

A PROGRAM FOR

A
CLASSIC
AUTOMOBILE
RESTORATION
and
MUSEUM
FACILITY

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programing 4394

fall

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A
CLASSIC
AUTOMOBILE
RESTORATION
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FACILITY

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To Patsy and Donny....

for all their help and support.

I Love You

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Thesis Proposal

THESIS PROPOSAL

1984

During the past six years, I have been active in the antique and classic restoration business. In these years, I have seen good, but mostly bad, processes for automotive restoration. Therefore, my thesis topic is to explore this integration of antique artifacts (automotive) with the high technological restoration processes, resulting in a conflict of opposites. In an effort to explore this thesis, I hope to seek out the ideal process and facility for car restoration and, in turn, program and design a very exclusive automotive restoration facility. From this design exercise, I expect to ascertain a viable future location for such a project, identify a specific user group, work out a precise and profitable process for antique auto restoration, and to develop a presentation of the state-of-the-art facility to exhibit at the 1985 National Antique Car Show.

Since antique and classic car restoration is a somewhat expensive hobby/investment, the target user group is at least the upper middle class. Due to this higher income bracket and the nature of the automobiles that are professionally restored (\$50,000 +), the needs and preferences of a client are somewhat different from the average shadetree mechanic. Therefore, the prospective client, and his customer would be somewhat wealthy people seeking the best possible restoration. These customers are usually drawn from many

countries in addition to America and can afford the expensive and often eccentric hobby.

The site will be selected during the programming process, however, I wish to explain some of the criteria for site selection. The site will need egress from both land and air. The climate of the site will need to be dry, low humidity, of moderate temperature and with limited precipitation. The site should be an attractive area with lush greenery, trees, and a mild breeze. In addition, there should be an abundance of available land. The site should not be located near a coast line due to the salt content in the air and the consequent deterioration resulting from this air quality.

The project scope includes more than just a garage. The project will encompass a museum, showroom, offices, computer log room, library, paint room, tear-down room, catalogue and storage room, an upholstery area, machine shop, stripping area, mechanical room, sandblasting, etc. In addition, the facility could possibly include lodging facilities for guest staying short and extended periods of time, a restaurant, parking, a test track, and recreational facilities for guest and employees. This facility should be an exclusive restoration company where clients can bring their cars, or have them delivered since some will be from overseas, and be confident of quality service and accommodations; then throughout the period of restoration can visit the facility, check on progress and quality, as well as view the restoration process.

The restoration facility itself will be state-of-the-art.

It will be solar oriented to avoid air conditioning and heating costs that largely affect operational cost, with passive and active backup systems. Lighting will be a very important consideration and will need to be in the floor as well as the ceiling and walls. Creativity of form and space is unlimited.

This project will involve research on this facility, the process, and the management of automotive restoration, and will be a prototype facility. This, however, does not limit its scope. There are obvious case studies of lodging, restaurants and museums. The main emphasis, however, will be on the restoration facility itself. This will be carried out in two forms of research. One form is the original assembly process carried out by automakers such as Auburn, Cord, Nash, Rolls-Royce, and the master of efficiency - Henry Ford. The second research form is that of existing restoration companies. A few examples include Harrah's Automobile Collection in Sparks, Nevada - White Post Restorations in White Post, Virginia - Coleman Classic Motors in Houston, Texas - Brochman Coach Builders in Goring on Thames, England.

Project Summary

PROJECT SUMMARY

The project is intended to develop a viable alternative, in an architecturally pleasing way, to the often haphazard existing restoration and automotive service facilities. Since there are people who are interested in developing a restoration facility, this project should show that it is possible to construct a cost feasible and production efficient facility that is architecturally sensitive. In addition, this project should give a basically unprecedented basis for programming of such a project.

The entire scope of such a project will include in the initial planning, and at least a phasing plan, to provide a museum and display area for restored and unrestored automobiles. This will establish an area for that which will enable people, who know very little about antique cars and the process that is involved in restoring them, to learn about the craftsmanship, and the sometimes involved process that it takes to put a car in perfect condition. In addition, it will help to afford a greater awareness about the automobile and its evolution.

Restoration of antique automobiles is a very costly undertaking and is often unnecessarily so. The inefficient facilities, organization, and work sequences often contribute to the waste of costly time and labor. This, in turn, increases the total cost. If a more efficient process and facility can be designed, then the cost can be reduced, and

more people can afford the traditionally expensive artifact. In the future, the restorer that can produce the best and most qualitative product in the least amount of time, and for the least amount of money, will have the most customers and the most work. Therefore, this project should help identify some of the problems that are related to these inefficiencies, and pose a viable solution by which these problems can be reduced with respect to process as well as facility.

Finally, this facility will provide a place for craftsmen to carry on the trades that will otherwise die as the tradesmen pass on. This trade is an art form that produces sculpturized works of art in an industrial sense. Many of the techniques, which are superior to present day techniques, are already gone. With a facility that focuses on production and quality, as well as techniques, both traditional and high tech, the future trends can continue in an atmosphere of an improved state of the art.

Goals

GOALS

- To provide an adequate space for automobile restoration that is product/quality oriented.
- To allow interaction of restoration craftsmen in a manner that does not inhibit their personal work ethics.
- To develop a safe and interesting environment for visitors and clients to investigate the restoration process.
- To discover priority relationships for the restoration process in terms of time/distance equivalents and to develop a sequential flow for efficient work production.
- To provide a place for the public to observe and research the antique automobile in the restoration process.
- To discover alternatives to the traditional museum space.
- To utilize a real site that poses environmental problems that often conflict with industrial processes.
- To protect the environment from harmful restoration processes.
- To provide an image other than that of just another garage.
- To discover the cost/benefits as well as returns on an investment in a restoration facility.
- To relate cost effectiveness to a facility for restoration and display of antique cars.
- To minimize operation costs in such a facility through efficient scheduling and operation.
- To reduce life cycle costs through proper planning of initial construction.
- To relate building form to construction cost and realize the feasibility or unfeasibility of the project.

To provide a link with the past in terms of historic preservation.

To discover through museum display and restoration observation, the changes in automobile production.

To create a place to continue the dying art of restoration and body working in the sculptural sense.

To incorporate state of the art technology into the facility.

To provide expansibility with respect to newly developed technology utilized in the future.

Objectives

OBJECTIVES

The facility should be able to function efficiently and productively without time and economic delay.

Visitors should be able to visit the facility in a manner that does not interfere with the restoration process and should leave with a positive feeling about the facility and the products.

To utilize indoor as well as outdoor display space.

The employees should be able to function and carry out their designated tasks without delay, confusion, and damage to finished products.

The facility should be large enough not to have unsightly storage problems and dangerous debris in circulation paths.

The site should be altered in the last possible way that is still positive to the aesthetic value of the landscape.

The building should be climatically efficient and comfortable.

The restoration process and the user groups that visit the facility should not be harmful to the environment, nor should the surrounding environment be polluted in any way.

The facility should be cost effective and a feasible investment.

To orient the facility to solar considerations and climatic restraints.

The facility should be cost effective with respect to energy and operation costs and paybacks.

The facility should be flexible and amend to the changing technology and restoration process.

Background

In the United States today, there are only a hand full of automobile restoration facilities that are equiped to carry out complete and comprehensive restoration of various automobiles. The few restoration companies that do exist in the United States, are not set up to handle all the functions and activities that are necessary for self contained auto restoration. These companies are generally started in small garages, then as the need arises for more space and equipment, they expand in the cheapest, most efficient manner. This expansion is generally unattractive and often turns out to be quite inefficient.

In the ever increasing environment-conscious society that we live in today, there is a need to build a facility, and in the future several facilities, that are pleasing to the user, are not abusive or degrading to the environment, and provide an efficient area to preserve the art of antique automobile restoration and preservation, as well as display these sculptures of the industrialization of the United States.

The need for a project of this nature was first identified in the summer of 1983 when it was brought to my attention that there are very few restoration facilities that are equiped to handle the entire restoration process, and that none were built with the users activities in full understanding.¹ Latter, I learned that there are overseas interest that would like to bring the European market for antique restoration to the

United States, in order to train young people the art of coach building. However, there are no available facilities to be bought, and that a new facility would have to be built in order to fully encompass the entire needs of a restoration facility of this nature.²

A project of this nature is very important if the art of preservation and restoration of antique automobiles is to continue. In the future, facilities will need to encompass high technology and state-of-the-art equipment that need specific environments, conditions, and space requirements. Simple add-on restoration facilities will not be adequate to produce high quality products which can be economically feasible to the automobile collector. State-of-the-art technology such as increased labor efficiency, increased and intensified lighting, computerization, energy efficient materials and tools, comprehensive managerial operations, will all need to be utilized in building facilities that can be expanded and improved without detracting from the building, the restoration process, and the surrounding environment.

In the United States as well as abroad, there is growing interest in all forms of preservation. From this increase in concern, there are many clubs and organizations involved with preservation.³ With respect to the automobile, there are hundreds of publications, museums, and enthusiasts that are becoming more involved with the classic automobiles that are preserved to perfection. These enthusiasts are finding it rare when a business can restore an automobile in a cost

efficient manner. It would be in the best interest of all auto restoration enthusiasts if a complete and comprehensive facility were to be designed which would contribute to the increased understanding of cost beneficial automobile restoration. This would be evidenced by an increased awareness of cost reducing techniques which would relay greater savings to the investor, and increased profit to the restorer. If the hobby was not as expensive, more people could get involved with antique cars, which would help in preserving more cars. With more involvement in the business, the market value of automobiles would increase and this would benefit financial investment returns.

Presently, the restoration industry in the United States consists of a large network of communication periodicals. This allows parts and services to be relayed across the nation making restoration easier and more viable. There are also many companies that specialize in antique automobile part reproduction. However, most of these reproduced parts are very poor in quality and rarely function as well as the original parts. This is due mainly to the overseas labor that is utilized in the production of these parts. Aside from the parts and supply aspects, there are hundreds of people that are involved with restoration services. This can range from chrome work to engine rebuilding to specialized fabric manufacturers to complete automobile restoration. From examining periodicals over the past five years, the scope of automobile restoration is growing every year as more and more people realize the

investment as well as enjoyment that is associated with antique automobiles.

Issues

In examining existing restoration facilities, there are several basic issues that must be addressed in order to create a successful restoration/museum facility.

- a. The facility must be sensitive to the surrounding environment.
- b. The facility must be of sufficient size to restore the quantity of cars required to be cost beneficial.
- c. The work environment must be comfortable and product intensive as well as one that does not infringe upon the individual work paces and ethics of the employees.⁴
- d. The facility must be cost effective and have the lowest operational costs as possible.
- e. The facility must present a receptive and impressive statement to the customer.⁵

The main "activity network" is automobile restoration. This process involves all the activities that are directly related to the reconstruction or preservation of an automobile. There are, however, activity networks that do not deal directly with the automobile itself. There is client/customer relations. This involves the ability of customers to view the restoration process and check the progress of their car. This is very important to many customers in order for them to achieve a sense of participation in the restoration process, and also to allow them to make changes in the restoration as it proceeds.

There are also managerial processes that must be kept separate from the restoration process. This involves bookkeeping, employment, employee scheduling, buying, selling, shipping and receiving, and customer relations.

The behavioral settings in a restoration facility are also very important. There must be a general work environment that is conducive to efficient work progress, as well as conducive to good product performance. Safety is another important behavior setting involved with any industry. The restoration facility must be safe for employees and visitors. The visitors must be protected from hazards and the automobile must be protected from the visitor.

The environmental setting needs protection from the often destructive effects of any industrial type work. The environment should not be effected by pollutants and or waste products involved with automobile restoration. The environment must also be located in a place that is supplied by efficient trucking, from interstate, intrastate, and international origins. It should also be adequately supplied by air and ground transportation.

In any facility of this nature, there must be certain provisions made for expansion and change. Within these are included the flexibility standards with regard to information systems, transportation systems, light equipment relocation, and activity efficiency improvements that will be beneficial with the introduction of improved state-of-the-art technology.⁶

Description of Client and User Group

The client for this project is generally the business investor that is involved with the restoration business and is seeking a professional restoration facility that enhances the restoration process. The client is a potential investor who seeks a precise and qualitative facility to develop for overseas interest. The user group, which we will state as the employees that perform the various tasks involved in auto restoration, are on the other hand, generally blue collar workers that take pride in their work and are artists and sculptors in their own sense.⁷ These employees are loyal to the employer and tend to be perfectionists in their task.⁸ The economic position of the user group is generally lower middle income workers with a family and are from the services and miscellaneous sector of the work force.⁹

The customer on the other hand, is quite different. The customer is whom we will refer to as the person who is seeking professional automobile restoration. The customer is generally from the upper middle income bracket (\$50,000 +). The motives for car restoration range from simple interest in the preservation of antique automobiles, to a simple investment in a growing market, to the automobile enthusiast who merely seeks a toy for enjoyment, and family fun. The antique automobile is experiencing a slow change in demographics from the traditional investor to the ordinary middle income investor. In the past, the only people who dealt with antique and classic cars

were the wealthy and the investor with a supportive portfolio. However, the trend is changing and more and more people are finding antique cars to be less expensive and more profitable than before. This is evidenced by the increased circulation in periodicals, the increased membership in automobile clubs such as the Model A Restorers Club, the 57 Chevy Club, the Packard Club, and the Cadillac-LaSalle Club, and the emergence of part suppliers and service companies. As the market changes and more people seek cars for investment, part suppliers continue to produce cheaper and better parts for the enthusiast, this in turn reduces the cost of finished product cars, which makes the antique automobile more feasible for the middle income worker. In following this trend, in the future, more people will seek restored antique automobiles which will make an increased demand for restoration facilities, and facilities that can produce quality restoration for a reasonable price.

ENDNOTES

- ¹Telephone Interview with Bill Coleman, 20 August 1983.
- ²"Survey to Brachman Coachbuilders," (4 May 1984), n.p.
- ³Williams, Norman, Jr., with Edmund H. Kellog and Frank B. Gilbert, Readings in Historic Preservation, (New Brunswick, N.J.: Center for Urban Policy Research, 1984).
- ⁴"Survey to Brachman Coachbuilders"
- ⁵Niemann, Nemo, "White Post Restorations," Skinned Knuckles, Vik 4-No. 1 (Aug. 1979), pp.30-36.
- ⁶"Survey to Brachman Coachbuilders"
- ⁷Telephone Interview with Bill Coleman, 25 September 1984.
- ⁸Niemann, pp.30-36.
- ⁹Basic Data-City of Austin, (Austin, TX: City of Austin Planning Department, May 1980).

Introduction

The activity analysis in this facility can be divided into two major parts. These two divisions are 1) the restoration facility and 2) the museum facility. Within these areas are three separate activities relative to the restoration process, and two activities relative to the museum administration. In the restoration process, the client must be concerned with the managerial and business operations, the user group must be in control of the actual restoration process, and the customer will generally want to be involved with observation and involvement in the restoration process as well as the progress of the restoration work. With the museum administration, first is the administration of museum displays and records. Second, is the visitor activity involved in observation of the museum contents and displays.

RESTORATION FACILITY

Client :

The client is the individual or individuals who are responsible for business aspects of the facility. The client would first open up the facility each day. Then proceed to organize the daily job schedules to be carried out by the specific user group personnel. After scheduling, the client would distribute the work loads and deal with any problems involved with employee work loads from the previous day. The client would

then assign, to the manager, any catalogue problems and work out specific problems with parts ordering or requisition. The manager would then send each of the employees on their way to do the days work. The client would then be ready to carry out the sales and representative faction of the restoration business. This would include customer relations and general buying and selling of cars and parts. After the general business of the day has been completed, the client could then proceed to work on restoration projects or do other business of the day. One such business, depending on the size, could be the administration of the museum facility and display areas.¹

User Group

The user group is the general workers that carry out the process of automobile restoration. The restoration process is a detailed and involved process that includes the talents of several craftsmen. The activities of each of these craftsmen are diverse and individualized according to each ones own work pace, work skills, and task requirements.² Following is a analysis of the task activities involved with restoration work.

OUTLINE OF RESTORATION PROCESS³

The car is brought from storage or recieved from the customer. It is then taken to the tear down and cataloguing area. Upon arrival to the cataloguing area, thecar proceeds as follows:

a. The car is completely disassembled and recorded.

(see tear down analysis)

After tear down, a comprehensive list of the cars needs and requirements for parts and supplies should be made. The restoration work should not proceed further until a majority of parts have been attained. This will prvent disruptive delays in the restoration process later.³

b. When the decision to begin restoration has been made, the automobile parts will be sent individually to the cleaning areas. This would include sandblasting, chemical stripping, waterblasting, or hand grinding.

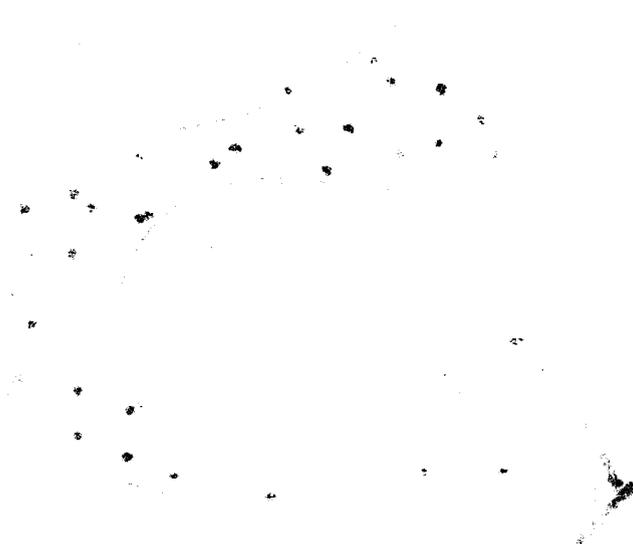
c. After cleaning, the parts would be evaluated further for assurance that they can be restored.

d. The parts would then be sent to the appropriate restoration areas. These would include:

Chasis	Restoration of drive train and running gear.
Engine Shop	Complete rebuilding of all components of the engine to readiness of chasis installation.
Body Shop	All body components are repaired,

	reshaped, redesigned, and prepared for painting. If necessary, body panels are sent to the wood shop for restructuring.
Woodworking	Frame for body substructure and body panel reinforcing are carried out when appropriate.
Painting	Body components and chassis parts are primed and painted to perfection, then placed in a safe storage area until needed for assembly.
Assembly	The finished products are assembled and aligned. This includes engine and chassis, body to chassis, and wings or fenders.
Upholstery	The interior and top upholstery occurs here.
Final Fit & Finish	Final touch up, fit and finish, polishing and cleaning, accessory installation, and other final assembly is carried out here.

During the restoration process, it is necessary to carry out several forms of mechanical and cosmetic repair work that requires spaces other than the area the car is in. This will include machine shops, work spaces, polishing and buffing, and small part repair.



In addition, the entire process must be checked and regulated by the restoration manager. This manager, be it client or employee, is the one most important person in the process. He or she regulates project schedules, cost, and operation cost. The success and capabilities of this manager is essential to the success of the shop and the restoration product in terms of cost efficiency and long term operational costs.⁴

Customer :

The customer is relatively unimportant to the restoration process, aside from financial responsibility. However, it is important to many of the customers to be a part, in as many ways as possible, of the restoration process. This is both positive and negative. The customer can contribute to research and design development if it is relevant to the automobile, as well as provide a valuable asset in the search for hard-to-find or unavailable parts. On the other hand, the customer can get in the way of managerial scheduling, employee communication, and be placed in a potentially dangerous environment.⁵

The customer's primary activity, if so desired, would be to visit the facility and check the progress of restoration. The customer may want to photograph the step-by-step process of his own personal car, and meet with the project manager to discuss problems that are disruptive to the project. The customer would basically be dealing with the client and the manager in progress meetings and guided observation tours. The customer might want to make use of the computer research facilities to aid in the research of the automobile.

There are customers who are very interested and concerned with the progress of each automobile they have restored and being a part of the actual process is very important to them. Many, however, who merely want the car restored to the best possible condition and do not want anything to do with the restoration process. They want the car restored, and then to be called when it is finished. In this case, the activity of customer would be limited in scope and participation.

MUSEUM FACILITY

Administration :⁶

The museum for antique cars is a special museum that contains life size artifacts. These are sculpture and art just as any other museum, but have a special character. These automobiles often have sentimental relation to the people that observe them, and therefore need special display that is sensitive to these emotional aspects. The displays should serve to explain the path or evolution of various automobiles as well as educate the public in the processes involved with restoring a rusted, wrecked car into a beautiful work of art. The cars should be displayed in all forms of existence; restored, original, and unrestored. This makes for a type of living museum, but with machines, not people.

In maintaining such a museum, The administration would be responsible for designing, producing the exhibits, and maintaining exhibits. This includes mechanical maintenance, upkeep, cleaning, and changing or rotating the display with cars that are either loaned or owned. In addition, the administrator would be in charge of the tours or circulation design for each individual display. The administrator would also be in charge of security and personnel, visitor information centers, and research.

Visitor

The visitor to this museum facility could be one of many types. The visitor could be a customer, or a potential

customer, who is interested in the quality of restoration work that is carried out by the facility. The visitor could also range from a automobile enthusiast researching a particular car, or just a curious onlooker interested in antique automobiles. In any case, the activities are basically the same.

The visitor first approaches the museum. There must be appropriate parking that is close to the entry, and provides handicapped facilities. The visitor then enters the facility and needs to be orientated to the contents and type of displays. This should incorporate some background. The visitor would then proceed through the museum in an orderly manner of circulation. This circulation can be aided by discrete signage, or guided tours. As the visitor proceeds through the facility, there are rest locations for resting and discussion in the case of guided tours. Without guided tours, the visitor should be allowed to discuss questions with a permanent museum administrator. Bathrooms can also be located in this vicinity. At the visitor's leisure, he may then enter into the research facility, or leave the facility. The exit should be located near or adjacent to the parking and should be protected from the weather.

The research library would be a non-circulatory controlled library that would consist of the usual library materials. This research library would be shared by customers, visitors, the client, and the employees involved in the restoration process.

ENDNOTES

¹"Telephone Interview with Bill Coleman, Coleman Classic Motors", 25 September 1984.

²"Survey to Brachman Coach Builders." n.p.
4 May 1984.

³Page, Victor W., Môdel A Ford Construction, Operation, and Repair for the Restorer. (Arcadia, California: Post Motor Books, 1970).

⁴"Bill Coleman".

⁵"Telephone Interview with Shatzy Crouch, Rumpel Kammer Restorations." 25 September 1984.

⁶Yakel, Frank Ryan. A Program: Panhandle-Plains Historical Museum Canyon, Texas , 1981.

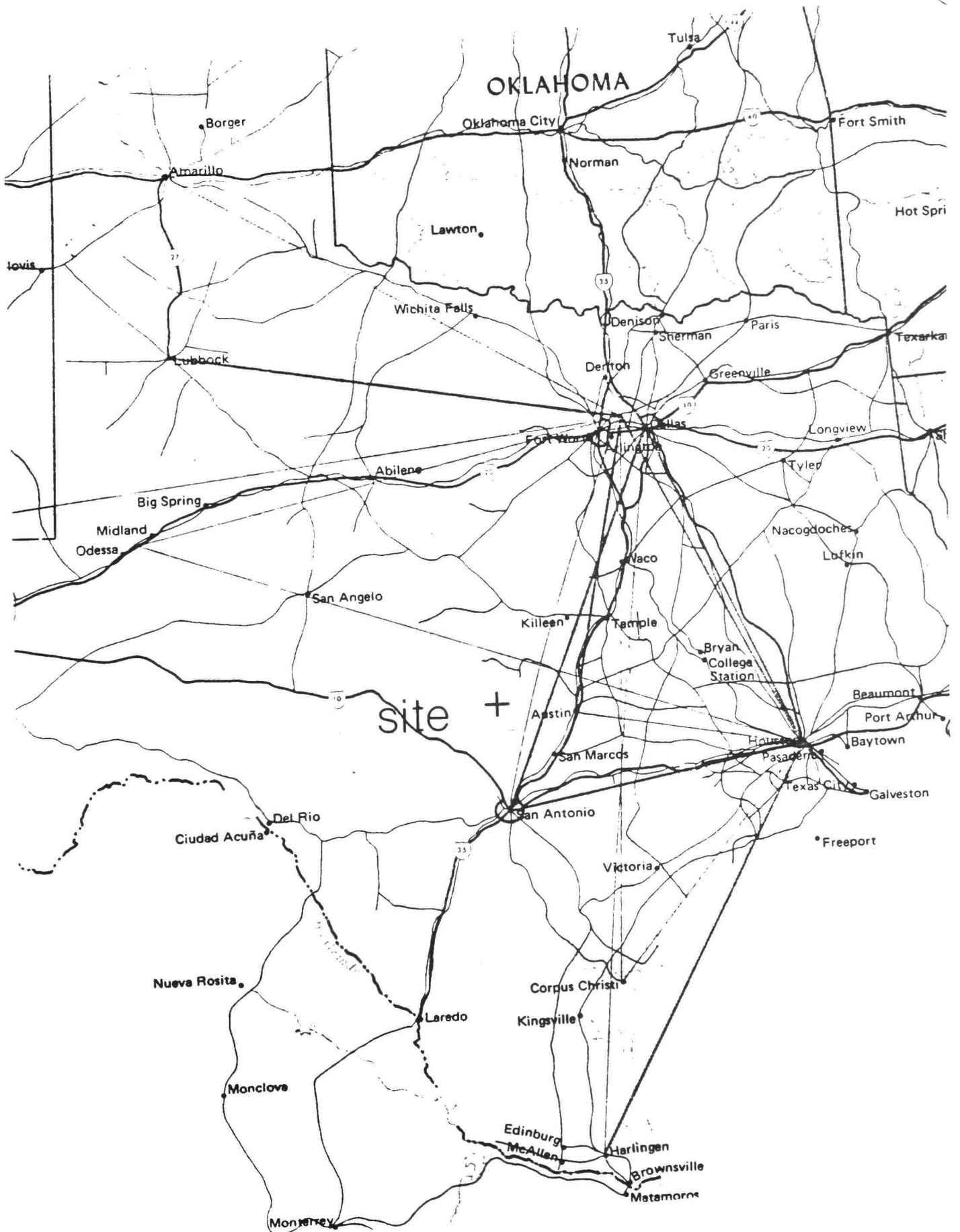
Site Selection Criteria

In the restoration of antique automobiles, the target customer is a somewhat elite group that tend to be wealthy and do not necessarily fit into standard demographic statistics. Hence, a demographic/population analysis of the proposed area in Austin, Texas was not particularly helpful. The trend is changing from the more wealthy class segments who traditionally participate in the antique and classic automobile collection, to the middle class segments of the population. This is partially due to an improved availability of parts and cars, along with the higher interest in do-it-yourself auto restorers who are supported by the various automobile clubs throughout the U.S. and abroad. With respect to this change in automobile collectors, there is still no real value in locating the site in a demographically supportive region. The clientel who seek professional restoration will travel to whatever location that is necessary in order to obtain high quality restoration work. However, there are some significant factors affecting the general population that would frequent the museum and seek smaller repairs and routine service on restored cars.

In terms of preliminary site selection criteria for this restoratin/museum facility, there are six basic criteria. These criteria are :

1. Select portion of the immediate region or neighboring city.
2. Income of potential customers relative to the immediate

TEXAS



Map 1

region.

3. Availability of work force. (skilled)
4. Availability and quality of support systems. (ie. ports, airports, transportation, trucking, utilities.)
5. Climatology in the sense of environmental efficiency and overhead costs, both long term and short term.
6. The economical feasibility of purchasing the land, and the long term investment return and appreciation.

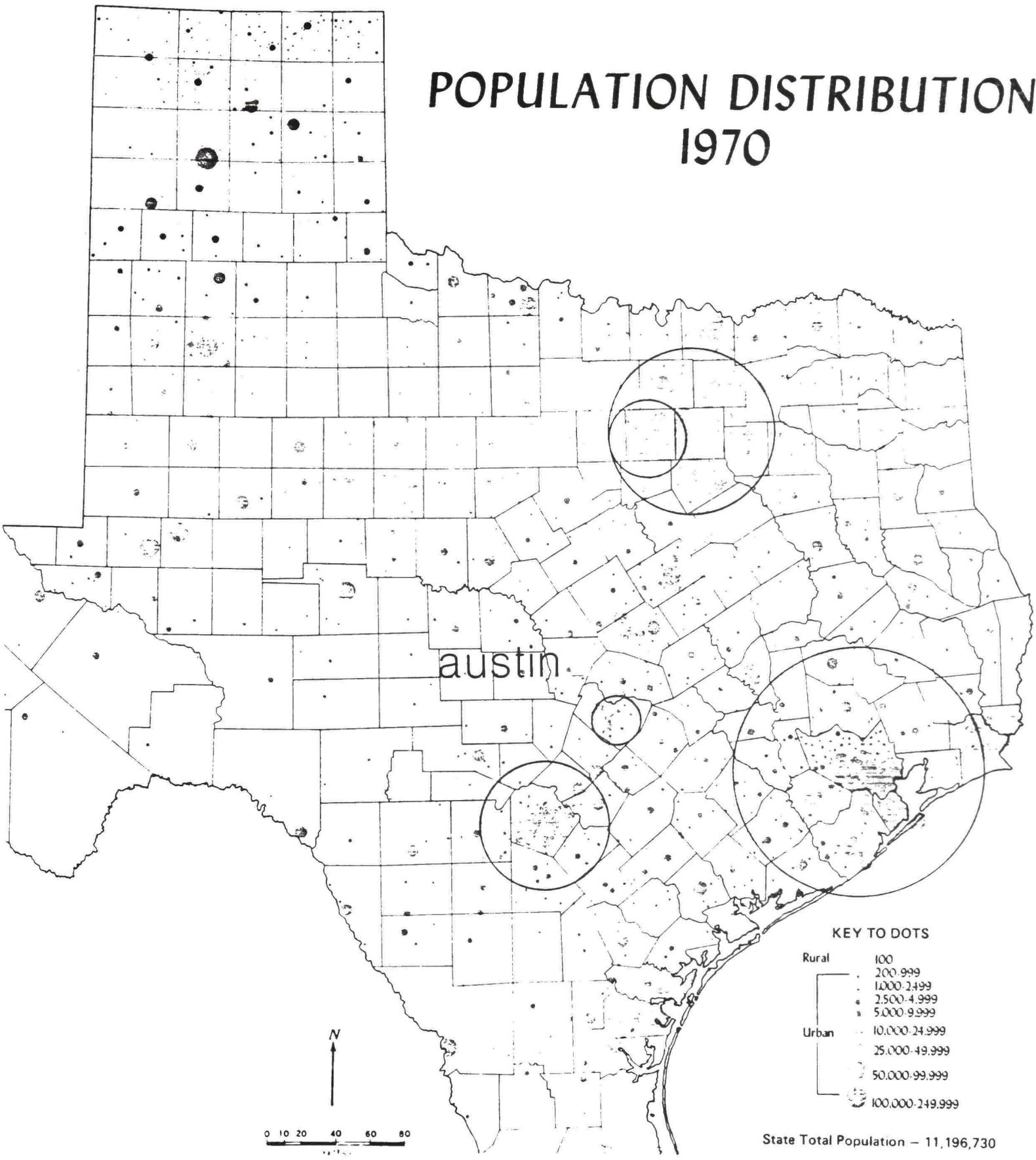
The site selected for this project is a beautiful site located in the Barton Creek Bluff area. The site is presently owned by Charles Lawrence, FAIA, and has been approved by Mr. Lawrence for use in this project.

