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The Built Environment Image Guide

FOR THE NATIONAL FORESTS AND GRASSLANDS

The Built Environment Image Guide

for the National Forests and Grasslands

Built Environment Image

THE USDA FOREST SERVICE PHILOSOPHY...

The *built environment*, as used in this guide, refers to the administrative and recreation buildings, landscape structures, site furnishings, structures on roads and trails, and signs installed or operated by the U.S. Department of Agriculture (USDA) Forest Service, its cooperators, and permittees.

The elements of the built environment constructed on national forest lands and grasslands, or those used for administrative purposes
in rural areas, towns, and cities, shall—to the extent practicable—incorporate the principles of sustainability, reflect their place within the natural and cultural landscape, and provide optimal service to our customers and cooperators.

These elements will:

- Be located, planned, and designed with respect for the natural systems in which they reside.
- Aesthetically integrate their natural, cultural, and experiential context.
- Contain design elements, including appropriate signs, that reinforce a national agency identity.
- Emphasize efficiency of energy and materials consumption in construction and operation.
- Serve as premier examples to interpret conservation of natural resources and sustainable development.
- Create environments for people to enjoy and gain increased appreciation for the natural environment, and in which employees work productively, experiencing the connection to the resources they manage.

In so doing, the USDA Forest Service built environment will strengthen and reinforce the image of the agency as an international conservation leader.

Reader's Guide

The *Built Environment Image Guide* can be read in different ways, depending on how, and by whom it will be applied. The following will aid the reader in selecting the sections most applicable to their needs.

Section	Page	Content	Purpose	Primary Audiences
Chapter 1 Image and the Built Environment	1	Establishes the **Intent** of the guide, **why** it is needed, and describes common **applications**. Outlines major elements of a positive image	To **motivate** those involved in facility management to utilize the guide	**Everyone** involved in authorizing, planning, designing, operating, and maintaining facilities
Chapter 2 Origins of the National Forest Built Environment	9	An overview of influences on and **traditions of Forest Service** facility design from early park design through the CCC era to present-day environmental considerations	To enhance **understanding** of the origins of **Forest Service design traditions** and appreciation for contributions of design to agency image	**Project sponsors** (Forest Service line officers, permittees, and partners) and **designers** (engineers, landscape architects, and architects)
Chapter 3 The Sustainable Image: Responses to Context	19	Explanations of the **primary components of context that drive design**—ecological, cultural, and economic—and an **overview of the design process**	To ensure thorough consideration of the primary components in the site-specific design of facilities	**Project designers,** both internal and external
Chapter 4 Architectural Character Guidelines for the Nation and the Provinces	31	**Regional Architectural Character Types** that incorporate the components of context **are illustrated** for a range of facility types and settings	To provide **graphic examples** of the regional character types **to be incorporated in all built environment designs**	**Everyone** involved in authorizing, planning, designing, operating, and maintaining facilities
Chapter 5 Integrating Architectural Character With the Facility Management Process	231	The sequence of **planning, design, operations, maintenance, and deconstruction of facilities,** along with roles and responsibilities of everyone involved in developing and maintaining them	To enhance **understanding of relationships and roles,** along with appreciation for each participant's **contributions to** creating and maintaining **an appropriate facility image**	**Everyone** involved in authorizing, planning, designing, operating and maintaining facilities

Section	Page	Content	Purpose	Primary Audiences
Appendix A Built Environment Case Studies	239	Examples of administrative and recreation projects that incorporate character guidelines	To illustrate successful Forest Service projects for peers to see and discuss	Project sponsors, designers, operators, and maintenance personnel
Appendix B Forest Service Manual (FSM) and Handbook (FSH) Direction	249	Cites FSM 2330 and 7310 for recreation and administrative facilities	To reinforce USDA Forest Service policy for the built environment	Forest Service line and staff officers, designers
Appendix C Recreation Opportunity Spectrum (ROS)	253	Indicates appropriate site furnishings, construction materials, development scale, and density for the ROS classes	To integrate ROS considerations with architectural character to provide facilities and furnishings appropriate with the desired setting	Forest Service line and staff officers, designers, and maintenance personnel
Appendix D Glossary	263	Definition of terms used in the handbook	To clarify terminology for external cooperators and those not in design fields	All readers
Appendix E References	269	References for quotations used in the handbook	Provide sources for quotations	All readers
Appendix F Acknowledgments	271	Names of the individuals and teams who helped develop this guide	Acknowledgment	All readers

Table of Contents

Chapter 1

Image and the Built Environment

"A land ethic, then, reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land."

—Aldo Leopold

INTRODUCTION

Welcome to the Built Environment Image Guide. The built environment includes administrative and recreation structures, landscape structures, site furnishings, structures on roads and trails, and signs installed or operated by the Forest Service, its cooperators, and its permittees.

The guide intends to improve the image, aesthetics, sustainability, and overall quality of Forest Service facilities consistent with the agency's role as leaders in land stewardship.

To achieve this aim, the guide:

- Describes an approach to designing recreation and administrative facilities that highlights key elements of our agency's national identity and image.
- Describes a process to "fit" facilities within the context of their ecological, physical, and cultural settings.
- Establishes architectural character types for eight provinces, covering national forests and grasslands nationwide.
- Incorporates the principles of sustainability as an integral part of architectural character.
- Illustrates the role everyone, from project sponsors, line officers, and designers, to field staff and technicians, plays in creating and maintaining a quality facility.

WHY A BUILT ENVIRONMENT IMAGE GUIDE?

As much as the natural environment contained in the forests, the built environment influences:

- The visitor experience.
- The identity of the Forest Service as a high-quality provider of outdoor recreation.
- Impressions about how the Forest Service is fulfilling its mission of stewardship.

The guide aims to ensure thoughtful design and management of this built environment.

The public's image of the Forest Service's built environment is largely a historical one: We are the agency that built many of the beautifully handcrafted and sensitively designed rustic structures of the Civilian Conservation Corps (CCC) era. In many ways, this tradition has endured. The Forest Service built environment has continued to show respect for the spectacular scenery and landscape settings. Facilities continue to be designed to conserve natural resources.

However, in recent years, our recreational and organizational demands have soared. Budgets have not kept pace. Efforts to stretch funds have resulted in short-term fixes, including the use of less expensive but also less durable and less aesthetic building materials. Inconsistent signs and architectural styles have undermined our agency's identity. In addition, a larger group of people influences design beyond the Forest Service personnel: joint-venture partners, permittees, and consulting architects and engineers. This group may not always be aware of the Forest Service's tradition of design in harmony with our spectacular settings.

In some cases, these pressures have spawned inappropriate designs. The result is too many facilities that do not fit their natural settings; are poorly constructed and, therefore, costly to maintain; fail to meet customer and employee needs; and generally reflect poorly on the agency.

This guide does not replace or compete with professional training or functional manual direction. Rather, it focuses on the image, appearance, or architectural character of our facilities. It provides consistent examples, measures, and standards that allow everyone involved during the life of a project to grasp the importance of providing quality facilities.

THE AUDIENCE FOR THE GUIDE

This guide is not just for the landscape architects, architects, and engineers charged with the design of larger projects. It is for everyone who participates in planning, designing, constructing, repairing, maintaining, and authorizing facilities on the national forests and grasslands. It is for field staff and technicians who initiate and build projects and who maintain and rehabilitate facilities, modifying them and the design intent a bit at a time. All affect the function and image of each facility. The better each of us understands the environmental, cultural, and economic context of each facility's design, the better we will serve our customers and reflect a quality agency image.

Everyone in the Forest Service has a stake in creating and perpetuating a positive built environment image.

IMAGE AND IDENTITY—BENEATH THE SURFACE

Most definitions of the word "image" include "appearances" or "physical representations" of objects, places, or people. Aesthetics are, of course, very important in the creation of positive images. Research indicates that 87 percent of people's perceptions are derived through the sense of sight (Agriculture Handbook 462).

Scratch the surface and the word image can reveal a sense of integrity and true identity. Much like the saying that "beauty is more than skin deep," a positive image for the built environment goes beyond appearance to include a complete fit in the landscape and the global environment.

Our agency's public image is based upon people's impressions of the Forest Service. These perceptions may be based upon a casual reading of newspaper articles, a visit to a national forest a decade ago, or the experience of driving through a national forest without stopping.

An image that creates positive impressions determines not only whether a person will visit a national forest, but also whether they become curious enough to learn more about the natural environment. It may encourage them to learn more about the Forest Service mission of conservation and stewardship.

Beyond public image lie the issues of our agency's identity—who we really are and our values. The basis of a successful image is the factual truth that our identity matches our image. In short, we must constantly reinforce the positive image of the Forest Service as good stewards and conservationists by making sustainable choices in the built environment.

Moreover, we must make a visit to a national forest a legible experience—one that helps people understand the forces of ecology, the nature of the landscape, and the goals of the Forest Service. We can only achieve this by creating a legible built environment where buildings and structures complement the landscape, signs are clear and instructive, and minimal impact on the environment is strongly evident. Even during a short stay, visitors will easily grasp the essence of the landscape and the Forest Service's role as stewards.

IMAGE AND CONTEXT

The image of a facility depends largely on how well it fits within its context. This guide addresses three contexts—ecological, cultural, and economic—which can overlap and take many forms.

For example, a flat-roofed, heavy-walled, adobe-like structure would look inappropriate in the context of the Cascade Mountains of Washington. It would not match the landscape character of its natural surroundings or the building traditions of the Northwest culture. Nor would it function properly—ultimately an economic issue related to maintenance problems and high heating costs. Flat roofs do not shed water or snow sufficiently for the conditions in the Northwest. Heavy walls with recessed windows create a very dark and cool interior, not desirable in that area. In the Northwest, with plentiful timber resources, igneous rock, and different climactic patterns, buildings have taken a much different form since the earliest cultures began modifying their environments to respond to their context.

The adobe building fits into the Southwest for a number of reasons. In the Southwest region, the main building material (soil) was the most plentiful one. It worked well for the climate. It was an inexpensive material as long as labor was plentiful. Therefore, it was used extensively and came to be associated with cultural groups of the Southwest.

The proper fit of Forest Service facilities into their natural, cultural, and economic contexts requires careful consideration of many aspects of design, including scale, proportion, and selection of building materials. The cultural context of community is also crucial. The size, style, and materials chosen for a regional office in a large city would be much different than those for a ranger station in a small town. Less obvious is how the small-town ranger station should reflect the character of the town around it. It should not be pretentious, but fit comfortably in the community, while still presenting the image of a quality natural resource agency. Integration into the local context conveys messages about what the agency represents.

In summary, the built environment must go beyond superficial images. It must integrate the principles of sustainability regarding siting, energy efficiency, building materials, and even long-term considerations for decommissioning. Such integration of function, aesthetics, economics, and sustainability will result in facilities that truly fit their environments and, therefore, are beautiful, inside and out.

CHARACTERISTICS OF A POSITIVE IMAGE

The built environment should reflect the context of its surroundings, including its physical setting, social context, and long-term economic effects. Specifically, Forest Service buildings, sites, and facilities must:

- Be instantly recognized through thoughtful and selective use of the Forest Service family of signs and of the Forest Service shield.
- Harmonize with or complement the character of their landscape settings.
- Value and reflect the diversity of different regions of the country, retaining elements that identify them with the entire agency.
- Use the Recreation Opportunity Spectrum (ROS) to select the location, type, and scale of facilities and building materials.
- Employ the principles of sustainability, including sensitivity to natural systems, energy efficiency, and durability and cost efficiency over time.

By creating and maintaining facilities that fit their natural, cultural, and economic contexts, we speak strongly to our visitors and cooperators of the national forests about the values and overall quality of the agency. The same messages will reach each employee, volunteer, and cooperator and serve as a continuous reminder of our agency's traditions and mission.

APPLICATIONS FOR THE GUIDE

The following are examples of how the guide applies to the various sources of projects.

Capital Investment Program, Utilizing Forest Service Designers

Includes new recreation construction projects; rehabilitation of existing recreation sites; fire, administration and other (FA&O) facilities; and other facilities visited by the public.

The guide provides standards and guidance for fitting the facility into its context and defines the architectural character for the province in which it occurs. Designers will combine the prescribed character with site-specific analysis and planning to match the project to its setting.

Small Construction, Heavy Maintenance, and Major Repair Projects

These projects are often accomplished at the district level. Examples include repair or replacement of roofing, siding, and site furnishings; construction of small information stations and signs; fencing; walls; and site rehabilitation.

The guide provides insight into how these small-scale activities contribute to or detract from the overall image intended for the facility. It establishes a standard for either continuing the established design character or moving toward a new character through minor construction and maintenance.

Architectural and Engineering Contract Design

Increasingly, the Forest Service contracts the design of facilities to private architecture, landscape architecture, and engineering consultants. These firms may be unfamiliar with designing in natural landscapes. They may lack the tradition of harmonious, subordinate design that Forest Service designers are encultured with.

The guide communicates the desired Forest Service character to architectural and engineering (A&E) consultants. It provides Forest Service managers and contract administrators with standards to guide and measure A&E performance.

Infrastructure Emphasis Programs

These include major initiatives to emphasize specific programs, such as accessibility, recreation, or administrative facility improvements or to correct deferred maintenance backlogs in all program areas. Examples have included the CCC, Operation Outdoors, the National Recreation Strategy, and Fee Demonstration. These initiatives may include an array of capital investment, smaller maintenance and rehabilitation activities, and external involvement. These initiatives typically seek to show results in a short time.

The guide prescribes architectural character types that will ensure consistent quality even when projects are built under an urgent schedule.

Private Investment and Permittee-Provided Facilities

Because of factors ranging from increased recreation demand to decreased tax appropriations, the private sector is providing more customer services and facilities on national forests. Under Granger-Thye permits, private investments will increase in project development and operation as well as in improvements and landlord-type maintenance.

As with work done through A&E consultants, the guide provides the private sector with detailed information and standards regarding architectural character.

Partnerships and Cooperator Projects

Partnerships provide opportunities to match funds and labor to projects. They increase local involvement in Forest Service programs. The projects may be small, such as Eagle Scout projects, or they can involve the construction of entire recreation complexes through public-private ventures. Smaller projects are sometimes under-designed and under-supervised, resulting in facilities that lack the quality image or sense of permanence the Forest Service desires.

The guide helps prospective partners understand the desired character and standards for facilities. The guide provides managers with a clear image that will help them evaluate and oversee proposed improvements.

Leased Buildings

Many Forest Service facilities are located in rural and urban settings that can provide the biggest challenge to providing a "corporate image" of quality and permanence.

The guide identifies the "townscape" as the framework of context, communicates important image factors to contracting officers and prospective landlords, and provides managers with a framework for evaluating proposed facilities that support the positive image of the Forest Service.

Chapter 2

Origins of The National Forest Built Environment

"...the interest of the visitor...should concentrate on features of natural, in preference to artificial, beauty.... Architectural features should be confessedly subservient..."

—Frederick Law Olmsted & Calvert Vaux

A BRIEF HISTORY OF USDA FOREST SERVICE BUILT ENVIRONMENTS

In establishing the image of the Forest Service's built environment, the origins and meanings of the buildings, structures, furnishings, and signs that exist today were studied.

Early Park and Recreation Design Influences

The emphasis on harmonious design of the built environment on the national forests had its roots in the Public Park Movement of the mid-19th century. During the Industrial Revolution and its aftermath, social thinkers became concerned over crowded and unsanitary cities and the perceived loss of connection for the average citizen to the natural world. That led to efforts to set aside or create natural areas in urban areas, such as New York's Central Park (1853) and the metropolitan park system for Minneapolis-St. Paul (1872-1895).

At the same time, national interest was growing to conserve the dramatic landscapes of the West for tourism. As a result, large natural areas such as the Yosemite Valley (first as a California State park in 1864, later as a national park in 1890), the Adirondack Forest Preserve (1885), and Yellowstone (1872) were reserved as "public parks or pleasuring grounds for the benefit and enjoyment of the people" (Carr, 1998, p. 11).

The urban parks of that era emphasized maintaining "picturesque" landscapes for "passive" use such as picnicking or touring to enjoy the scenery. The built environment was often minimal, consisting primarily of curvilinear carriage drives and winding walking paths from which to enjoy the views of the landscape. Bridges and other structures were kept low and horizontal in form, often using rock from the immediate area. Rather than creating facilities for specific uses, large meadows and open spaces were provided to support an array of activities.

This philosophy prevailed when the Forest Service began permitting construction of summer homes, resorts, lodges, and boathouses in the early 20th century. The Forest Service constructed its own ranger stations, roads, and trails for administrative purposes, while private interests designed and built recreation facilities under Forest Service permits and regulations. Most of these early facilities fit into the landscape quite well (Tweed, 1978, p. 2).

However, public recreational facilities remained rare even though recreation use was growing rapidly. As described in an early report, rangers tried to fill this gap in some cases:

"Forest rangers took time to clear inflammable material from around heavily used camp spots and to build crude rock fireplaces. They erected toilets and dug garbage pits whenever materials could be obtained…. Tables, toilets, and garbage pit covers were made from lumber scraps and wooden boxes, and crude signs were painted and displayed on rough-hewn shakes. Many of these…improvements were raw looking and some of them were clearly out of place in the forest environment, but they filled a real need" (Tweed, 1978, p. 3).

Public Recreation Development and the Arts and Crafts Style

Public recreation facilities on a national forest were first truly planned and developed in 1916. This occurred in the Columbia Gorge Park division of the Oregon National Forest (later Mt. Hood National Forest and now within the Columbia River Gorge National Scenic Area) (Tweed, 1978). The campground and ranger station at Eagle Creek included an entrance station, restrooms, tables, fireplaces, and a trail designed in the Arts and Crafts architectural style of the day.

The Arts and Crafts movement favored the beauty and honesty of traditional handcraftsmanship and the use of natural building materials (Carley, 1994).

Like the earlier Public Park movement, the Arts and Crafts movement arose out of concern over the effects of the advancing Industrial Age. Proponents believed that mass production threatened people's appreciation of natural materials and craftsmanship. The use of natural materials, as well as an emphasis on simplicity in form, line, and function, made Arts and Crafts architecture fit well in natural settings. This influence was clearly visible at Eagle Creek and was a major influence in the evolving "rustic" style of architecture in natural areas (Tweed, 1978).

Arts and Crafts included the prairie-style architecture of Frank Lloyd Wright, who believed that a building should appear to grow organically from its site. Prairie-style roofs were low-pitched, usually hipped, and had wide, overhanging eaves and low porches and terraces. Architectural details emphasized horizontal lines as well. The style echoed the context of the landscape. Its long, low character reflected the horizontal line of America's prairies.

The Civilian Conservation Corps and Public Works Era

With the Great Depression of the 1930's came the first era of large-scale recreation planning and development in the Forest Service. Beginning in 1933, spurred on by the plentiful labor provided through the Civilian Conservation Corps (CCC) and other public works agencies, the Forest Service began to employ professionally trained landscape architects and architects to design and implement plans on national forests across the country.

Design guidance evolved quickly to ensure consistent levels of quality and image throughout the Forest Service. In 1935 and 1936, the Forest Service hired Albert D. Taylor, president of the American Society of Landscape Architects, to analyze problems and devise solutions to recreation planning and design. Taylor's three-volume 1936 report included drawings of many types of recreation structures unknown to earlier Forest Service recreation designers, such as bathhouses, shelters, amphitheaters, and playgrounds. *"Across the country in the middle 1930's, these types of facilities appeared in national forests where before there had been only privies and ranger cabins"* (Tweed, 1978, pp. 20-21).

At the same time, the National Park Service contracted architect Albert H. Good to catalog appropriate structures for use in the parks. In 1938, the Park Service published the definitive work, *Park & Recreation Structures*, edited by Good, which collected these and other examples of rustic architecture.

By 1940, W. Ellis Groben, Chief Architect of the Forest Service, had written *Architectural Trends of Future Forest Service Buildings*. In it, Groben decried the widespread use of inappropriate urban styles on many forests. He advocated "buildings of a more distinctive character…which both express the purposes of the Forest Service and which are more appropriate to their particular locales."

All these guides emphasized the need for harmonious design using local natural materials such as timber and stone. They also called for the use of trained design professionals.

The effects of this guidance, carried out by trained professionals and labor forces, soon became visible in the design and construction of forest roads, trails, buildings, and public recreation sites. Stone masonry and log structures predominated, and the massive scale of structural elements and site furnishings implied permanence and connection to the landscape.

The style was generally referred to as "rustic architecture." It was based upon a canny combination of pioneer building skills and techniques, principles of the Arts and Crafts movement, and the premise of harmony with the landscape. The guides captured and codified the prevailing design that already had been practiced for many decades in natural settings such as New York's Adirondack Reserve and the early national parks.

The work of the CCC influenced virtually every national forest. While the architectural style was consistently rustic, featuring stone and massive timbers, regional variations that reflected cultural context and the availability of building materials did occur.

For example, in the Juan Tabo and La Cueva Picnic Area on the Cibola National Forest in New Mexico and in Sabino Canyon on the Coronado National Forest in Arizona, picnic shelters, restrooms, and bridges are made entirely of large granite boulders and native stone. These fit well within the rocky, arid character of the site.

"However, the highest expression of CCC-era rustic architecture came in the Pacific Northwest Region of the Forest Service. Both in quantity and quality of facilities, this region surpassed all others, including that of the National Parks in the area. Rich in timber and volcanic rock, the region's architecture and recreation site furnishings exhibited the classic elements of rustic architecture—stone bases, massive timbers, wood shakes, and incorporation of handcrafted features. This expression of rustic architecture in the Northwest became known as Cascadian style" (Tweed, 1978, pp 21–22).

The most significant example of the Cascadian style is the Timberline Lodge. Begun in 1936 by the Works Progress Administration (WPA), this massive rustic structure used native materials and incorporated lavish use of handcrafted regional decoration in the Arts and Crafts style.

With the onset of World War II, the public works era came to an end. The built works and publications of the era, however, established the principles and tradition of rustic architecture for parks and public lands. These principles, summarized, were:

- Emphasis on horizontal form and avoidance of hard straight lines.
- Combinations of harmonious exterior textures and colors.
- Use of local natural materials sized in proportion to the grand scale of the landscape.
- Appearance of pioneer building methods.
- Strong incorporation of handcrafted elements.
- Reflection of regional cultural influences.

The rustic style resonated strongly because it reflected the character of the forests themselves and stood in pleasing contrast to the increasing "civilization" of the rest of the country. People sensed a connection to the uniqueness of the natural settings and to frontier traditions. These bonds contributed strongly to the agency image for decades. For many people, rustic architecture represents the ideal for natural parks and forests. Indeed, the work of the CCC is a legacy we cherish to this day.

Post-World War II and Operation Outdoors

Following World War II, the context of recreation use and architecture in the United States changed again. The post-war economic boom created demand for recreation on the national forests. It also increased distribution of manufactured and finished materials throughout the country.

In 1956, the National Park Service began "Mission 66," a 10-year program to upgrade its facilities by the agency's 50th anniversary. The Forest Service began a parallel program called "Operation Outdoors" in 1957. Designers in both programs consciously departed from the nostalgic rustic style and embraced the tenets of the international style and modern design. This style included simple forms with clean, straight edges; functional design with little ornamentation or decoration; and the use of manufactured rather than handcrafted materials.

In addition, construction practices reflected a new era of manufacturing technology, distribution processes, and human resources. As such, facilities from that era reflect the practical realities and the spirit of their time as clearly as those built by the CCC. This modern era resulted in some landmark structures, as well as many other examples of design excellence. In other cases, the new manufactured materials proved less durable than the natural materials of the rustic era. Many people sensed that modern design, in general, was less evocative of and sensitive to the forest settings.

Evolution of Sustainable Design

Pioneered by landscape architects Ian McHarg and Phillip Lewis in the 1960's, a new ecological approach to planning and design emphasized respect for the flows of wildlife, air, and water across the landscape.

Parallel to that movement was the increased awareness of the need to conserve energy, prompted by the oil crisis of the mid 1970's. This resulted in increased conservation measures in buildings, development of such "off the grid" energy systems as solar and wind power, and use of natural ventilation and daylighting. Recycling became part of the American consciousness, reflected in increased reuse of building materials and buildings themselves. The effects of building materials on human health also became a concern.

These developments eventually converged under the umbrella term of "sustainable design." A 1993 National Park Service publication, *Guiding Principles of Sustainable Design*, synthesized many of these concepts for park and recreation settings.

RECREATION PLANNING AND SCENERY MANAGEMENT SYSTEMS

Over the past 25 years, two systems based on social science research emerged to affect the form of the built environment. These are the Recreation Opportunity Spectrum (ROS) and the Scenery (previously known as Visual) Management System (SMS). In addition to these two systems, the Forest Service's customer base has diversified and expanded, reflecting social changes.

Recreation Opportunity Spectrum

ROS is based on the premise that people expect certain levels of development related to the character of the setting and the type of recreation they prefer. For example, a facility intended to create a safe, controlled environment for large numbers of people should be highly developed using modern materials and providing ample conveniences. Consistent with visitor expectations, a more primitive "backwoods" area would have far fewer constructed elements. Those would generally be small in scale and made of natural materials. More detail on ROS can be found in chapter 3 and appendix C.

Scenery Management System

One premise of SMS is that land management activities (including construction of facilities) should not contrast with the existing natural-appearing landscape. Within a framework of regional landscape character types, form, line, color, and texture should be used to make activities and structures "fit" within landscapes (Agricultural Handbook 666). This approach promotes a strong response to the context of the natural landscape. It also reinforces the concept of early park planning that structures should be visually subordinate to the landscape.

Diversity of Customer Base/Accessibility

Public lands provide outdoor recreation opportunities for an increasingly diverse customer base. This reflects demographic changes within the American population, including an increase in the number of ethnic groups, recognition of nontraditional family structures, and the increased mobility of persons with disabilities. Locally, such factors may require new design responses for different group sizes, different types of amenities, and different language needs, although they generally do not affect overall architectural character on a regional scale.

Under the Architectural Barriers Act of 1968 and other mandates, universal design requires complete integration of accessibility within our facilities. As with sustainable design elements, universal design principles applied to a site or facility design from the outset seldom, if ever, have any obvious effect on architectural character. When skillfully executed, universally designed facilities fit seamlessly within the natural and social environments.

As population increases near national forests, facilities must also be made more resistant to vandalism. In addition, offices must be made secure for Forest Service employees who sometimes work in communities where tensions arise over forest resource issues.

CONSTRUCTION TECHNOLOGIES, MATERIALS, AND LABOR AVAILABILITY

Three trends of the post-World War II era have accelerated in recent years. Construction technology and distribution systems have greatly increased the availability and variety of construction materials and furnishings. Labor for construction is increasingly scarce and costly. Two developments in particular have direct bearing on the image of the built environment:

- Prefabricated construction systems or modular buildings and structures, including toilets, are readily available, have relatively low initial costs, and require little labor beyond site preparation to install. Therefore, they are often used to meet functional needs and economic constraints.
- Prefabricated recreation site furnishings, such as tables, benches, and trash receptacles, are often used instead of the custom designed and built furnishings of the past. The character of these ranges from fairly rustic (made of natural or natural-appearing materials) to manufactured (including metal and plastics).

Already an economic reality, prefabricated units can be carefully selected and sited to meet requirements of function, efficiency, and aesthetics. This requires professional analysis of the landscape and ROS setting to yield locations and design treatments that blend these elements into forest settings. Without such measures, prefabricated units can look out of place. The contexts of ecology and culture should not be sacrificed to economics. All three contexts must be kept in careful balance.

ROLE AND LEVEL OF GOVERNMENT

"The era of big government is over."

Then-President Clinton's pronouncement during the 1996 State of the Union address capped a 20-year trend toward reduced Government size and increased privatization of public services. The Forest Service had been moving in that direction for some time. In 1987, the National Recreation Strategy emphasized "partnerships" and private investment in national forest recreation management. Since then, the number of entities involved in providing recreation facilities and services has exploded. Nonprofit organizations have contributed to construction of recreation and wildlife viewing facilities. About 50 percent of the national forest campground capacity is managed under concessionaire permits. The Forest Service is also strongly considering a program to encourage private investment, not just for the operation but for the planning, design, and construction of recreation facilities.

In short, the Forest Service is moving away from direct development of projects to a position of guidance, approval, and oversight. Our design philosophies will face the realities posed by the private sector's cycles of investment and amortization. Key considerations include permanence versus short-term adaptability and the use of prefabricated elements, as previously discussed.

THE BUILT ENVIRONMENT IMAGE—PAST AND FUTURE

To many people, the rustic imagery of the CCC era remains the most positive image for the built environment of the Forest Service. Perhaps this image remains popular because of its strong relation to the natural, cultural, and economic contexts; its reflections of a frontier past; and the humanizing aspects of handcrafted buildings. In subsequent decades, different stylistic trends have touched the Forest Service, with varying levels of success. All were responses to the context and spirit of the times.

Many trends have had positive effects, but others simply reflect the changing context of the times. One result has been a lack of a unified vision for the appropriate built environment image for the Forest Service. This guide attempts to define that vision. Just as the success of the rustic style was based on integration of context, the new Forest Service philosophy for the built environment must integrate the lessons of the past with the context of the present to create new and enduring places.

Chapter 3

The Sustainable Image: Responses to Context

"The solution of every problem is contained within itself. Its plan, form, and character are determined by the nature of the site, the nature of the materials used, the nature of the system using them, and the nature of the life concerned, and the purpose of the building itself."

—Frank Lloyd Wright

THE SUSTAINABLE IMAGE: CONTEXT AND COMMONALTIES

Introduction: Why Sustainable Design?

"Sustainability is not a new building style. Instead it represents a revolution in how we think about, design, construct, and operate buildings."

—*A Primer on Sustainable Building*
published by Rocky Mountain Institute
Green Development Services

The image of our built environment is strongly related to sustainability. Sustainability grows from principles of conservation and stewardship that are integral to the identity and mission of the Forest Service. A sustainable built environment meets the following goals:

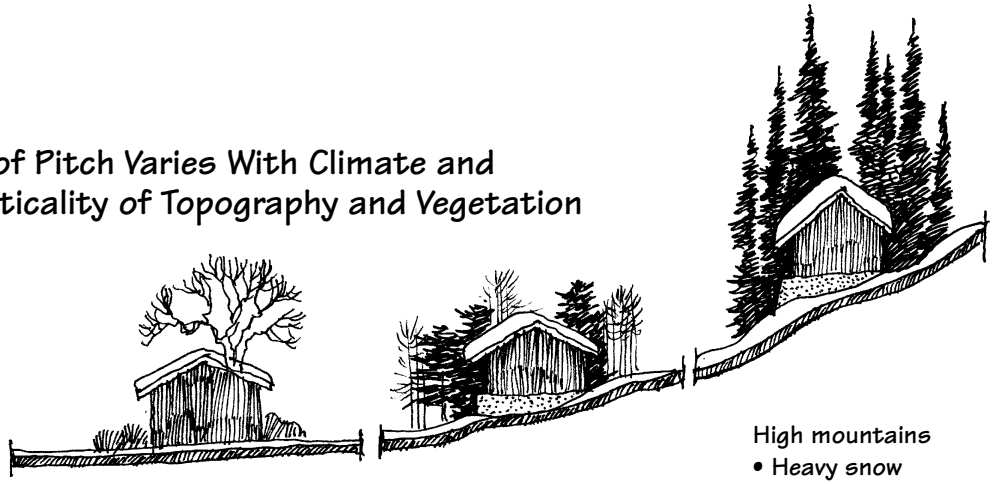
- Minimize the use of resources.
- Conserve ecosystems, the source of all resources.
- Create healthy built environments and landscapes for present and future generations.

Our forests are the ultimate renewable resource—one that, if managed with care, will meet the needs of people and ecosystems indefinitely. It is our mission to demonstrate to all Americans how to conserve these resources. As the construction, maintenance, heating, and cooling of structures consume an ever-increasing portion of our country's natural resources, sustainable design becomes more important.

We can launch our drive toward sustainability by examining the Forest Service structures built during the era of the Civilian Conservation Corps (CCC). The rustic design of these 1930's structures harmonized superbly with their natural settings. The designers accomplished this by including natural materials such as stone and logs. Moreover, the craftsmanship and proportions of CCC structures were often exquisite.

But that is only a start. The rustic style of design was just that: a look. A rustic structure is not inherently any more ecological or sustainable than any other building dressed in the clothing of the forest.

Roof Pitch Varies With Climate and Verticality of Topography and Vegetation



Broad valleys
- **Mild winter**
- **Flat topography**
- **Short or sparse vegetation**
- **Flat or gentle roof pitch**

Foothills

High mountains
- **Heavy snow**
- **Steep topography**
- **Tall trees**
- **Steep roof pitch**

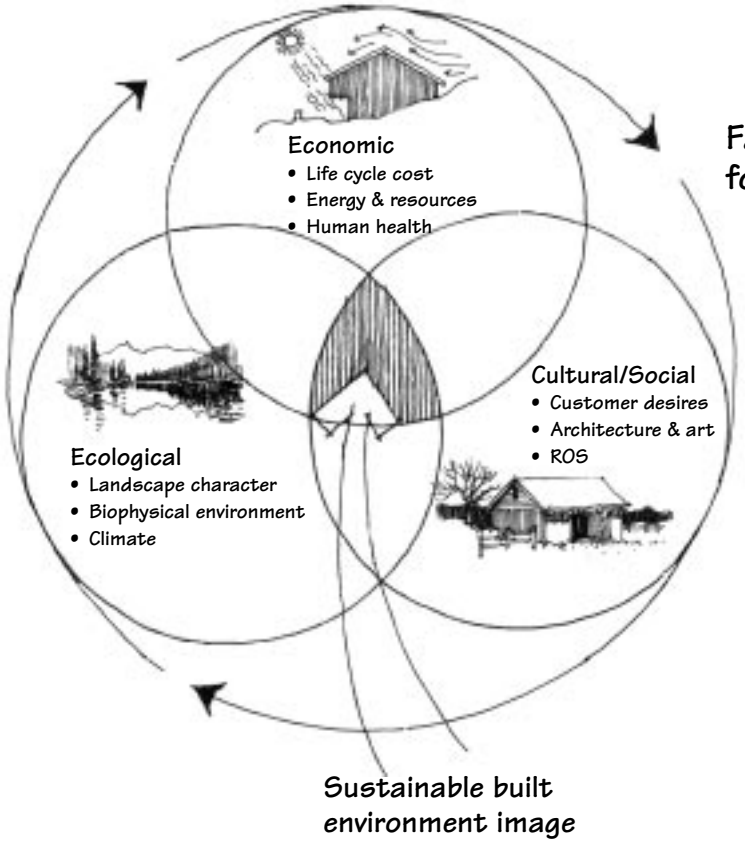
The future of the Forest Service's built environment image lies in drawing from aspects of our rustic past while using today's environmentally sensitive design and construction techniques.

This synthesis of past and present will create visual harmony with the landscape setting and functional harmony with the ecological setting. That means construction must not consume excessive materials and energy. It should restore rather than disturb native vegetation, wetlands, and other wildlife habitat. It should be built to last.

How can we make sustainable design a reality within national forests? There is more than one path because, by nature, sustainability varies to meet the requirements of each individual setting. In short, sustainability responds directly to its context. The three most important contexts for creating sustainable design are:

- **Ecological:** The natural forces that shape landscape, including climate, geology, soils, water, elevation, and vegetation.
- **Cultural:** The human forces that shape and define landscape, including history, development patterns, agriculture, and social uses.
- **Economic:** The budget realities and cost-saving considerations that shape the built environment.

The following figure represents the intersection of all three contexts to form a sustainable image. By exploring these contexts, we find new answers to the questions that drive our building programs. How can we improve working conditions? Serve a growing number of visitors? Present a better Forest Service image, even while budgets grow tighter? Include the structures we design and build as part of our stewardship of the land? Keeping these contexts in mind, we can create structures that complement, rather than overwhelm, the landscape.



Factors of Context for a Sustainable Image

THE ECOLOGICAL CONTEXT AND LANDSCAPE CHARACTER

Visitors to national forests expect to see natural-appearing landscapes. To fulfill those expectations, Forest Service facilities should harmonize with their landscape settings.

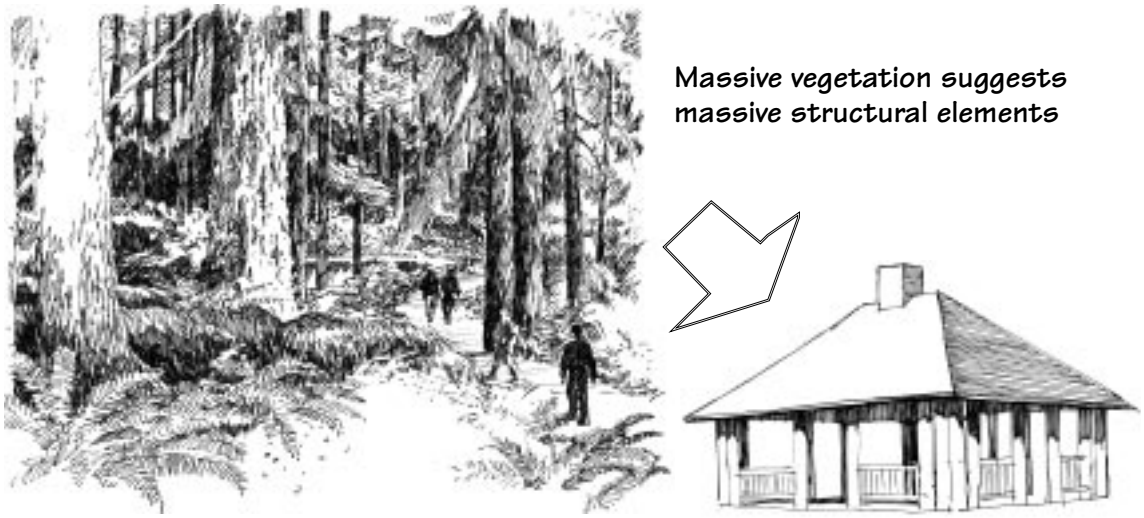
Landscape character results from a combination of ecological and visual factors. Design should grow from the character of each site: its ecology, geology, landforms, colors, plant life, microclimate, and cultural setting. Structures and roads should not disturb ecological integrity. They should match visual features of the landscape such as color, texture, form, and line. For example, design in the Southeastern United States can respond to the slender nature of vegetation in forests by including slender structural elements. In areas with massive vegetation and geology, such as the North Pacific, designs can include massive structural elements such as boulders and large logs. (The relationship of landscape and architectural character is shown in table 3.1.)

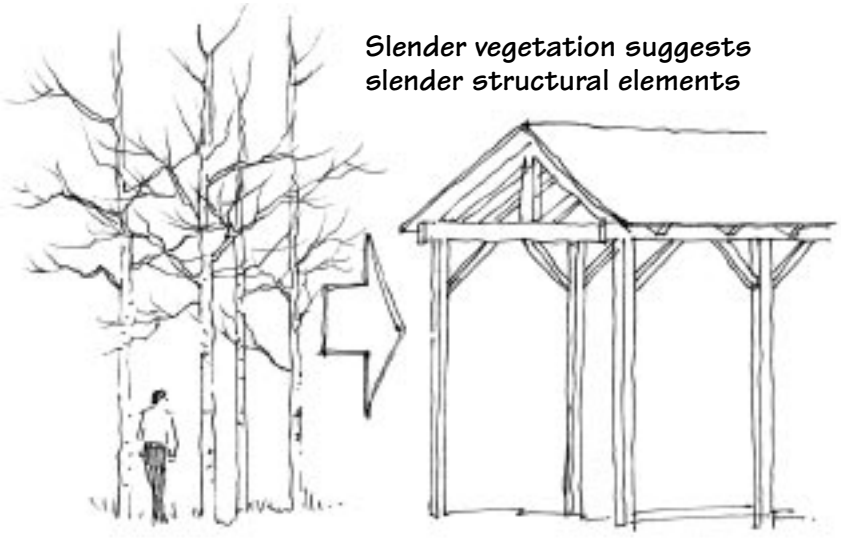
Table 3.1 Effect of Ecological Context on Architectural Character

Landscape Attribute	Influence	Resulting Architectural Character
Climate Low precipitation (3–18") Clear bright sky Hot summer temperatures Mild, clear winters	roof slope wall material and mass shading colors wall openings	flat roofs thick walls for insulation and heat retention bright intense colors recessed windows & doors shade overhangs, arbors solar design commonplace
Vegetation Sparse Open pine, juniper forests Small-leaved shrubs Ground cover	building materials structure massing roof structure	wood used sparingly wood logs, poles for roof xeric, sparse landscaping water conserving
Surface Geology/Rock Sedimentary Sandstones Shales	building materials structure massing wall thickness wall finishes	thick, adobe block walls plaster finish walls sandstone light colors, tans wall texture of surrounding soil

Each ecological setting should be analyzed to determine suitable materials, colors, textures, and forms. Elements to analyze include:

- Vegetation: Type, canopy coverage, patterns.
- Climate: Prevailing winds, precipitation, temperature, freeze-thaw cycles, seasonal variations, heating and cooling loads.
- Color: Degree of lightness or darkness; tones based on local plant life, geology, soils, water, quality of light, and sky.
- Solar: Orientation, aspect, intensity, and available days.
- Surface geology and soils: Type, texture, size, color, scale, construction capacity, or limitations.
- Hydrology: Runoff, drainage patterns, subsurface conditions, and aesthetic qualities of lakes and streams.

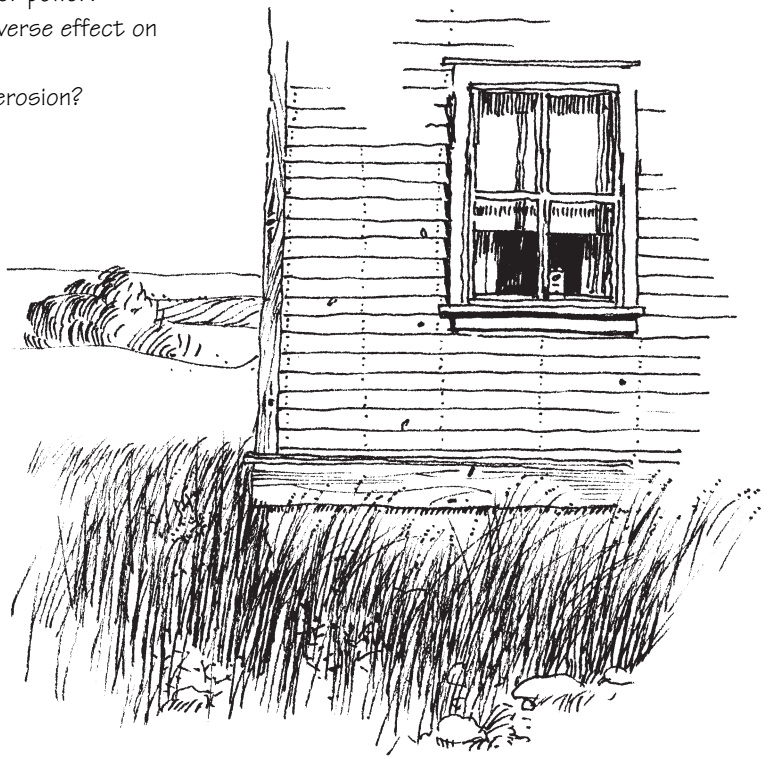




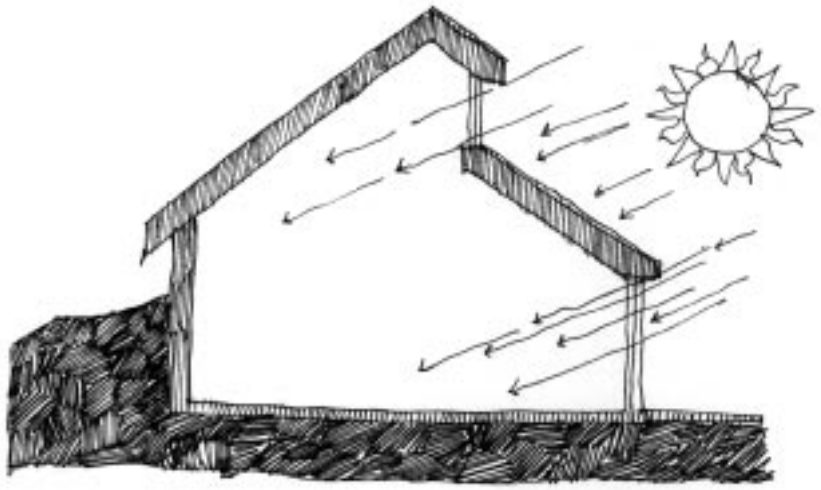
Careful consideration of the following questions will help illustrate how landscape factors influence architectural character and materials:

- Will the design visually complement the landscape?
- Does the design respond to the area's ecological influences?
- Does it use colors and shapes found within the forest?
- Are important views created or blocked?
- Does the design respond to climate?
- Does the design require regrading or clearing of vegetation?
- Must new utilities be extended to the site?
- Are the building materials locally produced, recycled, or recyclable?
- Can the structures be made energy efficient?
- Can they take advantage of energy sources such as solar, wind, or water power?
- Will the project have an adverse effect on wildlife habitat?
- Will it increase runoff and erosion?

**Materials respond to the scale of the setting—
Large mountains, rocks, or trees suggest a larger scale of materials**



**Materials respond to the scale of the setting—
Grasslands suggests a finer scale of materials**



Climate-responsive building characteristics

Cold, dry climate: promote solar gain

- Clerestory window
- South-facing window to promote solar gain
- Berm toward the north
- Thermal mass

Climate-responsive building characteristics

Hot, humid climate: insulate and ventilate to reduce solar gain

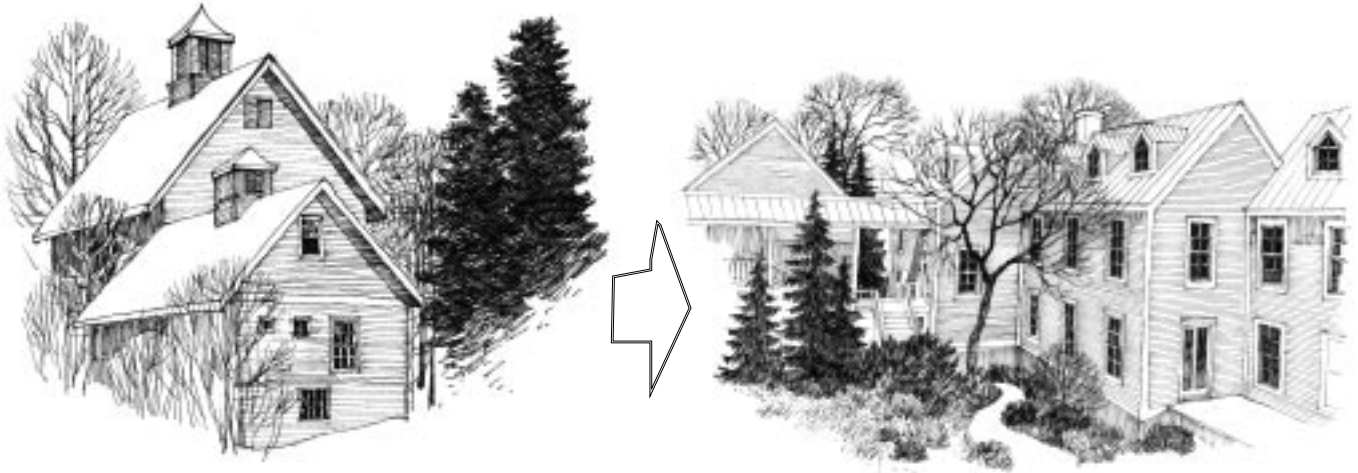
- Ridge venting
- Reflective roofing color and material
- Windows positioned to promote cross-ventilation
- Under floor ventilation

THE CULTURAL CONTEXT

The design, construction, or modification of buildings and facilities must reflect the architectural character of the region. Architectural character grows from the following factors:

- Landscape setting and physical characteristics.
- Traditions of indigenous cultures, including early European settlers and subsequent development.
- National and regional architectural styles.

European settlers imported their building traditions. For example, New England's early English settlers imported the use of split boards for siding (a response to the shortage of timber in England) to New England. In the mid-Atlantic region, German settlers who favored square-log house construction in central Europe (which had large forests to support this construction) continued to build with logs in the new land.



New England historical context

New England response

North Pacific historical context

North Pacific response

Other settlers adapted to new conditions. In the Southwest, the Spanish colonists combined their architectural traditions with the adobe Pueblo architecture that adapted so well to the desert. In rainy Florida, the Spaniards developed a waterproofing material called tabby, made from a ground-up mix of lime and oyster shells.

Lacking such modern technologies as air conditioning or earth-moving equipment, earlier builders learned to work with the constraints of each site. The results of their labors provide valuable lessons for sustainability. For example, they knew how to minimize site disturbance and how to maximize natural heating and cooling.

The early built environments of the Forest Service fit squarely within these cultural traditions. When sited in remote locations, Forest Service buildings were by necessity made from local materials using local skills. As a result, log cabins were erected in the mountains and adobe structures in the Southwest.

Tested by time and proven to be utilitarian, traditional designs continue to be suitable and sustainable models for Forest Service structures. The best traditional designs:

- Use locally available building materials.
- Respond to the climate.
- Work sensitively within the landscape setting, taking advantage of solar orientation, shade trees, prevailing breezes, and topography.
- Reflect the region's culture.

Issues to consider:

- What are the traditional building styles of the region? Of the forest?
- What materials, colors, and building techniques were traditionally used?
- Can these be adapted using modern building techniques and materials?
- Does the design fit within the image, history, and culture of the Forest Service?
- Where does the site fit into the Recreation Opportunity Spectrum?

North Pacific historical context

North Pacific response

THE ECONOMIC CONTEXT

"Excellent design is not the same as elaborate or expensive design. Some excellent design may in fact compensate for smaller square feet and less expensive materials. A poorly designed project cuts the chance of success and increases the risk. It is also very expensive to go back and correct design problems later."

—Eleanor White, Massachusetts Housing Finance Agency

More than any other factor, economics drive decisions related to the design and construction of Forest Service facilities. Decisions are often based upon the short term, such as the lowest initial costs. While this sometimes leads to the wrong decision, there is no denying that economic pressures are real.

Project-cost analysis must recognize the long-term value represented by greater durability, improved function, and lower energy and maintenance costs. We need to replace our short-term economic decisions with best value analysis.

Best value analysis represents the economic equivalent of design solutions that respond to ecology and other contexts. Best value analysis examines effects in two areas that influence design: short term and long term. Table 3.2 explains the differences between short-term and long-term considerations.

The most successful projects are built with long-term considerations in mind. For example, it may seem to make sense to select on-grid electrical power for a campground simply when the source is locally available and has a lower initial cost versus an alternative energy source. But what about long-term costs? What is the cost to future generations because power was generated from a nonrenewable source of fossil fuels or from dam construction required to generate additional power? Does the least-cost alternative create a positive message about Forest Service stewardship of resources?

Another example might involve the selection of low-cost paint and floor coverings for an administrative office. Does the low cost of the finish compensate for such potential problems as poor indoor air quality, potential employee health problems, and a short life for the materials before they wind up in a landfill?

Table 3.2 Short- and Long-Term Considerations

Short-Term	Long-Term
Initial investment	Project budgets are what percent of overall cost of the facility?
Immediate need for space	Life Cycle Costs
	Potential for future adjustments in facility use
Quantifiable environmental impacts within the immediate area of the project	Attention to long-term environmental impacts and those which occur off-site
Known measurable potential human health impacts	Emphasis on human health (present and future generations)
Short-term or current year maintenance needs	Emphasis on long-term maintenance and ease of upgrade
	Response to regional or national trends

Issues to consider:

Type of facility: What will the facility be used for? Will it be highly visible to the public? Will it be for administrative or utilitarian use? The cost to construct a visitor center or office differs greatly from the cost of a warehouse or utilitarian structure.

Planning budget: How much money is available to scope out the project? When might the project be funded? Are there alternatives to new construction, such as remodeling or adaptive use of an existing structure?

Design budget: How much is available to complete the design and contract package? Is there an urgent timeline to use available funds? Are funds available to research alternative building systems and materials?

Construction budget: Are sufficient funds available to build the facility? Besides building square footage, what other values are important to assess? How will siting and design contribute to image and function?

Maintenance budget: What is the current annual maintenance budget? Will the budget for maintenance and staff sustain the design objectives? Are sufficient funds available to provide for the quality of maintenance staff needed to sustain design objectives?

Operation budget: How much is available to operate the facility? What are projected utility costs? Is the facility expected to last 10, 30, or 100 years?

User impacts: How will the facility affect the public and Forest Service employees? Will it create a productive work area and a healthy built environment? Can recycling be incorporated into building design? Is it vandal resistant?

Owner perspective: Is the owner the Forest Service or a private individual or organization? What kind of economic return does the private owner expect? How might this affect design, materials, and construction?

Facility reuse or "deconstruction": Will the facility be demolished or reused at the end of its life? Can it be remodeled or renovated to meet changing needs?

These questions suggest considerations to include in a best value analysis.

Chapter 4

Architectural Character Guidelines for the Nation and the Provinces

"To build responsibly in the landscape should be the architect's first consideration."

—Javier Barba

INTRODUCTION

Chapter 4 is made up of two parts. Part 1 describes design principles common across the Nation for our built environment. Part 2 describes architectural character based on ecological and cultural influences in eight separate geographic provinces. The term province is used here to distinguish it from a Forest Service region. A province combines common elements from both ecological and cultural influences. The resulting geographic areas may cross, combine, or split the Forest Service regional boundaries.

THE CHARETTE PROCESS

In 1999, the Forest Service held a series of design charettes (workshops) across the Nation. These discussions and drawing sessions included the participation of members of the Forest Service, other Federal agencies, academics, and a team of consultants. By profession, participants included architects, engineers, landscape architects, historians, writers, archeologists, recreation and facility managers, field technicians, and line officers.

The charettes identified the following influences and responses for each province:

- Ecological influences.
- Cultural influences.
- Economic influences.
- Architectural response to the influences of ecology, culture, and economics.
- Suitable architectural character types for the province.

These influences and detailed recommendations for architectural responses are discussed in part 2.

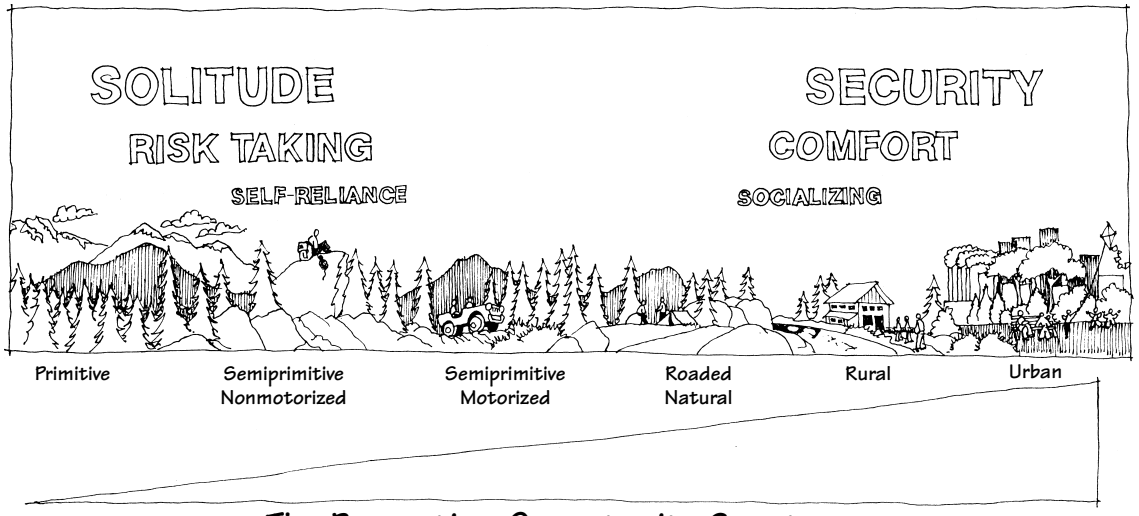
Part 1: Principles Common to All Provinces

The charettes revealed characteristics shared by all eight provinces. This section includes a series of universal principles that apply in the following areas of design:

- Recreation Opportunity Spectrum (ROS)—an inventory and management tool for recreation settings.
- Site planning—the arrangement of buildings and parking within the landscape.
- Forest Service image and identity—signs, kiosks, and information boards.
- Sustainability—the creation of healthy built environments by minimizing the use of resources and conserving ecosystems.
- Structures—common principles, such as massing and scale, materials, and colors, for structures from offices to picnic shelters.
- Urban settings and townscapes—design, siting, and reuse of existing buildings.

RECREATION OPPORTUNITY SPECTRUM

The ROS system is an inventory and management tool used by the Forest Service to assist in providing lands for recreation use. A premise of ROS is that people expect and seek variety in forest settings. For example, backcountry campers are not looking for highly developed facilities such as roads, lighted areas, picnic tables, or flush toilets; they seek solitude and hope to find few reminders of civilization. Recreation vehicle campers and car campers, on the other hand, often expect easy access and developed facilities offering comfort, security, and social opportunities.



The Recreation Opportunity Spectrum

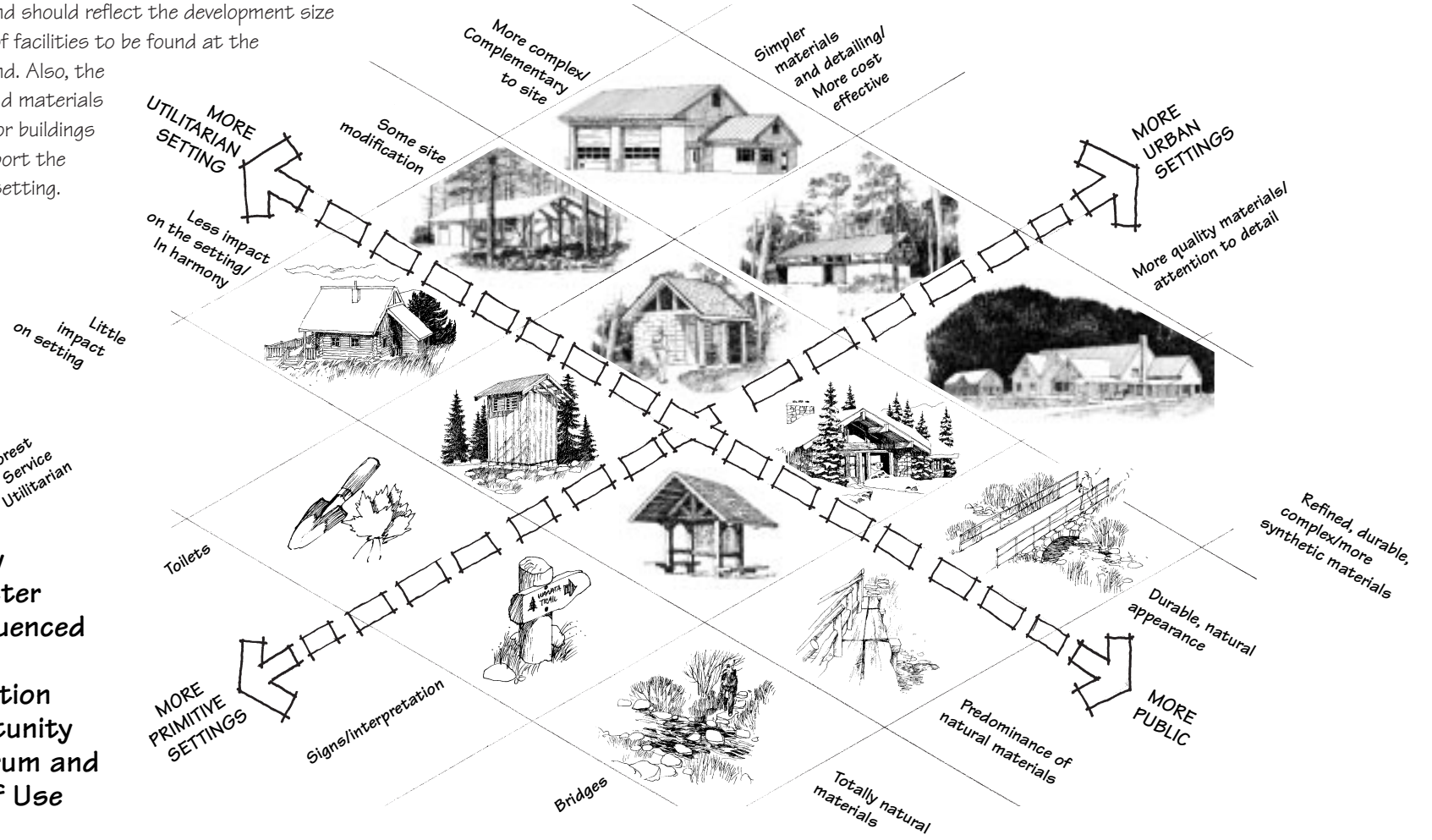
The figure above illustrates the six ROS classes reflecting the range of possible recreation settings. The Forest Service strives to provide and maintain the range of settings from roaded natural through primitive to meet the expectations and desires of visitors.

