...to Cinda for teaching me about myself.
This thesis book provides an overview, as well as giving an opportunity for reflection, of the architectural thesis project. The book concentrates on the project selection, research, influences, and other considerations in the development of the final design.
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PREFACE

Americans are consuming more wine today than ever before and more of it is being produced domestically. Advanced viticulture and enological practices have improved the quality of American wines so that they are now comparable to the great wines of Europe. Not only are Americans drinking more but a greater knowledge of wines is desired.

The Winery provides both production facilities as well as promoting the product. It allows the tourist, visitor, and local patron the opportunity to be educated, observe, and enjoy the various aspects of the wine making industry while contributing to the amenities of the surrounding community.
The Winery involved considerable research of the wine industry and the production processes. Final project selection and requirements were derived from this information.
PURPOSE

The Winery involves the combination of both production and promotion facilities in the wine industry. The facilities are located in Oregon’s rapidly advancing world of fine wines. The production facilities are designed to allow the visitor to learn about, watch, and experience the various aspects of the wine making processes. The restaurant and other public activity spaces incorporated within the design provides promotion of the wine.

The purpose of the project is, therefore, to provide the opportunity to produce and promote a product at the same time. This concept is more practical and economically feasible while it also allows the public to familiarize themselves with the wine industry.
Americans are consuming and producing more wine today than ever before. Production in the United States is large and increasing, and the finest of these wines are now acknowledged to be among the best in the world. With this increase in consumption, there is a greater need and desire for the public to become more familiarized and aware of the wine industry.

Wine is a product of its environment. Therefore, consideration for the facility to be sensitive to the site, and surrounding context must be a major concern. From the site selection process to the orientation of the building and vineyard locations the environmental context was considered.

The facility is actually composed of many different building types. The research and study of the facility was both interesting and a valuable learning experience. The expression of each individual building, while maintaining the imagery and character of the entire complex, was an important element as well.

The project is a response to these particular needs. The Winery includes the wine production facility, visitor/tour center, restaurant, administrative, and support facilities.
BRIEF HISTORY OF WINE

Cultivation of the vine began several thousand years before Christ and is mentioned many times in the Old Testament. The ancient Egyptians made wine. The early Greeks exported it on a considerable scale. During the Roman Empire, vine cultivation was extended to such a degree that a surplus ensued, and in 92 A.D. the emperor Domitian decreed that half the vines outside of Italy be uprooted. When replanting was later permitted, vineyards extended into northern France and Germany and even into southern England. The Middle Ages saw little progress in viticulture. From about 1200, monasteries kept the art of wine making alive.

During the second half of the 19th century the European vineyards were threatened by phylloxera, which was imported from America. Phylloxera is a plant louse which feeds upon the roots of the vine. Over 2,500,000 acres were destroyed in France alone. Not until about 1880 was the grafting of European vine species onto immune American rootstock accepted as the only viable solution. Simultaneously, a movement began to ensure the authenticity of wine. It culminated in 1936 when the French established the appellation contrôlée laws. These laws are now the model for similar legislation in other countries.

European colonists endeavored to produce wine wherever possible and were particularly successful in Australia, South Africa, South America, and California. The industry in the United States grew despite cyclical setbacks and prohibition. Following the repeal in 1933, the wine industry revived gradually, and following World War II, the University of California became a center for wine research.
Harvesting
The crop is harvested in autumn when the grapes contain the optimum balance of sugar and acidity. Premature harvesting results in thin, low-alcohol wines; very late harvesting may yield high-alcohol, low-acid wines. Harvesting may be completed in one picking. The grape cluster is cut from the vine with a special picking knife, or shears may be used for the greater convenience in removing rotten berries. The clusters, placed in buckets or boxes are transferred to larger containers for transportation to the winery. At the winery the grapes are dumped directly into the crusher.

