a few miles). The mesoclimate is affected by topography, elevation and proximity to water. Keuka Lake is 20 miles long, with a maximum depth of 183 feet and 715 feet high in elevation. Due to the steep elevation near the water, the lake effects in Keuka Lake are not very significant.

Microclimate:
Even more specific than mesoclimate, microclimate is at the scale of a few feet. This is why some vineyards grow different types of grapes within a few miles. It is recommended to select a site that is sloping as this will provide good drainage as well as collect cold air. Also, heavy vegetation below the vineyard should be avoided as this slows drainage and can trap cold air.

Vineyard Site Evaluation
All data and information acquired from:
Vineyard Site Suitability Analysis, designed by IAGT (The Institute for the Application of Geospatial Technology at Cayuga Community College, Inc)
Link provided by Susan Spence.
About 25% of winters in the area near the site will get temperatures below -15 deg F. In these more extreme temperatures, there is a moderate injury hazard to grapes so only hardy hybrids should be grown as these are more resistant to cold weather.

Almost all winters have temperatures under -5 deg F. In these conditions, injury hazard to the grapes because of low temperature is not very high and most northern vinifera types of vines can grow (Riesling and Chardonnay for example).

As can be seen from the map above, about 60% of the winters near the site see temperatures under -10 deg F. Under these conditions, more hardy vinifera or moderately hardy hybrids should be grown.

In general, because of the climate, early and mid-season table wine varieties should be produced in the site area.
Soil requirements

For successful wine growing the soil should have good drainage, an appropriate range of pH, reasonable rooting depth, good soil water holding capacity and moderate fertility.

The Finger Lakes are post-glacial with fine sedimentary lake deposits that have evolved into silty soils and acidic shales.

Slope

The top of the site is not appropriate, because of its flat nature, it has no drainage potential. The slope becomes very steep very fast, as the diagram above shows, most falls under the red category meaning a slope of over 12.5%. This means water drainage is excellent but there are some concerns for nutrient loss. As long as run-off is controlled and the rows are oriented perpendicular to the slope, vines can be grown in this condition.

pH

Soil pH is important because it affects the availability of mineral nutrients in the soil. The areas in yellow are between 5.0 and 5.9 pH. These would be ideal as in this range there is the greatest balance of nutrients. Lime and fertilizers can be used to make adjustments and improve the soil. The areas in red are more acidic and less suitable for vine growing as a lot of correction would be needed to improve the conditions.

Orientation

The slope is mainly south but also east and west. This is ideal as a North slope would receive much less solar heating. The east slope receives more morning sunlight whereas the west receives more afternoon sunlight.
Soil Drainage

Grapes require very good soil aeration so drainage is a critical factor for adequate vine growth. The site has very favorable drainage [the green areas] due to the slope towards the lake. Because of the good drainage, some irrigation may be necessary but water is removed from the soil steadily. The areas in red should not be used for vine growth.

Soil Texture

Overall conditions of the soil indicate the site is very appropriate for vine growth, especially in the steeper areas near the water.
Grapes

Existing vineyard types

Potential of site [soil distinctions]
The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

Site analysis

Grape Types Appropriate for the Site

Chardonnay: “broad, inoffensive”
Gewurztraminer: lychees, roses, heady, high alcohol, deep-colored”
Pinot Noir: cherry, raspberry, violets, game, mid-ruby hue
Riesling: aromatic, delicate, racy, expressive

A study of the terroir has led to the conclusion that the four most suitable grapes for the site are those shown above. Because of the extreme weather changes, soil types and slopes present, the grapes most suitable are more ‘hardy’ or resistant.

Images and definitions borrowed from the Atlas of wine [see bibliography]
Climate:

Lake Characteristics:
Avg Winter temps: 22 degrees Fahrenheit
Avg Summer temps: 72 degrees Fahrenheit
Precipitation: <36 inches<40 inches

Elevation: 715 feet
Area: 11,584 acres
Length: 19.6 miles
Maximum width: 1.9 miles
Maximum depth: 183 feet
Thermocline: between 30-35 feet
The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

Site analysis

Sun Movement
Materials

The materials chosen for the winery should be related to the earth or should bear a resemblance to earthworks. There is an issue of time and material that should also be addressed. The materials chosen should be able to show time. This passing of time may be a reaction to the temperature, the rain or the amount of people walking over a surface.

Rammed Earth:
Could be taken from the site itself. Needs more maintaining and may not be the best option due to the extreme weather changes.

Corten Steel:
One of the materials that shows wearing [especially with the rain]

Concrete:
Can be easily shaped and conditioned for different effects [polished and colored]
Water:
Although not a building material, the refractive and reflective qualities of water can affect the perception of the architecture.

Oak Wood:
One of the most common materials on site, oak wood is not a cold material as most others shown.