ROS classifications help determine acceptable development for each specific site. A combination of the following factors determines the ROS class for an area:

- Remoteness, including distance from roads and settlements.
- Degree of naturalness, based upon the level of human modification to the landscape.
- Social setting, based upon the number of encounters with other people experienced in a typical day.
- Managerial setting or degree of visitor controls evident.

To maintain a setting's integrity while creating a satisfying visitor experience, these factors must be consistent within a setting. For example, the width and surface of an access road that leads to a campground should reflect the development size and type of facilities to be found at the campground. Also, the utilities and materials selected for buildings must support the assigned setting.

The ROS does not apply to recreation facilities alone, but to all types of Forest Service facilities from public to nonpublic to utilitarian. The following graphic illustrates the system of appropriate structures and uses and how they fit into the ROS settings.

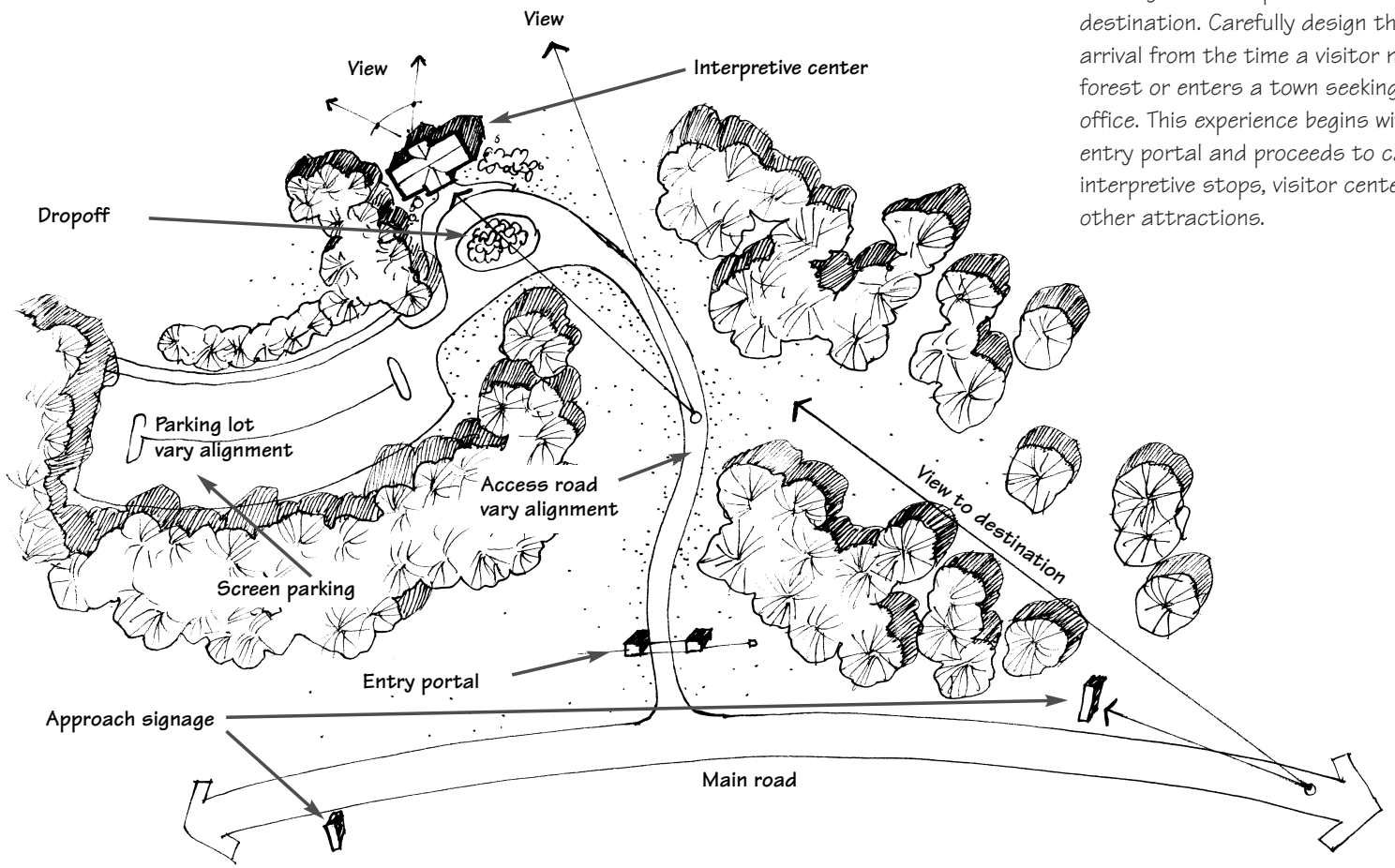


Facility Character as Influenced by the Recreation Opportunity Spectrum and Type of Use

SITE PLANNING

Visitors to national forests and related facilities need a clear idea of where they are heading, where to park, and where to enter their destination. Carefully design this sequence of arrival from the time a visitor nears a national forest or enters a town seeking a Forest Service office. This experience begins with a well-designed entry portal and proceeds to campgrounds, interpretive stops, visitor centers, offices, and other attractions.

The Sequential Entry Experience

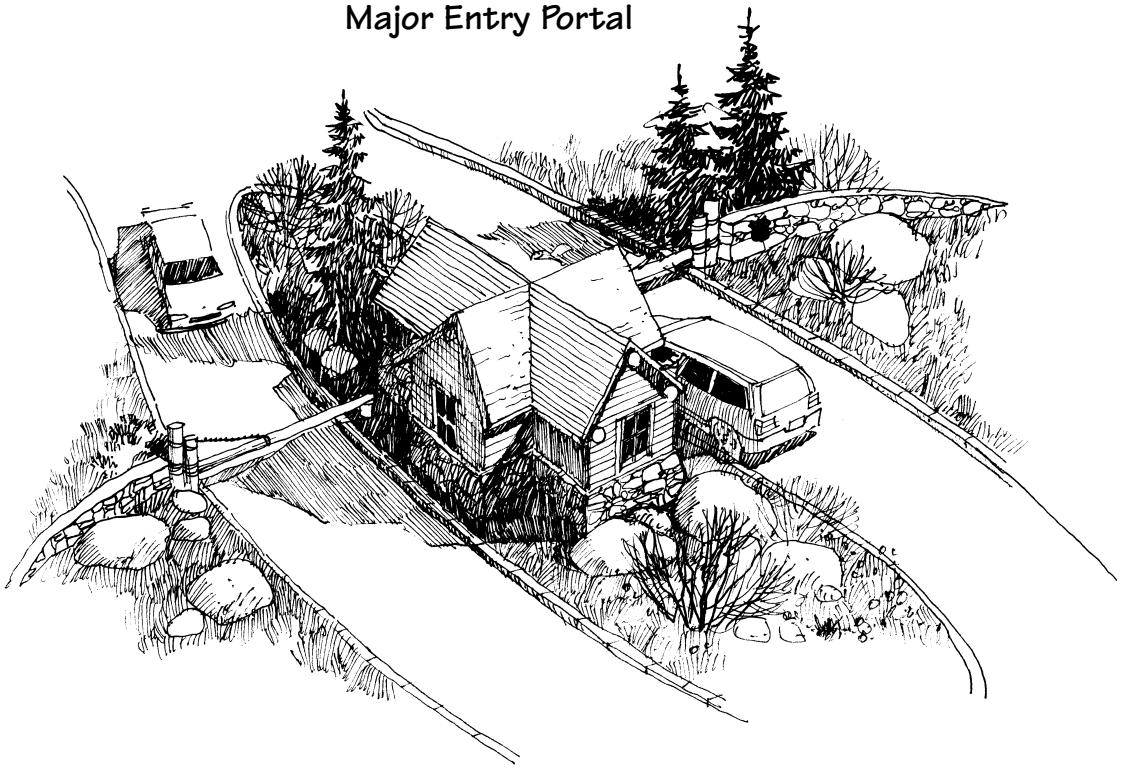


Portals and Entrance Stations

Entry portals are the "front door" to national forest sites. Before visitors reach this forest gateway, they should receive clear direction from well-placed signs on the main highway. The entry road should include appropriate traffic controls (such as a light or turn lane) so visitors can enter and exit with safety and convenience.

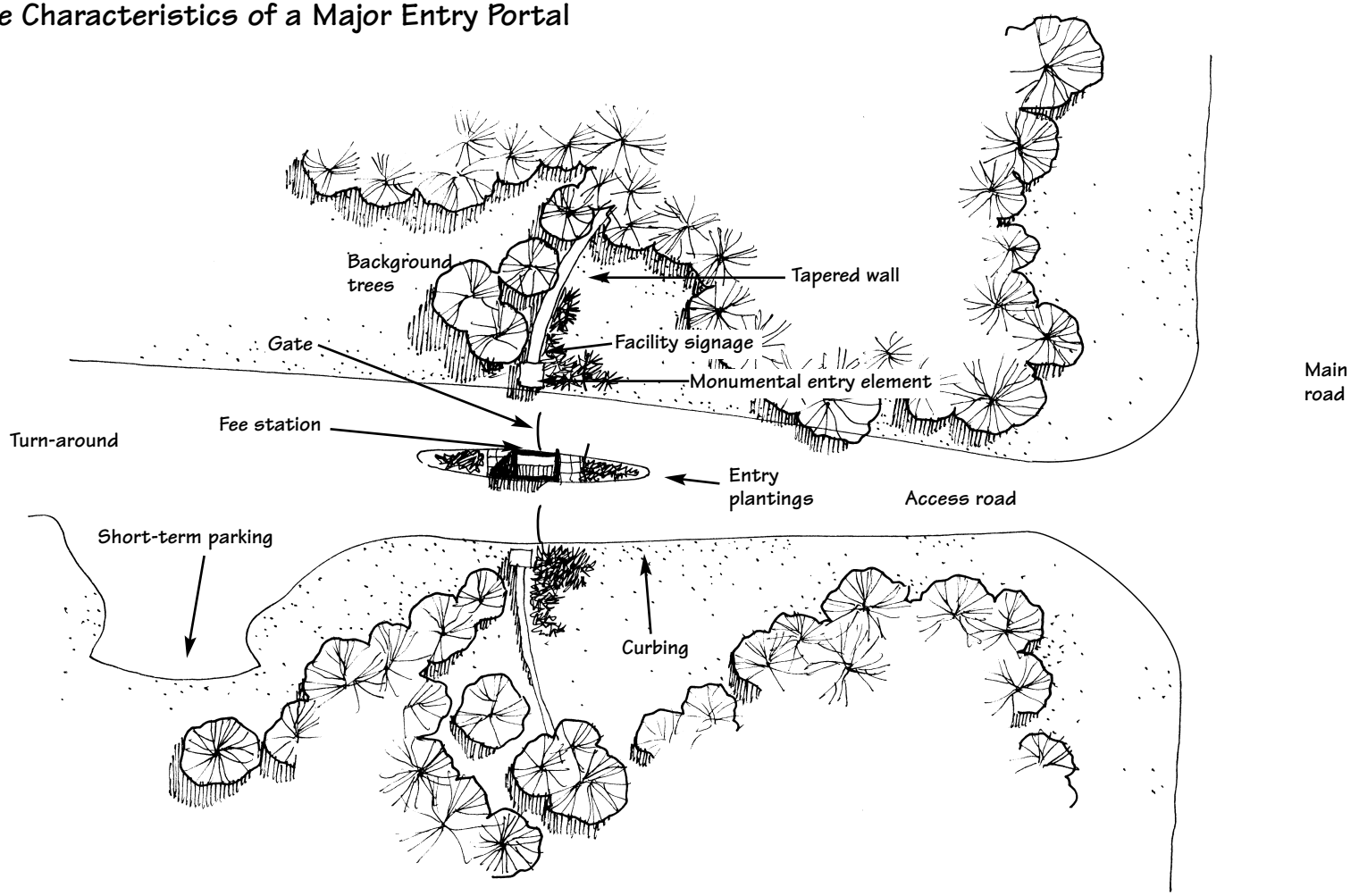
- When possible, place the portal near a natural landmark, such as a rock outcrop, specimen tree, or the mouth of a canyon.
- If there is no natural feature available, bracket the station with "embracing elements," such as a curving wall, fence, or planting.
- Place the portal entry station, when provided, in an attractively landscaped island in the middle of a road section outfitted with curb cuts.
- When a portal entry station is provided, place a turnaround and short-term parking area adequate for all kinds of vehicles just beyond the entry station.
- When access control is needed, provide an operable gate.
- Orchestrate the "entry experience" so that visitors can find their way and will be enticed to explore the facilities and landscape.
- Locate the approach road or the destination, if it is a building or other constructed feature, so that visitors may catch glimpses of their destination as they approach.

Major Entry Portal



- Place good directional signs to help visitors find the access road or approach road.
- When possible, create landscape openings to frame the view of the facility or attraction for approaching visitors.
- To preserve vegetation and create vistas, align the access road and parking with natural topography.
- Identify each segment in this entry sequence through tasteful use of the Forest Service shield and the family of signs.

Positive Characteristics of a Major Entry Portal



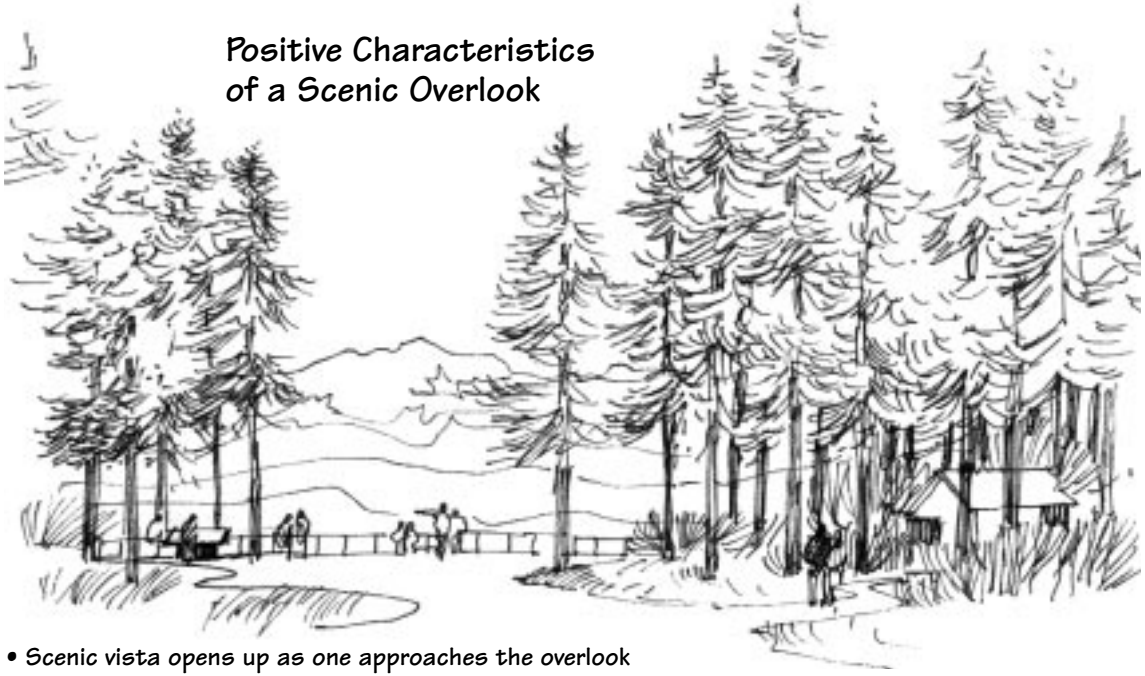
Parking

- Locate parking away from the direct line of sight for the attraction, whether it is a facility or natural feature.
- Provide adequate parking for normal demand.
- Place parking conveniently close to facilities.
- Separate staff parking from visitor parking.
- Provide adequate lighting when needed.
- Provide parking for all potential visitors, including persons with disabilities.
- Provide parking for all potential vehicle types, from bicycles to large recreation vehicles (RV's).
- Provide parking at all locations, from offices to interpretive rest stops, for all potential visitors and vehicles.
- Provide one-way traffic flow and a single entry/exit when possible.
- Provide short-term parking for deliveries, trash removal, and so forth.
- When possible, place a convenient vehicle dropoff point from which visitors can see the main parking lot.
- Use vegetation to screen parking, as well as dumpsters and other utilitarian features, from the main road.

Universal Design

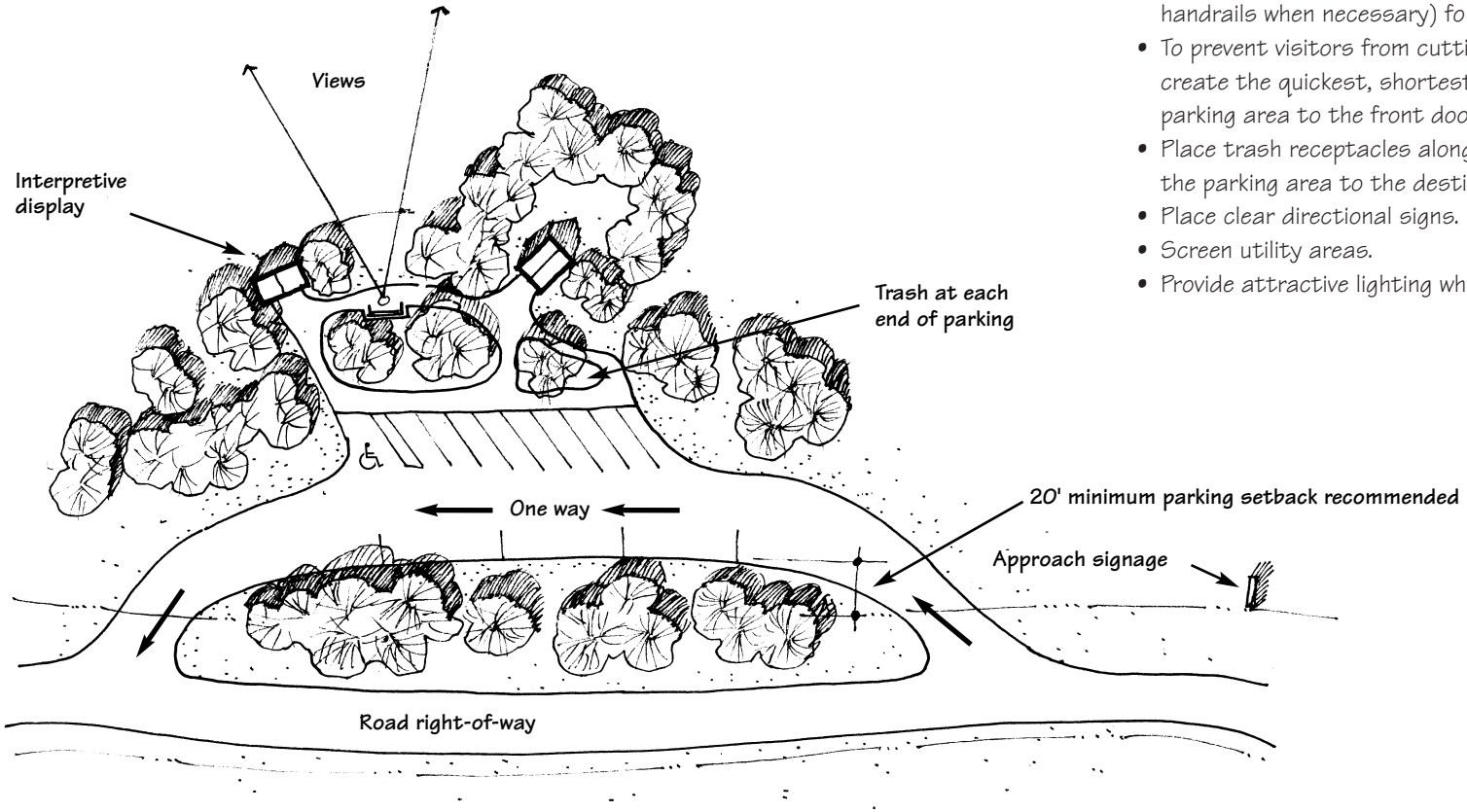
Implementation of universal design principles ensures access for all people, including persons with disabilities, to workplaces and administrative programs and offers access to diverse recreation opportunities. Universal design allows for integration, choice, and dignity for all users.

- Incorporate universal design principles to accommodate the broadest possible spectrum of people, regardless of ability, at recreation and administration facilities.
- Apply the most up-to-date standards, currently the Uniform Federal Accessibility Standards (UFAS) and the Americans with Disabilities Act Accessibility Guidelines (ADAAG).



- **Scenic vista opens up as one approaches the overlook**
- **Facilities & improvements are subordinate to landscape features**
- **Buildings have been placed away from views**

Positive Characteristics of a Small Interpretive Site



Pedestrian Circulation

Once they leave their vehicles, visitors should be welcomed with convenient, safe, and attractive walkways and circulation areas:

- Ensure that visitors can safely walk from vehicles to pathways to destinations.
- If there are curbs, provide curb cuts (and handrails when necessary) for universal access.
- To prevent visitors from cutting new paths, create the quickest, shortest walk from the parking area to the front door or destination.
- Place trash receptacles along the path from the parking area to the destination.
- Place clear directional signs.
- Screen utility areas.
- Provide attractive lighting when needed.

FOREST SERVICE IMAGE AND IDENTITY

See the section on site planning for additional design principles related to Forest Service image and identity in all provinces.

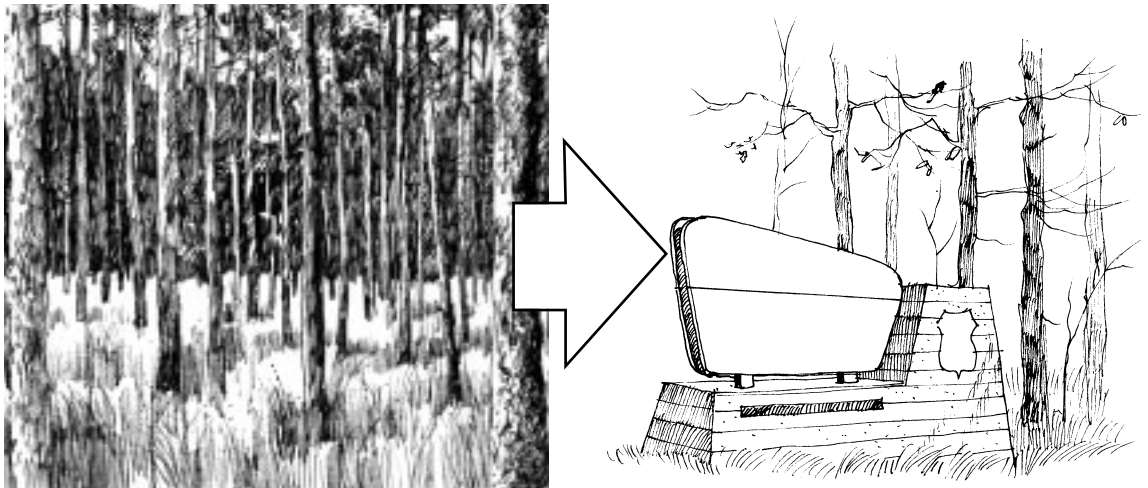
Signs

Like any other built element, a sign should complement the natural and cultural context. The signs themselves must follow the Forest Service Sign and Poster Guidelines for the Forest Service, Engineering Management (EM) Series publication (EM-7100-15). Within the standards of the publication, the sign and its supporting base should adhere to its province's guidelines for massing, scale, material, color, and sustainability.

For example, a base of large natural timbers and massive boulders might be used to support an entry sign situated within the massive trees of the North Pacific province.

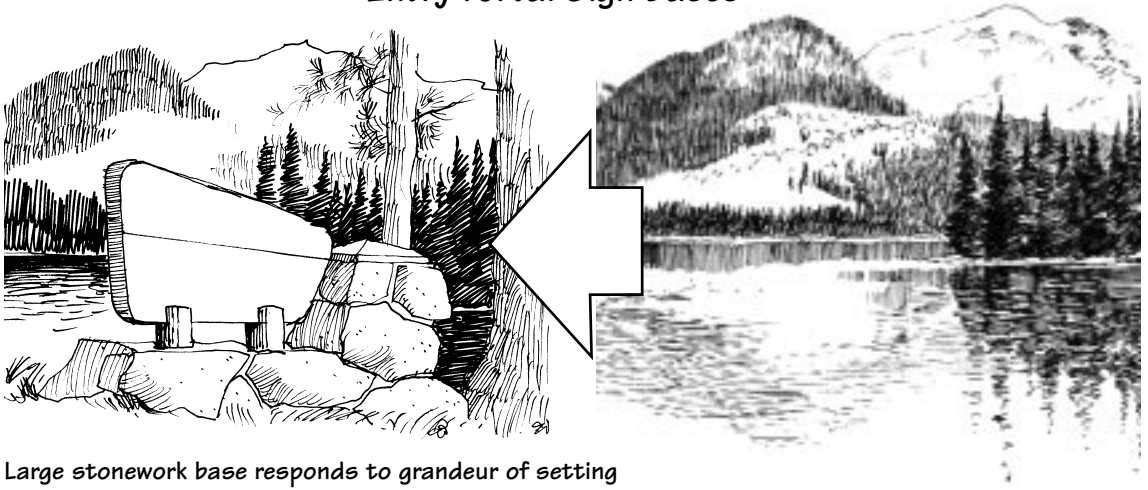
Conversely, more delicate, dimensional (machined) materials, such as four-by-four wood posts and board-formed concrete might be used as the base for an entry sign within the more slender vegetation of the Southeast Coastal province.

The Forest Service shield is a powerful and widely recognized symbol of the agency and its values. To help establish identity, place the shield as an emblem and icon in key locations. Guidance for use of the shield can be found in FSM 7160.34 and in EM-7100-15.2.6.



Narrow, slatted wood base responds to small scale of tree boles

Positive Characteristics of Entry Portal Sign Bases



Large stonework base responds to grandeur of setting

In addition:

- Highlight the Forest Service image through signs and inviting building entries.
- Incorporate the main entry sign or monument marker so that it makes a statement about the character of the place.
- In locations with distinctive natural features, integrate sign elements into the setting by using complementary materials, such as local stone or timbers.
- Locate signs to support, and not obstruct, the interpretation of the natural resource.
- In unique areas, consider using site-specific, handcrafted details to create a high-quality identity.
- Place highway signs to direct visitors to Forest Service facilities.

Kiosks and Information Boards

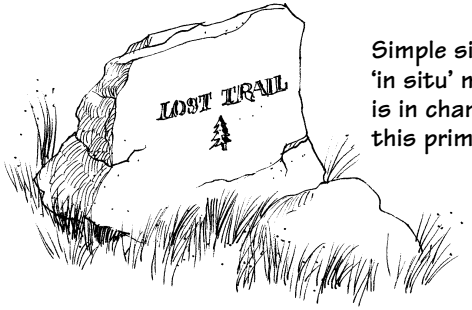
Kiosks and information boards should be carefully designed to meet the Forest Service's graphic standards. Kiosks should provide shelter from the weather. A useful kiosk or information board may include:

- Map with proper visitor orientation.
- Location of recreation areas.
- Facilities available within the area.
- Emergency phone numbers.
- Permit requirements.
- Address and phone number of the nearest Forest Service office.

Positive Characteristics of Signs

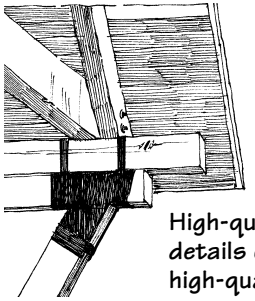
Wide and appropriate use of the Forest Service shield helps establish the agency's presence and identity

The low-angled mounting of this interpretive sign does not block the view and reduces sun glare



Simple sign using 'in situ' material is in character on this primitive trail

The roof over this interpretive sign provides shelter from weather and protects displays and information



High-quality crafted details create a high-quality image

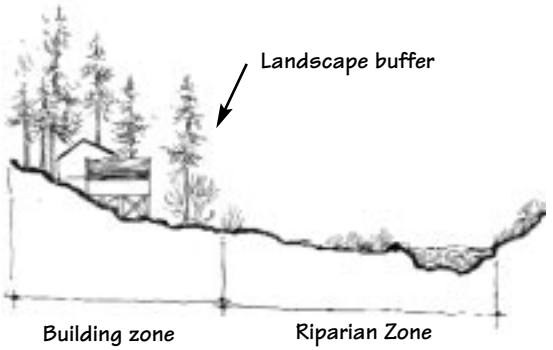
SUSTAINABILITY

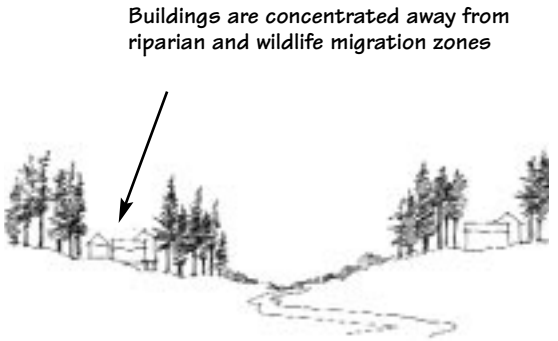
Sustainability is an across-the-board stewardship strategy that begins by considering whether a new facility is truly needed. Sustainability starts with site planning, continues with building design and materials selection, and is finally achieved through the life cycle of a structure. It considers energy conservation at every level, from the energy required to transport materials to the energy consumed by heating, cooling, lighting, and maintaining a structure.

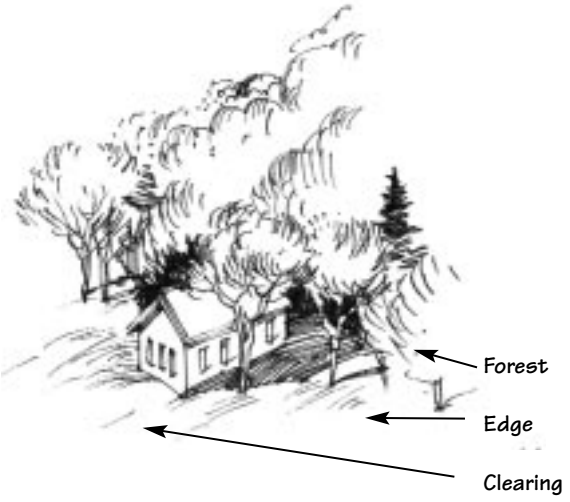
"Common sense" and "low-tech" are frequently the most sustainable solutions. For example, designing a building with well-placed windows that light offices and other workspaces makes "daylighting" an alternative to electric lights for daytime use.

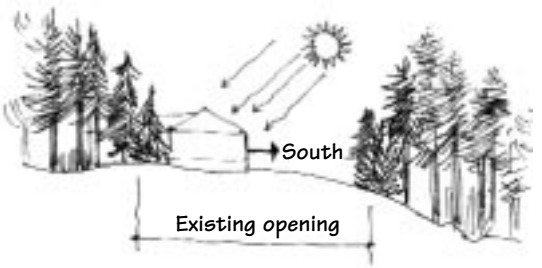
Buildings that are healthy for the environment can be healthy for people as well. In some climates, buildings designed for daylighting and natural ventilation may reduce energy use while exposing people to beneficial natural light and fresh air.

Sustainable measures that apply everywhere include landscape planning, energy conservation, water conservation, and recycling.





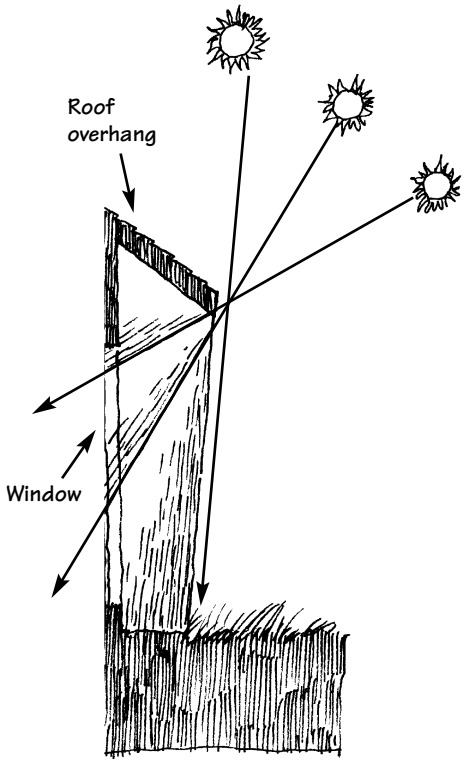




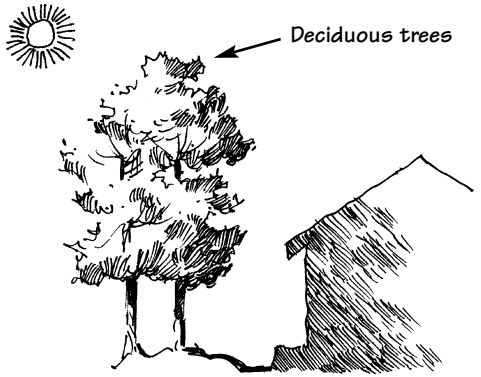
Landscape Planning

- Minimize site disturbance and surface grading by following the contours of the land and by locating facilities near existing roads and utilities.
- Minimize clearing of native vegetation.
- Minimize construction of new roads and parking.
- Avoid building in sensitive wildlife or riparian areas.
- Consider climate, solar orientation, and prevailing winds when siting buildings.
- Consider wildfire potential when setting clearing limits around buildings and when selecting vegetation for planting.
- Landscape with native plants to reduce maintenance while enhancing wildlife habitat.
- Minimize the use of irrigation systems. Where needed, use drip or other point-of-use irrigation systems and consider temporary systems to establish plants only.
- Where landscape plants must be watered, grade surface terrain to harvest runoff.

Building Features and Vegetation Can Radically Reduce Energy Costs



Length and placement of a fixed roof overhang determines amount of natural light entering a building at different seasons or times of day



Locating deciduous trees on the south side of a building will help reduce summer solar gain while allowing solar heating in the winter

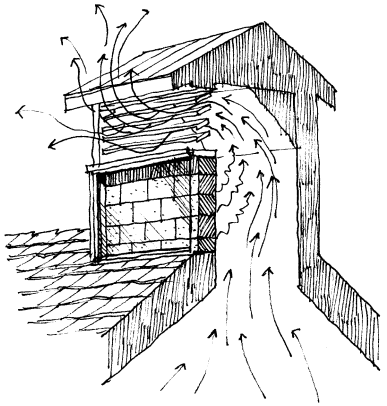
Building Features and Vegetation Can Radically Reduce Energy Costs

Energy Conservation

- Introduce daylight into interior spaces through careful placement of large, high windows and clerestory windows for balanced light.
- In appropriate settings, use thick, massive walls such as masonry, earth walls, and straw bales designed at the correct thermal mass to retain and release heat.
- Insulate roofs to maintain desired interior temperature.
- Locate mechanical systems centrally for efficient distribution of heat, cooling, and power.
- In mild climates, consider using operable windows and other measures to reduce the need for mechanical ventilation.
- Consider ground-coupled heat pumps, passive solar, and other energy-saving heating techniques.

Water Conservation

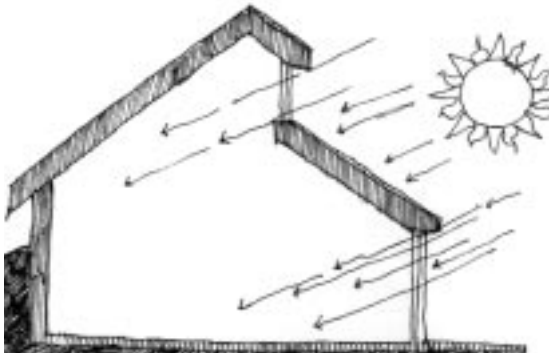
- Consider constructed wetlands, sand filters, and other alternatives to mechanical systems for sewage treatment.
- Install water-conserving fixtures.
- Conserve water through such strategies as water harvesting with cisterns, xeriscaping, and graywater recycling.
- Install porous paving to minimize erosion and to "recharge" the groundwater.



A solar chimney may be used when heat gain is excessive

Recycling

- Rather than building anew, recycle or adaptively reuse a building for a new purpose.
- Design flexible interiors that can be converted to other uses.
- Encourage visitor and employee recycling through well-placed and marked containers and awareness programs.
- Seek building materials with high recycled content and low "embodied energy."



Window location and size influence solar heat gain and daylighting

A ground-coupled heat pump may be installed to drastically reduce a building's operation costs

STRUCTURES

See the section on sustainability for additional design principles common to structures in all provinces.

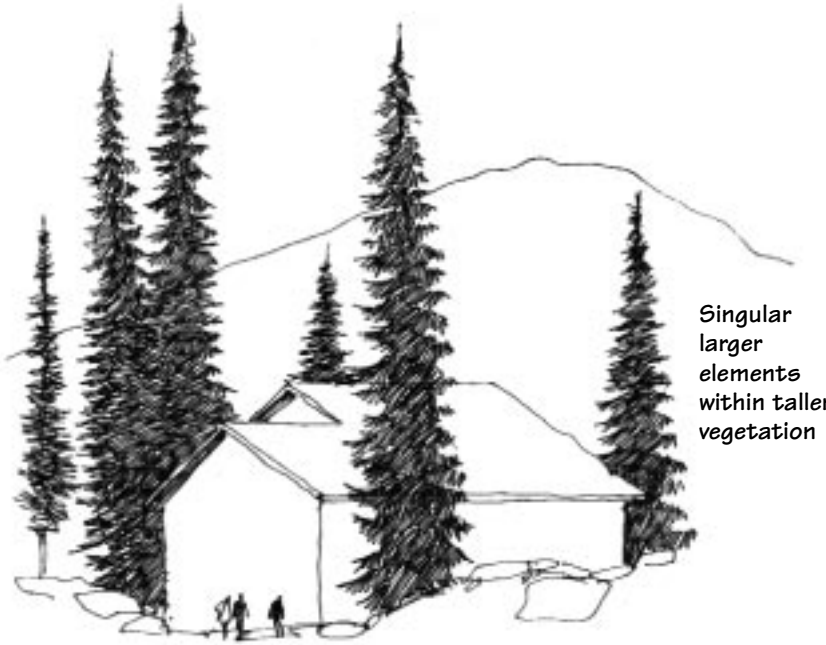
Building Scale and Massing

The massing and scale of structures should remain in harmony with the immediate natural setting. For example, buildings in grand mountain settings should be overscaled with large building materials such as boulders, timbers, and larger-than-typical doors and windows. In settings where buildings stand out from the landscape, such as open prairie and beachfronts, manipulate the massing and scale to reduce the apparent size of the structure and to relate it to the size of humans.

Materials

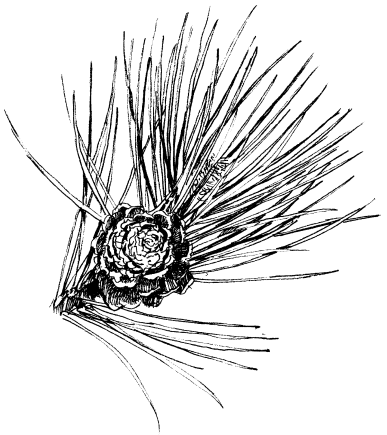
The ideal is to use natural building materials indigenous to a setting. However, some traditional or natural building materials may be too expensive or scarce to consider using today. Nevertheless, the careful selection of materials creates buildings that are more ecologically sound and a better match for particular settings.

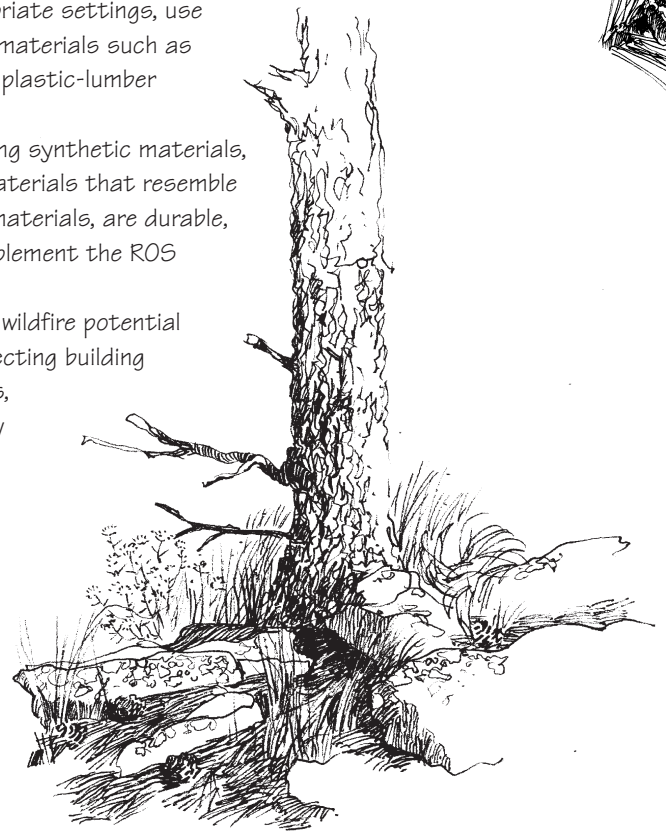
- Use natural, nontoxic building materials that require little maintenance.
- Celebrate, but do not overuse, wood—especially scarce species or sizes.



Buildings Should Be in Harmony With the Scale of Their Surroundings

- Use materials that are energy-efficient to produce and transport.
- Draw from local geology by using local stone as a primary material or as an inspiration for alternatives.
- Employ materials with integral colors that weather rather than materials that must be painted or stained.
- In appropriate settings, use recycled materials such as recycled, plastic-lumber decking.
- When using synthetic materials, select materials that resemble natural materials, are durable, and complement the ROS setting.
- Consider wildfire potential when selecting building materials, especially roofing.





Color

Standard color schemes should be developed for development complexes or special management areas within a national forest or grassland. Once established, the color scheme must be consistently applied throughout the complex or special area. Color schemes can be keyed to the landscape by:

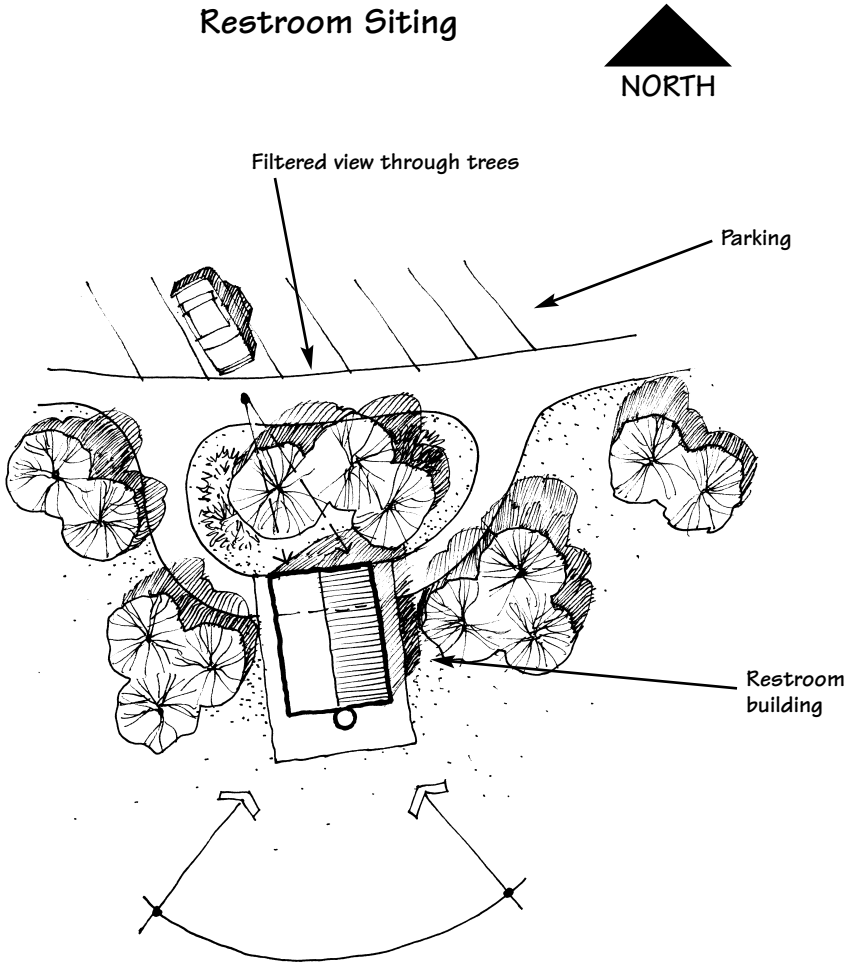
- Employing colors that complement local vegetation, soils, and rock outcrops.
- Integrating colors by using local, natural materials.
- Selecting shades for large planar surfaces that are slightly darker than the surrounding natural colors.

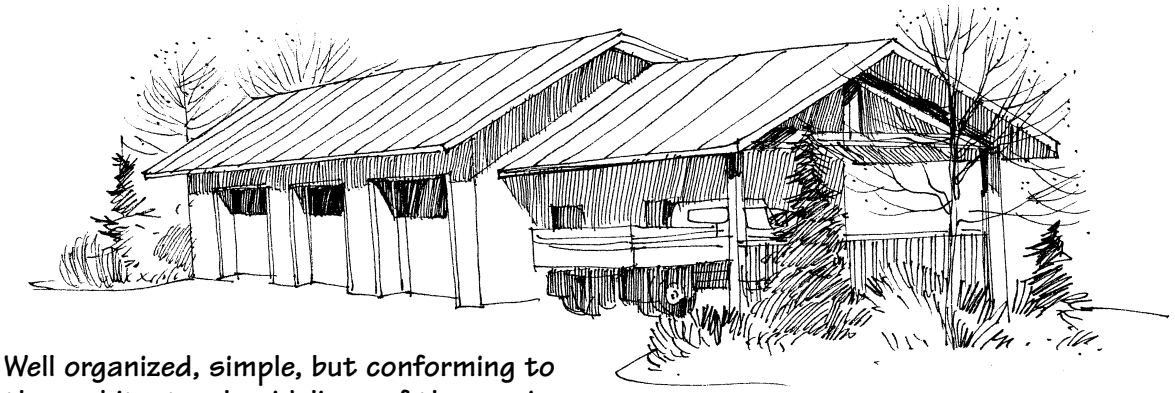
Note: On most National Forest System lands, deviating from standard colors of signs must be preapproved by the regional sign coordinator. See EM-7100-15 for descriptions of sign standards.

Toilet Buildings

As much as visitor centers, toilet buildings and restrooms provide the primary point of visitor contact. They leave a strong impression of the Forest Service's image.

- Design to standards suitable to the context, from highly detailed in highly developed and visible areas to more utilitarian in less developed and less visible areas.
- Use vegetation, rock outcrops, boulders, or screens to buffer views of more utilitarian structures.
- Place restrooms in locations convenient to parking areas and trailheads and within functional needs of service vehicles.
- Avoid placements that dominate or disrupt attractive views and vistas while allowing easy identification of location by visitors.
- Locate restrooms away from stream corridors, rivers, wetlands, or lakes in accordance with State water-quality standards.
- To optimize ventilation of vault toilet buildings, ensure an unobstructed airflow across the top of the vent pipe and ensure airflow is not restricted near the wall vent.
- Where possible, locate toilet buildings downwind of other developments and use areas.





Well organized, simple, but conforming to the architectural guidelines of the province

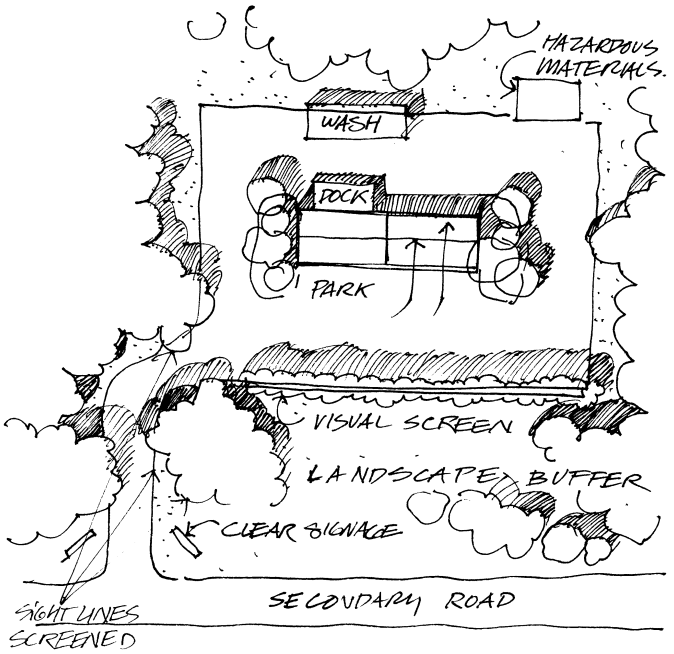
Maintenance building characteristics:

- Expressed building structure
- Building color blends with environmental/cultural context
- Inexpensive detail adds to building character
- Door setback increases shadows & visual character of building
- Roof extends to create shadow line
- Covered building entry
- Covered outdoor work area in appropriate climates
- Landscaping buffer from public areas

Utilitarian Structures

Though simpler and less expensive than public buildings, utilitarian structures—such as warehouses, barracks, and trash enclosures—should relate to the scale, rooflines, color, texture, and architectural detailing of visitor, recreation, and administration buildings in the same national forest.

- Separate utility buildings from visitor facilities and public byways.
- Screen utilitarian structures from public view with native vegetation, landforms, and constructed screens.
- Provide high-quality workspaces by including daylighting, natural ventilation, and appealing outdoor spaces.



Effective Building and Site Design Allows Use of Utilitarian Structures

Typical work center characteristics:

- Entry drive offset to minimize views to facility
- Landscape buffer
- Perimeter security fence as needed. Vines on fence for visual screening
- Adequate space provided for vehicle turning movements
- Required Clear Zone around hazardous materials

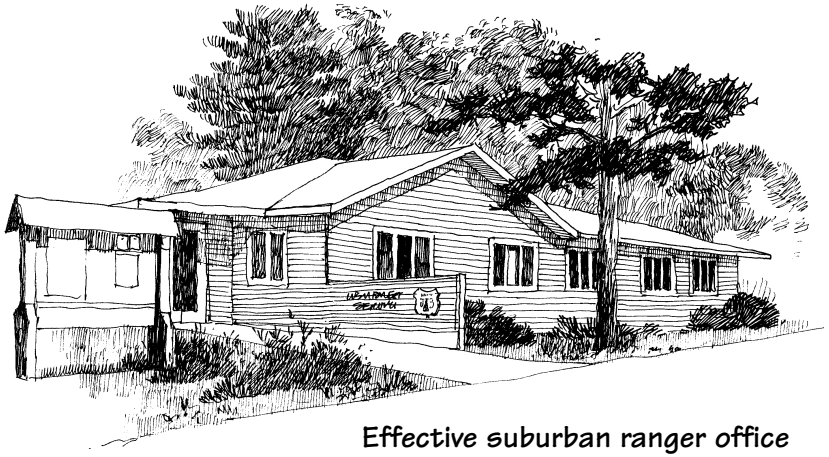
URBAN SETTINGS AND TOWNSCAPES

Forest Service administrative offices play a vital role in the life of rural communities. They should provide a visible, energizing presence on Main Street, a source of local pride, and a focus of orientation for visitors.

An office located in a town may be the first point of visitor contact. It should reflect a positive image for the entire Forest Service, as well as for the forest it serves. Forest Service offices must also fit within their urban context.

Design

- Design within the context of each community so that Forest Service buildings convey a neighborly image.
- Ensure that entrances, reception areas, and other points of visitor contact emphasize the Forest Service's mission as well as landscape character.



Effective suburban ranger office

Is your ranger office in town projecting the image of your forest?

Employing the shield establishes identity

Siting

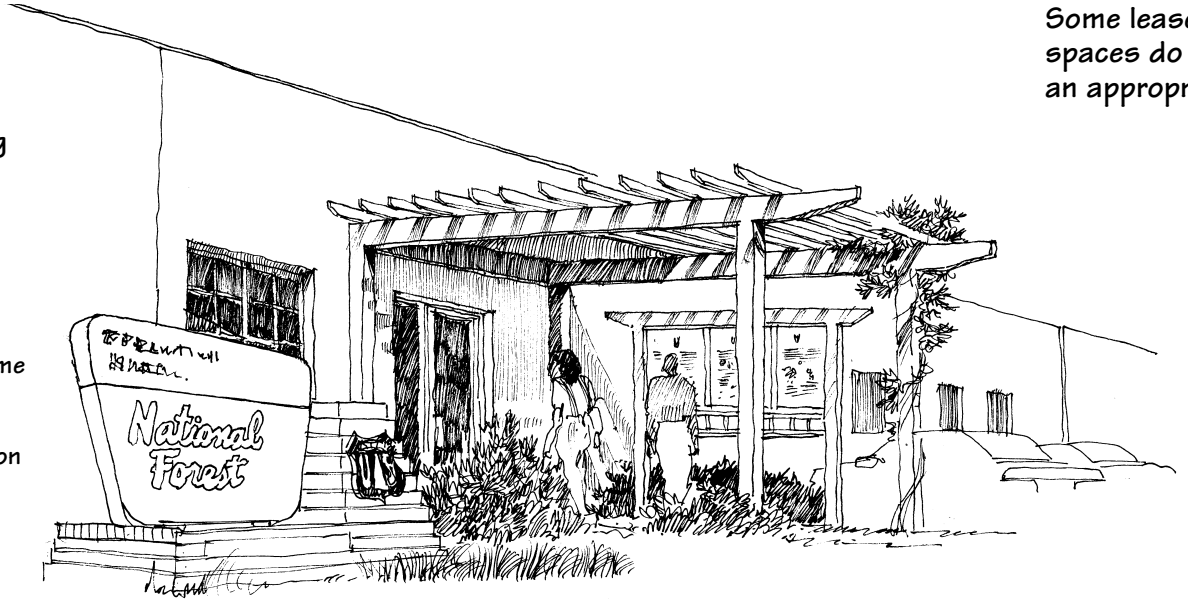
- Locate Forest Service administrative buildings where they are visible and accessible within a community.
- Avoid sites that are remote from the urban community served.
- When possible, consolidate multiple functions (and other Government services) and leases into one visible facility.
- Avoid lease locations that simply cannot provide an appropriate image for the Forest Service.

Reusing Existing Buildings

- Adapt and recycle historic buildings when practical.
- Retrofit existing buildings to express the Forest Service identity.

Effective reuse of existing building characteristics:

- **Office converted from an old bowling alley**
- **Clear Forest Service identification**
- **Inviting entry projection that relates to the built theme within the forest**
- **Opportunity to provide information and interpretation**
- **Natural landscaping**



Some leased office spaces do not convey an appropriate image

Part 2: Designing to the Scale of the Site and the Province

THE ISSUE OF SCALE: AN OVERVIEW

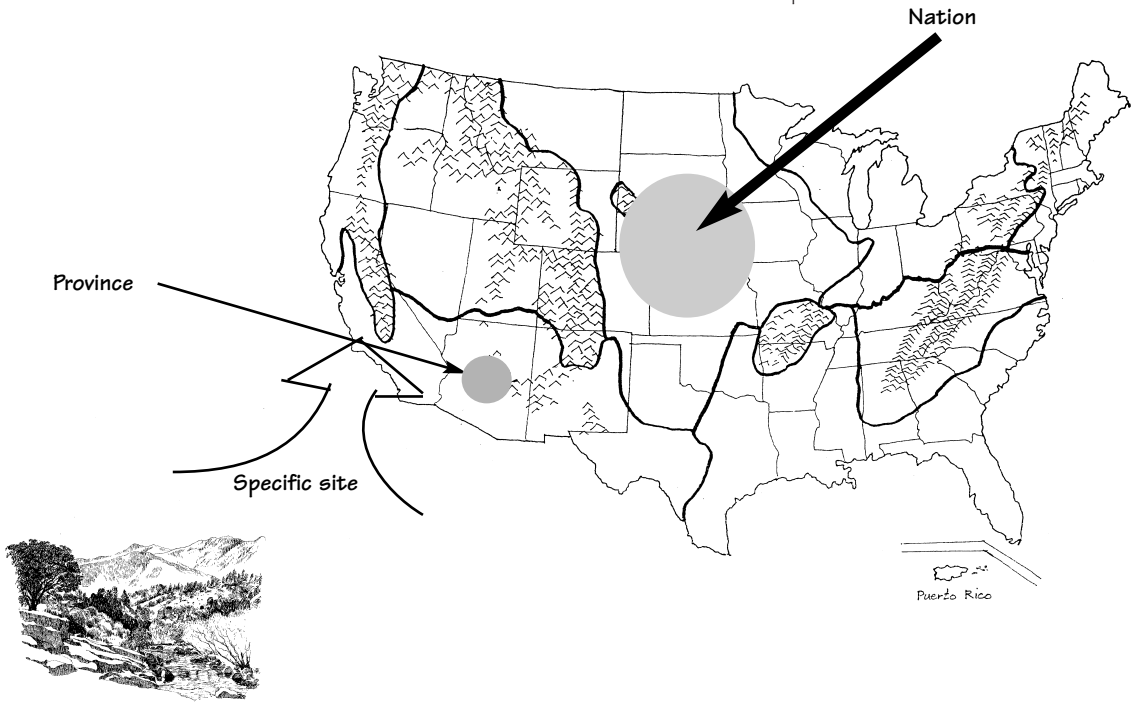
Ecological, cultural, and economic contexts occur at various scales. In terms of context for our built environment, we consider national, province, and site scales.

On the national scale, the Forest Service should be identified with quality facilities that reflect the agency's stewardship mission through integration with the setting, use of the Forest Service shield, and consistent application of the family of signs. Additionally, certain planning and design principles and elements are common to the built environment throughout the Nation. These common principles are described in the first section of chapter 4.

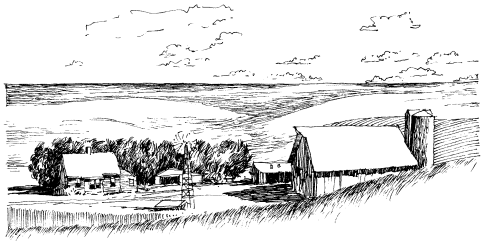
A Nation as large as the United States contains great variety within its ecological and cultural contexts, which has a direct effect on architectural character. Within this guide, the province is the main determinant of architectural character. A province combines common elements from the ecological and cultural contexts over large geographical areas. This begins to suggest sustainable strategies that work within a province. The remainder of this chapter includes extensive descriptions of the provinces and their architectural character.