Crushing/Stemming
The crushing is usually located outside to facilitate delivery of the grapes and for ease of cleaning. The grapes should be crushed as soon as possible after picking. Normally the grapes are crushed and stemmed at the same time by a crusher-stemmer, which consists of a perforated cylinder containing paddles. The grapes are crushed and fall through the cylinder perforations while the stems pass out of the end. Ancient methods of crushing with the feet or treading with shoes are rare today.
Pressing/Juice Separation
The juice of most grape varieties is colorless. When white wine is desired the juice is usually separated from the skins and seeds immediately after crushing. For red wine, the color is extracted from its contact with the skins during crushing, pressing and a portion of the fermentation period. Two main procedures are employed to separate the juice from the solids. Much of the juice may be drained off by placing the crushed grapes in a container having a false bottom and often false sides. This juice is called the free-run juice, and the mass of crushed grapes is called the must, a term also used to refer to the unfermented grape juice, with or without skins. More commonly, the crushed grapes are placed in a press. The traditional basket press is gradually being replaced by a horizontal basket press, applying pressure from both ends.

Fermentation
All that is needed to turn grape juice into wine is the simple, entirely natural process of fermentation. Fermentation is the chemical change of sugar into alcohol and carbon dioxide gas brought about by yeasts—micro-organisms which live on grape skins. They need only to have the grape skins broken to go to work on the sugar which compromises about 30% of the must. Under normal conditions the yeast will go on working until all the sugar in the grapes is converted into alcohol, or until the alcohol level in the wine reaches about 15% of the volume. On rare occasions, when the grapes are very sweet, fermentation will stop naturally when the yeast is overcome. It is possible to stop the fermentation before all the sugar is used up; either by adding alcohol to raise the level up to 15%, or by adding sulphur. Both of these techniques anaesthetize the yeast, but fermentation can also be stopped by filtering the wine through a very fine filter.
to take the yeast out.
Temperature control during fermentation is necessary and usually accomplished by the use of heat exchangers. Older methods include placing the fermentation vats in cold rooms or by pumping cold water through pipes within the vats. One wine differs from another first and foremost because of the differences in the grapes. But various ways of arranging the fermentation can produce all the other differences.

Racking/Clarification
Separation of the supernatant wine from the lees, or sediment is called racking. The containers are kept full from this time on by topping, a process performed frequently, as the temperature of the wine, and hence its volume decreases. During the early stages, topping is necessary every week or two. Later monthly or bimonthly fillings are adequate. Some wines deposit their suspended material very quickly, and the supernatant wine remains nearly brilliant. This is particularly true when 50-gallon wooden barrels are used, as they have a greater surface-to-volume ratio than larger containers. The rough interior of wooden cooperage facilitates the deposition of suspended material.
Aging
Many fine wines improve during barrel and bottle storage. Wines are usually aged in wooden containers made of oak or redwood, allowing oxygen to enter and water and alcohol to escape. Extracts from the wood contribute to the flavor of the wine. Some red wines appreciate in quality, developing less astringency and color, and a greater complexity of flavor with aging in oak cooperage for two to three years. In dry white wines, a fresher flavor is considered desirable, and the chief benefit of aging is greater clarification as various undesirable substances are precipitated. These wines are rarely aged for long periods. Earlier bottling of white wines reduces cost for storage and for handling in wooden cooperage and produces fresher, fruitier flavor. Sweet white table wines may profit by some aging in wood.

Bottling
Before bottling, wine may require blending, filtration, and the use of antiseptics to combat microbe development. Blending frequently improves quality by adding to the complexity of the wine. A final polishing filtration is required before bottling. Equipment, usually semi-automatic or completely automatic, is used. During the actual bottling operation, oxygen pickup must be kept to a minimum. Bottomfilling—that is, inserting a tube into the bottle and filling from the bottom—is often used. In some cases, the bottle may be flushed with carbon dioxide before filling. After bottling, the closure is made. Screw caps are common for standard wines, but cork closures are preferred. A capsule is place over the closure, the label is applied and the bottle are packaged in cases for shipment. Appropriate storage conditions for the wine include the absence of light and low, even temperatures.
The Winery provides both production facilities and means of promoting the wine through various techniques. The restaurant and visitor/tour center are obvious, but the outdoor spaces allow festivals, entertainment, interaction, and gatherings for the surrounding community.
SITE REQUIREMENTS

There is perhaps no single element of winery design more important than where the facility will be located. The ultimate effectiveness of marketing, production, and administrative functions are heavily influenced by its location.