Stone/Slate:
Also local to the site, this dark stone can be used as a building material and has a very rough texture.
Part four

Program Analysis

The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery
Programmatic Requirements

Grape crushing and receiving
Fermenting
Processing
Wood tank room
Barrel storage
Bottling room
Bottles and supplies storage
Cased goods storage
Laboratory
Production tasting room
Shop maintenance and tools
Mech systems room, hot water, electr, refrig
Bathrooms, lockers, employee lounge
Tasting and dining area
Kitchen
Offices and conf room

Typical Program:

A- Grape Receiving and Crushing
B- Fermenting and Processing
C- Processing
D- Wood Tank Room
E- Barrel Storage
F- Bottling Room
G- Bottle and Supplies Storage
H- Cased Goods Storage
I- Laboratory
J- Production Tasting Room
K- Shop, maintenance and tools
L- Mechanical systems
M- Employee Lounge and Toilets
N- Tasting, Sales and Dining
O- Kitchen
P- Offices and Conference

Based on information provided by R. Korman
**The program and its uses today**

A winery, by nature engages the senses. The grape is crushed, fermented and aged among other steps; the wine is looked at for color, smelled for odor and finally tasted. Most wineries only engage the user in the tasting room. In order to better appreciate the time and culture of wine, the experience should encompass the whole process from the ground to the glass of wine.

The main program is outlined on the previous page. In addition to these, some wineries add programs such as exhibition spaces, restaurants or wellness spaces.

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**Additional Programs**

- Spa/
- Wellness Center
- Exhibition space/
- Art showroom
- Rooms/hotel

**Outcome**

- Wine ready for shipment
- Wellness enter

**Production**

- Crusher
- Tank Hall
- Barrel cellar
- Wine bins
- Working arch

**Investigation**

- Tasting room
- Modern bottling line
- Catwalks
- Wine library

**Additional Programs**

- Office
- Exhibition space
- Wellness enter
- Laboratory
- Wine storage

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*Programmatic Additions*
Program Locations

The matrix above puts the different programs in relationship to their requirements [such as the amount or type of light needed for the space]. The adjacencies are also suggested although this will depend on the final circulation strategy chosen. The visitor can be made to pass through certain parts of the program that may not be logical in another winery. Although the use of the spaces is mostly the same all year, some programs such as the crush pads [under grape processing] are only used for a short time each year. These spaces could be used for different programs when not in use or could be developed in a way that they can be adapted to their uses when needed. The study of the program determines which programs can be put underground and which need more ventilation or natural lighting among other needs.

Programmatic Requirements
Programmatic Proposals

The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

Program Analysis

Options for Program Distribution
The final tasting of the wine is a very small portion of the whole winemaking process. As suggested before, a winery can make the process available to the visitor rather than making their experience about the final tasting only. In the diagram above, the process is divided into the main stages: growing, processing, aging, bottling, and finally, tasting. Above this, we see the abstracted programs and how some are more public than others. The programs that are closer to the bottom of the diagram, such as the kitchen are less public. These implications could suggest the program be put in the more hidden parts of the site where the view for example is not privileged. If the decision is made that the visitors do experience this space, it would reverse and take a different location where it could be connected to more public programs. The tasting room for example, is farthest up on the diagram and most public so it should be the room with the most valued views, spaces or materials. The connections between the program should also be considered where the programs with the most interaction are either adjacent or set up in a way that the transition between them become significant in the understanding of the programs.
Program and Views

The site chosen has a significant slope and this is an opportunity to engage the views. The programs should be arranged in a way that those requiring more light are placed towards the front of the slope. The tasting room, for example, may be an appropriate program to place at the end of a sequence with a prized view. On the other hand, the barrel room should not have daylight exposure and so can be pushed to the back of the site or tucked underground.
Program Requirements

The program of a winery has certain basic requirements in terms of program adjacencies. The crush pad, receiving, and processing must all be connected as this is the most intense during time of harvest. The large volumes of grapes are moved from one space to another within the production facilities (in green above). The main storage spaces (in blue) are the largest spaces and also those that need less daylight or none at all. These spaces can be put at the back of the site or tucked into the ground. The visitor circulation path could cut through these spaces on the way to the tasting room. The bottling programs (in yellow) should be close to the barrel storage as the wine is pumped in directly to the bottles. Finally, the supporting programs (in red) can be put anywhere on the site as long as they are well connected. These include programs such as office, lounge and tasting room.

Program Requirements

The program emerges from the ground responding to light requirements are views wanted. The slope of the site reveals or hides certain programs.
Circulation as a Director

The way that the openings engage the viewer are critical. As Barragán said, openings should be intentional. If there is too much light, there is no room left for the mind to wander. And if the opening do not communicate with the exterior they are framing, they are redundant. An architecture that intentionally guides the user can engage the different program components in a powerful way. This also focuses the senses on particular views or sounds.

