A Roadside Resort in the Black Hills

a study of architectural communication
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MARCH 19, 1982
A Roadside Resort in the Black Hills

a study of architectural communication

A professional paper submitted in partial fulfillment
of the requirements for the degree of

BACHELOR OF ARCHITECTURE

Approved:

[signature]
Advisor
Chairman, Thesis Committee
Director, School of Architecture

Montana State University
Bozeman, Montana

March 1982
To my very closest friends... 

your support through all 

those "B" days is undying.
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ACKNOWLEDGEMENTS

I would like to thank the following people for the influence they have had on my education and ultimately my life. My parents, Art and Helen Bissenden; Tom and Alta Simpson; David Matthews; and Bob Utzinger. Their encouragement, inspiration, and guidance enables me to continue on my life's journey with more confidence.
PROJECT INTENTIONS

An exploration into the ability of built form to communicate meaning to the viewer through the vehicle of a roadside resort centrally located in the Black Hills of South Dakota.
Introduction
PROJECT ORIGINS

My fascination with this thesis subject began as a high school student when my summers were spent working at a fishing resort in the Black Hills of South Dakota. My time there made me aware of the tremendous need (financially) to draw the tourist off the highway and into the business. The obvious way that this was done was through the use of hundreds of billboards strung along the highway for miles in either direction. But, there was more to the persuasion techniques than that. Once at the site the visitor had to be convinced to stop and take advantage of what the facility had to offer. With these realizations, I became curious about how the built environment can communicate to its viewers -- how forms can be assigned meanings by their respective cultures.
PROJECT DIRECTION

Borrowing the idea of a resort community -- one that requires its functions to be conveyed to the general observer -- as a project, I will investigate how a built environment can communicate meaning to viewers on the adjacent highway.

It should be noted that the site chosen is the site of an already existing fishing resort. This investigation will be as stated above and will not try to incorporate any of the existing built forms.
FORM INVESTIGATION

There are many different ways in which forms are manipulated in the process of design. Because of functional requirements and indeed, because of precedence, buildings that house similar functions seem to result in similar forms. This is not all inclusive, but it happens enough that man has been conditioned to recognize certain forms and relate them to certain functions.

All of us can recognize the form of a gas station and distinguish its form from a neighborhood grocery store even though some of the elements are similar. Just as images of hotels and motels, apartment buildings, office buildings, and restaurants, to name a few, demand that certain elements be present in order to obviate the function of these particular types of structures.

Through a visual analysis of the built environment this becomes clear. There are window patterns or rhythms unique to apartment buildings that set them off from office buildings. Hotels distinguish themselves from motels by mass and sometimes site. Restaurants express themselves in a variety
of sizes and forms which help to determine the building's function. The one thing common to most restaurants is the use of large expanses of glass that allow "glimpses of the interior". The window is used to effectively frame "the part of the interior which it exposes...showing just as much, and no more", than needs to be shown to visually cue passersby of the activity that is happening within. Some restaurants do not; however, express themselves in this way on the exterior - especially those responding to "higher class" clientele. They must depend on other means to attract customers. This is usually done through signage or a good reputation that is developed over time.

Geoffrey Broadbent, in his essays on symbiosis, states that the "first meaning of a building is what one must do in order to inhabit it -- the architectural object denotes a 'form of inhabitation'." This meaning, this denotation of function is what people consciously or unconsciously are looking for in a building. Take the simple structure in figure 1. Through its form it gives enough information to signal what is happening. There are no formal signs, as such, but all the elements that one expects to see when
looking for this service are present. The gas pumps, large windows and covered service area clearly indicate that in this building one can obtain gas and possibly some general repairs for his automobile. Also, with some indication of people present; i.e.: cars parked out front, open doors, lights, flags or actual people moving around; the passerby can reasonably conclude that this place is open for business.

What happens in figure 2 when some of the key elements in the form are removed and contradictory elements are added? Here the viewer becomes confused, or worse yet, doesn't bother with viewing it at all. Stephen Kaplan, in his book, *Humanscape*, speaks of the great human need for understanding. If people do not understand they will turn away, even if understanding means comfort or reward.

Umberto Eco, concerned with semiology, or the "theory of the way anything can take on meaning", describes his theory of how architecture is experienced.