General Background

This site location lends itself to be quite conducive to a project of this nature. The population in Austin is 345,496 people . Of these people, the median income is \$14,709 with 3.7% of the population making over \$50,000 dollars annually. This is among the highest in the state of Texas, with only Dallas/Fort Worth, Houston, and Midland/Odessa ranking higher. According to the wage and salary employment in the Austin area for 1980, 17.1% of the jobs are related to the Service & Miscellaneous classification of industry. This category is relative to the labor force involved in automobile restoration and the various support systems. In the project area, in 1975, there were 0% - 9.9% of the population in or below the poverty level,

and the annual median family income in the area was the highest with \$20,000 and more. In addition, the automobile and related service industries is one of the highest in the state, and only fourth from the top sales in the Travis county region.¹

POPULATION DISTRIBUTION, 1970

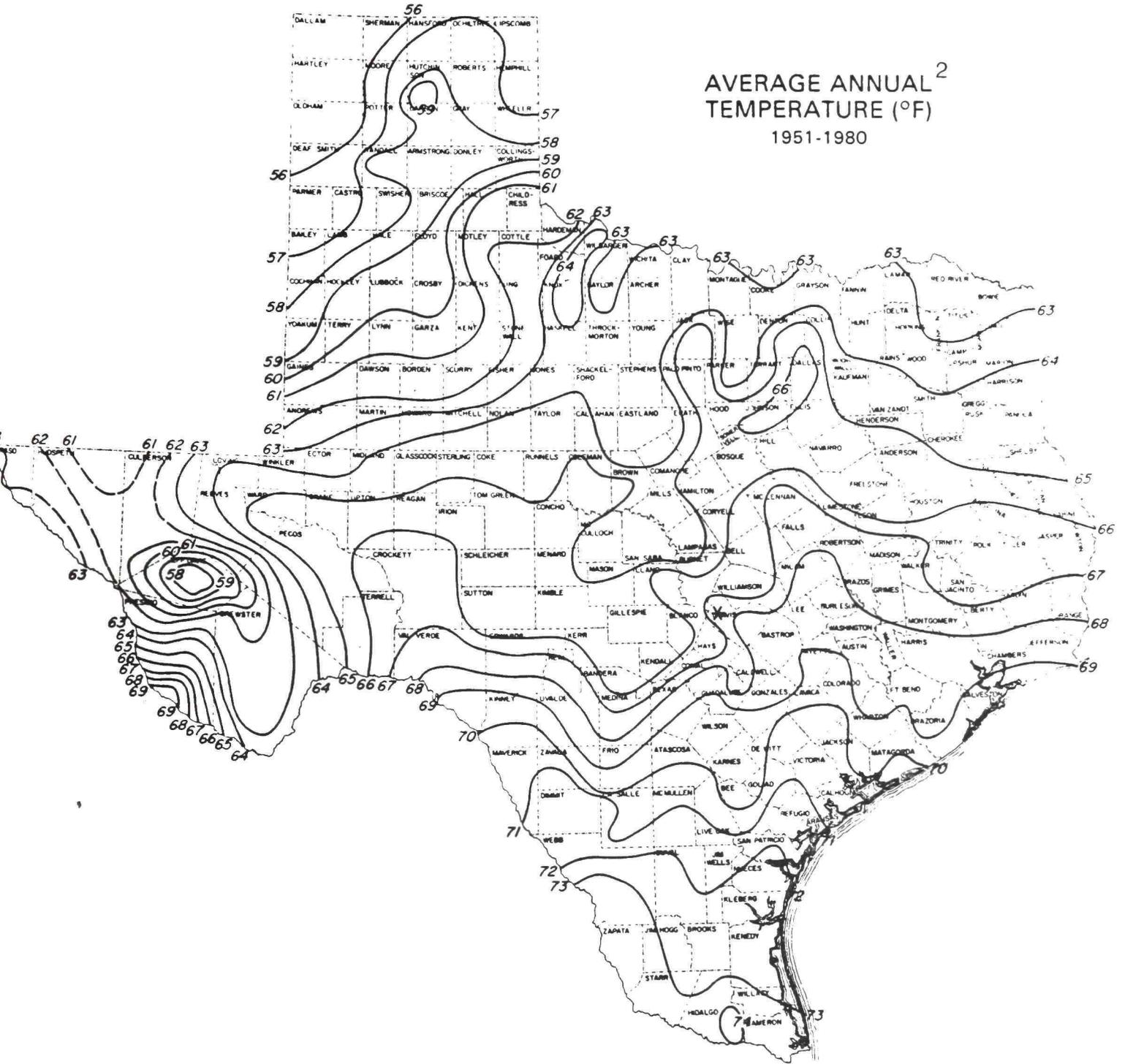


KEY TO DOTS

Rural	100
	200-999
	1,000-2,499
	2,500-4,999
	5,000-9,999
Urban	10,000-24,999
	25,000-49,999
	50,000-99,999
	100,000-249,999

State Total Population - 11,196,730

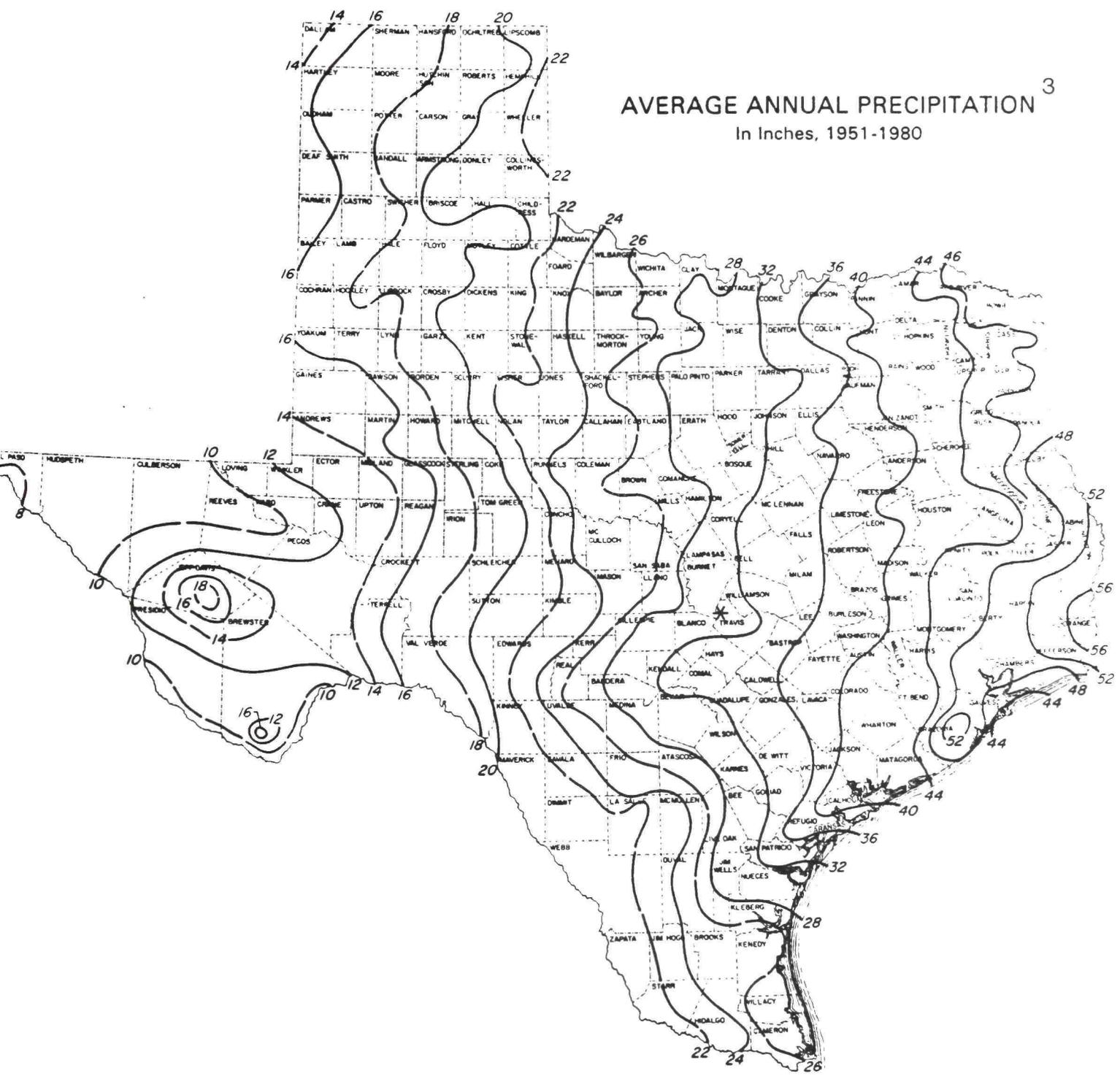
AVERAGE ANNUAL²
TEMPERATURE (°F)
1951-1980



Map 3

AVERAGE ANNUAL PRECIPITATION ³

In Inches, 1951-1980



Map 4

Location

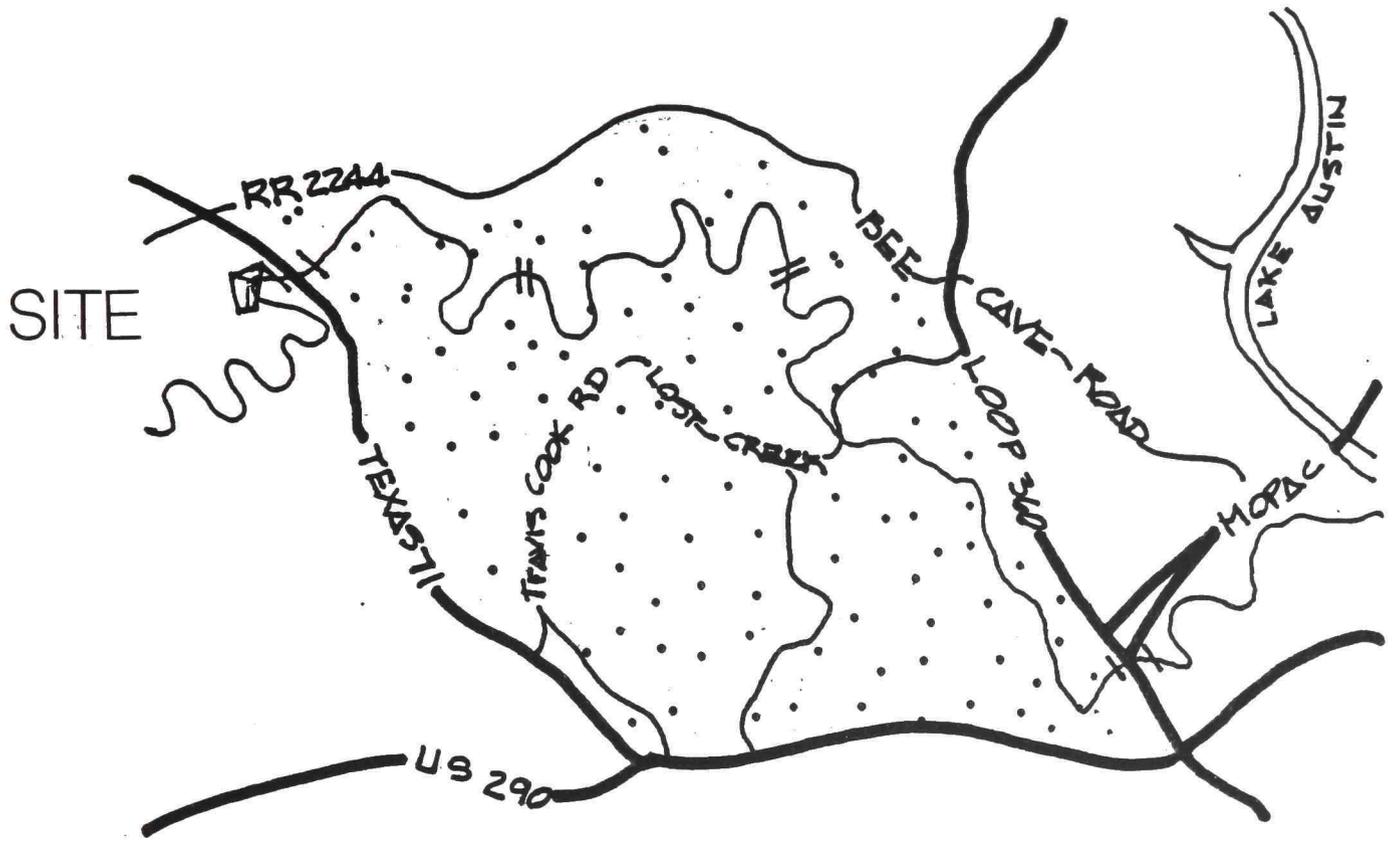
The site is located in the Barton Creek Bluffs area which is about twenty miles from the Austin City Limits. The location is supported by automobile transportation from the northwest and southeast by Texas Highway 71. Barton Creek runs through the site location. This entire area is located within the Travis county region. This area was chosen by Charles Lawrence, FAIA, and purchased about three years ago. This site is very pretty with several specimen Oaks and Maples. In addition, it has a rather challenging creek relative to the design issues standpoint.

Approach

The approach is from the Texas Highway 71, which makes connection with a small road which leads into the area. Once onto the area, the road which is composed of a crushed limestone base, leads to the specific lot location. Upon arrival to the lot location, a small foot trail takes one down the southwest edge of the site to Barton Creek. The site is not accessible from the creek as the level is not consistent.

Regionally, The Barton Creek Bluffs area is approached from the south by U.S. 290 onto Texas Highway 71. U.S. 290 bridges Austin and the intersection of Interstate 10 at Junction, Texas. To the north of the Barton Creek Bluff area,

"Barton Creek Bluffs"



Barton Creek Diamond

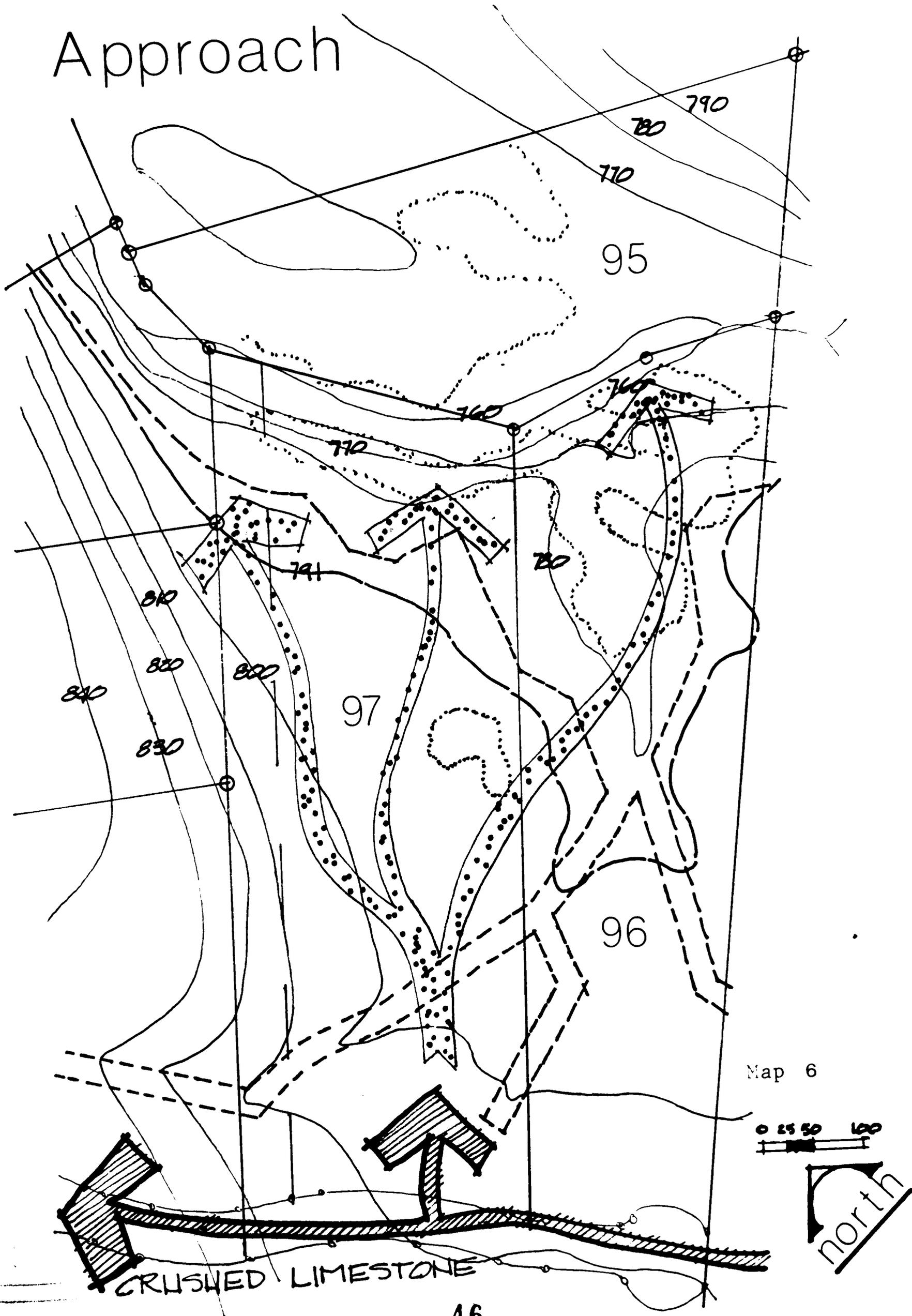


austin  miles

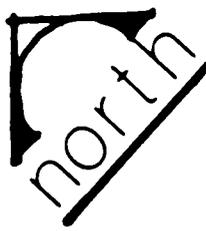
Map 5

is the small town of Bee Cave. Bee Cave road runs East and West and intersects the town of Bee Cave. Bee Cave road is officially known as Ranch Road 2244. Texas Highway 71 extends North where it crosses FM 620. FM 620 leads North and crosses Mansfield Dam at the point where Lake Travis and Lake Austin connect. Texas Highway 71 continues North from FM 620 to the town of Llano, Texas.

Approach



Map 6



CRUSHED LIMESTONE

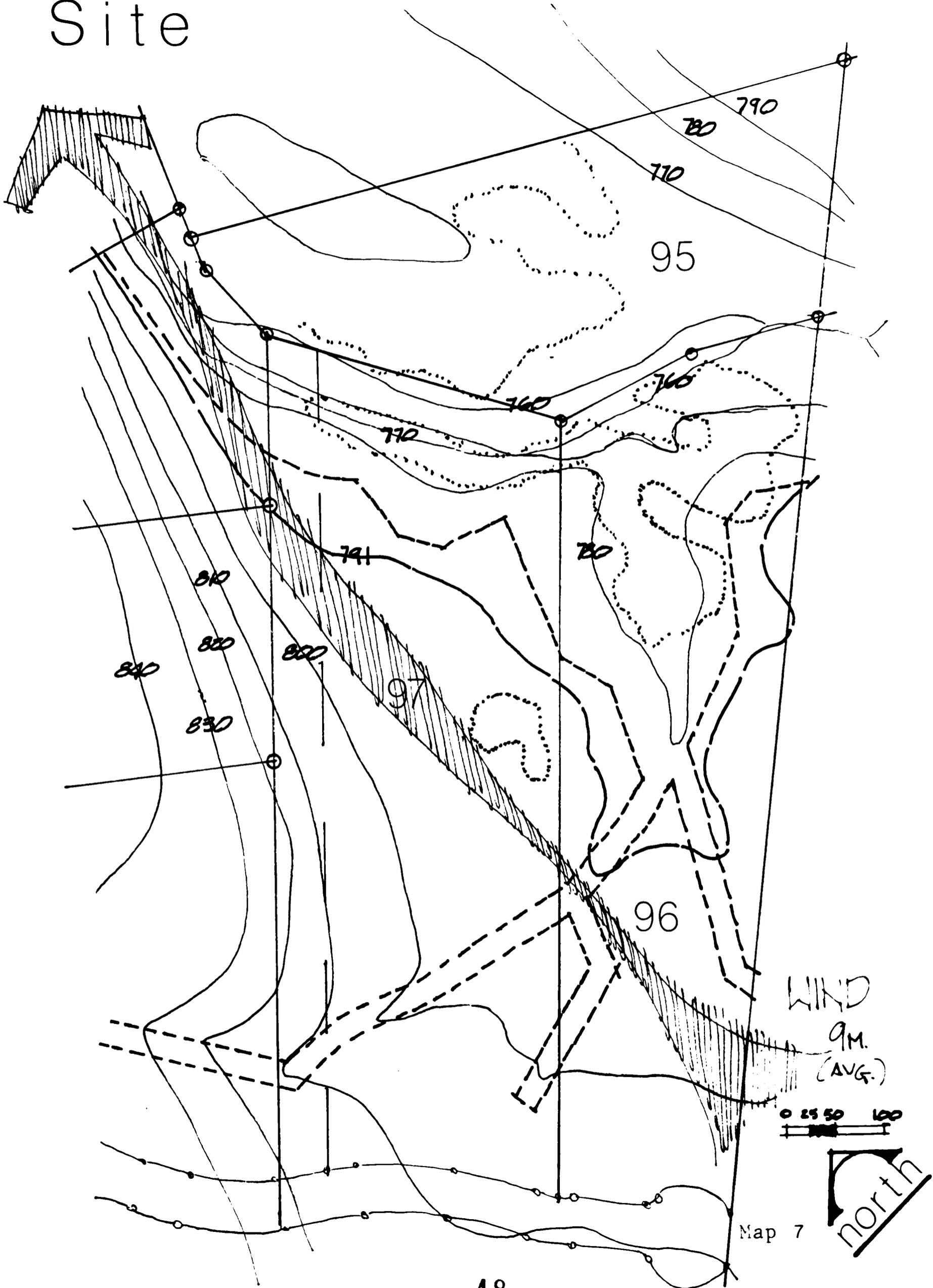
Sensitivity

This site is a very environmentally sensitive area. The site has several crucial considerations with regard to geographical, and natural design limitations as well.

The main concern with the environment is that any development on the property be sensitive to the natural resources that are abundant on the site. Of these natural resources are mineral components in the soil, the water availability from Barton Creek, the hill and bluff terrain on the property and the adjacent property, and the vegetation which exists on the site. This vegetation includes small trees and shrubs, as well as ground covers including Star Jasmine and Verbena. Trees on the site range from specimen Spanish Oaks, Cedars, Live Oaks, and Maples.

Another vital concern with regard to the site is the visual impact of any structure. There are several views that will be affected by any development. Among these views are those up the creek to the structure, the views upon approach from the East, and those from adjacent land. Of the adjacent land factors, there is a 40 foot bluff to the northwest which has some existing structures. Any structure developed on the site will have to be extremely sensitive to this existing structure on the bluff. This will have to be in the form of environmental pollution control, and also roof scape visual impact. The visual impact of the roofscape is probably one of the most important design issue criterias facing the project development.⁴

Site



Boundries

The property consists of three lots. These lots are numbered 95, 96, and 97.

These lots are bounded on the Northeast by a bluff about 40 feet high. Bounded to the West is the road. Bounded to the South is the property line which is made up of another road easment.

The southern border road easment has been changed and now makes up the northwest side of lot 97. The South border is S.61° 41' W. and is 1011.0 feet long. The West border is 438 feet long. The North border is 890.00 feet long. the eastern border is 716.00 feet long.

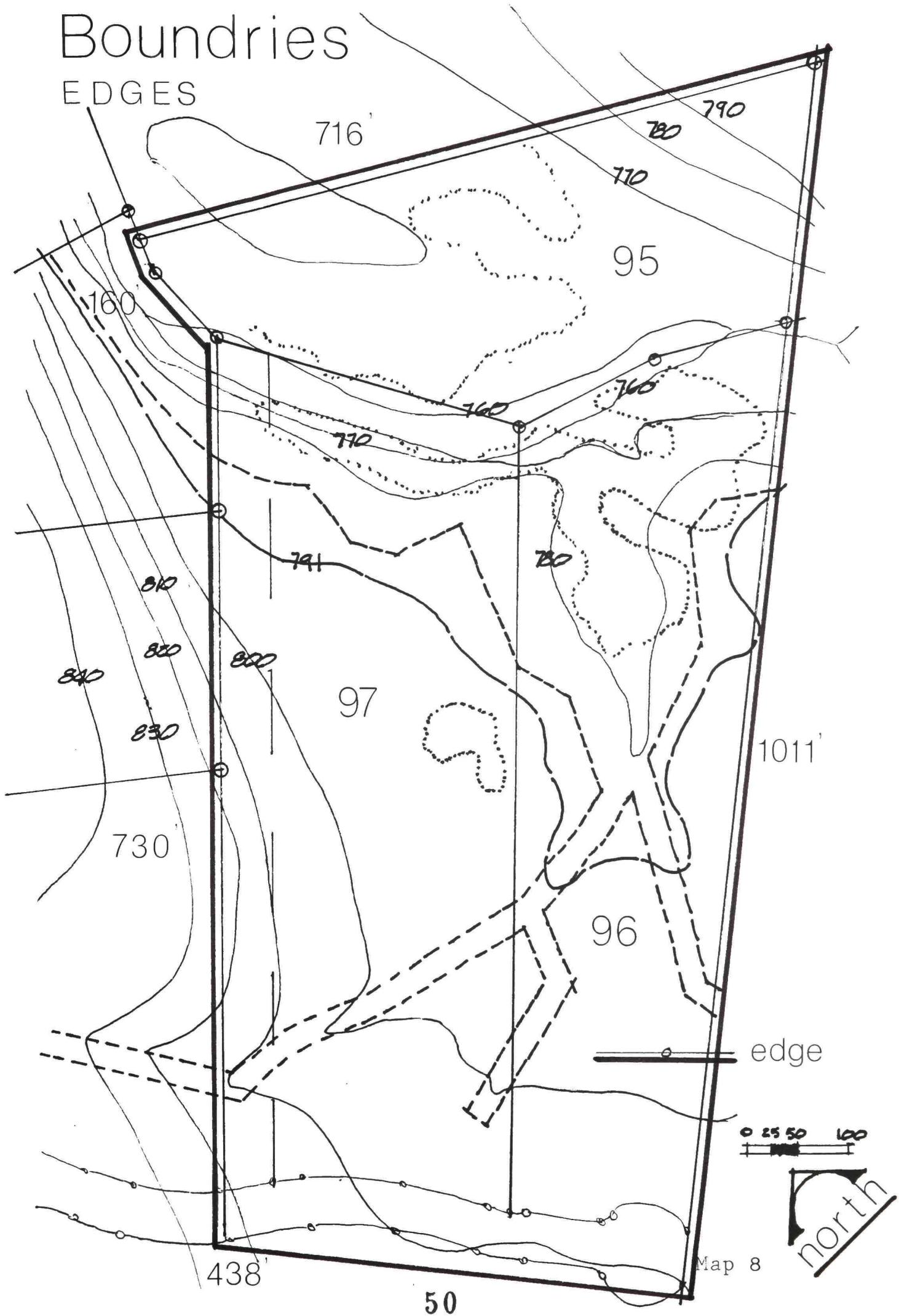
This property is located at between 760 ang 840 feet above sea level and there is a creek and drainage easment located at 790 feet above sea level. The 100 year flood plane level is at 791 feet above sea level. Since the flood plane is located at level 791, all occupied floor levels must be no lower than 792 feet above sea level, which is one foot above flood plane. Cantilevers are permitted past this structures limitation, however, the supporting columns or walls must not exceed this limitation. The "air rights" easment allowing this cantilever has been obtained and approved by the owner and officials involved.

Entry

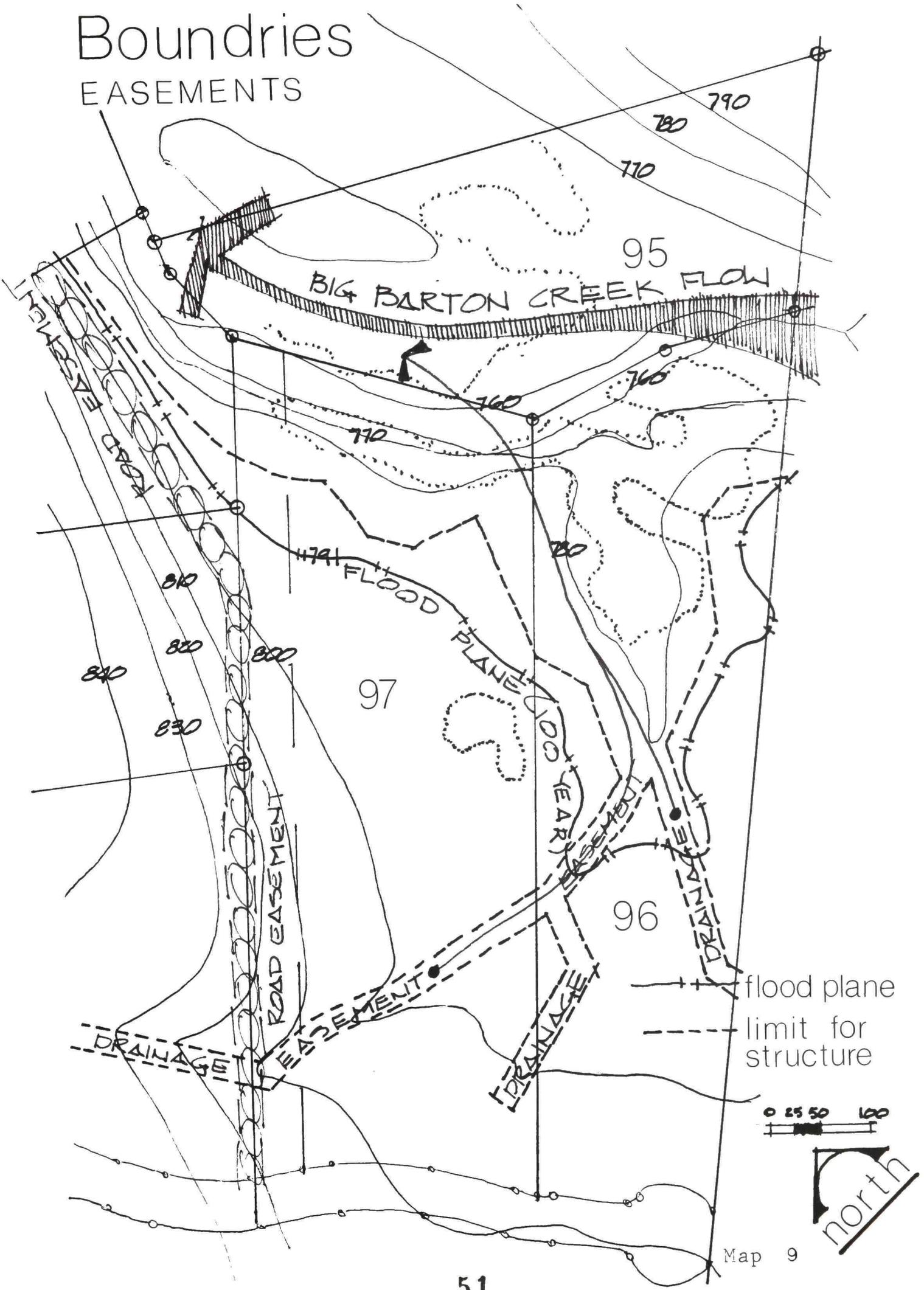
Entry is from the West border and has a small road layed out and based with crushed limestone.

Boundaries

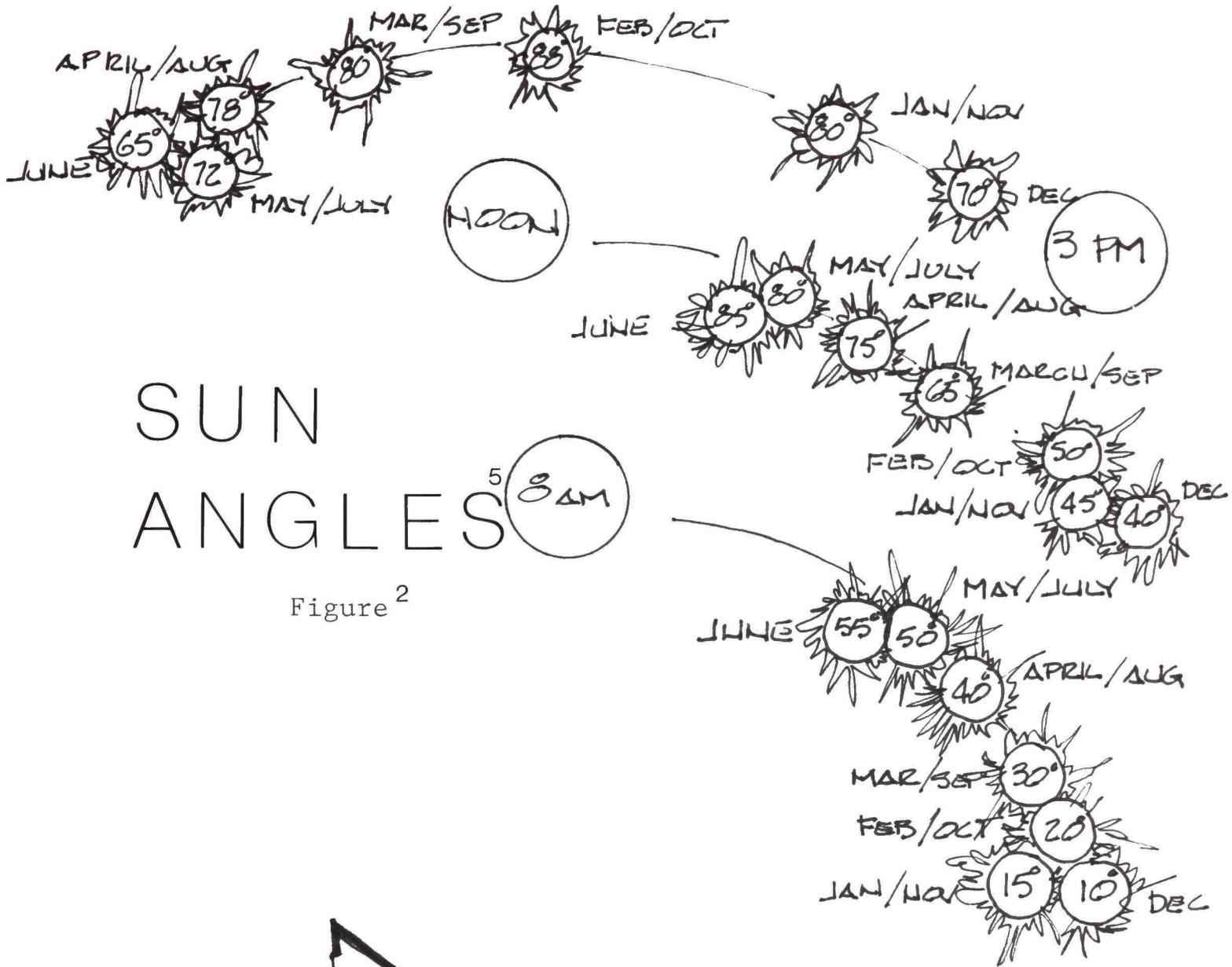
EDGES



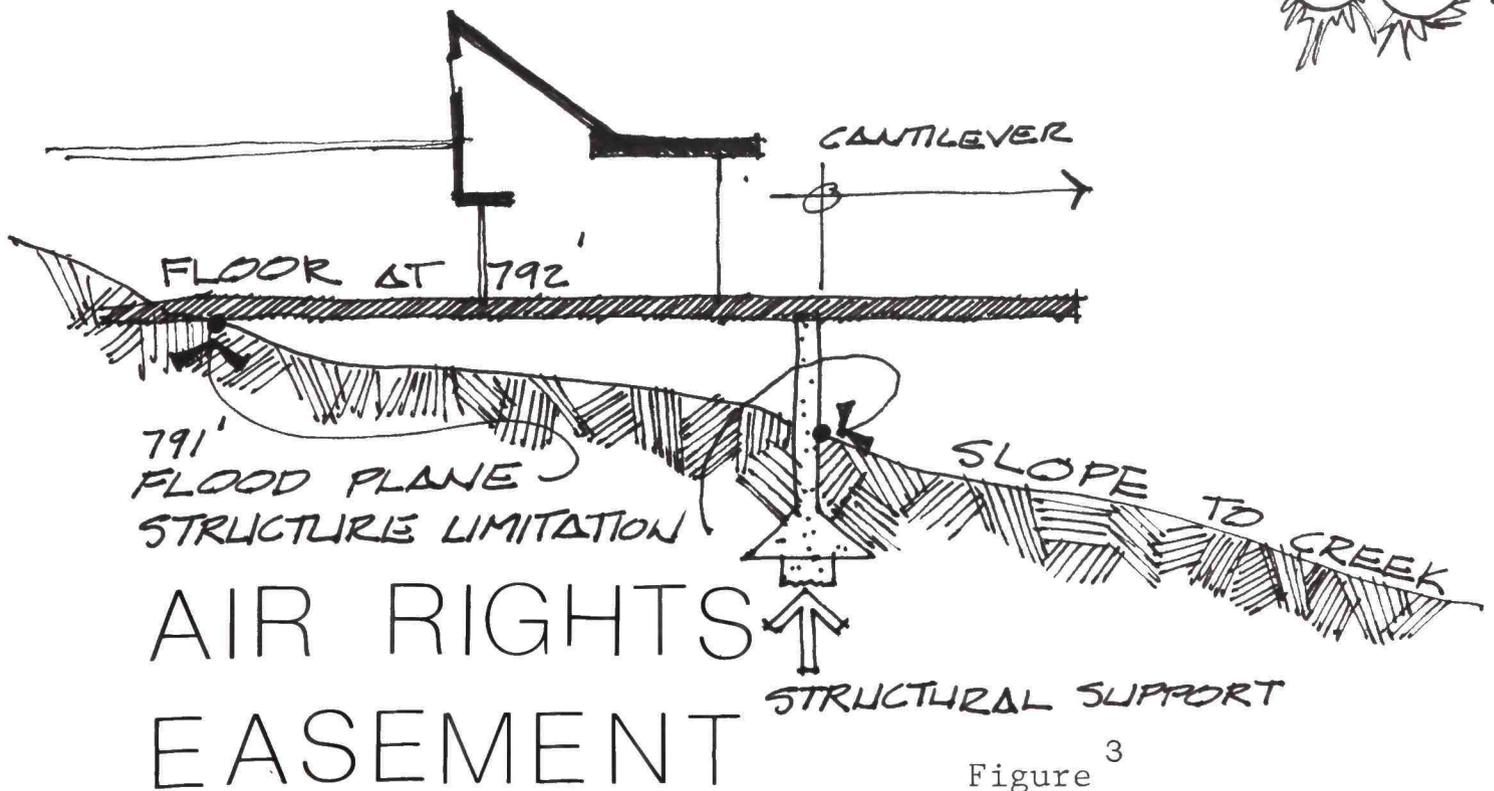
Boundaries EASEMENTS



Map 9



Figure²



Figure³

Climatology⁶

The Travis county area is located adjacent to the Colorado River at an elevation ranging from 400 to 900 feet above sea level. the climate is a humid subtropical climate with mild winters and hot summers. Nights are generally pleasant with night temperatures in the low seventies. Percipitation is about 39 inches per year with the heaviest amounts occuring in the late spring. Rainfalls in light rainsand some short heavy rainfall. Snow is rare. Wind is predominately from the South at an average of 9 miles per hour. Tropical storms occasionally effect the area.