In the small diagram on the left, the program is set in bars on a relatively small site. The necessary shifting in horizontal is a way to maximize the site and force turns on certain details. At certain points, the path leads to a moment of framing of the landscape or of the architecture itself.
The Barrel Cellar

The Barrel Cellar is usually the image of the production stages of the wine. The wine is usually in the barrel for two years before being put into the bottle although some whites stay for a few months only. It is important to test the wine often as the winemaker will determine which wines are aging well and can remain for longer and those that should be bottled sooner. This meticulous control of the wine development will also bring to attention the need for racking (changing the wine into a new barrel to prevent odors and further aerates the wine). Usually, the wines that still have the longest time left to age are left towards the back of the barrel cellar. As the wine in the barrels gets ready, the barrels are slowly moved toward the front in a way that the closest barrels are the ones that will be ready soonest. Oak has been used for centuries to age wine as it is easy to work with and also watertight. The pores in the wood still let the wine aerate helping in the aging process. The barrel adds some flavor to the wine and build on the tannins already present from the grape skin. The older the barrel, the less flavor is added to the wine. For this reason, some wineries only use the barrels twice and then sell it to other wineries or collectors. Selecting the oak is an art in itself. French oak is generally revered above all others. Different types of oak will release more spiced or a roasted taste among several others characteristic to oak.
The following pictures were all taken during a trip to Napa Valley. The wineries included are: Artesa Winery, Quintessa Winery, Clos Pegase Winery, Hess Collection and Stryker Winery.
The Crush Pad can be exterior or interior. The grapes are brought from the vines and sorted here where they are then moved to the first stage of fermentation. The crush pad must be easily accessible from the trucks that collect the grapes. Recently, it has been discovered that the more gravity can do for moving the grapes down, the better. For this reason, we see some crush pads are located directly above the fermentation tanks. There are openings directly above each tank and the grape can simply be moved down with gravity. The picture on the top left is the more simple version where the trucks bring the grape and elevate it to this platform. Once the grapes are sorted, they are taken to the tanks adjacent through pipes. The example in the center is indoors and directly connected to the fermentation tanks below. The disadvantage is that the space is only used for a few days a year. The picture on the right seems to be the most successful as it is a combination of both the other examples. On one hand, it has the advantage of being exterior and easily accessible by truck, on the other, the skylights double up as a connection to the fermentation tanks.
The Bottling Line

This is the final step in the process. The wine is moved from the barrels into the bottle. A cork, cap and label are added. The bottles are then put into boxes and sealed. This does not necessarily mean that the wine is ready for consumption as most wines remain in the bottle for at least a year before consumption. Depending on the wine, there will be an amount of time known from past experience for the wine to get the most favorable aging. Interestingly, more wines are consumed too old rather than too new.
The Laboratory

The winemaker performs several tests throughout the fermentation stage. In the lab, tests determine what step the winemaker will take with each wine. In some cases, more sugar or acid is added. Since fermentation happens because of the sugar content, the more sugar there is, the more alcohol will be produced. The second fermentation of the wine is called the malolactic fermentation. This is more delicate and must be controlled with even more attention than the first stage. Here the temperature may be altered as well as bacteria added. This second stage may happen in the barrels themselves for higher-quality wines only as it requires much more labor and supervision. By performing tests to understand the wine’s development, decisions are made as to what wines go where. If a wine is to be bottled soon, it will be moved toward the front of the barrel cellar. The final step before bottling the wine is making sure there are no bacteria left in the bottle as this could lead to a third fermentation inside the bottle. The wine is also cleared of excess color particles and other sediments before being put into the bottle.
The Tasting Room

This is the most familiar room to the visitor and offers a sample of the wines available for purchase. These are usually selected by season depending on the winery. Sometimes a wine may be tasted that may only be aimed to sell a year later. The tasting room is usually located near the main axis to the building. In this way the visitors can simply taste, buy and leave. Unfortunately, the downside of this is that the visitor does not get a full experience of the different stages of winemaking.

Tasting wine: specialists rank wine based on [from a wine competition in Paris]:

**Eye:** aspect
**Nose:** Intensity
**Nose:** Quality
**Mouth:** Intensity
**Mouth:** Quality
**Overall harmony**
Fermentation and Processing

Fermentation converts sweet grape juice into wine by adding yeast. The sugar in the grapes is used by the yeast to produce alcohol, carbon dioxide and heat. Because of the high levels of gas present in this process it is essential that this part of the program be well ventilated. The winemaker must decide whether to add yeast or let the natural strains of yeast in the atmosphere do the job. Some more traditional makers still think the natural yeast must be used since it is part of the local terroir. The temperature of the fermentation is essential as if a wine is fermented slowly with a moderate temperature it becomes more fruity and if the fermentation is warmer and thus more aggressive, the wine can take on more flavor and color. During fermentation, it is important to move the contents of the tanks very well as the skins tend to surface and the liquid sinks. Since the tannins are mostly held by the skin, it is important to move the contents around to ensure the maximum amount of flavor and color possible.

Program Analysis
The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

Program Analysis

Fermentation
The Codorníu-Raventos Family

The Codorníu family started making wine in the 16th century near Barcelona. In 1659 Anna Codorníu married Miguel Raventos and the name changed to Codorníu-Raventós. In 1872 Josep Raventós made the first sparkling wine outside of Champagne and it is named 'cava' after the caves in which it is made. In 1897 Codorníu became the exclusive supplier for the Spanish royal family. The family was also the first to advertise wine with art. The famous poster for Champagne Codorníu by Ramón Casas was designed in 1898 for a competition. In 1991, the Codorníu Napa opened [now the Artesa Winery]. The project cost $37 million.
The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

Precedent Studies

Program [with approximate areas]