"Architectural discourse is experienced inattentively, in the same way in which we experience the discourse of films and television, the comics,
or advertising - not, that is, in the way in which one is meant to experience works of art and other more demanding messages, which call for concentration, absorption, whole hearted interest in interpreting the message, interest in the intentions of the 'addressor'.

The average viewer, in other words, is not going to give the built environment much of his attention if he does not receive the stimulus he seeks. Taking this further, the said stimulus must present itself simply and directly enough in order to be perceived clearly, or with minimal additional investigation.

Communication through the built form, then, should play upon man's psychological conditioning, using it to its full advantage. "An essential aspect of people's interaction with buildings is the meaning they associate with those buildings; therefore, good design should encompass a conscious manipulation of intended meanings."
FRAME OF MIND

Vacationing people driving down the highway are in a certain frame of mind. They are on vacation. They have come to the Black Hills looking for fun, excitement, relaxation, and more often than not, they want to see and do the most in the least amount of time. Every traveler, however, is not in the same frame of mind. I will attempt here to discern the various types of travelers that might be coming down the highway, and to discover what their individual needs might be.

To begin this study I have divided the travelers into five groups. Realizing that every possible scenario could not be studied (or even discovered), I have chosen groups that I feel cover the vast majority of travelers.

The Unscheduled Day Traveler is defined to be a person or family from the surrounding area. They could be out for a Sunday drive or possibly showing some relatives the sights. They probably have no set goals to accomplish for the day so they would be easily influenced to activities happening beside the road. They would also be more likely to explore
an unknown or vague site to determine what might be happen-
ing.

The **Scheduled Day Traveler** is also defined to be a lo-
cal group. The difference between this group of travelers
and the Unscheduled Day Travelers is that they are probably
following some pre-arranged itinerary. More than likely,
they will pass by everything that they do not have scheduled.
It would be very difficult to persuade this group to change
their plans. However, I feel that this could possibly be
done through the use of services such as gasoline or snacks
as preliminary lures, and then exposing them to as much of
what the facility has to offer while they are there. Be-
cause they are local, this might be a way to encourage a
return visit.

Another type of traveler is the **Unscheduled Distance
Traveler**. This type of person falls into the group that is
going from point A to point D and is not concerned about
where they find points B and C. They have a very loose time
frame in which to complete their journey and are going to
see things in between at a casual pace. This group is the
one that would be easy prey for the roadside facility. Like the \textit{Unscheduled Day Traveler}, this group would be more likely to explore uncertain areas. Nonetheless, they do have needs and desires that must be fulfilled, so it is important to inform them of what it is that they can explore further. The "clincher" is that they may pull into the resort for a casual brunch and be convinced to remain for some or all of the other offerings.

On the other hand, the \textit{Scheduled Distance Traveler} is likely to be in a hurry. This group's destination is probably exceedingly ambitious in terms of miles. Their needs might be a toilet, a quick snack, and some gas. They are probably pre-programmed into finding a Quick-Stop Gas'N Shop and maybe will be helping "Jerry's Kids" at the same time. It doesn't really matter to them which brand of store they choose as long as it has the services they need.

This group is not going to be easily persuaded to stay very long. They simply do not have the time. Therefore, it becomes important to place services for these types of travelers in highly visible and easily accessible locations
in relation to the road.

Finally, there is the Destination Traveler. This group I have defined to be the Distance Traveler that has reached his destination. They are probably looking for a place to locate themselves for an extended time -- a "base" from which they can journey from each morning and return to each night. The importance here is to inform them of how the "resort concept" can cater to their particular needs. It also becomes important to inform them that there are many on-site activities to enjoy as well as non-active relaxation environments available.

Therefore, by studying the needs of these models, guidelines for a response to their needs begin to develop. The aim of the built environment along the roadside is to attract customers at first glance. In these situations a moments hesitation on the part of the potential customer will sweep him past the restaurant and into the arms of the rival two miles down the road." The ultimate design philosophies must consider that the potential customers "will be passing at high speeds," are not likely to be familiar with the bus-
iness personally, and will have many pre-conceived ideas about what building forms house the type of services they desire.
Satisfying the Visual Image

"...humans evolved as far reaching animals, attempting to cope with a not always friendly environment. To the extent that they lived by their wits, by anticipating events and acting accordingly, the first essential step was to perceive, to recognize objects, and to comprehend the space in which the objects existed."  