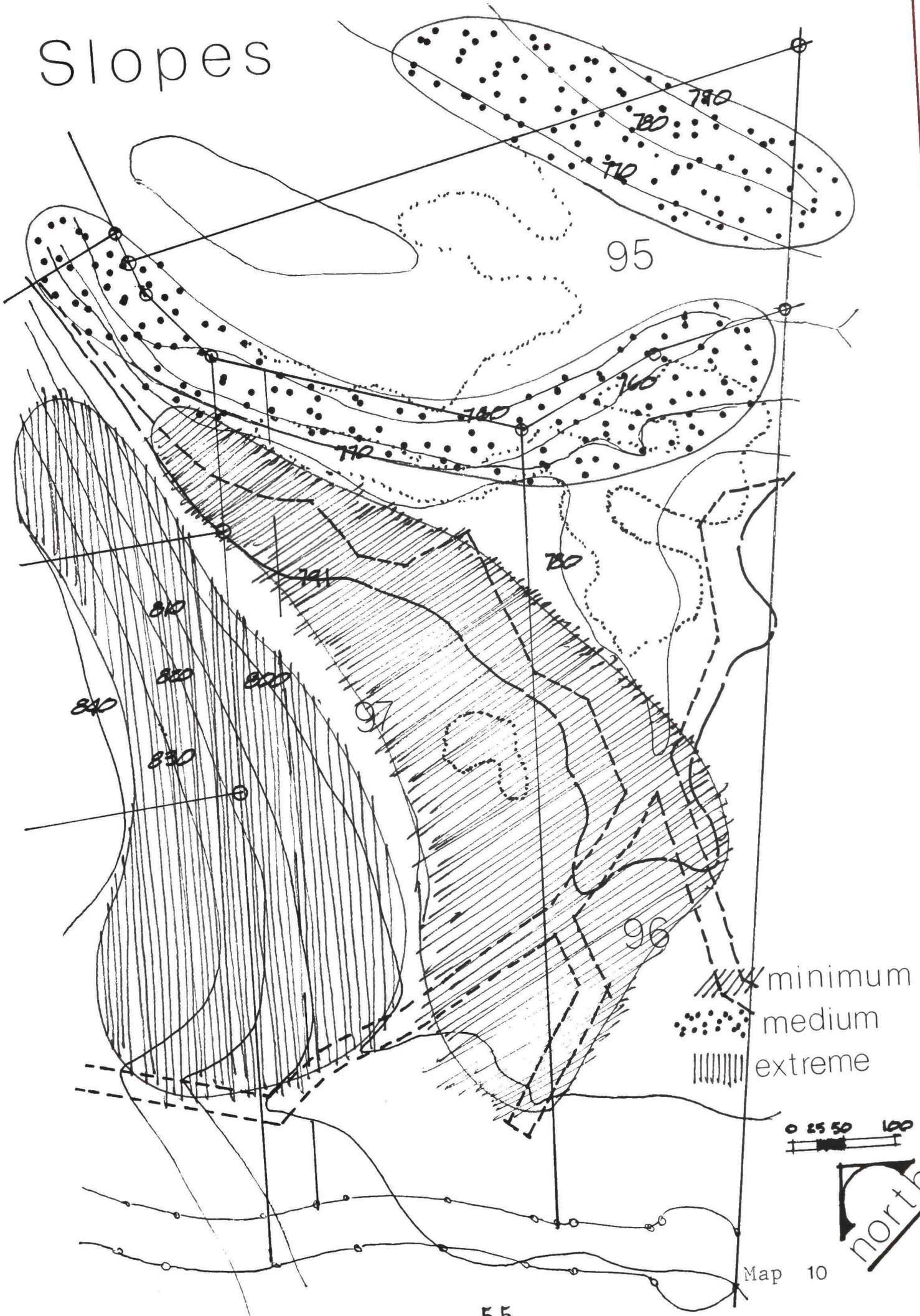
This particular site climate is very conducive to the operation of a restoration and museum facility. The light winds create a small breeze which is nice in the summer. The humidity is low enough so as not to inhibit painthours per year, and is not crutial to the rust inhibitor problems that occur in areas of higher humidity. These climate factors in conjunction with the mild winters and cool summers are benificial to the long term and short term cost benifits in terms of operational costs and life cycle costs.

Soils⁷

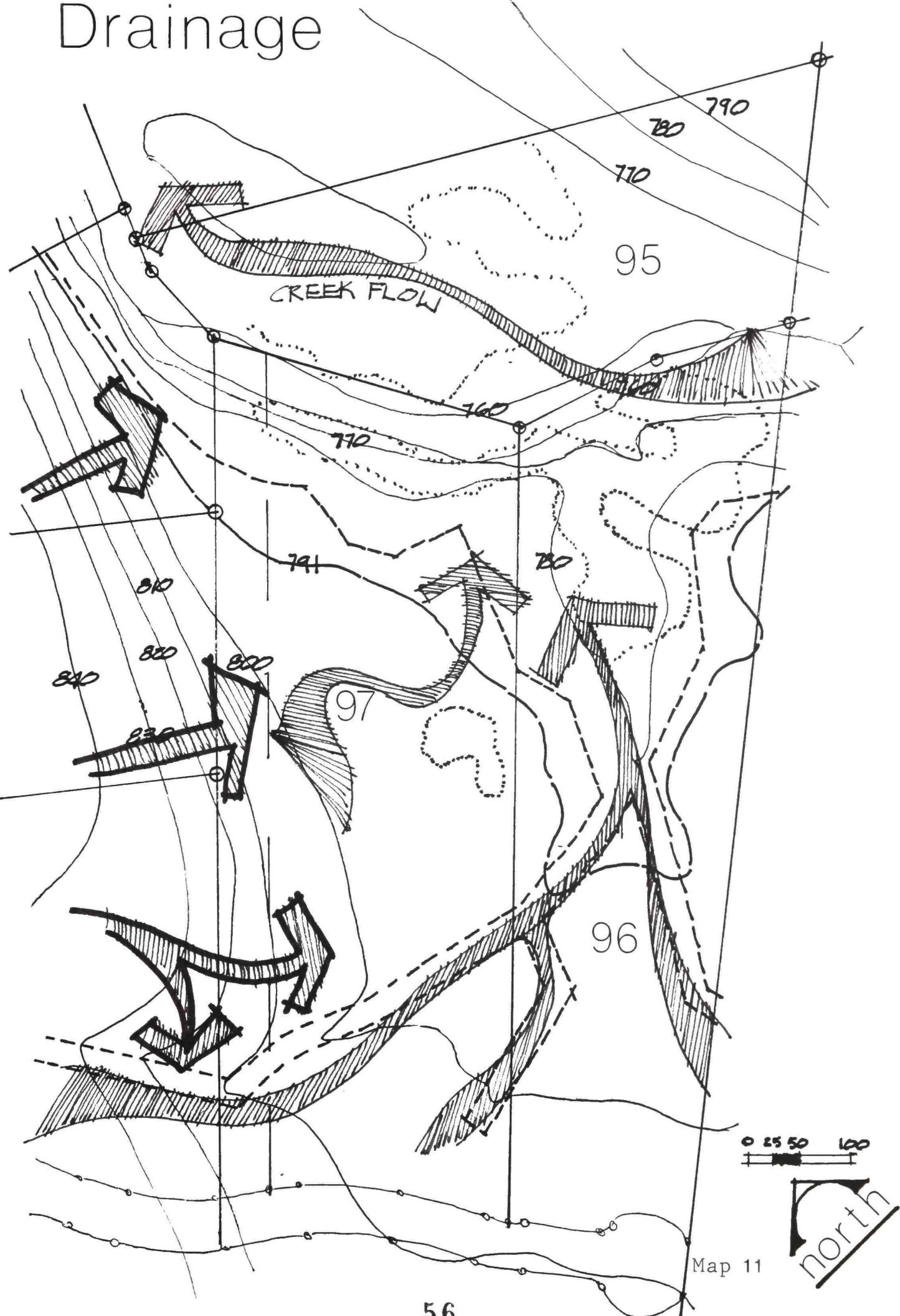
The land which makes up the Barton Creek Bluff area is composed of two basic types of soil consistency. The area in general is made up consistently hard bedrock. This bedrock is located throughout the area to the northwest and southwest of Austin and consists of the Edward formation, the Buda formation and the Bull Creek member of the Walnut formation. "This assemblage presents a moderate limiting factor for urban development: excavation is difficult and blasting is generally required: utility construction, landscaping and foundation excavation are expensive: sink holes, crevices, cavities, joints, and related seeps and springs are common. Slope stability and bearing capacity are good, however, and shrink-swell problems are minimal."

The land that makes up the creek bed and adjacent land areas are of a slightly different composition. This area is made up of alluvium deposits from the Colorado River and its tributaries. "These deposits are composed of sands, gravels, and clayey alluvium. Some of these, particularly the alluvium units, are easily excavated; slope stability is moderate to low. Bearing capacity and shrink-swell potential are also low to moderate. These materials are the source of the sand and gravel used as local construction materials. From an engineering standpoint, terrace and alluvium deposits pose few limitations to urban development."

Slopes



Drainage



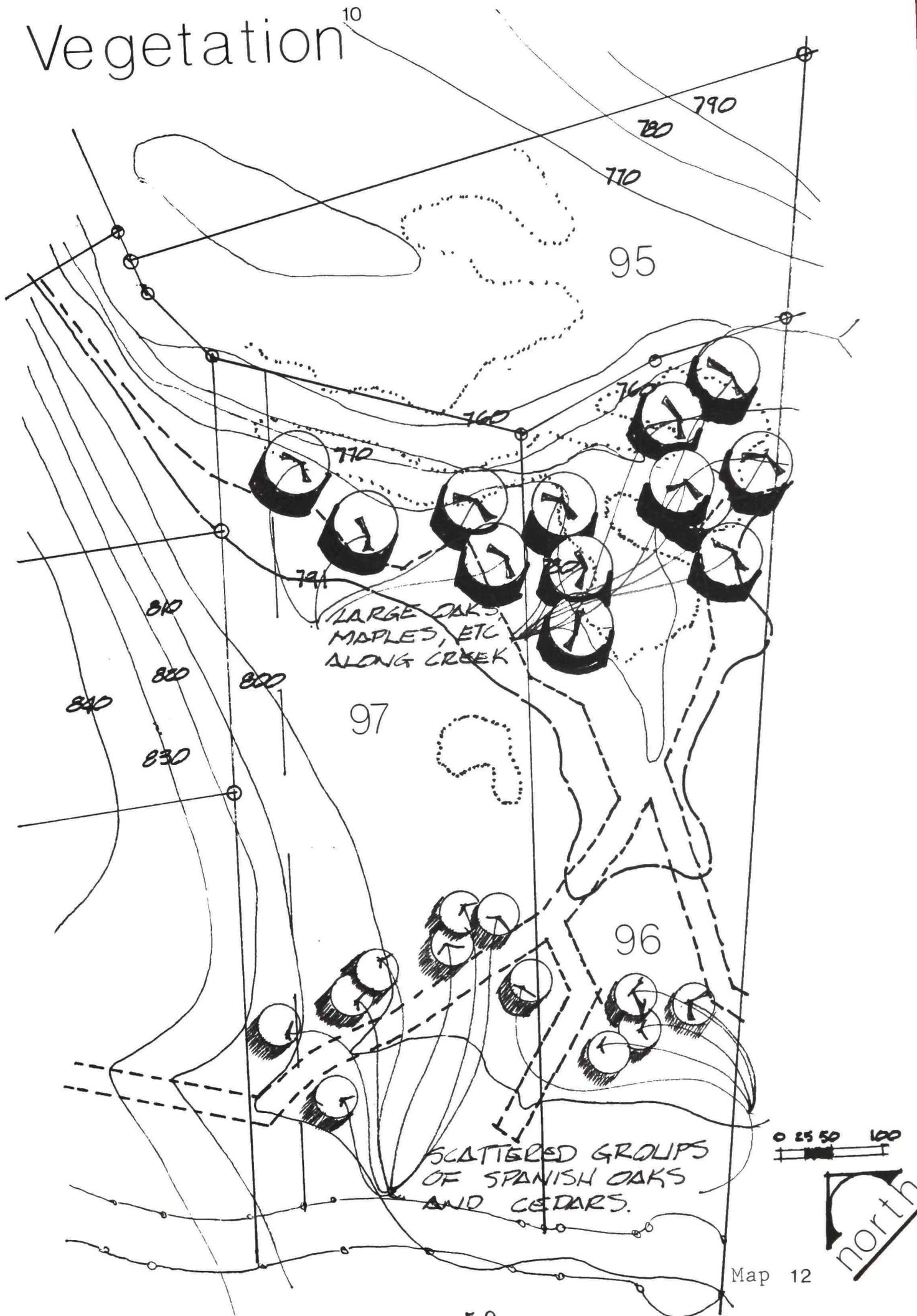
Slopes⁸

Slopes in excess of a fifteen percent grade pose a major limiting factor for development. Severe cutting and filling are often required when construction is desired on slopes of this nature, and this extreme landscape alteration often leaves severe scars on the land. In the case of the project site, with hard limestone bedrock, utility construction, storm drainage, water and waste water service costs are greatly increased. This contributes to an increased erosion potential of the unprotected slopes, leading to increased sedimentation in streams, creeks, and lakes. The site actually has no slopes with a fifteen percent grade but adjoining slopes exceed this grade and can pose problems on the project site if preventive measures are not taken.

Soil Limitations for Filter Fields⁹

"Where bedrock forms a consolidated impervious layer beneath the soil, septic tank effluent may surface at the nearest outcropping, and the steep slopes in the project area aggravate the problem. In many cases the bedrock has many cracks, fissures, and sinkholes which store and transmit water to the Edwards and Glen Rose aquifers. Septic tank effluent which is not absorbed by septic tank fields may enter these aquifers." In the project area, composed of shallow soils with fractured limestone and or dolomite bedrock, the problem with septic tank filter fields is a major obstacle.

Vegetation¹⁰





Photographs¹

ENDNOTES

¹Basic Data-City of Austin, (Austin, TX: City of Austin Planning Department, May 1980).

²U.S. Department of Commerce, County and City Data Book 1983, (Washington, D.C.: Bureau of the Census, 1983).

³U.S. Department of Commerce.

⁴Telephone Interview with Charles Lawrence, FAIA, 2 December 1984.

⁵How to Predict Interior Daylight Illumination, (Libbey-Owens-Ford-Company, 1976).

⁶Gale Research Company, Weather of U.S. Cities, Vol. 2 (Detroit, MI.: Book Tower, 1981).

⁷Austin Tomorrow Comprehensive Plan, (Austin, TX: City of Austin Planning Department, 1980).

⁸Austin Tomorrow Comprehensive Plan.

⁹Austin Tomorrow Comprehensive Plan.

¹⁰Sperry, Neil, Neil Sperry's Complete Guide to Texas Gardening, (Dallas, TX: Taylor Publishing Co., 1982).

The space summary is formulated into two parts, with subsets following each part. These subsets were formed according to type of space and the change in net-to-gross ratios, which will be used in the cost analysis. The two major sections are 1) restoration facility, and 2) the museum area.

RESTORATION FACILITY

Business Operations :

Office 300 sq ft

This is based on rule of thumb for office space from the Time-Savers Standards. This is allocated for one person office space.¹

375 sq ft

Office 400 sq ft

500 sq ft

Conference 200 sq ft

Based on a maximum of 15 occupants with 13 sq ft.²

250 sq ft

Storage 100 sq ft

General storage with a safe

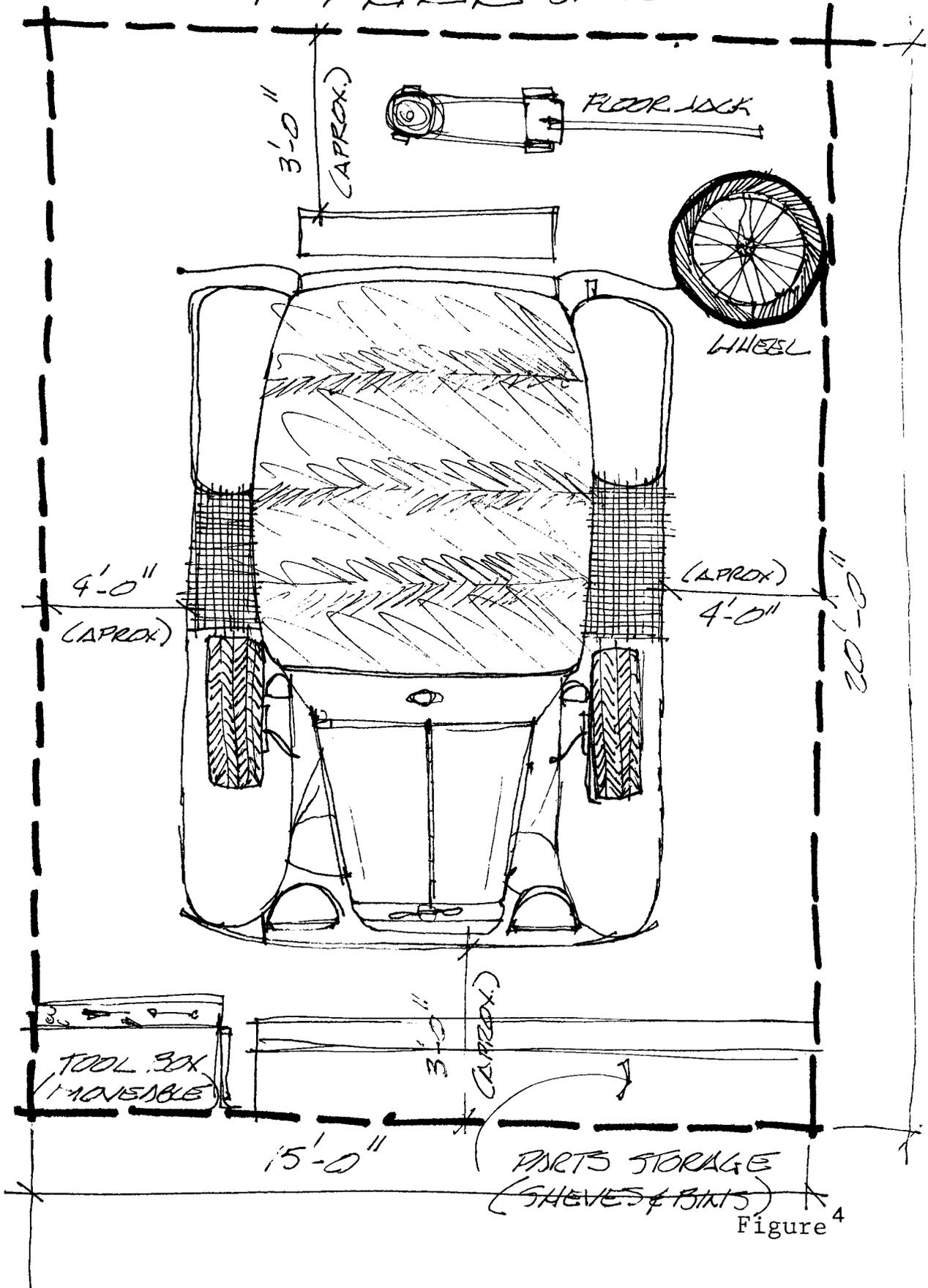
125 sq ft

Library 350 sq ft

Private library separate from main library that is located within the museum complex. The library should be adjacent to office and conference room.³

438 sq ft

MODULE (15'x20')



1 MODULE - 15'-20' (APPROX.) FOR ONE'S CAR. SERVES BOTH STORAGE & WORK PURPOSES. 20% MUST BE ADDED FOR CIRCULATION.

Drafting Room 150 sq ft
 Available for design work and production drafting
 for parts to be manufactured.⁴

188 sq ft

Lounge 400 sq ft
 Shared by workers and office personel. 15 people
 at 13 sq ft each.⁵

500 sq ft

Rest Rooms 200 sq ft
 Seperate facilities for men and women. One wash
 basin and one water closet.⁶

250 sq ft

Subtotal

Net 2100 sq ft

Gross(125%) 2626 sq ft

Restoration Process Area

Employee Clean Up and Rest Room 600 sq ft
 Showers, locker, wash basin, toilets.⁷

666 sq ft

Storage parts (large)⁸ 2500 sq ft

parts (small)⁹ 600 sq ft

automobiles (enclosed) 3000 sq ft

10 cars in 15' x 20' modules¹⁰

automobiles (outside, covered) 1500 sq ft

tools¹¹ 225 sq ft

paint	100 sq ft
raw materials	400 sq ft
wood, steel, fasteners, rubber	<u>9241 sq ft</u>
Tear Down & Catalogue	600 sq ft
2 modules (1 for operations, 1 for parts)	<u>666 sq ft</u>
Sandblasting	300 sq ft
1 module (possibly exterior)	<u>333 sq ft</u>
Chemical Stripping	600 sq ft
1 module for whole car (300)	
1 module for individual parts (300)	<u>666 sq ft</u>
Engine Shop	800 sq ft
	<u>888 sq ft</u>
Machine Shop	400 sq ft
	<u>444 sq ft</u>
Woodworking	1400 sq ft
1 module for car assembly (subframe)	
20' x 40' work space	<u>1554 sq ft</u>
Upholstery	1400 sq ft
2 modules and small work space ¹²	<u>1554 sq ft</u>
Paint Booth (2 separate facilities)	600 sq ft
1 module per booth ¹³	<u>666 sq ft</u>

Body Shop	1800 sq ft
6 modules	<u>1998 sq ft</u>
Final Assembly (large area)	1500 sq ft
5 modules in one clear span space for easy circulation and adequate space for finished product protection. ¹⁴	<u>1665 sq ft</u>
Workshop	300 sq ft
Specialty work and small part repair	<u>333 sq ft</u>
Final Fit & Finish	300 sq ft
1 module for make ready	<u>333 sq ft</u>
	Subtotal
	<hr/>
	Net
	18,925 sq ft
	Gross(111%)
	<u>21,007 sq ft</u>

MUSEUM FACILITY

Administration :¹⁵

Artifact Preparation	400 sq ft
Catalogueing and preparation. 1 module and a small work space.	<u>532 sq ft</u>
Storage	3000 sq ft
10 modules in storage for upcoming display or repair. Also for additional artifacts in museum	

SPACE RELATIONS ²⁰

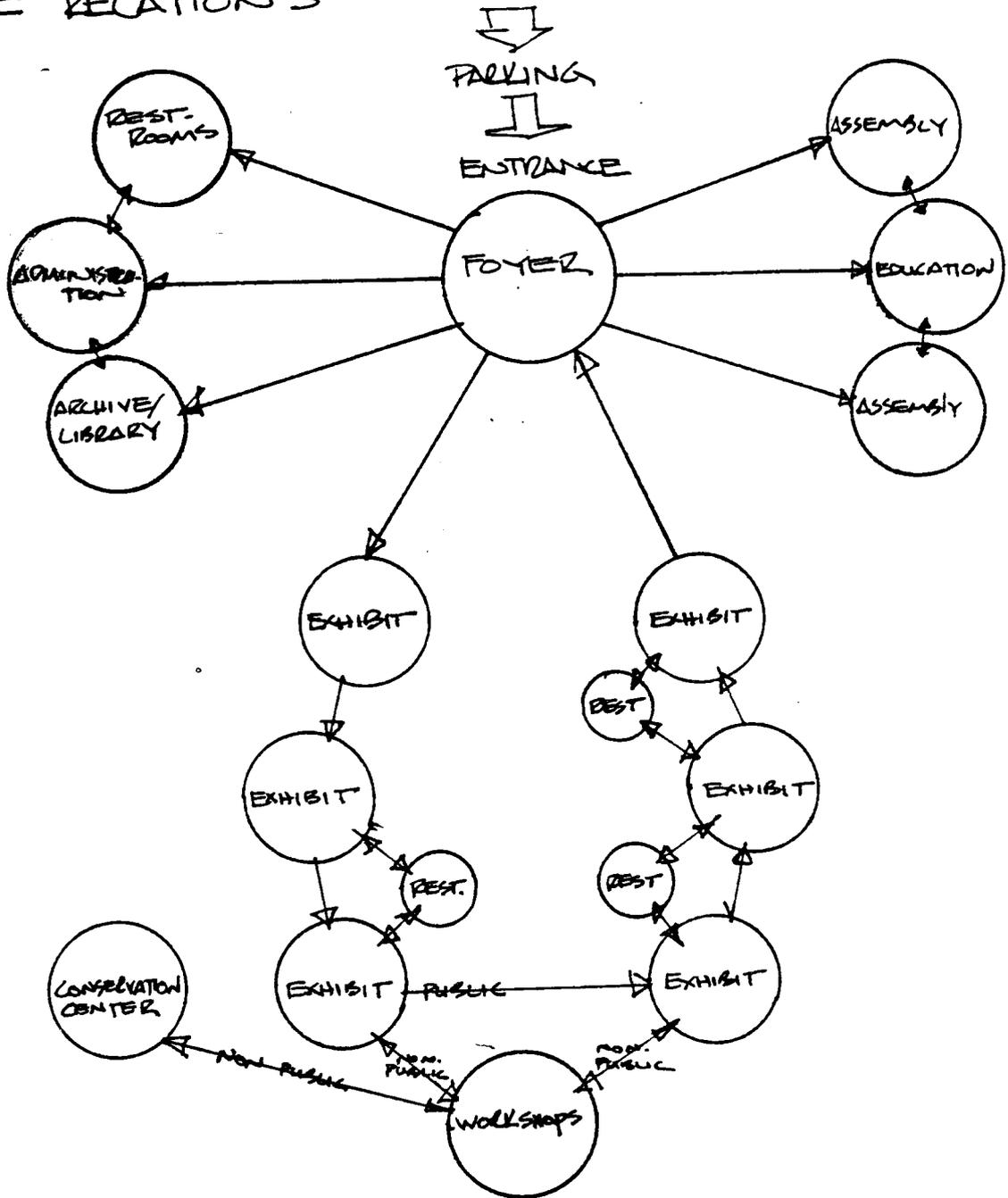


Figure ⁵

Showroom	2400 sq ft
	<u>3264 sq ft</u>
Showroom (small artifacts) ¹⁸	600 sq ft
	<u>816 sq ft</u>
Showroom (small artifacts)	600 sq ft
	<u>816 sq ft</u>
Rest Areas (three seperate areas)	300 sq ft
	300 sq ft
	300 sq ft
	<u>1224 sq ft</u>

Subtotals	<hr/>
Net	7600 sq ft
Gross(136%)	<u>10336 sq ft</u>

Research : ¹⁹

Library 1500 sq ft

Periodicals, and literature for the public.

This library would be a non-circulatory library shared by restorers who need to follow upon automobile research.

	<u>1860 sq ft</u>
Computer	300 sq ft
	<u>372 sq ft</u>

Subtotal	<hr/>
Net	1800 sq ft
Gross(124%)	<u>2232 sq ft</u>

THE EXHIBIT ¹⁷

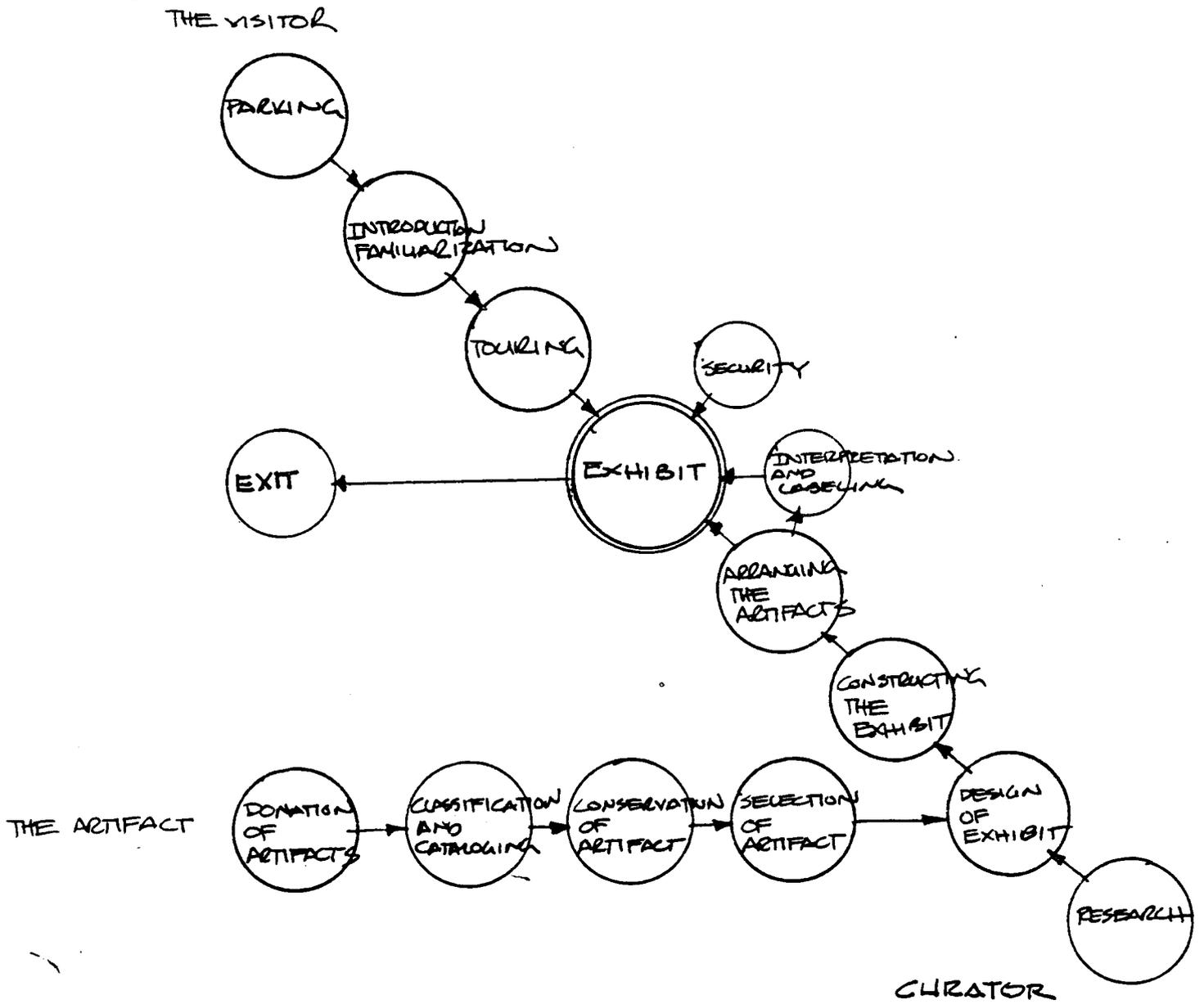


Figure ⁶

TOTALS

Restoration :

A. Business Operation	2100 sq ft
	<u>2626 sq ft</u>
B. Restoration Process Area	18925 sq ft
	<u>21007 sq ft</u>

Museum Facility :

C. Administration	6275 sq ft
	<u>8346 sq ft</u>
D. Visitation	7600 sq ft
	<u>10336 sq ft</u>
E. Research	1800 sq ft
	<u>2232 sq ft</u>

Mechanical (10 % of net total space) 3670 sq ft

Total Net Space 40,370 sq ft

Total Gross Space _____
48,217 sq ft

Total Gross Building Space 48,217 sq ft

ENDNOTES

¹Callender, John Hancock, ed., Time-Saver Standards for Architectural Design Data, sixth edition, (New York: McGraw-Hill Book Company, 1980).

²Callender.

³Packard, Robert T., ed., Architectural Graphic Standards, (New York: John Wiley & Sons, 1981).

⁴Packard.

⁵Callender.

⁶Packard.

⁷Packard.

⁸Telephone Interview with Coleman Classic Motors, 25 September 1984.

⁹Telephone Interview with Coleman Classic Motors, 25 September 1984.

¹⁰"Survey to Brachman Coachbuilders," 4 May 1984.

¹¹Telephone Interview with Coleman Classic Motors, 25 September 1984.

¹²Telephone Interview with Coleman Classic Motors, 25 September 1984.

¹³"Survey to Brachman Coachbuilders," 4 May 1984.

¹⁴Niemann, Nemo, "White Post Restorations," Skinned Knuckles, Vol. 4-No. 1 (Aug. 1979), pp. 30-36.

¹⁵Stephens, Jaye, Laguna Gloria Art Museum, n.p. (original) 1982.

Building Cost ¹

A.	Business Facility		
	2626 sq ft @ \$65.00		\$170,690
B.	Restoration Facility		
	21007 sq ft @ \$37.60		\$789,863
C.	Museum Administration		
	8346 @ \$69.20		\$577,534
D.	Visitation		
	10336 sq ft @ \$69.20		\$715,251
E.	Library		
	2232 @ \$81.00		\$180,792
		Total	
			<hr/>
			\$2,434,130

Escalation to mid-point of construction.

1 year or 12 months at 11% per year.

\$2,434,130 x 5.5% escalation ²	=	\$133,877
		<hr/>
		\$2,568,007

Fixed Equipment (8% of building cost) ³ \$205,440

Site Development (15% of building cost) ⁴ \$385,201

Total Construction Cost

Combined building, fixed, and site development.

\$3,158,648

Site Acquisition (already owned) ⁵		\$100,000
Moveable Equipment (8% of building cost) ⁶		\$205,440
Professional Fees (6% of construction Cost) ⁷		\$189,519
Contingencies (10% of construction cost) ⁸		\$315,864
Administrative Cost (1% of construction cost) ⁹		\$31,586
<u>Total Budget Required</u>	=	\$3,901,057
Total Budget @ 90.2 cost index for Austin, Tx ¹⁰		\$3,518,753
Permanent Financing Cost (investment fee) ¹²		\$140,750
4% of total budget required.		
Permanent Financing Cost (construction loan fee) ¹³		
2 points(2% of total budget required.) \$70,375		
Permanent Financing cost (interim financing)		\$206,726
11 3/4% interest for half the total budget for a period of one year. ¹⁴		
Total Cost of Project	=	<u>\$3,936,604</u>

PROJECT DEVELOPMENT and CONSTRUCTION SCHEDULE ¹⁵

The construction is a complicated process and involves several factors that are both predictable and unforeseen. This is a tentative schedule proposal that lists important dates for construction.