Public Tasting related areas:
- Tasting/Overflow Bar-on wheels [500ft²]
- Retail Shop [30ft²]
- Special events room [200ft²]
- Private Bar/room for members [100ft²]
- Merchandise Storage [20ft²]
- Kitchen [50ft²]

Wine Spaces:
- Wine Barrel storage for 8000 barrels [2000+ft²]
- Fermentation for red wines [exterior]
- Fermentation for white wines [2000ft²]
- Crush Pad [4000ft²]
- Bottling Line [500ft²]
- Library [1000ft²]

Office Spaces: [100 employees]
- Employee Lounge [400ft²]
- Human Resources [300ft²]
- Marketing, Accounting [300ft²]
- Mailboxes, Office supply storage [50ft²]
- Viticulture/Wine-makers office [400ft²]
- Laboratory [300ft²]
Artesa Winery, Napa Valley, CA

**Building relationship to the landscape:** The owners wanted to keep the landscape as similar as possible to the way it was before breaking grounds. For this reason, the winery is almost completely built into the hill on which it sits. The building is framed through the sequence of approach and in turn frames the landscape in its interior circulation sequence.

**How the architect separates production from the visitor:** Unlike other wineries visited, the building was designed with the intention of providing guided tours. There is a circulation through the production facility where the visitor gets an explanation and views to the facility. Important to note is that the public and private circulation paths are completely detached from one another. In this way, the visitor’s exposure to the wine process becomes a museum-like experience.

**Technical issues:** Fermentation tanks are placed in the exterior of the facilities. This way, CO2 emissions are not an issue in terms of safety. When the barrels are cleaned, sulphur is used and this is toxic. The barrel storage spaces are indoor and therefore have doors that seal off the area when cleaning is in progress. Only masked workers enter the zone at that point.

**Language:** The owners wanted the winery to be embedded into the landscape leaving its appearance similar to the original site. The architect uses mainly concrete and glass to create the visible structure. The green that was removed in the construction was then replaced to cover the structure.

**Precedents**
Precedent Studies

Sequence/choreography: The visitor accesses the site by driving up a road to the parking on the ground level of the winery [this is more private and not the main entrance]. The sequence of approach is then defined by the paved circulation and flowing water. The guest is brought up a level onto a plane where there is unobstructed view of the surrounding landscape. The visitor also gets the first view of the building, embedded in the landscape at the end of the paved path. The accessible entrance is the only one that cuts through the barrel room immediately from the parking spaces and the elevator brings the visitor up to the tasting rooms. Unfortunately, the experience in this case is inverted from the idealized sequence of circulation.

Celebration: The more public spaces are located around the only interior courtyard. The space is centered around a sculpture surrounded by a pool of water. All of the spaces adjacent to this courtyard have a view to it. The tasting bars lead the visitor to the terrace where one can view the rolling hills of vines.

Special/additional features: The winery has a resident artist: Gordon Heuter who makes site-specific work for Artesa. The Winery exhibits his work in the reception and tasting spaces. A museum was transformed into more tasting space. The vast amount of visitors requires more office space than in similar sized wineries. There is also a small shop as well as tables for tasting both inside and outdoors.
The public and private access to the site are different. As in most wineries, the trucks with supplies access through the back of the winery toward the production areas. The public access is usually more picturesque and leads to the tasting areas.

The visitor leaves the car and engages in the sequence of approach. The circulation is guided by water and elevates the visitor to the plinth where one can observe the surrounding rolling hills of the Napa region. The accessible entrance cuts under the stairs and gives direct access to the barrel storage rooms. As mentioned before, the programmatic sequential experience in this case is reversed.
Water as circulation. Views to the building and landscape.

Water brings the visitor from the parking, up the stairs and into the building where water is found in the center of the open courtyard. The water is never contained but always connected to channel where it flows. The building frames the landscape from the tasting areas and becomes part of it from the exterior. The visitor can also walk outside to the terrace and view the different vines.
Quintessa Winery, Napa Valley, CA

**Building relationship to the landscape:** “The owners wanted an inconspicuous structure of simple materials”. The production facilities are embedded within the hillside with a curved wall made of local stone from the excavation of the site. Similar to Artesa, the building is built into the existing landscape taking advantage of the existing slope.

**How the architect separates production from the visitor:** The visitor’s circulation during the tour is mostly the same as that of the producers. There is a catwalk over the fermentation tanks but this is also functional in times of production. The visitor’s access to the barrel storage spaces and production rooms are the same as the employees. Thus there is no separation in the production facilities. In the tasting areas, the visitor occupies the central spaces and adjacent on both sides are the private programs such as the kitchen and offices.

**Technical issues:** Fermentation tanks are placed in the interior of the facilities. When CO2 emissions are an issue or when the barrels and tanks are being cleaned, the large doors open to the exterior offering plenty of ventilation.

**Language:** Because of the owner’s intentions, the building is made of local materials. The more public areas such as the tasting room are made of steel-framed glass. The ceilings are made of cork soffits and the retaining walls are covered in stone. Stacked black walnut is used for details such as shelves.
Sequence/choreography: The visitor drives us the crescent wall and find the tasting room on top. Driving across in front of the tasting room, the parking is just beyond the center of the building, on the top floor. After dropping off the car, the guest enters the glass and steel building to the reception and tasting rooms. For the tours, the visitor exits the glass building and descends into a much heavier construction of concrete embedded in the ground.