Marketing programs developed by new vintners must include thorough planning for optimal retail sales at the winery. By selling to the consumer direct at the winery, the gross profit can be increased several times, not to mention benefits of immediate cash flow and the elimination of shipping costs. Retail sales are usually made after tours and wine tasting, which provides for product identification and instantaneous consumer reaction and feedback. It appears obvious, that for economic reasons, a site needs to be selected that can maximize the visitor/tourist traffic.
Climate strongly influences the composition of the grapes. Important factors include differences in night and day temperatures, hours of sun, and soil temperature. The optimum vineyard location is a western slope, with a wind-break to prevent the prevailing summer winds from blowing the warm micro-climate from between the rows. The rows should be planted in a north-south orientation, which allows the sun maximum exposure to the soil, and vine-leaves, while the grapes remain shaded.

Administrative efforts and technical production problems can be resolved more easily if a metropolitan area is nearby. A location near a city also provides a good source of tourists and visitors, as well as the local populace. Community acceptance can result in many contributions toward the ultimate success of the winery.
PROGRAM AND SPATIAL REQUIREMENTS

Production Facility 4,500 sq. ft.
Includes the processing equipment layout, wine cellar, laboratory for testing and tasting the wine, tax paid room for government personnel and their records, seals, etc., and required tax support areas. Must accommodate the circulation of guided tours through production and storage areas.

Tour/Visitor Center 3,500 sq. ft.
Provide areas for orientation, and introduction to the complex, observation of the wine making processes, wine tasting, displays from information on serving wine to its history to local or national artworks. Must have direct contact with production facilities without interfering with production activities.

Restaurant 14,800 sq. ft.
Seating for 200 with a variety of dining areas, both indoor and outdoor, bar and lounge, lobby, food preparation, and additional required support areas. Provisions for private entertainment and dining must be provided.

Administration 2,000 sq. ft.
Includes offices for the management, promotion, and production staff, conference, reception and required support areas. Must be available for the promotion of the wine to the public.

Outdoor Spaces 12,000 sq. ft.
Provide areas for the interaction, gathering, and entertainment during festivals and other public activities, observation of the vineyards and surrounding amenities.

Parking 22,500 sq. ft.
Parking for 75 cars with provisions for handicap and deliveries.
“Few wineries have been functionally and artistically designed. This is unfortunate because winery operations are more expensive when functions are not considered. Also by proper architectural design the winery can be a credit to the community and a tourist attraction.”

—Maynard Amerine
INITIAL THOUGHTS AND CONCEPTS

The initial idea of The Winery is that of a small production facility (approximately 12,000 cases) with major emphasis on public activities for promotion of the wine produced. These thoughts formulate the basic framework for the design process which follows.

The character of the complex presents two alternatives. One is to contrast it with the environment by form and material selection. A "high tech" or "industrial" solution seems to follow. The other choice is a more "rural" and "natural" approach. In this alternative, the buildings would be of conventional wood construction and use authentic, old world methods of wine production. These choices provide two distinct alternatives; either one can be justified.

Another issue which presents many alternatives is the organization of the major programmatic elements. The options range from creating a "wine village" to that of a "wine factory" and everything in-between. Some of the other alternatives are the combination of the production facilities and restaurant. This would allow continual contact with the production process for the patron, but presents a conflict for the visitor and tourist. Another possibility would be to combine the production and visitor/tour facilities, and the restaurant and administrative functions into two structures. This would allow for some separation between the various facilities.
The Winery will be a center where the public can be educated about the various aspect of wine. Providing spaces for public activities would facilitate the promotional activities at the center. Festivals celebrating certain events throughout the production of the grapes and wine are typical. But, other everyday activities need to be incorporated if the project is to be economically feasible. Visitor and tour facilities not only need to focus on the production process, but also could include information on the history, current research and technological advancements, and how to select and serve wine are just a few of the possibilities.
SITE SELECTION

The single most important factor of the initial design process was the selection of the appropriate site. Considerable time was devoted to this selection process. From the requirements established earlier, the possible sites were selected. These ranged from Washington to South Carolina, and from New Jersey to Missouri.

Climatic conditions strongly influenced the selection and eventually eliminated some of the original choices. Wisconsin, Minnesota, and western Canada, while having the ability to grow grapes for wine production, lacked the overall requirements for a quality product.

California, New York, Ohio, and Michigan have long been leaders in the production of wine in the United States. These states all contained appropriate sites but the possibility of promoting the wine industry in an area where it is not established seemed to be a challenging proposition.