December	1985	Bid Date
February	1986	Site Preparation
		Grading and Foundation Work
March		Building Construction
July		Mechanical
		Plumbing
		Electrical
October		Interior Finishes
January	1987	Completion

Amortization Schedule¹⁶

Payment per year = 39,736.46 x 12 = 437,101.06

Year	Principal portion	Interest portion	Principal Balance
-----	-----	-----	-----
1987	14,614.75	422,486.31	3,921,989.25
1988	16,929.82	459,909.70	3,905,059.43
1989	19,029.78	457,807.74	3,886,029.65
1990	21,390.19	455,447.33	3,864,639.46
1991	24,043.40	452,794.12	3,840,596.06
1992	27,025.70	449,811.82	3,813,570.36
1993	30,377.94	446,459.58	3,783,192.42
1994	34,145.97	442,691.55	3,749,046.45
1995	38,381.38	438,456.14	3,710,665.07
1996	43,142.16	433,695.36	3,667,522.91
1997	48,493.44	428,344.08	6,619,029.47
1998	54,508.50	422,329.02	3,564,520.97
1999	61,269.65	415,567.87	3,503,251.32
2000	68,869.45	407,968.07	3,434,381.87
2001	77,411.90	399,425.62	3,356,969.97
2002	87,013.98	389,823.54	3,269,955.99
2003	97,807.04	379,030.48	3,172,148.95
2004	109,938.90	366,898.62	3,062,210.05
2005	123,575.56	353,261.96	2,938,634.49
2006	138,903.68	337,933.84	2,799,730.81
2007	156,133.06	320,704.46	2,643,597.75
2008	175,499.60	301,337.92	2,468,098.15
2009	197,268.29	279,569.23	2,270,829.86
2010	221,737.18	255,100.34	2,049,092.68
2011	249,241.13	227,596.39	1,799,851.55
2012	280,156.62	196,680.90	1,519,694.93
2013	314,906.39	161,930.68	1,204,788.09
2014	353,967.41	122,870.11	850,820.68
2015	397,873.00	78,964.52	452,947.68
2016	447,224.56	29,612.96	5,723.12
2017	5,723.12	57.11	.00

ENDNOTES

¹Pereira, Percival E., ed., Dodge Construction Systems Costs 1984, (Princeton, N.J.: McGraw-Hill Inc., 1983).

²Godfrey, Robert Sturgis, Building Construction Cost Data 1984, (Kingston, MA.: Construction Consultants & Publishers, 1983).

³Pena, William, Problem Seeking, (Houston, TX.: CBI Publishing Company, Inc., 1977).

⁴Pena.

⁵Telephone Interview with Charles Lawrence, FAIA,
2 December 1984.

⁶Pena.

⁷Pena.

⁸Pena.

⁹Pena.

¹⁰Pereira.

¹¹Pena.

¹²Pena.

¹³Pena.

¹⁴Interview with Bob Tate, First National Bank,
11 December 1984.

¹⁵Kavanagh, Thomas C., Frank Muller, James J. Obrien.
Construction Management: A Professional Approach, (New York:
McGraw-Hill Book Company, Inc., 1977).

¹⁶Interview with Bob Tate.

Structural Issues

The structural system should be a sound structure that is capable of resisting adverse weather conditions. The structure should be insulated enough that the operational costs for both long and short terms will be minimally affected. The temperature shall be easily controlled to maintain a comfortable temperature in Winter, Summer, Spring, and Fall.

The floor support system shall be of concrete with a smooth surface that does not retain dust and dirt particles. This floor system should be adequate to support cranes, heavy equipment, trucks, and the structural system itself. In addition to this, the floor system should be able to support concentrated loads. The surface should be easy to clean and should be dyed to a color consistent to the color scheme that is chosen throughout the building. The surface shall also be resistant to grease, acids, and paints.

The roof system shall be a clear span structure that allows for easy circulation of both equipment and people. This roof system will need to be clear span in the assembly area only. This is due to the nature of antique automobile restoration which is done in a piece by piece assembly process that shares common support systems and spaces. The ceiling should not collect dust and paint particles and must be easily accessible for cleaning. The ceiling shall also be a relatively low ceiling so as not to create extra space for climate control.¹

The structure shall not prohibit the manipulation of automobiles in any way. This is very important since many of the automobiles will not be under their own power and circulation restrictions can be very distractive.

The structure shall be adequately soundproofed so that the sound from the process will not be distractive to the office or museum operation. The heart of the restoration shop is the air compressor and relative support systems. However, this generally makes an excessive amount of noise that can be very distractive. Therefore, the structure and wall systems shall be soundproofed within themselves as well as toward the outside environment. The compressors shall be put in areas that can be adequately soundproofed.

The structure shall be successfully ventilative so as to remove harmful pollutants and dispose of them in a manner that is not harmful to the exterior environment.²

The structural systems shall allow natural daylighting to be utilized except where this would limit the successful restraint of sound, pollution, and climate control.

The enclosure materials shall be of sturdy material that shall not be easily damaged as some operations involved with restoration can be damaging to the wall surfaces. The surrounding wall enclosure shall be of a slick surface quality that is resistant to grease, oil, paint overspray, and dust. An epoxied steel panel would possibly lend itself to this task. All of the openings in the enclosure systems shall be smooth, flush mount and with a minimum of lips, crevices, and ridges, so as to minimize dust collection.

Mechanical Systems

The mechanical systems shall be designed to meet the specific needs of each individual space. The main assembly area shall have a large open span space which will require increased climate control with a greater need for air exchange, and conditioning recharge when openings must be opened and adverse weather conditions are allowed to enter the area. the entire system must be concealed to avoid collection of dust and other unwanted pollutants. The system in this area shall be easily rearranged since this area will be the most likely to be rearranged with the increased restoration load and increased technology becomes available.³

The office area will need a simple central air mechanical system which will have separate thermostats and control devices. the museum will need a system much as the assembly area because of the large span sizes. The system involved here will not however, need to be as complex as the mechanical system in the assembly area. The museum spaces are less effected by heat and will have less air recharge requirements due to a relaxed heat load and fewer BTU's from machinery and occupants.

The individual restoration spaces shall have their own mechanical system interlocked with each other. This system will have to be separate from the main assembly area system. Each space shall have its own control thermostats and can be shut off from the main system in case of fire or air contamination in the system. The exception to these spaces will be the paint area, the sandblasting area, the chemical stripping

area, the woodworking area. These areas will have to have a small independent mechanical system that will exchange air at a increased amount upon demand without affecting the other space environments. These additional restraints are due to the increased heat loads that are incurred in the processes. Also there are ventilation and air exchange requirements in these areas. In addition to the air conditioning/heating systems, there must also be exhaust fans for removing pollutants.

The above mechanical systems must be the most cost effective in terms of the long range costs and operational cost cycling.

The mechanical systems should ber able to maintain an interior temperature of 68 degrees with an exterior fluxuation in the 18 to 100 degree range.⁴

The floors in the paint facilities should be electrostatic so as to pull dust particals and overspray onto the ground with the least amount of air circulation while painting is occurring.

The enclosures in the paint rooms and sandblasting areas shall be air tight and have no air circulation if desired. The sandblasting area shall have the affect of a reverse seal to keep the particals from entering the adjacent areas, and the paint booths shall prohibit particals from entering the paint area. Exhaust fans will be responsible for removing the particals from these spaces.⁵

In the restoration areas, excluding paint areas, chemical areas, upholstery area, and storage areas, shall all be equiped

with couplers to tie into the acetelene, oxygen, electric supply, and compressed air systems. Compressed air shall be available from a concealed and soundproofed area, and shall be piped throughout the building. There should be no areas that are in the restoration facilities in which automotive work is performed that air is not readily available, and is not regulatable.

Acetelene and oxygen for use with gas welders shall be piped throughout the building restoration facility so as the availability shall not exceed from point-to-point twenty feet. These couplers shall be of different sizes, as outlined in the OSHA handbook for industrial safety, so as not to get the leads confused or mistaken.

Electric pigtails shall be available for arc welding at points not to exceed forty feet from point-to-point. These should also be marked and have different size couplers to insure proper ground and positive arc pigtails. At each point of connection, a voltage load regulator shall be installed in order to regulate arc current and resistance.

Electric current in 110 voltage shall be ampally supplied and should not exceed a point-to-point span of 12' on any wall surface, and every wall shall have at least one outlet. These outlets shall be a minimum distance from the floor level when possible to prevent circulation confusion, and shall be over all workbenches at the appropriate level. Convenience outlets over benches shall be a minimum of 4' apart and shall be adequately grounded.

Electrical

Electrical current in 110 voltage shall comply with the mechanical outline on electrical outlet location. In addition, 220 single phase and three phase shall be supplied at locations that are next to heavy equipment that requires such electrical service.

The electricity supply shall conform to all regulations and restraints in the National Electrical Code.

Illumination of each space shall meet requirements laid out in the IES Lighting Handbook.

The lighting/electrical supply shall be visually pleasant and should not be obtrusive or located in a dangerous area.

Rooms that have computerization, library, main library, offices, catalogueing and tear down, and storage, shall be adequately grounded and supplied according to the manufacture specifications.

Floor plugs shall be located at all places, including the museum, restoration facility, and storage areas, that are large enough that the maximum distance to any wall plug be greater than 20'. These floor plugs shall not, however, be located in the direct path of public or employee circulation.

Lighting shall be located in the roofs and walls when natural lighting is conducive and does not adversely affect the climate control of the area.

When lighting by natural means is not feasible, artificial

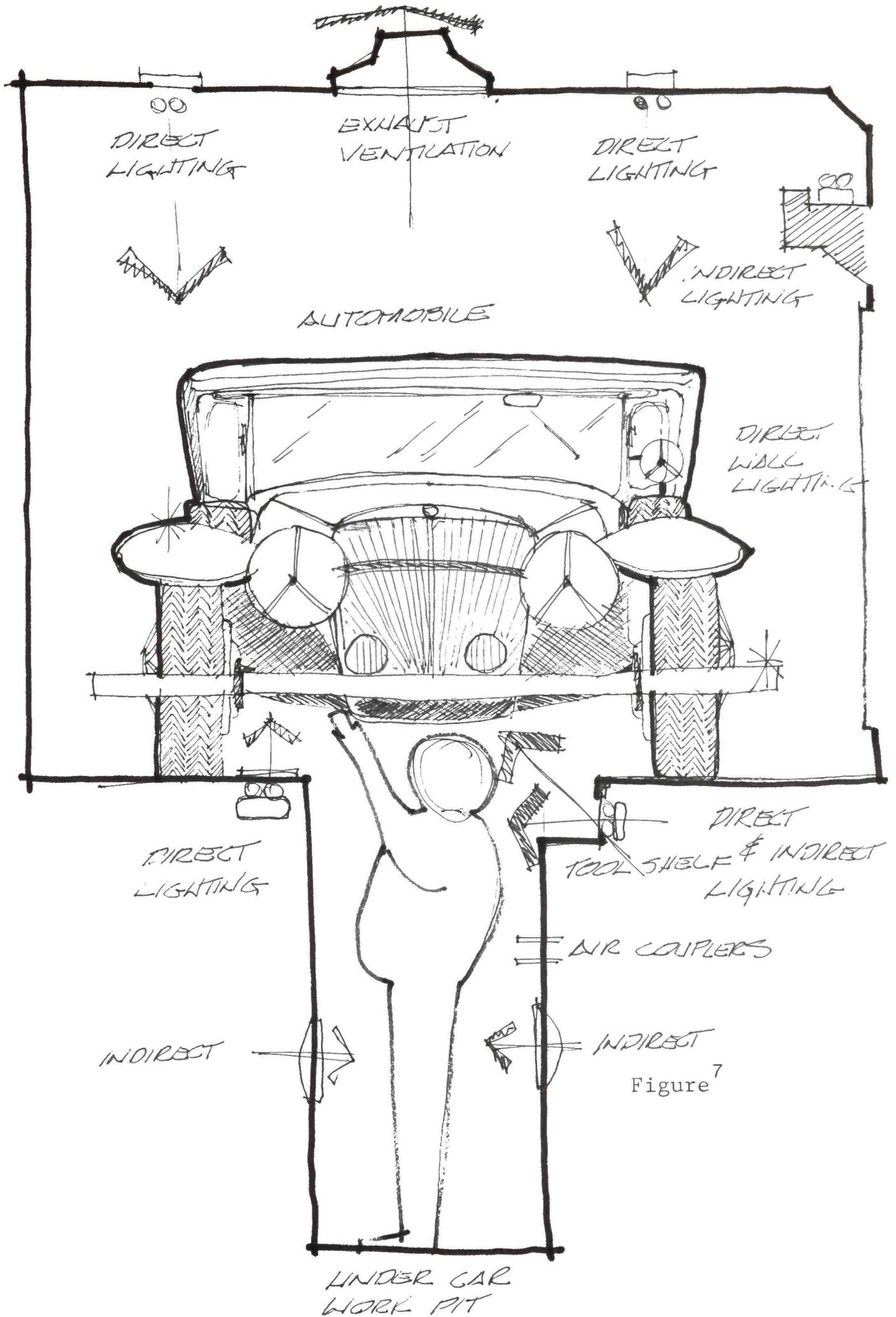


Figure 7

lighting shall be supplied to bring the space up to the recommendations of the IES Lighting Handbook. This lighting shall maximize efficiency and operational cost benefits. The light element shall be the most durable and shall be energy efficient to the utmost degree.

All lighting shall be indirect except where this is not feasible such as in the paint room.

In the areas that electrical explosions or chemically flammable materials are used, such as in the chemical stripping area, paint area, woodworking area, and machine shop, all electrical outlets shall be explosion proof and cause no spark in their use. Proper ground faults shall also be utilized throughout the building.

In locations of special lighting needs (paint areas, final fit and finish, machine shop, repair room, and museum showroom areas) the lighting shall be flexible, and accommodate these needs for intensified, indirect, and focal lighting.

Transportation

The approach to the site shall be adequate to carry and support trucks supplying various supplies. The roads should also be wide enough to allow two lanes of traffic. One onto the premise, and one off the premises. This can be carried out by utilization of entrance and exit roadways.

Once onto the site, visitor and employee parking shall be separated. There should also be a separate area for receiving and shipping, as well as an area to load and unload automobiles from car haulers and transports. The parking should be unobtrusive and should not be single leveled or in the direct path of important views to the creek or onto the bluff. The parking should be well landscaped and should not support a walking distance of more than 100' to the entrance. The parking should be sufficient to handle 20 cars for the restoration facility employees and office personnel, (1 car for every 1000 sq ft); 5 cars for the museum administration employee parking, (1 car for every 1500 sq ft); 30 cars for the visitation and research area of the museum, (1 car for every 400 sq ft).⁶

A receiving area for guest to the museum is to be covered and adequate for two lanes of traffic, one in each direction.

All surfaces shall be accessible to the handicapped.

A system of floor supportive and overhead conveyance should be designed to be efficient, cost effective, and minimize long term cost overhead. These systems shall be supplied

in the restoration areas. The following areas shall have floor conveyence systems such as dollys, or tracks:

- parts and automobile storage areas
- sandblasting
- paint booth
- body shop

The following areas shall have overheard conveyence systems:

- Tear down and catalogue
- engine shop

The following areas shall have both overhead conveyence and floor conveyence systems:

- chemical stripping
- final assembly
- body shop

The overhead conveyence systems shall be linear slide systems with a single direction slide,except for the assembly area which must have a dual direction slide. These overhead systems shall be at least 3 tons in maximum capacity support.⁷

Security and Safety

The security systems shall be self supportive and self activating. These systems shall be concealed in all openings and passageways. These shall also be connected to the police and security patrols.

The museum, in addition to doorways and openings, shall also have motion detectors that can be activated during closing hours. In the museum there should also be a guard on duty to provide information and security. This guard shall be high visibility. Specific display cases and shelving that displays small objects shall be alarmed with sonic glass breaking detectors and where glass is not present shall be protected by electronic beams.

The building shall also have fire alarm systems that meet federal regulations and detection specifications. This should be connected to the appropriate fire quenching devices.(ie. sprinklers, chemical diffusers, and smoke exhaust systems)

There should be a backup system in case of power failure and lights as well as alarms, and exit instructions shall be supported by these support systems.

Fire alarm manual activation should be available throughout the museum and should be placed in each module of the restoration facility.

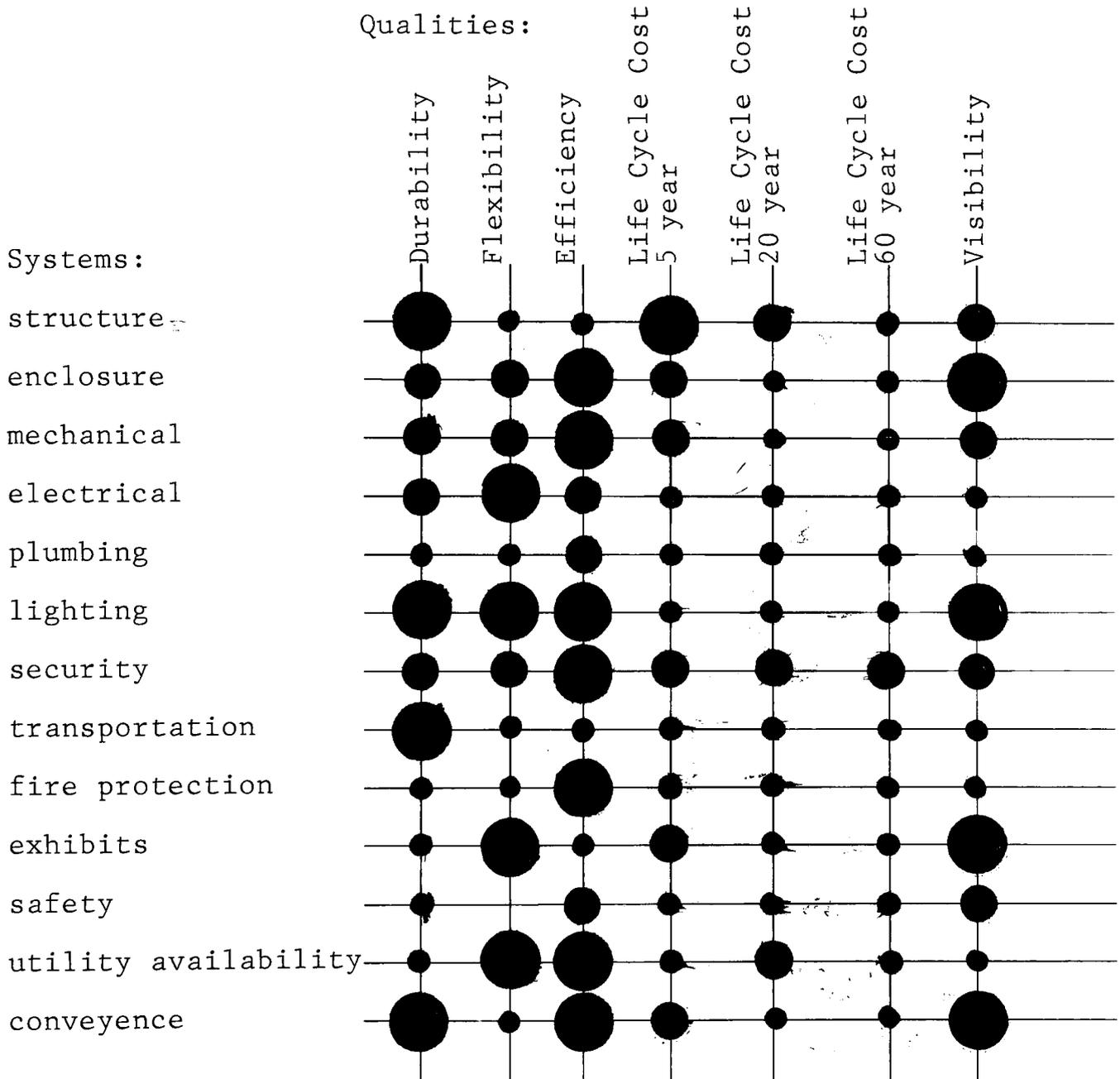
The employees as well as visitors shall be warned when overhead equipment is in use by audible alert warning devices.

First aid should be available in the rest areas of the museum, a central area to the administration offices in both the restoration facility and the museum facility, and in

the employee clean up and locker area of the restoration area.

In designing for safety, consult the OSHA Safety Regulation Manual.

SYSTEM QUALITIES



Figure⁸

IMPORTANCE:

Maximum



Minimum



Medium



ENDNOTES

¹"Case Study" (photocopy) n.d. Wilson, Donald T. Jr.

²Boyd, John H., American Cotton Growers Industrial Textile Plant, n.p. (original), 1982.

³"Case Study"

⁴Billman, Jeffery D., Northpark National Bank Tower, n.p. (original), 1981.

⁵"Case Study"

⁶Packard, Robert T., ed., Architectural Graphic Standards, (New York: John Wiley & Sons, 1981).

⁷"Case Study"

Facility # 102 Facility Title : Office

Number Of Occupants : 2 Assignable Floor Area : 400 sq ft

Functional Description : This office would serve the office secretary and the project manager. It should haouse all important files and information.

Environmental Description : Walls should be durable and easily maintained. This room will have heavy traffic.

Architectural : The architectural environment will be functional. The traffic will be great and needs to be durable to withstand this increased traffic. This will include resistance to grease, dirt, dust, and oil. This must have adequate lighting for recommended foot candles. The floor should not have carpet.

Mechanical : The mechanical system will need to be adequate to maintain a 69 degree average. This room does not need its own thermostat control, just a temperature maintenance control.

Equipment : The equipment in this office will consist of typwriters, fileing system with good retrieval. Phone system, intercom system, general office equipment. Two desks. It will also need two terminals for the office secretary and the manager. This room should be equipped with adequate seating for two additional people.

Storage : Storage should be in the form of secretarial supplies and fileing system.

Location Relevant to Adjacent Spaces : This facility needs to be adjacent to the other office, the safe, and the main assembly area.

Facility # 103 Facility Title : conference

Number Of Occupants : 15 max Assignable Floor Area : 200 sq ft

Functional Description : Used for business conference with customers and office/employee meetings for scheduling and research.

Environmental Description :

Architectural : This room will need to be elegant for customer meetings, but durable for employee meetings. This will require a heavy duty commercial carpet, and wall covering that is resistant to oil, grease, and dirt, but that is aesthetic and pleasing.
Possibility of natural lighting in this area.

Mechanical : This area shall be on the same mechanical system as the offices and library. Thermostat control is required. This area should also have running water for a wet bar.

Equipment : This conference area should be equipped with one large conference table, adequate chairs for 15. There should also be a bar, shelves for books, proper lighting, one computer terminal , and telephone - intercom system.

Storage : Requires no storage other than bookshelves.

Location Relevant to Adjacent Spaces : Should be adjacent to offices and library.

Facility # 105 Facility Title : Private library

Number Of Occupants : 3 Assignable Floor Area : 350

Functional Description : A private library for the manager and office . will be separate from the main library but connected with computer terminal. will serve as reading area.

Environmental Description :

Architectural : Needs to be a relaxing setting for reading and relaxing study. Should be sound proof from restoration areas. should be carpeted, with good soft wall textures. Lighting needs to be variable and flexible. Should range from intense to subdued lighting characteristics.

Mechanical : Mechanical system that is for other office and conference areas. Needs separate thermostat control. Computer terminal should be provided here so electrical supply and ground is necessary.

Equipment : Will need three desks (small) for writing, and two chairs for reading. Each should have independent lighting. The area should be equipped with abundance of shelving and storage for books. This area should have fire proof walls and fire box storage.

Computer terminal should be provided for this area.

Storage : Storage for books and documents. Both shelving and fire safe storage.

Location Relevant to Adjacent Spaces : Should be adjacent to the drafting room, office 101, and the conference.

Facility # 106 Facility Title : drafting room

Number Of Occupants : 1 Assignable Floor Area :150 sq ft

Functional Description : Would serve as drafting room for client and customers who are doing design work on an automobile. Would also serve to make shop drawings and machine drawings for manufacture of special parts.

Environmental Description :

Architectural : Must have comfortable floor covering that is easy on feet, such as thick pad carpet. Lighting must be intense and variable. Wall material should be covered so that entire wall surfaces can be used as a tack board for pin up. Ceiling should be a grid type ceiling for hanging of objects and so lighting can be manipulated. The mechanical could be exposed.

Mechanical : Simple mechanical system as in other office areas. Could be exposed and flexible to what ever extent is possible.

Equipment :Should have drafting table, and 1 layout table. slide projector and opaque projection equipment. One drafting stool. Grid ceiling for hanging. Natural lighting if possible. Adjustable lighting that can be dimmed. ONE standard chair for sitting. Should have shelving and flat files.

Storage : Role storage, flat files, and shelving for books. Small closet (approx 10 sq ft) for drafting equipment.

Location Relevant to Adjacent Spaces : Should be near library and project manager office # 102.

Facility # 107 Facility Title : lounge

Number Of Occupants : varies Assignable Floor Area :400 sq ft

Functional Description : Serve as lounge for employees of facility.
will be used on breaktimes and lunches.

Environmental Description :

Architectural : Will need to be durable from employee use.
This will require grease, oil, and dirt resistant wall,
floor and furniture, since employees of restoration facility
will be utilizing the space. Should be soft interior
atmosphere conducive to relaxing. Carpeted with heavy duty
commercial carpet.

Mechanical : Adequate mechanical sytem to cool and heat the
facility when in use. Can be from the assembly area
mechanical system if office sytem is not efficient to use for
this purpose. Natural ventilation can be utilized and should
if possible.

Equipment : Tables and chairs to seat 20 people maximum. Will
need small microwave oven, sink, coffee machine, vending
machines according to employee request. Small refrigerator.
1 couch. to be included in the seating requirement. Cabinets
for food and likewise storage.

Storage : Cabinets of 30 sq ft for food and pantry use.
Refrigerator.

Location Relevant to Adjacent Spaces : Should be adjacent to
the main assembly area and should be accessible from other
office areas.

Facility # 201 Facility Title : employee clean up

Number of users : 10-20 Assignable Floor Area : 600 sq ft

Functional Description : Employee clean up and rest rooms.
This area is for the restoration people. It will be lockers
changing, and rest rooms.

Environmental Requirements : Modules : 2 modules

I Floors: Floors will need to be a surface resisitent to oil and
grease. It will need to be a surface that is not slick
when wet since this area will have showers and clean up.

II Walls and Partitions: Have partitions to seperate toilet
facilities and shower facilities. Must also seperate
lockers from general clean up. Partitions need not be full
ceiling height, but do need to be resistant surface to
grease. A spectra-glaze II or like product should be utilized
in this area.

III Ceilings : Ceiling should be durable and not conducive
to dust collection. Can be open to structure and have exposed
mechanical.

IV Doors Windows : Door should be swinging door with no locking
mechanism. Toilet partitions should be lockable from within.
Natural lighting should be used if possible.

V Mechanical : Needs no mecahnical system except for existing
system in the assembly area.
Exhaust fan for area.

VI Electrical : Must have ground fault electrical outlets and
lighting fixtures.

VII Utility Service : Hot and cold water supply and sewage
handling equipment for toilet and wash basins.

VIII Life Safety : Non-slip surface on floors and ground fault
electrical. Grab rails for showers .

IX Equipment : Wash basins for 5, two toilets, 1 urinal, 1 wash
up stand, lockers, 2 showers, seating, first aid, cabinets.

Facility #202 Facility Title : Large part storage

Number of users : 0 Assignable Floor Area : 2500 sq ft

Functional Description : Storage of large parts and equipment such as engines, fenders, frames, etc. that need to be stored indoors. This would also be storage for finished products awaiting assembly.

Environmental Requirements : Modules :

I Floors: Concrete, or wood floors if storage is overhead. must be able to withstand medium loads on concentrated amounts of 1000 pounds. Should have conveyance system.

II Walls and Partitions: Should be grid or like wall system so parts could be hung on the wall. This surface should be durable and easy to clean. Should be covered floor to ceiling and insulated.

III Ceilings : Should be grid system for hanging of parts and lights. Can be exposed above grid to structure if desired or budget requires.

IV Doors Windows : Should have double doors for large part handling and should have open width of 10'. Should be no windows due to security problems and climate control.

V Mechanical : No mechanical system needed. Lighting should be adequate to light area.

VI Electrical : Electricity to lighting . Supply should also be made available for conveyance system control.

VII Utility Service : none

VIII Life Safety :

IX Equipment : Track for conveyance system, shelving for storage, hanging for parts,

Facility # 203 Facility Title : small part storage
Number of users : 0 Assignable Floor Area : 600 sq ft
Functional Description : Storage for small parts and new parts.

Environmental Requirements : Modules : 2

I Floors: Concrete if on ground level, wood or steel if located on upper levels.

II Walls and Partitions: Strong enough to hold parts bins, or shelving. Possible to use grid wall system for hanging versatility.

Should be eight foot in height.

III Ceilings : Enclosed ceiling for dust control and cleaning.

IV Doors Windows : Four foot door opening for access to part area. No windows.

V Mechanical : Supplied with cooling and heating. Should not be exposed mechanical system.

VI Electrical : Electrical supply for lighting and convenience outlets. Must also be supplied with proper grounding and electric supply for computer terminal to be connected with main inventory program.

VII Utility Service :

VIII Life Safety : Fire extinguisher.

IX Equipment : Computer terminal, shelving, lockable storage cabinets, glass storage cabinets. self standing storage bins.

Facility # 204 Facility Title : enclosed auto storage
Number of users :10 cars Assignable Floor Area : 3000 sq ft

Functional Description : Storage for unrestored cars that require enclosed storage, or for restored cars that are finished. This would also be the place for cars in the restoration process awaiting parts or equipment.

Environmental Requirements : Modules : 10

I Floors: Concrete floors, dyed to designer choice of color. Should be smooth surface to make easy for car manipulation and cleaning.

II Walls and Partitions:Should have no partitions in area to avoid inhibiting car moving. Exterior doors must open up to 12 ' width and have security alarm and lock. Interior doors should also open to 12' width.

III Ceilings : Exposed.

IV Doors Windows : See above.

V Mechanical Mechanical system for humidifying and dehumidifying. Temperature control to maintain constant temperature of between 65 and 72 degrees. Can have floor heating radiants.

VI Electrical : Supply for heating and outlets. Lighting should be florescent fixtures and should be on the ceiling only.

VII Utility Service :

VIII Life Safety : Storage shelves, lockable cabinets, fire extenguisher, sprinkler system, fir wall between adjacent areas rated for five hours.

IX Equipment :Storage shelves, lockable cabinets, floor conveyance sytem,

Facility # 205 Facility Title : Outside storage for cars
Number of users : 6-7 Assignable Floor Area : 1500 sq ft
Functional Description : Storage for unrestored cars that do not
require covered, enclosed storage.

Environmental Requirements : Modules :

I Floors:
Concrete, unless budget will not support this construction
system. Asphalt ,otherwise.

II Walls and Partitions:
Open to outside. Protection wall against wind and rain if
located on the south side.

III Ceilings : Steel roof system or material of equal quality.
Must be clear span or divided into stalls. The preferred
system is clear span.

IV Doors Windows :

V Mechanical :

VI Electrical : Some lighting for night security.

VII Utility Service :

VIII Life Safety :

IX Equipment :

Facility # 206 Facility Title : tool storage

Number of users : 0 Assignable Floor Area :225 sq ft

Functional Description : Storage for small tools that need to be controlled by project manager. This would contain specialty tools and tools that are not to be handled except by qualified personnel.

Environmental Requirements : Modules :

I Floors: Concrete floor to match existing areas adjacent to this space.

II Walls and Partitions: Reinforced wall system with restrictive qualities.

Can be cage type system.

III Ceilings : Enclosed onto wall system to prevent entry.

IV Doors Windows : Lockable from outside and inside. Small window for check out and receiving.

V Mechanical :

VI Electrical : electrical supply for lighting and equipment checking.

VII Utility Service :

VIII Life Safety :

IX Equipment : cabinets(lockable) shelving, wall grid for hanging seat.

Facility # 207 Facility Title : paint storage

Number of users : 0 Assignable Floor Area :100 sq ft

Functional Description : Small area for paint storage and mixing. Should be located central to the body shop and paint booths.

Environmental Requirements : Modules :

I Floors: Floor system that easily cleaned. should be possibly of epoxied floor panels.

II Walls and Partitions: easiliy cleaned from spilage and paint splatter. Enclosed area to control heat and humidity.

III Ceilings :

IV Doors Windows : Lockable door. 3' opening.

V Mechanical : Mechanical system that will keep humidity at a constant level and the temperature within the 65 to 72 degree area.

VI Electrical : Natural lighting that will show true paint shades and hues, or equal lighting(artificial).
Power supply to run mixing equipment.

VII Utility Service :

VIII LIfe Safety : Exhaust fan, fire extinguisher for chemical fires,

IX Equipment : Mixer for raw paint, pouring devices, shelving for storage, benches for mixing(steel tops)

Facility # 208 Facility Title : raw material storage
Number of users : 0 Assignable Floor Area : 400 sq ft

Functional Description : Storage for raw materials such as
steel, wood, fasteners, etc.

Environmental Requirements : Modules :

I Floors: Floors concrete

II Walls and Partitions: Enclosed wall partitions with
access to outside for shipping and receiving.

III Ceilings :

IV Doors Windows : Locking and alarmed doors to outside that open
to 12' width.
Windows on exterior walls and skylights to allow natural lighting.

V Mechanical : Heating and cooling from main assembly area system.

VI Electrical :

VII Utility Service :

VIII Life Safety : Sprinklers for fire. fire extinguishers.

IX Equipment : Storage bins for large and small parts.
shelving and cabinets.

Facility # 210 Facility Title : sandblasting
Number of users : 1 Assignable Floor Area :300
Functional Description : Sandblasting area for part cleaning .

Environmental Requirements : Modules : 1

I Floors: Smooth concret surface . Must be smooth in order to scoop up sand and reuse.
Should have base around floor.

II Walls and Partitions: Should be sealed to prevent sand from entering wall cavities. Must have partition in front of doorway to prevent dust from leaving space when in use.
10' min height.

III Ceilings : Sealed with sealed lighting to prevent sand escape. 10' minimum clearance. Must be made of materials that are not effected by sand spray. Rubber coated is preferable.

IV Doors Windows : Doors must be sealed to prevent escape of dust particals. Should open to 10' width.
No windows.

V Mechanical : No air conditioning, but will need powerful exhaust fans to keep air clear.

VI Electrical : Closed lighting. No outlets since sand will get into the outlets. Switches must be outside the room.
Should havelight to shine when sandblasting is in use.

VII Utility Service :

VIII Life Safety : exhaust fans. Piped air to helment or sandblasting hood.

IX Equipment : Sand blaster, overhead hoist, conveyance system support equipment for material that is being cleaned.

Facility # 211 Facility Title : Chemical Stripping Area

Number of users : 1 Assignable Floor Area : 600 sq ft

Functional Description : Area for chemically removing rust, grease, and paint from all surfaces. Would be set up with tanks for dipping whole chasis or bodys and tanks for individual parts. Should also have facility to rinse acid from parts.

Environmental Requirements : Modules : 2

I Floors: Must be chemically resistant with floor drains for water and toxic chemical handling. Should be waterproof and proofing shall be resistant to the high Ph chemical(12.5)acid used in the stripping process.

II Walls and Partitions: Must be water resistant and easily cleaned. Shall be full height and sealed at floor and ceiling. Should have curved base on floor. Area could utilize Spectra Glaze II.

III Ceilings : Must be waterproof and easily cleaned. In addition must have provisions for overhead cranes to lift parts out of vats(tanks).

IV Doors Windows : No windows, doors must be able to be sealed to avoid water leakage.

V Mechanical : Needs toxic exhaust removal system. Needs to be sensitive to fire and explosion proofing. Since this is a possibility in use of these toxic chemicals.

VI Electrical : All electrical should be out of room to avoid electrical explosion. Lighting should have ground fault, and be waterproof.