Finally, the site scale will determine suitable architectural character types and sustainable strategies. For each project, tailor design elements such as colors and building materials to the specific site and to fit the local context, including the economic context. Other site considerations include ecology, vegetation, climate, and topography; the ROS setting; and the patterns of use by visitors, concessionaires, and employees.

In some cases, a special area or development complex may develop a specific architectural theme to ensure consistency throughout an area. The process of adapting individual projects to their context and developing architectural themes is described in chapter 5.



Rocky Mountain

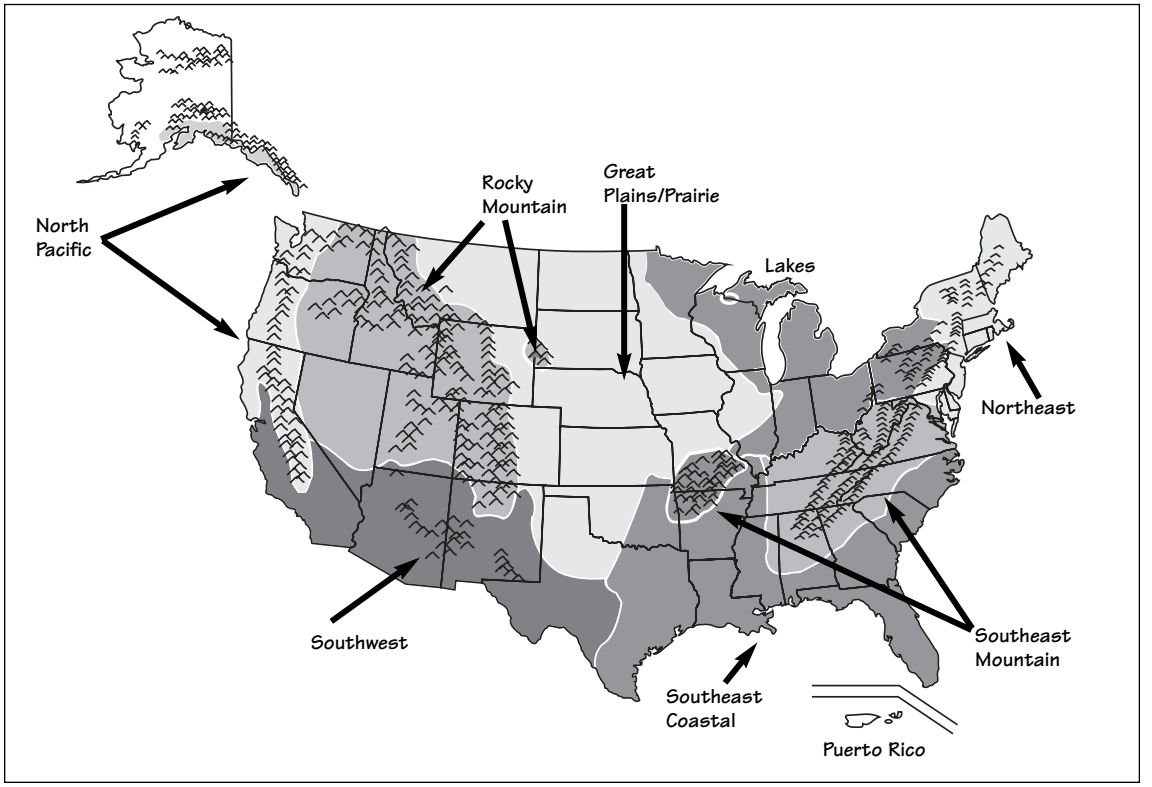


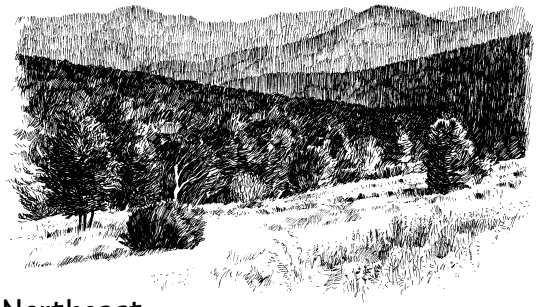
Great Plains/Prairie

Lakes

North Pacific

Southwest





Northeast

Southeast Mountain

Southeast Coastal

THE EIGHT PROVINCES: ARCHITECTURAL RESPONSES TO THE INFLUENCES OF ECOLOGY AND CULTURE

"My forest setting is unique" was a comment frequently heard at the charettes. This may be true regarding the individual sense of place for each forest and grassland. Yet the charettes revealed ecological and cultural patterns that cross forest boundaries.

To ensure sensitive responses to the contexts of ecology and culture, the guide addresses eight geographic areas known as provinces. For example, the Southeast Coastal Province is a lowland area with a hot climate and aristocratic cultural traditions. The Southeast Mountain Province includes characteristics such as higher elevations, a cooler climate, and cultural traditions formed by such "common" people as farmers and frontier families. Both contexts merit separate and individualized design responses.

The provinces are:

- Northeast Province, including the Middle Atlantic States and northern Appalachians into New England.
- Lakes Province, including the eastern prairies and the Great Lakes States.
- Southeast Coastal Province, including coastal areas of the Southeast and Gulf States and Puerto Rico.
- Southeast Mountain Province, including the southern Appalachian Mountains, the Ozarks, and the Ohio River Basin.
- Great Plains/Prairie Province.
- Rocky Mountain Province, including the northern Rockies, the Black Hills, and the Wasatch Range.
- North Pacific Province, including the Olympic Range, the Cascades Range, and Southeast and South Central Alaska.
- Southwest Province, including the southern Rockies, the Mohave and Sonoran deserts, and Southern California.

There may be anomalies within these broad provinces. In these cases, designers can consult the guidelines from an adjacent province to find characteristics that match a particular forest or grassland setting. Such variations must be documented in a Design Narrative.

Chapter 4.1

The Northeast Province

"The relationship of man-made structures to the natural world offers the richest and most valuable experience that architecture can show."

—Vincent Scully


Northeast

OVERVIEW: CHARACTER OF THE NORTHEAST PROVINCE BUILT AND NATURAL ENVIRONMENTS

The Northeast Province of the Forest Service encompasses national forests and facilities in the New England and Middle Atlantic States.

Northeast design is traditionally sensitive to climate. Early builders were preoccupied with keeping warm and dry. Because they lacked mechanical systems to help them, they developed architectural adaptations that still work well today. For example, to conserve heat, they placed chimneys within the building rather than outside the wall. They connected farm buildings to their homes—not just for the people, but for the animals, who were more productive when kept warm and sheltered.

Influenced by the traditions of Mother England, New Englanders strongly preferred wood as a building material. Writings of the period are full of pointed comments about damp, cold masonry buildings.

The buildings of New England are traditionally sensitive to their sites and landscapes. The rambling fieldstone walls of New England farms literally grew from the land as farmers moved them out of fields and stacked them into boundaries. New England barns fit well with the contours of the rolling topography.

Farther south, in the Middle Atlantic, German settlers enjoyed brick and stone masonry and celebrated its use with elaborate design. Many rural buildings of Pennsylvania seem to grow directly from the landscape of fractured rocks shaped by glacial freeze-thaw cycles. Scandinavian settlers introduced the log cabin in Delaware. Scottish-Irish settlers spread this most-American of building forms throughout mountains and valleys.

Throughout the province, farm buildings were clustered close to roads to ease transportation of crops and products to market. This is only one example of a traditional idea that makes sense today. For example, contemporary buildings placed close to roads simplify snow clearance and mail delivery. This also is a sustainable strategy as it concentrates buildings near existing services, transportation, utilities, and infrastructure.

INFLUENCES ON ARCHITECTURAL CHARACTER

Landscape and Ecological

"The Appalachians are immensely old—older than the oceans and continents (at least in their present configurations), far, far older than other mountain chains, older indeed than almost all the other landscape features on earth."

—Bill Bryson, *A Walk in the Woods*

The Northeast landscape can be divided into three distinct ecological zones.

The northern part of the Northeast Province includes the Allegheny Mountains and Maine and drifts into the Lakes Province. This is a glacially carved landscape with long, cold winters (average winter temperatures below freezing and only 100 to 140 frost-free days annually). Landforms are level to rolling. Vegetation ranges from broadleaf deciduous forests to conifers (which grow well in local acid soils) to mixed forests. The summer landscape is lushly green. Fall brings brilliant colors. The long winters are white and brown. Little rock is exposed except along waterways.

The White and Green mountains of the northern Appalachians, is a craggy landscape that features glacially carved granite mountains, many rock outcrops, and abundant snowfall. The forested setting changes with elevation from a mixture of hardwoods and conifers to spruce-fir.

To the south are the Appalachian Highlands and a topographically diverse landscape with plateaus, coastal plains, and the Ozark Mountains. These are smoother, more rounded mountains with little exposed rock. The average winter temperature is above freezing. The forest is mostly deciduous with a wider variety of trees in the wetter east and a dominant mixture of oak-hickory in the drier west.

Cultural

"If we don't know where we've come from, how will we know where we are?"

—Pauline Chase-Harrell, architectural historian

During the Colonial period, the English dominated settlement in New England, the Dutch in New York and New Jersey, the Germans in Pennsylvania, the Scandinavians in Delaware, and the French along the lake and river system of what was then the Western frontier. The patterns of westward migration of these groups established paths of architectural influence throughout the region.

The English established the prevailing cultural patterns, including a preference for wood architecture, especially for timber framing and clapboard, shingle, or vertical board siding. Steeply pitched roofs are another common and prominent design feature. Early building types included the salt box (a house made by attaching a shed roof to a gable roof); the timber-framed "English barn"; and, later, the "connected farmstead" of New England in the latter part of the 19th century.

In the Middle Atlantic, the Dutch, German, and Scandinavian builders made their own contributions. These included the double-pitched Dutch gambrel roof (originally common only to barns in New York's Genesee Valley but now everywhere) and German masonry construction. The French influence worked its way up the Mississippi and is visible in the enduring traditions of sweeping roof forms and generous porches.

Swedes and Finns introduced log homes in Delaware. Other ethnic groups adapted log structures as they moved into the southern and middle frontier. Originally they used rough logs. Later cabins used hewn logs and permanent chinking. Except for the Iroquois in New York State, Native American structures have been obliterated, but archaeology has allowed for renewed interest in these forms.

The 19th century brought cultural and technological changes that blurred distinctions among styles in favor of a national style, or rather a series of national styles. The first of these was Greek Revival, launched in the 1830's. A decade later, a preference for Gothic Revival and other "Victorian" styles was greatly aided by popular pattern books for houses. The invention of the balloon-frame house in Chicago in 1833 introduced mass-production techniques to the

construction of houses. Railroads fostered the shipment of prefabricated building parts (such as ornamental cast-iron building façades) to frontier towns across the Nation.

Later in the century, several movements promoted artistry as an antidote to standardization. The Arts and Crafts movement emphasized handcrafted buildings and custom-designed details and decorations. A regional variation, the Adirondack style, created elaborate "rustic" log-and-stone vacation homes for the wealthy.

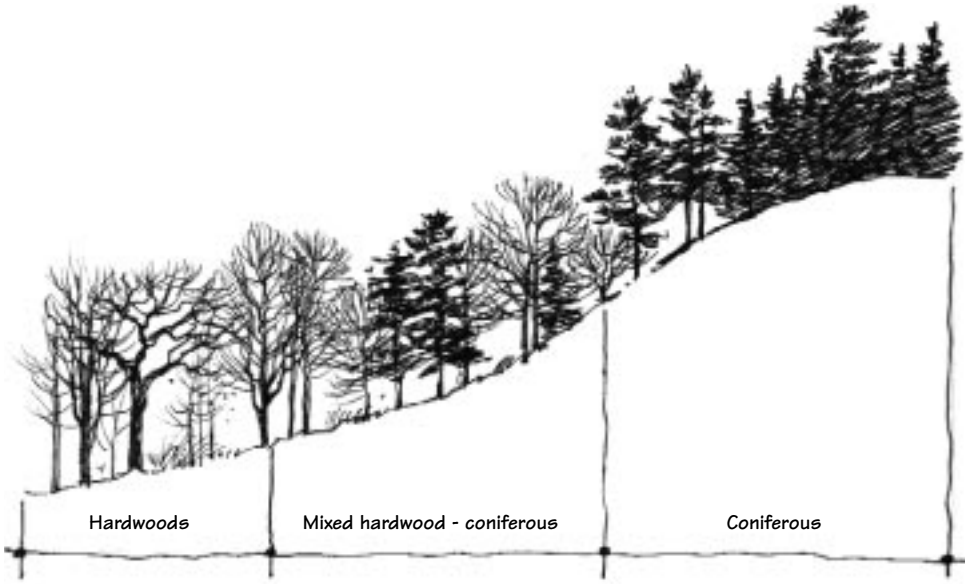
Rustic design was later adapted for hotels and public recreational structures, especially in the 1930's during the height of the Civilian Conservation Corps (CCC). The movement left a powerful imprint on the design of Forest Service structures in the 20th century.

Modernism continued the trend of standardization started during the Industrial Revolution. Increasingly, buildings were designed to look the same and be built from the same materials no matter where they were sited. But in the New England States, movements toward Colonial Revival and other historical interpretations provided a powerful counterbalance, as did the growth of the historic preservation movement. Reverence for history remains an important factor.

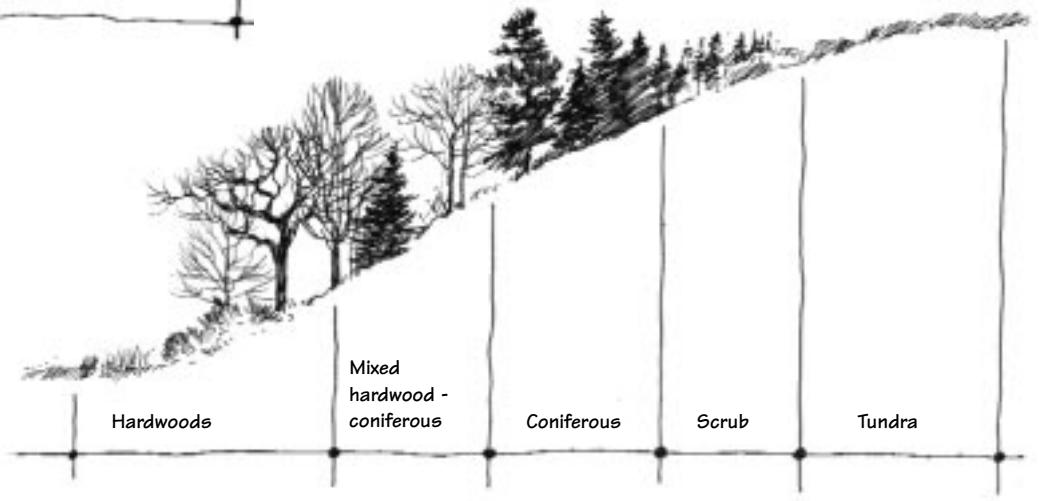
SUMMARY OF INFLUENCES AND RESPONSES THAT SHAPE THE CHARACTER OF THE BUILT ENVIRONMENT

Ecological Influences

- Topography dominated by mountains and rolling hills with few open plains or fields.
- Glacier-sculpted granite mountains that feature dramatic rock outcrops.
- Mountains that run north-south with east-west exposures.
- More snowfall and wetter climate than the Lakes Province.
- Cold, wet, and overcast winters.
- Dramatic freeze-thaw cycles.
- Prevailing northeasterly winds.
- Long vistas.
- Lush, dense vegetation.
- Vegetation that changes with elevation from low areas of hardwood forest to mixed conifers with spruces and firs in upper elevations.
- Tree line as low as 1,800 feet in northern areas.



Hills country



Mountains

Cultural Influences

- This is settled country, not wilderness.
- Early settlers were English, Dutch, French, German, and Scandinavian, but the English influence is primary.
- Preservation of landscapes and traditional townscape character is highly valued.
- Tourism is an important industry.
- Rural culture is focused on villages, hamlets, and small farms.
- Traditional farms feature connected buildings.
- Dairy farms are typical in Vermont.
- Wood is preferred over brick as a building material.
- Early houses are timber frame and log.
- The area is the most densely populated portion of the United States.
- Users of a national forest expect cultural features as part of their experience.
- Traditional building forms include the Cape Cod cottage, the masonry German farmhouse, and brick or log mill buildings.
- Rustic design originated here in the Adirondacks in vacation homes for the wealthy.

Mill structure

English influence

Rural farmstead

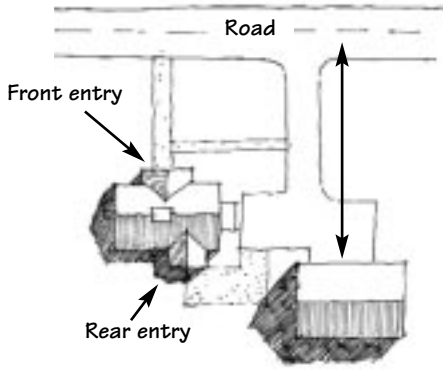
Scandinavian

Saltbox

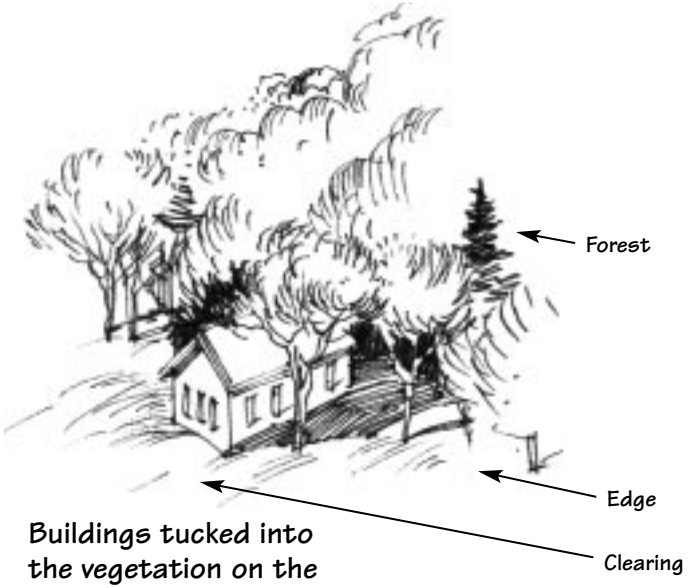
ARCHITECTURAL GUIDELINES FOR THE NORTHEAST PROVINCE

Siting

- Select from limited building sites because of topography and regulations to protect the landscape character.
- Orient and cluster rural buildings toward and near roadways rather than lined up along a road. When practical, cluster buildings around a common site, as seen in a village green or town center.
- Tuck buildings into the edges of clearings and at changes in grade.



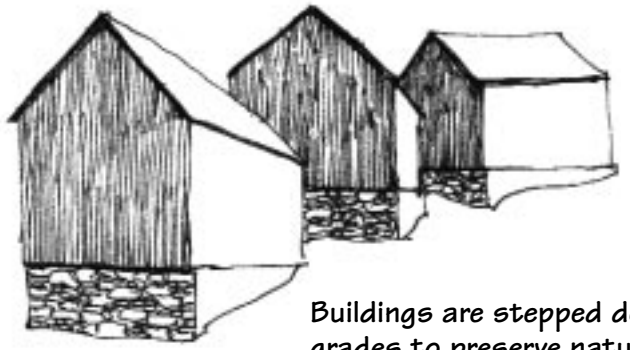
Structures oriented toward roads



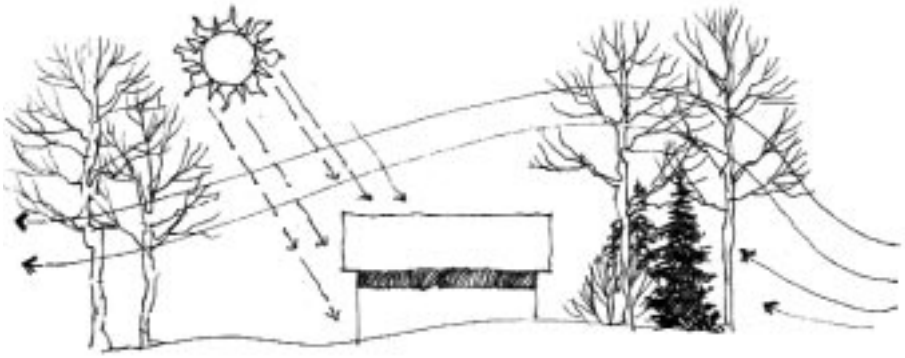
Buildings tucked into the vegetation on the edge of clearings

Buildings clustered around a common site

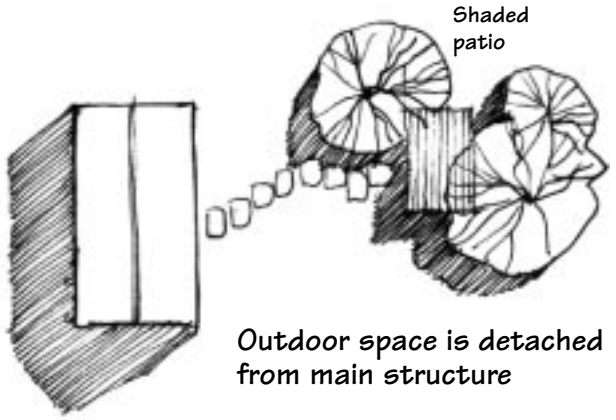
- Design buildings to step down grades rather than leveling site.
- Design roads to be site sensitive. They should follow contours of the land like a river weaving through landscape.
- Landscape the site for snow storage.
- Berm the back wall of buildings into slopes.
- Visually screen structures by planting banks of native vegetation.
- Detach outdoor space from the building with gardens or plazas (no attached decks).



Buildings are stepped down grades to preserve natural landforms



Clearing of vegetation is provided in Allegheny region



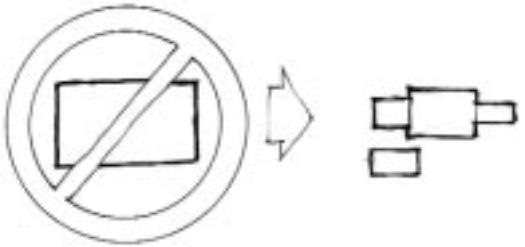
Outdoor space is detached from main structure

Massing and Scale

"Simplify, simplify." —Henry David Thoreau

- Break functions into smaller building wings as opposed to using one big building.
- Make buildings appear to have grown organically through additions over time.
- Design rectangular buildings, as in barns or saltbox houses.
- Use traditional building heights from one and a half to two stories that remain well suited for tight, restricted sites.
- Use narrow, horizontal siding and small, punched window openings to reduce the apparent mass of a building.
- Do not design rambling, irregular Victorian or Queen Anne-style building volumes.
- Include small porches.
- Make the chimneys visible on the gable side.
- Match larger buildings in scale to a larger backdrop.

Simple forms, added to each other



Mass should be broken into several smaller forms

Complicated irregular forms

The building's mass should be related to its surroundings:

Short vegetation and moderate hills

Tall vegetation and steeper hills

Buildings are generally 1 1/2 - 2 stories

Base

Bases are both functional and symbolic. They suggest permanence and solidity when expressed and celebrated using solid, textured materials. A weathering base creates a platform that protects the rest of the building from frost, mud, and snow.

- Sink the base below the frost line.
- Use traditional, random-pattern stone bases.
- Select stones that match local stones.
- Lay stone in patterns that mimic local geology.
- Create textures with synthetic materials by coloring concrete or using split-face stone.

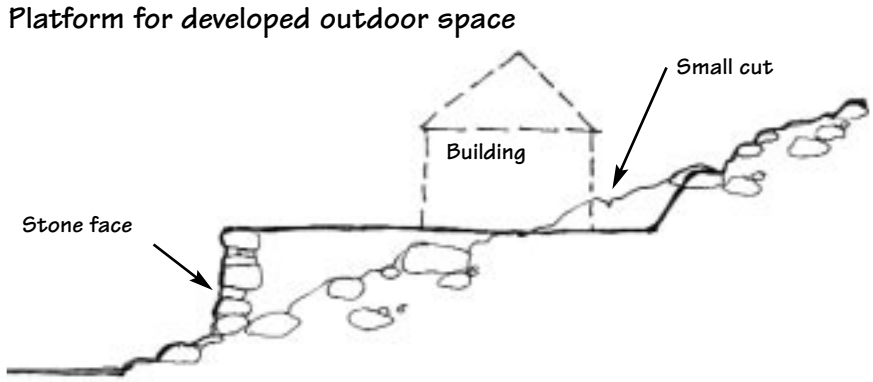
Walls

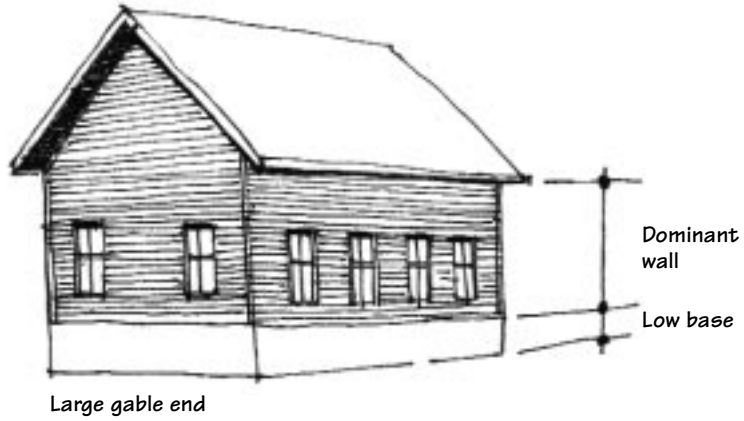
Walls are the primary elements of architecture in this province. Wall materials are usually wood in horizontal patterns. Suitable materials include:

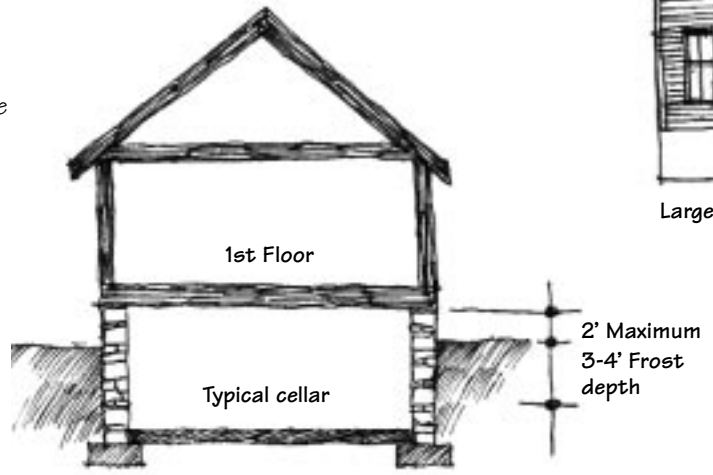
- Clapboards.
- Weathered shingles painted white or red.
- Vertical corner-boards painted in contrasting colors.

Natural stone:
random pattern

Cut stone:
Random ashlar pattern





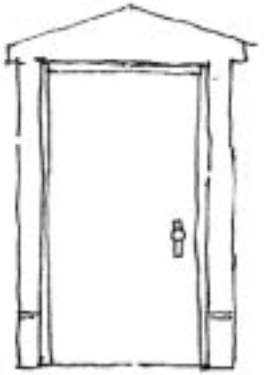


Windows and Openings

Windows are typically small, double-hung, and divided (traditionally up to 12 panes over 12 panes).

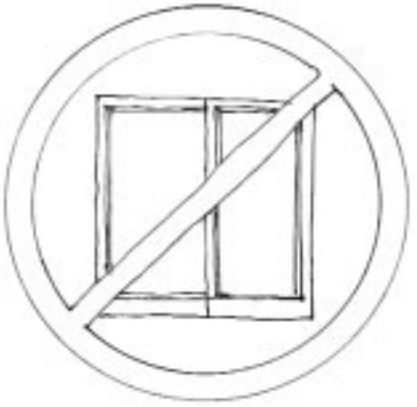
- Arrange windows for symmetry.
- Avoid strip windows in horizontal bands.
- Use lintels, sills, and pediments for ornamental purposes.
- Use single doors instead of double doors.
- Use porches for public entries to buildings.
- Use simple entries for nonpublic buildings.
- Include air locks or vestibules.

Appropriate windows and openings:



Single door

Inappropriate windows and openings:



Double doors

Window characteristics:

- Ornamental lintel
- Double-hung window
- Expressed sill

Multiple small double-hung windows

Horizontal strips of windows

Roofs

- Design roof pitch to ranges from 6:12 to 12:12
- Use gable shape instead of a flat or shed style (unless shed extends from main building).
- Include slate, shingle, simulated shingle, or metal material.
- Reduce ice damage with a minimal (if any) overhang.
- Include gutters to keep walls dry.
- Use thin eaves and bargeboards.
- Integrate cupola for venting.
- Avoid exposed rafter tails for maintenance reasons.
- Make gables and sheds simple and uncluttered.
- Include snow and ice guards on metal roofs where "snow dump" is an issue.

Appropriate roof elements:

Simple gable roof

Gutters and narrow overhangs keep walls dry

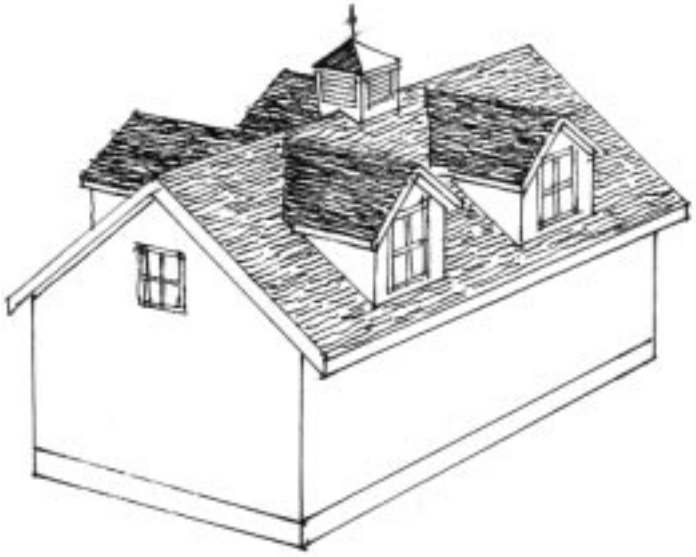
Inappropriate roof elements:

Broad overhangs may cause ice damming

Exposed rafter tails increase maintenance

Flat roofs

Shed roofs



Typical roof elements:

- Gable roof
- Cupola for roof venting
- Simple gable dormers
- Minimal overhang
- Narrow fascia board (no exposed rafters)

Structure

Buildings of this province do not typically include heavily expressed or exposed structural members. Rustic, CCC-inspired buildings are suitable for picnic and cabin structures in remote areas, but they are out of character in settings classified as developed on the ROS.

- Avoid exposed structure on exterior;
- Include some exposed timber framing on the interior.

Heavy, expressive structures

Simple porch entries:

Gable porch

Shed porch

Materials

- Use durable, natural, local materials such as stone, wood, and clapboard. Alternatives include textured, colored concrete block.
- Use metal or vinyl siding for low-maintenance utilitarian buildings.

Avoid:

- Stucco or synthetic stucco.
- Asphalt-shingle siding.
- Glass "curtain" wall.
- Metal buildings in public areas.
- High-tech looking, sleek, or smooth materials.
- Mediterranean tile.

Suitable site materials include:

- Crushed granite.
- Granite curbs.
- Stamped concrete for walkways.
- Concrete pavers (tumbled block to add texture and look rustic).
- Waste quarry stone.

Inappropriate roof materials:

Tile roofing

Appropriate roof materials:

Wood, slate, fiber-cement, or composition shingles

Seamed metal

Color

Take cues from the setting, emphasizing blues, grays, and browns. Follow the ROS guidelines:

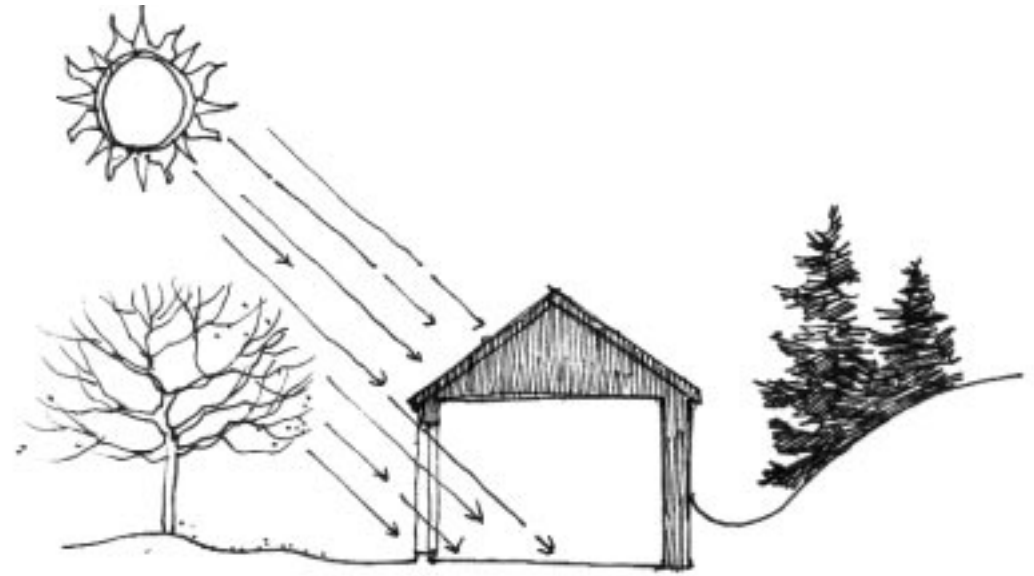
- Naturally weathering materials and earth tones with no accents in primitive or semiprimitive settings.
- Naturally weathering materials and earth tones with limited accents drawn from nature in roaded natural settings.
- White, red, gray, and naturally weathering materials in rural settings.
- Warm earth tones with a wide range of accents in rural settings.

Other Guidelines:

- Contrast colors in "detail areas" such as windows and doors. For example, use dark trim with a light wall and light trim with a dark wall.
- Paint porch ceilings using historical colors, such as robin's egg or sky blue.

SUSTAINABILITY

- Recycle materials and components from other structures.
- Reuse existing and historic structures.
- See the "Common Principles" section in the introduction to this chapter for more recommendations on sustainability.



Simple, adaptable forms constructed as necessary

Additions planned for the future

SYNTHESIS

In the Northeast, we do not need to reproduce the saltbox houses found on Cape Cod or the barns of the Genesee Valley to create successful designs. But we can learn from these earlier models of design and construction. For example, the saltbox house employed forms and materials that proved durable and comfortable in New England's coastal climate.

The climate, harsh at times, presents challenges for building, maintenance, and sustainability. For example, cloudy winters offer low potential for implementing active or passive solar heat.

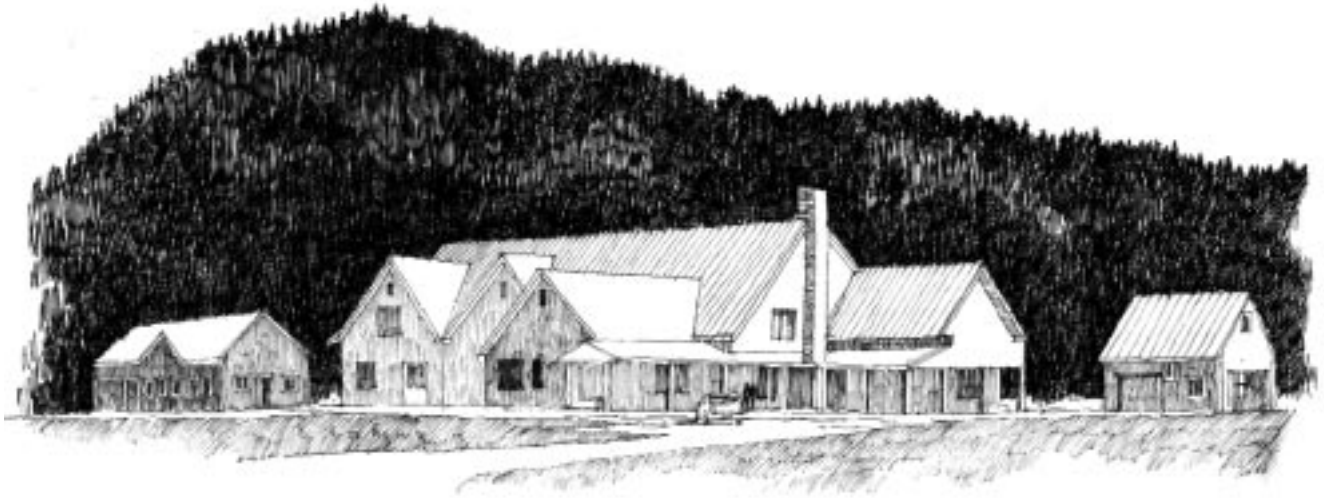
Yet the Northeast Province can be a forgiving place in which to build. The dense forest and lush vegetation can screen many structures so they seem to disappear into the landscape. The preponderance of native trees and rocks provides ready-made building materials or at least matches for suitable materials.

Clustered compound on a slope characteristics:

- **Simple forms, added to each other**
- **Buildings step down grades**
- **Multiple double-hung windows**
- **Clapboard siding**
- **Simple roof with gable dormers**
- **Shed porch**
- **Large gable ends**

Visitor facility characteristics:

- Saltbox form
- Simple forms repeated
- Single, punched windows with divided lights



Administration/ maintenance compound characteristics:

- Simple forms repeated
- Clustering of smaller masses

Overlook characteristics:

- Simple forms
- Minimal base

Restroom characteristics:

- Steep roof with minimal overhangs
- Simple gable end
- Entry porch
- Small window with divided lites
- Light structure
- Minimal base

Maintenance shop characteristics:

- Gable roofs with attached shed forms
- Clustering of forms
- Mass broken down

Chapter 4.2

The Lakes Province

"Organic building is natural building: construction proceeding harmoniously from the nature of a planned or organized inside outward to a consistent outside...."

—Frank Lloyd Wright


Lakes

OVERVIEW: CHARACTER OF THE LAKES PROVINCE BUILT AND NATURAL ENVIRONMENTS

In the last 400 years, the landscape of the Lakes Province has been substantially altered by development. European settlers cleared swaths of original forests for farms and timber. The tallgrass prairie was completely cleared for farming and grazing.

The landscape of this vast province is generally a cultivated, altered, and domesticated landscape rather than a wild one. Even in national forests, few spots are more than a few miles from a road.

Yet nature is regenerating strongly here. The northern tier of this province did not readily yield to the plow. Early settlers found the growing season too short to raise crops. Much of this landscape has reverted to pasture or forest and efforts are underway to restore the prairies.

In this densely settled province, urban populations rely on national forest lands, which comprise the largest areas of open space and outdoor recreation opportunities. People may expect high levels of development in these recreation facilities.

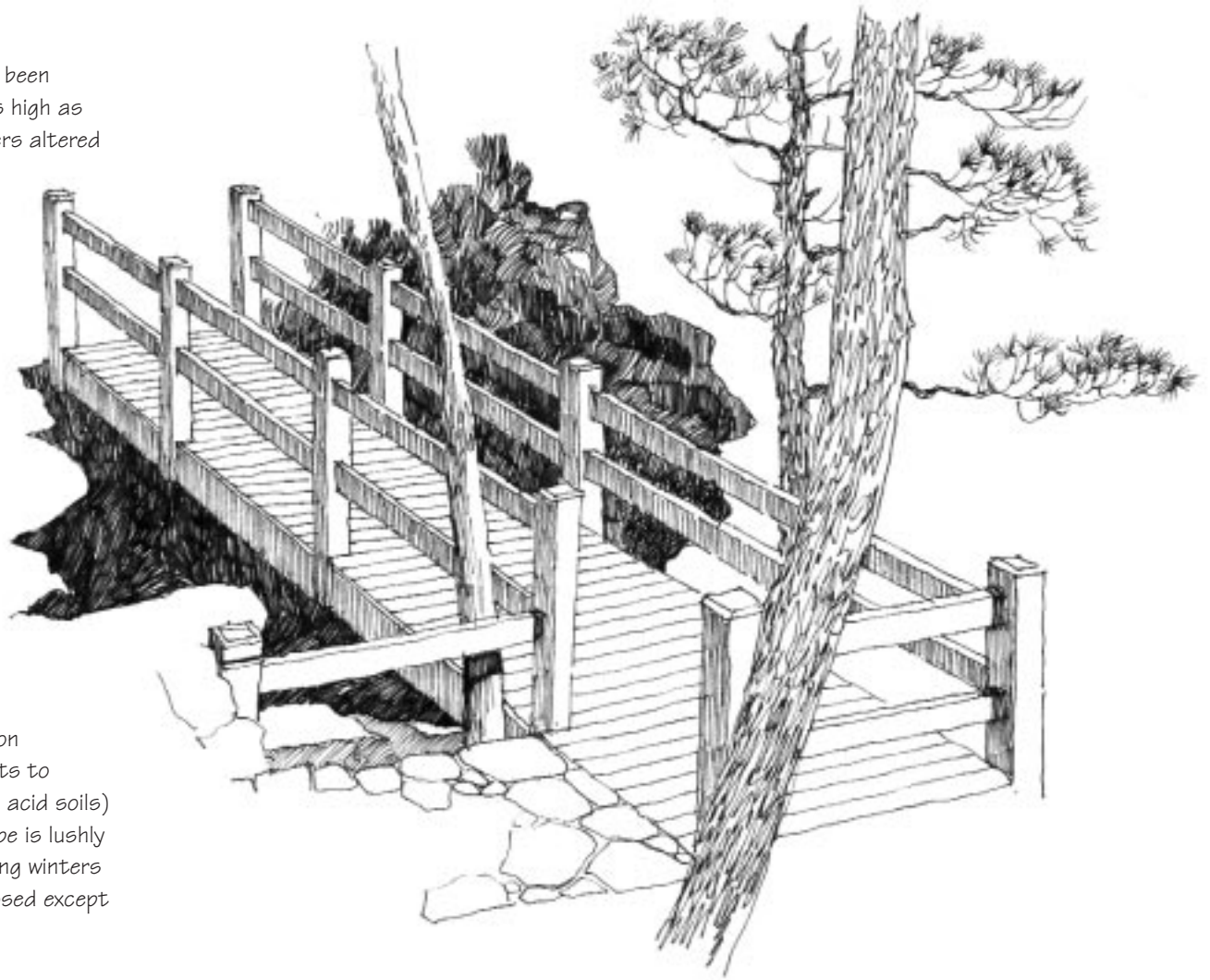
INFLUENCES ON ARCHITECTURAL CHARACTER

Landscape and Ecological

Long ago, the Lakes Province may have been dominated by mountains with peaks as high as the Rockies; however, millennia of glaciers altered this landscape. Each advance and retreat of the glaciers carved the land like a sculpture. When the Wisconsin glacier retreated about 9,000 years ago, it left behind rolling lands full of glacial till and dotted with lakes.

The Lakes landscape can be divided into two distinct ecological zones:

The northern and eastern parts of the Lakes Province drift into the Allegheny Mountains and Maine of the Northeast Province. This is a glacially carved landscape with long, cold winters that has average winter temperatures below freezing and only 100 to 140 frost-free days annually. Landforms are level to rolling. Vegetation ranges from broadleaf deciduous forests to conifers (which grow well in the region's acid soils) to mixed forests. The summer landscape is lushly green. Fall brings brilliant colors. The long winters are white and brown. Little rock is exposed except along waterways.



In the western and southern parts of the Lakes Province, the Great Plains begin rolling west to the Rockies. Within these open grasslands there is not enough precipitation to grow many trees and there is virtually no exposed rock. The climate is harsh, with hot summers and long, cold winters.

Cultural

"Forest Service architecture had an intimate relationship with the landscape and was sympathetic to the natural environment.…The Forest Service's philosophy of nonintrusiveness called for the use of native and natural materials."

—Kathryn Bishop Eckert, *Buildings of Michigan*

Native peoples arrived more than 12,000 years ago and found a landscape dominated by glaciers. Before the arrival of white settlers, native peoples built dome-shaped wigwams by stretching bark over curved poles. Other building types included communal long houses (built by the Hurons), sweat lodges, and earthworks (which may have been either forts or ceremonial places). Only remnants of the building heritage of Native Americans remain in this province.

Waterborne commerce brought the first influences of European design into the province. French and British trappers and traders, who used the province's rivers and lakes like highways, built fortified compounds for trading posts, military commands, and religious missions. These compounds were typically square complexes of log construction protected by tall log fences or stone ramparts. In 1817, the American Fur Company built an agency house on Mackinac Island in the elegant Federal style, foreshadowing the accelerated use of East Coast architecture in coming decades.

The opening of the Erie Canal in 1825 introduced European settlement in the form of frontier farms and villages. The new pioneers initially built log cabins but soon replaced them with fashionable East Coast structures in such styles as the Greek Revival and the Gothic Revival. They also employed such New York and New England building methods as coursed cobblestone and wood.

In 1833, the invention of the balloon-frame house in Chicago introduced mass-production techniques to the construction of houses. Railroads fostered the shipment of prefabricated building parts (such as elaborately ornamental cast-iron building façades) to frontier towns across the Nation.

The log cabin was another major influence that originated with early Scandinavian settlers in Delaware. A staple of the Appalachian frontier, the log cabin was reintroduced by Scandinavian settlers in the upper Great Lakes in the 19th century. Early versions used logs in their natural state as they were cleared from the land. Later versions were more sophisticated, with hewn logs and more permanent chinking.

The abundance of wood (especially in the huge stands of pine forests) and lakes also influenced design. Ornate wooden houses filled the towns where lumber was plentiful.

Later in the century, the Arts and Crafts movement emphasized handcrafted buildings and custom-designed details and decorations as an antidote to standardized design. A regional variation, the Adirondack style, created elaborately crafted "rustic" log-and-stone vacation homes for the wealthy. In the Lakes Province, rustic design for hotels, resorts, and getaway cabins peaked between 1890 and 1910. Rustic design for public recreational structures peaked during the 1930's height of the CCC. The Park Lodge in St. Croix State Park, Pine County, Minnesota, is an example of the rustic style in the Lakes Province.

SUMMARY OF INFLUENCES AND RESPONSES THAT SHAPE THE CHARACTER OF THE BUILT ENVIRONMENT

Ecological Influences

- The area has a cold climate with a short growing season.
- Summer is lush and green accented by the whiteness of birch tree trunks.
- The landscape is relatively flat, with many lakes and bogs.
- The groundwater table is high.
- Coniferous forests prevail over deciduous forests.
- In winter, frost depth ranges from 4 feet to 8 feet.
- Snowfall can reach 100 inches.
- Snow stays on the ground all winter.
- Prevailing winds are from the northwest.
- The landscape is intimate, with most views closed off by trees.
- The summer climate is muggy and buggy.
- Lakes and wetlands provide the main openings for views.
- Riparian zones protect the integrity of lakeshores and water quality.

Cultural Influences

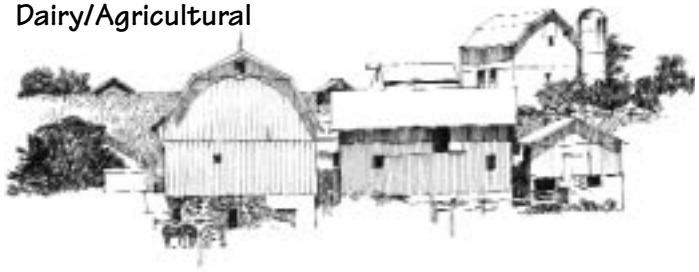
- A strong tradition of well-constructed and well-crafted structures endures.
- Early white settlers were Scandinavian, French, and northern European.
- Early structures were log homes.
- Settlements were traditionally close to water for transportation.
- Culture was shaped by tens of thousands of lakes.
- Lakefront sites are desirable for structures but are highly regulated and require setbacks.
- Hunting, cross-country skiing, and fishing (including ice fishing) are popular activities in national forests.
- The culture values a manicured landscape, which can be ecologically sterile.
- Ten million people live within driving distance of national forest facilities.

Lakefront structures

Scandinavian log influence

Northern European influence

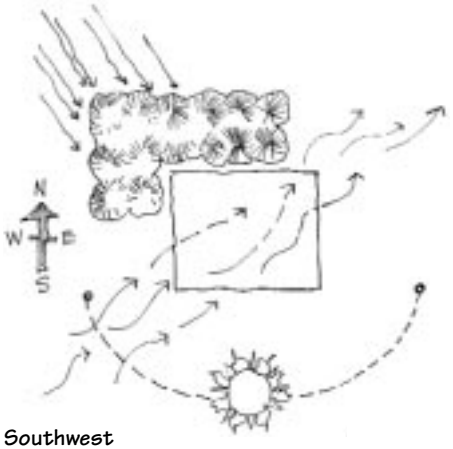
Dairy/Agricultural



ARCHITECTURAL GUIDELINES FOR THE LAKES PROVINCE

Siting

- Place recreation structures near lakes for views and access to water.
- Thin, but do not clear, trees to provide views.
- Respect the shoreline by observing setbacks and preserving, enhancing, and restoring natural shorelines.
- Maintain a natural landscape buffer between lakeside structures and the shoreline.
- Consider what the shoreline might look like when viewed from the lake.
- Maintain a natural-looking shoreline rather than a resort-like, "poolside" setting that is paved and overdeveloped.
- Build on rises of land overlooking the lakes when possible.
- Locate building to take advantage of daylighting.
- Site buildings for protection against northwest winter winds and to catch southwest summer breezes.
- Plan for snow storage in parking areas and roads.

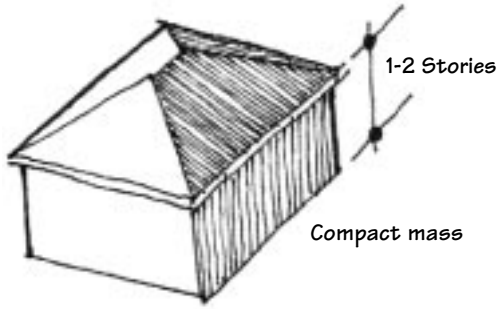


Natural shoreline appearance

Trees thinned to protect view, but not completely cleared from the site

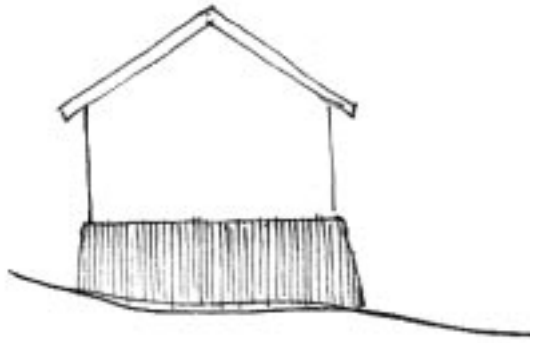
Massing and Scale

- Design buildings that feature compact footprints to retain and conserve heat; with compact footprints, buildings can be up to two stories tall.
- In frequently visited areas such as recreation facilities, make the base of the structure strong to express solidity and mass and to protect the building from weather and animal damage.
- Make the base prominent and visible by raising it and creating color and texture that matches the surrounding landscape.
- Step bases to adjust to slope.
- Avoid basements—they are expensive to build and maintain because of high water tables and they create universal access problems.
- Make the bases of portal signs substantial so that they appear to be anchored to the earth.



Basements are expensive to build and maintain

Prominent, raised base anchors sign to land

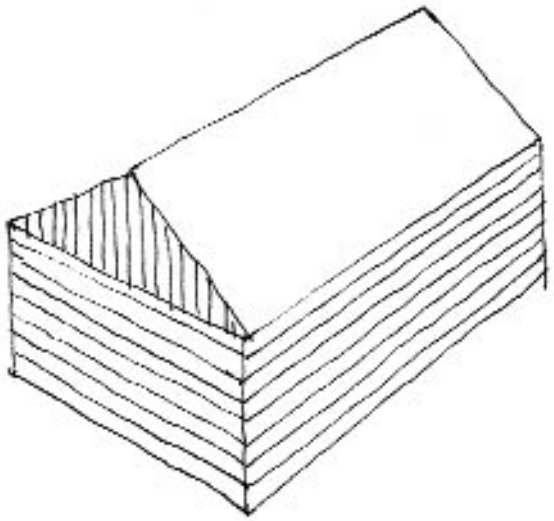


Base accommodates site

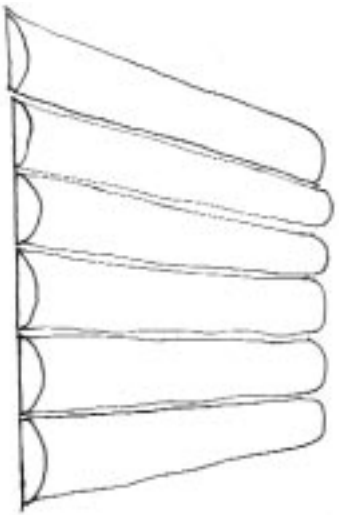
Walls

- Use horizontal materials and patterns to emphasize low, horizontal structures.
- Use vertical materials and patterns as accents in gables.
- Use timber structures, which usually have rounded, smooth logs as opposed to raw or split logs.
- Use wide, large-scale lap siding.
- Avoid synthetic products such as T-111 or fiberboard.

Appropriate wall elements:



Vertical accent in gable
Horizontal siding



Rounded contours

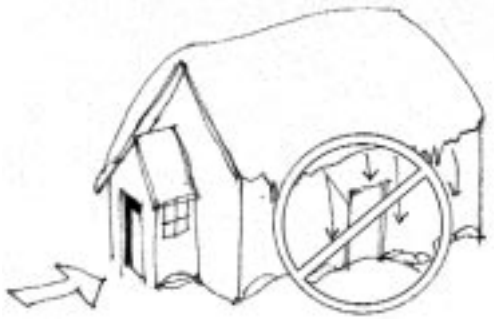
Inappropriate wall elements:

Overly refined products

Openings

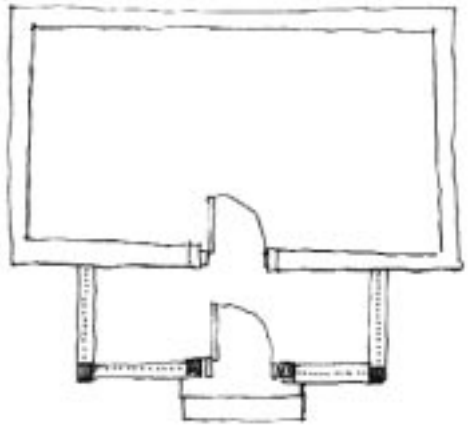
- Use porches for visitor and administrative buildings; these work best when placed on the gable end of a building or extended as a shed addition.
- Use windows that are more vertical than horizontal.
- Use double-hung windows.
- Adapt openings to seasons with summer screens and winter boards or shutters.
- Avoid window openings in gables.
- Avoid large areas of horizontal banded windows.
- Add a vestibule to a building rather than placing a vestibule within the footprint.
- Screen vestibules for summer ventilation.

Vertical double-hung window



Entries at gable ends avoid snow and ice

Horizontal bands of windows



Protruding vestibule (plan view)

Porch as shed or eave extension or as extrusion of gable end

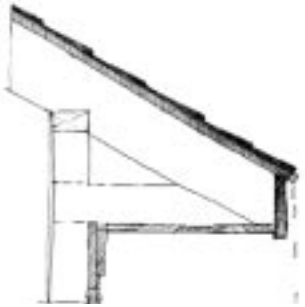
Roofs

- Design steep roof pitches of 7:12 or more.
- Use hip roofs, which are common and can diminish mass and scale of large buildings.
- Incorporate broad overhangs on eaves to protect walls from driving rain and snow.
- Make rafter tails shorter than eaves to protect exposed wood.
- Avoid gutters and plan for drip lines.
- Do not mix roofing materials.
- Do not use flat roofs.

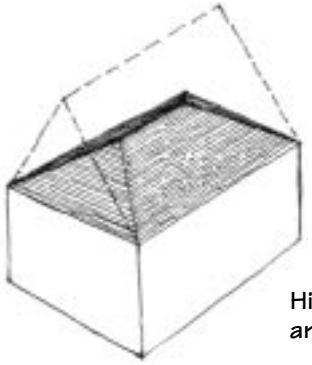
Appropriate roof elements:

Roofing extended to accommodate dripline

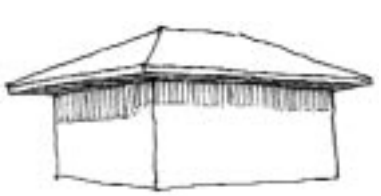
Simple gable roofs

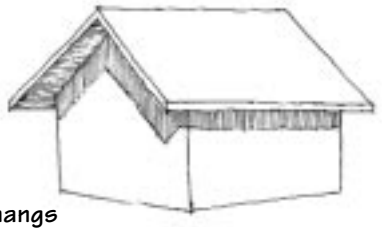


Roofing extended beyond rafter tail, protecting ends/ underside



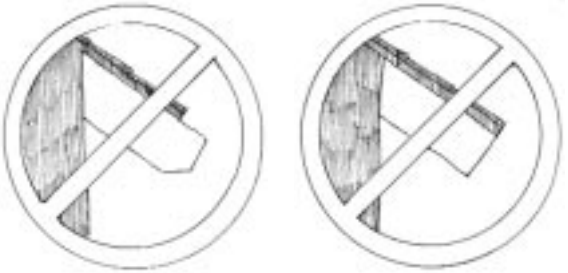
Hipped roof to diminish mass and height of building





Broad overhangs

Inappropriate roof elements:



Unprotected rafter tails

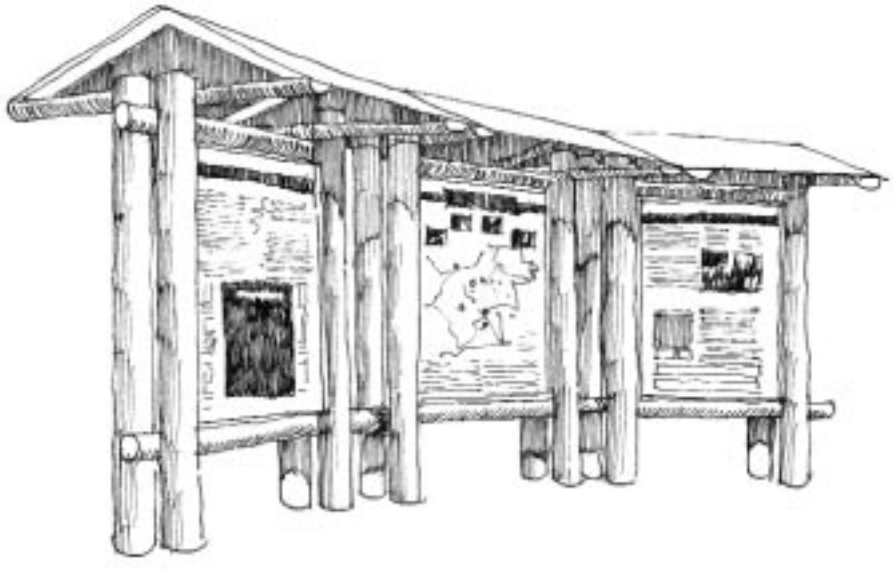
Flat roofs

Gutters

Mixture of roofing materials

Structure

- Expose and celebrate structural elements such as brackets, trusses, and vaulted ceilings in public areas of buildings.
- Make vertical structure oversized to convey a sense of permanence and to appear massive enough to support the snow loads.
- Do not expose mechanical or heating and air-conditioning systems. This would create a "high-tech" image unsuitable for the Forest Service.