How do these groups find the businesses that satisfy their needs? As pointed out above, the first step is to perceive, and then to recognize. The use of signage is one way of aiding perception and signaling function. These signs could be familiar, well-advertized symbols for businesses: McDonald's, Best Western, Kwik-Way; or brightly painted or illuminated letters spelling out the function of the business.

Whatever the means of informing the public of building function, the building itself must convey an appropriate message. "A major concern of non-architects is that a build-
ing design seem appropriate to the building type and use."
The building must correlate with the observer's preconceived ideas about appropriate building form in order to be successful in relaying information about its function. Imagine a McDonald's restaurant operating out of a building form generally associated with religious functions. The average viewer would be bothered -- maybe only subconsciously -- that the familiar restaurant image was not present. The building has a better chance of being considered successful if its form is interpreted as being consistent with its purpose.

So the key to architectural communication through the built form is to investigate what the consumer desires and to what degree the forms signal how their needs can be fulfilled.
In the previous sections I have discussed how man has been conditioned to relate certain functions with certain forms; and, by making use of forms that man is familiar with, the designer can inform the consumer of the building's function and thereby attract him into his facility. This concept is extremely important in a roadside location. The building becomes the billboard -- it becomes the informer of function -- that tells the consumer what is happening within so that he can decide if this place will fulfill his needs. This must be an honest means of communication that will not mislead or lead up to unfulfilled expectations.

The roadside environment consists of many images. Some of these images can be both 'meaningful' and 'meaningless' at the same time, having meaning to those people that have had some sort of past experience with them. The rural farm could bring back pleasant memories to the man that lived on a farm as a boy, but has since moved to the city. He might wish to drive closer to an old barn and re-
late stories out of his past to his family. Or, this image could merely be an added feature informing the city dweller of the rustic quality of the environment that he is passing through.

To the commercial facility located beside the road it becomes very important to play on this idea of relating to the quality of the environment. In Las Vegas it becomes a necessity to build a very large, well-lit structure with as many unique features as possible. This allows the building to be as equally impressive as all other forms that are striving for the consumers attention. On commercial strips in most cities across the country it becomes important to develop a consistent form or a symbol for a business and to use that image in every city; thus, relying on previous experiences by the consumer. However, when occupying a rural roadside site it becomes important to combine the philosophy of blending with the surrounding built environment (as in Las Vegas) and having a consistent image (as on commercial strips). The facility must esthetically complement the rural environment by using suitable materials, colors, and textures, as well as making use of culturally understood forms to relate function to the consumer.
SIGNAGE

With a business depending on passersby for its patronage, the need for a good system of signage arises. The sign should not do the work of the built form, it should only serve as a complementing feature to complete the image.

The present trend in advertising roadside facilities is to visually "scream" at the passersby. The result is visual saturation. The highways are "lined with billboards, jazzed-up diners, used car lots, drive-in movies, beflagged gas stations, and garish motels". The prospective patron is told everything about a business before he ever enters the actual site. What he is told about the facility, however, may not correspond to what is actually being offered.

I feel that there is an alternative to this type of roadside environment. A facility built in a desirable natural setting can capitalize on the free advertising that its surroundings will provide for it. This facility can complement the natural character of the site and offer to its patrons the qualities that they came to the area to enjoy. There is no need for miles of billboards explaining
every detail about the business. The colored flags, flashing neon and illuminated arrows only serve to condemn the quality of the facility.\textsuperscript{13}

The simplicity of the natural environment should be respected in the signage scheme. Natural, contextural materials and colors should be used to reflect the quality of the roadside facility. The number and size of the signs should also respond to the intelligence of the type of people the facility expects to attract.

A small sign at the entrance stating the name and possibly the hours of business, and a sign placed a few miles in either direction up the highway is all that is necessary to inform the traveler of the facility's existence. The natural quality of the sign and the simplistic advertising scheme in itself will be a refreshing change that should attract the conscientious traveler; and, the anticipation that he derives from the sign will not be frustrated. I feel that this approach to roadside signage will encourage the visitor to further explore the environment to which he is being presented.
Therefore, the signage system should reflect and complement the quality of the environment and allow the built environment to relay its meaning to the road. The sign should only serve as a supplement to the communication concept. By using this philosophy, the architectural forms, enhanced by the natural environment, develop and maintain an integrity of their own. I dare say, they develop a "quality without a name". \[14\]
In the study of travelers, I have determined some possibilities of the types of groups that might be moving along the highway. I also have defined what might be some of their needs. Given this basic understanding of what the traveler knows and cares about, "it should be possible to form at least a tentative conception of an environment that would be supportive and satisfying..." for him. By using this information specific to a roadside resort facility, I will attempt to find out what forms would be appropriate to incorporate within this facility, and how they relate themselves to the highway.