Celebration: The production facilities are tucked into the landscape and anchored by the curved stone wall. Above this are the tasting spaces, sales and office spaces. Rather than heavy and earthy, this construction sits lightly on top of the building and looks out onto the crush pads and beyond this, the landscape of vines.

Special/additional features: The building is environmentally conscious including an irrigated sod roof, thermal mass and night air ventilation minimizing the need for heating and cooling.
The public and private access is once again separated. The public rises to the tasting level and the private remains on the lower level with direct access to the production facilities.
Quintessa is unique in that it only makes one wine: a blend of Cabernet Sauvignon, Merlot and Cabernet Franc. Each block of vines grows a specific grape and this distribution is determined by the soil type, sun exposure and drainage. Each block is then harvested separately and placed in the fermentation tanks. Quintessa has different sized tanks in order to accommodate the uneven amounts that grow in each block of vines [each block=1 terroir]. Barrels are used twice and sold. Each wine stays in the barrels from 20 to 22 months and after bottling are held one year before being tasted. Due to the construction embedded in the landscape, the barrel rooms remain at a constant temperature all year around without additional heating or cooling.
Building relationship to the landscape: The low structure merges into the hills and is made of wood and glass. The transparency and elevated position of the tasting room above the vines allows for an extensive view of the landscape.

How the architect separates production from the visitor: The two are completely separate except for the view of the barrel cellar from the tasting room.

Technical issues: Production is isolated from consumption so this is not an issue. The cellar can be well ventilated by large doors.

Language: The owner wanted a modern take on a barn to reflect the small-scale farming community. While relating to the neighborhood, the winery’s contemporary construction reflects the character of operation.

Sequence/choreography: The visitor walks under an arbor for 200ft and then reaches a bridge that connects to the tasting room and the only part accessible to the common visitor.

Celebration: The view to the barrel cellar from the tasting room and on the opposite side: the landscape.
Materials: wood, concrete, corten steel

Program

Tasting [3200ft²]
Retail Shop [10ft²]
Private Tasting [80ft²]
Storage [50ft²]
Offices [2000ft²]
Laboratory [400ft²]
Work Yard [10000ft²]
Fermentation [8000ft²]
Equipment [400ft²]
Barrel Cellar [10000ft²]
Building relationship to the landscape: The winery sits on the landscape and is clearly visible as one approaches from the main road adjacent to the building.

How the architect separates production from the visitor: The winery is not used exactly as it was designed. Now, there are painting classes and art is exhibited in the room with the wood tanks. The cellar room is beyond the wood tanks and not accessible to the guest. This is one of the smaller wineries visited.

Technical issues: Production and consumption almost share a space. The adjacency means the building has to be well connected to assure the fumes from fermentation do not become toxic.

Language: The winery's contemporary construction reflects the character of operation.

Sequence/choreography: The visitor walks under an arbor for 200 ft and then reaches a bridge that connects to the tasting room.

Celebration: The view to the barrel cellar and on the opposite side: the landscape.

Precedents
Precedent Studies

Clos Pegase Winery
Building relationship to the landscape: Rather than being built into the landscape like Artesa for example, Opus One creates its own landscape. The building is surrounded by earth and the core is open to the sky.

How the architect separates production from the visitor: This winery was not built for tours. Due to the high number of visitors, they made this possible. The tour goes back stage directly into the barrel cellar and rooms that are usually only used by privileged visitors or expert tasters.

Technical issues: The winery was built above a spring that had not been accounted for in the design process. Since the barrels have to remain at a constant temperature, there is a lot of temperature control needed to make sure the aging process goes well.

Language: The owners wanted the building to be a modern building that had referenced to the old as they thought this would best express their wine quality. The architecture juxtaposes Redwood and Stainless Steel with cream-colored limestone.

Sequence/choreography: The visitor drives straight down a road on axis with the winery. The car is dropped off around the building and one cuts through what seems like heavy earth to find the winery inside.

Precedents
Celebration: The winery is symmetric around a round skylight. This connects the earth and the sky through three levels of the building. The main stairs underneath the light and self-sustaining and lead to the private tasting room with a view to the barrel cellar.
Dominus Winery, Napa Valley, CA

Building relationship to the landscape: The building is an object in the landscape and belongs to the Swiss Factual Architecture. It was made to be ‘invisible’ in the landscape and is quite successful in this manner as it is easily missed more than once when driving on the main highway.

How the architect separates production from the visitor: The winery is not open to visits. The architects made the production facilities directly accessible to the vehicles by opening the center of the building to the landscape.

Technical issues: The building is made of stone with several openings allowing for plenty of ventilation.

Language: Swiss factual architecture aims to make buildings literal to what they represent. In this case, the building is made from the earth, the same material from which the wine is made.

Sequence/choreography: The visitor can only see the building from the outside if lucky enough to find it [as it is not on the map].