Oversized structures

Oversized vertical structural elements

Materials

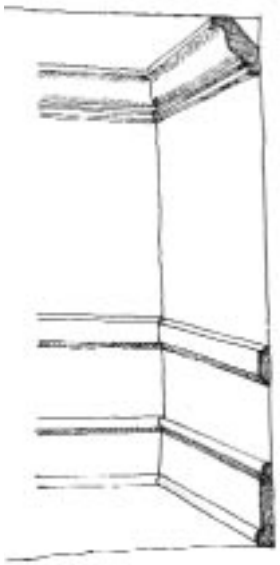
"Where so many of our basic building materials are wholly new, we must search again for a natural way to build." —Frank Lloyd Wright

- Use rock, stone, and other natural materials that harmonize with the surrounding landscape.
- Use manufactured stone and siding products if selected and installed with care.
- Meet the province's expectations for craftsmanship, good-quality materials, and a high level of detailing.
- Create a hierarchy of materials for a balanced composition rather than mixing and matching materials.
- Smooth out the interior log, wood interior trim, and other surfaces so that they do not gather dirt.
- Avoid obviously synthetic materials, such as vinyl siding.
- Avoid refined, dimensional pavers for pathways.

Color

- Choose colors that reflect local geology, vegetation, and culture, taking cues from earth tones, including rock, leaves, birch bark, and so forth. Darker colors predominate in the color scheme.
- Make color contrasts subtle.
- Use muted colors rather than primary colors for accents.
- Use materials that weather naturally to attractive colors and tones.

Use refined interior trim to express craftsmanship:



- **Crown molding**
- **Smooth wall surfaces**
- **Chair rail**
- **Base**

Inappropriate elements:

Overly regular materials

Appropriate elements:

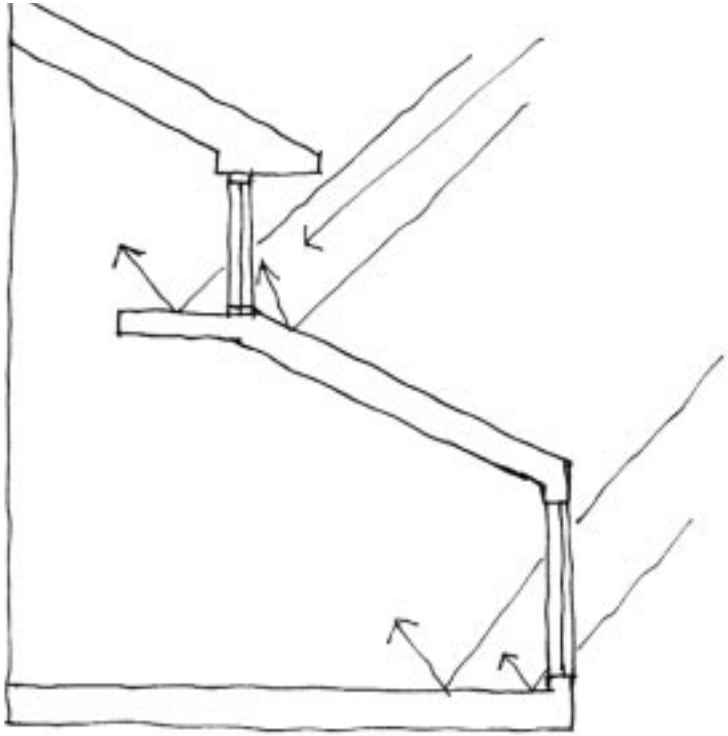
Natural & irregular materials

Color characteristics:

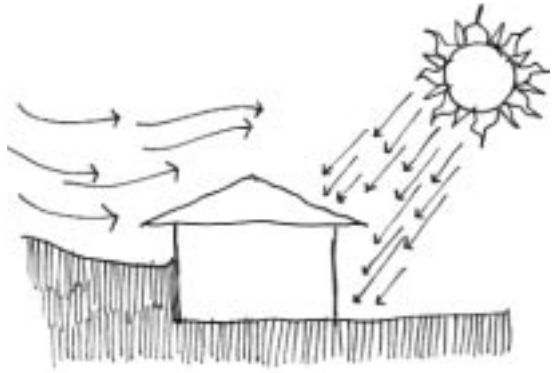
- **Medium-brown pine bark**
- **Light gray bark**
- **Low deciduous shrubs**
- **Gray granite rocks**

SUSTAINABILITY

- Adapt existing buildings for new uses.
- "Deconstruct" and recycle building parts.
- Avoid skylights because of snow maintenance issues.
- Use earth-berming and structure to protect buildings from northwest winds.
- See the "Common Principles" section in the introduction to this chapter for more recommendations on sustainability.



Daylighting should be maximized by adding high windows for additional daylighting



Earth berms protect buildings from northwest winds

Natural landscaping on prevailing wind side of building

SYNTHESIS

Successful design in the Lakes Province will not merely copy the buildings and structures of the past, it will learn from them while paying equal attention to modern needs, materials, and sustainable technologies. Contemporary variations on rustic design have a place in this province. However, it will be a more refined version of rustic with smaller dimension materials; for example, using hewn rather than unfinished logs. People in this province generally expect high-quality building craftsmanship, as well as more developed and comfortable visitor facilities.

Restroom characteristics:

- Horizontal log pattern
- Materials finished

Visitor facility characteristics:

- Broad overhangs to protect wall
- Oversized, exposed structure
- Rounded logs

Administrative and visitor facility characteristics:

- Hipped roofs to diminish mass
- Broad overhangs

Administrative and visitor facility characteristics:

- Oversized log structure
- Broad overhangs
- Rounded Logs

Particularly important are those elements that make buildings welcoming, durable, warm, and dry. Forest Service structures must provide access to lakes and other natural features without detracting from the setting. Initially, frontier people and settlers were attracted to the province's waterways and lakefronts for transportation and for their potential to produce lumber, host industry, and ship goods. Today's populations look to the water for recreation. When possible, orient buildings and structures in this province toward the water and elevate them for views and breezes.

Interpretive facility characteristics:
- Extended porch
- Vertical chimney accent
- Add high windows for additional daylighting

Bridge characteristics:
- Finished materials
- Fine to moderate scale

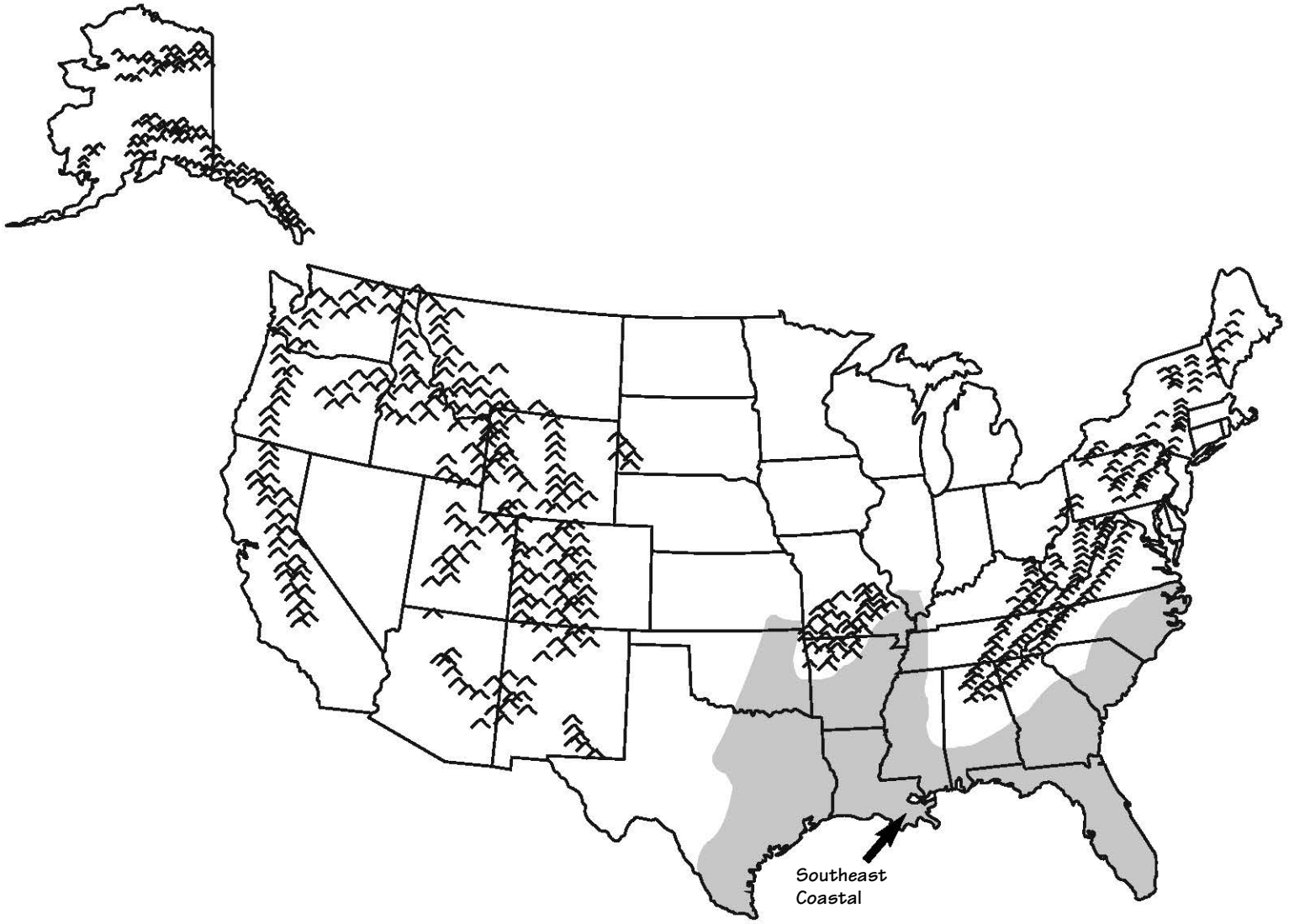
Maintenance/Storage facility characteristics:
- Hipped roofs
- Daylighting

Chapter 4.3

The Southeast Coastal Province

"Let it not be for present delight, nor for present use alone;
let it be such work as our descendants will thank us for."

—Frederick Law Olmsted


Southeast
Coastal

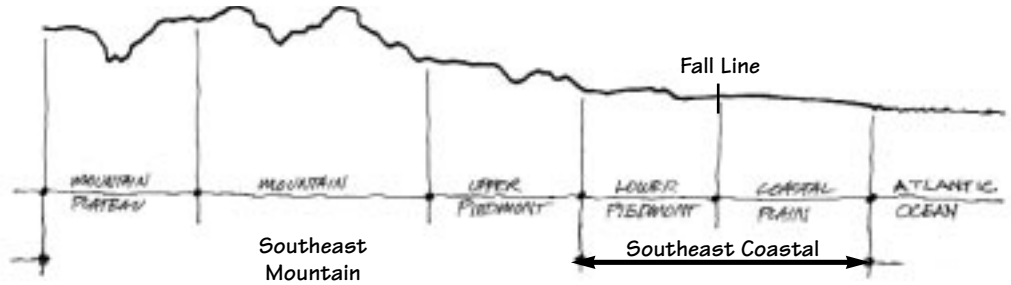
OVERVIEW: CHARACTER OF THE SOUTHEAST COASTAL PROVINCE BUILT AND NATURAL ENVIRONMENTS

The Southeast Coastal Province is layered with cultural and building traditions that respond directly to its warm, humid climate; tidal rivers; wetlands; and landscape features. It was originally populated by Native Americans (who were largely relocated in the 1830's), wealthy planters, African-American slaves and freedmen, Spanish settlers of Florida, and the French and frontiersmen of the tropical Gulf Coast.

In this province, keeping cool was the traditional concern of builders. Dating from the early Native Americans up until the advent of air conditioning, many building types were designed to catch breezes, create shade, and provide cool, outdoor spaces such as courtyards and sleeping porches. The porches of shotgun houses and the generous verandas of traditional houses in Charleston achieved these objectives within distinctive building forms. Light-colored structures also mitigate this climate by reflecting solar radiation.

Culture and climate are nearly inseparable in this province. Traditional structures provided balconies, porches, large hallways and breezeways, wide eaves, and louvered windows that provided relief from blazing, humid summers.

In Louisiana, many houses were built on tall foundations to protect against flooding. In Georgia, South Carolina, and Alabama, simple wood-frame structures elevated on wooden stilts may have been influenced by the Florida Seminole huts called "chickees." Dairies and springhouses were burrowed into the earth to preserve perishable goods. The dogtrot house included a single roof covering two pens, creating a breezeway and shelter connecting two buildings. In agrarian compounds, kitchens were frequently placed in separate buildings to keep heat (and the threat of fire) out of the main house. Plantations and farms put different functions into separate buildings such as smokehouses, blacksmith shops, or winnowing houses for separating rice or grain from its hard outer shell.



INFLUENCES ON ARCHITECTURAL CHARACTER

Landscape and Ecological

The Southeast Coastal Province is characterized by flat topography; sandy, well-drained soils; bogs; and many other types of wetlands. Located primarily in drainages, the forests of the province mix tall, slender pines with deciduous trees. The oaks produce tannic acid that give this province's flat, slow-moving rivers a tea-colored hue. The weather is hot, with frequent thunderstorms. It is an enclosed landscape with few opportunities for vistas.

Above the "fall line" of rivers of the Southeast, the province includes the Lower Piedmont areas where streams run faster and clearer, topographical changes are more pronounced, and hardwood trees are bigger. This upland zone is an area of foothills and dense forests punctuated by towns and agricultural clearings.

Cultural

Old-world traditions shaped this new world. The French contributed the raised "Creole cottage" and the wrought ironwork seen in New Orleans. African-Americans are associated with the "shotgun house" with its connected rooms and broad, shaded entry. Formal British styles, such as Georgian houses, flourished almost everywhere. German immigrants contributed highly crafted stone and timber construction for farmhouses and barns. Another strong cultural factor is a high regard for heritage in this region, where the historic preservation movement began.

Other influences include:

Settlement Patterns: Early European settlements relied on shipping and fishing. They clung to the coasts and in communities along navigable rivers. Early waterborne industries included the fur trade, logging, fishing, and rice.

Agriculture and Industry: The early Southeast Coastal Province was an agrarian society. Tobacco flourished as a cash crop in Virginia, Maryland, and Kentucky. Rice was grown along the coasts of Georgia and the Carolinas. Sugar cane and, later, cotton were king in the South.

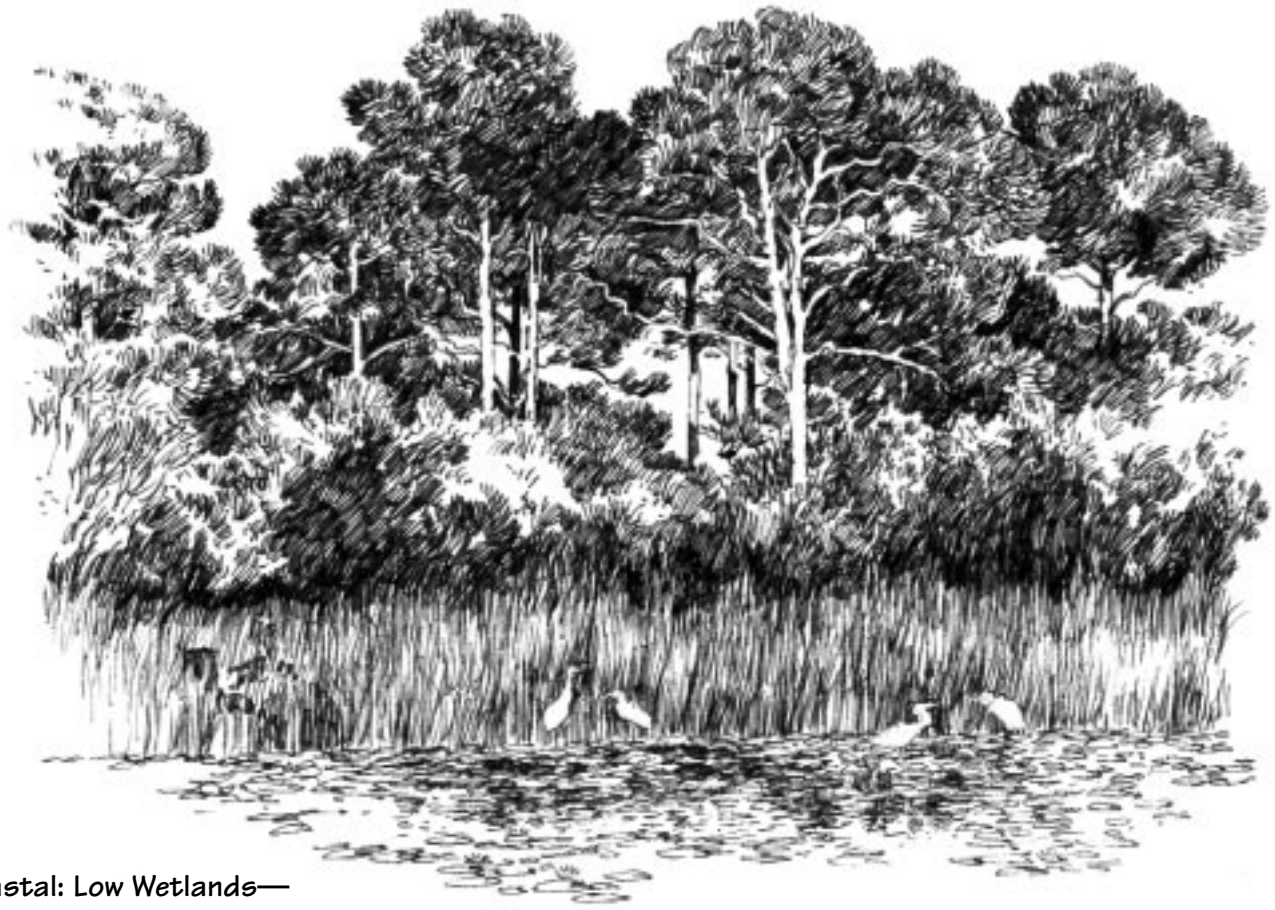
Indigenous Materials: Settlers in coastal South Carolina, Georgia, and Florida appropriated a Native American material called "tabby"—a mixture of lime, sand, and oyster shells.

Brick became common as more permanent buildings were erected in the colonies in the mid-1700's. This was particularly true in Virginia, where the red clay is suited to mixing and firing. This region's large stock of stone and brick buildings remaining today belies the fact that most early buildings were constructed of wood.

SUMMARY OF INFLUENCES AND RESPONSES THAT SHAPE THE CHARACTER OF THE BUILT ENVIRONMENT

Ecological Influences

- Flat landforms with gently rolling hills.
- High rainfall.
- Hot, humid summers.
- Rapidly changing weather with thunderstorms, hurricanes, and tornadoes.
- Humidity, intense summer sun, and presence of insects, such as termites, that quickly decay building materials.



Coastal: Low Wetlands—pine, oak, hemlock

Coastal pine forests

Lower Piedmont: hardwood, live oak, pines

- Dense vegetation with a high canopy of trees.
- Forests of pine with hardwoods in drainages.
- Plants that grow quickly.
- Sandy coastal soils.
- Rivers that take the form of slow-running estuaries with dark waters.
- Many marshes, swamps, and other wetlands.
- Abundant wildlife, from insects to alligators.

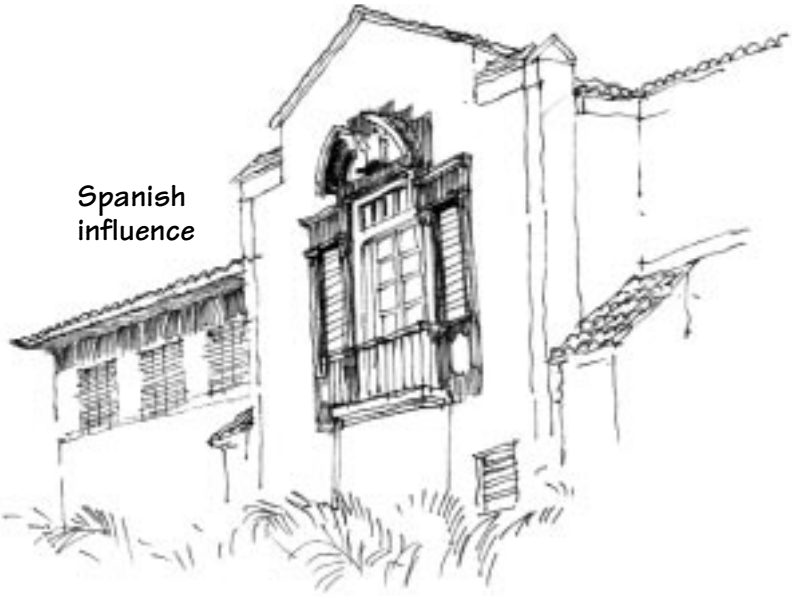
Cultural Influences

- Settled by Europeans for 400 years; has deep historical roots.
- Developed and altered landscape bisected by roads; no forest lands are more than a few miles from a road, and all are within a short drive of urban areas.
- Made up of an unconsolidated patchwork of private and public lands and forest lands.

French Creole cottage

Plantation influence

- Contains a rich architectural history that includes huts, slave cabins, and smokehouses as well as grand lodges and the estates and plantations of the aristocracy.
- Provides timber building material.
- Draws tourists to historic, as well as natural, sites.
- Provides water for boating, fishing, and swimming.



Spanish influence

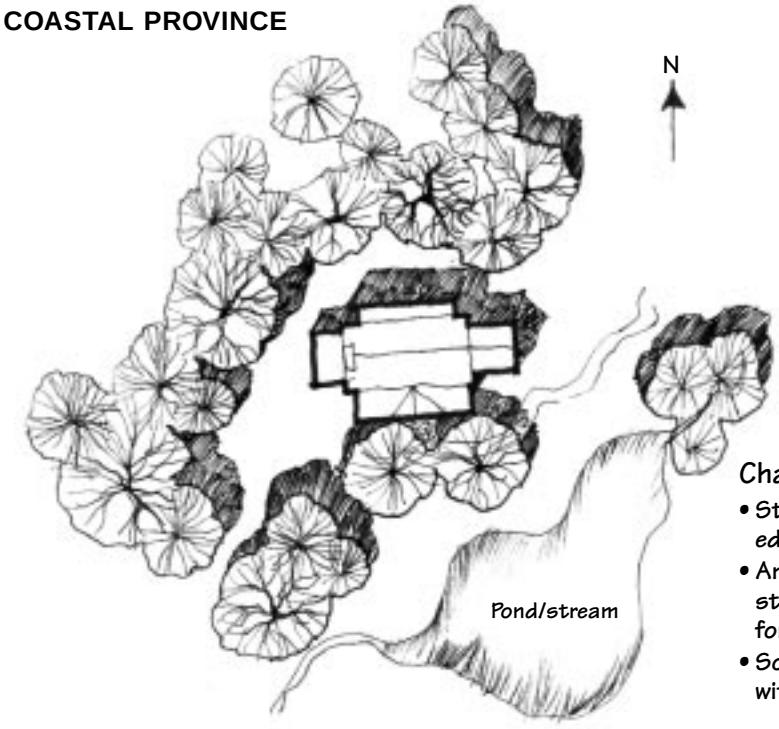
English influence

Early CCC

ARCHITECTURAL GUIDELINES FOR THE SOUTHEAST COASTAL PROVINCE

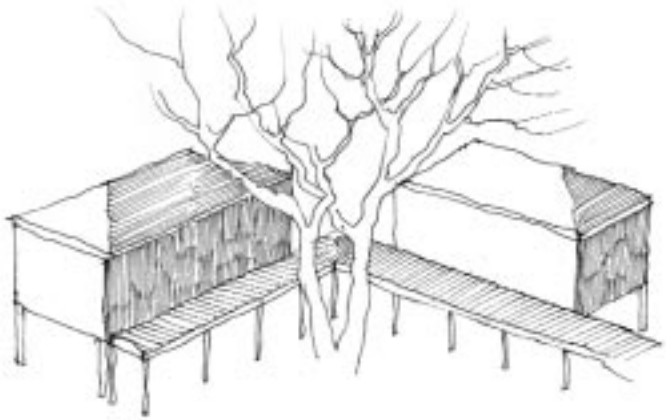
SITING

- Site buildings on high ground to preserve wetlands, capture breezes, avoid insects, and provide potable well water.
- Locate buildings at the edges of clearings to capture breezes and shade.



Characteristics:

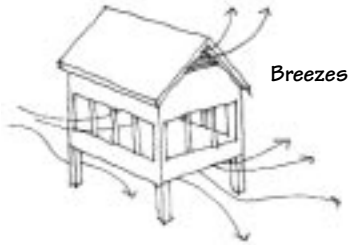
- Structure located at edge of vegetation
- Area around structure cleared for airflow
- South entry with shade



Raised boardwalks connect buildings

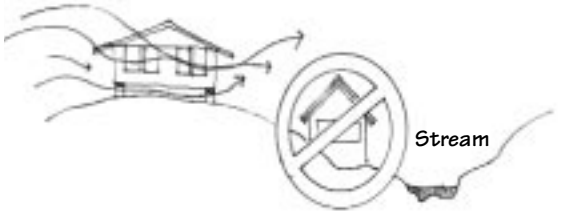
Access to raised level utilizing grade and boardwalk

Lower structure in cooler climate, retaining ventilation



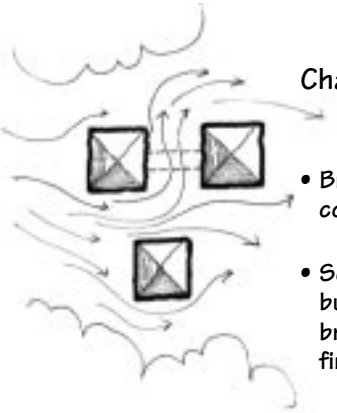
Higher, raised structures in warmer climate

- Separate functions into connected or related buildings.
- Clear vegetation around buildings for ventilation and to protect from insects and fire.
- Place hard surfaces ("aprons") around the bases of buildings to minimize mud splash.



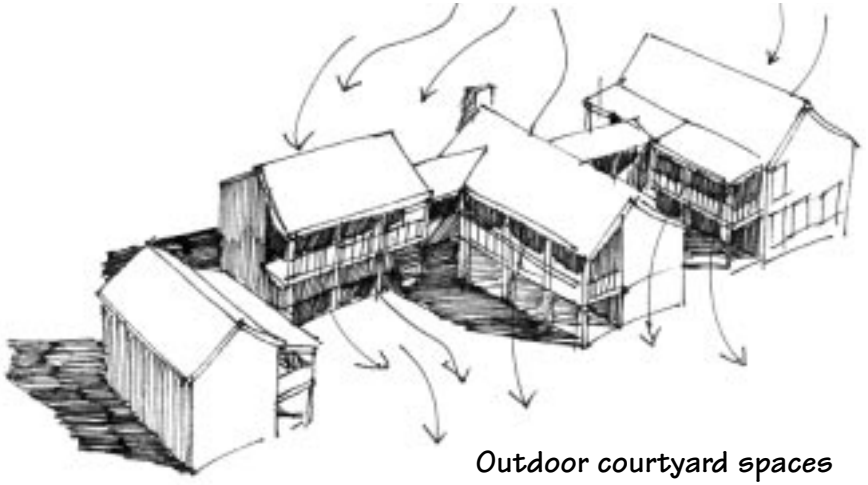
Structure placed well above and away from stream to avoid flooding and insects

Ground cover cleared and structure raised for ventilation



Characteristics:

- **Breezeway connection**
- **Separation of buildings for breezes and fire protection**

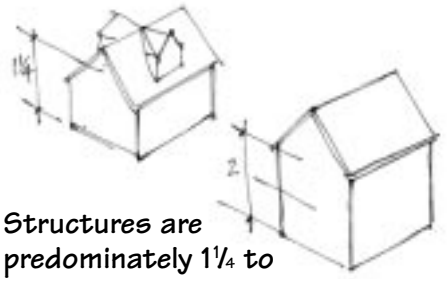


Outdoor courtyard spaces and upper level porches

Capture the breezes

Massing and Scale

- Use simple geometry and forms.
- Make buildings more vertical, with smaller footprints, to catch breezes and to promote ventilation.
- Add simple forms when expanding.
- Connect buildings through covered breezeways.
- Subtract volumes from the perimeter to create breezeways (as in a dogtrot house).
- Use slender framing and exposed structure to promote a "light" appearance.



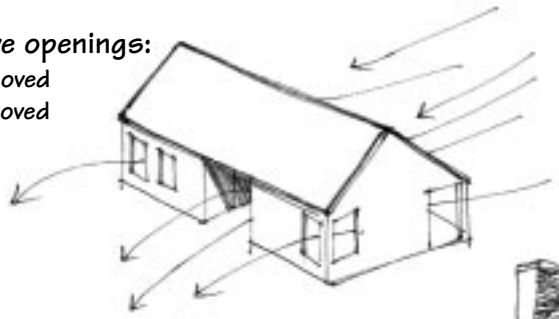
Structures are predominately 1¼ to 2 levels (high volumes)

Additive, simple forms

Subtractive forms (voids)

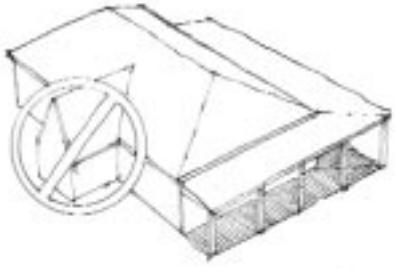
Side porch

Subtractive openings:
- **Center removed**
- **Corner removed**



Subtractive opening: traditional "dogtrot"

Porches should be continuous, not incidental



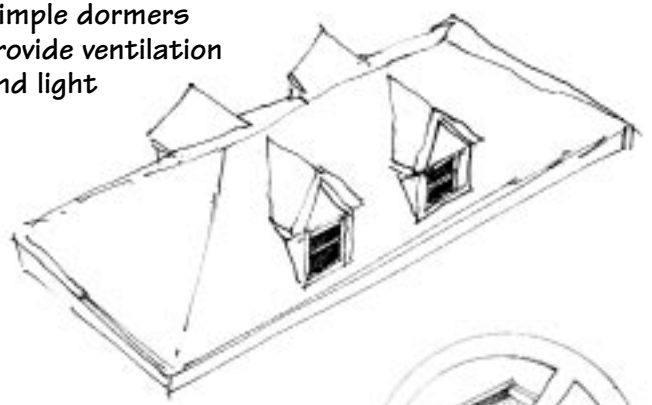
Roof

Roof elements include the roof itself, overhangs (eaves), dormers, skylights, and other features that penetrate the roof.

- Use simple roof forms such as shed, gable, or hipped.
- Minimize intersections of these forms that create "valleys" that can cause leaks.
- Design roof pitches to range from 7:12 to 12:12.
- Use broad overhangs to provide protection from sun and rain.
- Avoid gutters, but include a dripline trench of gravel or cobbles.
- Make gable-style dormers from simple forms to provide ventilation and light without complicating the roofline.

Broad overhangs:
- **Wall is protected from sun and driving rain**
- **No gutters**
- **Dripline trer**

Simple dormers provide ventilation and light



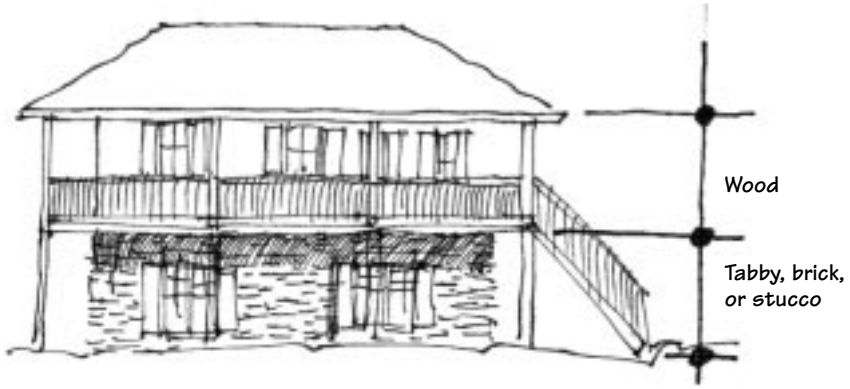
Hipped and gable roofs predominate
Valleys and complex roof forms are minimized

Simple, hipped roof, broad overhangs

Base

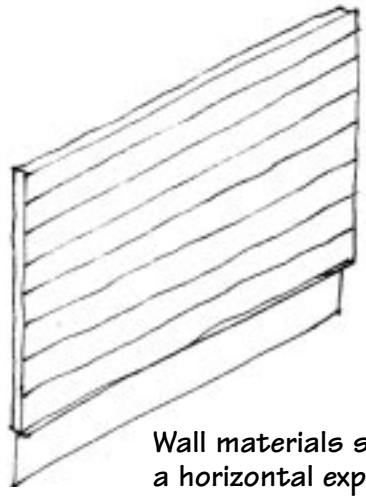
- Coastal buildings should sit very lightly on the land.
- Walls can meet the ground without a base.
- Basements are often not suitable.
- Lower Piedmont buildings may include bases made from a different material from the siding.

Building that is light on the land



Walls

- Expose or plaster brick walls with stucco or "tabby" (a mixture of lime, sand, and oyster shells).
- Use horizontal wood siding, as with lap siding.



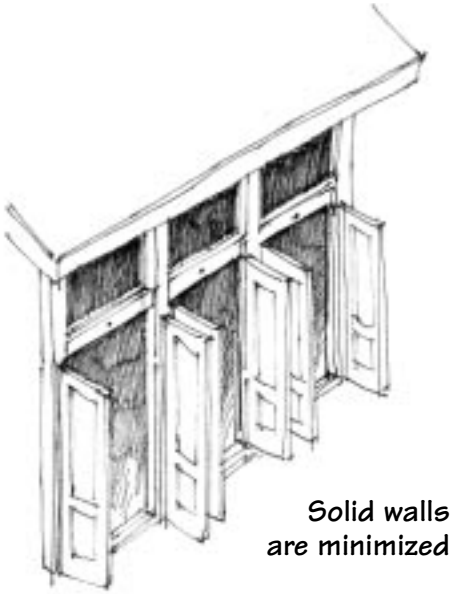
Wall materials should yield a horizontal expression

Windows and Openings

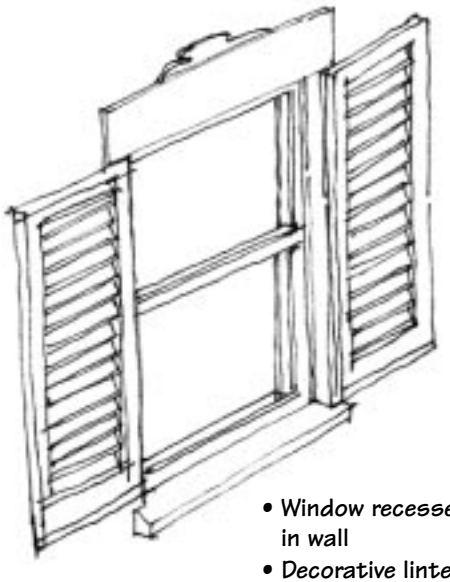
- Create a welcoming entrance that conveys a sense of arrival (for example, with a porch).
- Create porches either by extending the roof or by subtracting wall space.
- Provide good ventilation with traditional side porches.
- Use larger window openings for public buildings.
- Use sidelights to provide visual access and to daylight the entry.
- Install operable windows when possible.
- Screen windows and doors.
- Avoid heat-trapping fixed panes in dormers or gables.
- Remove obstructions (such as vegetation) in front of windows.
- Create lintels that can be expressed rather than flush to the wall.
- Make shutters functional, such as louvered shutters that block the sun while providing ventilation.
- Encourage cross-ventilation by placing louvered vents or windows directly across from each other.

Expression of the "open structure:"

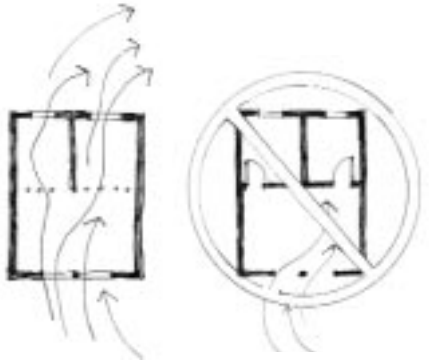
- Extended overhangs
- Walls retract



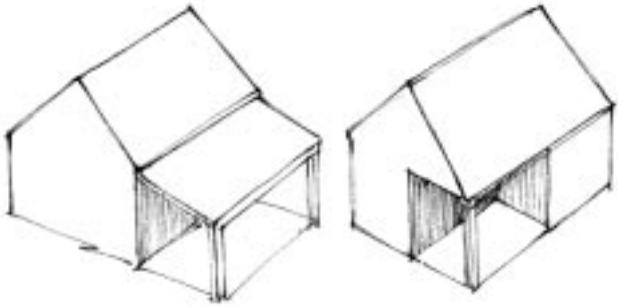
Solid walls are minimized



- Window recessed in wall
- Decorative lintels
- Louvered shutters



Open doors and walls
Opposing windows allow for cross ventilation



Porches are important transition spaces:

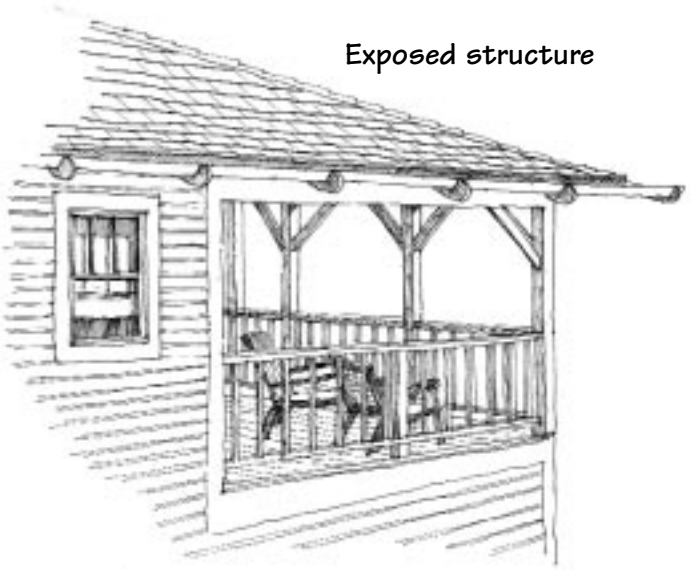
- Extended roof
- Subtracted walls

Structure

- Expose post and beam and other structure when suitable. Exposing structure reduces the volume of building materials needed.
- Use small-dimension posts and beams to create structures that appear to be light and airy.
- Use lighter, relatively narrow structures and materials to complement the tall, slender trees found in coastal forests.
- Minimize cladding that creates cavities that can trap moisture and insects.

Materials

- Use natural, indigenous, or locally produced materials when possible.
- Select durable, low-maintenance materials.
- Express local craft and artistry in public buildings.
- Use synthetic materials that resemble natural materials, are durable, and match the ROS setting.
- Use metal roofs in areas where they were used historically.
- Use materials that yield horizontal expression, such as clapboard siding.



Exposed structure

Tall, thin vegetation Yields → Light structure and materials

Color

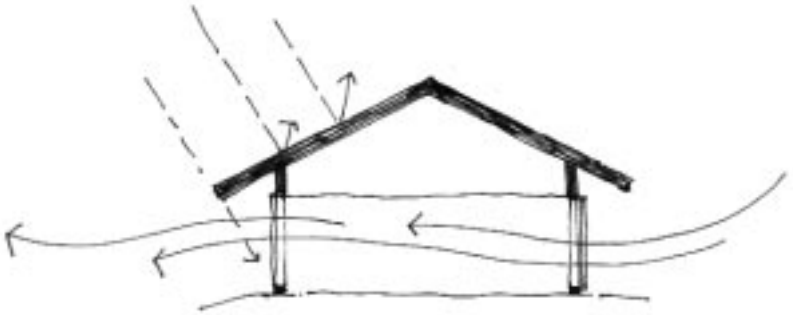
- Derive color schemes from native vegetation, landforms, and local culture.
- Create a color scheme to be used throughout a forest. Use darker colors within the forest canopy and lighter colors in open, sunny areas.
- Construct light-colored buildings that reflect heat and stay cooler.
- Use bright accent colors that can be derived from flowers, lichens, or cultural influences.
- Make roof colors light but nonreflective.
- Use light colors for exposed structural elements (posts, beams, and trusses) so they do not appear "heavy."

Colors:

- **Light grays and tans of tree bark and sands**
- **Greens of palm and pine**
- **Accents in the pastels, corals**
- **Red clay of the Lower Piedmont**

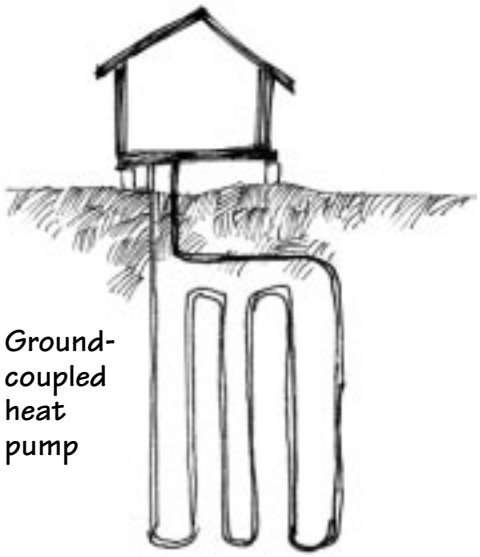
SUSTAINABILITY

- Maximize natural ventilation.
- Use colors and materials that reflect heat.
- Combine daylighting (natural light for buildings) with shading through deciduous trees.
- Provide shade on the west and south sides by planting or preserving trees.
- Integrate shade devices such as shutters, louvers, overhangs, and screens into building design.
- Situate buildings so that they catch breezes.
- Use the minimum amount of building materials.
- Minimize air conditioning and mechanical ventilation.
- Examine the potential of recycling graywater for irrigation.
- Recharge groundwater by creating permeable surfaces around buildings; maintain the historic runoff rates to prevent erosion.
- Consider ground-coupled heat pumps for heating.
- See the "Common Principles" section in the introduction to this chapter for more recommendations on sustainability.



Natural ventilation and shading are maximized
Operable windows are installed

Insulated and ventilated to reduce solar gain



Ground-coupled heat pump

SYNTHESIS

In this province, we do not expect Forest Service visitors or employees to survive without air conditioning. We do try, however, to learn from the past that structures designed to suit the climate require less energy (and money) to cool.

The structures of this province should be placed harmoniously within the landscape to afford a generous interplay with the many bogs, marshes, and slow-moving rivers. Boardwalk entries and buildings raised on pilings above wet earth are only two possibilities to site buildings within this ecologically rich but fragile setting.

Utilitarian structure:

- **Effective ventilation**
- **Large, operable openings**

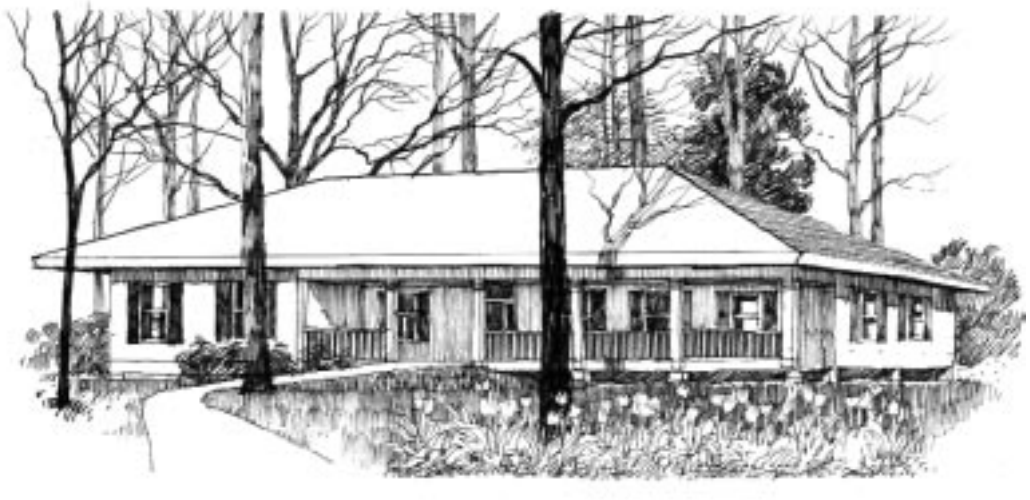
Toilet facility:

- **Simple roof with effective, protected ventilation**

This province's light-colored, airy structures should also appear structurally light rather than heavy. Gigantic logs and boulders are not suitable for exposed posts, beams, or trusses. Using smaller-dimension structural members will complement the slender loblolly pines and hardwoods of the forests.

Ranger station/ office characteristics:

- **Simple hip roof with broad overhangs**
- **Broad porch in subtractive volume**
- **Extensive windows**
- **Raised structure**
- **Vegetation retained for shade or cleared for airflow**
- **CCC tradition**



Picnic table with thick planks (3–4")

Utilitarian structure characteristics:

- Main elements adhere to the Southeastern expression while remaining inexpensive and functional
- Effective screening with landscaping
- Open air

Toilet facility characteristics

- Simple gable roof
- Slender structure
- Open screened ventilation

Interpretive shelter characteristics:

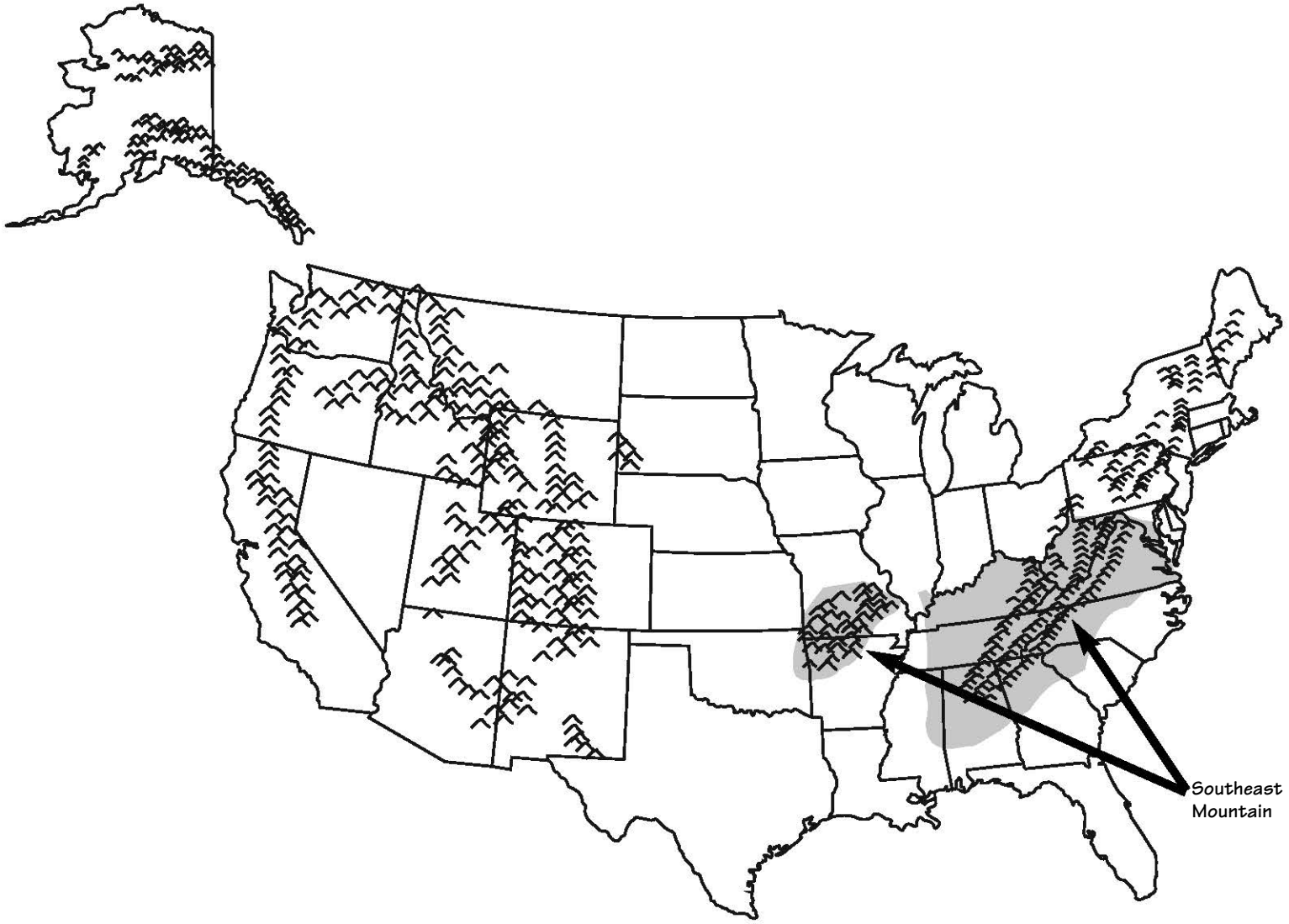
- Simple, hipped roof form
- Openly expressed structure for maximum airflow

Chapter 4.4

The Southeast Mountain Province

"Architecture and landscape design are not words on paper.... Situated in microclimates on the ground, connecting past to the future, palpably there, alive with flora and fauna, they are the stage for life itself."

—Douglas Kelbaugh

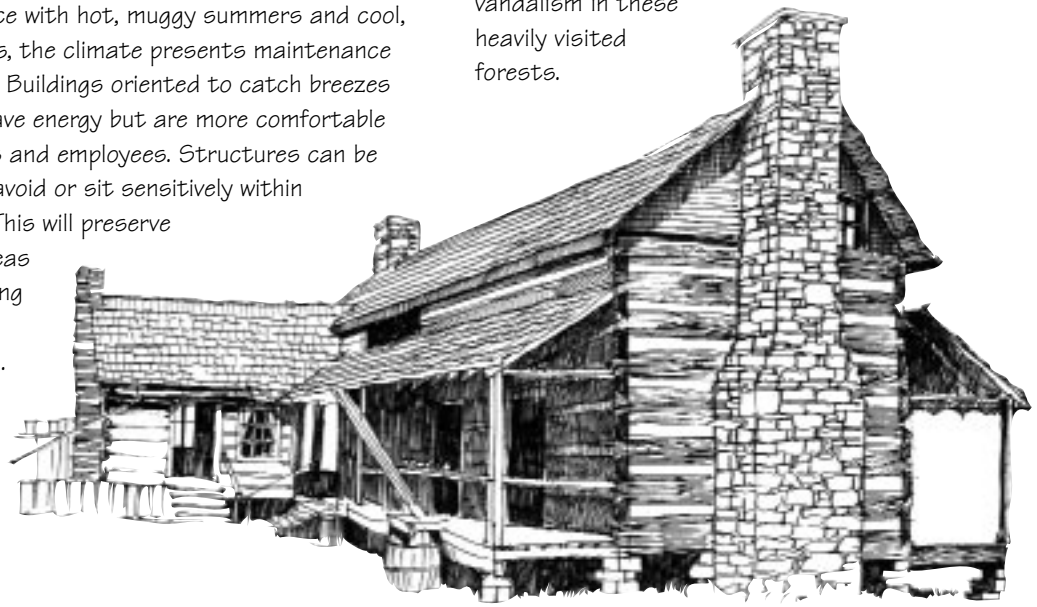

Southeast
Mountain

OVERVIEW: CHARACTER OF THE SOUTHEAST MOUNTAIN PROVINCE BUILT AND NATURAL ENVIRONMENTS

The Southeast Mountain Province contains every type of building and structure, from quite simple to very grand. There are frontier cabins, Native American huts, elegant brick townhomes, metal sheds, and the rustic structures built by the CCC. The best of these structures provide intelligent design responses to such factors as culture, climate, topography, and ecology.

Building in the Southeast Mountain Province has historically been attuned to climate, and climate continues to be a key to designing for sustainability. In a province with hot, muggy summers and cool, wet winters, the climate presents maintenance challenges. Buildings oriented to catch breezes not only save energy but are more comfortable for visitors and employees. Structures can be placed to avoid or sit sensitively within wetlands. This will preserve natural areas while allowing visitors to enjoy them.

As summer visitation is very high in this province, cooling and ventilation remain primary concerns. Rustic-style structures that feature unhewn logs and heavy stone foundations are cooler. Siting and designing to capture vistas is crucial, as is tucking structures into the edges of forests (or off the crests of mountains) to prevent silhouettes and preserve the view from other points. Designing for durability is vital because of the climate and because of concerns about vandalism in these heavily visited forests.



INFLUENCES ON ARCHITECTURAL CHARACTER

Landscape and Ecological

The Southeast Mountain Province includes lands above the "fall line" or the demarcation between the rushing rivers of the Piedmont and the flat, tidal rivers of the Coastal Province. There are two mountain ranges, one plateau, and three forest types. Early settlers inhabited moist coves, called hollows, that had rich soils forested with hemlock and white pine. Higher-elevation forests include mixed oaks. The highest and most northern forests are coniferous.

Valleys, rocky ridges, and cascading streams punctuate these mountains. Because of the higher elevation, there is dramatic seasonal color change with spectacular autumns. The views vary with one's place in the landscape, from enclosed in the valleys to open panoramas on ridgetops.

The Southeast Mountain Province generally is cool, wet, and high, with some elevations exceeding 6,000 feet. Summer temperatures are moderate, but weather swings can be dramatic, with 30-degree fluctuations in a single day. The limited flat land severely restricts building sites. Winter storms moving in from the west are more likely to include ice and snow, posing more challenges to heating and maintaining buildings. Soils are shallow with lots of rock and clay.

Grassy mountaintops called balds are an interesting ecological feature. They may have been created through clearing and overgrazing or perhaps were cleared by lightning. In any case, they remain clear of trees because mountaintops are too fragile to revegetate. Balds provide rich wildlife and plant habitat. According to the writer Hiram Rogers, balds in the Smoky Mountains cover less than 1 percent of the landscape but harbor 29 percent of the flora. They contain vistas that are vital to manage and maintain.

Writes Bill Bryson in *A Walk in the Woods:* "To climb for hours through cool, dark forest and emerge at last onto the liberating open space of a sunny bald, under a dome of blue sky, with views to every horizon, is an experience not to be forgotten."

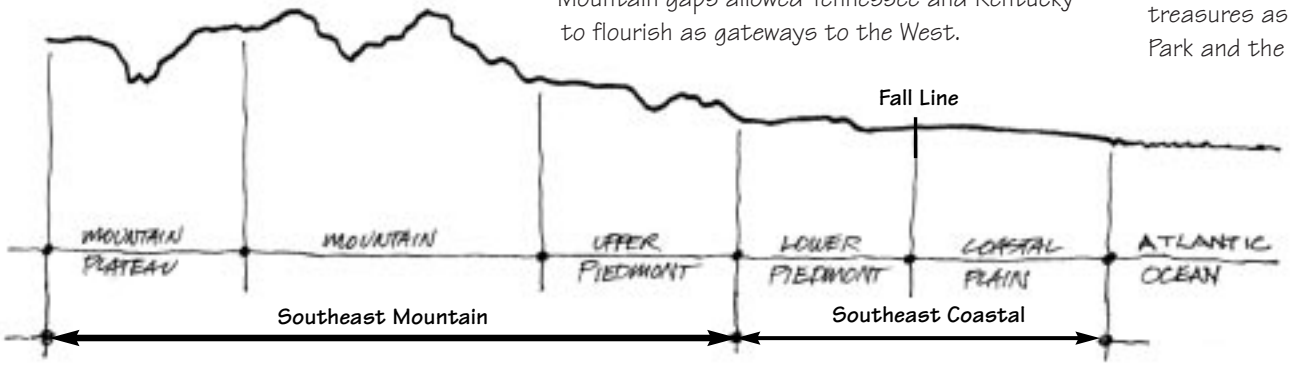
Cultural

The culture of the Southeast Mountain Province has informal and "common" antecedents. The early settlers—English, French, German, Scotch-Irish, and African-American—were loggers, subsistence farmers, and frontiersmen. They built simple, vernacular farmhouses and dependencies. Small towns are more typical than larger cities.

Settlement Patterns: Early settlers, moving down through the mountains from the north, were frontiersmen and subsistence farmers from German, English, and Scotch-Irish backgrounds. They built log cabins and settled in the coves sometimes known as hollows. The railroads allowed settlements and industries to become established upriver of the fall line that separates the Coastal Mountains from the Coastal Plain. Mountain gaps allowed Tennessee and Kentucky to flourish as gateways to the West.

Indigenous Materials: This was a heavily forested province (and heavily logged), where logs remained a favored building material into the 20th century. Logs were sometimes left unfinished. The chinking could be removed for summer ventilation. Stone was common, where it could be quarried or collected in fields.

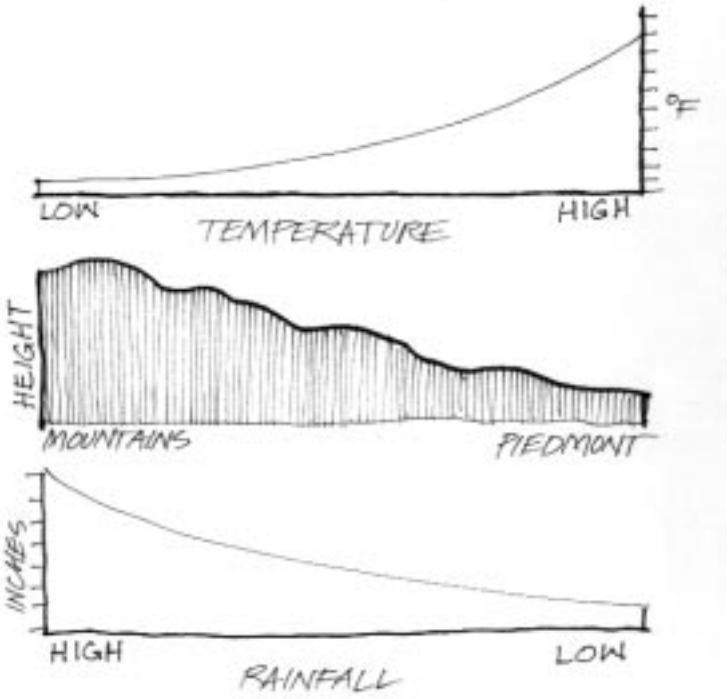
Rustic Design: The creation of such national treasures as Great Smoky Mountains National Park and the Blue Ridge Parkway spread rustic-influenced design across the spine of this province. Rustic design emphasizes the use of natural materials such as logs and boulders, as well as forms that fit into the mountain landscape.



SUMMARY OF INFLUENCES AND RESPONSES THAT SHAPE THE CHARACTER OF THE BUILT ENVIRONMENT

Ecological Influences

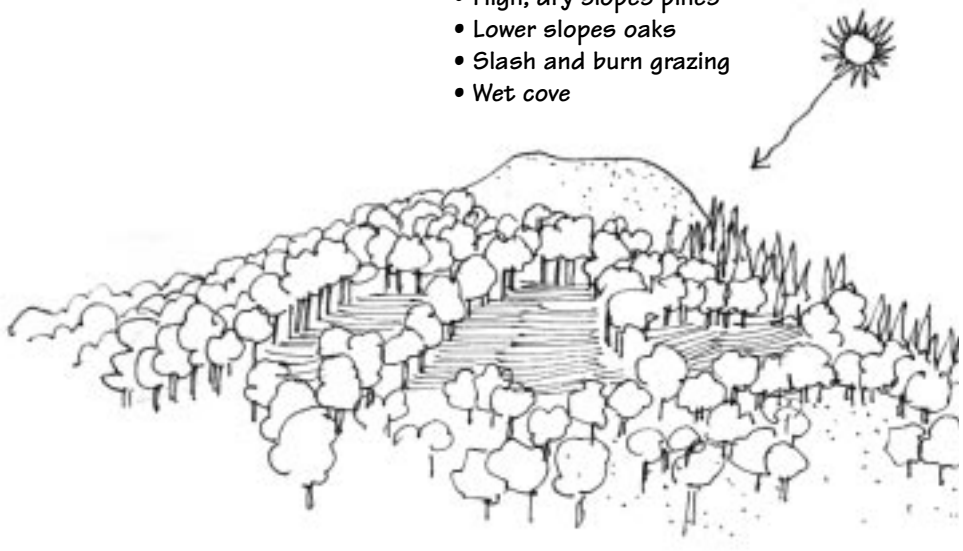
- Exposed geology with rocky ridges.
- Highly dissected mountains.
- Cool and wet winter climate.
- Dramatic temperature swings.
- Winter storms that approach from the west.
- Shallow soils with rock and clay.