The major needs of the traveler have been identified as a place to sleep, food and drink, some kind of recreational activity, and various support services. These needs must present themselves to the highway as built forms that can communicate their function. They should become the lyrical component of a complete architectural statement -- a statement that ultimately should communicate the idea of a resort community.
INTRODUCTION

In the previous sections I have discussed the roadside images that travelers have been conditioned to respond to in order to satisfy their needs. I have also categorized those needs as: a place to sleep, food and drink, some kind of recreational activity, and various support services.

To determine how large a facility might be required to satisfy these needs proved to be more difficult. Information on visitor numbers to the Black Hills and facilities to handle these tourists is hazey, at best.

Wes Shelton, Director for Economic Development in the Rapid City area did state "that tourism was up (for 1981) approximately 15% to 20% depending on the type of business." He went on to say that, "We, in the area, are promoting the Black Hills as an ultimate destination hoping visitors will stop three days or more rather than stop only briefly. If this is to be a reality, facilities will need to be such as will attract people from a distance of 300 to 1,000 miles and then meet their needs for an extended time." Tom Simpson, owner of Trout Haven Fishing Resort (a business
that depends on the day visitor for the majority of its income), also stated that to be successful a business just starting out would have to be able to handle a large number of people's overnight needs for an extended period of time. Therefore, the size of this facility became based on one that could provide a place to sleep, eat, and recreate for a "large" number of people. I have chosen 100-units as a definition of large and developed a program of 48 motel units and 40+ campsites. The numbers of each were based on my opinion of what the site could handle in terms of density and visual appeal. The square footages were based on accepted standards of facilities and support services for a typical 100-unit motel (considering some campers will not use the dining facilities and other patrons will only be day visitors). The facilities provided were based on my investigation of the needs of the travelers to the Black Hills area.

To determine the characteristics and quality of this facility I have developed a set of criteria by which to analyze each space. The following pages reveal the results of this process.
CRITERIA FOR ANALYSIS - DEFINITIONS

ZONES: Public
    Private/Guest
    Private/Staff
    Administrative
    Support - storage, refrigeration, stocking areas,
    janitorial
    Mechanical

FUNCTION: A brief description of the space's function.

OCCUPANT LOAD: Maximum number of persons occupying the area at any one time.

SEASON OF USE: Some areas will be shut down during the "off-season".
    Winter - (W)
    Spring - (S)
    Summer - (Su)
    Fall - (F)

DURATION OF USE: Expected time length of use.

ORIENTATION: Building placement with respect to environmental/adjacency influences.

ADJACENCY: Preferred bordering function indicated.
ACoustical: Noise level.

Illumination: Recommended means and type of illumination.
  General - (G)  Daylight - (DAY)
  Indirect - (I)  Incandescent - (INC)
  Direct - (D)  Fluorescent - (FLR)
  Task - (T)

Mechanical: Means of heating area.
  Gas - (G)
  Fireplace - (F)
  Passive Solar - (S)

Electrical: Outlet requirements or special power requirements.
Zone: Public

Function: Entry-information

Occupant load: Varies

Season of use: W, S, Su, F

Duration of use: 5-30 min

Orientation: Towards site activities

Adjacency: To dining for customer convenience

Acoustical: moderate

Illumination: G, I, INC, DAY

Mechanical: F, G, S if possible
Winter temp. may be cooler in lobby because transient nature of activities

Electrical: General outlets

Comments: Views from control area out onto site activities provides easier "sell".

- Lobby -1000
- Emp. toilet - 100
- Control - 225
- Gift shop - 600
- Circ. 10% 193

2118 sq. ft.
Zone: Public
Function: Guest dining
Occupant load: Dining -100
Bar -50
Coffee Shop -70
Season of use: W, S, Su, F
Duration of use: D - 1-2 hrs
B - 1-2 hrs
CS - 20m-1 hr
Orientation: Views toward site activities
Adjacency: Kitchen, main entry

Acoustical: Low to moderate
Illumination: D - T, D&I, INC, DAY
B - T, D&I, INC, DAY
CS - G, D&I, INC, DAY
Mechanical: G, S where possible
F especially in coffee shop for winter use
Electrical: Outlets for task lighting and bar

Comments: Dining area can be divided into smaller areas during slow periods. All dining and bar functions might move to coffee shop area during off seasons.