VII Utility Service : Water in the form of high pressure supply of at least 1500 psi. Must have cold water supply . Must have gas available to heat tanks of chemicals.

VIII Life Safety : Toxic exhaust and air circulators. Explosion warning devices. Fire sprinkler system.

IX Equipment :High pressure water blaster, vats, crane, lift, air drying provisions, water supply. steps.

CHEMICAL STRIPPING AREA

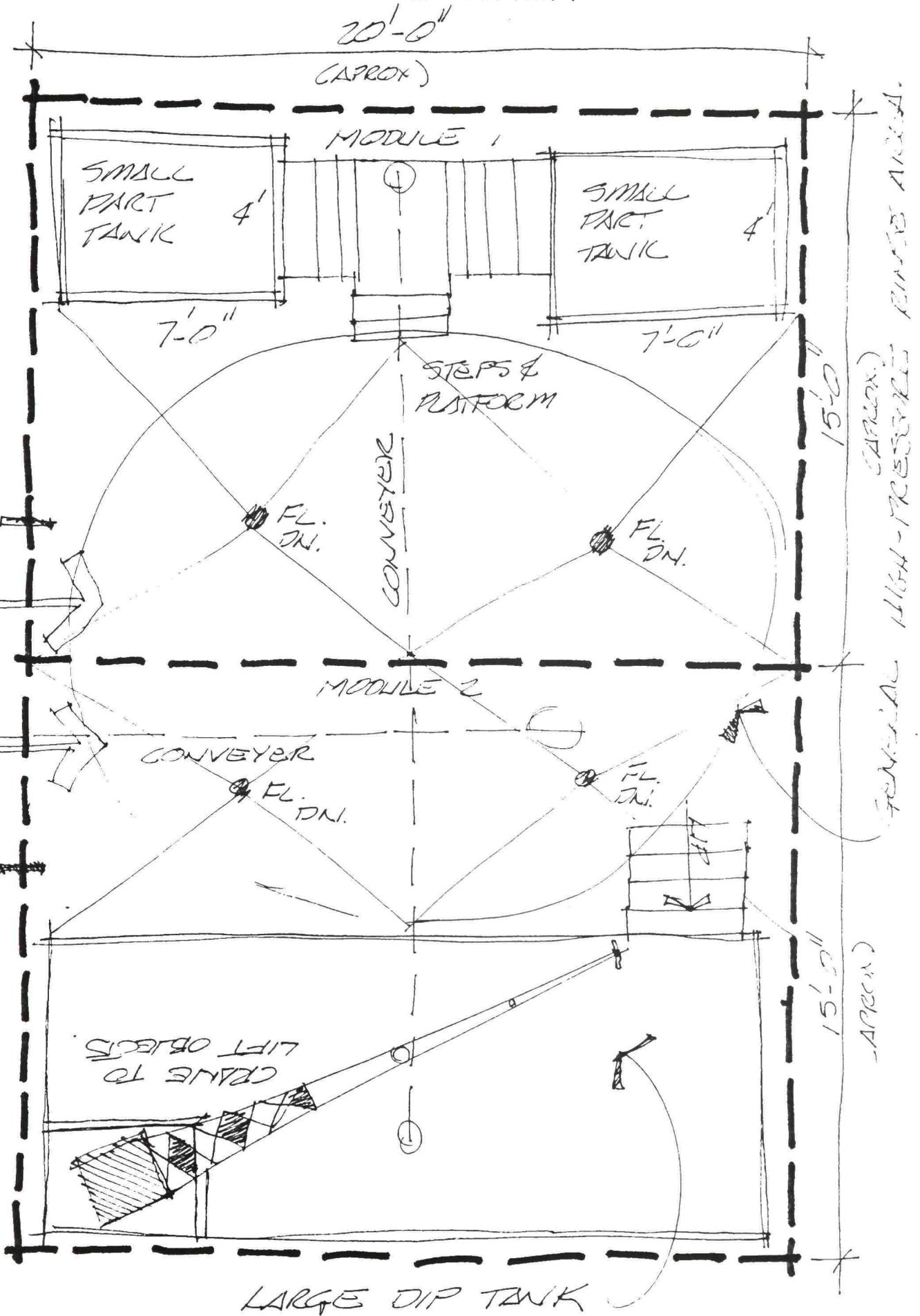


Figure 9

Facility # 212 Facility Title : Engine SHop

Number of users : 1 Assignable Floor Area : 800 sq ft

Functional Description : Equiped to perform all the tasks involved with engine rebuilding. Cleaning, boring, babiting, grinding, metalizing, magnafluxing, milling, etc.

Environmental Requirements : Modules :

I Floors: Smooth floor surface, that easy to clean. Must be dust free to build engines.

II Walls and Partitions: White walls that are not conducive to dust collection. Windows are permitted. Partitions do not need to be full height insde the area. Partitions outside the area need to be full height and enclosed.

III Ceilings : Needs overhead crane to lift engine blocks and heavy equipment. Should have natural lighting. must be 9' minimum.

IV Doors Windows : 4' opening, that can be sealed from dust. Windows should be located flush to the inside to prevent dust collection.

V Mechanical : Air conditioning and heating. Must have exhaust and venting for welding gases and chemical dipping fumes.

VI Electrical : Power supply to each equipment following manufacture specifications. Lighting that is adequate to proper footcandles, and is flexible to specific use. Power outlets should be above benches at intervals specified in

VII Utility Services:

Water and parts washer supply.

VIII Life Safety : Fire extinguisher, burn care for first aid.

eye protection areas(partitions) for welding.

IX Equipment : Welders, presses, drills, boring machines. Cabinets benches with steel tops, tool chest.

Facility # 213 Facility Title : Machine shop
Number of users : 1 Assignable Floor Area : 400 sq ft
Functional Description : Use in machining tools and specialty
 parts that cannot be otherwise obtained.

Environmental Requirements : Modules :

I Floors:
 See engine shop

II Walls and Partitions:

"

III Ceilings :

"

IV Doors Windows :

"

V Mechanical :

"

VI Electrical :

"

VII Utility Service :

"

VIII Life Safety :

"

IX Equipment : Mills,drills, lathes, presses, liners,balancers,
 etc.

Facility # 214 Facility Title : woodworking

Number of users : 1-2 Assignable Floor Area : 1400 sq ft

Functional Description : Space for woodworking to restore the subframes of the structures on the cars. Would be used for wood storage, wood working, and wood assembly.

Environmental Requirements : Modules : 1

I Floors: Concrete floors or equal. Must be smooth to ease clean up. Must have floor plugs as laid out in "systems performance Criteria" plus plugs at all equipment locations.

II Walls and Partitions: Wall partitions must be full height. windows are encouraged, and

Walls can be wood construction.

III Ceilings : 10 ' height. Lighting on ceiling.

IV Doors Windows : doors to outside for material receiving, 8' width. Doors to inside, main assembly, 12' for car. Windows should be flush mounted to the inside.

V Mechanical : Exhaust system for dust ventilation. air conditioning and heating of area is advised.

VI Electrical : Electrical supply for all equipment at base of equipment. Supply must be in two and three phase in addition to single phase 110. Lighting should meet footcandle requirements.

VII Utility Service :

VIII Life Safety : Fire and sprinkler warning. fire extinguisher. air exhaust. Safety guards on equipment.

IX Equipment : Wood working tools, small tool storage, wood bin, benches with steel tops.

Facility # 215 Facility Title : upholstery

Number of users : 1 Assignable Floor Area :1400 sq ft

Functional Description : Area for storage of cars, material, and tools for upholstery work. Would have necessary equipment to produce the pleats, tops, headlining, etc. to complete the restoratin work.

Environmental Requirements : Modules : 2 +

I Floors: Concrete floors, could have carpeting on parts not directly under car.

II Walls and Partitions: Minimum height og 8'. natural lighting and windows encouraged.

III Ceilings : 10' minimum height. Can be sealed are exposed and should have skylighting.

IV Doors Windows : Must allow for car entry from outside. 12' minimum. If located relavant to inside space, must have door opening of 12' to inside area.

V Mechanical : Air conditioning to area. Can be supplied from assembly area or can be on own system, depending on location in complex.

VI Electrical : Supplied in 110 and 220. Must have adequate plug location not to interfere with sewing machines. floor plugs should be located in addition to those requirements calle out in "spc".

VII Utility Service :

VIII Life Safety :

IX Equipment : Commercial sewing machines, storage area for cloth, tool area, pattern storage.

Facility #216 Facility Title : Paint booth

Number of users : 1 Assignable Floor Area : 600 sq ft

Functional Description : Shall serve to provide an adequately sealed environment for painting in a dust free areas. Shall have good supply or air circulation to keep fresh. Will be used for painting only.

Environmental Requirements : Modules : 1

I Floors: Floor shall pull dust down out of air. Possible electrostatic. Must have good surface to clean from spills and paint overspray. Could be a grating system that would pull particles through floor and remove from the area.

II Walls and Partitions: walls must be smooth and epoxied to facilitate good cleaning techniques. Shall be white to allow maximum reflection with limited glare. Shall have limited glazing to allow for limited life cycle cleaning from overspray.

III Ceilings : Shall be as low as possible and still allow for automobile clearance. Shall have some tracking device for heavy parts. Smooth surface texture is of maximum importance.

IV Doors Windows : Sufficient for transition of automobiles. Must be able to hermetically seal from other spaces. Shall have possibility of no air circulation from other spaces.

V Mechanical : Must have heating and air conditioning as well as humidifiers and de- humidifiers. Must also have exhaust system for unwanted particulates and toxic fume handling. Grills must be easy to clean and have exchangeable filters .

VI Electrical : 110 supply. Lighting is very important. Lighting must be flexible and variable. Natural daylighting must be accounted for so as to examine paint in natural lighting conditions.

VII Utility Service : Air and water filters to remove water from air service are required. Shall have water service, laquer thinner service, and cleaner service. Must be absolutely free from any source of silicon elements in air or solutions.

VIII Life Safety : Must have toxic fume exhaust equipment.

IX Equipment : Painters, air compressor on separate system, molecular exchangers, hoist equipment, and methods of suspending

Facility # 217 Facility Title : Body shop

Number of users : 3-4 Assignable Floor Area : 1800 sq ft

Functional Description : Preparation of body and chasis parts for paint. Includes all aspects of the paint process except the actual painting.
Sanding, filling, welding, shaping, etc.

Environmental Requirements : Modules : 6

- I Floors: Concrete or equal surface. Dyed if concrete. Floor should be level and have floor plugs as called out in the "spc". Areas in direct relation to painting should have exhausting in floor (grates). Conveyance system for heavy parts.
- II Walls and Partitions: Full height and covered in a resistant material to laquer thinners and reducers. Must be easy to clean overspray. Epoxied steel panels would be adequate.
Natural lighting is very important.
- III Ceilings : 15' height with skylights in top to allow abundance of natural lighting. Should be enclosed to prevent dust collection.
- IV Doors Windows : Doors should be easy to clean and resistant as walls. Windows should be flush mounted to inside of wall. Windows should be located in places out of the direct path of paintoverspray from primers and surfacers.
- V Mechanical : Toxic removal from area. Should have dehumidifiers to remove water particals from air. Must be enclosed space that can be sealed off to maintain constant atmosphere. Should be heated. Must have exhaust system and parical expulsion.
- VI Electrical : Abundant electricity to power equipment as recommender by manufacture.
- VII Utility Service : Air, gas, electrical, argon gas, oxygen, as called out in "spc"
- VIII Life Safety : Toxic air removal. air respirators.
- IX Equipment : Compressor supply(sounproof), pain guns, grinders, welders, etc.

Facility # 218

Facility Title : Final Assembly

Number Of Occupants : 6

Assignable Floor Area : 1500 sq ft

Functional Description : Area in which the final assembly of finished components are done. This area needs to be clear span to avoid car manipulation interference. This would be single area sharing common support systems. The area would need to be central to the offices and the entire restoration facility.

Environmental Description :

Architectural :

Walls would need to be full height of 15' min. Natural lighting in ceiling is desired. floors would be concrete with red dye, floor conveyance, and overhead conveyance. Pits in some floor stalls would be necessary. White wall treatment. Stall Partitions would not need to be full height inside the area itself. Benches with steel tops and storage would be a necessity to this space. This should be equipped with observation windows to see in the area and into adjacent areas.

Mechanical :

Needs to be cooled and heated, and should have humidity control for space. Area should be supplied by utilities as discussed in the "spc". Lighting would need to be from all directions and should be direct, indirect, and natural. Power supply is needed in all forms that are available throughout the building. Water needs to be supplied to the support area, as well as part cleaning facilities, air, welding, and polishing equipment.

Equipment : Floor jacks, overhead hoists, floor conveyance systems, pits in the floor, adjustable lighting, greasing and oiling supply, grinders, small tools, fixed equipment with respect to presses, drills, vise, etc.

Storage : Small tool storage, and part supply storage that should accompany each car.

Location Relevant to Adjacent Spaces : Central to areas, near manager's office, lounge, support facilities, parts supply storage. outside entry into area.

Facility # 219 Facility Title : workshop

Number Of Occupants : 1-3 Assignable Floor Area : 300 sq ft

Functional Description : Small area to work on specialty projects, such as speedometers, carburetors, gears, chrome casting, etc. Would house all specialty tools that are required to tasks of the above nature. This would need special lighting, and benches all around with plugs at specified intervals. Benches should have steel tops.

Environmental Description :

Architectural : Painted walls, carpeted floor, sound system ; Should be a very nice ,pleasing place to work on tasks that require intense concentration and thought. Walls should be white, ceiling should be a grid ceiling to allow hanging of objects. Walls should be equipped with shelving, storage bins, cabinets(locking),and grids fro hanging. Windows are encouraged. Door needs to be 3' min. width.

Mechanical : Airconditioning and heating. Canbe supplied from the office mechanical system. Should have running water,hot and cold. All the utilities, air,electricity, gas, oxygen, argon,etc.

Equipment : Benches with steel tops for work without damage to the binets themselves. Locking cabinets. Specialty tools, micrometers, reamers, flow measures, ampmeters, vise, soldering irons, casting equipment. Specialty screwdrivers, etc.

Lighting should be flexible and variable. Needs extra lighting beyond minimum requirement.

Storage : Storage in terms of cabinets above and below the benches. One closet for misc. storage, a possible bench island with storage above and below that.

Location Relevant to Adjacent Spaces : Assembly area and final fit and finish.

Facility # 220

Facility Title : Final Fit and Finish

Number Of Occupants : 1-2 Assignable Floor Area : 300 sq ft

Functional Description : Area for final detailing and clean up. would be used for everything from touch up on paint, to buffing, to asseccory installation, to upholstery cleaning.

Environmental Description :

Architectural : It must be easily cleaned and resistant from all types of abuse. This would include paint overspray, buffing compound, grease, etc. Wall system should be epoxied steel panels, with limited window openings. Floors should be red dyed concrete, with a small pit under car area. This might only be five foot by 3 foot , or there could be a floor lift to get car off ground. Ceiling height should be a minimum of 20'.

Mechanical : Area must be heated and air conditioned, as well as insulated from the outside weather.

Equipment : Floor hoist, conveyance system, vacuum cleaners, paint touch up guns, air supply, tools for small work, etc.

Storage : Storage for detailequipment and supplys. Small part storage should also be located in here. Shelving for items in use. The car should be stored in this area until picked up or moved to more permanent storage areas.

Location Relevant to Adjacent Spaces : Main assembly and to exit of facility. Should also be adjacent to project manager.

Facility # 301 Facility Title : Artifact Preparation

Number of Occupants : 2-3 Maximum anticipated Use :

Assignable Floor Area : 400 sq ft

Hours of Use : 10 am - 5 pm

Functional Description : This space is used in the preparation, of displays, artifacts, cars, and exhibits.
It would be used in researchm and construction of objects for display.

Type of Display : none

Environmental Factors :

Architectural : Walls need to be protected from fire with a two hour fire resistance. Walls must be minimum of 10' height. natural lighting is fine for ceiling, but not advised for walls. Floor can be carpeted in areas that do not get construction activities. Concrete(dyed) or wood floors elsewhere, Can be on any level, as long as cars can have access.

Mechanical : HVAC system with dehumidifiers, and temperature controls.

Power supply of 110 and lighting adequate for work space.

Storage : Storage in cabinets, and closets, or under steel top work benches. Shelving.

Equipment :

Special Requirements : Located near showrooms in central location. must have exposure to outside with 12' min. door opening.

Facility # 303 Facility Title : Curator office
Number of Occupants : 1 Maximum anticipated Use : 10am -5
Assignable Floor Area : 175 sq ft
Hours of Use : 10 am - 5 pm

Functional Description : Office for administration of museum
by curator. Used for exhibit planning, records, and secretarial
work.

Type of Display :

Environmental Factors :

Architectural : Comfortable space with windows. walls should be
soft in texture, floor should be carpeted with good grade
commercial carpet. Ceiling should have adequate lighting for
task functions.

Mechanical : Adequate HVAC system to maintain comfortable
temperature.
electrical supply with appropriate grounding for computer
terminal.

Storage : File storage in office, shelving , bookshelves for
40 linear sq ft of books.

Equipment : Computer terminal, typewriter, calculator, desk,
three chairs, other general office equipment.

Special Requirements : Central location to museum lobby,
and showroom. Location for security base also.

Facility # 304 Facility Title : lobby/entry

Number of Occupants : Maximum anticipated Use :

Assignable Floor Area : 800 sq ft

Hours of Use : 10 am -5 pm m-f
12 noon - 5 pm sat.- sun.

Functional Description : Entry to museum with access to facilities originating here.

Type of Display : small two dimensional presentations.

Environmental Factors :

Architectural : Durable to high traffic levels. safety factors include non-slip flooring such as commercial carpet. Wall treatment to vary with displays. Ceiling height to a minimum of 12' height.

natural daylighting from ceiling and walls. View should be taken into consideration.

Mechanical : HVAC adequate to supply the showrooms and other museum facilities. Humidifiers and dehumidifiers for control of atmosphere relative to the car conditions to humidity.

Temperature control at 68 degrees.

Storage : Cloak area.

Equipment : water fountain.phones.

Special Requirements : access to this and all other museum areas to the handicapped.

Facility # 305 Facility Title : Rest Rooms

Number of Occupants : 6 Maximum anticipated Use : 6

Assignable Floor Area : 700 sq ft

Hours of Use :

Functional Description : Men's rest room for museum visitors
and employees.

Type of Display :

Environmental Factors :

Architectural : Clean and sanitary environment. Spectra Glaze
II or better. Walls must be 8' minimum height.
floor treatment to be carpet in foyer of rest room, and
tile in the water closet area.

Mechanical : HVAC, and exhaust fan.

Storage : Small vanity to store toiletries (lockable)

Equipment : Two wash basins, four stalls, one three urinals.
hand drying equipment. Handicap grab rails in one stall.

Special Requirements : Adjacent to at least one rest area.

Facility # 306 Facility Title : Rest Rooms
Number of Occupants : 6 Maximum anticipated Use : 6
Assignable Floor Area : 700 sq ft
Hours of Use :

Functional Description : Women's rest room

Type of Display :

see room 305

Environmental Factors :

Architectural :

see room 305

Mechanical :

see room 305

Storage :

see room 305

Equipment : Two wash basins, and five water closet stalls.
one stand up mirror area, and small seating area.

Special Requirements :

see room 305

Facility # 307 Facility Title : security
Number of Occupants : 1-2 Maximum anticipated Use :
Assignable Floor Area : 100 sq ft
Hours of Use : museum time of operation

Functional Description : Security area for guard station.
Should be tied into the security base in curators office.

Type of Display :

Environmental Factors :

Architectural : Carpeted floor with simple painted wall or
equal wall covering. 8" ceiling height. No windows into
area, and must be located central to showrooms and entry.
Raised viewing stan for monitors.

Mechanical : closed circuit monitors in locations of
showrooms. HVAC air supply.

Storage : Storage closet for uniforms, and one storage
closet that is lockable for firearm security.

Equipment : Vidio monitors, sound monitors, fire alarm
control, telephone and intercom system, alarm activation
controls, and police/ patrol dispatch radio.

Special Requirements : Central to museum showrooms and entry.

Facility # 308 Facility Title : conference/lecture
Number of Occupants : 5-8 Maximum anticipated Use : 5
Assignable Floor Area : 100 sq ft
Hours of Use : museum time and employee overtime

Functional Description : Conference for museum employees
and the curator. Would also serve for meetings with customers
that were not held in the curatos office.
Private

Type of Display :

Environmental Factors :

Architectural : Wall treatment to be 10' minimum with windows
where possible.should have luxurios wall covering.
floor covering to be carpet. Ceiling to have recessed
lighting.

Mechanical : HVAC as other parts of museum.
Electrical supply as per computer.

Storage : Storage for books and office supplies. To be used
in conjunction with curator's storage.
Cabinets with wet bar and sound system.

Equipment : Conference table, chairs for 8. Computer terminal to
be connected to main frame. Small refrigerator.
Phone and intercom system.

Special Requirements : Adjacent to the curator's office.

Facility # 401 Facility Title : Orientation

Number of Occupants : 30 Maximum anticipated Use : 40

Assignable Floor Area : 700 sq ft

Hours of Use : 10 am to 3 pm monday through saturday

 12 noon to 3 pm sunday

Functional Description : This room will serve to orientate visitors to the museum and provide a start for tours. This will also serve for conferences, slide shows, and receptions.

Type of Display : Slides and visual electronic displays.

Environmental Factors :

Architectural : Floors will be usual loading with resilient surface. Walls shall be durable and have provisions for some flexibility. Ceiling shall be at least full height with some acoustical value.

Mechanical : Shall have a comfort zone that is consistent and can adjust to increased loads of heat from occupancy. The lighting shall be adjustable in different areas to benefit the visual needs of slides and films. Shall have a complete range of illumination. Shall have speaker and sound system.

Storage : Shall have small storage area for chairs, vidio equipment , etc. Mot to exceed 50 sq ft.

Equipment : Slide projectors, film projectors, rear screen projectors, sound system for audience address. Chairs and podium or speaking area (ie, stage platform.)

Special Requirements : Shall have a good acoustical value and should relate to the location of lobby and entrance. could possible have arrangements for refreshments in the area.

Facility # 402 Facility Title : Showroom

Number of Occupants : 5 - 100 Maximum anticipated Use : 50

Assignable Floor Area : 2400 sq ft

Hours of Use : 10 am to 5 pm ; 10 am to 9 pm on one week day
10 am to 6 pm on weekends

Functional Description : Shall serve to display antique cars and other large paraphernalia that relates to antique cars. could possibly be set up in atmosphere of old station or dealership. Shall be receptive to visitors and tours.

Type of Display : Antique automobiles and other equipment. shall display automobiles in various conditions and shall relate to restoration.

Environmental Factors :

Architectural : Floor load shall support cars and other heavy equipment. Should be durable to heavy traffic. Shall be resilient to grease, rubber, and oil. High ceilings with some moveable partitions to change display and exhibits. Should have adequate lighting to provide for good viewing but with limited glare. Doors shall have no threshold and shall be to open to allow for automobile entry.

Mechanical :
Air conditioning should keep temperature at constant level and a humidifier shall be incorporated to maintain humidity level constant. Air exchanges shall be limited. Lighting shall be abundant but not to cause glare. Shall have emergency backup lighting and a public address system.

Storage :

Storage for exhibits not in use. Not much since major storage will be done in the museum storage space.

Equipment : Car handling equipment and cleaning.
video cameras and security monitors.

Special Requirements : Must relate to other showrooms and be central to visitor convenience. Must have adequate clearance for exhibits and automobiles. Shall still relate to human scale.

Facility # 403 Facility Title : Showroom
Number of Occupants : Maximum anticipated Use :
Assignable Floor Area :
Hours of Use : See sheet 132, room 402

Functional Description :

Type of Display :

Environmental Factors :

Architectural :

Mechanical :

Storage :

Equipment :

Special Requirements :

Facility # 404 Facility Title : Showroom
Number of Occupants : 20 Maximum anticipated Use : 15
Assignable Floor Area : 600 sq ft
Hours of Use : standard museum hours

Functional Description : Display of two and three dimensional artifacts that are small and need special focus.
Would hold pictures, hood ornaments, historic motors, etc.

Type of Display : Two and three dimensional. Protected from visitors.

Environmental Factors :

Architectural : Shall be durable and resilient to heavy foot traffic by visitors. Floor should be of commercial grade carpet or tile. Walls should be 10' hieght and treated in a manner that is conducive to the automobile era.

 should have natural daylighting from ceiling.

Mechanical : HVAC system

 Vidio cameras for security.

Storage : Display case storage and under counter storage for small artifacts not in the display.

Equipment : Display cases, wall displays, audio-visual equipment.

Special Requirements :Adjacent to the showrooms. Could be on any level.

Facility # 406 Facility Title : Rest area
Number of Occupants : 10 Maximum anticipated Use : 10
Assignable Floor Area : 300 sq ft
Hours of Use : museum hours

Functional Description : Rest area for visitors going through the museum. Should serve as a seating area and information center. A place for tours to stop and prepare for the next area, or a place for audio-visual equipment if tours are self-guided.

Type of Display : audio-visual, and two dimensional

Environmental Factors :

Architectural : Seating for 10 people. Should be carpeted with commercial carpet. Wall should be 8' height and should be a texture that is conducive to relaxation.

Ceiling should have adjustable lighting but should be subdued most of the time. Lighting should be indirect.

Mechanical : HVAC

Storage : none

Equipment : Ash trays, water fountain, seating in comfortable chairs or couches for 10 people. audio-visual equipment when desired by the curator.

Special Requirements : Should be a t convenient intervals between showrooms.

Facility #407 Facility Title rest area

Number of Occupants : 10 Maximum anticipated Use :

Assignable Floor Area : 300 sq ft

Hours of Use : see sheet 136, room 406

Functional Description :

Type of Display :

Environmental Factors :

Architectural :

Mechanical :

Storage :

Equipment :

Special Requirements :

Facility # 501 Facility Title : Library
Number of Occupants : 10 Maximum anticipated Use : 2-3
Assignable Floor Area : 1500 sq ft
Hours of Use : museum hours and special appointment

Functional Description : A research library for research on antique automobiles. A non-circulatory library with books, literature, advertisements, etc.

Type of Display :

Environmental Factors :

Architectural : Sound proof area with lighting in various illumination. Must be flexible, and variable. Carpeted and soft wall texture. Natural lighting is necessary. Various levels, and small partitions to seperate private spaces.

Mechanical : HVAC to maintain constant temperature of 70 degrees. Dehumidifyer/humidifyer to control environment since manyt articals in library will be very old and need protective atmosphere. Computer supply electricity with proper ground and wattage.
Concealed ducts.

Storage : Shelving, and bins for microfilm.

Equipment : Layout tables, flat files for archive blueprints, microfilm stands, copy stand, photocopying machine, computer terminal, retrieval system for library material. Vidio cameras for security reason. Chair for reading and tables for writting and layout work. Various photgraphic equipment with slide projectors, dublicators. Intercom and sound system.

Special Requirements :

Facility # 502 Facility Title : Computer
Number of Occupants : 2 Maximum anticipated Use :
Assignable Floor Area : 300 sq ft
Hours of Use : Museum and arranged appointment hours.

Functional Description : Computer area for design development of programs for use in the facility and out. Location of main frame computer. Use for research of other material. Would be able to be hooked up by modium to research libraries across the country and utilize information .
Would be location of printer.
Type of Display :

Environmental Factors :

Architectural : Anti static flooring, clean environment that would be easy to clean. 8' min. height on walls and ceiling. windows to allow natural lighting, however, not to cast glare on terminals.

Mechanical : HVAC to maintain constant temperature and condition air from increased BTU output of main frame computer. Anti-static flooring. Concealed ducts.
Proper grounding on electrical power supply with circuit breakers and overload protection.

Storage : Temperature and humidity controled storage cabinets for disks, and programs. Paper storage in cabinets, and closets for general supply storage.

Equipment : Terminals (2) and one printer. Main frame base. Two desks, three chairs, storage areas, tables for printer, layout table.

Special Requirements : Needs to be adjacent to library and should be close, if not adjacent to, the curator's office and cinference area.

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Brachman's Coach Builders

Goring on the Thames, England

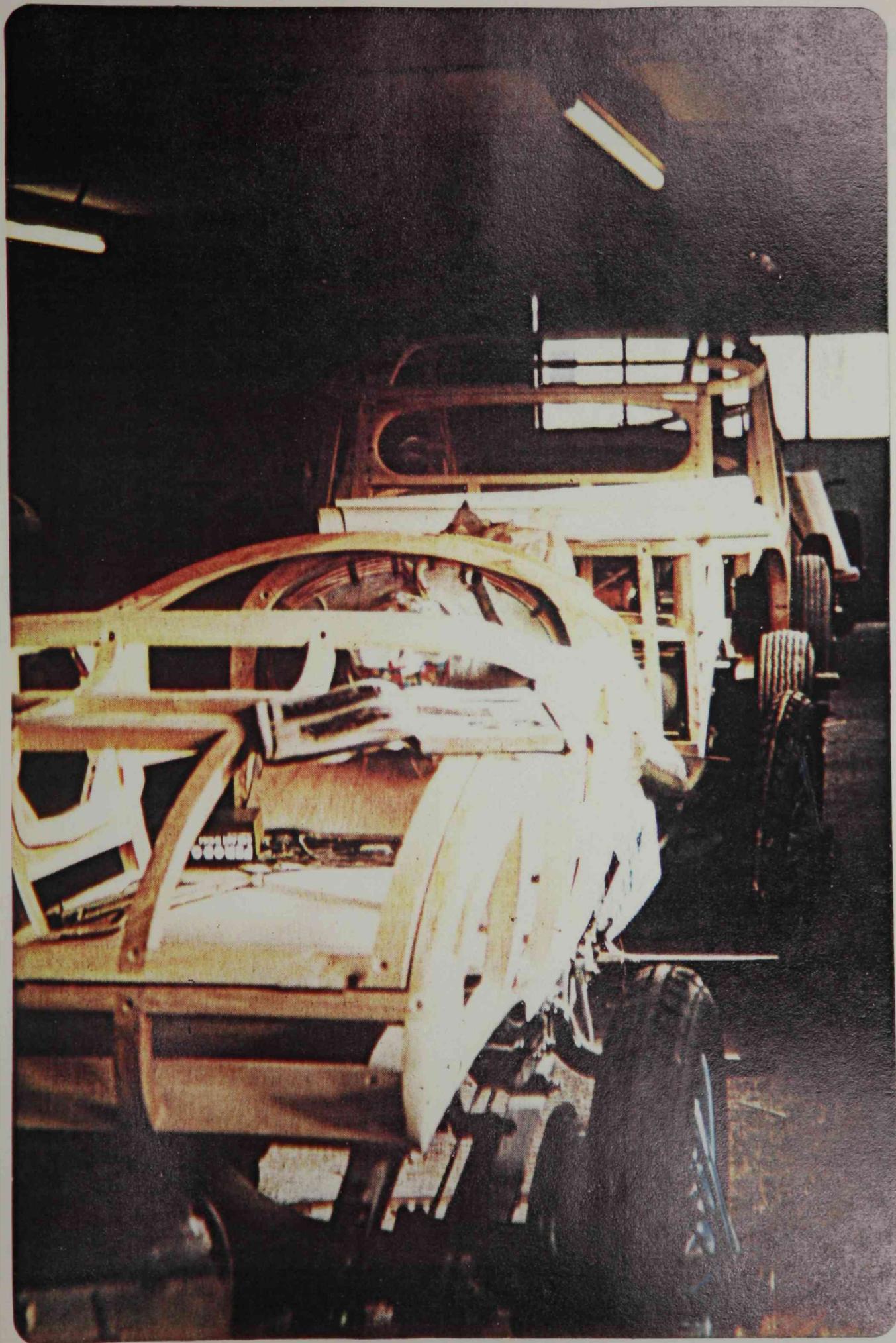
INTRODUCTION

Brachman's Coach Builders is a coach and body building facility located in Goring on Thames, England. The facility was started in the nineteen thirtys, building coaches for automakers such as Rolls Royce. The Brachman Coach Builders are well known restorers in the field of restoration today and produce exclusive, beautiful restorations. Brachman, also, builds custom cars for various clients. Some of these clients are world powers who desire one of a kind automobiles or automobiles that are patterned after their own design.

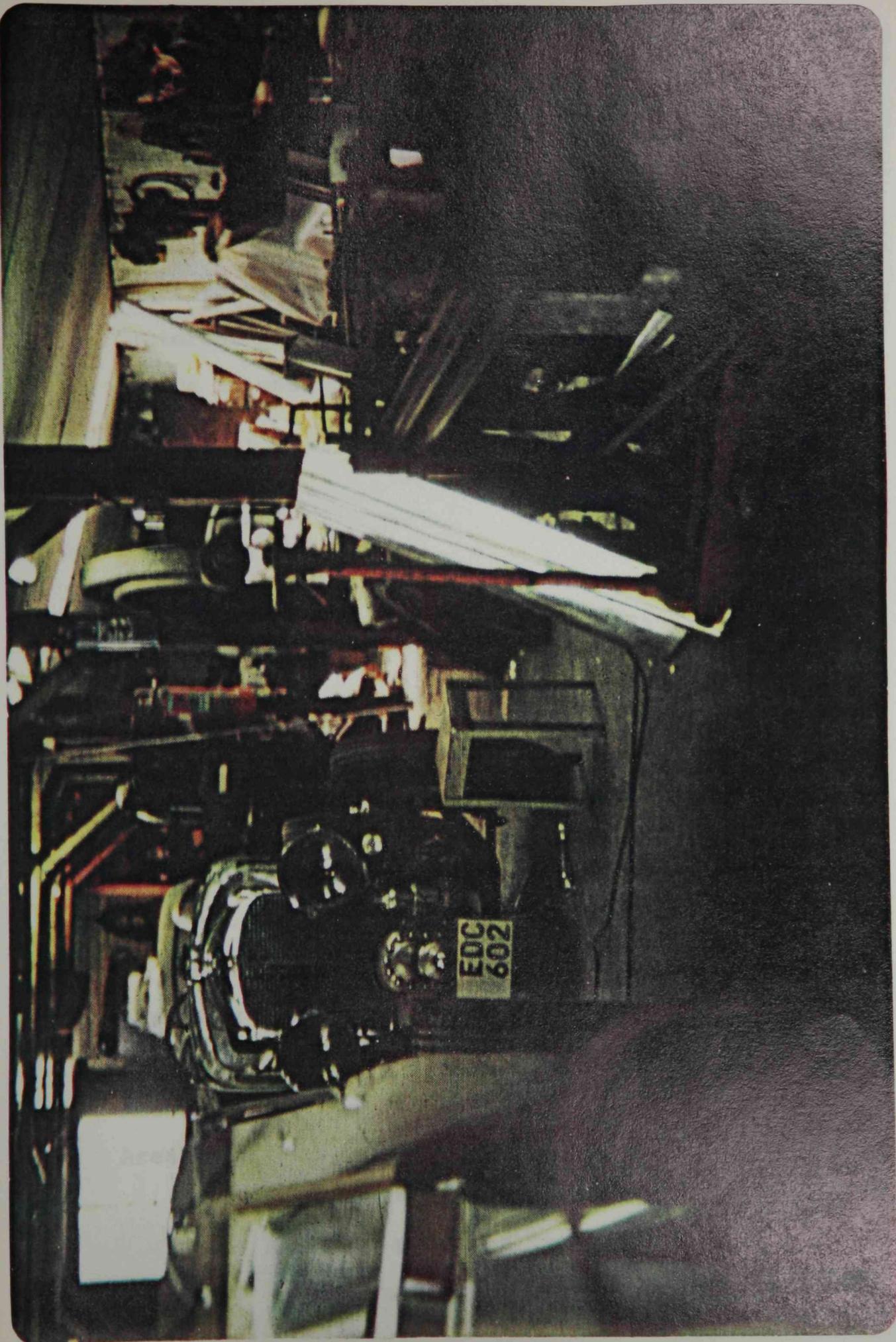
Brachman has a complete shop in the sense that the facility includes all the aspects of body restoration and sub-frame construction. However, most of the chasis work and upholstery is either subbed out to chasis builders or is done in other facilities located on the grounds that are separate from the body building facilities.