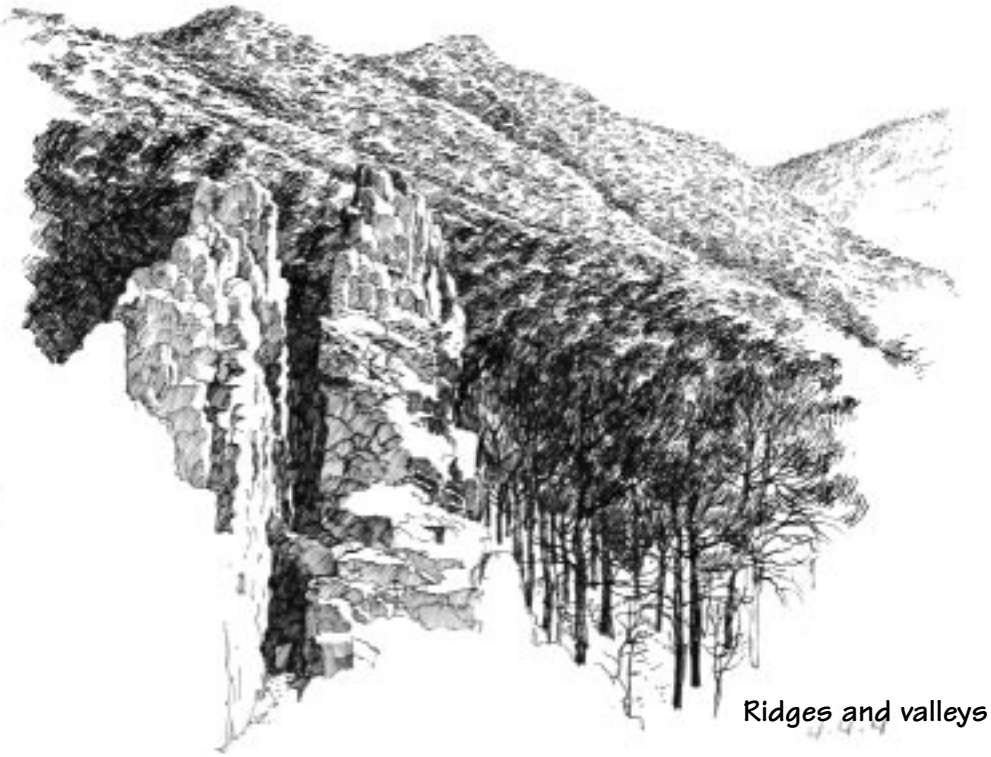
With altitude, temperatures drop and rainfall increases

Anatomy of ridges:

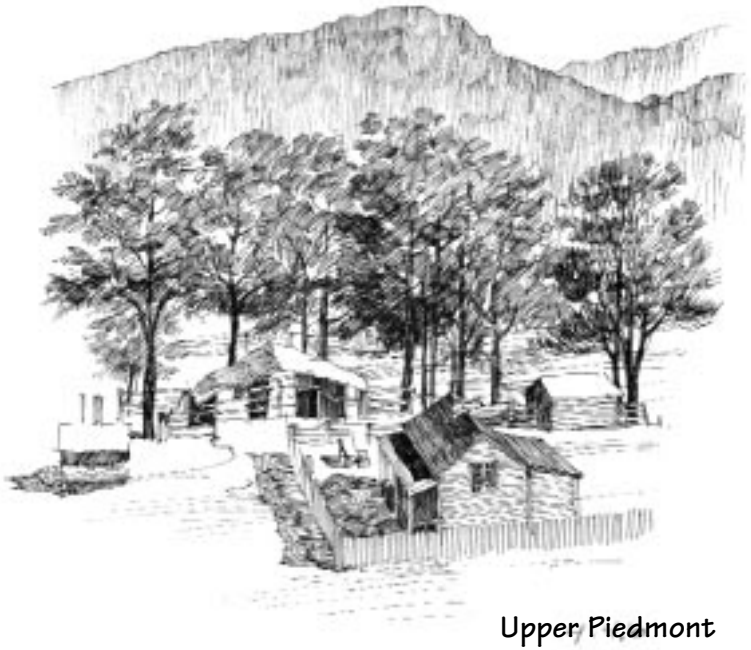
- **Grassy balds**
- **High, dry slopes pines**
- **Lower slopes oaks**
- **Slash and burn grazing**
- **Wet cove**



- Richer soils in valleys and coves.
- Fast-rushing rivers and waterfalls.
- Elevations up to 6,000 feet.
- Coves forested with hemlock and white pine.
- Mixed oaks and hardwoods at higher elevations.
- Coniferous forests at higher elevations.
- Presence of "balds"—mountain clearings preserved for habitat and vistas.
- Limited flat land that limits potential building sites.



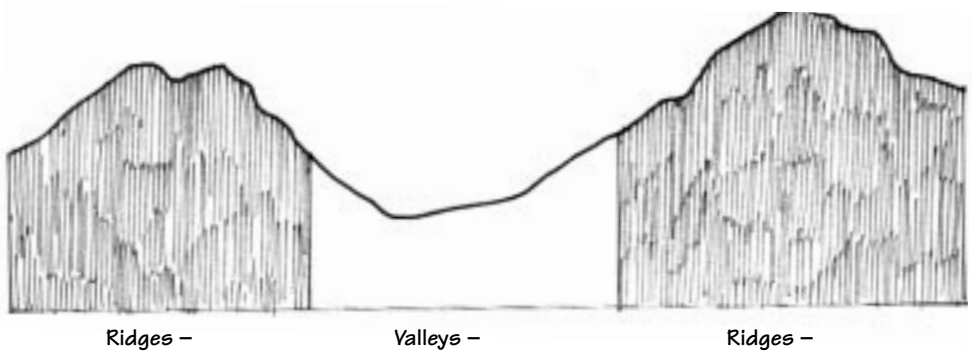
Ridges and valleys



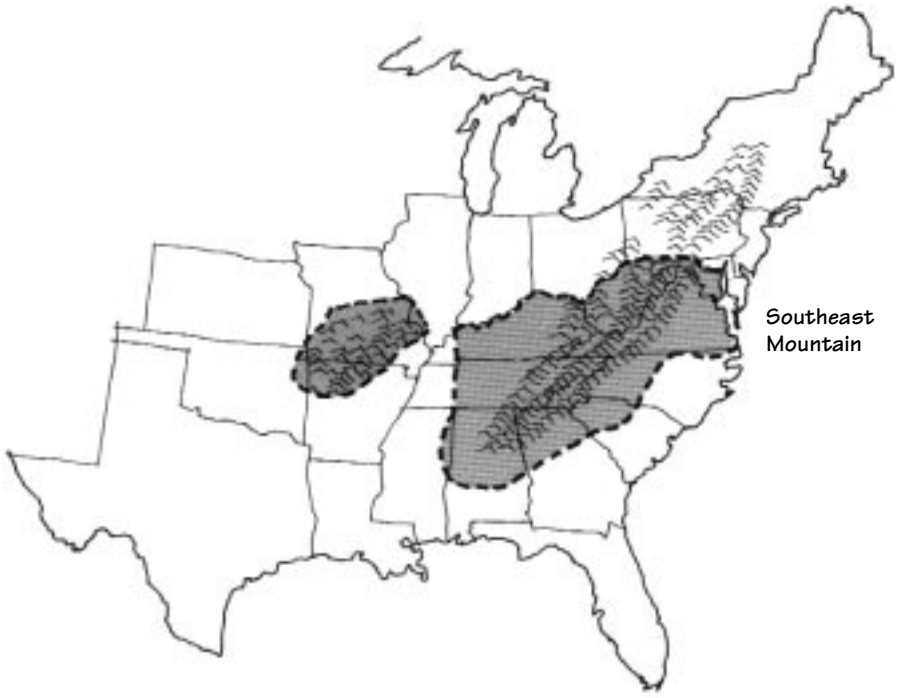
Upper Piedmont

Cultural Influences

- Early settlers were subsistence farmers, loggers, and frontier people.
- English, German, and Scotch-Irish settlers imported their vernacular building types.
- Land ownership pattern is private in valleys and public on ridges.



English stone



- Logs were a favored building material well into the 20th century.
- CCC legacy of rustic-style lodges and recreation facilities is seen.
- Small towns are more common than big cities.
- Early rural settlers preferred coves or hollows as home sites.

Log cabin

English influence

CCC rustic

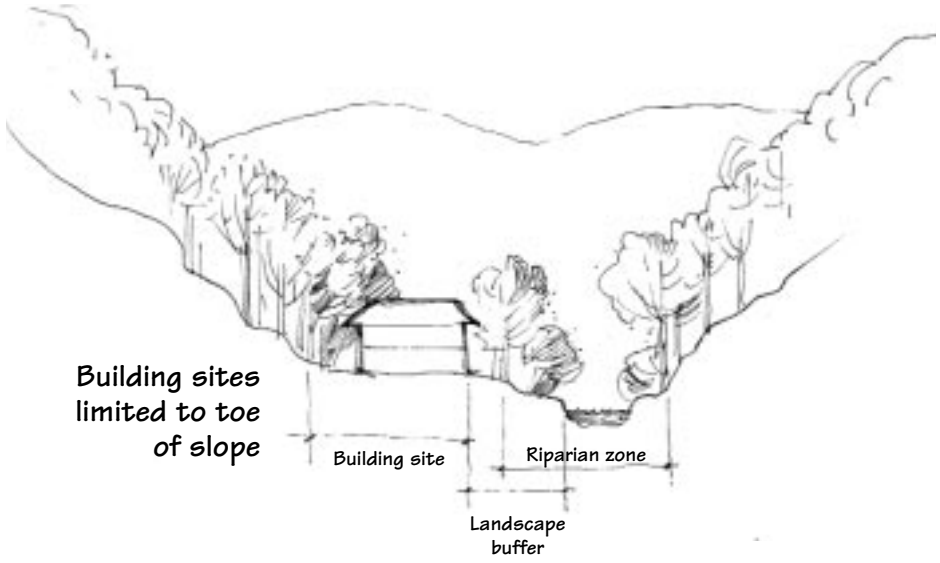
Rural piedmont

ARCHITECTURAL GUIDELINES FOR THE SOUTHEAST MOUNTAIN PROVINCE

Siting

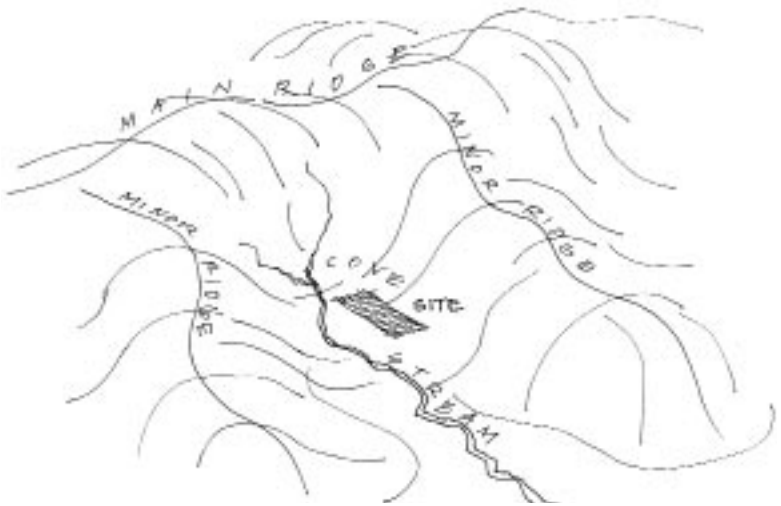
- Build within created clearings to preserve existing vegetation.
- On mountaintops, place structures below the top of the ridge to avoid structure silhouette.
- On plateaus, place structures at the highest elevation for vistas and breezes.
- Place observation structures (such as viewing platforms and towers) within the tree canopy and back from edge of ridges.
- Place buildings just above the floodplain in valleys.

Development limited at the top of the ridges
Structure moved off of the higher point

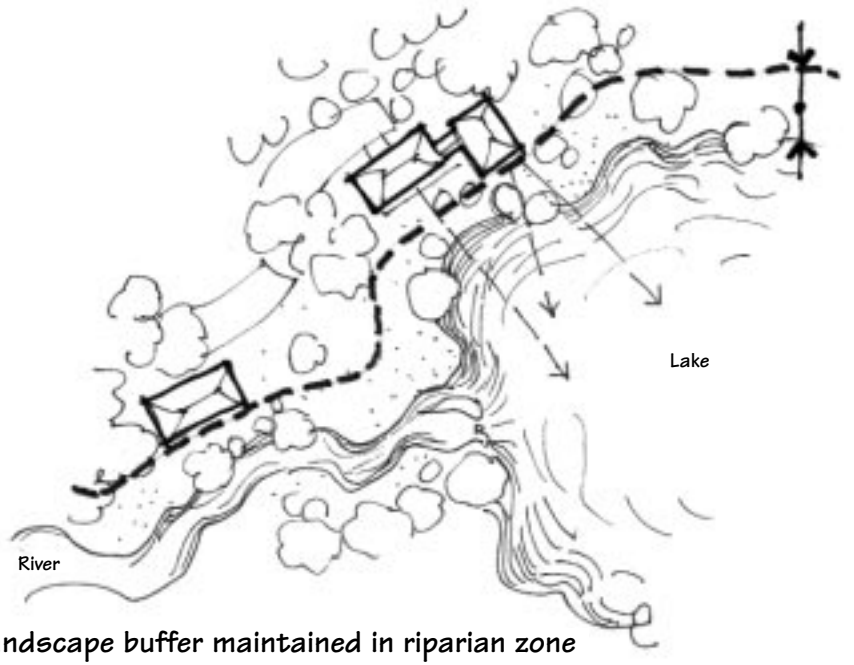


Observation platform uses local, natural materials

- Site buildings to shelter wind on three sides while providing sun exposure on the south side in coves.
- Place larger buildings in the broader valleys.
- Break up expanses of parking by terracing lots.
- Connect related buildings with decks and boardwalks.
- Clear vegetation around buildings (but "limb up" trees rather than removing them) for ventilation and protection from insects and snakes.
- Place structure parallel to contours of the landforms.



Historic development in sheltered coves

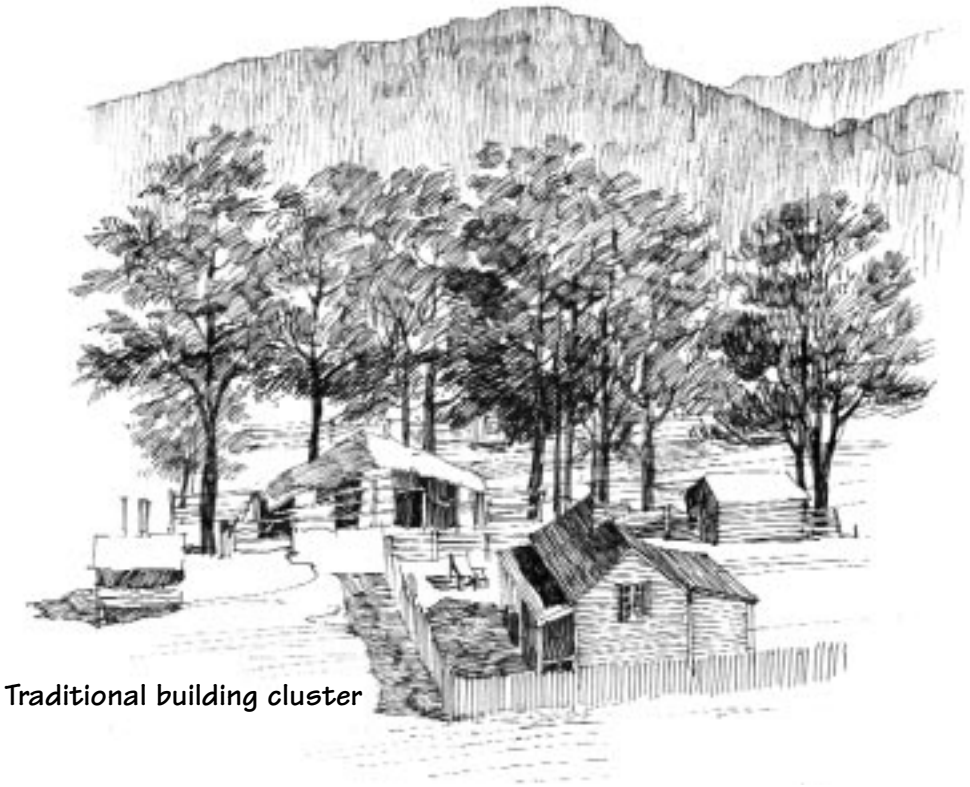


Landscape buffer maintained in riparian zone

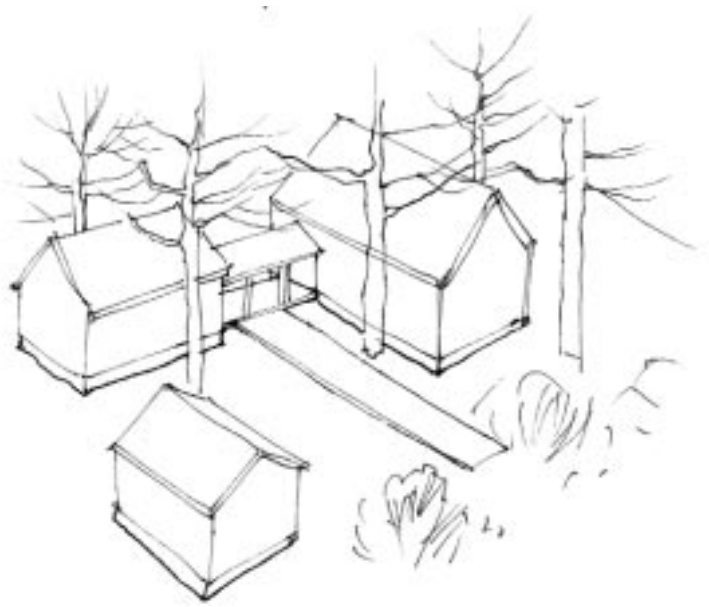
Branches trimmed up and undergrowth cleared

Massing and Scale

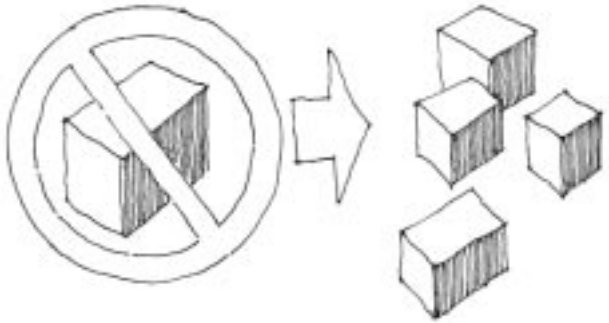
- Create compounds of several related buildings rather than one large building to minimize building footprints.
- Break down the scale of large buildings with multiple forms.
- Reduce building mass by stepping down sloped sites.



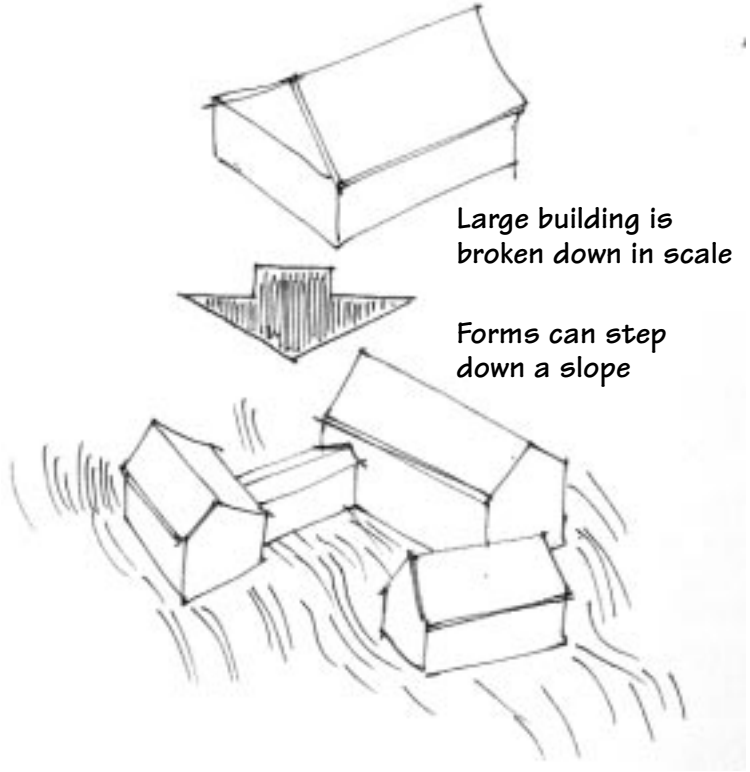
Traditional building cluster

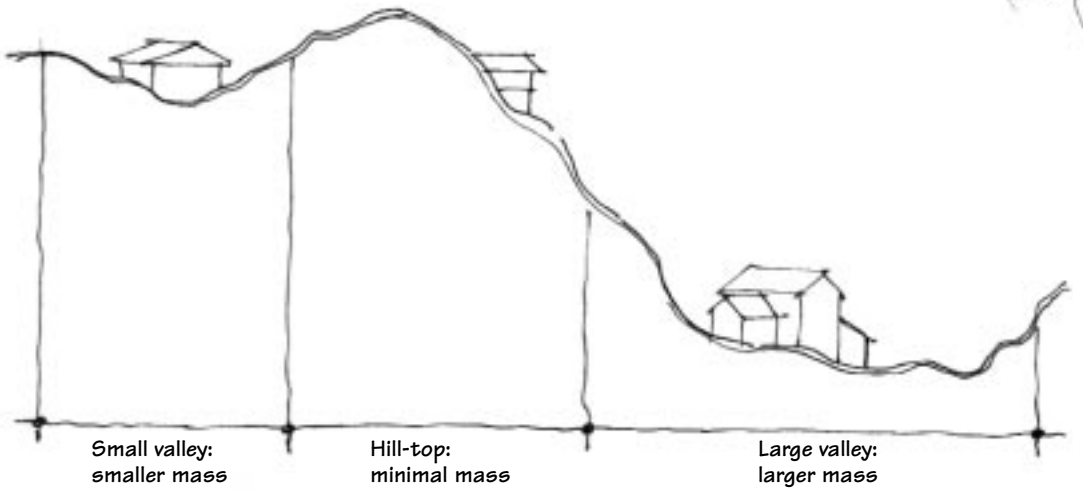


Clustering of structures is encouraged



- Create buildings that appear to have grown and evolved through time by combining different forms, such as shed and gable-style dormers.
- Design rectangular buildings to be sited on an east-west axis; these respond to solar conditions and breezes better than square buildings.

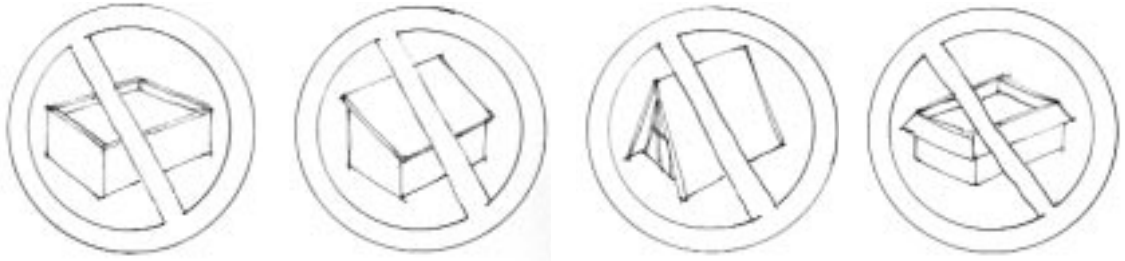




Mass relates to setting

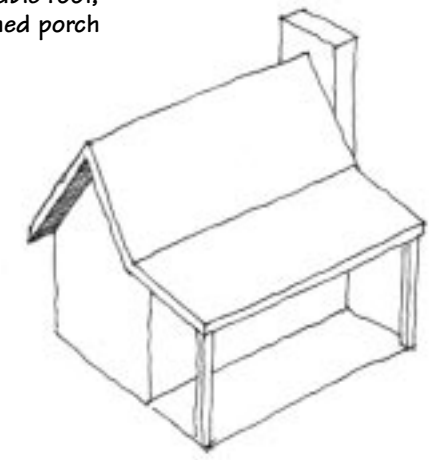
Roof

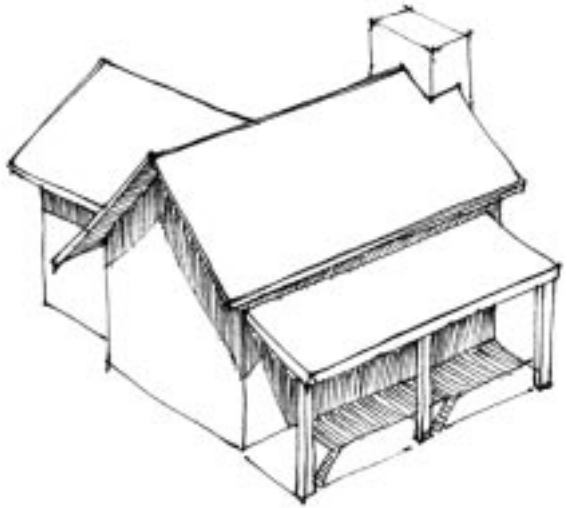
- Design roofs to be the dominant element of the building.
- Use broad overhangs to create a sheltering feeling.
- Complement the angles of landforms by sloping the roof.
- Design the roof pitches to range from 6:12 to 9:12; porch roofs can have a flatter pitch than the main roof.
- Avoid A-frames, mansard roofs, or flat roofs.



Predominant roof forms:

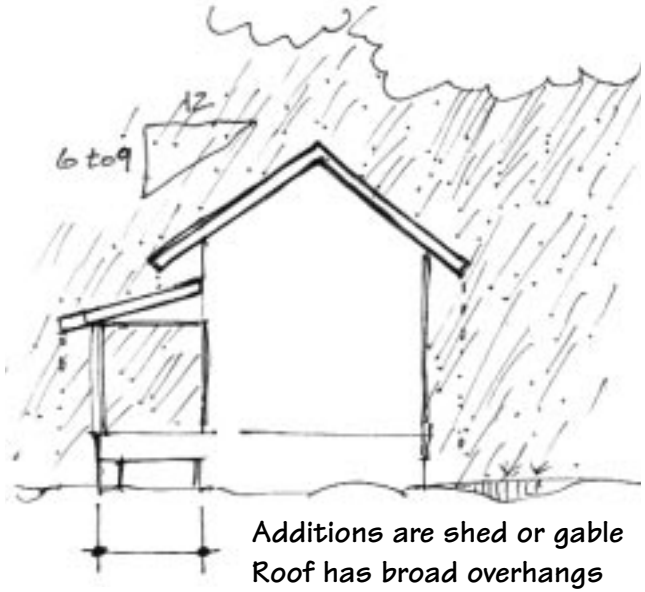
Gable roof, shed porch





Roof characteristics:

- **Addition intersecting with main roof**
- **Broad overhangs**
- **Flatter porch**
- **Chimney on end**



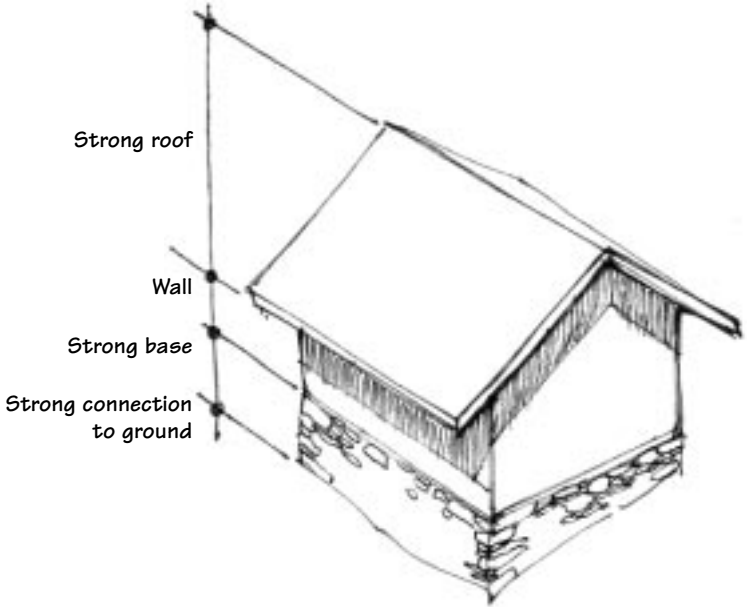
Additions are shed or gable
Roof has broad overhangs

Base

- Design the base so that it appears strongly connected to the ground.
- Build stone bases that seem to grow out of natural stone outcroppings.
- Use solid bases rather than piers or stilts.
- Ventilate the base and crawl space with openings.

Base up to window sills

Where appropriate, base can "grow" out of the stone outcroppings



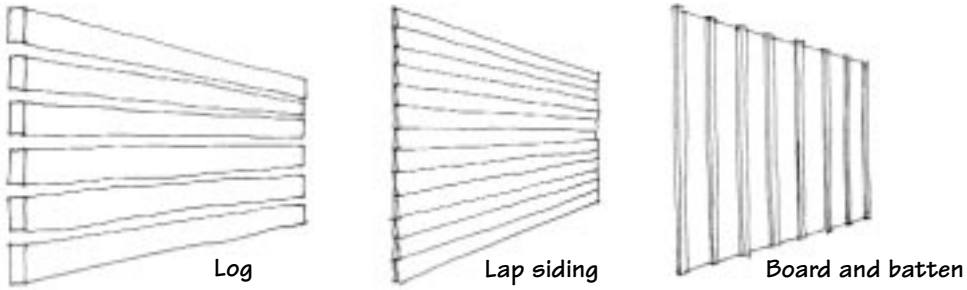
Wall is subservient to roof and base

and provide ventilation

All stone walls use local stone laid in local geological pattern

Walls and Openings

- Design walls that do not dominate the façade but instead create a relatively short plane between the more dominant base and roof.
- Use vertical windows that are either double-hung or casement.
- Install operable, screened windows when possible.
- Maximize ventilation with operable windows, transom windows, and vented roofs and gables.
- Use corners that look massive and substantial; avoid placing windows in building corners.
- Integrate skylights within the roof form; avoid bubble skylights.
- Include winter covers for gable openings.
- Design porches with high ceilings to allow views and to let daylight into the building.
- Emphasize entries to make them clear and inviting for visitors.
- Avoid sliding doors or jalousies.



Wall materials

Window proportion is vertical

Window types

Well-defined main entry

All spaces can be vented using:

- Vented roof
- Gable end vent
- High windows/transitions

Characteristics:

- Porch is an outdoor room
- Keep porch ceiling high for views and light
- Wood porch with stone pier
- Shed porch ceiling:
  Mountains: open Piedmont: closed
- Dormer for daylight and venting
- Add glass to gable end of building for daylighting

Windows can infill between structure

Structure

- Express structure by exposing posts, beams, and trusses, especially within shelters when possible.
- Use oversized structural elements to convey strength and permanence.

Structure is openly expressed

Materials

- Use materials that look substantial and heavy.
- Use indigenous, natural, and locally produced materials.

Suitable wall materials include:

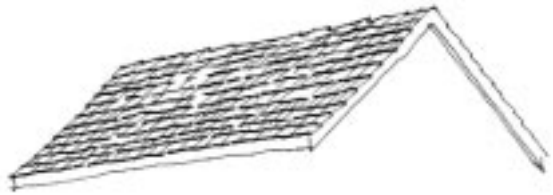
- Stone laid to reflect local geological patterns, and stone in scale with size of local rocks.
- Horizontal log.
- Board and batten.
- Wood-lap siding.

Alternate wall materials include:

- Split-face block, if skillfully constructed, as a substitute for stone.
- Concrete, if tinted and highly textured to blend with textures of natural surroundings.
- Cement-fiber siding to match wood.

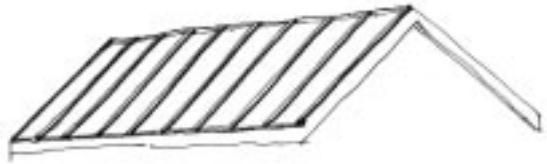
Avoid:

- Patterned plywood.



Treated, southern pine shake shingles

Composition shingles heavy texture



Standing seam metal

Suitable roof materials include:

- Treated, southern pine shake shingle.
- Standing seam metal in medium tones.
- Concrete tile, if it resembles a traditional material.
- Heavy-textured asphalt shingles.

Suitable base materials include:

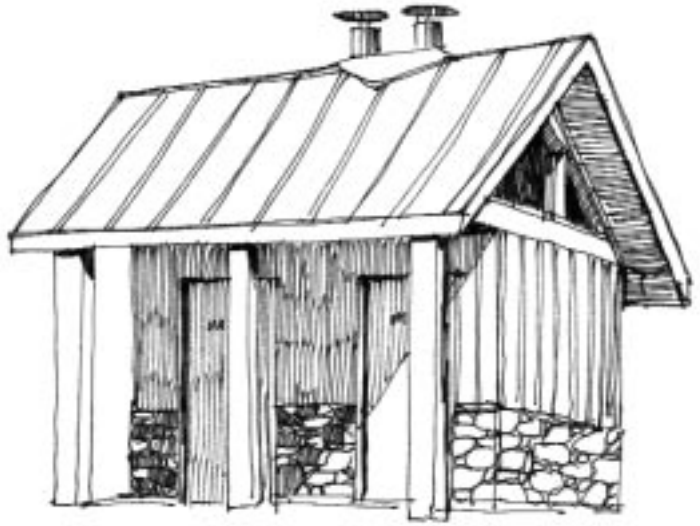
- Stone.
- Textured concrete.
- Split-face block.

Avoid:

- Wood, including railroad ties.

Characteristics:

- **Expressed structure**
- **Natural materials**
- **Strong connections**
- **Wood shake roof**
- **Heavy timber frame**



Predominant materials:

- **Stone base**
- **Standing seam metal roof**
- **Board and batten walls**

Color

- Draw color schemes from th immediate natural landscap especially rocks and trees.
- Use mid-tone earth colors such as brown, gray, and green.
- Stains, when used, should be solid, penetrating stain with UV protection.
- Use off-white paint color in the foothills of the Mountain Province.
- Bright colors may be used as accents if drawn from nature, such as wildflowers and lichens.
- Use gable ends that are stained in the mountains and painted in the foothills.

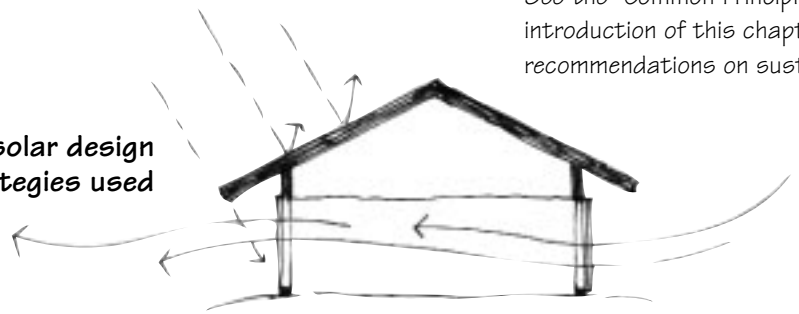
Colors:

- **Grays and browns of trees and rocks**
- **Greens of leaves and needles**

SUSTAINABILITY

- Use durable, locally produced materials such as pressure-treated southern pine shingles.
- Minimize painting and staining by using materials that weather or have integral color.
- Use wood from the region—avoid cedar or redwood, for example.
- Consider ground-coupled heat pumps, passive solar, and other energy-saving heating techniques.
- Ventilate all buildings and rooms, especially in conjunction with passive solar strategies.
- Use operable windows for effective ventilation.
- Consider constructed wetlands, sand filters, and other alternatives to mechanical systems for sewage treatment.
- Install porous paving to minimize erosion.
- Consider modular buildings that can be taken apart and stored out of season.
- Use daylight for interior spaces.
- Minimize disruption of natural landforms and vegetation when planning for roads, trails, utilities, and structures.
- See the "Common Principles" section in the introduction of this chapter for more recommendations on sustainability.

Passive solar design strategies used



SYNTHESIS

The Southeast Mountain Province has strong potential to use native materials such as boulders, fieldstone, and rough-hewn logs. These materials can be skillfully replicated or suggested with modern manufactured materials. Durability is a primary concern because of the high visitation to forest lands. Care must be taken to provide access to water without disturbing riparian areas and to orchestrate and preserve the long vistas of this province.

Utilitarian/work center characteristics:

- Adheres to design principles while recognizing economy
- Landscaping provides natural setting and screening

Public building characteristics:

- Simple roof form
- Simple dormer
- Windows contained by structure
- Massive corners
- Stone base

Information kiosk characteristics:

- Heavy timber
- Exposed structure
- Natural materials
- Well-organized graphics

Work or interpretive center characteristics:

- Clustered structures
- Natural materials
- Bases take up grade
- Exposed structure

Boardwalk characteristics:

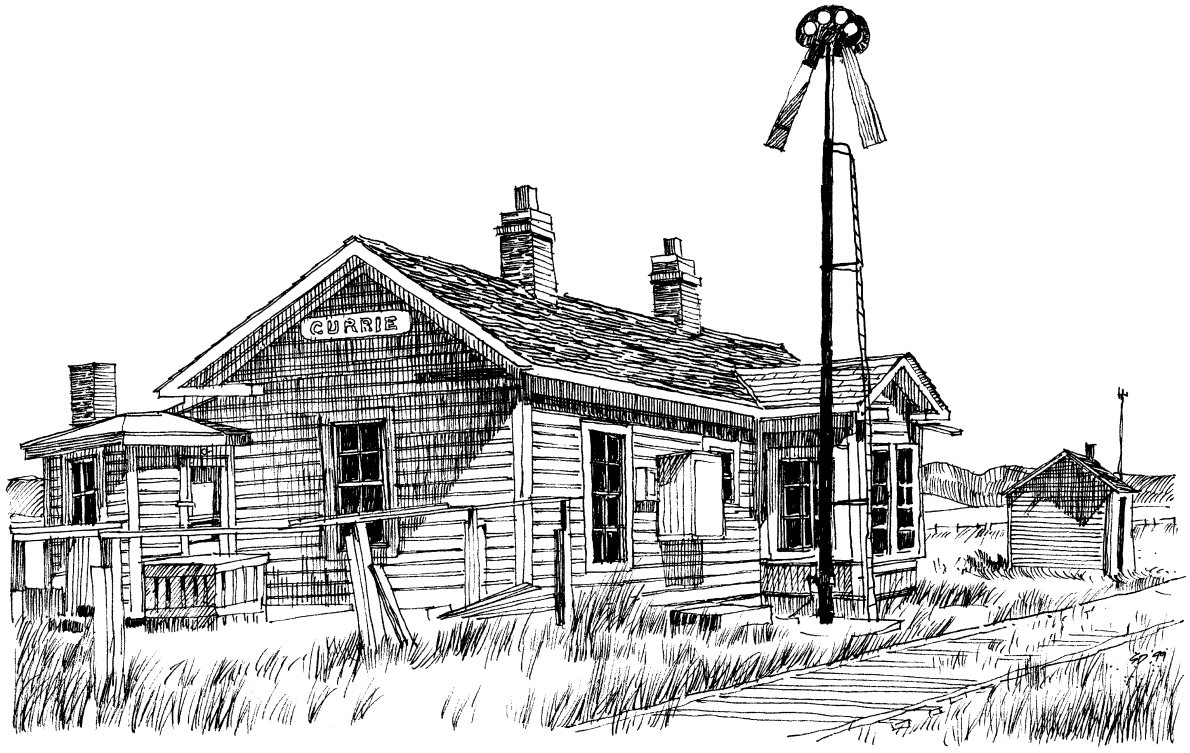
- Structure curves to preserve vegetation
- Minimal site disturbance
- Slender structure mimics vegetation

Chapter 4.5

The Great Plains Province

"The prairie, in all its expressions, is a massive, subtle place, with a long history of contradiction and misunderstanding. But it is worth the effort at comprehension. It is, after all, at the center of our national identity."

—Wayne Fields




Great
Plains

OVERVIEW: CHARACTER OF THE GREAT PLAINS PROVINCE BUILT AND NATURAL ENVIRONMENTS

The Great Plains Province can be divided into landscapes that include flat land, rolling land, and riparian areas. These are subtle landscapes that merit sympathetic design. Users of this guide should pay attention to the following characteristics:

Climate: The Great Plains climate is arid but rapidly changeable with dramatic extremes. Blizzards are common, although the sun evaporates or melts the snow quickly. Flash floods can occur in spring. Winds are strong and tornadoes are a factor.

Topography: The flat line of the horizon dominates the Great Plains. The topography actually varies from strictly flat, to rolling sandhills, to mesas and buttes.

Vegetation: With the exception of large cottonwoods that grow near creeks and ditches, the native vegetation of the Great Plains is sparse and small in scale, dominated by grasses and shrubs. The Great Plains appears both sparsely inhabited and highly domesticated because of widespread agriculture. Crops such as wheat, corn, soybeans, and pasture grasses contribute to our vision of the typical Great Plains landscape.

Water: Water may be the most precious resource on the Great Plains, as well as the element that most attracts people and wildlife. People are drawn to the shade, the lush substory vegetation, the wildlife, and the opportunities for fishing, boating, and swimming. Water elements include lakes, wetlands, creeks, and rivers.

"Aridity, more than anything else, gives the western landscape its character. It is aridity that gives the air its special dry clarity; aridity that puts brilliance in the light and polishes and enlarges the stars; aridity that leads the grasses to evolve as bunches rather than turf; aridity that exposes the pigmentation of the raw earth...."

—Wallace Stegner

INFLUENCES ON ARCHITECTURAL CHARACTER

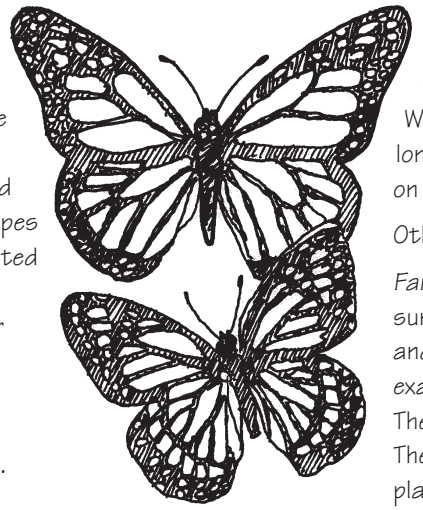
Landscape and Ecological

The character of the Great Plains landscape is dominated by spaciousness. Shaped by winds and glaciers, the topography is gently rolling with native vegetation of mixed grass prairie (a combination of tallgrass and mixed grass). Riparian areas are marked by verdant strands of hardwood trees that serve as a contrast to the rolling grasslands. This expanse of land can be overwhelming to the human scale. Horizontal forms predominate; they carry the eye to a seemingly limitless horizon. Vertical forms seem out of place and dwarfed by the horizontal expanse of the landscape. In the visual sense, the Great Plains have been compared to the open sea.

The climate adds to the sense of exposure characterizing the Great Plains. Rainfall is sparse and temperatures vary widely throughout the year, even within a day. Humidity is low, which results in intense sunlight and clear, brilliantly blue skies. These conditions are accentuated by the ever-present wind. With little landform to obstruct continental air movements, weather fronts move continuously across the plains. In the winter, cold fronts move on the winds from Canada; and in summer, storms and tornadoes are born in the Gulf of Mexico. Winters are cold, and summers can be hot and dry.

The expansiveness and harshness of the landscape offers challenges and opportunities to the built environment. The strong horizontal form of the landscape and the dramatic forces of the climate demand a careful response. Buildings constructed without sensitivity to siting, color, massing, and materials can appear very awkward and easily mar the views within the landscape. They must also be constructed to provide shade and shelter from the winds, heat, and cold. Done right, the result is one of the more distinctive forms in the country.

Visually and climatically, the Great Plains share many characteristics with other arid grassland landscapes in the Western United States. The architectural character types described in this section may apply to those grasslands as well.



Cultural

The early buildings and related structures erected by homesteaders, farmers, and ranchers harmonize with the Great Plains. The long, broad roofs shield people from wind and sun, but they also complement the rolling landscape. The sod roofs of early settler cabins create buildings that grow from the landscape itself. The bases of traditional buildings appear to be rooted. Structures such as windmills and silos symbolize the built environment within the prairie landscape.

As developed by Frank Lloyd Wright around 1900, prairie-style design made major advances in the art of blending buildings and structures within their locations. The forms Wright developed—low, horizontal buildings with long rooflines and overhanging eaves—work well on the Great Plains.

Other influences include:

Farming and Ranching: Isolated in windswept, sun-beaten settings, the traditional farms and ranches of the Great Plains are excellent examples of architectural response to climate. They were built from materials available nearby. Their orientations and rooflines were carefully planned to withstand snow loads, high winds,

and hot sun. They can be clustered in sheltering, village-like complexes that are flexible for changing uses and adaptations.

Railroads: Railroads not only shaped the landscape but allowed building materials and prefabricated building parts, such as cast-iron façades, to be shipped from other regions.

Immigration: The first European settlers imported their own building traditions, styles, and techniques. Other important influences include Spanish, Mexican, and Mormon designs. Migrants from other regions attempted to recreate the lusher landscapes of New York or Ohio, as well as familiar architecture such as Colonial Revival.

Prairie: The prairie style developed by Frank Lloyd Wright and others in the Midwest is one of the few indigenous modern styles of design to emerge in this country. Prairie architecture is low-slung with elongated roofs that seem to hug the earth. Windows are generously proportioned to take in the horizon. Decorative details are abstracted from native vegetation and geology.

Solar-oriented and Sustainable Design: This sunny province has high potential to harness solar energy for heat and power. At the edge of the Great Plains, the National Renewable Energy Laboratory (NREL) in Golden, Colorado, has provided leadership in "green" building and design.

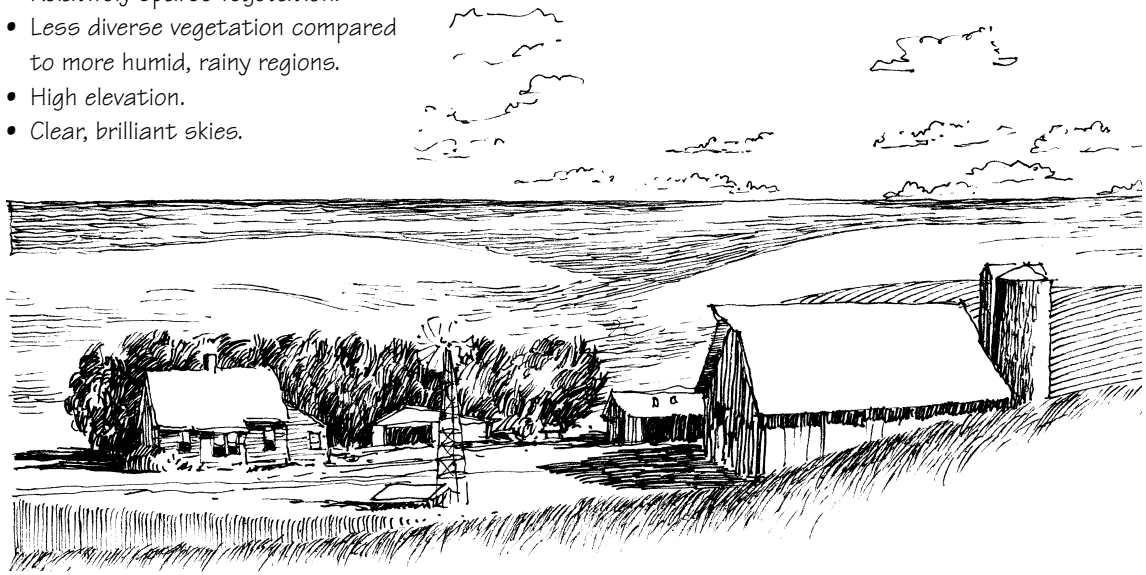
SUMMARY OF INFLUENCES AND RESPONSES THAT SHAPE THE CHARACTER OF THE BUILT ENVIRONMENT

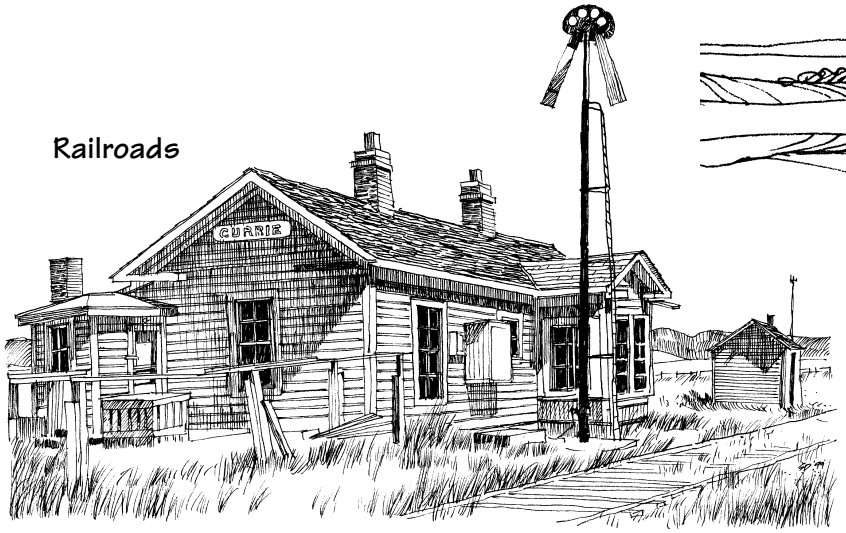
Ecological Influences

- Sparse rainfall.
- Low humidity.
- Abundant and intense sunlight.
- Dramatic freeze-thaw cycles.
- Visible geology—an abundance of rock visible on the Earth's surface.
- Long vistas with dramatic views.
- Wide-open landscapes that provide little sense of enclosure or sheltering from wind and sun.
- High winds.
- Thin soils.
- Relatively sparse vegetation.
- Less diverse vegetation compared to more humid, rainy regions.
- High elevation.
- Clear, brilliant skies.

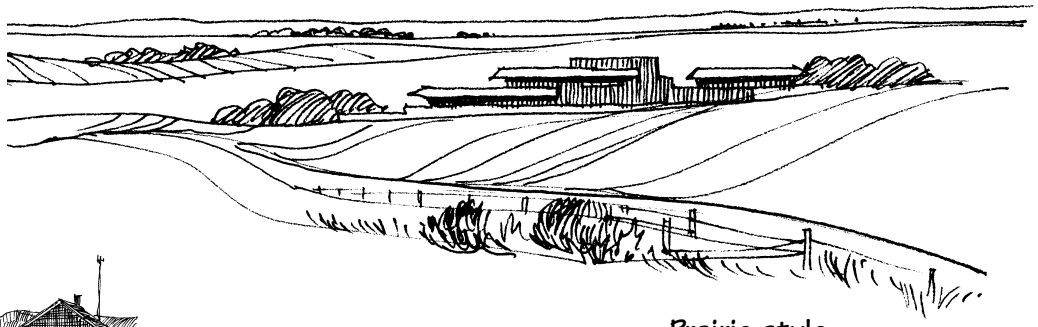
Cultural Influences

- European, Mormon, and Native American cultures.
- Tradition of building compounds to create community and shelter.
- Ranching and agricultural cultures.
- Landscape that is at once domesticated and sparsely populated.
- Prairie-style architecture that developed as a response to horizontal landscape with limitless horizon.

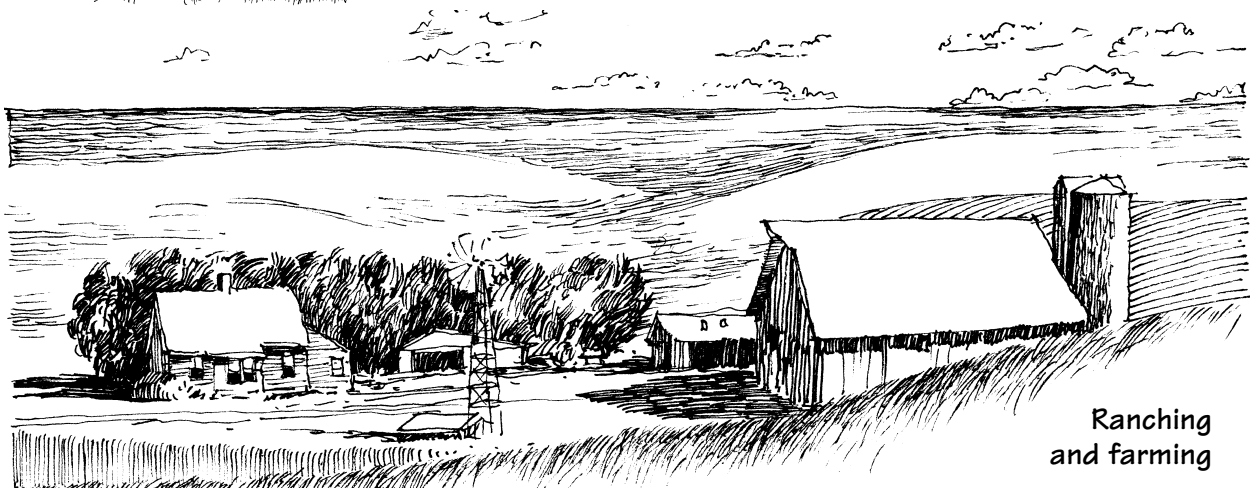




Railroads



Prairie style



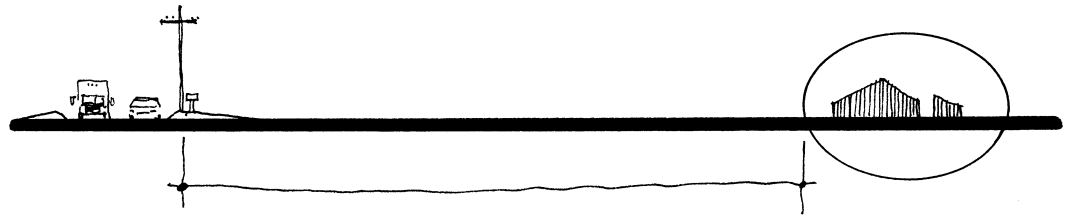
Ranching and farming

ARCHITECTURAL GUIDELINES FOR THE GREAT PLAINS PROVINCE

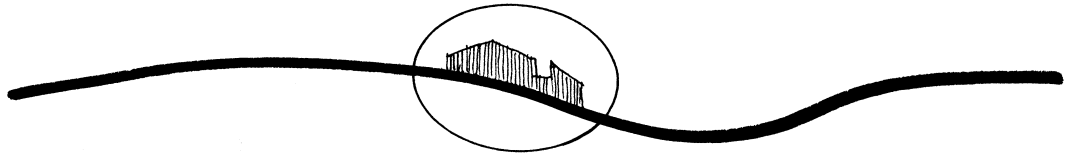
Siting

Site buildings on the edge of "transitional zones," such as the edges between flat plains and rolling landforms or at the edge of (rather than within) riparian areas. There are two basic types of sites:

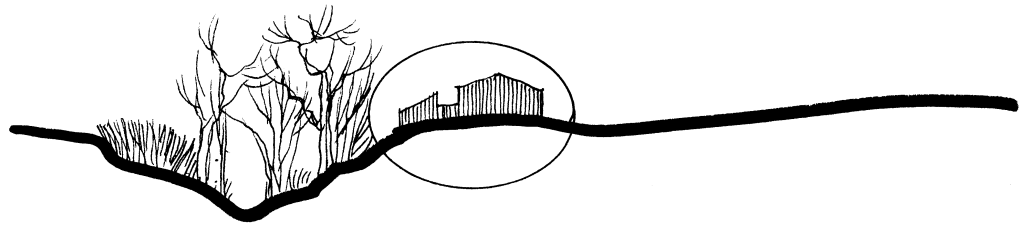
- Building compounds that create protective enclosure and human scale. Compounds create their own windbreaks and shade.
- A single consolidated structure that should be set back from major roads. It can be set against a landform so building mass merges with the horizon.



Flat plain — **Built at an extended distance from road**

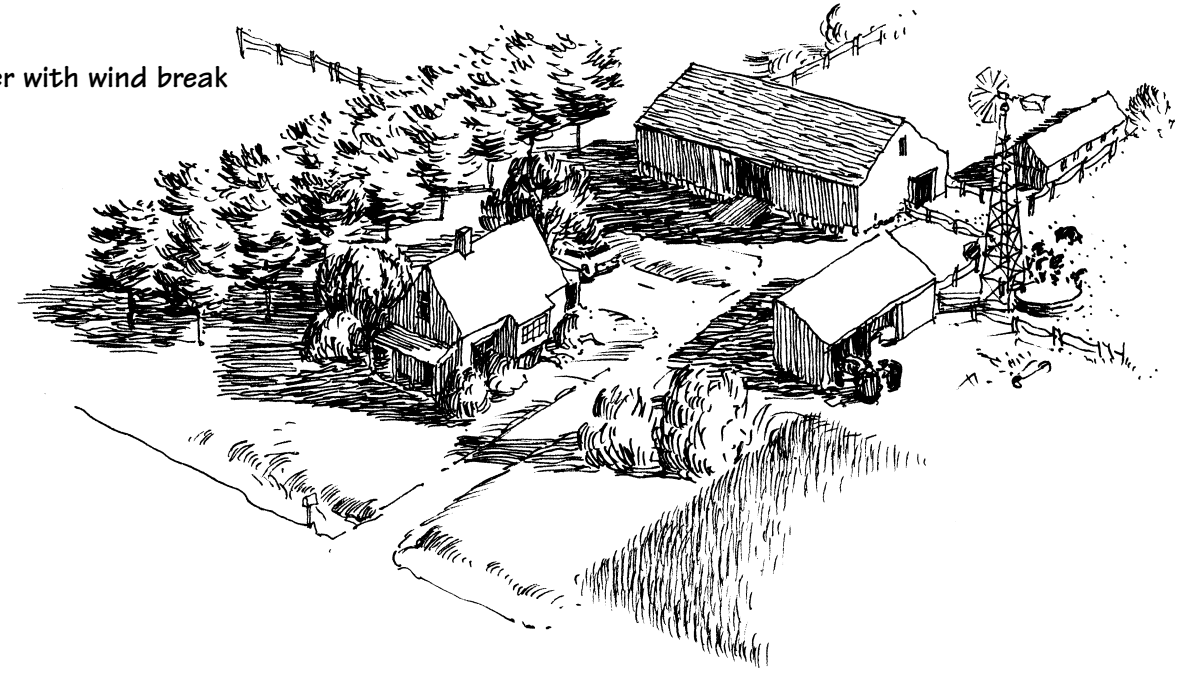


Rolling plain — **Built into the edge of the hill**



Riparian zone — **Built at edge of established growth**

Building cluster with wind break

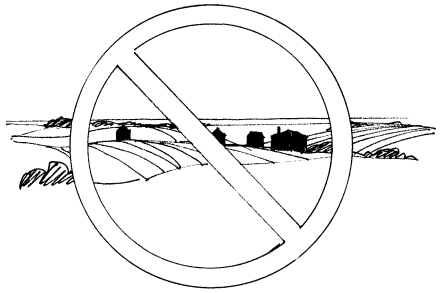


Building set back from road
Low plants provide visual base for building

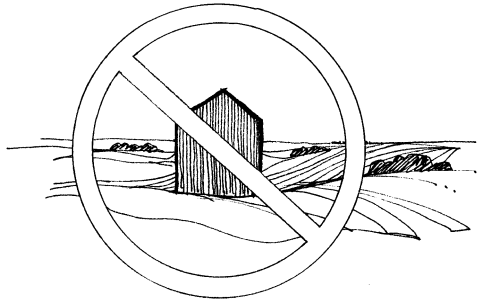
Massing and Scale

Buildings and structures of this province cannot be easily screened by vegetation or landforms. Poorly designed structures are visible for miles. Structures should not overwhelm or dominate their natural settings. Yet buildings for public visitation should not seem insignificant within their landscapes.