- Dining - 1700
- Bar - 800
- Coffee shop - 1125
- Toilets - 225
- Circ. 10% - 385

Total: 4235 sq. ft.
Zone: Support/Private (staff)

Function: Food storage & prep.
Employee dining

Occupant load: Food prep. 6-10
Dining 20

Season of use: W, S, Su, F

Duration of use: Day & evening, continuous

Orientation: Food prep - internal
Dining - provide view

Adjacency: Immediate to all dining areas--near bar

Acoustical: Moderate to loud

Illumination: Food prep & storage-
G, D, FLR, DAY
Employee Dining
I, INC, DAY

Mechanical: G, S where poss.

Electrical: Special electrical
for cooking appl.,
refrigeration, and
dishwashing machines

Comments: 1. Beverage
2. Dish room
3. Warm prep.
4. Cold prep.
5. Fast prep.
6. Dry storage
7. Cold storage
8. Service entrance
9. Garbage
10. Employee dining

Kitchen - 1300
Storage/refrig. - 830
Garbage - 100
Employ. dining - 260
Circ. - 249

2739 sq. ft.
Zone: Public

Function: Quick dining, services

Occupant load: Snack bar - 30
Groceries - 10±5

Season of use: Summer

Duration of use: 30 min

Orientation: Relate to the road
View into building

Adjacency: Camping areas and easy access from road

Acoustical: low to moderate

Illumination: G, D, INC

Mechanical: G, F in snack bar

Electrical: Special outlets for refrigeration units and cooking appliances

Comments: Provide central control area to operate both areas during slow periods.

Snack bar - 450
Groceries - 500
Control - 180
Covered pumps (gas) - 1700
Access area (gas) - 5000

7830 sq. ft.
Zone: Private (guest)
Function: Guest housing
Occupant load: 2-4
Season of use: S, Su, F, (W)
Duration of use: Varies overnight to extended
Orientation: Views to site activities or courts
Adjacency: Other units, but a sense of seclusion is important

Acoustical: Low
Illumination: T, INC, DAY
Mechanical: R, G, S if possible
Electrical: General outlets

Comments: Provide airlocks at both entries. Double entry provides cross-ventilation. Motel/lodge imagery. For four people move fireplace to side wall or eliminate. Bathroom enters from hall. Lavatory located in hall.

<table>
<thead>
<tr>
<th>Space</th>
<th>Sq. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airlock/entry</td>
<td>44</td>
</tr>
<tr>
<td>Toilet</td>
<td>48</td>
</tr>
<tr>
<td>Storage</td>
<td>24</td>
</tr>
<tr>
<td>Bedroom/sitting</td>
<td>224</td>
</tr>
<tr>
<td>Deck (2)</td>
<td>120</td>
</tr>
<tr>
<td>Wood storage/entry</td>
<td>24</td>
</tr>
</tbody>
</table>

484 sq. ft.
Zone: Private (staff-guest)
Function: Showers/Laundry
Occupant load: 13/2
Season of use: Summer
Duration of use: 1/2hr-2hrs
Orientation: NA
Adjacency: Campgrounds/Dorms

Acoustical: Low
Illumination: G,D,FLR,DAY
Mechanical: G
Electrical: Special outlets for dryers and general outlets near lavs.

Comments: Provide these spaces in campground and in dorms.

- Showers (4) - 144
- Toilets (3) - 52.5
- Lavatory (3) - 52.5
- Circ. 10% - 25
  - 274 sq.ft.