The employees are true artisans, most of whom have worked building bodys for cars since the early days in automobile production. The employees are highly individualistic, skilled craftsmen. These artisans take pride in their work and treat their work as an art form. Many of the cars are refined and redesigned to seek the ultimate design elements.

The body's subframes are built from wood to form the skeletal shape; and, then, flat sheet alloys of aluminum are worked by hand to fit over the wood subframes to form amazing results.



The company works for a very exclusive clientel located all over the world, who commonly seek first class restoration work in a clearly one of a kind or exclusive automobile. The restorations range from \$40,000 to \$200,000 when completed.¹



CONTEXT²

Client:

Upper class, international people.

User Group:

The most desirable images that the user must possess in order to be successful are:

"interest in what you are doing",

"pride in what you are doing; never say it will do".

FUNCTION

Worker/Activity:

- | | | | |
|----|-----------------------------|----------|-------|
| A. | Panel Beater | - Dick | |
| | Sheet Metal Worker | - Rodney | 3 |
| | Coachsmith | - John | |
| B. | Woodsmith | - Tim | |
| | Dash | - Frank | |
| | Wood Trim | - | 2 |
| C. | Upholstery | - Allen | 1 |
| D. | Mechanics | - | 3 |
| E. | Paint is subcontracted out, | | 1 man |

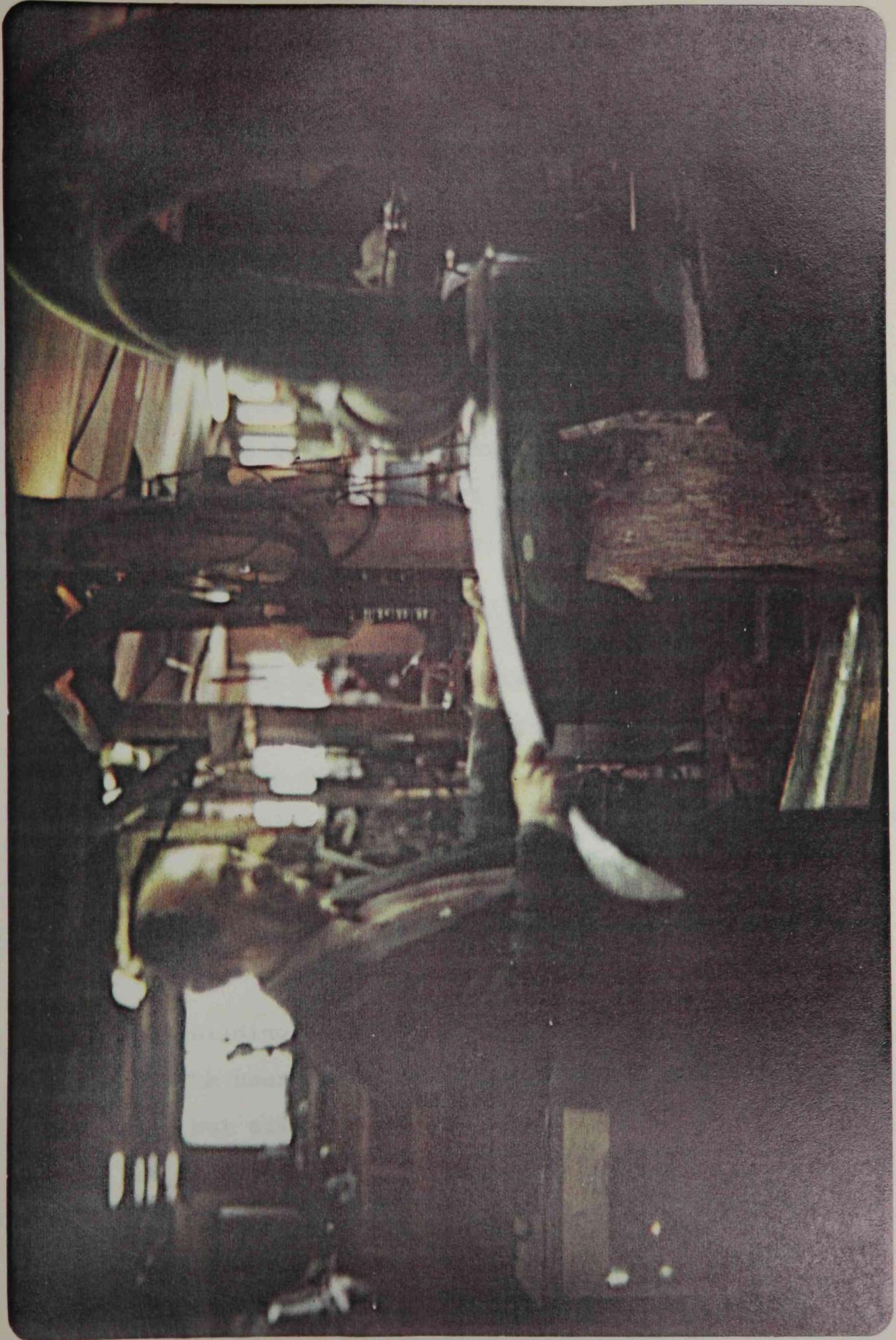
Space Summary:

All work is done in a module system with each module measuring approximately 15' x 20'.

Area One: Primary

Coach Building

Panel Beating, Iron Work, Fitting



Area Two: Secondary

Paint Shop

Trimmer (upholstery)

Mechanical (engine, drive train)

Fit and Finish

Building Plan:

Unavailable at this time.

Restoration Process:

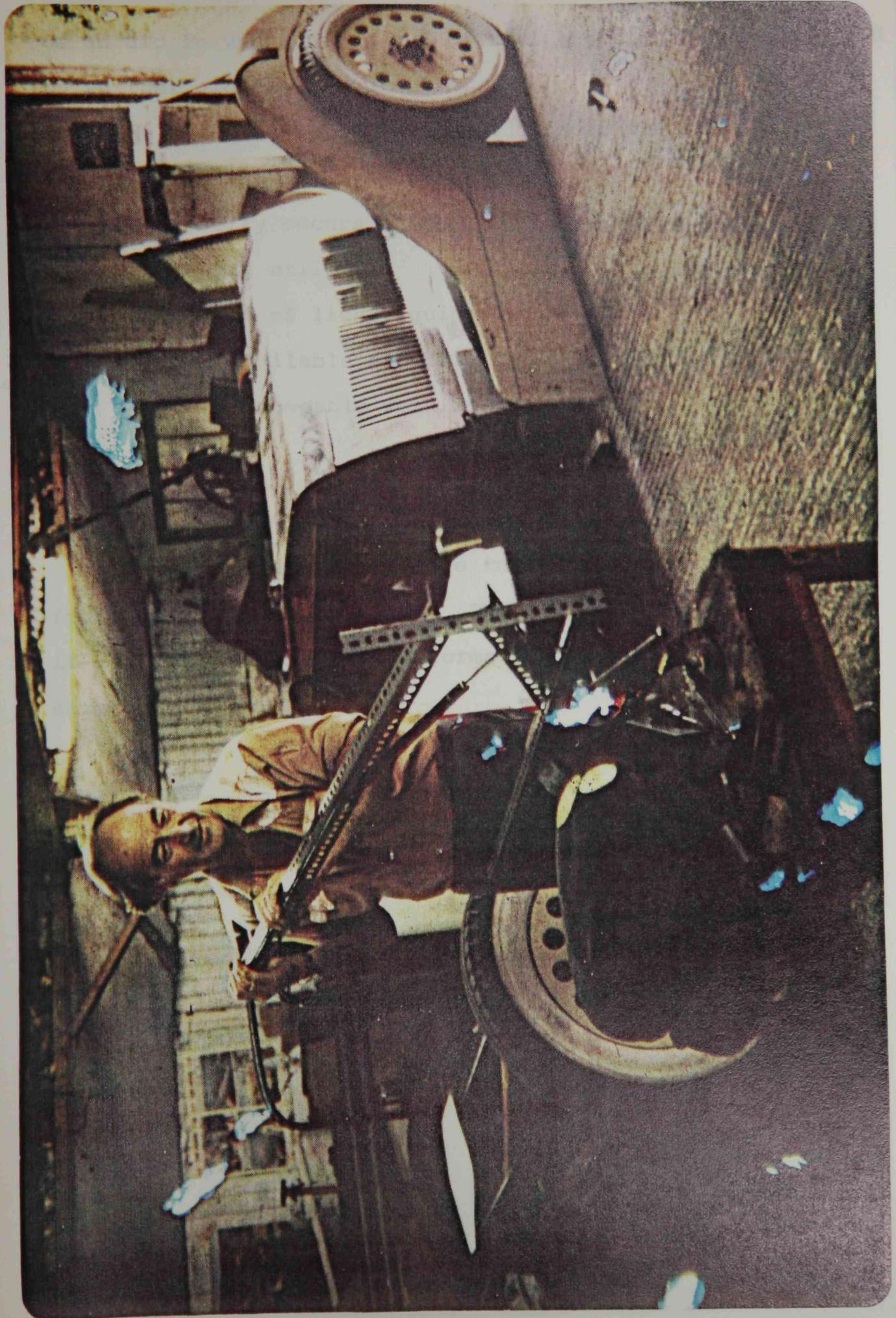
There are several aspects that the user identified as disruptive to the restoration process. These aspects are as follows in order of significance:

- A. Clients who don't care enough about doing the job right.
- B. Lack of unity among work team.
- C. Maintaining a comfortable work environment.
- D. Buying tools and materials in small quantities.
- E. Surprise problems in car particulars.

The user, also, feels a strong need for the client to mix with employees, cars, and work spaces.

BUILDING SYSTEM ANALYSIS

The building is a single story steel building with wood floors. The user prefers a work environment that is not too clinical, but still remains comfortable. Building must, and does accommodate flexibility in location of equipment. The building has overhead doors to facilitate car entry, as well



as an aid in ventilation and natural lighting. Fans are used to further aid air circulation.

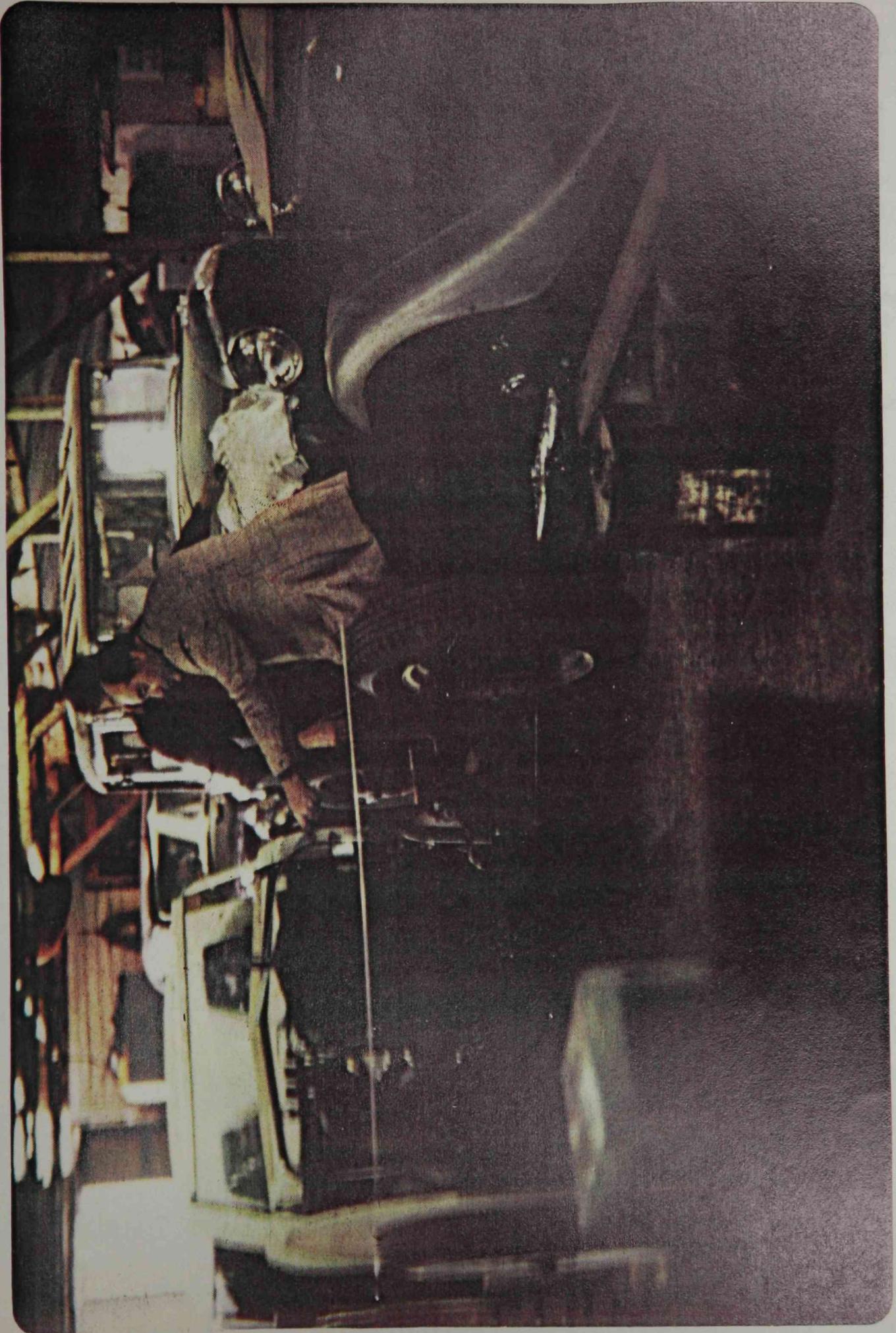
The building was formed by adding to the structure as the need for increased space became an issue.

Flexibility occurs in the following manner with respect to the building utility:

relocation of light equipment,
readily available electricity,
fixed and moveable work benches.

SITE ANALYSIS

Site condition has little to do with the activity aside from the climatological aspects. The clientel will come to you if you can do the work. Information on site orientation and size was not available.



3

INTRODUCTION

White Post Restoration is a family owned business in the out of the way town of White Post, Virginia. The business started in the 1940's as a small tractor and auto repair shop. At that time, the business had two employees, both of which are still with White Post Restoration today. The original owner, W. R. Thompson, died in 1958 and, after six months in the business, Billy Thompson took over what then was a feed store, repair shop, trucking firm, and supply store. In 1972, the restoration bug bit in the United States and the restoration shop started to prosper; hence, White Post Restoration was born.

White Post Restorations committed itself to providing all the services possibly needed to perform ground up, first class restorations. This included a machine shop and even a wood working shop to refurbish the body works. White Post now requires about eight months to restore a car and estimate the completion of about 100 cars restored in the past five years.

The employees of White Post possess a strong pride in the work they perform, as well as inter company competition for excellence in their respective trades. In the shop, no one person does all the work on every car. Each man is selected for his individual talents, such as engine work, painting, body shaping, wood working, or upholstery. "The shop functions as a well orchestrated team, working to

perfection on each job." White Post employs 15 men, and Billy is very loyal to his employees. "If a man will stick with White Post Restorations, there will be a job for him as long as he lives."

Customers visit the facility and, after a tour, always agree that the shop is one of the largest and finest shops of it's kind. The waiting list is about six months, and many customers will wait as long as it takes to get the car of their choice restored by White Post Restorations.

CONTEXT

Client:

The clients of White Post Restoration are mostly upper-middle class people from around the United States. The clients are interested in quality and professional restorations and are loyal to the restoration business of White Post Restoration.

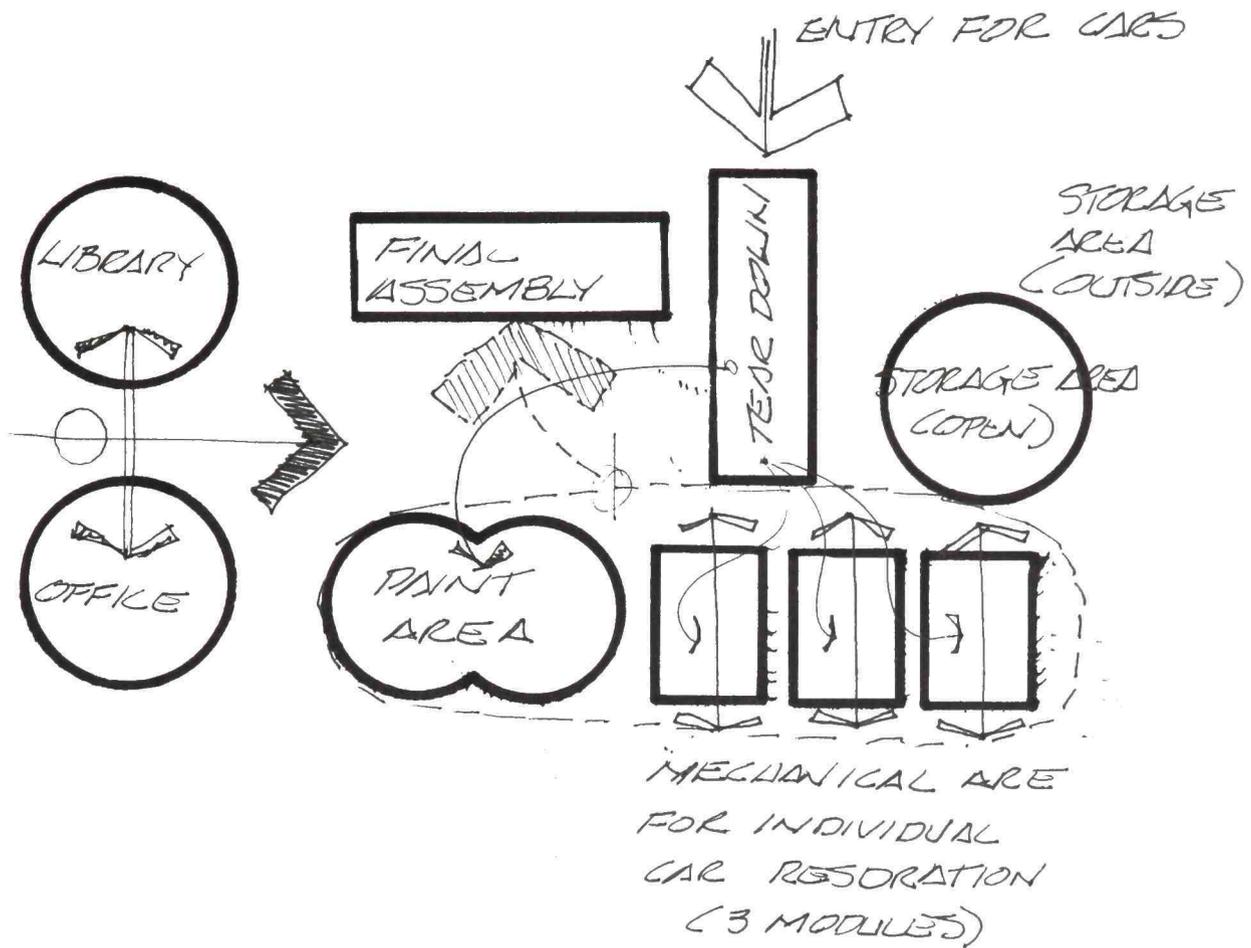
User Group:

The employees at White Post Restoration are craftsmen who have worked in the restoration business from the start, two of which have been working for 35 years. There is a high sense of pride among the craftsmen, and Billy Thompson is concerned about the employees.⁴

FUNCTION

Worker/Activity:

A. Machinest	- 2 employees
B. Tinkerest	- 1 employee
C. Mechanic	- 3 employees
D. Body Man	- 2 employees
E. Paint Man Combination	- 4 employees
F. Upholstery	- 1 employee
G. Catalogue/Tear Down	- 1 employee
H. Cleanup Helper	- <u>1</u> employee
	15 employees total



Analysis:

- a. Library and office adjacency is favorable for research, control, and client or employee conference.
- b. Library serves as conference area and saves space.
- c. Final assembly area is located in an appropriate area relative to office and client visitation. It also follows a favorable layout with automobiles having their own parts and area, which in turn share common support systems.
- d. Separation of engine, mechanical, paint, and assembly area is nice and convenient to process efficiency and overhead cost control.

Figure 10

Task Analysis:

As a car is brought to White Post, it is first taken to "Catalogue & Tear Down", where each automobile is taken apart, pieces are catalogued, bagged and boxed, and inspected for replacement or repair. Then the car is sandblasted and cleaned after engine removal. Each piece is then restored and painted and set aside for assembly. The car then moves to mechanical work, where chasis pieces are repaired/restored and small component systems are assembled. Components are then taken to assembly, where they are put together and then taken to final paint. The car is then moved to upholstery and to final detail.

BUILDING SYSTEM ANALYSIS

The clinical environment at White Post Restoration is one of the contributing factors involved with the quality, clean restoration they produce. The building structure is steel frame with corrugated steel walls - concrete floors dyed red. The building utilizes overhead doors, twenty foot ceilings in most of the work areas, with some overhead storage. The building utilizes tracks for carrying engines, bodies, etc. Shelving is on wheels, as well as stationary. Cars are moved to each room according to task being performed. The building is not air conditioned and uses doors and fans for ventilation. However, the office, library and conference room are air conditioned, panelled and carpeted.⁵

SITE ANALYSIS

The building is located in White Post, Virginia in a country setting. There is a slight breeze and comfortable climate. Trees are abundant. Most clients stay in White Post while visiting from out of state, where accommodations are provided by Howard Johnson Motel.⁶

INTRODUCTION

Coleman Classic Motors was started from the hobby enjoyed by Bill Coleman and his son, in 1968. The business has progressed through many stages, from chrome platers of antique parts to upholstery, to mechanical restoration. In it's present form, Coleman Classic Motors is a restoration facility complete with body work, painting, restoration of chasis, their own upholstery shop, and parts sales. In addition, the business has a large collection of antique trucks and gasoline and oil paraphernallia, many of which are one of a kind pieces.

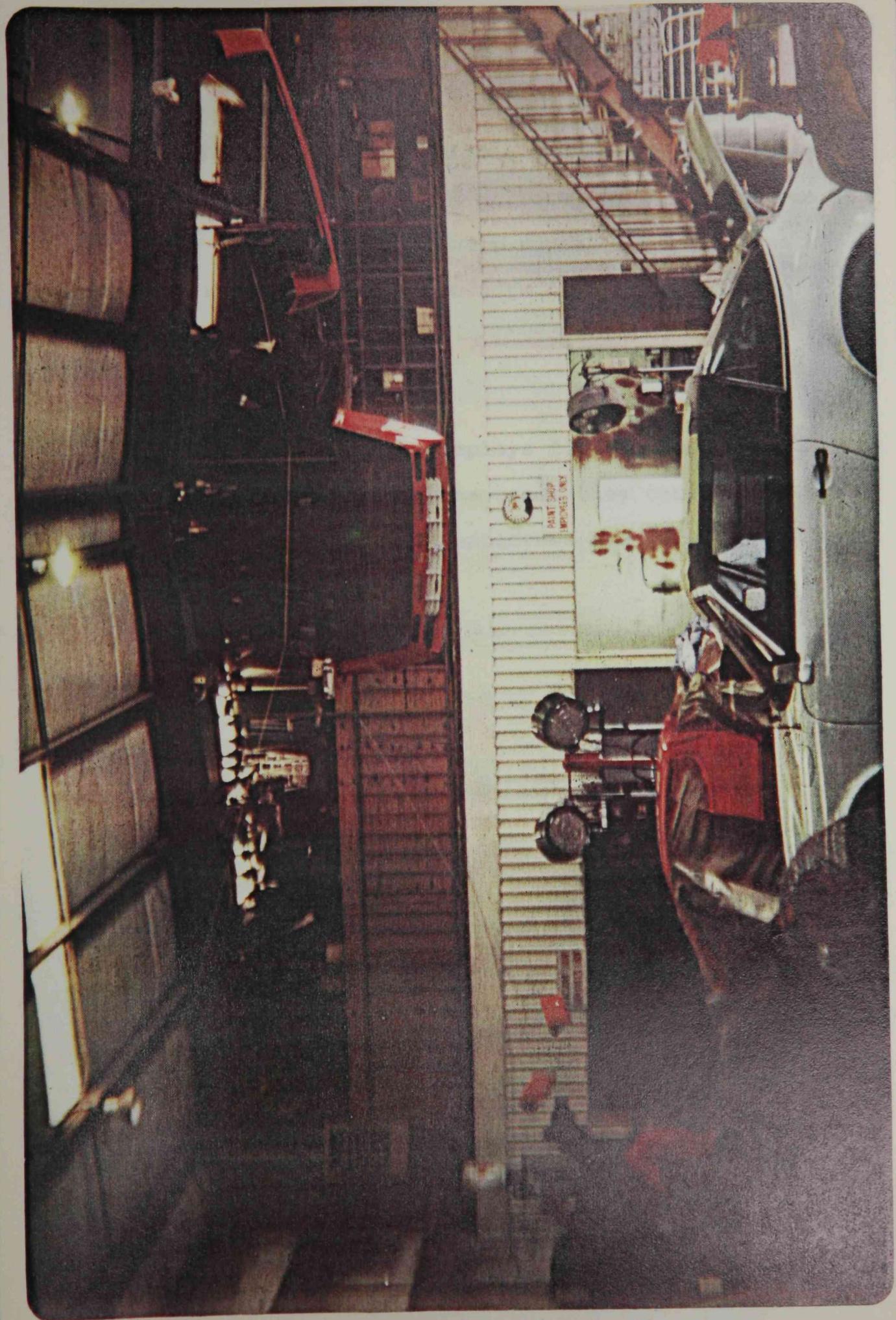
Coleman Classic Motors is located in Houston, Texas, on Interstate 10 East. The facility presently restores cars of all varieties and completes some of the most comprehensive and quality restorations in the country. Many of the cars have become national show winners and received awards of excellence from companies such as Ditzler Paint Company for best paint in the United States.

The type of cars restored cost in the neighborhood of \$10,000 to \$100,000, depending on the car and what degree of restoration is undertaken. The length of time required to restore a car is between a year and, some take as long as ten years, depending on the availability of parts and information.

Coleman Classic Motors has a variety of clientel - from the individual that simply desires a straightened hood, to

the many repeat customers who have as many as two cars a year restored to perfection. Bill continues to offer a personal concern to the antique car enthusiast and, often, provides technical sessions to restorers in the vicinity to instruct in the methods of restoration of various aspects of antique and classic cars.

The Coleman shop employs from 5 to 20 men and women, who continue to carry first rate restoration work.



CONTEXT⁷

Client:

The client ranges from middle income to high income people who seek restoration in various aspects of automobiles. The clients are generally repeat customers who know of the quality restoration products offered by Coleman Classic Motors.

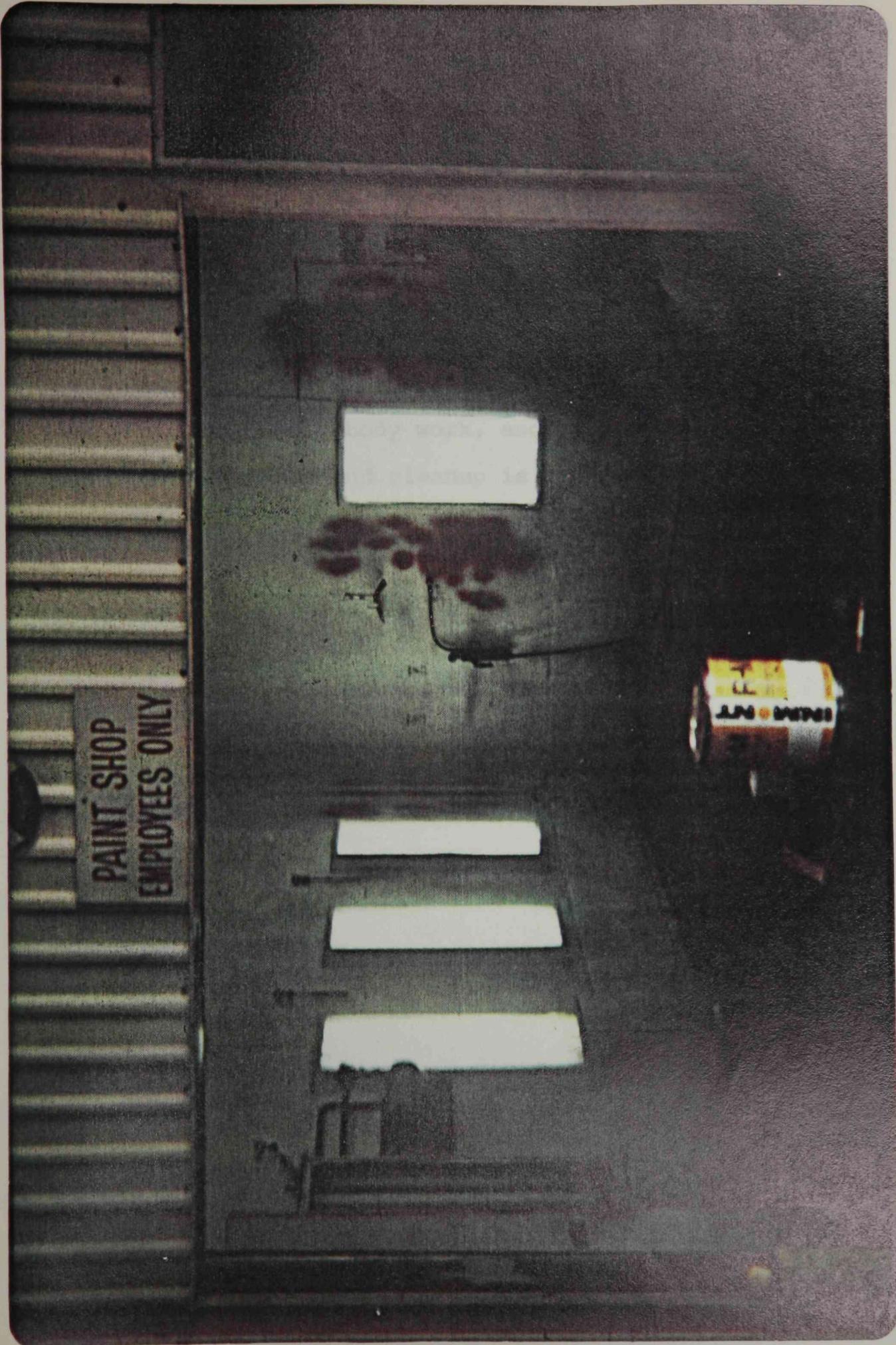
User Group:

Bill Coleman generally employs fifteen people. All these people are skilled in the trade they carry out and live near the facility. The employees are paid by the hour for their labor.