After additional research the state of Oregon was selected; not only because of its rapid advancement in the production of quality wines, but its concern for the natural environment as well. The region was restricted to the Willamette Valley for climatic, marketing, and economic reasons. Salem was selected because of its central location.
The area around Salem was investigated further and the northwestern portion provided the greatest possibilities. There were three major factors involved in selecting the exact location of the site: the topography and its relationship to both the building and vineyards, the ease of access to the winery from major highways, and most of all the scenic views from and into the site.
Throughout the design process there were many issues which influenced the final programmatic elements, character, form, functional arrangements and success of the project.

The site itself offered many advantages. The topography provided a natural organization of the programmatic elements. The vertical hierarchy of the spaces also accentuated the views from the site both across and down the valley.

Economic factors were also considered. Originally there were to be more spaces devoted to various public activities. After some consideration, it was determined that these facilities could never be made self-supporting and therefore could only be provided by an extremely large and profitable production facility. To maintain the projects feasibility, these spaces were reduced.

Additional considerations included the traditions, values, and history of the local people. The people of Oregon are concerned with maintaining and upgrading the natural environment of their very scenic state. They are also very proud of their heritage, which should be respected in the design solution by the character, use and selection of materials, and form. The production process will maintain an authentic, old world quality from hand picking the grapes to its use of wooden fermentation vats, presses, and casks to manually operated corkers.

The arrangement of the winery equipment should reflect the sequence and actual function of each operation. The other functions within the complex should also be arranged to facilitate the production of the final product. The spaces should allow for feasibility while following a logical sequence for visitor, tourist, and patron. The organizational scheme selected provides the best alternative to these needs.
"Our time is practical! We have to build in a practical way... I don't think we can say that if a building is practical it is beautiful. I do think we should say that a building has to be practical to be able to be beautiful... the very man who preaches practicability is not always practical himself. He plants roses in his garden. Why roses? Roses are not practical. Cabbage is more practical."

—Eliel Saarinen
THE SITE

The site is designed to allow the visitor to experience both the vineyards and buildings throughout the approach. The one-way circulation system helps to ease the parking congestion, while different paving textures define the approach and entrance to the buildings.
THE APPROACH
RESTAURANT AND VISITOR/TOUR CENTER

The main level of the restaurant includes the main indoor dining area, a limited amount of exterior dining, bar and lounge, lobby, food preparation, and support spaces. The upper level contains the private dining areas, additional outdoor dining, and the administrative offices. The major dining area is emphasized by projecting the space both horizontally and vertically. This also allows for variety in the form and a separation of dining areas.
The visitor/tour center is organized around maximizing the observation of the production process. The orientation and wine tasting facilities are on the main level while the observation and major display areas are on the upper level. The upper level also could serve as a display area for unrelated subjects, while still allowing the visitor a view of the production facilities. The form attempts to reflect the simplicity of the authentic, old world method of wine making.
The production facility is arranged to facilitate the wine making process. Tours can be conducted with little interruption of the production process while allowing all of the operations to be viewed and experienced.
Vaulted cellars, heavy timber, and massive stone walls are common elements in the wineries of Europe. These forms and materials also reflect the "rural" and "natural" character common to this area of Oregon. These materials were selected to enhance this character.
west elevation
Physical and visual connections provide various spaces in both buildings the necessary integration. The finish materials include field stone, exposed wood trusses, and wood decking.
The building are typical wood frame construction, with laminated wood beams and decking for the floors. The roofs utilize fan-type trusses and wood decking.

Mechanical systems are distributed throughout the facility within the space provided by the double joists. The major portion of the heating/cooling load would be provided by the fireplaces and natural ventilation.
Wine, a product of the earth and of the sun, is also a work of art. This project intends to reflect those thoughts.
REFERENCES


ACKNOWLEDGEMENTS

Winery Information
Thomas Durum - Glen Creek
Winery in Salem, Oregon
David Upton - Tabor Hill
Vineyard and Winecellar in
Barrien County, Michigan
Domaine Chandon Winery in
Yountville, California
Joseph Phelps Vineyard in St.
Helena, California
Mondavi Winery in Oakville,
California
The Association of American
Vintners in Watkins Glen, New
York

Studio Critics
Dave Ferguson-landscape
Bob Meden
Stan Mendelsohn
Dan Woodfin

most of all thanks to...
my classmates from the past six
years
Scott Hendrie for the cover
design
my sister, Pattye, c/o The
SandPaper, for typesetting
my parents for their constant
support and patience