Laundry - 100 sq.ft.
Zone: Private(staff)
Function: Staff housing
Occupant load: 1-2
Season of use: W, S, Su, F
Duration of use: Off-duty hrs
Orientation: to private views
Adjacency: to main entry for night time avail. and security

Acoustical: low
Illumination: T, INC, DAY

Mechanical: F, G, S if orient. allows

Electrical: Range outlets, general outlets

Comments: Provide as secluded a feeling as possible for manager, yet close proximity to control desk

Apt, sq. ft, --450

MANAGER'S APARTMENT
Zone: Private(Guest)

Function: Recreation/Relaxation

Occupant load: 20

Season of use: Summer

Duration of use: Varies

Orientation: Views away from site (if possible)

Adjacency: Secluded from site activities

Acoustical: low to moderate

Illumination: T, INC, DAY
(Kitchen, Laundry -- G, FLR, DAY)

Mechanical: G

Electrical: Range & dryer outlets, general outlets

Comments: Kitchen and dining facilities supplement those provided for employees in the main dining facility.

<table>
<thead>
<tr>
<th>Room</th>
<th>Coverage</th>
</tr>
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<tbody>
<tr>
<td>kitchen</td>
<td>-150</td>
</tr>
<tr>
<td>dining</td>
<td>-300</td>
</tr>
<tr>
<td>living</td>
<td>-400</td>
</tr>
<tr>
<td>recreation</td>
<td>-500</td>
</tr>
<tr>
<td>laundry</td>
<td>-100</td>
</tr>
<tr>
<td>outdoor area</td>
<td>-600</td>
</tr>
<tr>
<td>(private)</td>
<td></td>
</tr>
<tr>
<td>circ. 10%</td>
<td>205</td>
</tr>
</tbody>
</table>

2255 sq. ft.
Zone: Private (staff)  
Function: Employee housing  
Occupant load: 1  
Season of use: Summer  
Duration of use: Varies  
Orientation: View away from site if possible  
Adjacency: Secluded from site activities  
Acoustical: Low  
Illumination: T.INC.DAY  
Mechanical: G  
Electrical: General outlets  

Comments: Provide all moveable furnishings to allow maximum identification. Common shower and toilet facilities. See program sheets.  
Provide 20 units--some employees commute daily.  

Sleeping room: 115  
Deck: 25  
Total room: 140 sq.ft.  
20-units: 2800  
Circ. 10%: 280  
Total dorm: 3080 sq.ft.
Zone: Private (staff)
Function: Owner's housing
Occupant load: 2
Season of use: Summer
Duration of use: Varies
Orientation: Overview of site
Adjacency: Secluded

Acoustical: Low
Illumination: T, INC, DAY
Mechanical: F, G
Electrical: Range outlet, General outlets

Comments: Provide airlock entrances. Provide a private residence for the owners with an overview of the site for general supervision.

Airlock - 20
Kitchen - 90
Utility - 63
Bath - 72
Bedroom - 195
Dining - 120
Living - 280
Deck - 96
-936 sq. ft.
### PROGRAM OF SPACES — SUMMARY

#### MAIN ENTRY
- Lobby: 1000
- Control: 225
- Gift Shop: 600
- Employee Toilet: 100
- Circulation 10%: **193**

**Total:** 2118 sq.ft.

#### DINING ROOMS
- Dining: 1700
- Bar: 800
- Coffee Shop: 1125
- Toilets: 225
- Circulation 10%: **385**

**Total:** 4235 sq.ft.

#### KITCHEN
- Kitchen: 1300
- Storage/Refrigeration: 830
- Garbage: 100
- Employee Dining: 260
- Circulation 10%: **249**

**Total:** 2739 sq.ft.
GROCERIES/GAS STATION

Groceries 500
Control 180
Gas Pump Area 1700
Access Area 5000

7380 sq.ft.

MOTEL UNITS

Airlock Entry 44
Toilet 48
Storage 24
Bedroom/Sitting 224
Deck (2) 120
Wood Storage/Entry 24

484 sq.ft.

SHOWERS/LAUNDRY

Showers (4) 144
Toilets (3) 52.5
Lavatory (3) 52.5
Circulation 10% 25
Laundry 100

374 sq.ft.

MANAGER'S APARTMENT

450 sq.ft.
BAITHOUSE

Storage 60
Cleaning/Packaging 60

120 sq.ft.

STOCKED TROUT POND

450-500 gals/min water change*
45° - 60° F water temperature*
separation of stream water from
stocked pond for disease control
ponds shallow at edge for safety,
10-12 feet deep in middle for
temperature control

*on site spring water temperature averages
55° F with the capability of pumping 2500
gallons/minute from the spring.