FUNCTION

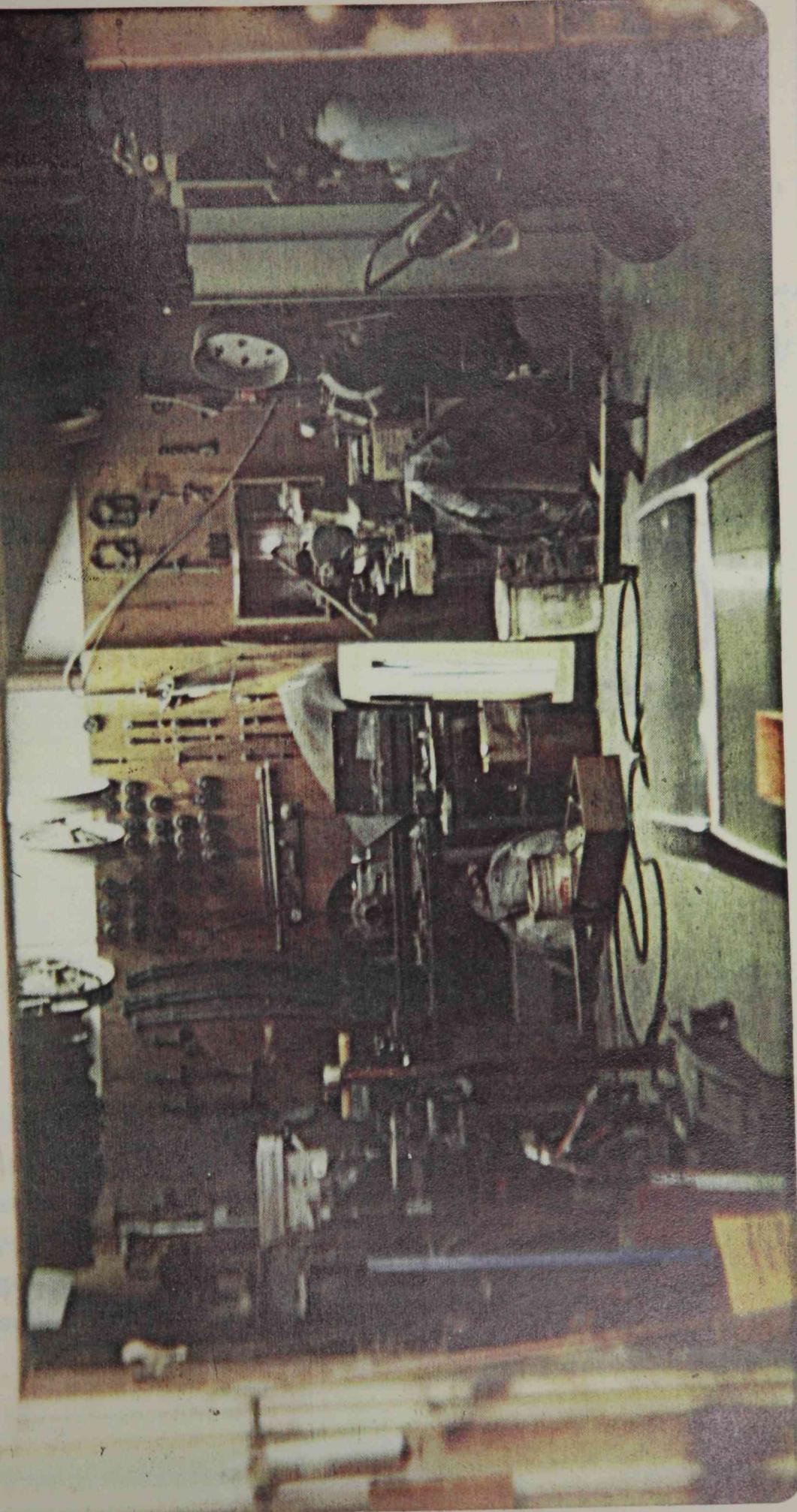
Worker/Activity:

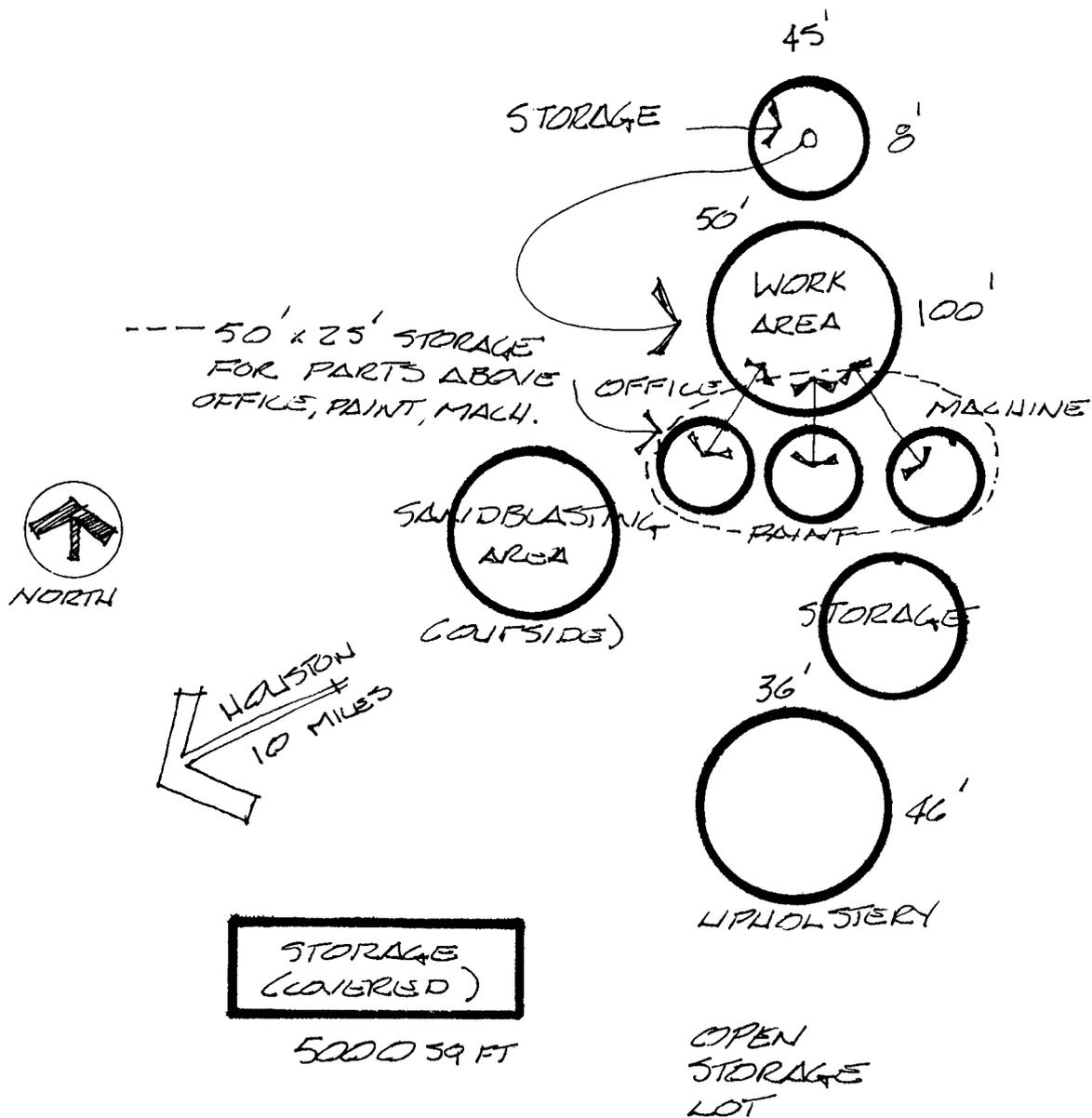
A. Machinest	- 1 employee
B. Painter	- 3 employees
C. Bodyman/Painter	- 5 employees
D. Sandblast	- 1 employee
E. Detail Man	- 1 employee
F. Tinkerest	- 1 employee
G. Upholstery, Leatherman, Trim	- 1 employee
H. Mechanic	- 1 employee
I. Cleaner/Flunky	- <u>1</u> employee
	15 employees total



Task Analysis:

Painting is 70 to 80% of work on a car. The cars are brought in and torn down, cleaned and sandblasted, dipped, and water blasted. The parts are repaired and replaced when necessary. Painting is done in a separate paint booth that is ventilated. Parts are machined in a machine shop next to the paint booth. All work except sandblasting and upholstery are done in an open span building. This includes assembly, tear down, body work, and mechanical. Parts are sometimes misplaced and cleanup is a problem.





Analysis:

- a. Paint is subject to dust and overspray in area.
- b. Sandblasting should be remote and separated from other areas.
- c. Building is not oriented for positive aspects of solar, and climatological effects.
- d. Separation of upholstery is good aspect and prevents overspray from damaging finished products.
- e. Storage is adequate with covered, uncovered, and total enclosed storage facilities.

Figure 11

BUILDING SYSTEM

The building is a metal building with three overhead doors for ventilation and vehicular access. The office is air conditioned and there is storage over the office, paint booth and machine shop. Storage facilities are either in metal buildings elsewhere on the premises or in five shipping containers (8' x 45'). The building is worked in and is filled with sanding powder and debris.⁸

SITE ANALYSIS

The facility is located on Interstate 10 East of Houston. It is on the access road Southside. Doors are oriented to the West, which makes it very hot in summer. Humidity causes a problem with rust and water in paint.

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Rumpel Kammers Restoration

Fredricksburg, Texas

INTRODUCTION

Rumpel Kammer Restorations is a family business run by Shatzy Crouch. The facility is located in downtown Fredericksburg, Texas. This area of the Hill Country is very picturesque and offers an excellent climate for car restoration due to its pleasant weather and lack of humidity.

The business is a rare relationship between customer and client in which business is done on a first name basis with a hand shake. The people are very friendly and virtually go out of their way to be friendly and helpful.

The Rumpel Kammer business started out in 1968 as a parts house specializing in antique auto parts for the Model A and Model T cars. The parts business then expanded to include very high quality engine rebuilding, and Model A and T automotive restoration in 1972. They employ family and friends numbering between five and ten. The facility continues to turn out cars for the average car enthusiast for very reasonable cost. The parts, as well as the cars they sell, have a reputation for being very high quality; and Rumpel Kammers continue to have many pleased customers.

CONTEXT⁹

Client:

Antique car enthusiasts, basically concerned with the Model A (1928-1931) and Model T (1903-1927) automobiles.

User Group:

Employees are very friendly, country people, who are craftsmen and enjoy a great amount of pride in their work

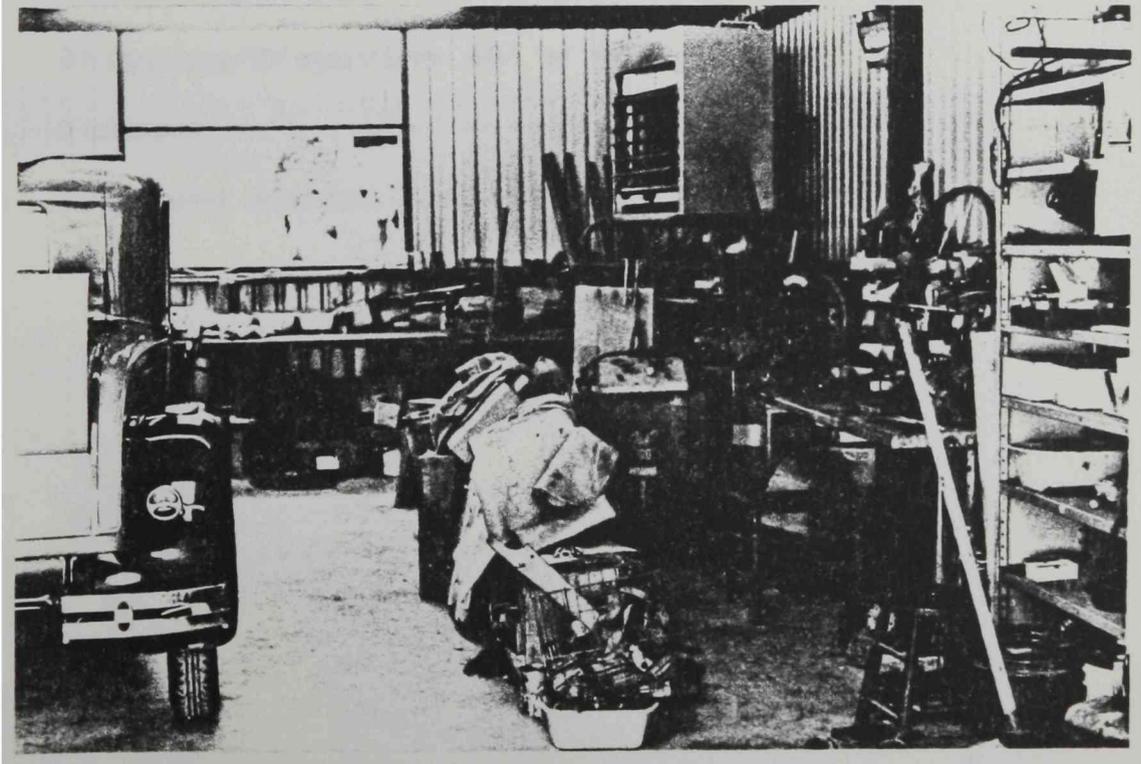
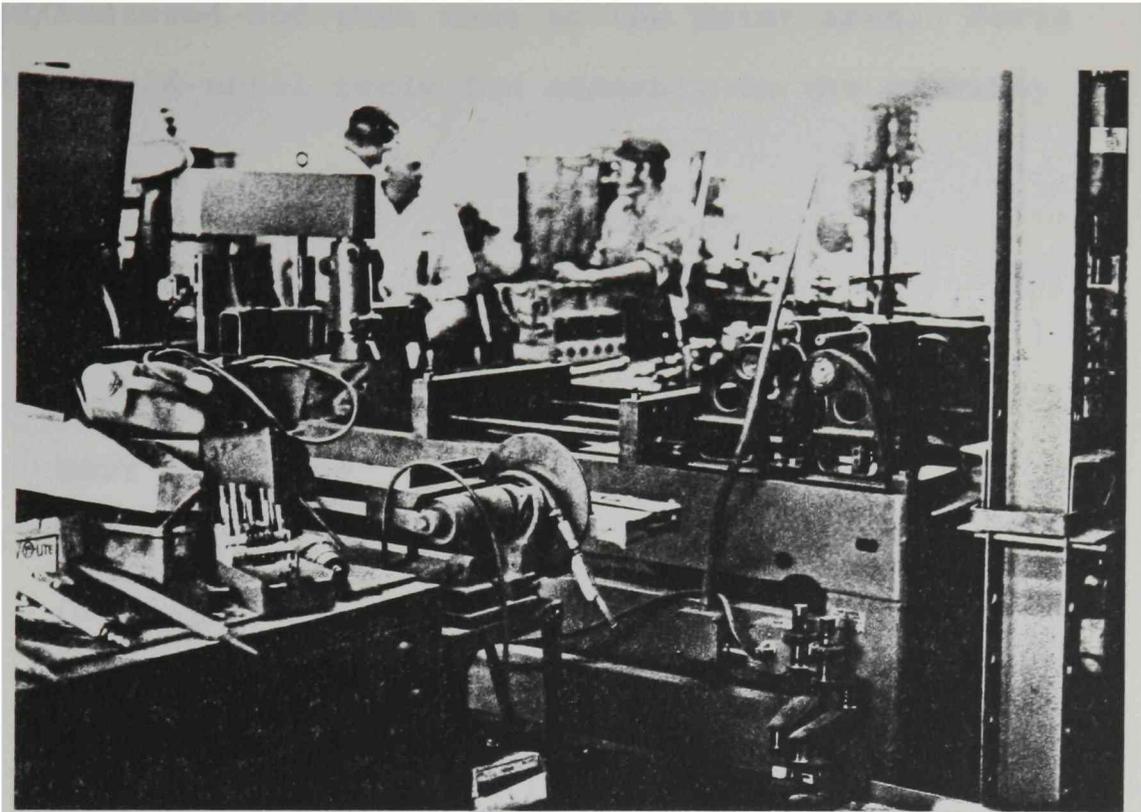
FUNCTION

Worker/Activity:

A. Engine Man	- 2 employees
B. Paint Man	- 1 employee
C. Body Man/Paint	- 1 employee
D. Tear Down	- 1 employee
E. Assembly/Chasis	- 2 employees
F. Parts Sales	- 2 employees
G. General Work Cleanup, part work, sandblasting, dipper, etc.	- 2 employees
	—
	9 employees

Activity Analysis:

Cars are brought in to the dock area which is adjacent to the assembly area. The cars are torn down and parts are sent to the appropriate areas for restoration or storage (engine area, paint, body, dipping, etc). All parts are

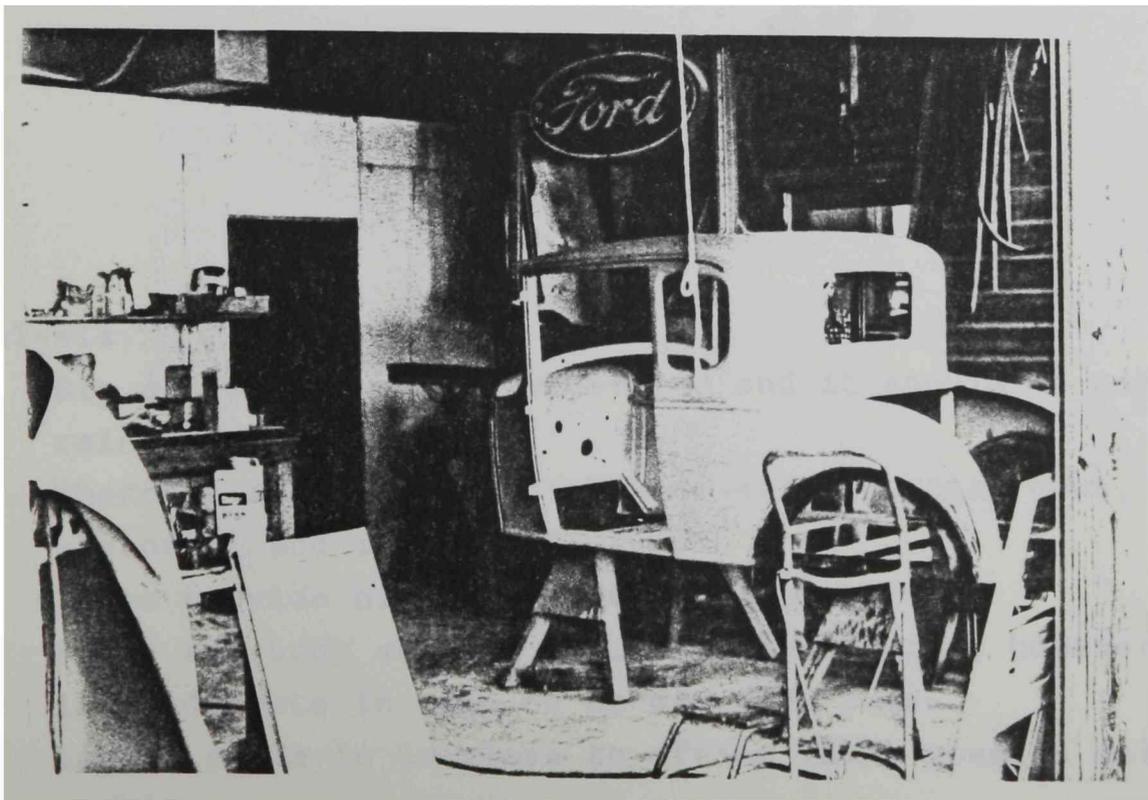
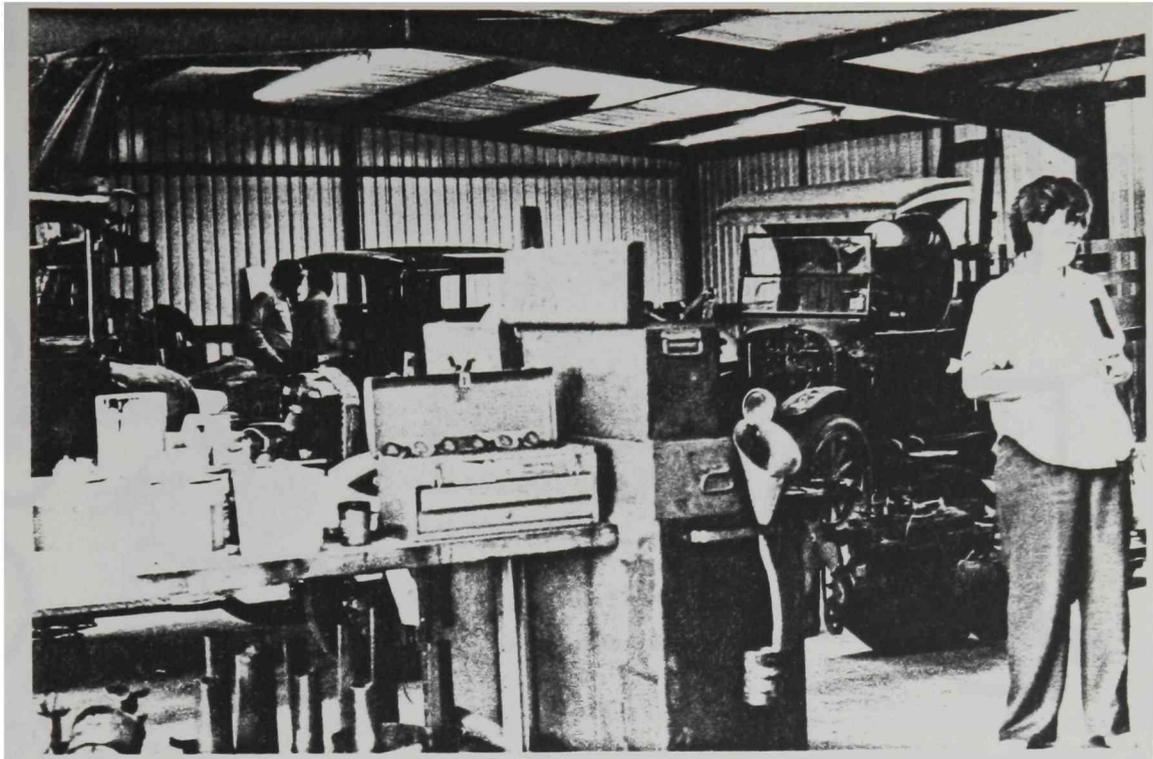


Photograph 10

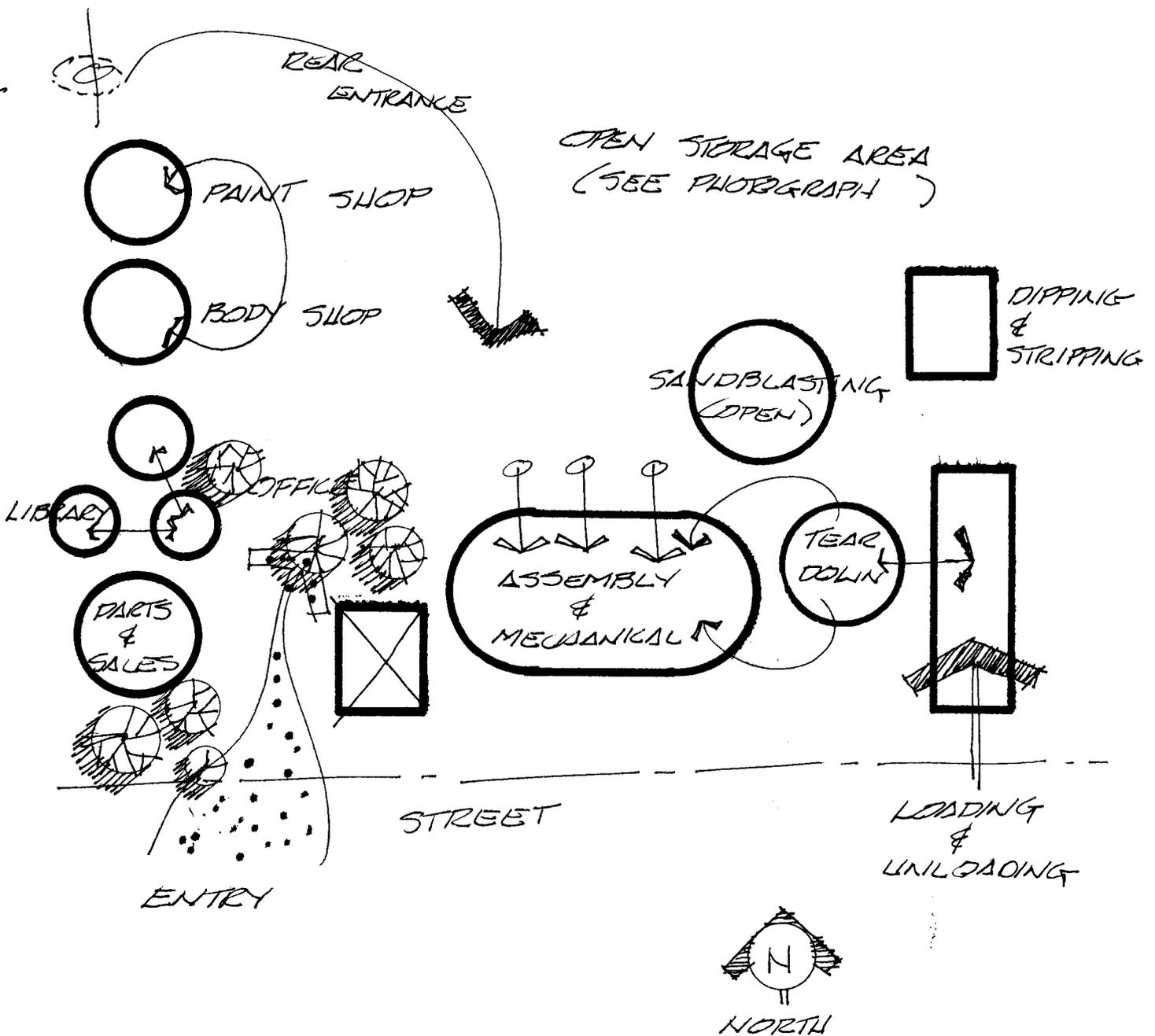
repaired/restored and then sent to the paint area. Parts are then stored until ready for assembly in the assembly area.

Space Summary:

1. Engine Area - 40' x 40' (Needs to be 60' x 60')
2. Body Shop - 30' x 40'
3. Tear Down Area
4. Paint Area - 30' x 40' or 20' x 30'
5. Dipping area 15' x 20' Outside-open (needs to be closed.)
6. Sandblast area
7. Service & assembly 80' x 100'
8. Office
9. Library
10. Parts Department 40' x 20'
11. Shipping/Receiving 40' x 60'
12. Storage
13. Proposed Museum Space



Photograph 11



Analysis:

- a. Dip and strip area is uncovered and it should be out of rain.
- b. There is a good relationship of loading, tear down, cleaning, and mechanical.
- c. Trees provide nice entry to facility area.
- d. Paint and body shop is remote which is nice, however, it is inadequate in size to handle work load.
- e. Engine area is too close to office which poses a noise problem.
- f. Library is too small to hold necessary quantity of books.

Figure 12



Photograph 12

BUILDING SYSTEM

Some of the buildings are steel construction, with sky lights for natural daylighting, and overhead doors. Parts area, office, and engine rebuilding are wood construction. The building system is an add-on approach as the need arises. This approach is haphazard and not always pleasing and efficient.

In the activity of automobile restoration, the people need to see the cars; however, there is a need to set traffic patterns and control visitor traffic in the work area.

SITE ANALYSIS

The site is in the Hill Country area of Central Texas and is located in the German settlement town of Fredericksburg. Site is a slight downgrade to the North and has a nice breeze through the buildings. Fans are, also, used as an aid in air circulation. The buildings are not air conditioned. Humidity is very low and ideal since outside storage is needed at times.

Evaluations

EVALUATIONS

From interviews, surveys and literature from each of the facilities, the following evaluations were made. Certain aspects were discovered as either good or bad; however, some aspects could be used well in any ideal facility. These aspects are listed below, along with a short description.

Working Environment:

The building should be kept clean and as clinical as possible. This is so because of the damage or injury to the finished product, enthusiasm by employees to work in a neat area, and client impressions when visiting the facility. The best example of this is White Post Restorations.

In restoration work, the process is a piecework assembly in which each car progresses at it's own pace with it's own schedule. This schedule can be held up for any number of reasons, such as unavailability of parts, paint curing time, or labor holdups. For this reason, an assembly line process cannot be used and the favored process is one that involves piecework in which each car has it's own space with it's own collection of parts, and all the cars share common support facilities.

	Library	Steel Built	Wood Built	Clinical Work Space	Seperate Paint Space	# of Employees	Self Contained	Museum	Adequate Storage	Lighting	Sandblasting	Chemical Stripping
Brachman	YES	X	X	NO	YES	10	NO	NO	NO	POOR	NO	NO
White Post	YES	X		YES	YES	15	YES	NO	YES	GOOD	YES	NO
Coleman	NO	X		NO	NO	15	NO	P L A N S	YES	FAIR	YES	NO
Rumple Kammer	YES	X	X	NO	YES	6-9	NO	P L A N S	NO	GOOD	YES	YES

Figure 13

Flexibility:

The facility needs some flexibility. It must be able to accommodate the relocation of light equipment as well as some heavy equipment (cranes, lifts, frame & engine equipment).

Client Involvement:

Clients need and are welcomed to be a part of the process and observe what is happening. However, there is a thin line between observing and getting in the way. Clients can distract workers, injure finished projects, and children can be hard to control. In addition, clients can interfere with employee/supervisor communication.

Housing:

Housing for clients and employees can be both positive and negative based on the following comparisons:

Inappropriate because of:

Liability problem with client and employees on site.

Security problem with visitors.

Initial and long term cost benefits.

Appropriate because of:

Convenience to visitor as a service.

Possible income from employee rent.

Security benefit from employees on site.

NOTE: Housing must be separate from work area to be successful.

Storage:

The ideal storage would be an area for each car in which the process of assembly could take place when ready. This, could, also, be facilitated by work benches, as well as shelving on wheels. Neither of the facilities has such space, but all expressed a need in the interview.

Vertical Circulation:

Vertical Systems could be of use and possibly beneficial, especially for storage; however, the cost analysis versus facility benefits would have to be studied carefully. None of the facilities had vertical circulation for the cars themselves.

Lighting:

Lighting is very important and needs to be readily available from all directions.

Ventilation:

The building needs to be ventilated and must have fresh air circulation. This is to exhaust sanding particles, as well as dust and fumes. In addition, it provides a more comfortable work environment.

Utilities:

The building must have air for pneumatic tools, as well as electricity (110 & 220) with a maximum of 10' span to work station.

Employees:

The average shop needs between 10 and 20 employees to operate smoothly.

Museum:

A museum in conjunction with a restoration facility is an important feature dealing with public awareness and education, and employee psychological affirmation.

The general public knows very little about the restoration process as well as the laborious tasks involved with restoring a car. A restoration facility/museum will form a living museum in which people can not only view the finished product, but see the process involved with obtaining this product, and the automobile in the state before restoration begins.

A primary concern in the restoration business is the quality of the product. In order to obtain quality, the craftsmen performing the various tasks must exercise care and take pride in their work to insure the highest degree of perfection. A museum would allow finished products to be displayed so that the craftsmen could view their finished product. Displays of this nature would help to affirm their sense of pride and encourage state of the art restoration in the future.

ACTIVITY AND SPACE SUMMARY

Storage:

Storage is a major consideration and varies for number of cars the building is designed to handle.

- Parts Storage
- Equipment Storage
- Car Storage (Inside and Outside)
- Finish Car Storage

Office:

Small office space is necessary for business managers/ job supervisor.

Library:

Small library and research area is vitally important. Possibly enough for one full time man.

Employee Lounge:

Small employee lounge is desirable, as well as a cleanup and restroom facilities.

Woodworking:

A woodworking (coachbuilding space) shop to work on wood parts and frame or body structure. Separate from paint with dust control.

Paint Shop:

A paint shop with storage for paint. Wall lighted, epoxy walls for easy cleaning, ventilated, heated, and downdraft air circulation.

Upholstery Shop:

Upholstery shop for storage of cloth and equipment.

Final Detail Area:

Final fit and final detail area for the final make ready.

Machine Shop:

Machine shop with all equipment to produce small parts and repair other parts.

Engine Shop:

Engine shop with line boring, cleaning, babbit room, assembly area (dust free) and tear down area.

Body Shop:

Body shop for repair, shaping and fitting.

Tear Down Area:

Tear down area with storage, shelving and catalogue facilities.

Sandblast Area:

Sandblast area for cleanup.

Chemical Stripping Area:

Chemical Stripping Area - Outside, but covered.

Mechanical Area:

- A. General work.
- B. Assembly.
- C. Chassis Work.
- D. Body and engine installation.
- E. Area for finished cars in for small service and repair - warranty area.

Chrome Plating:

Chrome shop if economically feasible. Can be subbed out.

Buff and Polish Area:

Buff and Polish Area, pending Chrome Plating Area.

General Area:

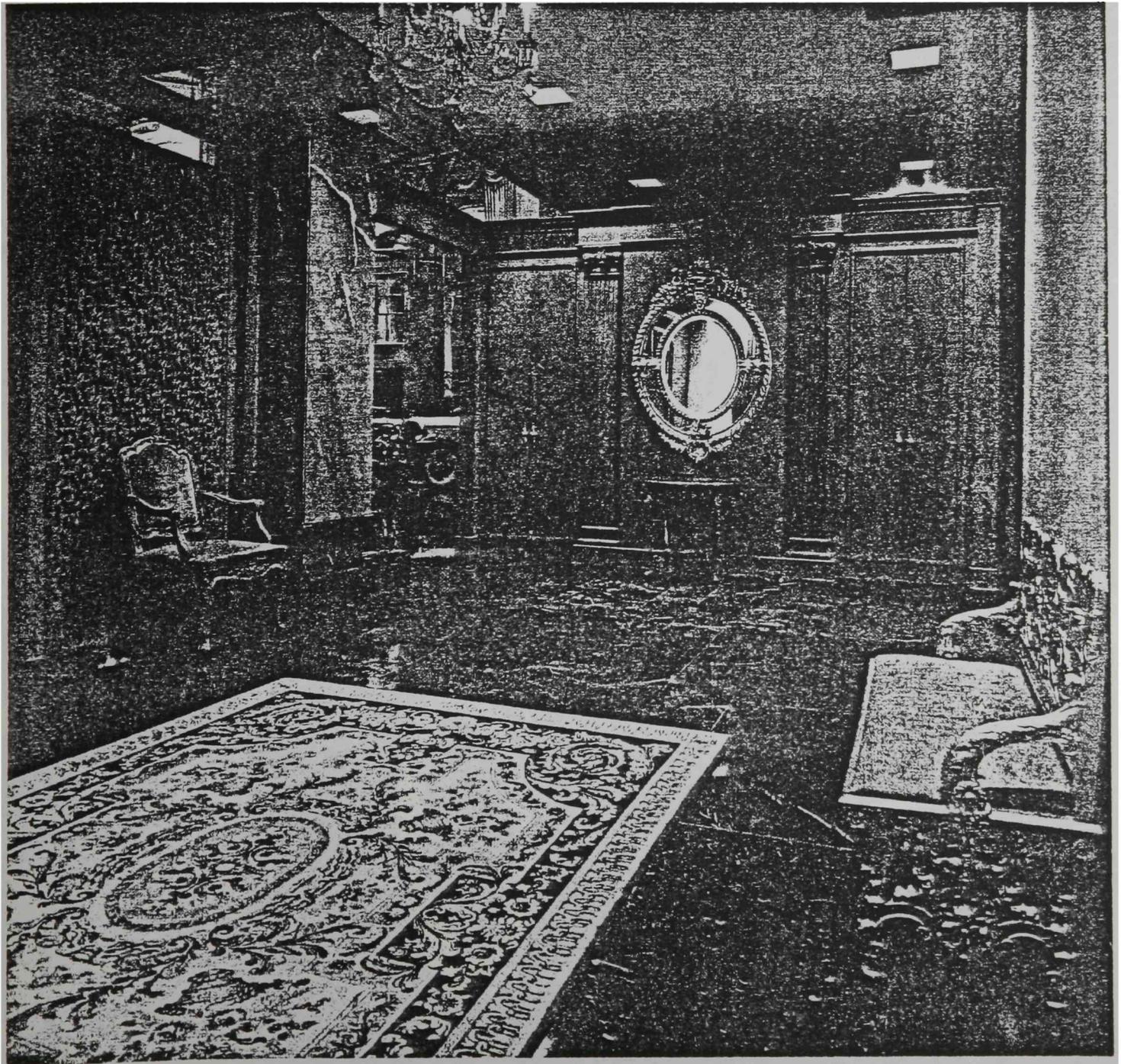
One general room for "tinkerest" activity such as instruments, guages, lights, etc., which require special lighting and tools.