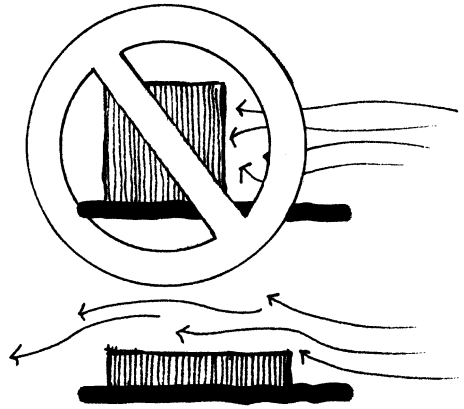
- Build structures that are low profiled and layered horizontally upon the landscape.
- Make buildings compact to retain heat and conserve energy.
- Avoid tall, stand-alone buildings—they look awkward when set into vast landscapes.
- Use landscape elements, such as native grasses, to help relate the building scale to the sweeping landscape.
- Use porches to reduce the appearance of mass in buildings.

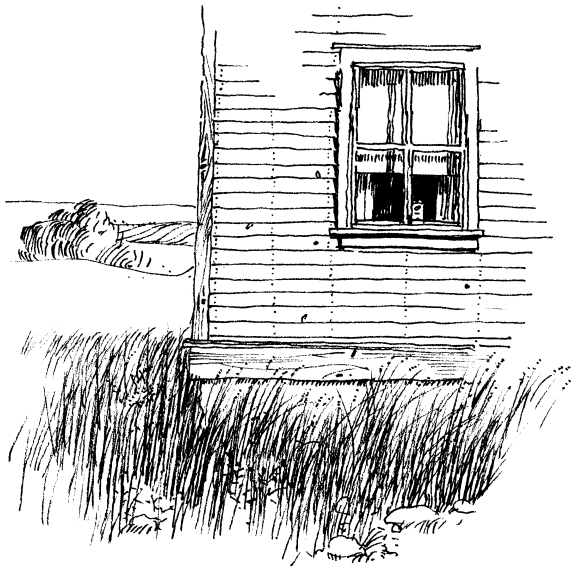


Small structures sprinkled on the landscape



Isolated, tall structure

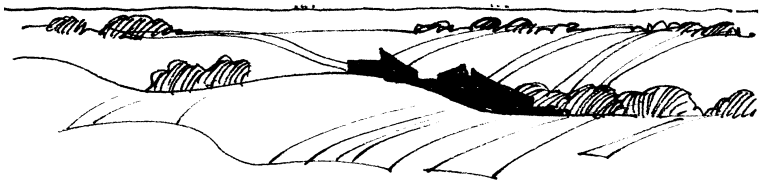




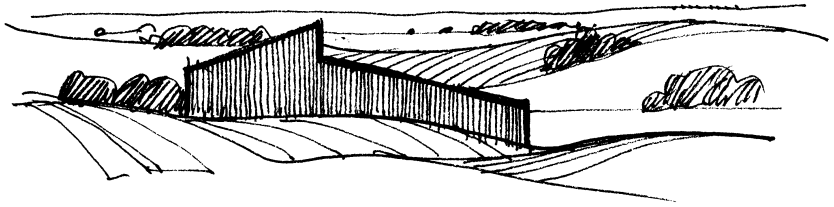
Scale of details should relate to landscape

Finer scale landscape

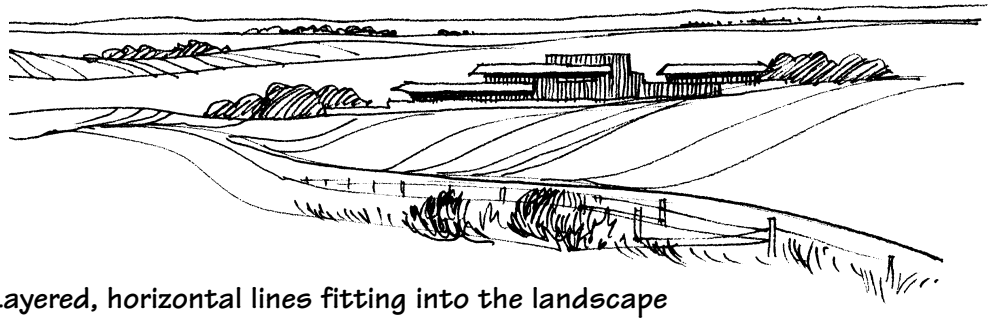
A vertical accent in a horizontal grouping is acceptable



Clustered structures conforming to the landscape



Low structure set into the land form

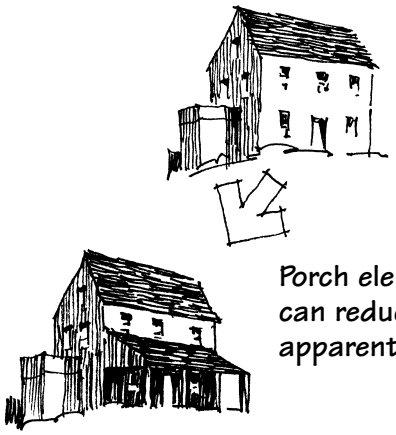


Layered, horizontal lines fitting into the landscape

Roofs

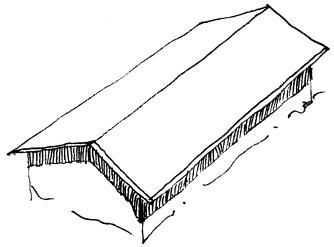
Roof elements include the roof itself, eaves, dormers, skylights, and other features that penetrate the roof.

- Roofs and gables should have a low or flat pitch.
- Forms should be simple, with continuous horizontal lines.
- The roof should appear solidly connected to the building.
- Porches are desirable.
- Moderate overhangs should be used to provide summer shade and allow for passive solar heating in winter.
- Roofs should be made of smooth to fine-grained materials using medium-toned colors.
- Roof materials should reflect heat without creating glare.
- Roofs should slope to withstand high winds.

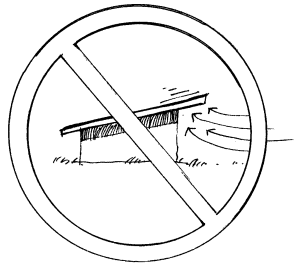


Porch element can reduce apparent mass

Appropriate element:
Simple, horizontal roofs

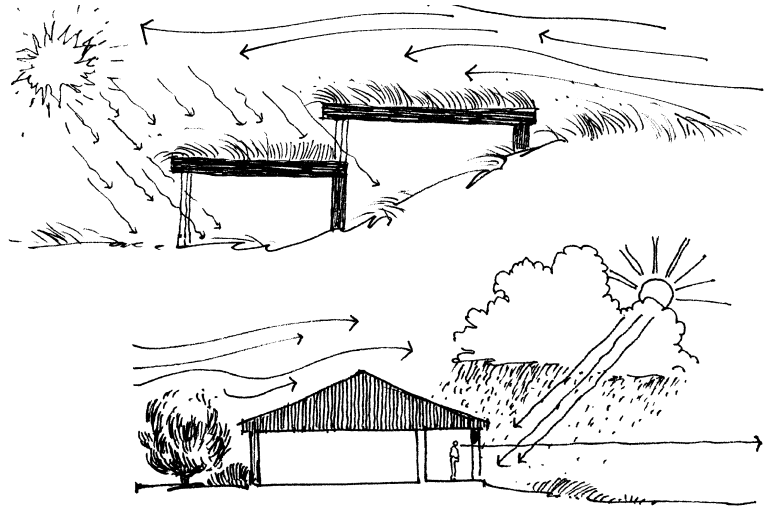


Inappropriate elements:



Excessive overhangs

Complex roofs



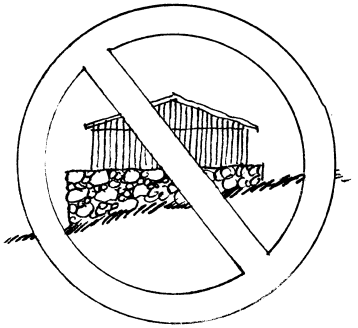
Porch as transition and protection

Base and Walls

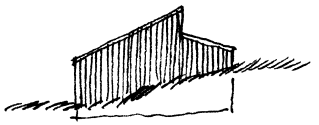
- Build straight walls, although some Native American buildings, such as Mandan lodges, featured curved walls.
- Construct walls from a single material without a strongly articulated separate base.
- Use light frame walls predominantly.
- Consider using rammed earth or hay bales for exterior walls.
- Integrate the base with a berm.

Walls should appear anchored to the land or rooted as though they grow from the land. This can be accomplished through:

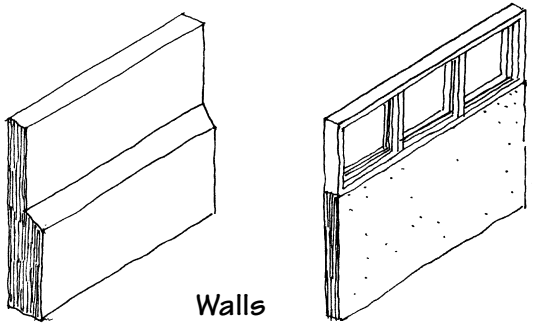
- Change of plane.
- Change of material.
- Use of uniform window sills.



Heavy Base

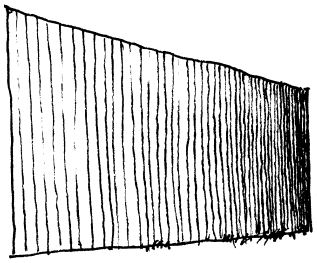


Rooted in the land

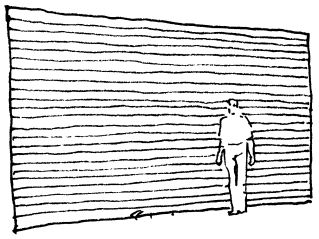


Walls

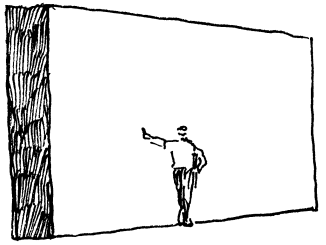
Walls are used to emphasize the horizontal:



Fine grained vertical



Strong horizontal



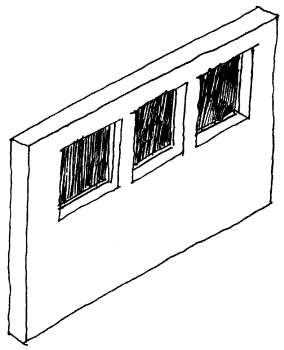
Massive earthen/masonry

Windows and Openings

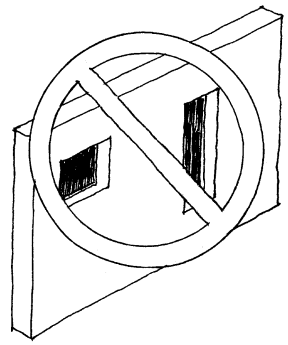
- Make windows more extensive on the south side.
- Align windows to create a horizontal pattern.
- Save energy and create a pleasant work environment by using clerestory windows to provide "daylighting" or allow natural light to illuminate interiors.
- Make entries obvious to first-time visitors. They can be marked and sheltered by a porch, which can double as interpretive space or as an outdoor work and meeting space. Porches provide a transition between the intimate indoors and the vast outdoors.
- Make windows energy-efficient through the use of low-E and triple-glazed glass. They should be operable to provide natural ventilation.
- Include vestibules or air locks for entries making them energy efficient.

Structure

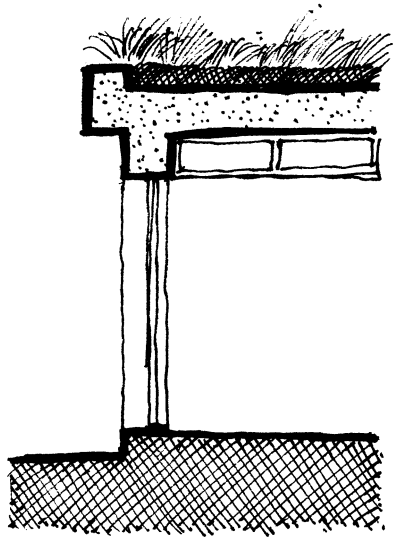
- Enclose rather than expose structural elements, such as beams and trusses. This provides for greater energy efficiency, lower maintenance costs and procedures, and clean architectural lines.
- Make buildings lightly framed but well-insulated.



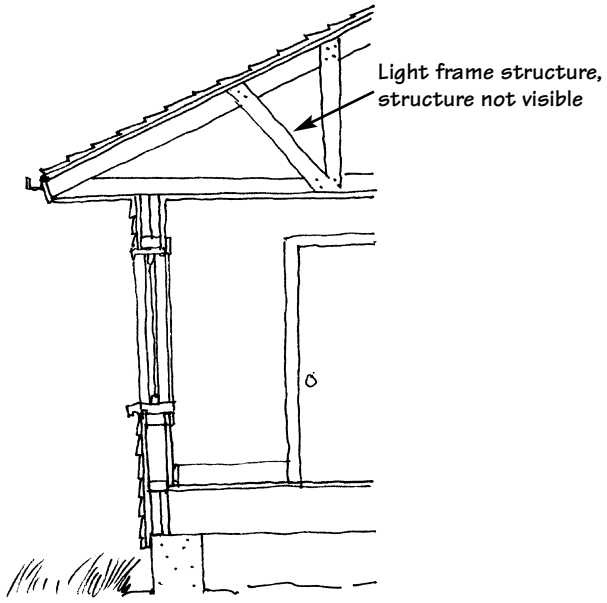
Horizontal sets of windows



Random openings



Thermal mass in earthen structure



Materials

- Use a fine texture and nonreflective building materials.
- Avoid such materials as massive boulders and heavy logs and timbers, which are not native to the Great Plains.
- Use suitable "native" materials, which include walls made from rammed earth, straw bale, and smaller-scaled sandstone.

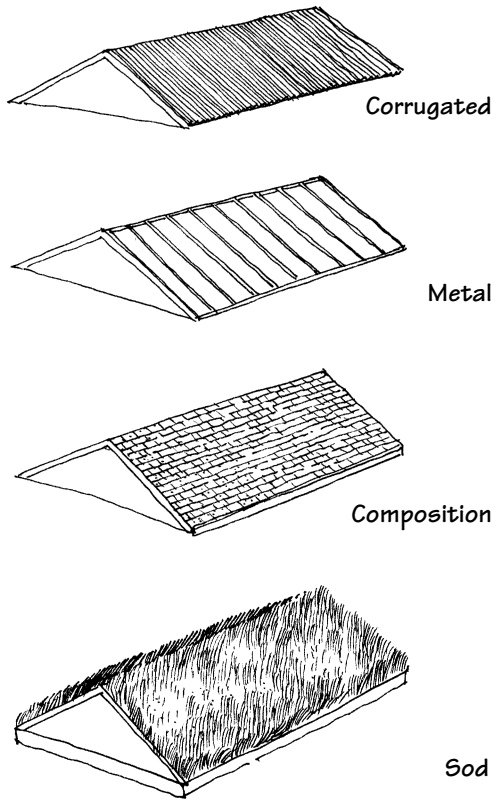
Suitable manufactured materials for siding include:

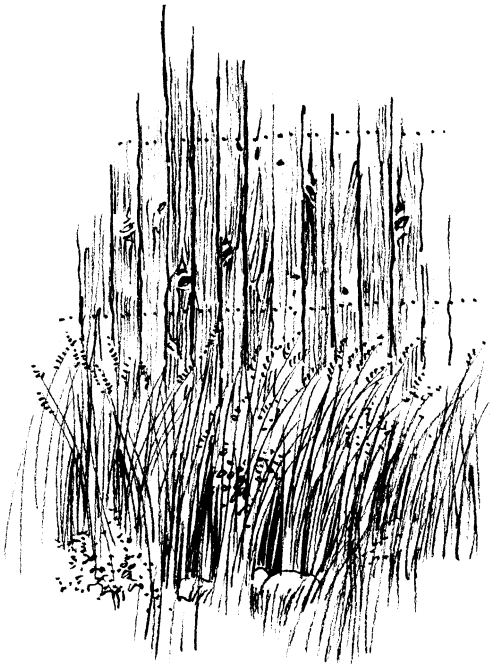
- Wood lap siding.
- Stucco.
- Corrugated metal (for roofs and siding).
- Poured concrete.
- Split-face concrete block.
- Finely detailed precast concrete panels.

Acceptable roof materials include:

- Metal.
- Composition shingles (thick, architectural grade).
- Concrete tile.
- Sod.

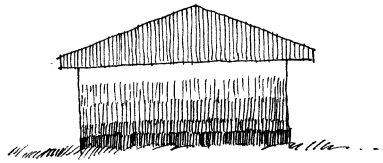
Range of roof materials:

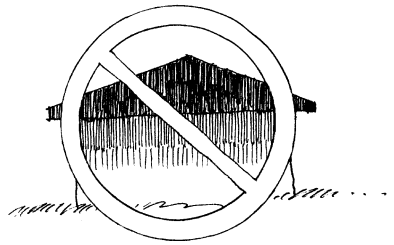




Color

- Study the landscape for cues.
- Use darker colors at the base of walls and lighter colors for the tops of walls.
- Use darker colors or earth tones (buff, tan, ochre) for expanses of walls, with brighter accents such as orange, sienna, green, or white for trim.
- Use neutral roof colors between light and dark, avoiding white or reflective materials.





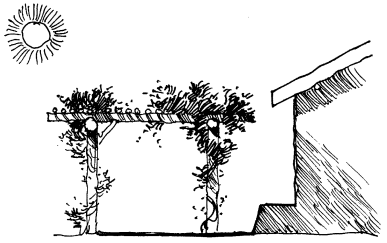
Medium tone roof
Darker tones at bottom

Study landscapes for color cues:

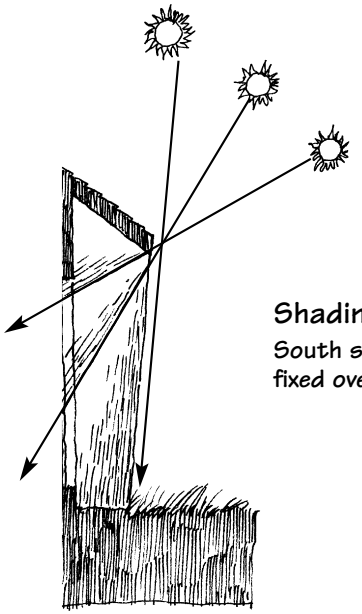
- Light brown and yellow
- Grass greens
- Light and pale yellow highlights
- Straw yellows
- Pale violets and blues

SUSTAINABILITY

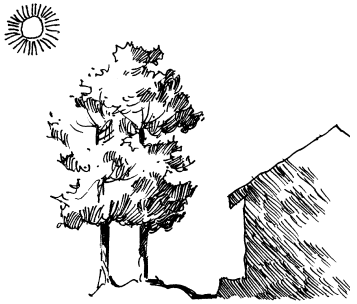
- Use indigenous materials, such as rammed earth, or agricultural products, such as straw bales for exterior walls.
- Use wind and solar power, which are viable in this region and fit within this cultural setting.
- "Harvest" rainwater for irrigation.
- Use drought-tolerant and wind resistant plantings.
- Plant wind breaks.
- Berm buildings and incorporate sod roofs to save on heating and cooling costs.
- Place buildings on an east-west orientation to maximize southern solar gains.
- Minimize the intense western exposure.
- Plant deciduous shade trees on the south and west sides.
- Include basements and berms to take advantage of the Earth's thermal mass for cooling and insulation.
- See the "Common Principles" section in the introduction to this chapter for more recommendations on sustainability.



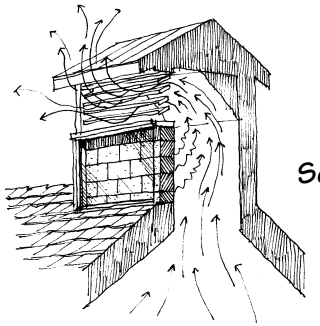
West side trellis shading



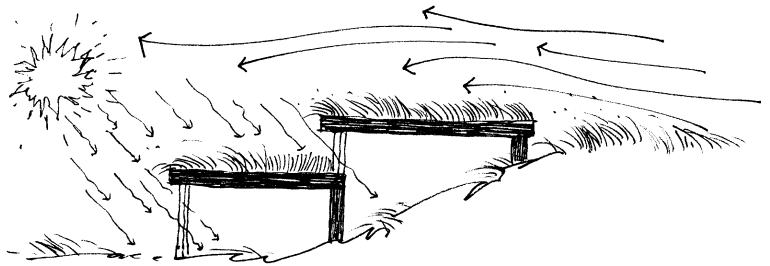
Shading:
South side
fixed overhang



Deciduous vegetation
located to west for summer
shading and winter solar gain



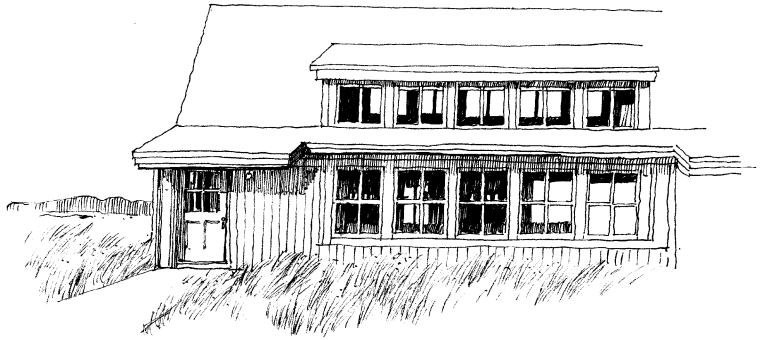
Solar chimney



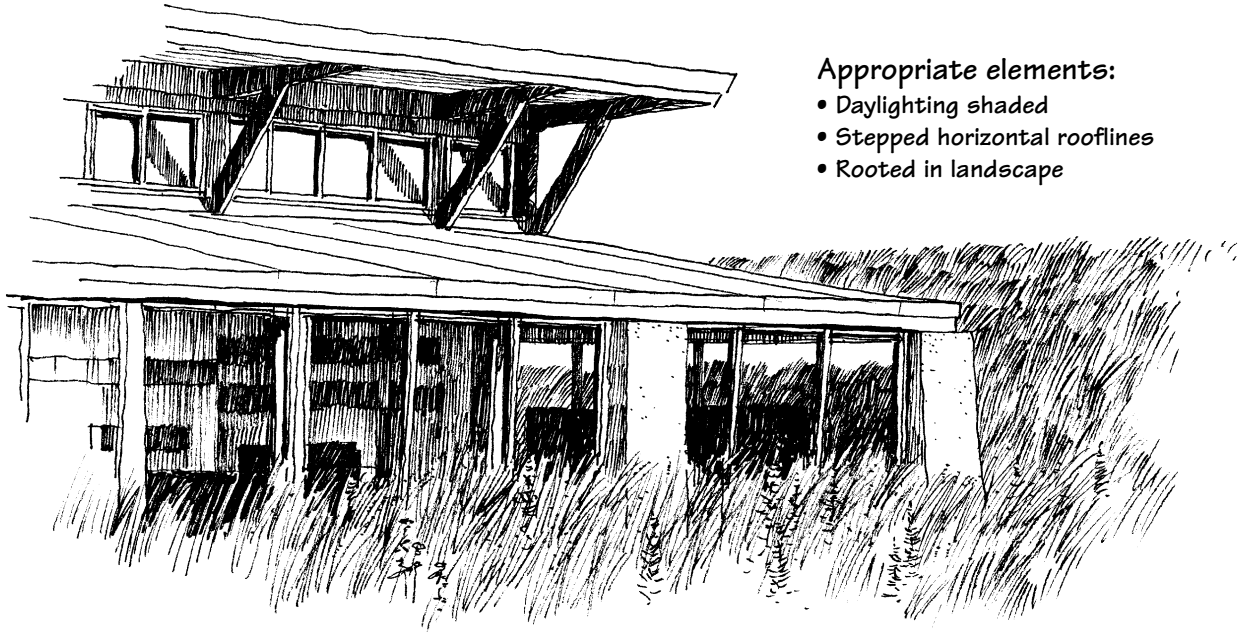
Topography used to shelter north winds

SYNTHESIS

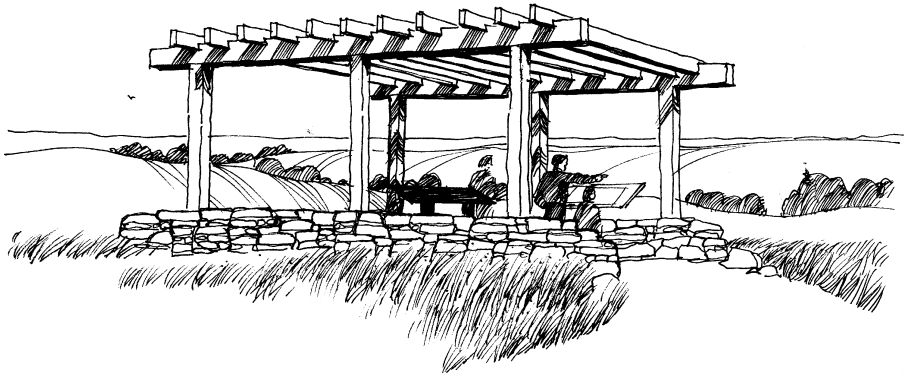
Forest Service structures on the Great Plains must respond to the subtle landscapes of their settings. They should be low to the ground, of light color and structure, and provide shade and other sheltering elements against a harsh climate. Study cultural landmarks such as ranch complexes and farmsteads to see how they were integrated into the land. To achieve sustainability, carefully choose materials that endure and provide comfort with minimal expenditure of energy and materials.



Work structure characteristics:
Solar orientation/daylighting

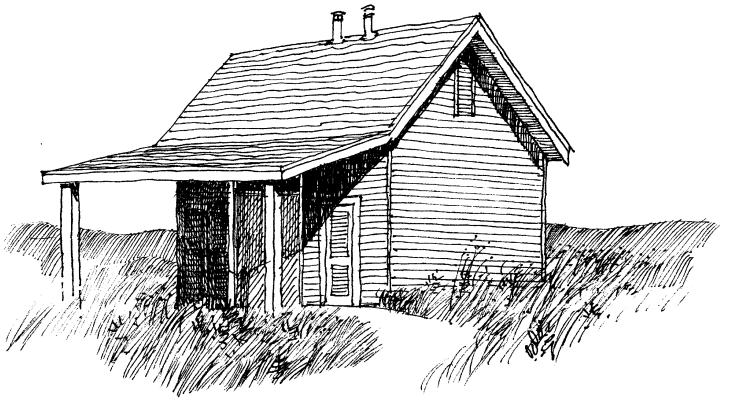


Appropriate elements:
- **Daylighting shaded**
- **Stepped horizontal rooflines**
- **Rooted in landscape**



Shade shelter, interpretive site characteristics:

- Light, dimensional timbers
- Local stone, such as sandstone, layered in horizontal pattern

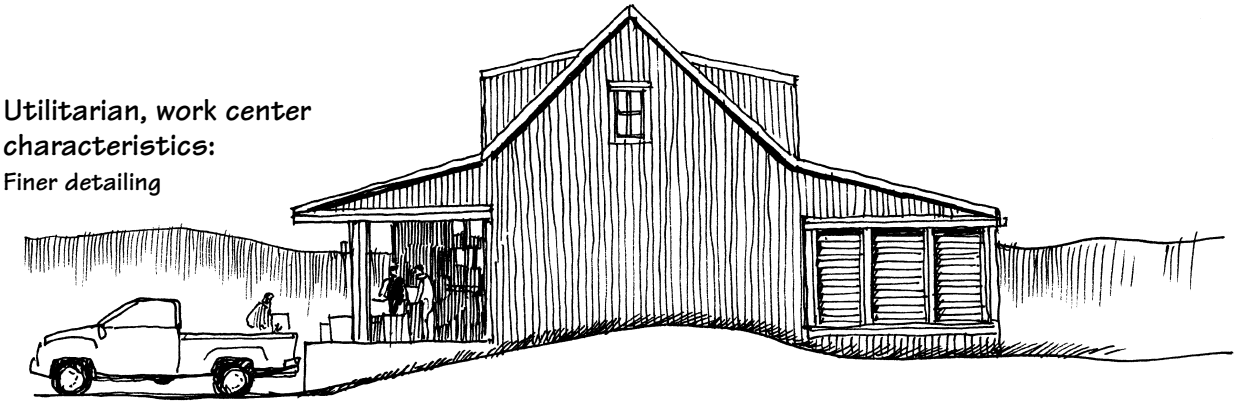


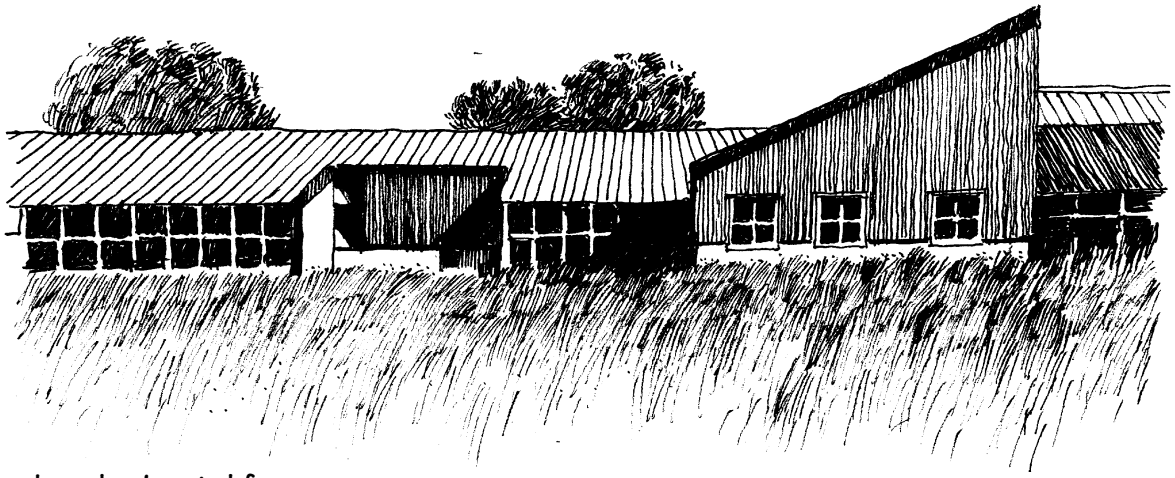
Toilet facility characteristics:

- Light structure
- Fine-scale materials

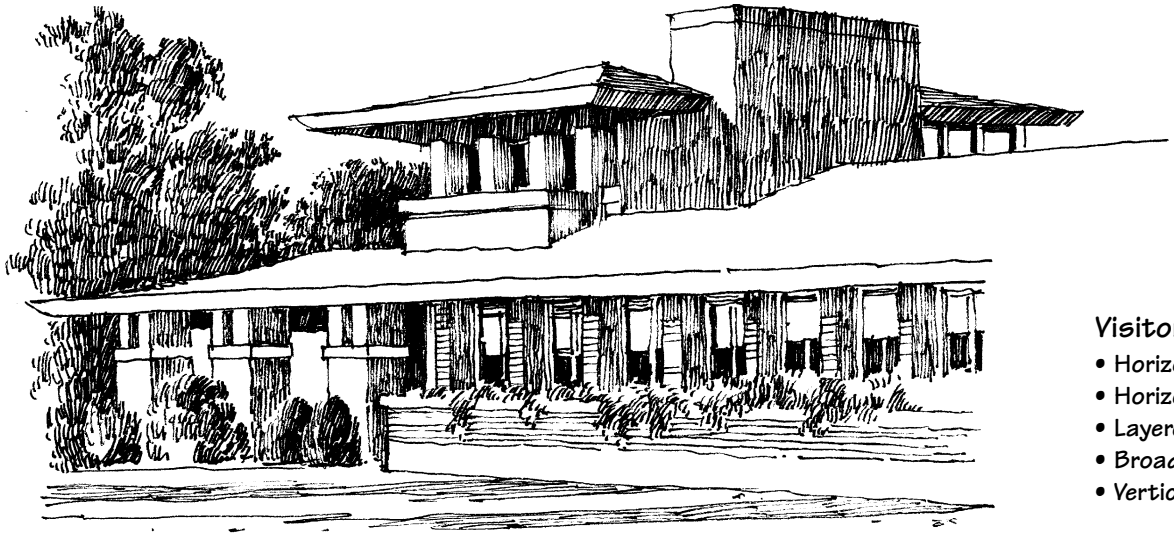
Utilitarian, work center characteristics:

Finer detailing





Low, horizontal forms



Visitor center characteristics:

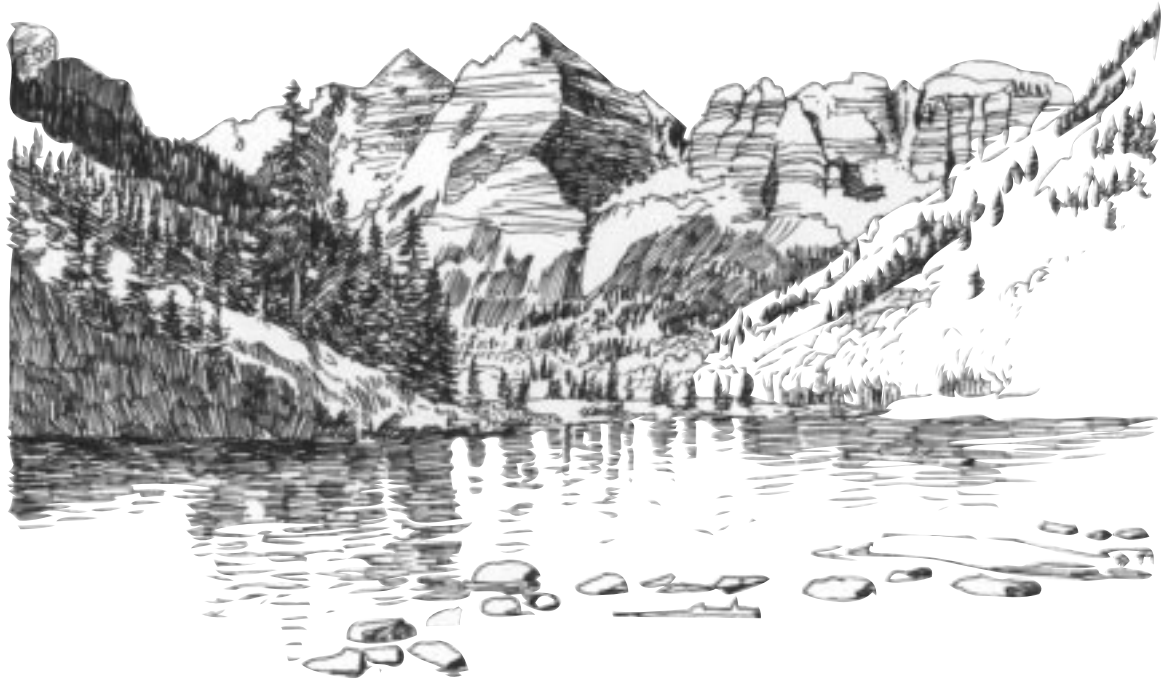
- Horizontal site elements
- Horizontal bands of windows
- Layered, horizontal planes
- Broad overhangs
- Vertical accent

Chapter 4.6

The Rocky Mountain Province

"If we build in sensible ways, responding to the opportunities and limitations afforded by each site, the light, climate and topography, we will also begin to reinforce the distinctive character of our region, deepening its residents' sense of place."

—Jeff Limerick




Rocky Mountain Province
including Black Hills

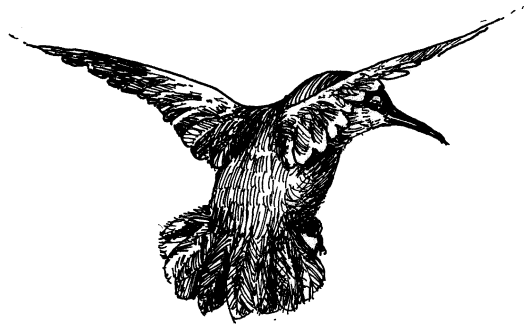
OVERVIEW: CHARACTER OF THE ROCKY MOUNTAIN PROVINCE BUILT AND NATURAL ENVIRONMENTS

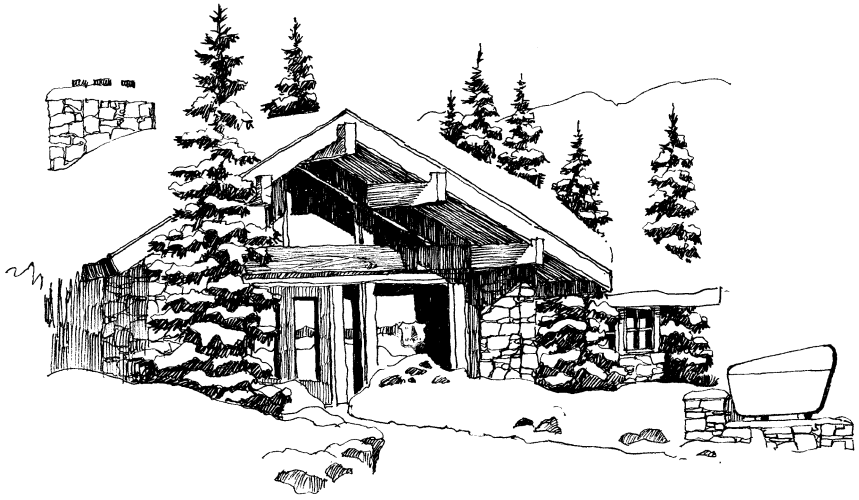
The Rocky Mountain Province contains some of our Nation's most celebrated landscapes. It also is a repository for examples of rustic architecture and landscape design that match the scale and materials of the province's mountains, valleys, and canyons. From the historic lodges of Yellowstone to the contemporary mountain resorts, this province offers many examples of buildings, roads, and site furnishings that seem to grow from their landscape settings. Author Harvey Kaiser notes that the Old Faithful Inn embodies the three "key working principles" of rustic design: "use of natural, local materials; allusions to pioneer building techniques; and strong ties to the site."

Contemporary Forest Service design should synthesize rustic precedents with contemporary needs and realities. For example, historic rustic architecture appeared comfortable within the forest, but this effect was frequently achieved by placing a veneer of natural materials over a conventional building. Today's Rocky Mountain structures may not always use natural materials. Yet they can still complement their settings, be more durable, consume less energy, and lay more lightly within the landscape than structures from previous eras.

The province's vast landscapes dwarf buildings and structures. Even though the landscape is overpowering in scale, it is fragile. Once disturbed, it heals slowly, if at all. Poorly designed buildings protrude awkwardly and destroy the long, open vistas that westerners treasure.

While this can be a challenging province in which to build, it also has high potential to promote sustainable designs built from locally harvested, renewable materials. It can take advantage of passive and active solar, as well as wind power.





INFLUENCES ON ARCHITECTURAL CHARACTER

Landscape and Ecological

The Rocky Mountain Province is generally sunny, dry, cool, and windy with long, sweeping vistas. In addition, the broad valleys, parks, and high plateaus of the mountains feature prairie-like qualities, such as flat land, grasslands instead of forests, and long views.

Geology is varied. It changes from exposed sedimentary sandstone in the foothills to granite outcrops in alpine glacier fields. Buildings may be enclosed by vegetation and landforms, with more limited vistas than in other provinces. Vegetation is more abundant and large scaled, including coniferous and deciduous forests with juniper, pinon, fir, spruce, lodgepole pine, willows, aspens, scrub oak, and cottonwoods.

The Rocky Mountain Province can be divided into foothills, broad mountain valleys, narrow valleys and canyons, alpine, and high plateaus.

The glaciated terrain of northern Idaho, western Montana, and eastern Washington encompasses some 38,100 square miles which includes rugged mountains, steppes, coniferous forests, and alpine meadows. Winters are harsh and skies are more gray than blue. Greater precipitation (compared to the rest of the province) makes possible stands of trees, such as giant western red cedar.

The middle and southern Rocky Mountains encompass a 102,300-square-mile area. Vegetation occurs in zones from the foothills (where grasslands and ponderosa pine dominate), to the subalpine spruce-fir forests, to the tundra of alpine areas above 14,000 feet. The mountains are punctuated by broad, flat valleys called "parks."

The coniferous Black Hills area in South Dakota, Nebraska, and Wyoming, springs from a core of Precambrian rock rising between 1,000 and 5,000 feet from the Plains Province. Trees range from white spruce, to eastern broadleaf species, such as ash and oak, to ponderosa pine and aspen. There are no alpine zones in these low mountains.

Cultural

This province contains some of the oldest structures in the United States, dating to the cliff dwellings and pueblo villages constructed by the Anasazi peoples. Yet we consider it a "new" province in America's history because it was settled by Europeans well after the East Coast or the Southwest.

Cultural influences include:

Farming and Ranching: Isolated in windswept, sun-beaten settings, the traditional farms and ranches of the Rocky Mountain Province provide excellent examples of architectural response to climate. They were built from materials available nearby. Their orientation and rooflines were carefully planned to withstand snow loads, high winds, and hot sun. They were often clustered in sheltering, village-like complexes making them flexible for changing uses and adaptations.

Mining: Mining structures, such as headframes, are among the province's industrial landmarks. They are unadorned, muscular structures, frequently built on the steepest and most sensitive natural landscapes. Although the mining legacy is sometimes that of environmental destruction, the simple and powerful structural forms continue to inspire new designs. Mining towns were built quickly with log cabins and shacks. After the railroads arrived, the more prosperous towns evolved, grew, and created sophisticated urban architecture derived from the towns and cities of the East. Cities such as Aspen, Colorado, and Park City, Utah, built fine hotels and opera houses that endure today as landmarks.

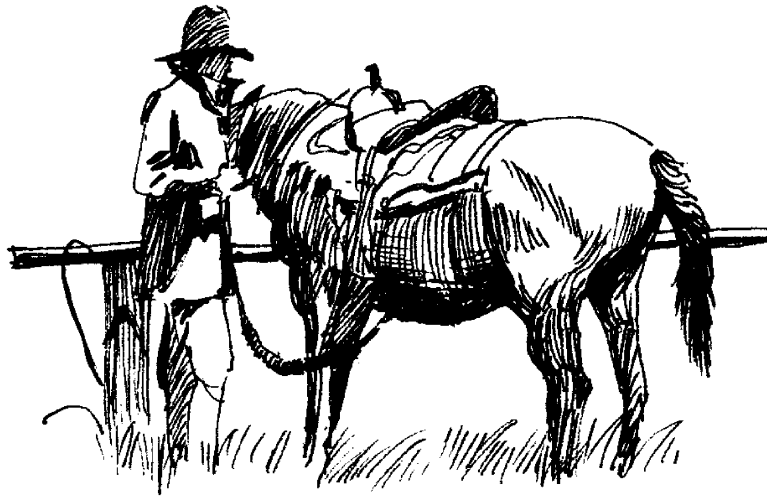
Railroads: They not only shaped the landscape and influenced settlement patterns, they also allowed building materials and prefabricated building parts, such as cast-iron façades, to be shipped from other provinces.

Immigration: The first European settlers imported their own building traditions, styles, and techniques. The mountain town of Crested Butte, Colorado, contains numerous examples of wooden Gothic buildings that Croatian carpenters constructed using Central European styles. Other important influences include Spanish, Mexican, and Mormon styles.

Rustic Style: In the first half of this century, the National Park Service and the Forest Service adapted the rustic style, which had been developed from models such as Swiss chalets and 19th century Adirondack lodges. Influential examples include the Old Faithful Inn at Yellowstone (1904) and the Timberline Lodge on Mt. Hood (1937).

Rustic-style buildings, often built by the CCC, are highly crafted structures featuring native stone and unhewn logs. The scale of details can be massive, even in the cases of kiosks or cabins. The rustic style was popularized in the 1900 to 1940 era by resort developers like Averill Harriman, who called Sun Valley, Idaho, the St. Moritz of America. In the Rocky Mountain Province, the public associates images of rustic-style lodges with recreation.

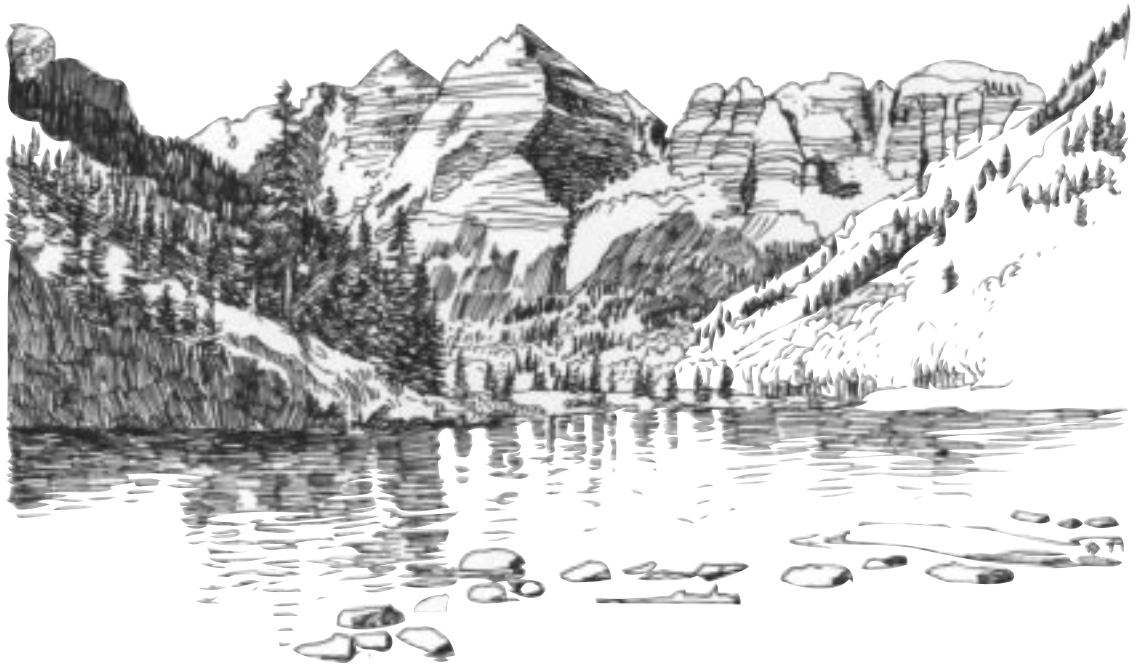
Solar-oriented and Sustainable Design: For three decades, the Rocky Mountain Province has been a leader in this area. This is in part because ever-present sunshine can be harnessed for heat and power. Institutions such as the Rocky Mountain Institute in Snowmass, Colorado, have provided leadership in "green" building and design.

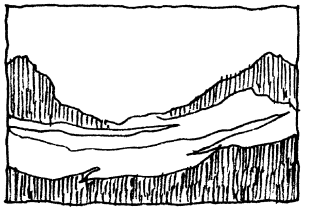


SUMMARY OF INFLUENCES AND RESPONSES THAT SHAPE THE CHARACTER OF THE BUILT ENVIRONMENT

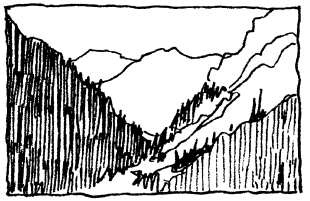
Ecological Influences

- Sparse rainfall.
- Low humidity.
- Abundant and intense sunlight.
- Dramatic freeze-thaw cycles.
- Visible geology—an abundance of rock visible on the Earth's surface.
- Long vistas with dramatic views.
- Wide-open landscapes that provide little sense of enclosure or sheltering from wind and sun.
- High winds.
- Thin soils.
- Less diverse vegetation compared to more humid, rainy provinces.
- Mountainous terrain including the high peaks that form the "spine of the Nation."
- High elevation.
- Clear, brilliant skies.

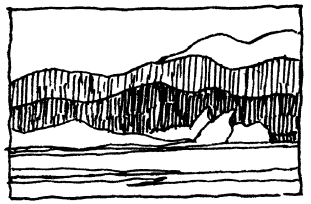




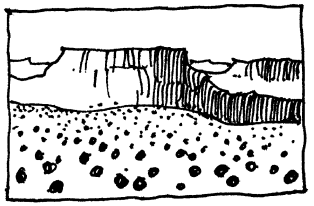
Broad mountain valleys



Narrow mountain valleys



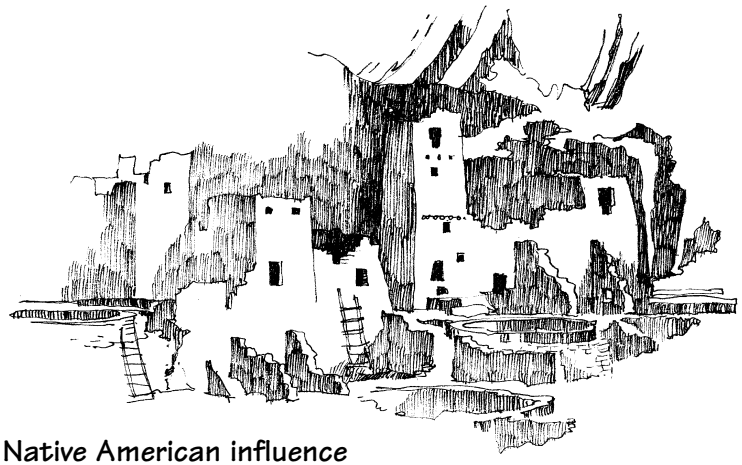
Foothills



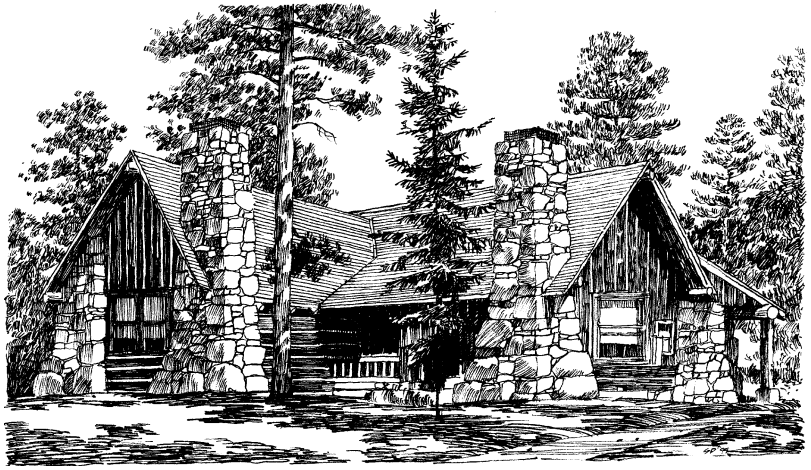
High plateaus

Cultural Influences

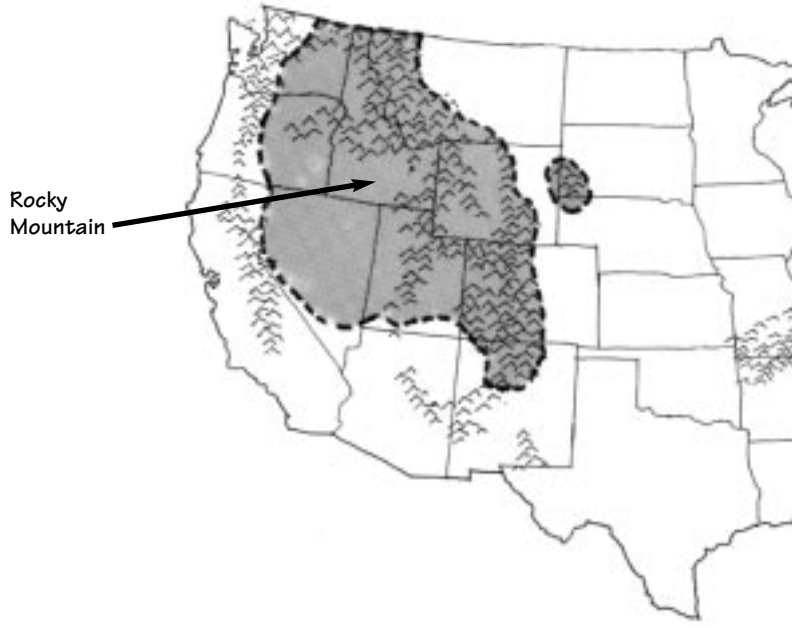
- European, Mormon, and Native American cultures.
- Mining.
- Ranching.
- Tourism, including national parks and resorts.
- Fast growing population with strong demands and expectations for all kinds of recreation.
- Strong heritage of rustic architecture and design.
- National forests and other public lands that comprise the majority of acreage.
- Strong public expectation for "wilderness experience."

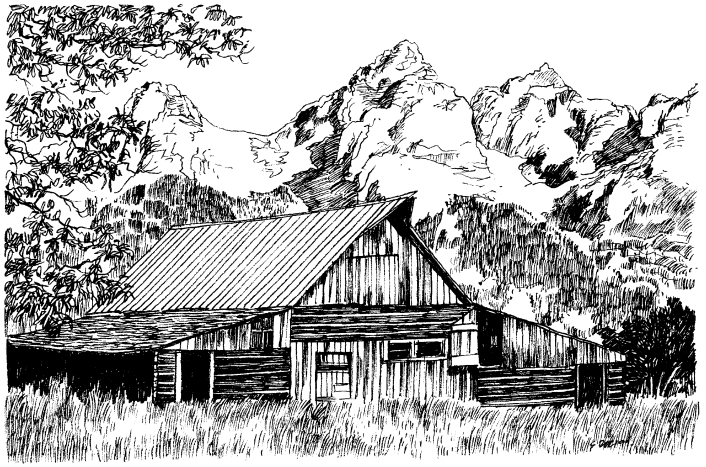


Native American influence



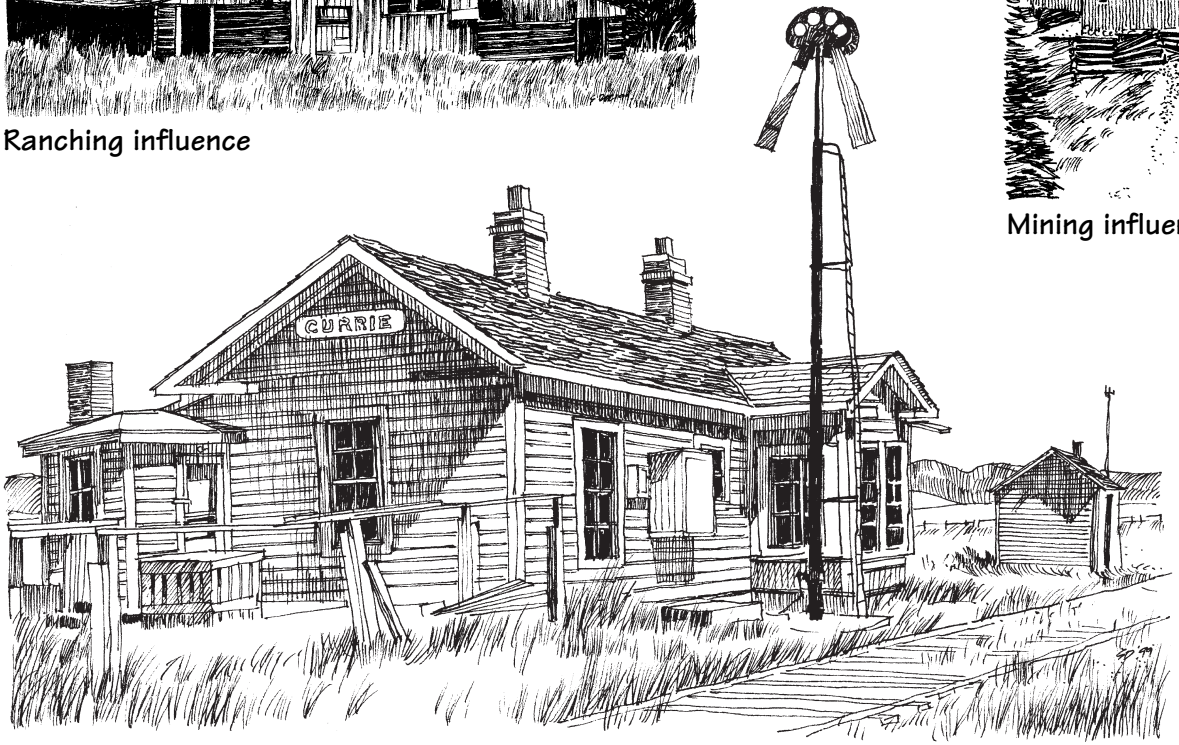
Rustic influence





Ranching influence

Mining influence

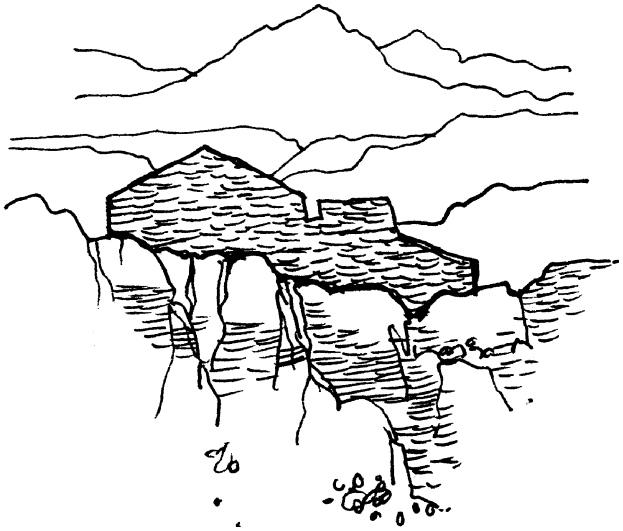


Railroads

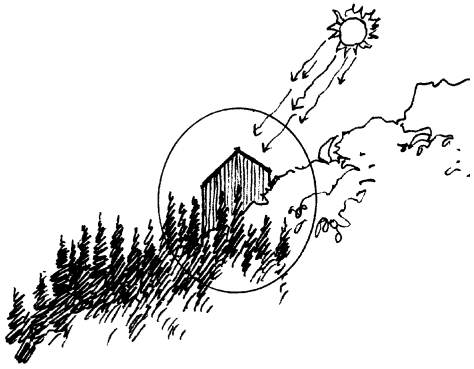
ARCHITECTURAL GUIDELINES FOR THE ROCKY MOUNTAIN PROVINCE

Siting

- Locate structures at the edges of clearings.
- Place buildings on the south side of dense vegetation or mountain slopes to ensure adequate sun for heat and light.
- Use low vegetation on the north side to anchor buildings to their sites.