EMLOYEE SERVICES

Kitchen 150
Dining 300
Living 400
Recreation 500
Laundry 100
Outdoor Area (Private) 600
Circulation 10% 205

2255 sq.ft.
### DORMS

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleeping Room</td>
<td>115</td>
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<tr>
<td>Deck</td>
<td>25</td>
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<tr>
<td>Total room</td>
<td>140 sq.ft.</td>
</tr>
<tr>
<td>20 Units</td>
<td>2800</td>
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<tr>
<td>Circulation 10%</td>
<td>280</td>
</tr>
<tr>
<td>Total dorm</td>
<td>3080 sq.ft.</td>
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### OWNERS RESIDENCE

<table>
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<th>Component</th>
<th>Value</th>
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<tbody>
<tr>
<td>Airlock</td>
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<tr>
<td>Kitchen</td>
<td>90</td>
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<tr>
<td>Utility</td>
<td>63</td>
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<tr>
<td>Bath</td>
<td>72</td>
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<tr>
<td>Bedroom</td>
<td>195</td>
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<tr>
<td>Dining</td>
<td>120</td>
</tr>
<tr>
<td>Living</td>
<td>280</td>
</tr>
<tr>
<td>Deck</td>
<td>96</td>
</tr>
</tbody>
</table>

936 sq.ft.
Restaurant A - 3
- less than 300 occupant load, 15 sq. ft./occupant min.
- must front directly upon or have access to a public street
- 2 exits minimum
- handicapped access required
- exterior walls must be 2 hour fire resistant less than 20 feet, 1 hour elsewhere

Retail B - 2
- ground floor, 1 exit required for occupant load 50 or under
- 30 sq. ft./occupant
- handicapped access required
- exterior walls must be 1 hour fire resistant less than 20 feet, 1 hour elsewhere

Bar B - 2
- 15 sq. ft./occupant
- one exit required for occupant load 50 or under
- handicapped access required
- exterior walls must be 1 hour fire resistant less than 20 feet, 1 hour elsewhere
Gasoline Station R - 1
- 1 exit minimum
- 100 sq.ft./person
- no handicapped access required
- exterior walls must be 1 hour fire resistant greater than 20 feet

Hotels R - 1
- 1 exit for each unit to the outside
- 200 sq.ft./occupant
- at least one unit must be accessible to the physically handicapped
- exterior walls must be 2 hour fire resistant less than 20 feet, 1 hour elsewhere

Dwelling Units R - 3
- minimum 2 exits if occupant load is over 10
- 300 sq.ft./occupant
- no handicapped access required
- exterior walls must be 1 hour fire resistant greater than 20 feet
Dormitories R - 3
- minimum 2 exits if occupant load is over 10
- 50 sq.ft./occupant
- handicapped access required
- exterior walls must be 2 hour fire resistant less than 20 feet, 1 hour elsewhere
The site I have chosen for this resort facility is located in western South Dakota on private land within the boundaries of the Black Hills National Forest. Rapid City is located 19 miles to the east with Mount Rushmore National Monument 35 miles to the south. Although one must leave Interstate 90 to reach the facility, it is located on Highway 385 -- a major tourist route to and from Mount Rushmore.
South Dakota

- Site
  - Rapid City
- Pierre
- Aberdeen
- Brookings
- Sioux Falls
Black Hills Area

- Spearfish
- Lead
- Deadwood
- Rapid City
- Mt. Rushmore

- 19 miles west of Rapid City
- 20 miles south of Deadwood
- 35 miles north of Mt. Rushmore
The Black Hills area receives its summer winds from the west and its winter winds from the northwest. Due to the site's location in a valley, the winds that effect the site come down the valley from the northwest. The site is somewhat protected by the hills from unusually high winds although they sometimes do occur.

The northeast facing slope on the site's southwest side
rises over 200' above the valley floor at slopes of 30% or more. This renders approximately 8½ acres of the site's 22½ acres undesirable for building.

Average yearly rainfall is 28½ inches with drainage via Jim Creek which runs through the site.