Precedents

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Precedent Studies
Building relationship to the landscape: The main facade is planted and changes color depending on the season. After harvest, it is read as the picture above shows. The courtyard in front on the main facade is planted in lines to mimic the vine rows behind the building.

How the architect separates production from the visitor: Production is visible as an additional art work to the visitor. Behind glass, the different stages of production can be seen along the main circulation throughout the art gallery.

Technical issues: Production is isolated from consumption so this is not an issue.

Language: The owner renovated an old building to make the winery. Here, the interesting component is how the gallery exhibits both the art of the famous collection as well as the wine production stages.

Sequence/choreography: The visitor walks up to the exhibition passing windows that frame the production.

Celebration: Several views to the production facilities as well as the famous art collection.

Hess Collection Winery, Napa Valley, CA
**Building relationship to the landscape:** The half buried building is made of materials that come from the earth such as rammed earth, enforcing the idea that the architect wanted the building to emerge from the earth.

**How the architect separates production from the visitor:** Production happens at a separate facility. The main building houses a tasting area as well as an art museum similar to the previous example.

**Technical issues:** Production is disconnected from this building so this is not an issue.

**Language:** “Almost like an earthworks sculpture that can be read as an artefact, the TarraWarra Musem of Art in Yarra Glen is a monument to modernism”

**Sequence/choreography:** The visitor walks through the museum tasting wine—there is no experience of the process of winemaking as this building is more about the art and the experience of the building as part of the earth.

**Celebration:** Views to the production facilities as well as the prestigious art collection.
The Corona School by Neutra in California

This school by Richard Neutra has large doors that slide open allowing the classroom to take part both inside and when weather permits, outside. This inside/outside relationship is one that could easily be applied to the design of a winery. There are certain programs that are only used for a few weeks. The crush pad for example could be used for other programs when the weather permits. The barrel cellar for example always needs to be at a constant temperature so it could not take advantage of the weather changes. The tasting room is a good example of a program that can be flexible in winter/summer allowing the visitor to sit outside. Allowing the architecture to change with the weather is a way to embrace the season changes that are very extreme in the sight. In the spring, when the snow starts to melt, the water could become a part of the visitors experience just like the garden becomes part of the classroom in Neutra’s Corona School.
The Sant’ Elai School by Terragni in Como, Italy

Giuseppe Terragni’s school is similar in that it also allows the classroom to be brought outside. Here phenomenological transparency plays a role in the interior/exterior dialogue. Terragni uses both vertical and horizontal planes to define the space of the school. The picture on the top left show the shades enclosing the exterior space that in the bottom right picture are drawn back.
Site Specific art in the Gori Collection in Prato, Italy

The Gori Collection consists of a series of site-specific art made for the Gori Villa in Prato, just outside of Florence in Italy. This piece is toward the end of the visitor's trajectory, on a high point in the gardens. Two poles mark the place in front of the work. One sees the hole in the landscape and the long path that digs into the ground and leads to a dark entry. A water canal leads the way from the poles to the interior of the earth. Once inside the dark tunnel, the pupils must adjust to the light. At the end of the labyrinth-like space, stairs lead to the light and one immediately emerges back into the landscape within a pristine glass box. In dealing with the landscape, this precedent is one which engages the earth and the senses- the relationship of the winery to the earth should be just as powerful.
The Alhambra Palace/Generalife, Granada, Spain

This Alhambra was built on a hill overlooking what is now the city of Granada. The position over the landscape gives the Alhambra the opportunity to frame it. The intricate Islamic patterns are made into screens that frame and orient the visitor inside. The warm climate allows for several courtyards to be placed in the palaces in a way that when there is not a view out to the landscape, there is one up to the sky [in red above]. Very important to the Alhambra is the use of water. In accordance to the Islamic idea of the four-part garden, the Alhambra has water channels that bring the visitor up to the main palaces as well as direct the visitor from space to space inside the palaces. The water is used to affect the human senses. The first is the sight, the water serves as circulation in the hierarchy of the spaces. The water also produces a soft sound as it runs down the channels. Additionally, the water was used in a clever way as a cooling device. Thousands of years ago, the handrails on the stairs were designed with water flowing down the center. One can touch the water, drink it or it will gently splash as the stairs are climbed.
Water as Circulation

Frames circulation sequences, creates symmetries, produces gentle sounds and refreshes the visitor throughout the project.
Architecture Frames the Landscape

The intricate pattern frames the landscape below and orients the visitor as one moves from open to closed spaces. The frames connect axes throughout the project. The Islamic pattern screens frame the bright exterior and at night serve as an image of the building to the city below.
Alvaro Siza-Leça Swimming Pools, Leça da Palmeira, Portugal

This precedent is valuable in the way that the architect allows for the natural and the artificial landscapes to engage. This pool project from the 60's is the mediator between the city and the sea. Siza’s lines change from more geometric on the city side to much more organic as the project advances on the water. This juxtaposition can be compared to the conditions on the site where the more geometric lines of the road start to contrast with the more organic lines of the contours on the landscape. Whether the project works its way down to the water or not, this precedent serves as a reminder that place should be a direct response to location and local conditions. The way that Siza leaves the natural rocks on the site reinforce the idea of architecture coming out from the earth in a similar way.
This precedent is valuable as the slope of the site is comparable to that of the chosen site. Both the circulation and the living spaces in this house emerge from the landscape. The experience starts at the top where the car is dropped off [similar to the site in Keuka Lake]. Each level has a different function and the surfaces are used both as interior and exterior spaces [we see a pool for example above a living space].
Part six