Building in context with geological setting



On edges: good sun exposure

Structures located at transitions

Structural forms echo landscape forms

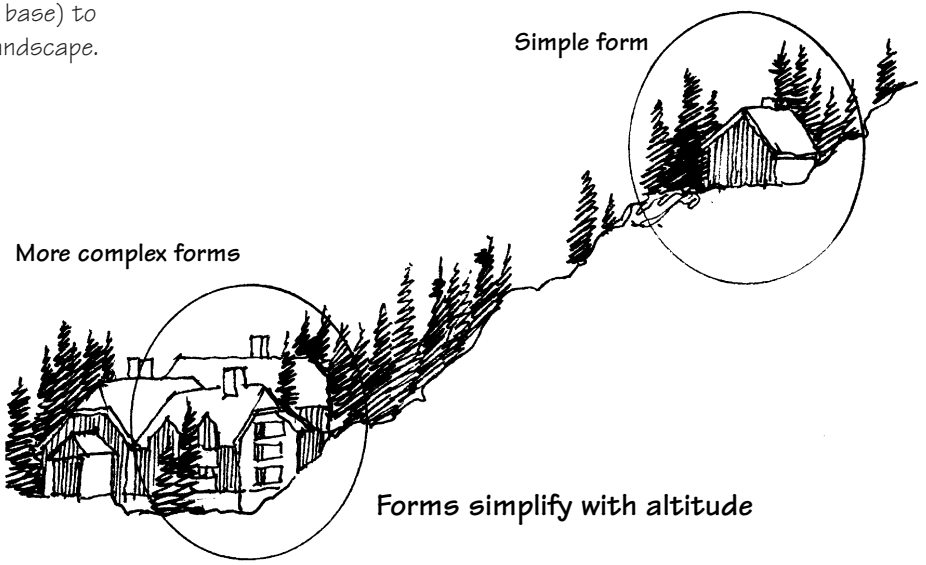
Massing and Scale

Mountain buildings and structures can be dwarfed by the grandeur of the soaring forests and rugged geological formations that surround them. Mountain buildings set within overscaled landscapes often include overscaled building elements, such as oversized doors and windows, heavy timber structures, and boulders incorporated into the building base. Such elements help humans relate to the overpowering scale of the landscape.

- Use simple, compact forms.
- Break up larger buildings with similarly shaped smaller masses.
- Repeat simple forms.
- Use large-scale building materials (such as boulders at the base) to match the scale of the landscape.

Large-scale materials

Simple form



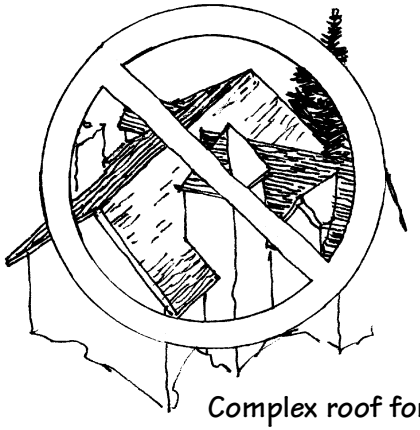
Forms simplify with altitude

Repetition of simple forms

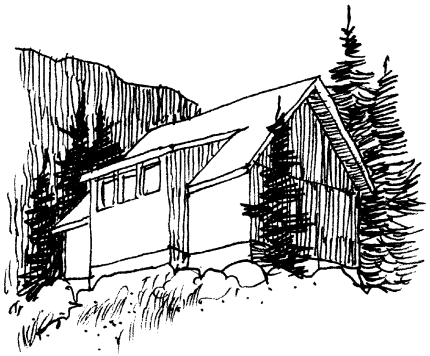
Roofs

Roofs should convey a strong sense of protection. They typically dominate the architectural composition.

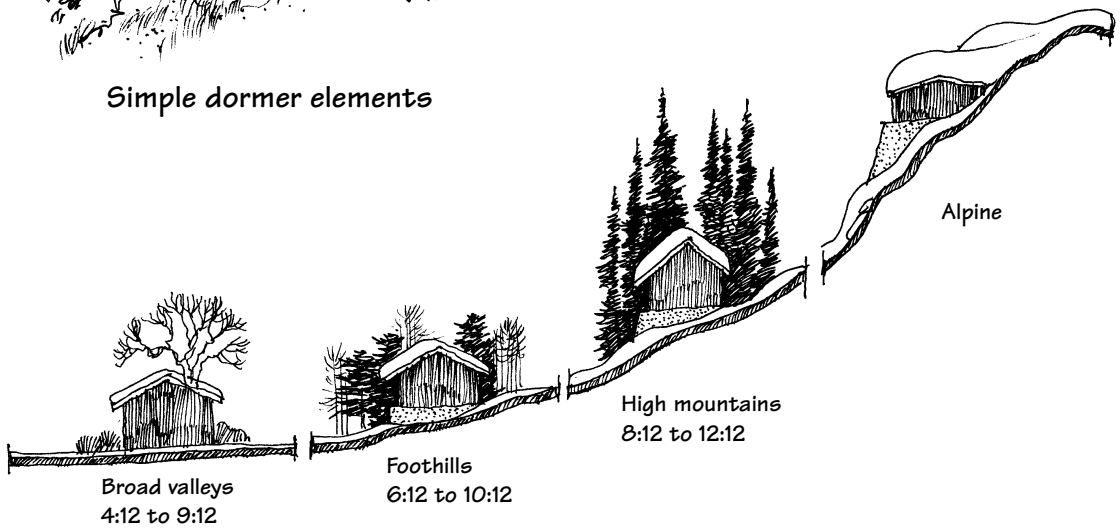
- Echo topography with the roofline.
- Increase pitch as the site steepens or as the forest becomes more vertical.
- Use alpine roofs with flatter pitch to avoid snowshed problems.
- Avoid complex multiple roof forms such as those that combine shed and gable dormers. These create "valleys" that trap moisture and cause maintenance problems.
- Provide broad overhangs at sites enclosed by landforms or vegetation.
- Provide modest overhangs at exposed, windy sites.



Complex roof forms



Simple dormer elements

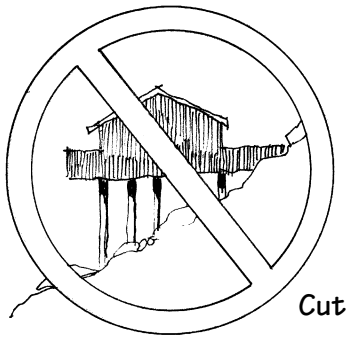


Roof pitch varies with verticality of landscape and setting

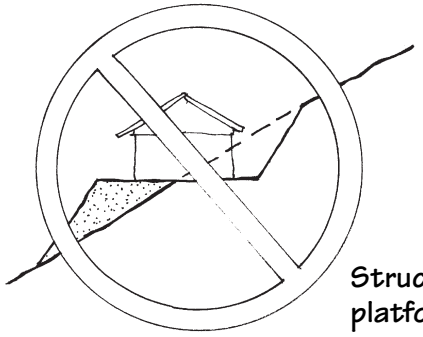
Base

The base functions as the transition from the landform to the mid-wall, creating a sense that the structure is growing out of the site.

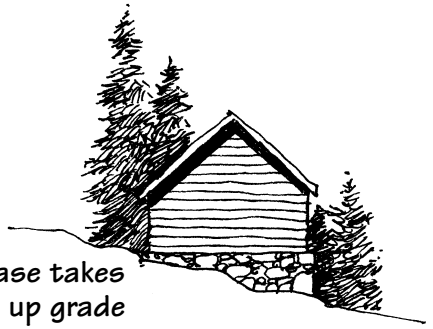
- Anchor the building into the site with a strong base.
- Use a uniform base on moderate slopes to provide a platform for the building.
- Step the base on steep slopes or for large buildings to match the forms and volumes of the building.



Cut and fill

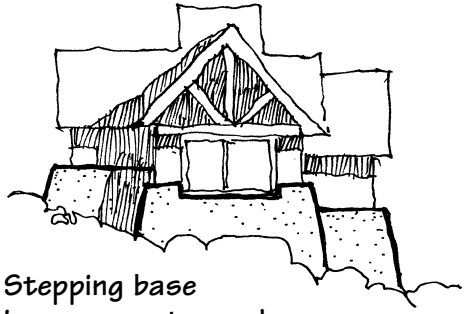


Structural platform



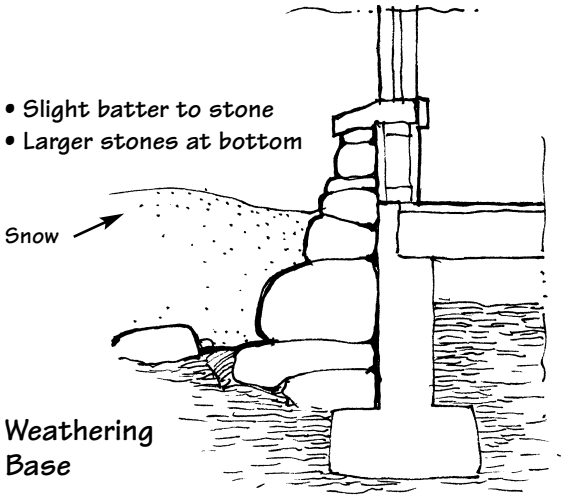
Base takes up grade

Where appropriate, base can "grow" out of the stone outcroppings



Stepping base in response to grade

Stepping base on steep slope



Weathering Base

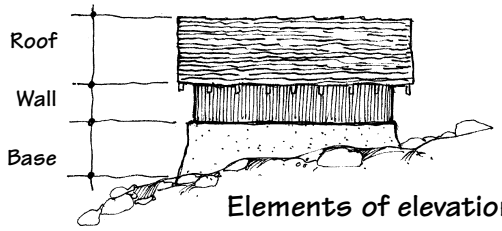
Walls

Walls can appear to be thick and substantial, with heavy corners. Emphasize corners through:

- Using larger materials.
- Making them solid—avoid placing windows and other openings in the corners.

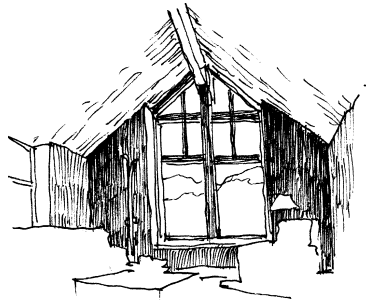
Windows and Openings

- Concentrate windows toward the center of wall planes to emphasize the mass of corners.
- Express windows as "punched" openings within solid, massive walls.
- Recess windows into the wall face to emphasize building mass and to protect windows from weather.
- Extend and slope window sills to shed water.
- Build a large porch to serve as an outdoor extension of the building.
- Construct a vestibule or airlock for comfort and energy efficiency.

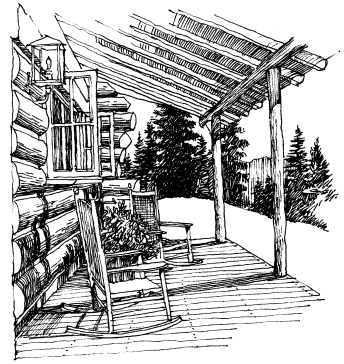


Elements of elevation:
Wall is less dominant than roof

Strong corners

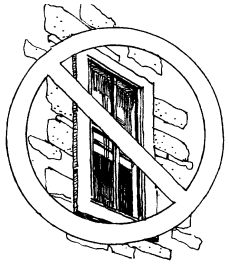


Large windows

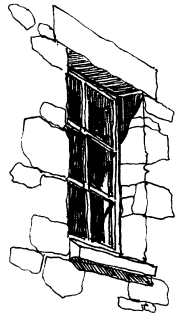


Porch as an outdoor room

Windows are openings to the exterior:

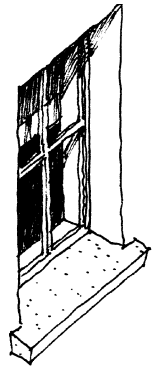


Flush windows with boxed frame



Recessed windows

Clusters of vertical windows are effective



Sloping sill with drip

Structure

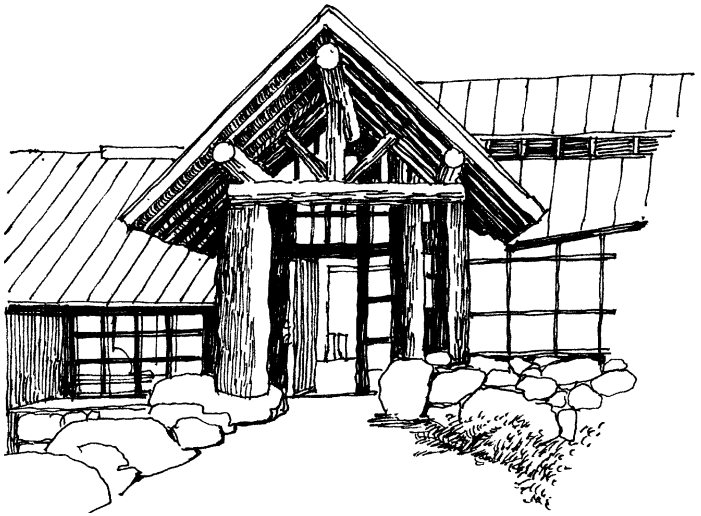
- In buildings designed for public use, express the structure by exposing wood beams, trusses, brackets, or framing.
- Handle cosmetic expressions of structure—such as nonstructural log beams—with care.

Materials

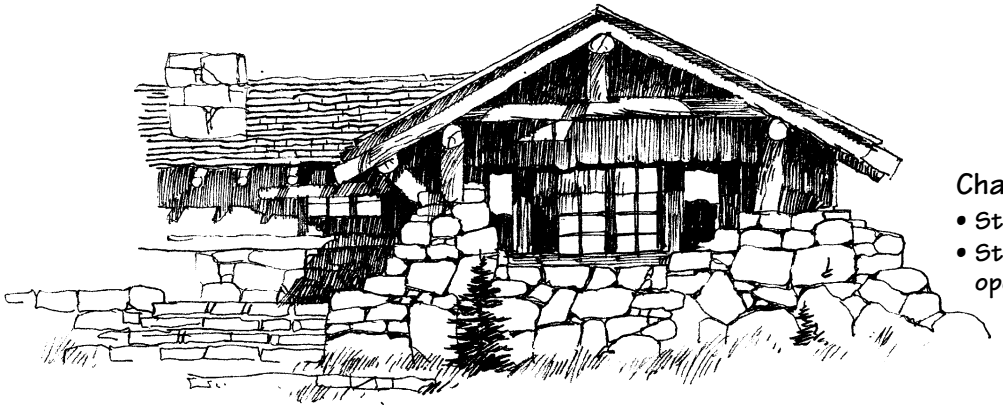
- Use stone, wood, heavy timber, and other natural materials when they are available and practical to use.
- Substitute manufactured materials, such as synthetic stone, if they can achieve the appearance of natural materials. The key is to make the scale, color, and texture of materials correspond to the setting.
- Consider costs and availability in remote locations.

Roof Materials

- Design to achieve the look of cedar-shake shingles using such substitutes as heavy-textured asphalt shake shingles.
- Use metal if sensitively designed.



Well-defined main entry expressing structural elements

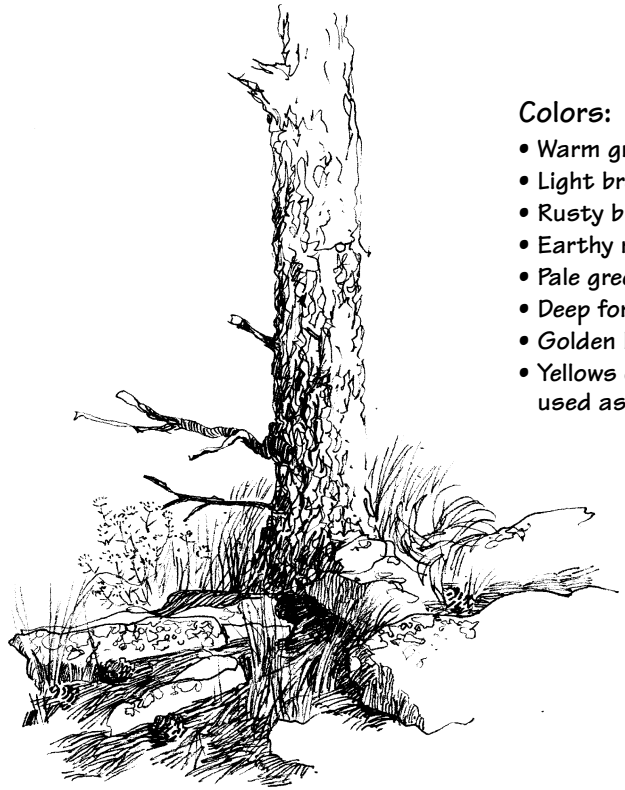


Characteristics:

- **Structure exposed**
- **Stone and timbers openly expressed**

Color

- Analyze the local landscape for indigenous colors and materials.
- Use color schemes that are inspired by rock outcrops, leaves or needles, tree trunks and bark, and colors found on the forest floor.
- Dominate the palette with earth tones.
- Integrate colors with natural materials where possible.
- Use accent colors drawn from accents of the setting: the green or orange-rust of lichen, the red-brown of red-twig dogwood, the deep burgundy of willow stands, and the ivory of aspen bark.

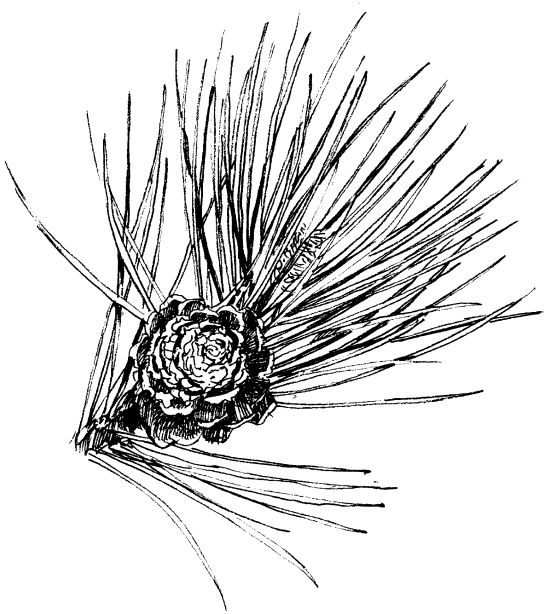


Colors:

- Warm grays of bark
- Light browns
- Rusty brown of needles
- Earthy rose of rocks
- Pale greens of lichens
- Deep forest greens of trees
- Golden brown of pinecones
- Yellows & violets of wildflowers used as accents

SUSTAINABILITY

- Minimize site disturbance by following the contours of the land and locating structures near existing utilities.
- Minimize the construction of new roads and parking.
- Use local and indigenous building materials.
- Integrate passive solar into building design with proper orientation, massing, window location, shading, ventilation, and shade structures.
- Use natural, nontoxic building materials that require little maintenance. Use photovoltaics for supplementary power.
- Use thick, massive walls for thermal mass, such as masonry, earth walls, and so forth.
- Emphasize water conservation in fixtures, water harvesting, xeriscaping, and graywater recycling.
- See the "Common Principles" section in the introduction of this chapter for more recommendations on sustainability.



SYNTHESIS

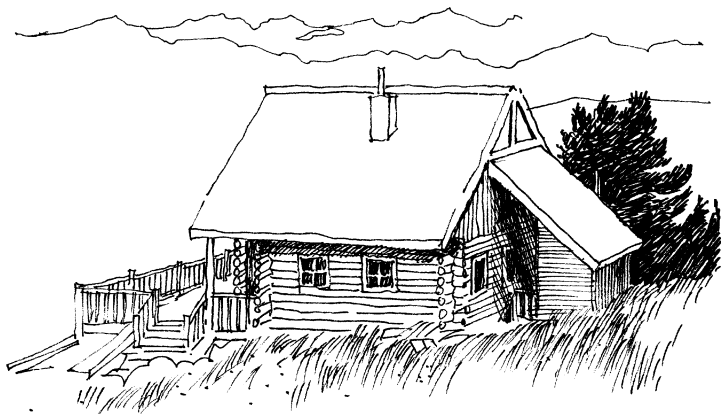
Structures of the Rocky Mountain Province should match the impressive scale and texture of their settings. Achieve this by using materials found in the landscape, such as timbers, boulders, and natural stone pavers, and by making substantial structural members, such as brackets, beams, and posts, visible. Designers can examine and learn from the province's rich tradition of rustic architecture, log cabins, and mining structures.

Restroom characteristics:

- Strong roof with protected entry
- Extra daylight-exposed structure
- Strong base
- Can be prefabricated or built on site

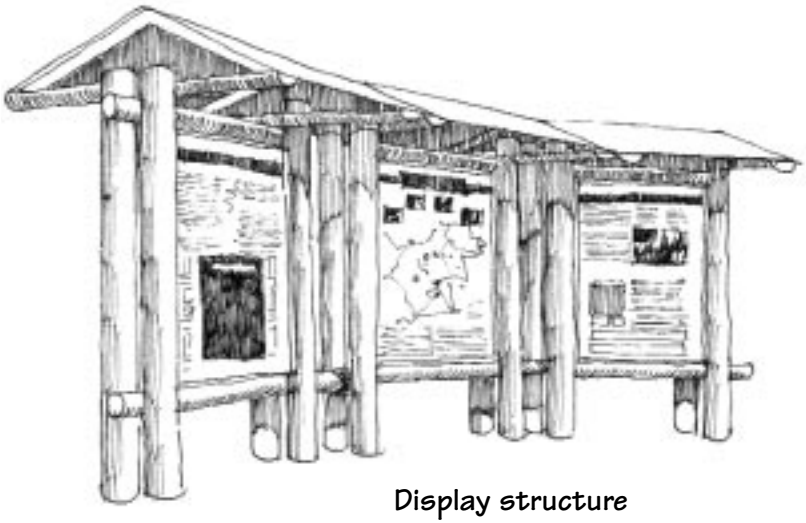
Public office characteristics:

- Simple roof
- Well-defined entry
- Broad porches



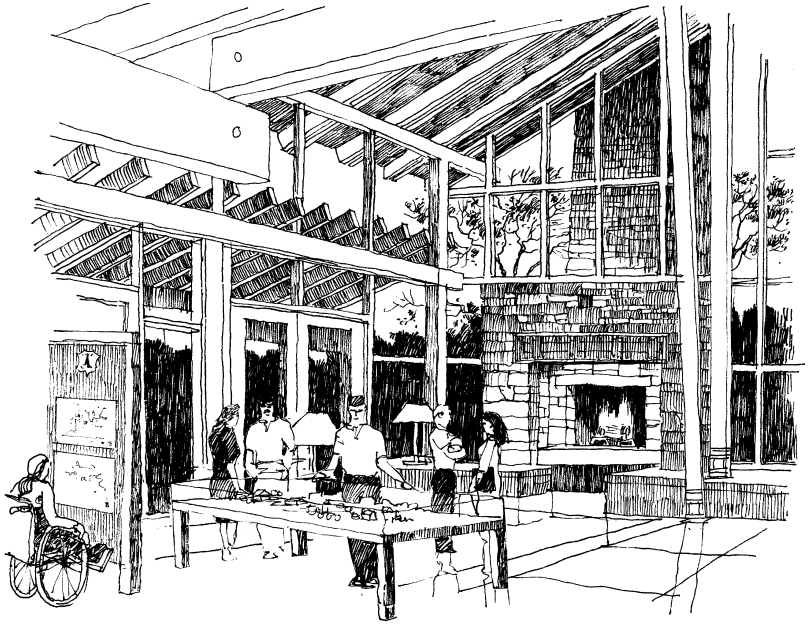
Recreation cabin characteristics:

- Simple massing
- Outdoor room
- Local materials
- Detached toilet



Display structure characteristics:

- Fully expressed log structure
- Overhang for protection



Visitor center characteristics:

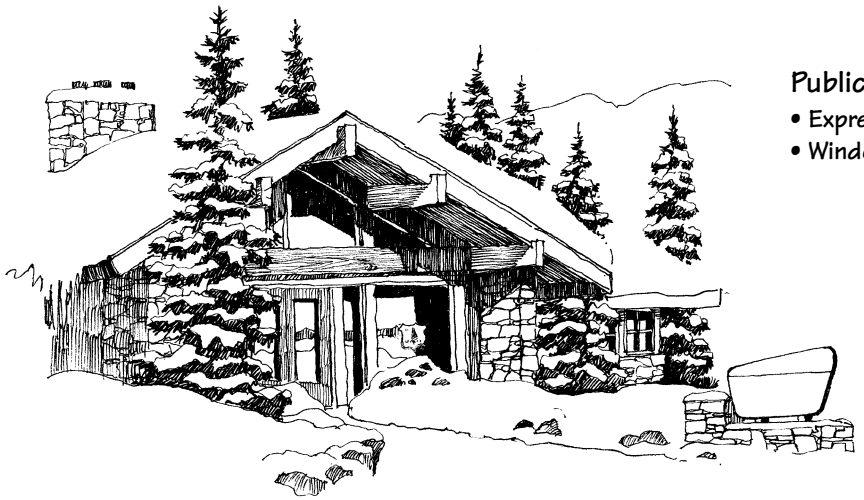
- Open, expressed structure
- Daylighting, open to views
- Natural materials

Public/office characteristics:

- Strong entry identity
- Daylighting

Vista point characteristics:

- Unobstructed views
- Natural materials
- Stone and setting of stone match local formation
- Flowing natural line of path, integrated into site



Public/office characteristics:

- Expressed structure of stone and heavy timber
- Window area contained within strong structure

Utilitarian building characteristics:

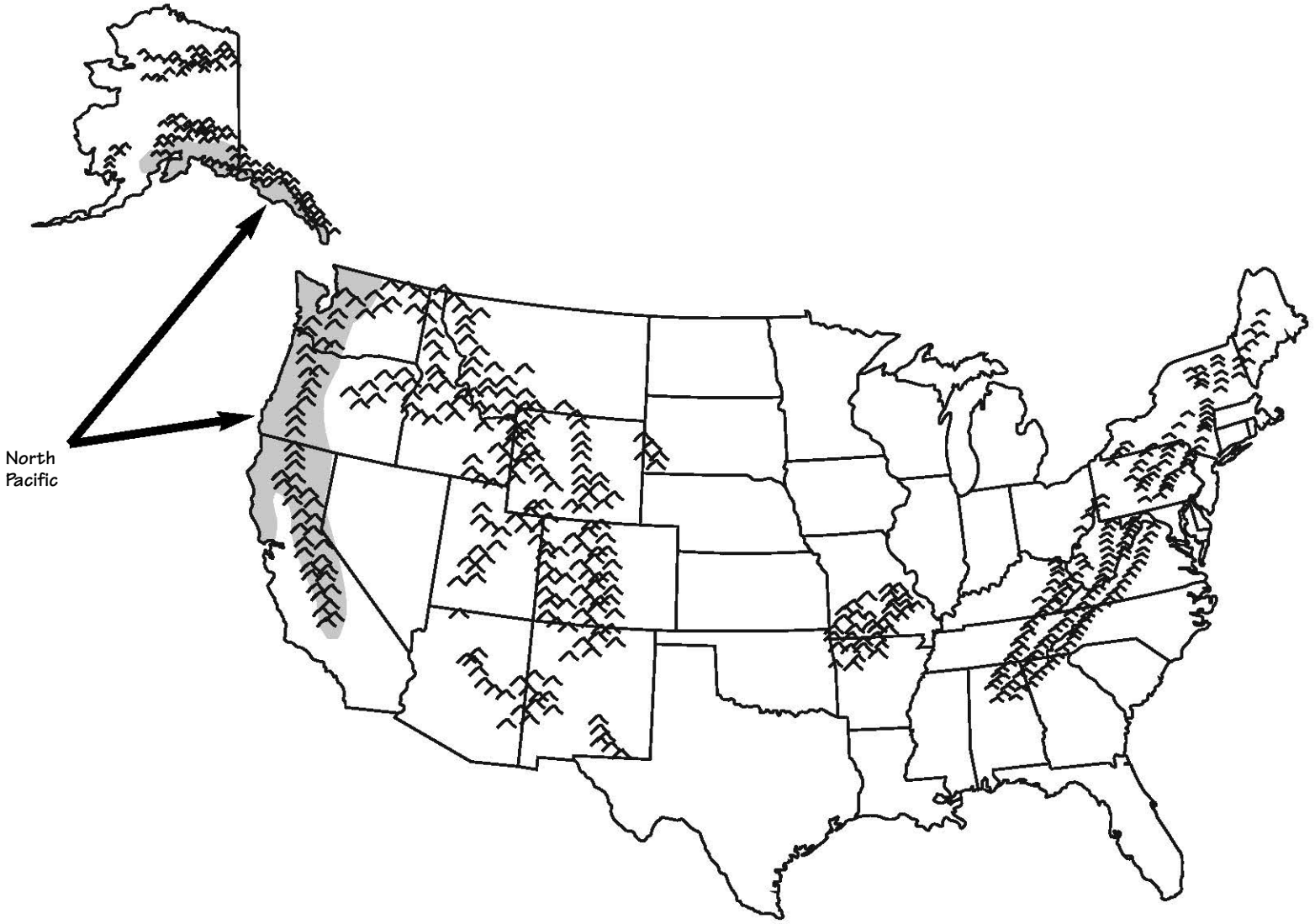
- Simple massing and form
- Landscaping to screen work areas
- Materials sensitive to the setting
- Protected entry

Chapter 4.7

The North Pacific Province

"A natural environment of this magnificence and grandeur has had a humbling impact on the region's architecture.... This is not the climate for loud and glamorous architecture."

—Douglas Kelbaugh


North
Pacific

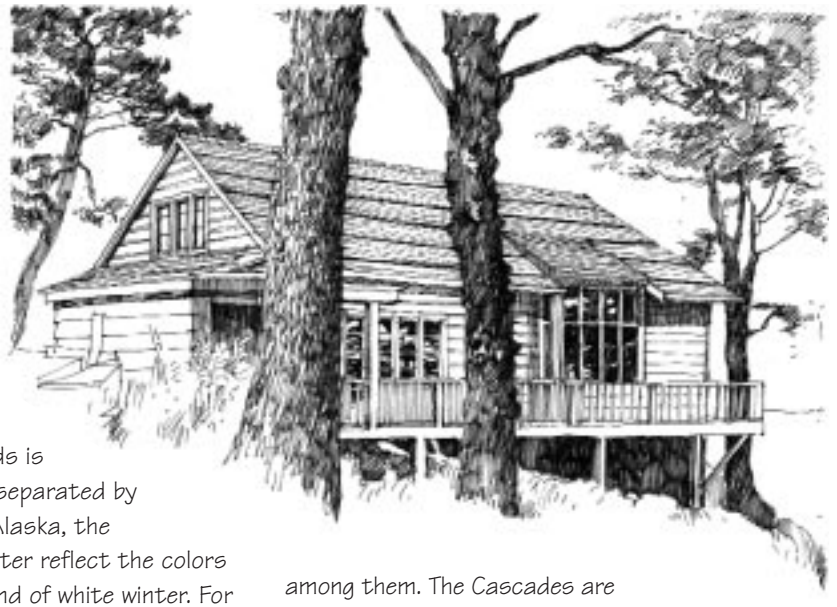
OVERVIEW: CHARACTER OF THE NORTH PACIFIC PROVINCE BUILT AND NATURAL ENVIRONMENTS

The North Pacific Province includes the national forests and scenic areas in northern California, northwestern Oregon and Washington, and the coastal region of Alaska. This is a land of dramatic landscapes and climate and diverse cultural influences. These elements are frequently celebrated through a regional architectural style called Cascadian.

The landscape has been altered but not nearly tamed by human settlement. It is still being shaped by volcanoes, glaciers, seismic movement, and tidal surges. Climate, maritime forces, and landscape are inseparable elements. Some areas receive more than 100 inches of rain annually; others up to 26 feet of snow. The intense precipitation fosters lush, dense plant life, including a rare temperate-zone rainforest and some of the world's largest trees. Vivid contrasts are everywhere. The province's rainiest point in the Olympic Range (240 inches per year) is a day's hike from its driest coastal spot, Dungeness Spit (15 inches).

Forest Service design in the North Pacific includes a richness worthy of this landscape. The bridges, parkways, and buildings of the Columbia River Gorge, the Timberline Lodge on Mt. Hood, and the Visitor Center at Mendenhall Glacier are only three examples of Forest Service structures that match the grandeur of their settings.

INFLUENCES ON ARCHITECTURAL CHARACTER



Landscape and Ecological

"The great trees are seldom crowded, and their columnar trunks may rise dozens of feet skyward before the first branches appear. …The space beneath may be open enough that light filtered through the upper branches is diffused to create a softly luminous glow throughout. The effect is not one of gloom, but of solemnity."

—Stephen Whitney, *Western Forests*

Literature about the North Pacific consistently sounds such themes as reverence for nature and a strong desire to harmonize with the setting. Perhaps this is because the province possesses such a wild and grand scale. People have a front row seat on major ecological processes. Glaciers, rivers that change course, volcanoes, and earthquakes shape a young landscape that seems only recently emerged from the primeval era. West of the Cascades, the maritime climate creates moderate temperatures and high precipitation. This maritime influence sends storms from the west to the east.

In Alaska, the steep mountains of the Tongass National Forest collide with the ocean. Inland are glacially carved valleys, lakes, and waterfalls. The Coast Range meets a sea dotted with tidewater glaciers and islands. Farther north and west in the Chugach National Forest, the land masses are constantly shifting in a landscape dominated by glaciers. Broad valleys contain filled-in fiords that have become marshlands bisected by glacially fed rivers. The archipelago of coastal islands is foggy, heavily forested, and separated by deep channels. Throughout Alaska, the landscape, sky, light, and water reflect the colors of glacial blue, of gray fog, and of white winter. For a brief burst in summer, wildflowers alter the landscape with an explosion of color.

The most visible geology results from angular forms of graywacke shale. Even at lower elevations, trees cover the landscape only in patches. The treeline can occur as low as 1,500 feet.

The Cascade and Klamath ranges of Washington, Oregon, and northern California are extremely rugged, with large mountains dominated by volcanic peaks and deep, heavy snows at higher elevations. Some of the world's largest and oldest trees live within this lush, cool coniferous forest: Douglas fir, Sitka spruce, western hemlock, and coast redwood among them. The Cascades are a place with abundant rivers, streams, and waterfalls. The west side comes in many shades of green dictated by ferns, mosses, and big trees that stay green through the year. High rainfall intensifies colors in the landscape.

East of the Cascades is much drier with sparse vegetation. Rolling hills and high prairies are punctuated by volcanic cones. Space between trees seems open and expansive with long vistas. The landscape is generally rural rather than wilderness with irrigated fields, pasture, orchards, and rangeland. Colors are warm with pastel hues varied by the rock and soil visible through the vegetation. Shades of dark gray, dark brown, and

black are evident in rock formations of columnar basalt. Signature trees include ponderosa pine, lodgepole pine, and sugar pine.

North central California includes the Mediterranean subarea of this province embracing the northern Sierra Nevadas. Here coniferous forests, shaped by long summer droughts and mild wet winters, are extremely diverse. Species range from giant sequoia in the high mountains to California red fir to bristlecone pine.

Cultural

Native American Design: The original Native American inhabitants built to deal with precipitation. Along the Pacific coast, on the Columbia River plateau, and within the Great Basin, the inhabitants of each area made their own adaptations.

In the coastal zone, houses were made of planks from driftwood logs or sometimes split from the sides of living trees. The large communal dwelling might be a gable-roofed long house with vertical plank walls, as among the Quinault in Washington, or shed-roofed long houses, as among the Tillimook. In southern Oregon and northern California, the Umpqua, Chetco, Yurok, and Hoopa built related types of "hooped branch" houses.

European Settlers: The first European settlers built log structures, often using trees cleared for farming. They built farmhouses (Scandinavians, English, Germans), trading posts (French), and forts (Russian). They typically used broad-hewn logs locked in dovetail joints. Onion-dome Russian churches endure along coastal Alaska.

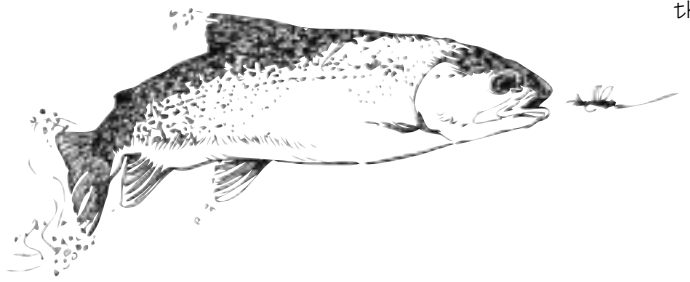
Agricultural Structures: The simple forms of traditional Willamette Valley barns have inspired many contemporary architects and artists. These picturesque barns employed building techniques in use since medieval times: heavily timbered frame construction held together by skillfully made mortice and tenon joints.

Rustic: From about 1890 to 1940, architects and designers created a Northwestern variation on the rustic design called Cascadian. An early example is the Cloud Cap Inn, a hikers' lodge on Mt. Hood, perhaps inspired by rustic buildings then being constructed in the Adirondacks.

The CCC of the 1930's incorporated rustic design and a high level of craft into public works. A notable example is the shelters, pavilions, way stations, and comfort facilities built along the Columbia Gorge Scenic Highway. In the late 1930's, the WPA built Timberline Lodge, an Arts and Crafts extravaganza that employed scores of masons, carpenters, sculptors, and artisans.

Alaska: Many Alaskan buildings and sites were designed for access by boat or float plane. Alaskan design ranges from the Quonset huts of the Aleutian Islands, to the Russian churches of Sitka, to industrial oil terminals and canneries. Coastal fishing villages are a building type somewhat unique to Alaska. These villages typically feature brightly colored cottages rising on steep slopes straight up from the waterfront.

Northwest Modernism: The Modernist movement aimed to create a worldwide design—the so-called International style. The Northwest responded with variations. In the 1930's and 1940's, architects Pietro Belluschi and John Yeon designed modernist churches inspired by barns of Oregon's Willamette Valley. They adapted their buildings to the Northwest by using wood as a structural material and by including broad roof overhangs to keep rain off windows. More recent architects skillfully meld natural and industrial materials suggesting that modern design can be contemporary in spirit, massive in scale for durability's sake, and yet comforting to the human touch and scale.



SUMMARY OF INFLUENCES AND RESPONSES THAT SHAPE THE CHARACTER OF THE BUILT ENVIRONMENT

Ecological Influences

- Moist, cool climate with lots of rain, fog, mist, and snow.
- Temperate maritime climate.
- In California, hot climate with Mediterranean influence and design responses similar to the Southwest Province.
- Rugged terrain with many rock outcrops and lava flows.
- Volcanoes, glaciers, and earthquakes that are still shaping a young landscape with sharp peaks and massive landforms.
- Prevailing winds from the west, with highs from the northwest and lows from the southwest.
- Lush, dense vegetation that is green year-round.
- Forests that are largely coniferous and contain the world's largest and oldest trees.
- Water elements, including lakes, rivers, fiords, and waterfalls, that are prevalent and of a large scale.
- Much landscape that occupies the edge between ocean and land—a magnet for diversity of people and wildlife.
- Declination of the sun that creates radical angles of light.
- Long vistas with snow-capped volcanic peaks.
- Sunlight that has become important, even revered, when it appears because of prevalent gray skies and short winter days.

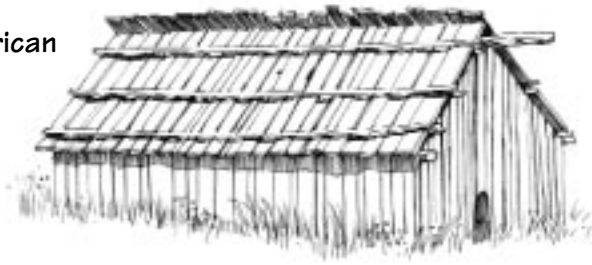
Cultural Influences

- Russian influence is seen in remaining forts and onion-dome churches.
- Native influence is seen in such structures as the long house, with few windows and planked construction that sheds rain. Colors are red, aqua, and black.
- Culture of totemic art is incorporated into CCC-era buildings in Alaska.
- Asian influence is seen in low structures with expressed post-and-beam structure and large expanses of windows.
- Scandinavian influence is seen in log cabins and decorated frame houses with cutout details in shutters.
- Wood is lavishly used in buildings.
- Timber industry remains a powerful cultural force and shaper of the landscape.

Alaskan maritime

CCC-"Cascadian"

Native American long house



Northwest modernism

North Pacific

Scandinavian log

ARCHITECTURAL GUIDELINES FOR THE NORTH PACIFIC PROVINCE

"The public architecture of the forest can be of a scale appropriate to the powerful scale of the trees and the masses of the mountains, of a construction durable enough to survive years of intense use, and yet possessing a finish and subtlety of design that stimulate the human eye and imagination."

—Leland M. Roth, architectural historian

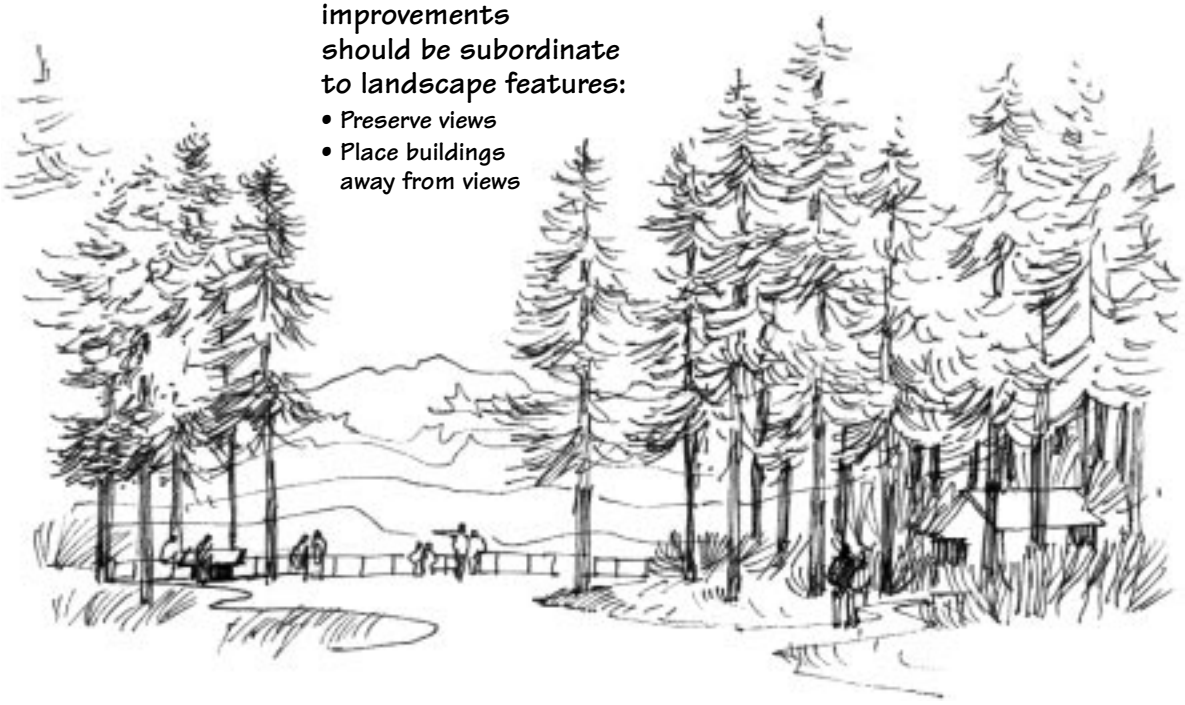
Buildings concentrated away from riparian and wildlife migration zones

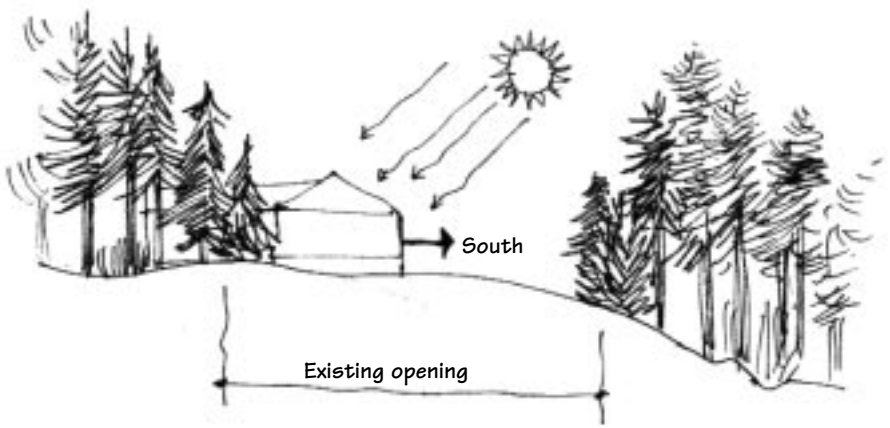
SITING

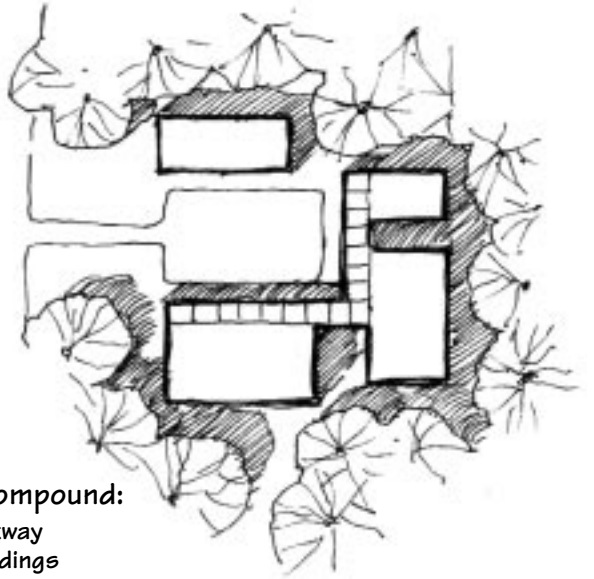
- Place structures at the edge of existing clearings. This preserves views and habitat, avoids the need to clear vegetation, and creates opportunities for sun and shade as needed seasonally.
- Make work complexes into building compounds connected by covered walkways.
- Site to catch the breezes necessary to mitigate the bug problem in Alaska.
- Shield structures with plantings on the north and west sides in areas with intense wind.
- Manage vegetation near structures; plantings can become overgrown and block views.

Facilities and improvements should be subordinate to landscape features:

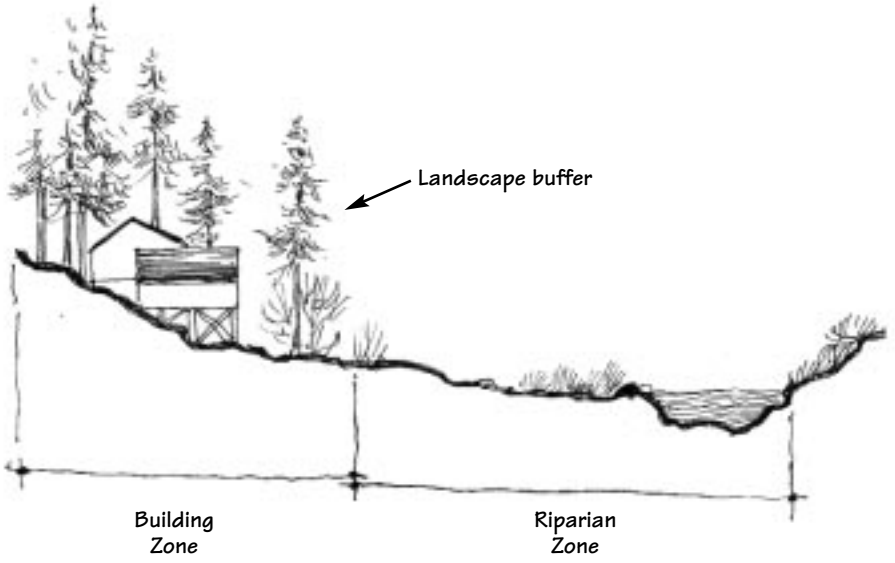
- **Preserve views**
- **Place buildings away from views**

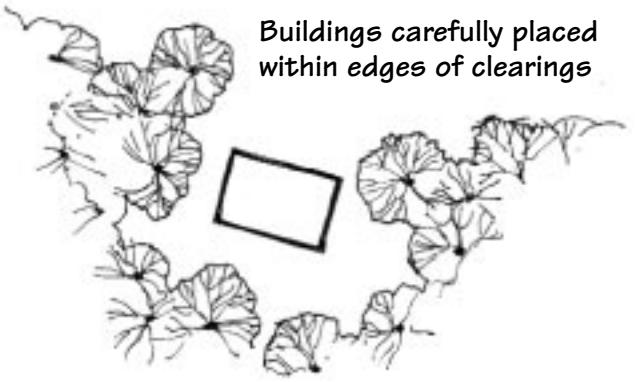






Building compound:
Covered walkway
between buildings

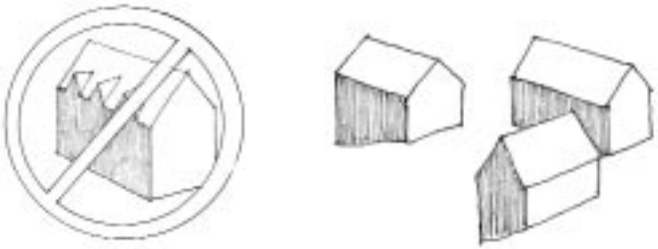




Buildings carefully placed within edges of clearings

Massing and Scale

- Diminish apparent mass of larger buildings by creating wings or compounds of connected structures.
- Use building materials in scale (for example, oversized stone and timbers) in massive forests.



Building's mass should be a collection of smaller elements

Appropriate mass of building elements in rugged terrain

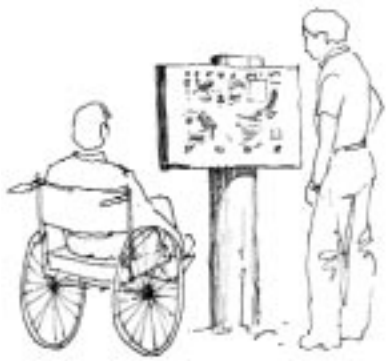
Buildings should complement the scale of their surroundings:

Massive scale landscape allows larger, more massive buildings

Lesser-scale landscape dictates smaller scale and massing

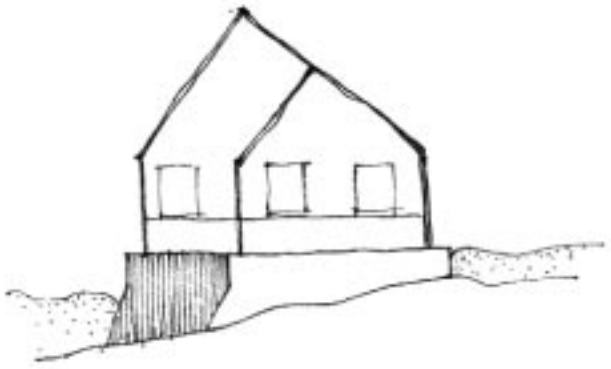
Base

- Complement the province's dramatic landscape while reducing wear and tear on buildings by using a strong stone base. The base should appear anchored to the ground and comprise a major portion of the wall.
- Use battered stone rock when possible (although good-quality building stone may not be available in Alaska).
- "Float" buildings and pathways over landscape on pilings or piers in tidal zones and other wet areas.
- Use a concrete base if it is skillfully textured and colored.



Appropriate sign base

Inappropriate sign base



Base used to protect wall from snow

Strong, battered stone base

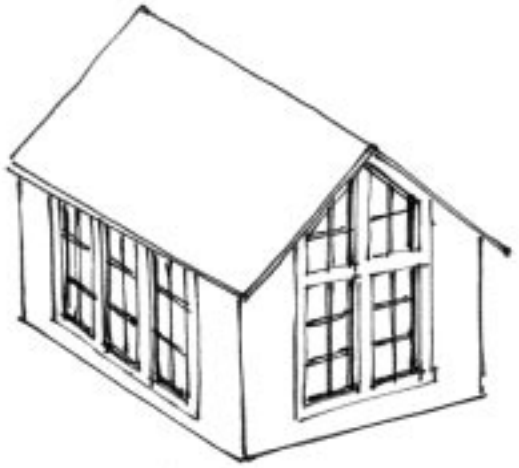
Walls

- Design walls that appear to be growing from the ground.
- Use both vertical and horizontal wall textures; however, do not mix within one wall.

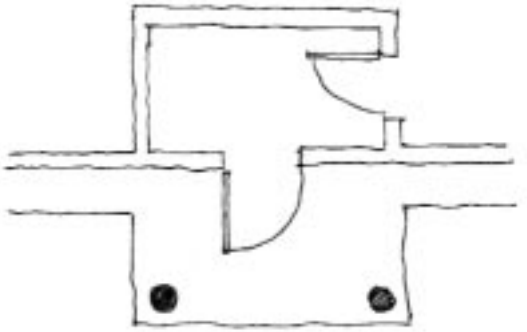
A building's wall should be smaller than its base and roof

Windows and Openings

- Make windows large to take in views, warmth, and precious sunlight.
- Protect entrances from driving rain and snow by including porches and vestibules when possible. Particularly in Alaska, a vestibule provides a valuable airlock and a place to remove rain gear, to stack firewood, or to let dogs sleep. An arctic variation turns the entry 90 degrees from the building to keep the indoors warm and dry.
- Avoid extensive horizontal bands of windows.
- Follow historical precedent and scale by using divided-pane windows.
- Do not place windows in corners.
- Minimize northside entries and maximize southside entries.
- Keep overhangs shorter on south side of building to maximize daylighting.
- Use gable-end entries, but leave gables open to bring light into building.



- **Windows should be maximized, especially south and southeast**
- **Windows to the north should be minimized**

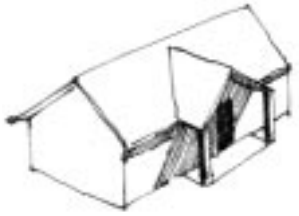


Airlock vestibule, especially appropriate in Alaska

Protected entries:

Extruded gable porch

Continuous eave porch

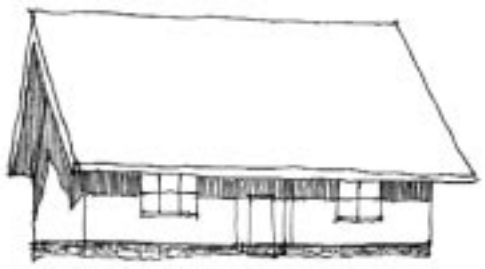


Added gable porch

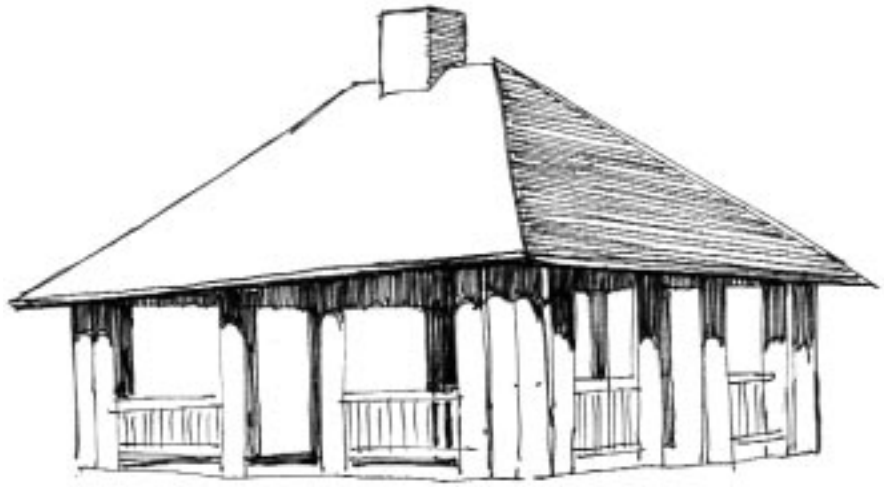
Covered entry porch

Roofs

- Design the roof so that it dominates the architectural composition, except in warm California climates.
- Design roof pitch to range from 6:12 to 12:12; use lower pitches in warm California climates.
- Keep roof shapes simple. Complex shapes create "valleys" that trap snow, creating maintenance problems.
- Use gable and shed roof types if desired.
- Use hip roofs for coastal areas or as shelters.
- Avoid use of flat roofs and gambrel roofs.
- Use gutters in rainy maritime climate but not in heavy snow areas.
- Use a steeper pitch with shorter overhangs in areas with heavy snows.
- Avoid multiple roof forms that may shed snow onto other roofs.



Roofs should dominate the building



Simple hipped roof

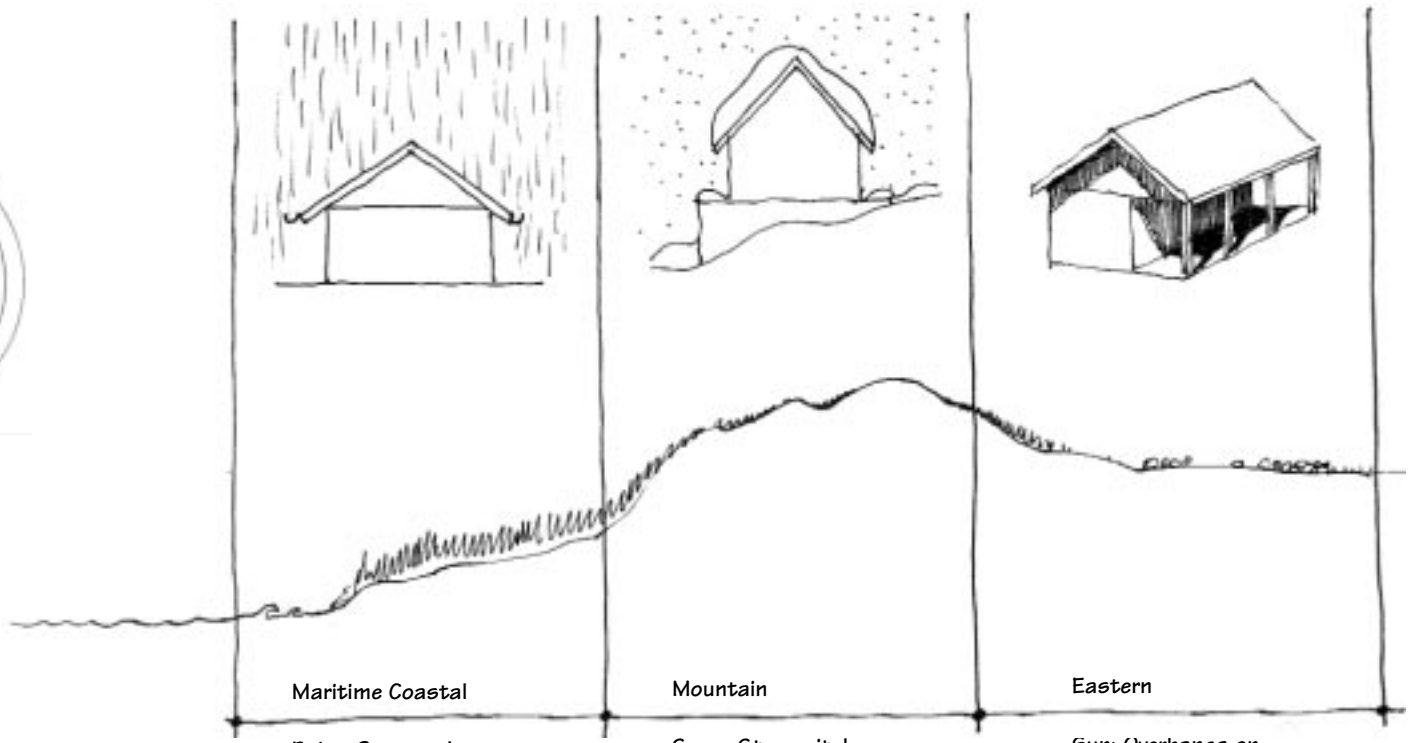
Unprotected rafter tails

Eave soffits

Cover rafter tails

- Keep gables open to bring in sunlight.
- Use shed or gable type dormers.
- Use eaves that have heavy bargeboards.
- Expose rafters, but protect rafter tails from the elements by not extending them beyond the roofing.
- Avoid skylights when possible, or place them near the ridgeline.