Flooding does not propose a major concern. Buildings should be 5 feet above the creek to insure against damage by "100 year" flood levels. The 1972 flood disaster caused minor damage to the pond facilities and no damage to the buildings. "...the 1972 storm was a rare one indeed with precipitation averaging four times the six-hour amounts that are to be expected once every 100 years".
The northeast facing slope covered with a dense forest of fifty foot ponderosa pine. This serves as a controlled (on site) backdrop for any development and enhances the beauty of the site. However, during the winter months this visual asset casts a shadow on the site, dramatically reducing the solar capabilities of the site.
SUMMER SHADE ANALYSIS

SUNRISE: 4 am - June 21
SUNSET: 8 pm - June 21
MAXIMUM ALTITUDE: 69° - June 21
% POSSIBLE SUNSHINE: 68%
AVERAGE HIGH TEMPERATURE: 67.3° - July
MEAN MAXIMUM TEMPERATURE: 81° - July
MEAN MINIMUM TEMPERATURE: 48° - July

Full solar coverage of the site.
WINTER SHADE ANALYSIS

SUNRISE: 8 am - December 21
SUNSET: 4 pm - December 21
MAXIMUM ALTITUDE: 22° - December 21
% POSSIBLE SUNSHINE: 55%

AVERAGE HIGH TEMPERATURE: 23.2° - January
MEAN MAXIMUM TEMPERATURE: 35° - January
MEAN MINIMUM TEMPERATURE: 9° - January

Solar coverage dramatically reduced in the afternoon hours.
PAE: Pactola-Rock outcrop association, hilly.

"This map unit consists of deep, well drained soils and rock outcrop in the Black Hills. It is on smooth upland divides and sides of mountain valleys and drainage ways."

65% Pactola Soil
20% Rock outcrops - occurs mainly on tops of ridges and points.
15% Minor soils
"Most areas of this map unit are in ponderosa pine forest. The soils in this unit have good potential for timber production, woodland grazing, and woodland wildlife habitat. They have fair potential for tame pasture and poor potential for cultivated crops, rangeland, recreational uses, most building sites, sanitary facilities, and local roads and streets."

MBE - Marshdale-Maitland Association, sloping.

"This map unit consists of deep, poorly drained and well drained soils on bottom lands, terraces, and mountain uplands."

- Marshdale soil - 60%
- Maitland soil - 40%

"Marshdale soil is in the lower part of the landscape along drainage ways and is subject to common flooding for brief periods. Maitland soil is in the upper part of the landscape."

"The soils have fair potential for most recreational uses and poor potential for most building sites and sanitary facilities."

"This map unit is suited to such recreational uses as playgrounds, camp sites, paths and trails, and picnic areas; these facilities need to be placed on the Maitland soil. The hazard of flooding limits the Marshdale soil for recreational use."
For both soil types. "Buildings and sanitary facilities need to be placed... where slopes are not so steep and rock outcrop and stones are less common. If buildings are constructed on these soils, proper design of foundations and footings helps prevent structural damage caused by shrinking and swelling and low strength of the soil. Sanitary facilities have the potential to pollute shallow ground water. If this soil is used for septic tank absorption fields, enlarging the area helps to overcome the limitation of slow movement of effluent."

"Local roads and streets need to be graded to shed water, and the base material needs to be strengthened to support vehicular traffic control of roadside erosion is needed in borrow and cut areas."
Water is pumped from two wells and a natural spring. All provide suitable drinking water as well as healthy water for fish habitats. Water from Jim Creek can be used for fishery habitats, but should be checked periodically and preventively treated for bacteria that could be harmful to the trout.

Power is provided through an overhead transmission line that runs through the site.
Gas is propane brought to the site in trucks and stored in tanks.

Sewage is handled through septic systems.
The highway is a source of moderate undesirable noise levels that increase to high undesirable when logging trucks are in use. This would be a daytime problem only.

Views directed inward appear to be the most desirable. Facing away from the highway towards on-site forested lands provides a buffer from the fast-pack of the road. Also, this on-site forested land is controlled by the owner; thus, it is not subject to undesirable change (barring fire!).
Views outward from the site are also pleasing if the point of view is set far back from the highway. This view; it should be remembered, is subject to undesirable change (clear cutting, development, etc.).
Dining Facility: main dining, kitchen, and bar/second level
Dining Facility  north elevation
Dining Facility section through main dining
Motel Unit Elevation  two level

19 Simpson.


22 *Climates of the United States*, p. 19.


Shelton, Wes. Personal letter.

Simpson, Tom C. Personal interview.

*Soil Survey of Lawrence County, South Dakota*. United States Department of Agriculture in cooperation with the Forest Service and the South Dakota Agriculture Experiment Station, 1979.