Montages on Site
Montages

The following are a series of montages, all on images of the site taken in December 2009. The montages are made with objects made on Rhino as study models to stimulate conditions on the site or overlaid images of works by Luis Barragán.
The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

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Montages on Site
The Architecture of Terroir: A Phenomenological Approach to the Design of a Winery

Montages on Site
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Hauptmann, Deborah. The Body in Architecture. Rotterdam: 010, 2006. This reading offers more interpretations to the idea of body, whether it is individual, collective or mystical for example. There is also an interest in how the author explores the relationships between temporality and the body.

Harries, Karsten. The Ethical Function of Architecture. Cambridge: MIT, 1997. This book may be helpful in that whilst discussing several theories, a link to built form is always made. Since the project will consist of combination of theory and eventually the selection of a program and site, this book seems like a good compliment to the other sources. Of particular interest are chapters 10 (Building and Dwelling), 11 (Space and Place), 12 (The Voices of Space) and especially 14 (Building, Dwelling and Time).


Sources
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Merleau-Ponty, Maurice. Phenomenology of Perception. New York: Routledge, 1995. The theory that perception guides every conscious action and that as humans, there is no separation between us and the world [a necessary claim in making a contention that a built environment may have a direct effect on perception and its consciousness].


Nogué i Font, Joan. “Toward a Phenomenology of Landscape and Landscape Experience: An Example from Catalonia.” Dwelling, Seeing, and Designing: Toward a Phenomenological Ecology. Albany: State University of New York, 1993. 159-80. Complements previous sources as it touches on the phenomenology of the landscape: this should be understood before being able to make an intervention in the landscape.

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Pallasmaa, Juhani. The Eyes of the Skin Architecture and the Senses. New York: Academy, 2005. This source is the one that most addresses the human senses in experiencing place. It calls attention to all senses [not just the visual] and is important in understanding how much of the experience of place can actually rely on the senses.


Till, Jeremy. Architecture depends. Cambridge, MA: MIT, 2009. This book also refers to the fact that although the architect wants a building to do certain things, there are inevitable external forces that shape the design and ultimately the experience of the final product.

Zumthor, Peter. Peter Zumthor. Tokyo, Japan: A+u Pub. Co., Distributor, Japan Architect Co., 1998. A collection of works by Peter Zumthor. May be useful to study in terms of identifying what common traits can be identified in his architecture that may be deemed phenomenological in some way.

Zumthor, Peter. Thinking architecture. Baden: Lars Müller, 1998. According to Zumthor, a building starts with construction but the experience goes far beyond this. This book is about his work and how he has come to think of design in a rather poetic way. He talks about a range of experiences that are personal and how a building can stimulate a certain memory or a perception of something particular.

Winery/Wine information:


The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach
I contend that architecture has the capacity to make one more aware of the sensory components of experience and that this heightened awareness is a desirable condition. For architecture to be more phenomenologically tuned, it must return to privileging the senses as the elemental way in which we experience and recall an encounter with the physical environment. In this project, I have taken a phenomenological approach to the design process, which has emphasized the engagement of the senses in the design of the building and the site. My interest in a phenomenologically enhanced architecture derives from a belief in the potential for the landscape and the processes of winemaking to collaborate in heightening the experience of the built environment. Although the effects on individuals cannot be preordained, creating the basis for an enhanced phenomenological experience of the building and the site offers the opportunity for one to be more aware of environment and the manner in which one’s senses contribute to this heightened awareness.

Because the process of making and consuming wine involves all of the senses, a winery is an appropriate building type to explore this contention. The same intensity of engagement of the senses that is present in the process of making wine can be translated to the experience of the architecture of wineries; in other words, the goal of an enhanced phenomenological experience can inform architecture in significant ways.

The condition of the “terroir” (quality and characteristics of the soil) determines to a great extent the quality and characteristics of the wine. In a similar manner, the architecture of the winery should be a result of its ‘architectural terroir’. Here, ‘architectural terroir’ is intended to mean that the architecture emerges from and has a fundamental relationship to the earth and the landscape. The nature and potential of the site can inform the making of the building as it does the making of the wine. In this way, the earth, sky and water are seen as generative sources.

The winery is an appropriate vehicle for this project since the experience of wine and wine making lend themselves to an enhanced phenomenological experience. The program and building type offer a rich opportunity to explore a variety of ideas about form, space, use and tectonics. These relate to winemaking but also to architecture in general where architecture has the ability to become a communicative artifact having the capacity to carry meaning and messages to the observer.

Historically, the culture of wine and the traditions of winemaking have a great capacity to factor into the generative aspects of the design process. The production of wine is very specific and a complex process involving several stages over time. The culture of wine and winemaking should be embraced in a winery so that this elaborate process can be acknowledged by the visitor and finally culminate in a better appreciation of the wine at the end of the promenade.