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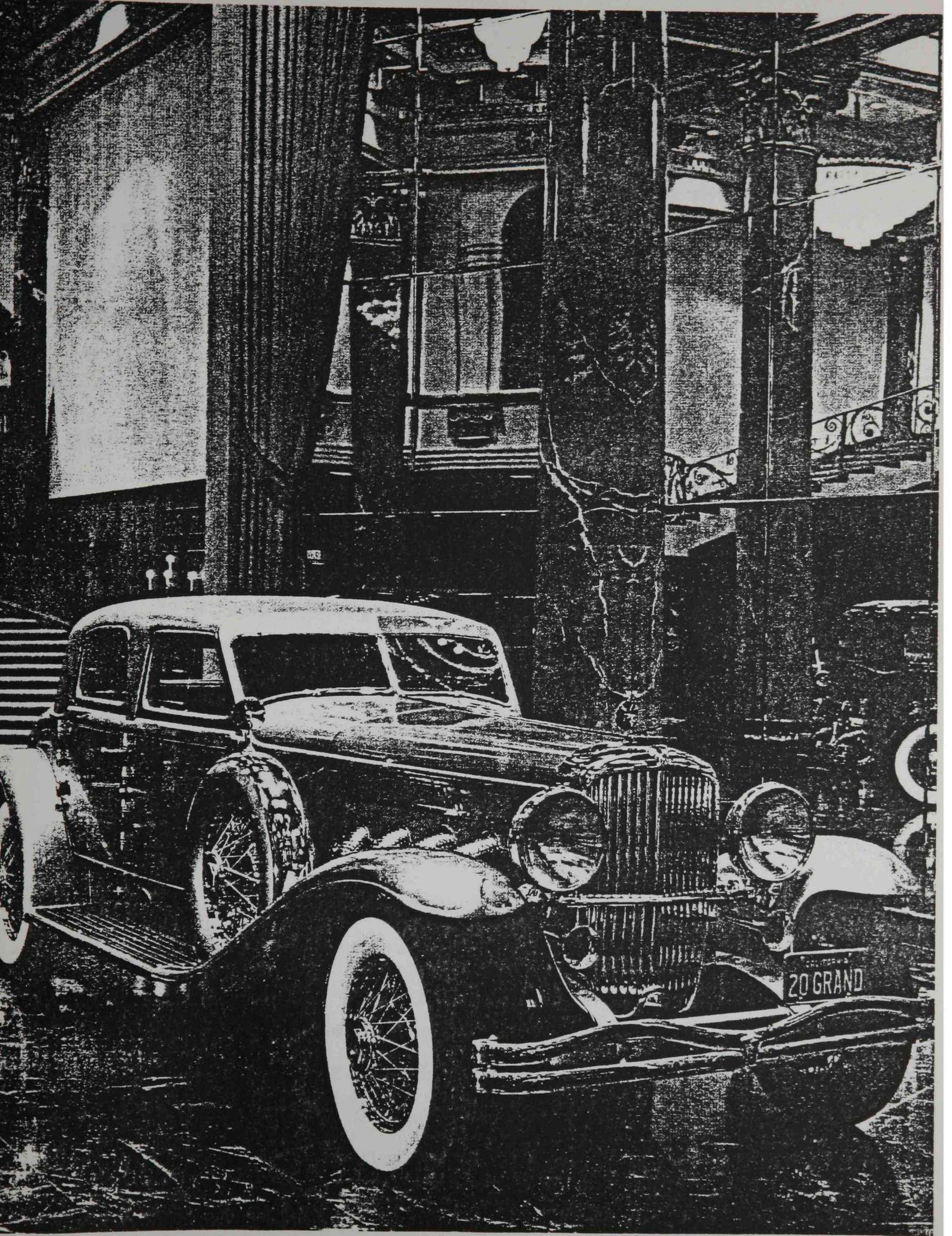
III

San Sylmar, California

THE GRAND SALON SHOWROOM



Photograph 13



Photograph 14

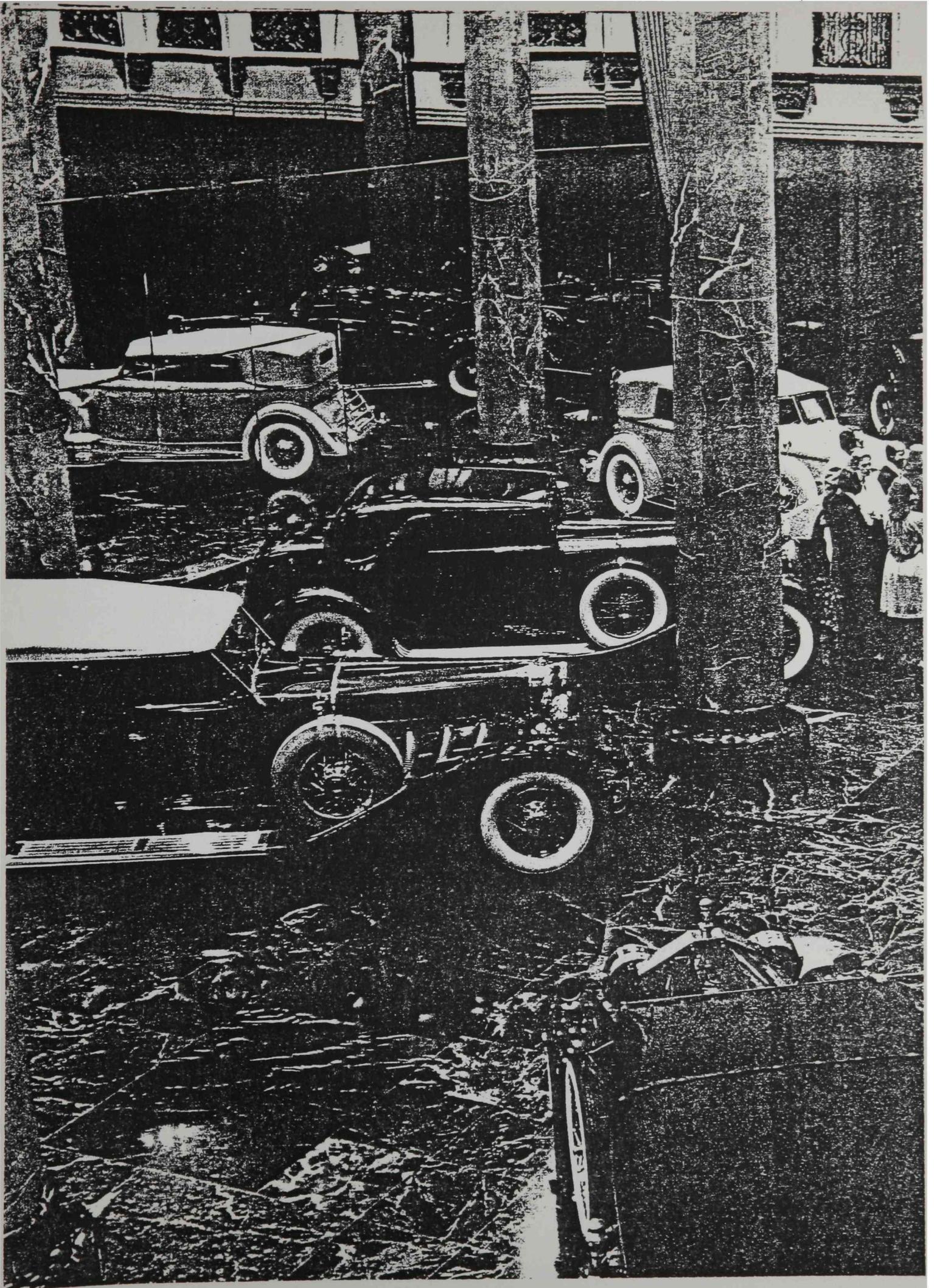
CONTEXT

"San Sylmar is living beauty, because everything the senses relate to in this unique structure has a purpose over and above that of beauty for the sake of beauty. San Sylmar is a complete departure from the often cold, sterile "museum" filled with stark, though beautiful, objects of art. It is a collection of functional fine art, restored to perfect operating condition and displayed in a warm, colorful, exotic treasure house."

J. B. Nethercutt, who is Chairman of the Board and Executive Officer of Merle Norman Cosmetics, states "There is beauty in everything, for those who will see it." In lieu of this, J. B. and Dorothy Nethercutt had a strong desire to display their treasures of functional art in a manner permitting easy viewing for anyone wishing to see them. San Sylmar construction began in 1968, and in August 1972, the collection was first displayed to the public.¹⁰

FUNCTION

Tours are conducted through San Sylmar for groups up to 50 people twice a day, six days a week and on one evening. At San Sylmar, the primary activities are the display of antique cars (all restored to perfect working order), an extensive collection of mascots, and hundreds of automatic musical instruments. Secondary activities include a complete restoration shop, a movie theater, and a research library.

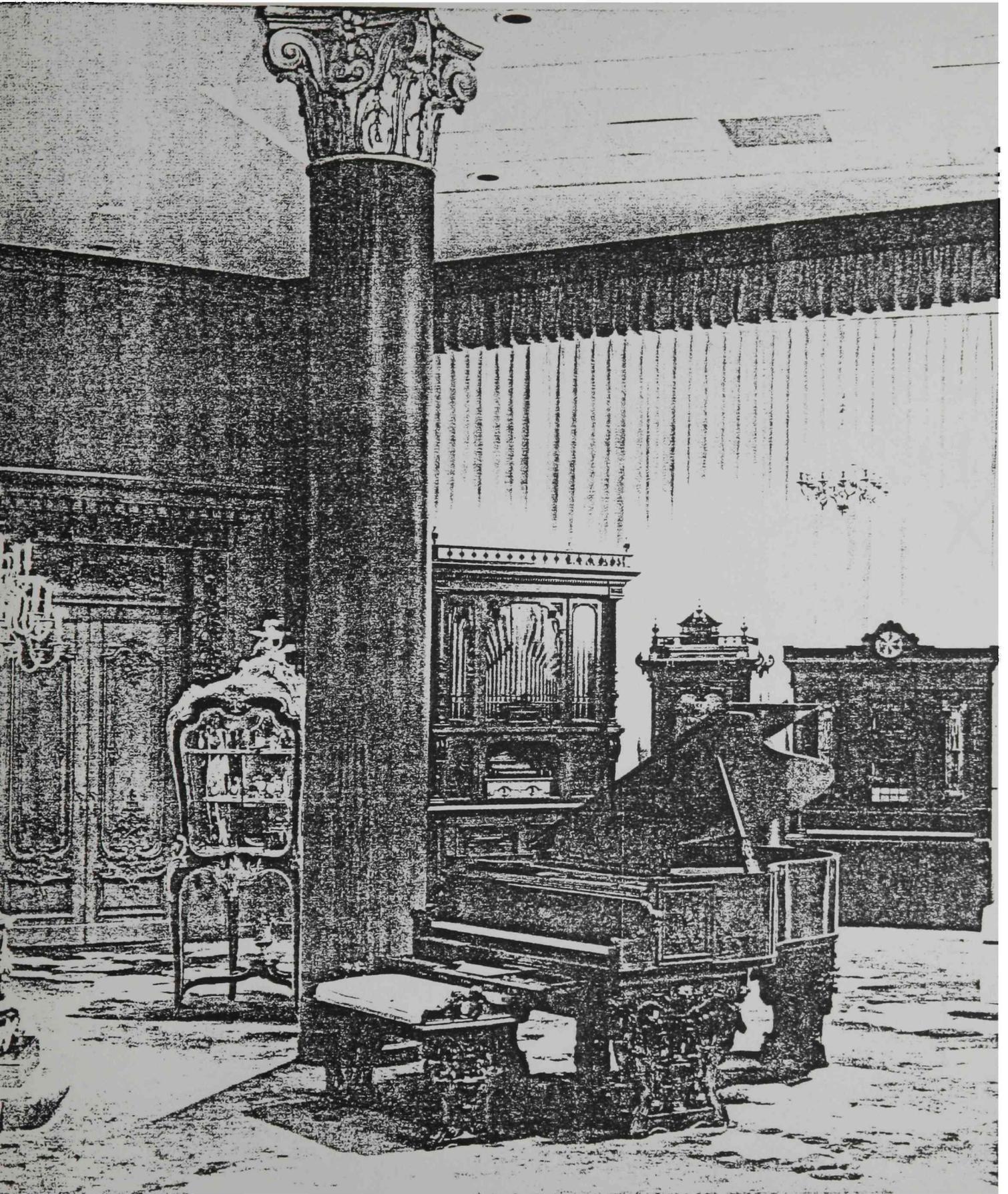


FORM

San Sylmar is a five level tower constructed of concrete. The building is elegantly decorated with green marble floors and columns extending 30' high. The top of this is a recessed ceiling decorated with elaborate molding, hand painted designs, flour de lis, and garnished with 24 carat gold leaf.

Level Summary:¹¹

- First - The Grand Salon - housing up to 20 cars from the Nethercutt collection.
- Second - Mezzanine - combines the second and third level and houses fine art and the collection of hood ornaments. Stairway to the Stars leads to the fourth level.
- Fourth - Cloud 99 - houses all musical instruments, etc.
- Fifth - Collection Room - houses library, holding room for music boxes, phonographs and the Cameo Motion Picture Theater (for cinema-scope, panavision and screen vision).



Photograph 16

CONTEXT

The Harrah Automobile Collection (H.A.C.) is a private collection of the late Bill Harrah. The collection is one of the largest in the world, with over 5000 cars and over 1500 on display. The idea was in Bill Harrah's view to "Display everything he can get into the showrooms, even if it means fender to fender and bumper to bumper". Harrah wanted to display even unrestored cars if there was room. This display was often disappointing to visitors, but was the policy. The visitors are mostly "Very nice, pleasant persons who were thrilled to be able to see what H.A.C. had to offer.

Visitor Attendance: highest in July and August

1962 - 36,000

1967 - 146,000

1976 - 350,000

Total today - 4,500,000. 80% are from California with 15% from Portland and Vancouver.¹²

FUNCTION

Visitors purchased a ticket (\$5.00) and proceeded through the main shop where final assembly of newly restored cars take place. Visitors then proceed West to the Showroom One. Cars were displayed in chronological order from 1892 to 1926. Visitors followed tour arrows, through circulated area.

Entering Showroom Two, cars ranged from 1926 to World War II, with some special lines. Across the yard to Showroom Three, passing a shed for storage of cars, housed the Ford line, sports cars, boats and motorcycles. This was the worst, due to lack of lighting. In the museum, visitors were not normally allowed to enter the restoration facilities.¹³

PRIMARY ACTIVITIES

Display of cars in various showrooms.

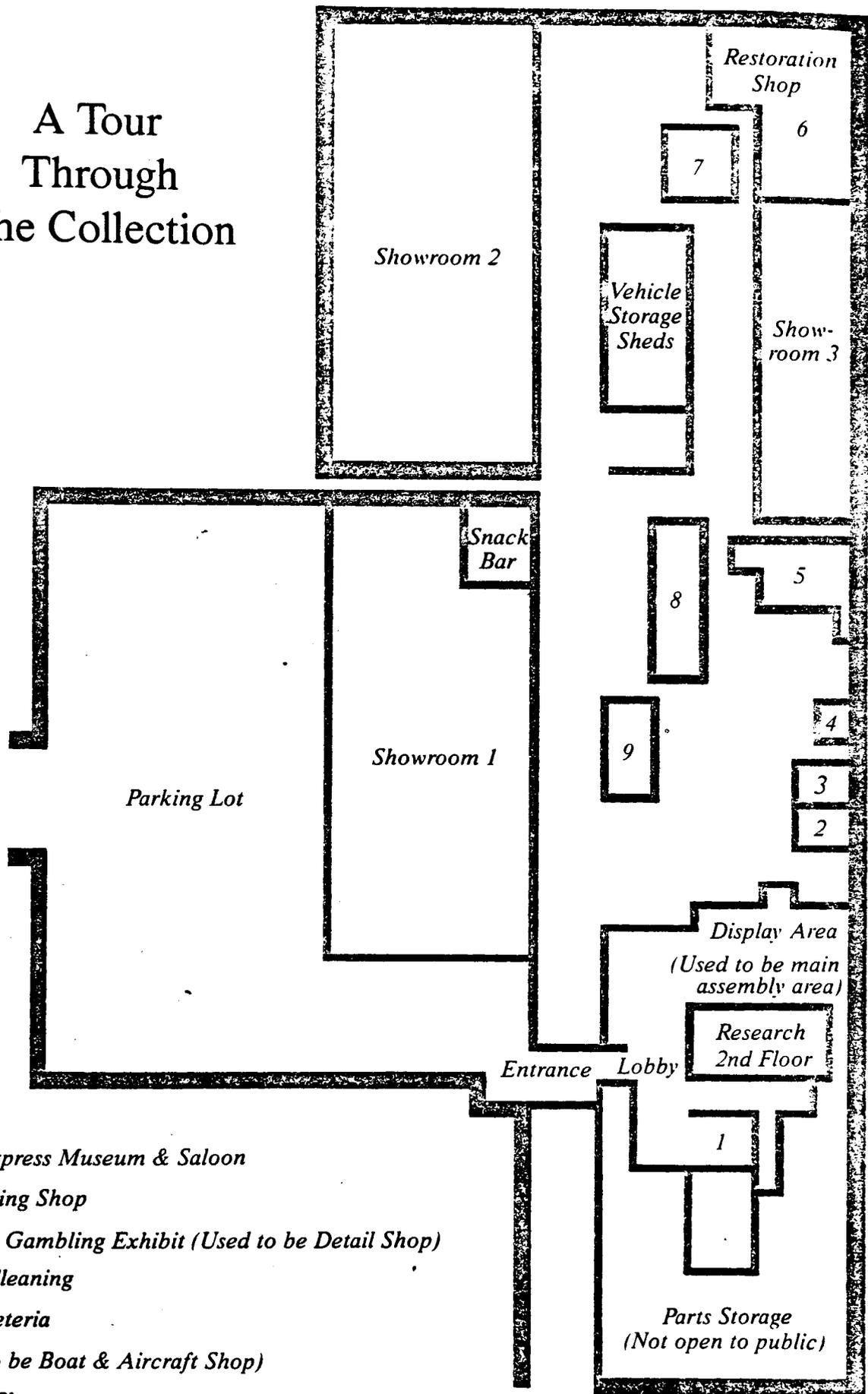
SECONDARY ACTIVITIES:

Restoration of awaiting cars.

Security.

Tour Guide/Information

A Tour Through The Collection



- 1 Pony Express Museum & Saloon
- 2 Old Plating Shop
- 3 Frontier Gambling Exhibit (Used to be Detail Shop)
- 4 Steam Cleaning
- 5 Old Cafeteria
- 6 (Used to be Boat & Aircraft Shop)
- 7 Plating Shop
- 8 Detail and Welding Shop
- 9 Locomotive Building

Harrah's Automobile Collection

Figure 14

ANALYSIS

- A. Buildings are scattered out, which is tiring to visitors.
- B. Is good to have showroom adjacent.
- C. Part storage is not located next to restoration. This is very inconvenient.
- D. Parking lot is too much of eyesore upon entry.
- E. Large spaces contribute to security problems.

FORM

The primary building itself was an ice house for the railroad. It was leased from John Dermody in the late thirtys. The H.A.C., however, is composed of several buildings, sheds and structures. Included in this is two pre-fab concrete showrooms and one corrugated sheet metal showroom. The Pony Express Museum and souvenir area were added later. The main building is constructed of painted stucco.

SITE ANALYSIS

The H.A.C. is located in Sparks, Nevada off Glendale Avenue. The entrance is not aesthetically pleasant and resembles somewhat of a construction site or junkyard. The building has no approach and is not located in a nice area of town. In addition to this, the H.A.C. is made up of several buildings scattered about in an illogical sense.

Evaluations

CASE STUDY EVALUATIONS: MERLE NORMAN TOWER
HARRAHS AUTOMOBILE COLLECTION

FINDINGS

1. Display of cars in an elegant and pristeen environment is better received by visitors, such as the case at San Sylmar. When automobiles are packed together in haphazard arrangement, visitors seem to receive automobiles in a less than respected manner.
2. San Sylmar's elegant and plush interior compliments classic automobiles whereas a less than elegant setting seems to distract from automobiles.
3. Visitors are less apt to touch, crawl or damage cars in a formal environment, such as San Sylmar where cars and building compliment each other. Security is a problem at Harrahs, where automobiles are the focal point of the exhibit and the building is secondary to automobiles.
4. Conducting tours through an exhibit as opposed to self-guided observation is more advantageous, such as in the San Sylmar facility where:
 - A. Security is less a problem as a tour guide can monitor cars and visitors throughout the tour.
 - B. There is no need for arrows or signs marking a pre-designed circulation path in the showrooms and areas that are pedestrian supportive, as at Harrahs.
 - C. Tours like the ones conducted at San Sylmar are much more informative to the average visitor.

5. Automobile restoration facilities at the museum is an advantage. This is the case at H.A.C., San Sylmar, and Blackhawk Classic Automobile Collection at San Ramon, California.
6. The building location and environmental setting appears not to be detrimental in visitation, which is evidenced by the displeasing location at Harrahs.
7. If a restoration facility is involved with the museum, steps must be taken to separate visitors from the workmen and automobiles being restored. It is, however, necessary for the visitors to be allowed to view aspects of the restoration process. Visitor separation is necessary due to security, safety factors, liability of visitors in work space, and employee interruption by the visitors.
8. In a large museum, seating and periodical rest places are beneficial to visitor comfort.

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Library

To date, information in regards to a specific library research center in a museum-restoration facility is unavailable. However, there are several guidelines and design criteria which involve library/research centers in general. Following is an evaluation on advantageous aspects to be design criteria for any library and specifically in a restoration, research library.

1. A library center is an absolute must in a restoration facility and must be readily accessible to employees and, also, available to visitors.
2. Computerization in the restoration facility can provide for library research on cars, which can in turn be used as a teaching aid for new employees, automobile clients, and the public.
3. Resource sharing through telematics is becoming increasingly important. This allows one to connect with libraries all over the United States and some specialized libraries in the Research Library Group.
4. Since many of the automobile archives are on microfilm, microfilm plan tables and microfilm screen monitors are essential.
5. By utilizing microfilm, it serves to gain access to material one might not otherwise be able to utilize. It helps to protect rare documents by reducing the handling of said documents.

6. Architecturally, libraries should be designed to allow maximum flexibility in the use of interior space.
7. Libraries should utilize antistatic carpets in certain areas, abundance of electrical outlets, and ergonomic furnishings.
8. Obviously, libraries must, also, be sensitive to the physical requirements of library materials.
 - A. Control of light to control deteriorating ultraviolet radiation, while still providing light to see adequately the materials.
 - B. Control of temperature and humidity.
 - C. Well designed fire and sprinkle systems with automatic activation and deactivation.

ENDNOTES

- ¹Telephone Interview with Charles Lawrence, FAIA
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- ²"Survey to Brachman Coachbuilders," (4 May 1984.), NP.
- ³Niemann, Nemo, "White Post Restorations," Skinned Knuckles, Vol. 4-No.1 (Aug. 1979), pp. 30-36.
- ⁴"White Post Restoration Review," Old Cars Weekly (Michigan), 26 January 1984, p. 12, cols. 1-3.
- ⁵Niemann, pp. 30-36.
- ⁶"White Post Restoration Review," p.12, cols. 1-3.
- ⁷Telephone Interview with Bill Coleman, 25 September, 1984.
- ⁸"Survey to Coleman Classic Motors," (8 August, 1984), p. 60.
- ⁹Telephone Interview with Shatzy Crouch, Rumpel Kammer Restorations, 25 September, 1984.
- ¹⁰Bowers, David, SAN SYLMAR A Treasure House of Functional Fine Art (Los Angeles: Merle Norman Cosmetics, 1978), p. 61.
- ¹¹Bowers, p. 61.
- ¹²Batchelor, Dean. Harrah's Automobile Collection (Pontiac, MI: GP Publishing, 1984), p. 61.
- ¹³"Harrah's Automobile Collection, The World's Largest" Brochure (Reno, Nevada, 1984), p. 60.
- ¹⁴Rochell, Carlton C. "Designing Tomorrow's Libraries," Architectural Record, (Aug. 1983), p. 91.

¹⁶Batchelor, Dean. Harrah's Automobile Collection
Pontiac, Michigan: GP Publishing, 1984.

¹⁷Yakel, Frank Ryan. A Program: Panhandle-Plains
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¹⁸Bowers, David. San Sylmar: A Treasure House of
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²⁰Yakel.

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The Bus Service- for their prompt and reliable service.

Thank You,

A handwritten signature in black ink, appearing to be the initials 'S.J.' with a flourish.

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Documentation

This project involved the design of a facility for the restoration and display of antique and classic cars. The thesis statement was the conflict of opposites that evolved from the juxtaposition of antique artifacts with the high technology that is available both in the automotive industry and the architectural context.

The facility was a process architecture that flowed from storage, to tear down and computer logging, to chassis and body cleaning, repair, painting, final assembly and then to upholstery and final fit and finish. This process type architecture led to some very interesting discoveries that were both form suggestive and process informative.

As a result of this architecture it seems that the main point was the fact that when architecture is designed for people it is tailored to their needs and then the inhabitants fit the building. In process architecture, however, the process has very little allowance for change. This results in architecture that is dictated by the process, and therefore the process is form generative.

The type of form generation involved in the automotive restoration process led to some very interesting design options and those in turn were the basis for my design concepts.

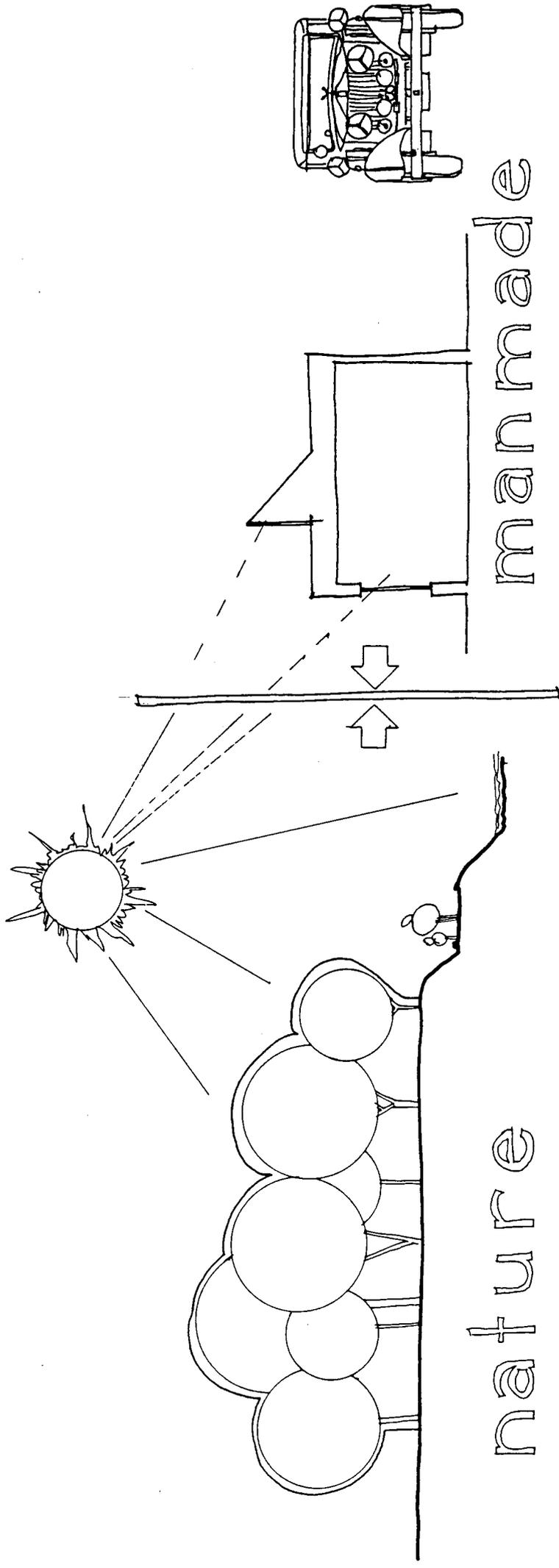
First, the automobile is an art form in this case and is to be viewed as such. This led to some involved symbolism. The form of the building took the shape of the process, with a whole degraded car, broken into pieces, then repaired to several entities, and then reassembled into a perfect, whole

product. The main circular areas represent the wheel and its kinetic qualities. The roof structures represent spokes of a wheel. The automobile is a man made object placed upon the natural environment. Therefore the building is a kinetic structure placed upon the environment that is set apart from the natural qualities, thus the white contrast and raised structures.

The lighting was another important design option and was developed with an important reliance on natural lighting. This accounts for the long spine, massive space frame skylights and large open glass walls.

The most revolutionary design option was that of vertical or horizontal circulation systems. Up until now, there are no facilities that utilize vertical systems. All of the case studies said that vertical systems would not be useful. However, the storage system is a very good application for vertical circulation. Storage needs to be compact and as utilitarian as possible. Vertical circulation systems lend themselves for the most efficient manner that can be achieved and therefore, I utilized verticality in my storage areas.

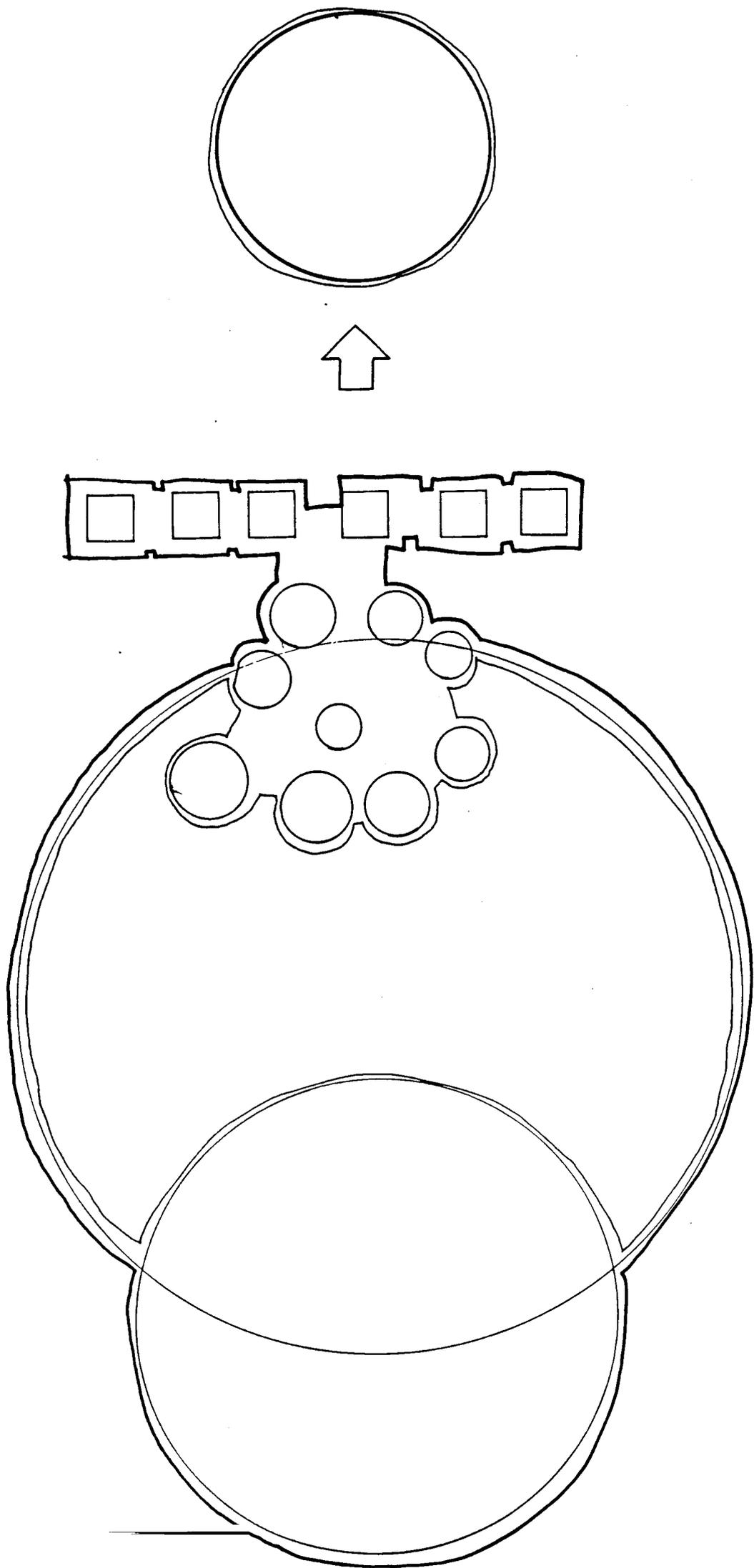
In conclusion, this project was very fun and proved both educational and exciting. It also demonstrated that process architecture is an important exercise in architectural design. This project was more than I expected and included a scope far more encompassing than I anticipated. It was, however, very enjoyable.



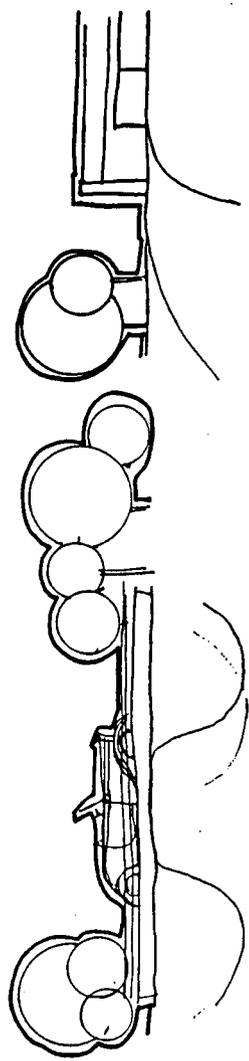
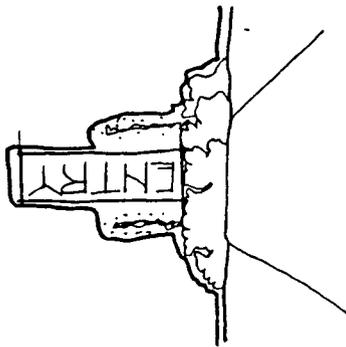
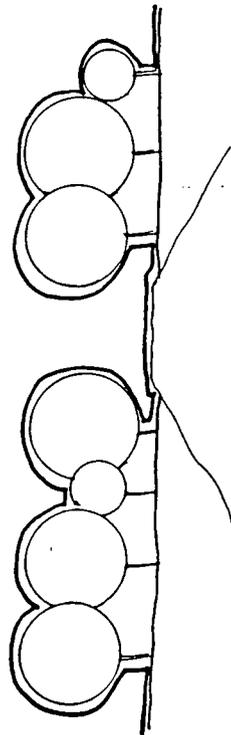
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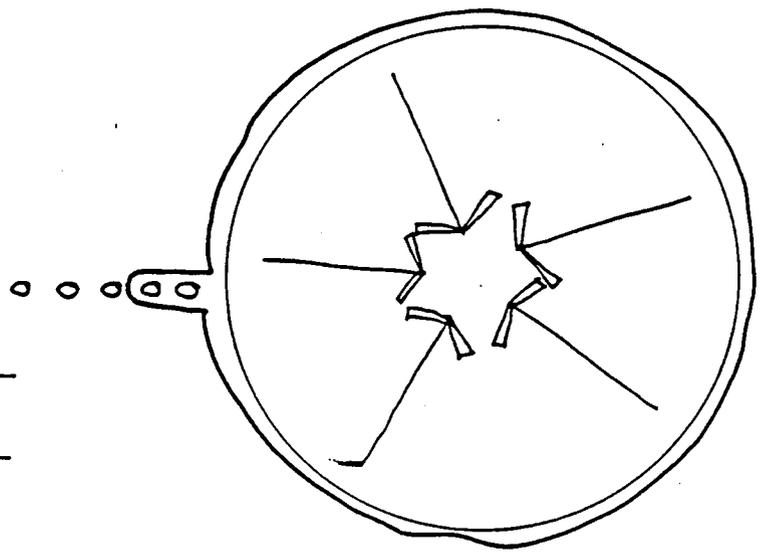
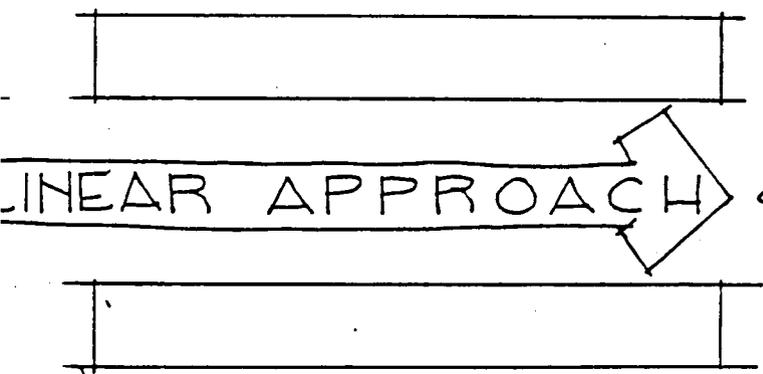
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SEPARATE



approach





RADIAL ASSEMBLY