In my Thesis Preparation, I investigated existing wineries and the requirements of the spaces needed to produce and store wine. Having gone to California and seen a series of contemporary wineries, I was able to come back and compare them to the local wineries in the Finger Lakes. I noticed that the region is in need of buildings that express the processes of winemaking as well as the landscape that the Finger Lakes sit within. The idea of the cultivated landscape interested me and motivated the design process throughout. There is nothing natural about the process of winemaking. Every step is rigorously controlled and defined and
the building should not only accommodate this specificity but also offer the opportunity for the user to appreciate and understand these processes in a practical as well as an experiential manner.

The site chosen allows for the meaningful integration of the winery within the context of a vineyard. It overlooks Keuka Lake and because of its location near a bluff, the site allows for a dramatic sequence of approach that begins with the access by vehicle from some distance. My intention for the experience of the building begins as one drives toward the site down the axis of the plateau affordings glimpses of the surrounding landscape, but not the prized view. As one approaches the site, the buildings are revealed below the visitor along with the cultivated landscape of dense vines and the lake beyond. In this way, the designed promenade serves as a director for the public circulation influencing the sequence in which one experiences the winery and the site in which it sites. The building, or rather set of buildings are also a reference to be seen from across the lake from the South. They speak to the processes of winemaking as well as to the cultivated landscape of wine. The lattice that surrounds the buildings is derived from the veins of a grape leaf. The form of the buildings is a reference to the rows of vines in the cultivated landscape.

Terracing is a technique used for planting grapes on a slope. Similarly, the project lies within a terrace of its own, overlooking the lake. The pool surrounding the projects starts to speak of a figure-ground reversal of the Finger Lakes. It was also a result of more practical issues such as having available water near the building in case of a fire. The water serves as a way to connect these buildings by refracting and reflecting the building itself and providing a connection to the view of the lake beyond.

The promenade continues from the sequence of access through the building and consists of a narrative where the viewer is brought through a specific set of programmatic and spatial experiences designed to reveal the processes of winemaking. In this way, the building is didactic. The points of entry to each building frame the process pertaining to that location within the larger structure. The buildings go from more public, to building of process and finally the tasting room, once again a very public space. The sensory experiences are never left aside as one moves from building to building or within the building itself. Due to the form and orientation, at the base of the building, one has views to the pool and through the building itself. It is only at the end of the internal sequence of each building that the visitor is offered the prized view of the lake. Ones senses are heightened by making the visitor experience a series of spaces with varied effects. The fermentation building is much more humid and warmer than the case storage building. Also, the tasting room on the East has very different light qualities as the visitor center or entry building which is located on the West of the site.

Finally, I believe the building should express its relationship to the site and should be able to accommodate the passing of time since being built. The corten steel lattice will change over time as the oxygen and rainwater will begin to rust its surface. The color of the steel will also start to bleed onto the inner concrete building. The vines in the vineyard could also start to grow on the lattice in a way that as time passes and seasons change, the building will be a reflection of the conditions it has been exposed to.
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake through a phenomenological approach

I contend that architecture has the capacity to make one more aware of the sensory components of experience and that this heightened awareness is a desirable condition. For architecture to be more phenomenologically tuned, it must return to privileging the senses as the elemental way in which we experience and recall an encounter with the physical environment.
The nature and potential of the site can inform the making of the building as it does the making of the wine. The earth, sky and water are seen as generative sources.

The condition of the “terroir” determines to a great extent the quality and characteristics of the wine.

In a similar manner, the architecture of the winery should be a result of its ‘architectural terroir’. Here, ‘architectural terroir’ is intended to mean that the architecture emerges from and has a fundamental relationship to the earth and the landscape.
View at the end of the Promenade: Keuka Lake
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach
The Designed Promenade

Sequence of approach

Vehicular

Pedestrian
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach

Design
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach
The section of the building is set up in a way that the visitor never has the prized view of the lake right away. Whether the ground plane shifts up to reveal this, or the plan rotates, the visitor must take the interior promenade of the building and walk all the way to the end to appreciate the view.
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach
Corten Lattice as a Second Skin: Informs Inner Building Apertures
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach
Circulation: Interstitial Space
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach
The building captures the changing light throughout the day and the seasons. The second skin reads on the inside through the translucent concrete tasting and restaurant building. As the sun moves across the sky, the interior is cast with dancing lights that are informed by the second corten steel skin.
Below Crush Pad: Fermentation Tanks
Case Storage Level
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach
The Architecture of Terroir: The Design of a Contemporary Winery on Keuka Lake Through a Phenomenological Approach

Night Shot in Vineyard Context
Site model: Larger Context
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Early Parti
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Second Skin Detail
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Design

Inner Building Detail
Second Skin Studies
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Design
Final Model

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I would like to thank everyone who believed in me throughout this wonderful journey, I could not have done it without you.

Professor Korman for making Thesis such a wonderful and enriching experience.

Minha familia querida por estar sempre do meu lado me apoianto e acreditando em mim.

To my friends who helped me in ways I will never forget. Each grain of sand together builds a sand castle.

What a wonderful way to finish 5 year at Syracuse University.

THANK YOU