Multiple roofs



Structure

- Design structure to look solid and substantial.
- Use exposed structure, such as trusses and post-and-beam, for both interior and exterior.
- Avoid lightweight, flimsy tables and site furnishings.

Exposed substantial structure

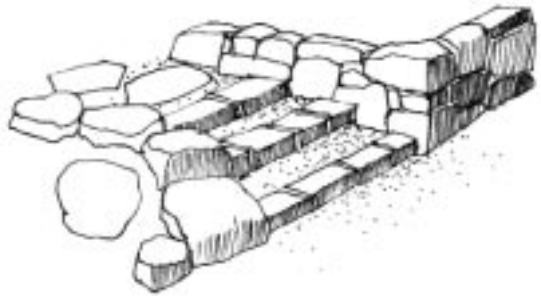
Materials

- Celebrate the use of wood as a symbol and the most significant resource of the province.
- Match the texture of materials to the scale of the setting. For example, in beachfront settings, use narrow siding to match the texture of grass and sand; do not use boulders or massive timbers.

Roof Materials:

- Use cedar shakes; however, they may be difficult to obtain and maintain.
- Use standing-seam metal and "oxidizing" steel roofs in dark tones.
- Use patterned asphalt shingles.
- Avoid intrinsically bright, shiny, light-colored roof material.
- Avoid slate or Spanish-tile roofs.

Cluster members together to increase massive expression

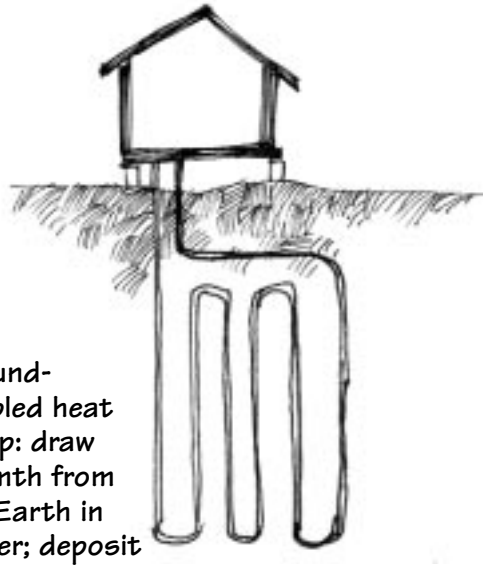


Steps and site wall
Assemble natural, not overly refined materials

Feature existing natural materials

Color

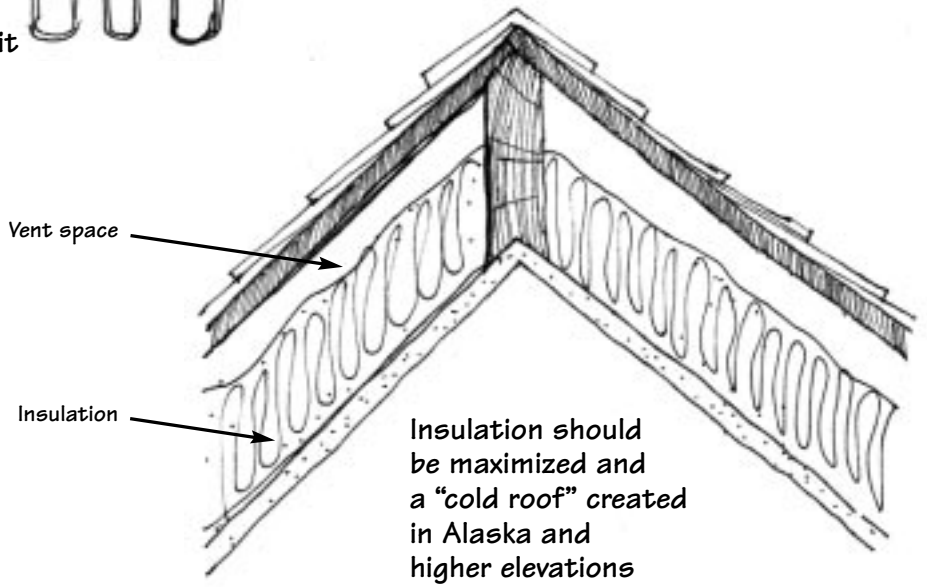
- Emphasize muted earth tones such as beige, brown, tan, and ochre.
- Keep values in the medium range in response to gray skies in northern areas.
- Use darker values in southern areas.
- Use turquoise in Alaska as it reflects the color of water, ice, and snow. Native American accent colors are aqua, red, and black.
- Use weathered blue and gray colors to match the fog and gray sky in seaside settings.
- Make urban structures more colorful with pastels and strong accent colors for trim.
- Avoid dark colors indoors. Make interiors light and reflective to create a light, airy environment.
- Use dark colors for metal roofs—green, black, or brown, or dark blue in maritime areas.



Ground-coupled heat pump: draw warmth from the Earth in winter; deposit warmth in summer

SUSTAINABILITY

- Celebrate, but do not overuse, wood; especially avoid scarce species or sizes.
- Employ daylighting to bring natural light into buildings.
- Use hyperinsulation in Alaska and other cold climes.
- See the "Common Principles" section in the introduction of this chapter for more recommendations on sustainability.



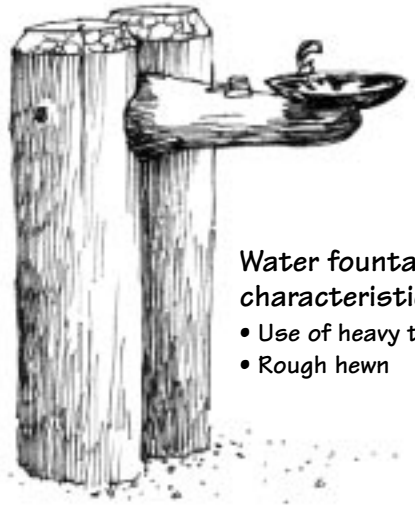
Insulation should be maximized and a "cold roof" created in Alaska and higher elevations

SYNTHESIS

The North Pacific Province draws upon the rich traditions of Cascadian, Native American, and ethnic designs, as well as the industrial designs of lumber mills, fish canneries, and working waterfronts. In this province, culture does not dominate nature. Successful design does not merely repeat historical precedent. It expresses respect for the place that honors local climate, topography, vegetation, and building practices.

Interpretive facility characteristics:

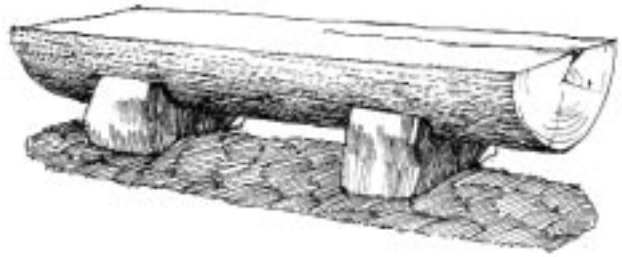
- Simple, dominant roof
- Strong base
- Windows maximized



Water fountain characteristics:

- Use of heavy timbers
- Rough hewn

Bench with a massive feel



Restroom characteristics:

- Stone base on walls and columns
- Heavy timbers, clustered

Multifunctional building characteristics:

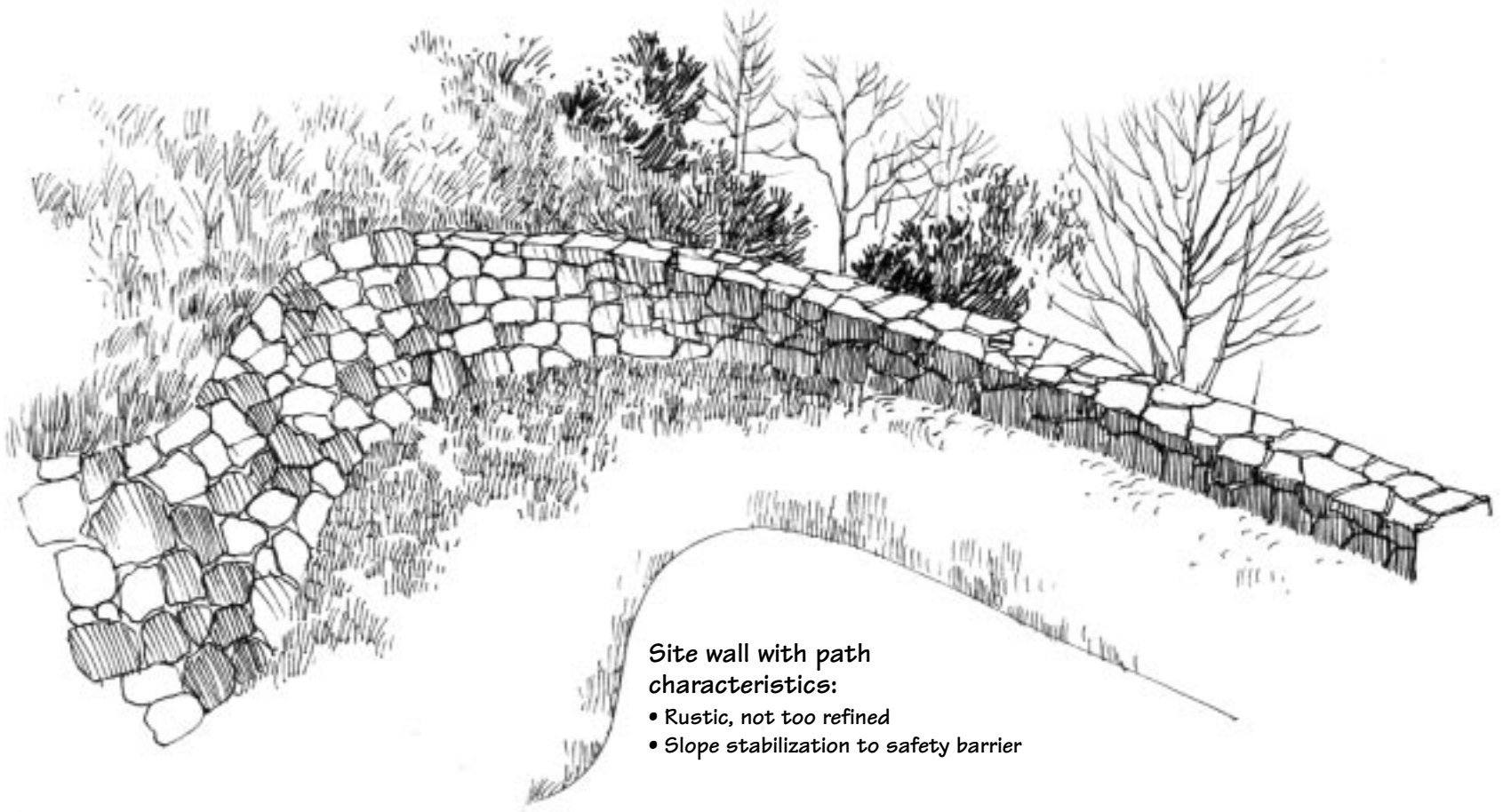
- Stone base
- Heavy, rough-hewn timbers

Table characteristics:

- Use of heavy planks 3–4" thick
- Accessible

Maintenance shop characteristics:

- Simple forms, dominant roof
- Dormer for daylighting
- Base is expressed



Site wall with path characteristics:

- Rustic, not too refined
- Slope stabilization to safety barrier

Multiuse compound characteristics:

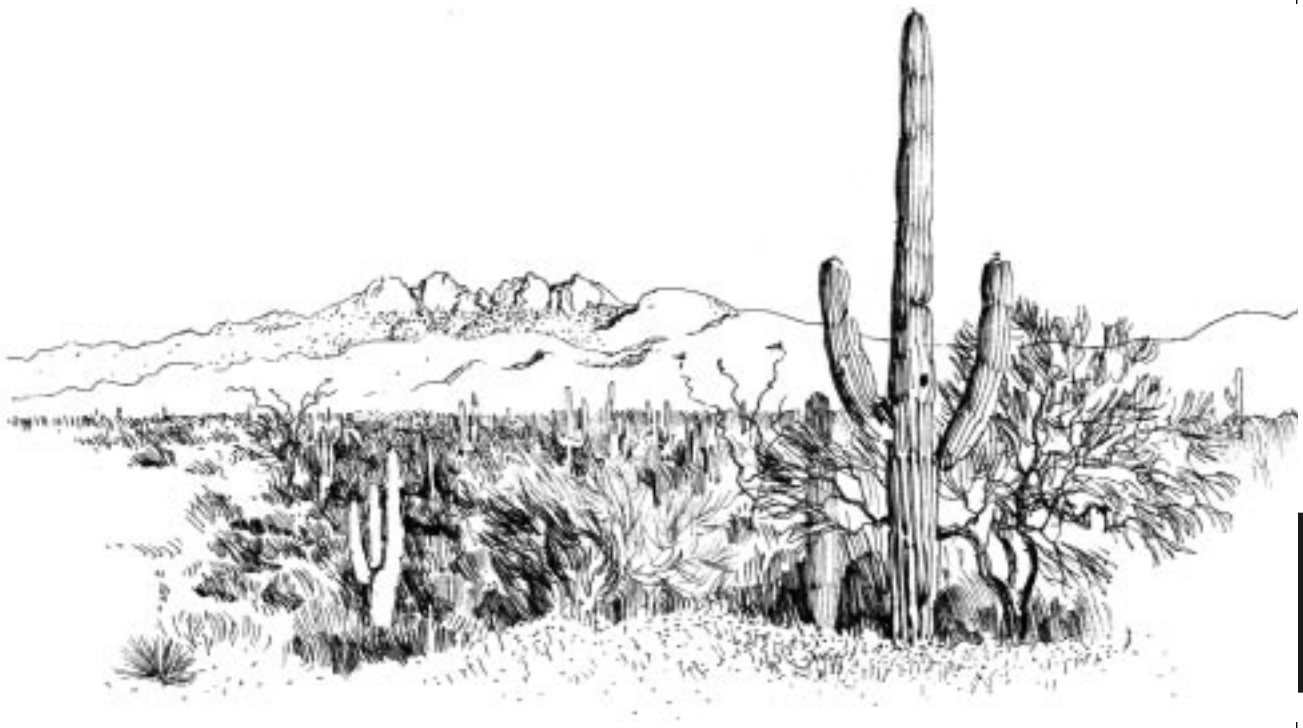
- Dominant roof
- Stone base
- Paired, divided pane windows

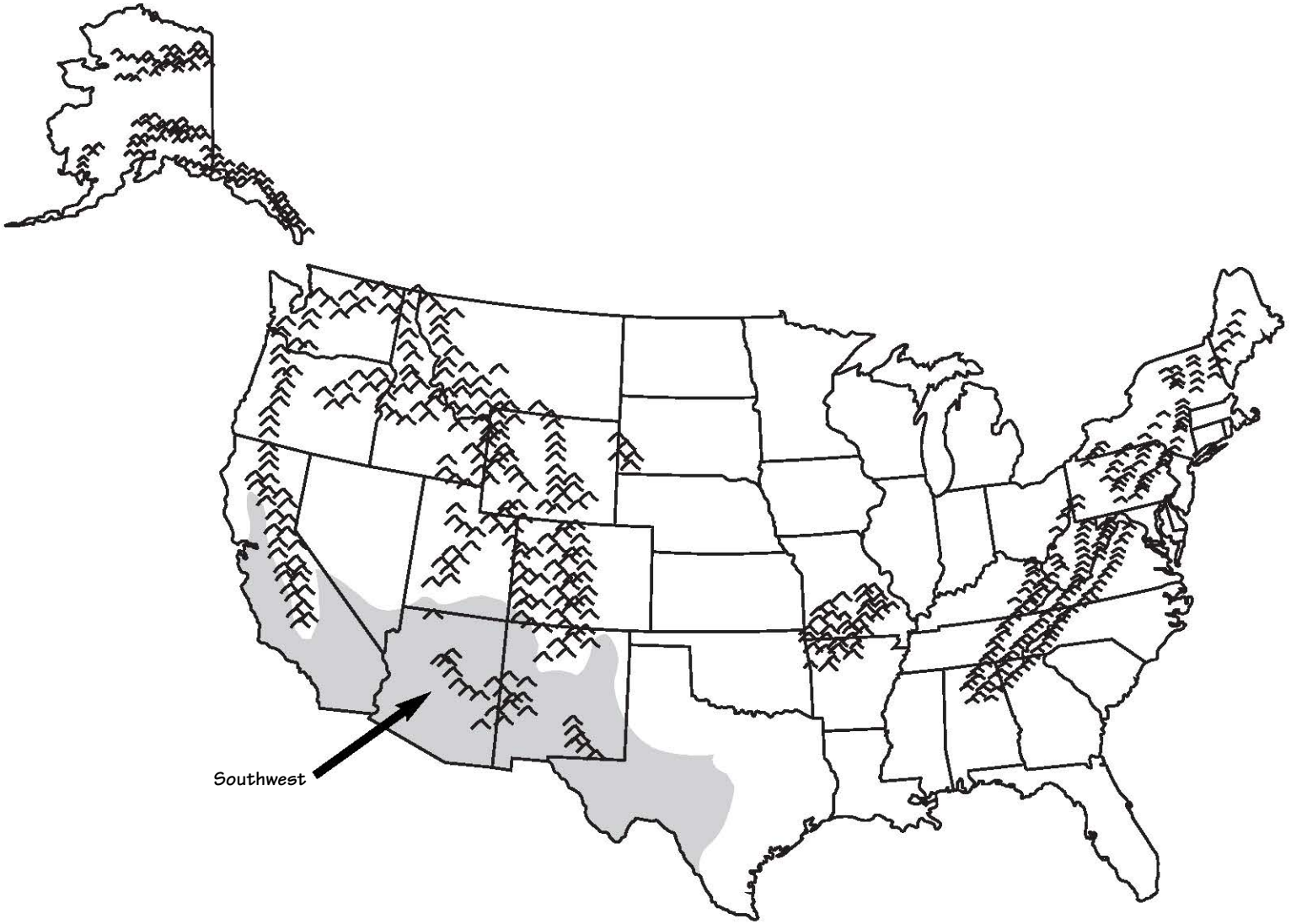
Chapter 4.8

The Southwest Province

"Over time the forced weave of the two [Spanish and Native American] cultures took hold. There was enough of the Old World that the New World liked."

—Timothy Egan




Southwest

OVERVIEW: CHARACTER OF THE SOUTHWEST PROVINCE BUILT AND NATURAL ENVIRONMENTS

The Southwest's natural environment ranges from semiarid to extremely arid. Torrid summers give way to bitter cold winters. The relative lack of timber and abundance of stone has helped shape a distinctive regional design.

The Southwest Province is home to the oldest building traditions in the United States. When Spanish explorers arrived in the 1500's, they encountered native pueblo settlements already hundreds of years old and Anasazi ruins that are the oldest structures on the continent. Influences on Southwest design include the Native American building model that influenced Spanish colonists. From southern California to central Texas, centuries of Spanish-Mexican presence created a design heritage well adapted to climate, geography, and scarcity of water. Built forms often are simple but exquisitely scaled and detailed. In today's Southwest, visible remains of Native American and early European settlement are preserved and celebrated. These design traditions endure in contemporary structures.

Although diverse, the Southwest contains a strong, unified sense of cultural identity. Cultural traditions remain alive because the source cultures are still vital. For example, reservations in the province host dozens of sovereign Indian nations. Many landowners can trace their ancestral properties to land grants made by Spanish kings.

The air-cooled, post-World War II era brought an influx of residents from other parts of the country, particularly to booming cities like Albuquerque, Los Angeles, Tucson, and Phoenix. They have imported their own expectations and tastes.

INFLUENCES ON ARCHITECTURAL CHARACTER

Landscape and Ecological

Southwestern ecosystems embrace a range of landscapes from tundra to grasslands. Drought and fire are dominant influences. Only 4 percent of the land in the Southwest is riparian. These ribbons of green are highly valued and sometimes contested by competing interests.

The province contains six landscape character types. From California to Texas, these share the characteristics of vast skies, long vistas, and a strong horizontal line. The land forms are plateaus, mountains, valleys, plains, and canyons. Vegetation creates washes of color varying from olive-drab scrublands to gray-green woodlands. Geology adds grays and the deep reds of dramatic sandstone formations. Landscape character types include:

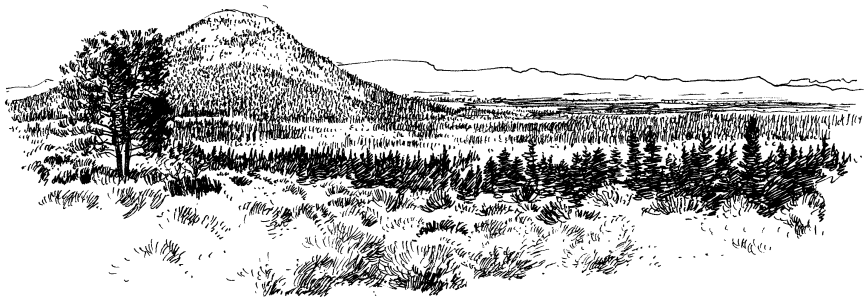
The *Mexican Highlands,* a vast area of Arizona and New Mexico, roughly is divided into one-third mountains and two-thirds plains and grasslands. Drained by V-shaped ravines, the mountains of the Mexican Highlands feature bold escarpments and outcrops. Dry washes called arroyos drain the plains. Vegetation varies from coniferous forests at higher elevation, to woodland, to desert shrub.

The *Sonoran Desert* dominates southwest Arizona. Like the Mexican Highlands, the area combines mountains with canyons and plains drained by arroyos. The Colorado River is the principal waterway. Mountains are relatively low and barren with many exposed rocks. The plains are relatively barren. Areas with no ground cover plantings are justly called "desert pavement." But places where Saguaro cactus grows host a rich complement of palo verde, mesquite, and prickly pear.

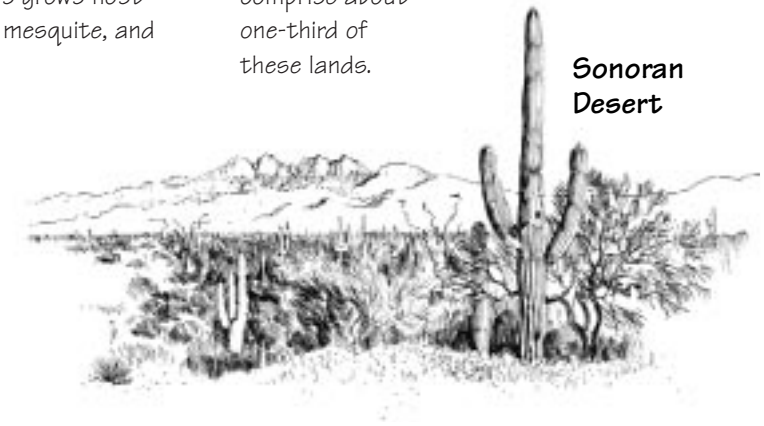
The *Tonto* makes a transition between the desert floor and the Colorado Plateau. This is a landscape of coniferous forests, deciduous woodlands, desert shrub, chaparral grasslands, palo verde, and cholla cactus. Geology is epitomized by the dramatic red-rock formations of Sedona, Arizona. The principal rivers are the Verde and Salt rivers with dry washes draining the foothills.

In California, the *Southwest Mountain and Valley* is crossed by earthquake faults and dominated by chaparral grasses that can grow 10 feet tall. The province stretches from San Luis Obispo County to the north to the Mexican border and from the undulating coastal plains to three rugged mountain ranges: the Transverse, the Peninsular, and the Southern Coastal. National forests comprise about one-third of these lands.

Desert and Desert Mountain



Sonoran Desert

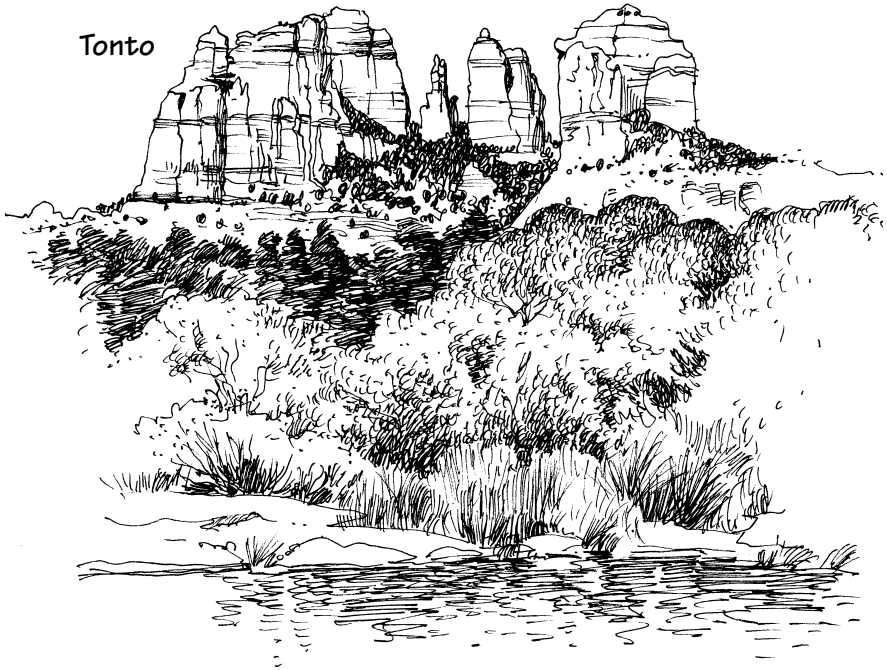


This landscape generally is semiarid with forested stands limited to higher elevations. It is dissected by canyons and riparian areas.

The *Desert and Desert Mountain* includes southeastern California from the Mexican border and Nevada to the eastern base of the Sierra Nevada, Peninsular, and Transverse mountain ranges. Parts of the Colorado and Mohave deserts fall within this province. Elevations range from below sea level in Death Valley to 14,242 feet on White Mountain Peak. This landscape character type is typified by long views across sagebrush and shadscale or creosote bush. Alkali flats and bare peaks may be visible in the distance. Open stands of Joshua trees are common. Pinyon-juniper woodlands cover the foothills and lower mountain slopes. Bristlecone pines grow at elevations above 10,000 feet.

The *Sierra Foothills and Low Coastal Mountains* include low hills at the base of the Sierra Nevada and Cascade ranges as well as a major portion of the Coastal Range. The Sierra foothills and eastern Coastal Mountains are typified by oak woodlands, rounded hills, and chaparral-covered slopes. Trees range from 15 to 70 feet tall. Several major rivers and canyons bisect the province. The green hills of winter turn gold with fields of poppy and lupine in summer. The western Coastal Range rises to 5,000 feet with dense forests of pine, fir, and oak. Madrone cover north- and east-facing slopes, and chaparral grasses cover west- and south-facing slopes.

Tonto



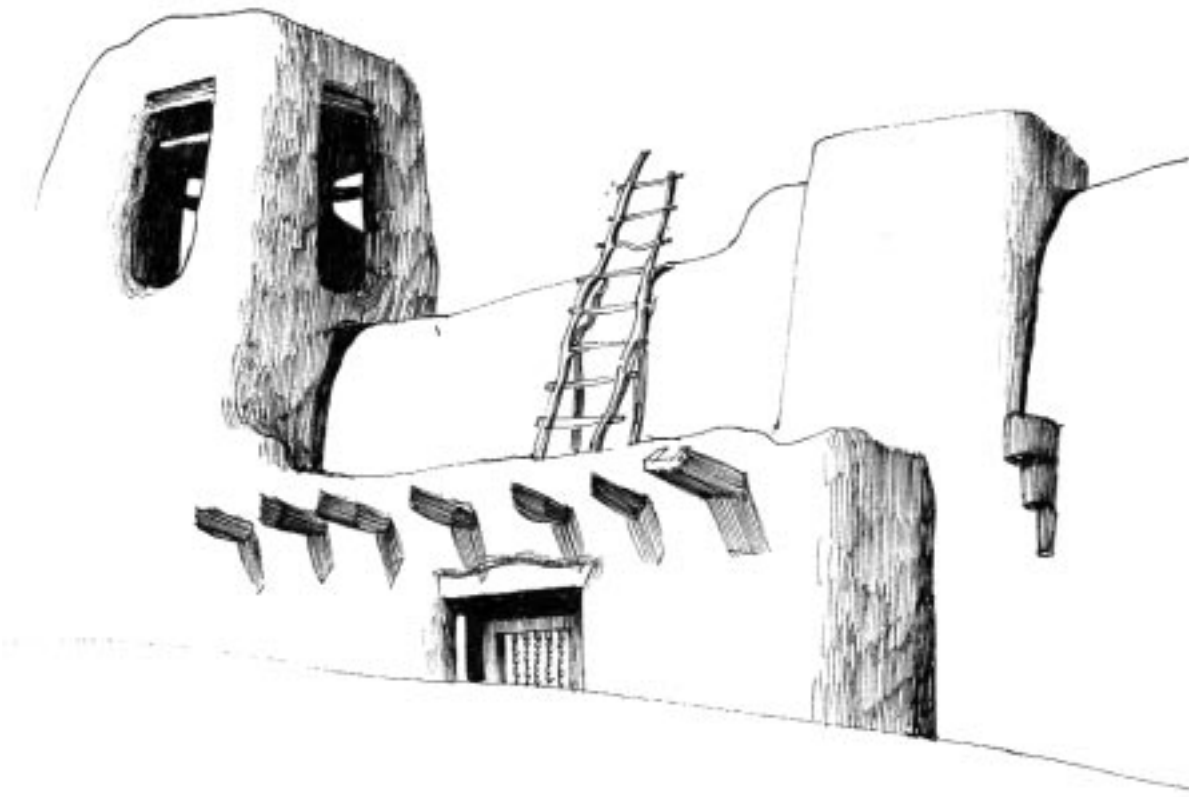
Sierra Foothills/Low Coastal Mountains

Cultural

Native American: Early Native Americans in Arizona, New Mexico, and southwestern Colorado built the province's first permanent structures—modified caves and rock shelters. Eventually the Anasazi groups built surface dwellings such as pit houses. Between 700 and 900 A.D., they developed above-ground masonry dwellings that eventually were joined to form small villages. Anasazi architecture reached its peak between 1150 and 1350 in the great multistoried pueblos such as those in the Four Corners area. Perhaps due to droughts, the Anasazi dispersed. Their descendants built plaza-centered pueblos of stone or puddled adobe. The Taos, Acoma, Zuni, and Hopi pueblos date to this period.

Spanish Colonial: The first permanent Spanish colonists occupied an abandoned pueblo near the Rio Grande River and modified it with Spanish-type doors and windows. In 1610, Governor Don Pedro de Peralta established Santa Fe under a town plan that followed a mandate called the Law of the Indies. The code dictated that all Spanish colonial towns contain a central plaza with public, commercial, and institutional buildings (such as churches) facing the plaza. Residences were built along a grid pattern of streets extending from the plaza.

The Pueblo Indian Revolt of 1680 forced the Spanish to flee to the El Paso valley. When the Spanish returned, they fortified buildings and churches against further Indian attack. For example, they built enclosed complexes with smooth windowless exterior walls. Their buildings included such defensive features as parapets, *troneras* (gun ports), and *torreones* (lookout towers).



Mission Style: Spanish Colonial missions and churches were a continuing influence on later Southwest design. Unlike the adobe structures of the pueblos, these missions were built of stone. Their construction derived almost entirely from European designs.

Territorial Style: After the Gold Rush of 1849, Americans surged into California on overland routes like the Santa Fe Trail. The new settlers adopted methods that served the Spanish well in the arid Southwest, but they added decorative elements from "back East." Milled woodwork added to flat-roofed adobe houses spawned the Territorial style, so named because Arizona and New Mexico, where this trend predominated, remained territories into the 20th century.

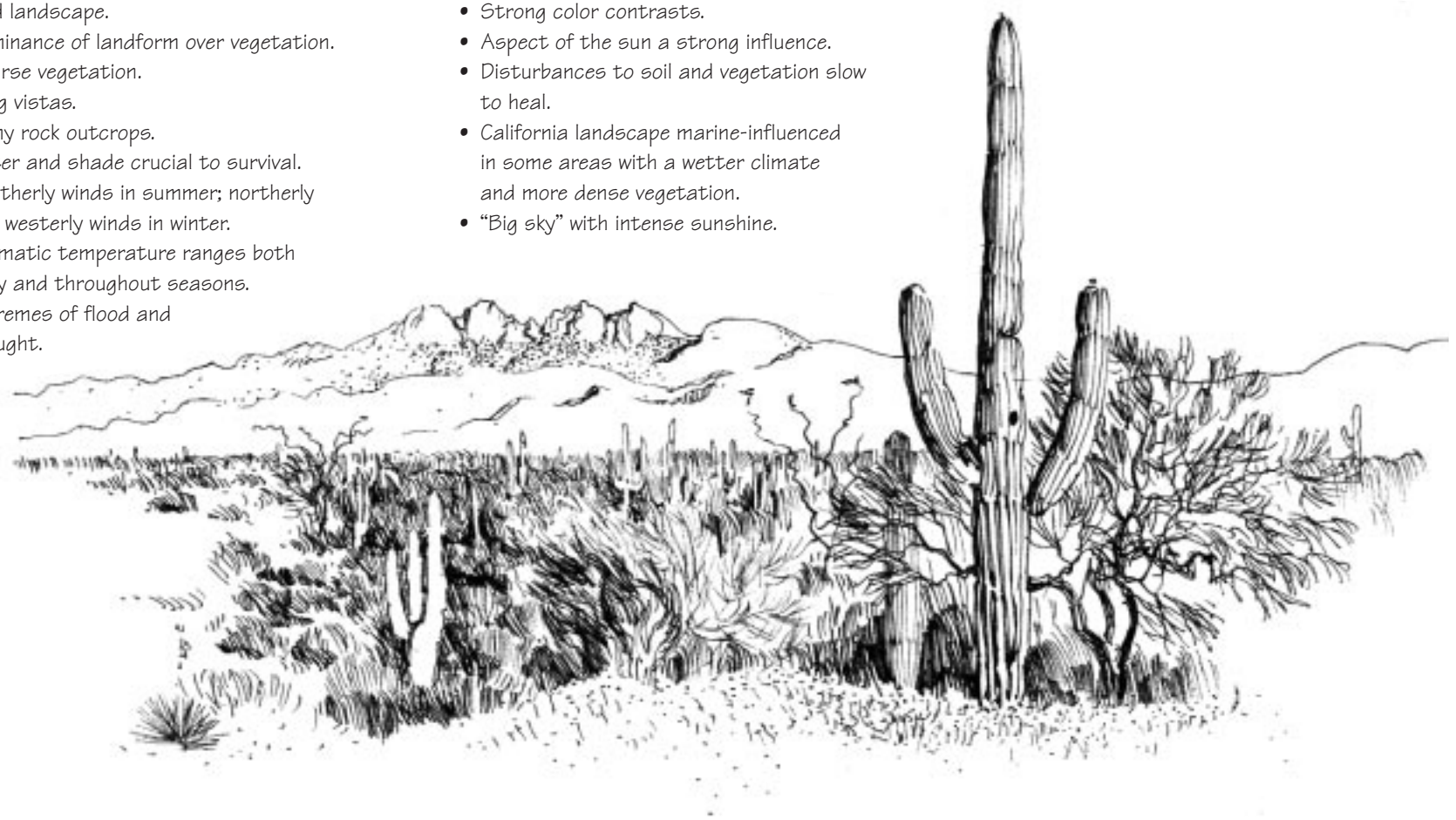
CCC-Rustic: During the 1930's, the WPA, CCC, and other Federal relief programs built civic buildings and public works throughout the country. In the Southwest, WPA-era buildings adopted Spanish Colonial, Pueblo, and Territorial Revival styles. They used domes, curvilinear parapets, vigas, canales, and stucco. The "rustic" idiom was evident in parks, forests, and outdoor recreational areas.

Materials: Adobe was not the only indigenous building material. Clay beds along the lower Rio Grande provided raw material for local brickmaking operations from the 1860's to the present. Generations of Mexican and Mexican-American artisans have built distinctive brick dwellings, churches, and commercial buildings on both sides of the Rio Grande from Laredo to Brownsville.

SUMMARY OF INFLUENCES AND RESPONSES THAT SHAPE THE CHARACTER OF THE BUILT ENVIRONMENT

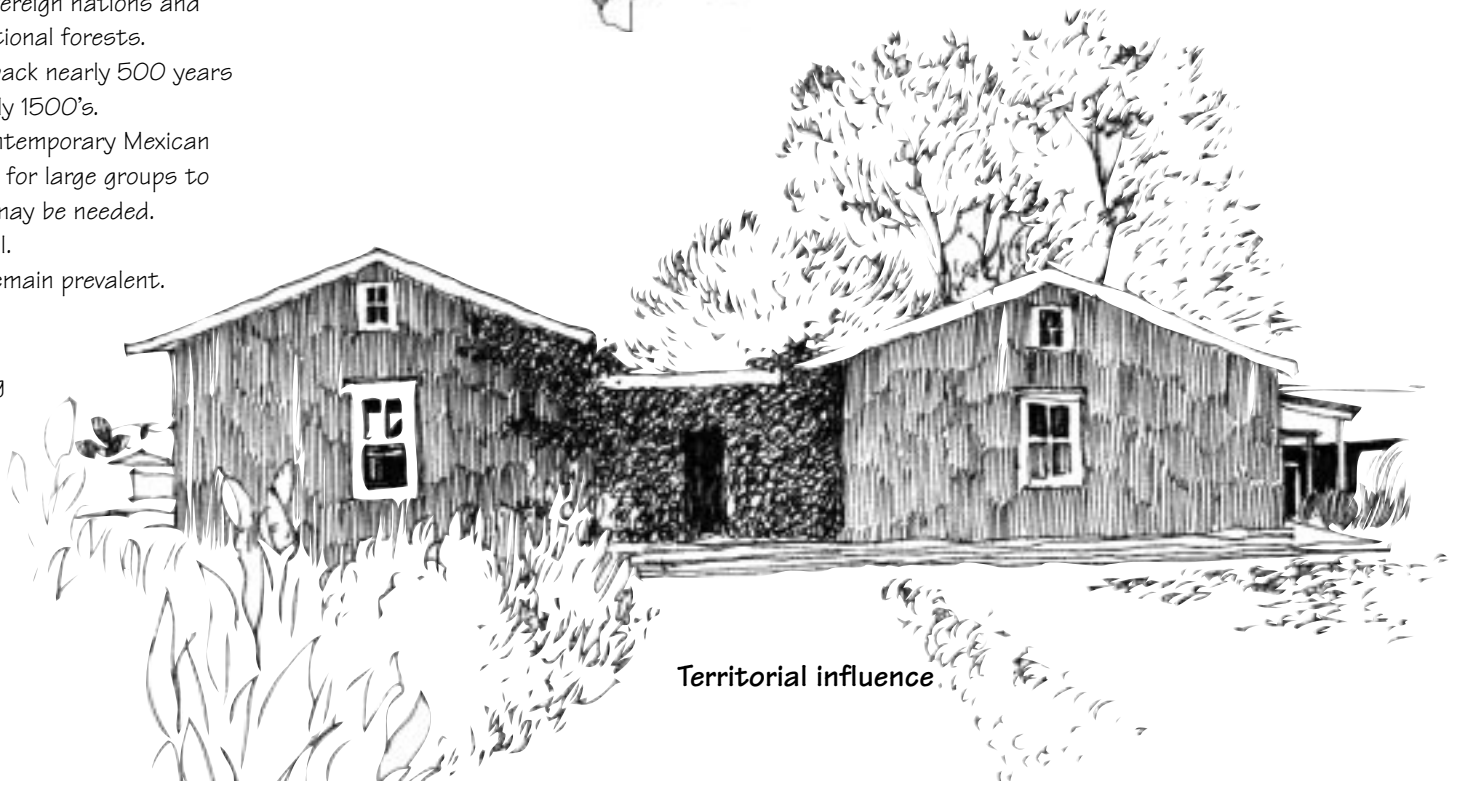
Ecological Influences

- Hot, dry climate.
- Arid landscape.
- Dominance of landform over vegetation.
- Sparse vegetation.
- Long vistas.
- Many rock outcrops.
- Water and shade crucial to survival.
- Southerly winds in summer; northerly and westerly winds in winter.
- Dramatic temperature ranges both daily and throughout seasons.
- Extremes of flood and drought.
- Ecosystems dependent on fire for renewal.
- Strong color contrasts.
- Aspect of the sun a strong influence.
- Disturbances to soil and vegetation slow to heal.
- California landscape marine-influenced in some areas with a wetter climate and more dense vegetation.
- "Big sky" with intense sunshine.



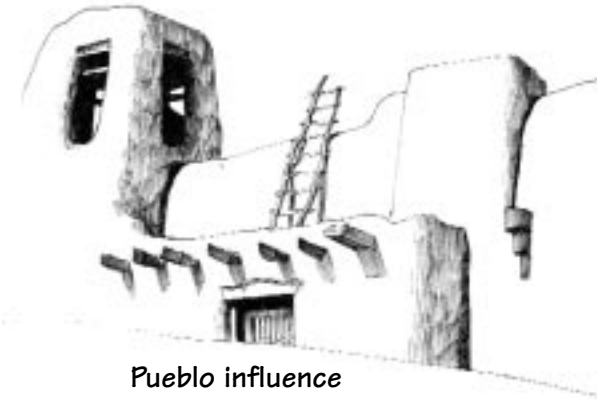
Cultural Influences

- Area has a highly urban population, with few people living outside cities.
- Forest Service areas receive year-round use.
- Three main cultural groups are Anglo, Native American, and Hispanic.
- People are attracted to the higher, cooler places and to water for recreation.
- Native American cultures are highly visible, with more than 30 sovereign nations and reservations within national forests.
- Spanish culture goes back nearly 500 years to explorers of the early 1500's.
- Strong influence of contemporary Mexican culture requires places for large groups to meet; larger facilities may be needed.
- Society is multicultural.
- Ranching and mining remain prevalent.
- The area has many archeological sites.
- The area is experiencing rapid population growth.



Territorial influence

Spanish Colonial influence



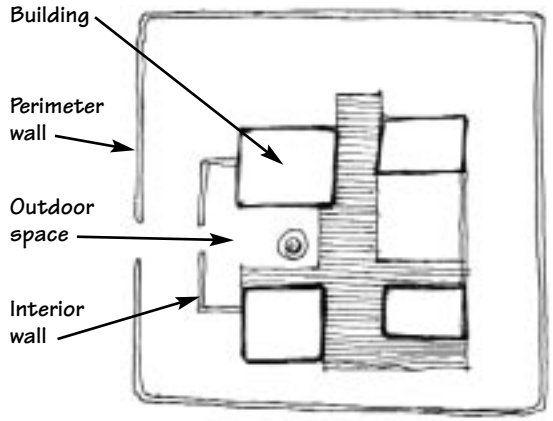
Pueblo influence

CCC-era pueblo revival

ARCHITECTURAL GUIDELINES FOR THE SOUTHWEST PROVINCE

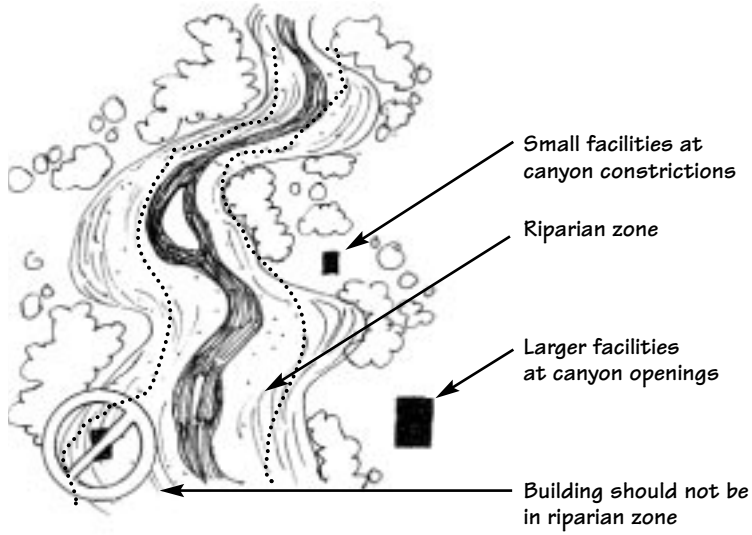
Siting

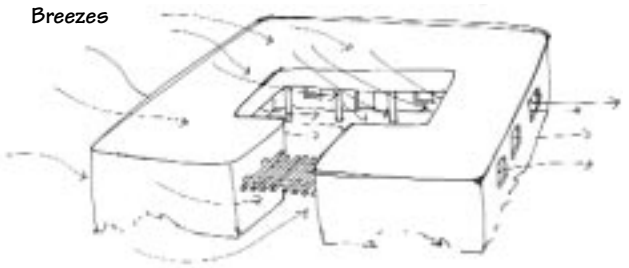
- Choose site based on the availability of shade.
- Use traditional courtyards to provide shade and cooling for year-round use.
- Use traditional L-shaped or U-shaped courtyards, particularly as entryways.
- Cluster different building functions around courtyards.
- Plant shade trees on west side.
- Locate buildings for views and access to water.
- Avoid riparian areas—direct people to the water with trails, but do not locate facilities there.
- Locate parking farthest from water in riparian areas.
- Locate public facilities back from the rim of canyons or on a bench above the riparian zone.
- Site entries on south side to create potential courtyards and seating.
- Select site based on the form of the land; for example, site structures to match the horizontal plane of the landscape.
- Buffer parking from buildings to keep buildings cool.



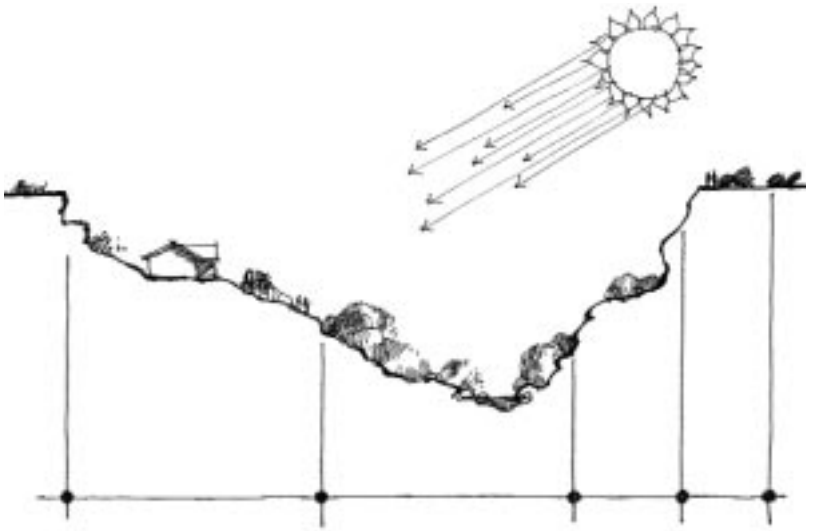
Buildings and walls create outdoor rooms

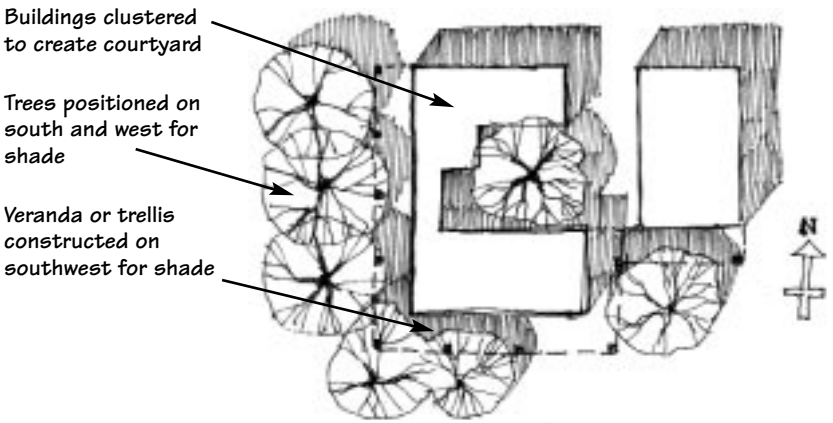
Courtyard with water feature for evaporative cooling

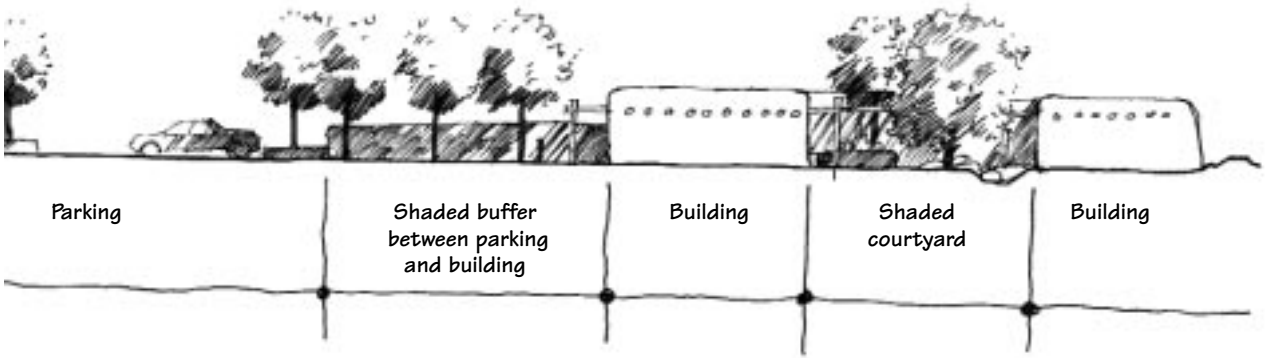




Courtyards protected from the sun, while promoting ventilation







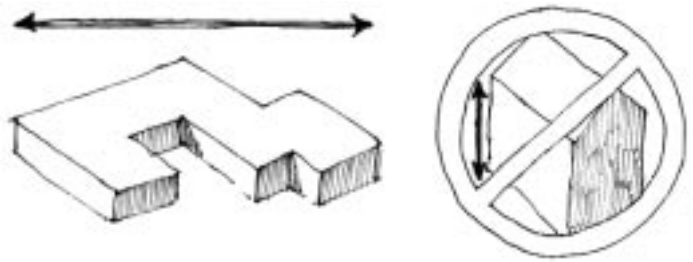
Massing and Scale

- Structures are usually low, horizontal, blocky, and rectilinear.
- Blocky, massive, rectilinear forms create texture and shade.
- Terraced, stepped massing fits into landscape better and is preferable to one solid block.
- Simple wall masses are common.
- Rounded, kiva-like building forms can work for "special" places such as spaces for exhibits and ceremonies.

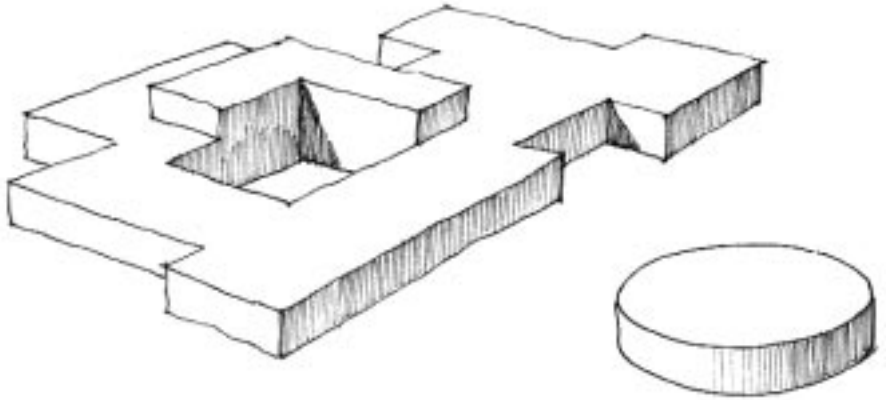
California Variations:

- Foothills evoke taller, more vertical structures, especially in areas with taller oaks and mountain backdrops.
- Roofs and walls are in equal proportion.

Doors and windows used to create human scale



Buildings should be kept more horizontal than vertical

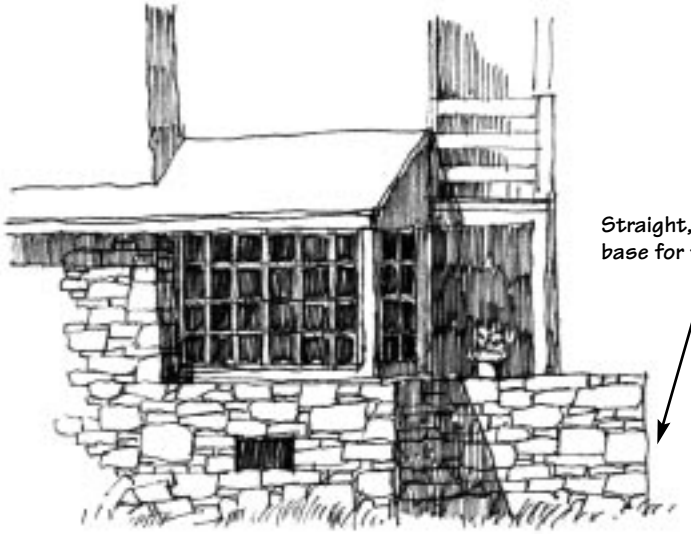


- **Low, horizontal, and rectangular massing is appropriate for most structures**
- **Second story possible**
- **Corners create added shade**

Rounded forms may be appropriate for special and ceremonial functions

Base

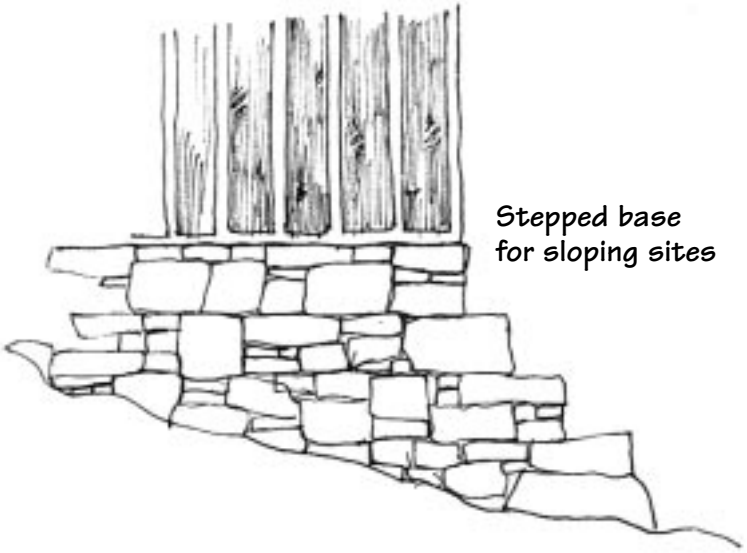
- Create a solid, firm base as a connection to the ground.
- Design a rock foundation if rocks are prevalent in area.
- Use a stone base for structural columns.
- Avoid an articulated base on level sites.
- Avoid elevation on "stilts."
- Minimize foundation planting.
- "Band" the base in a different color so mud splash will not show.
- Provide drainage away from structure.
- Design the bottom of the wall wider so that walls appear "stacked" on top.



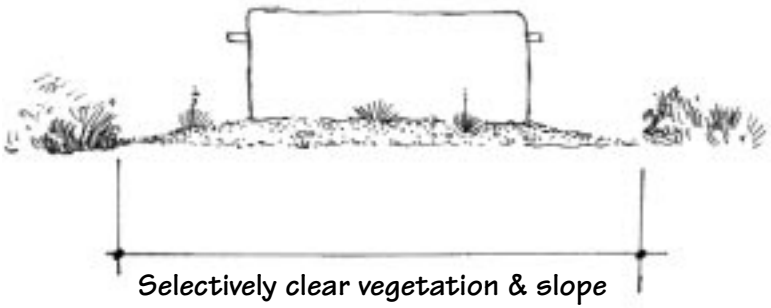
Straight, vertical base for flat sites

Distinctly separate base

Elevating structure off ground



Stepped base for sloping sites

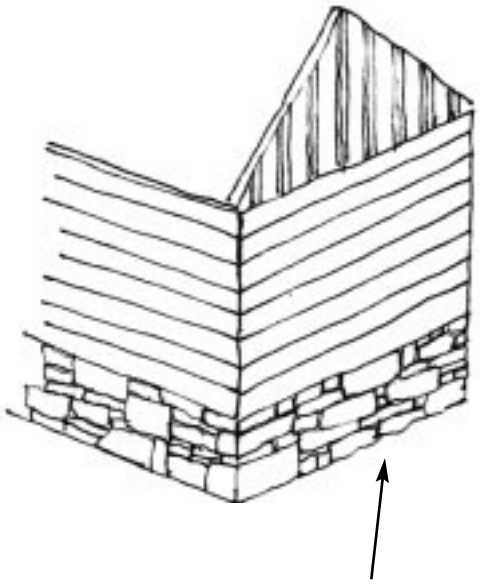


Selectively clear vegetation & slope away from structure for drainage

California Variations:

Stone bases are more prevalent in California landscape types.

- Employ more variety in base types.
- Design the base to be more vertical.
- Use a battered base for slopes.



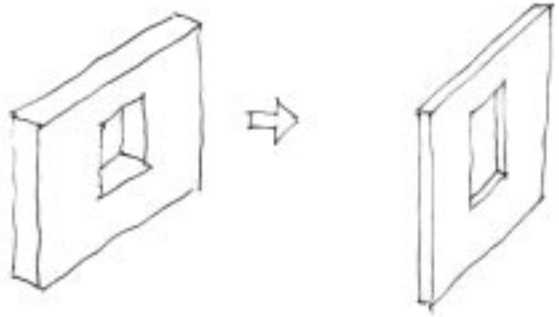
Base created from different natural material in California mountains

WALLS

- Walls (including parapets) are dominant in the building composition.
- Walls are monolithic and massive.
- Monolithic, unadorned walls can be accented by wood elements and detailing.
- Walls have soft, rounded edges and corners.
- Caps on walls add texture.
- Variations include buttresses on walls.
- Courtyard walls are extended from the building with the same materials, color, and texture.

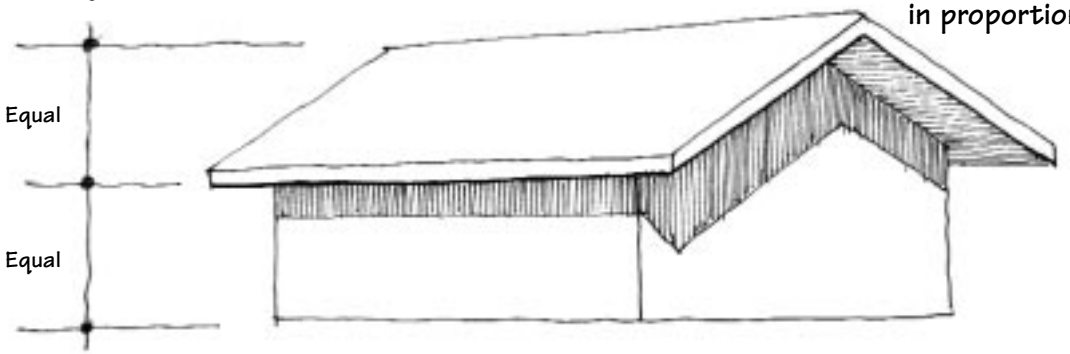
California Variations:

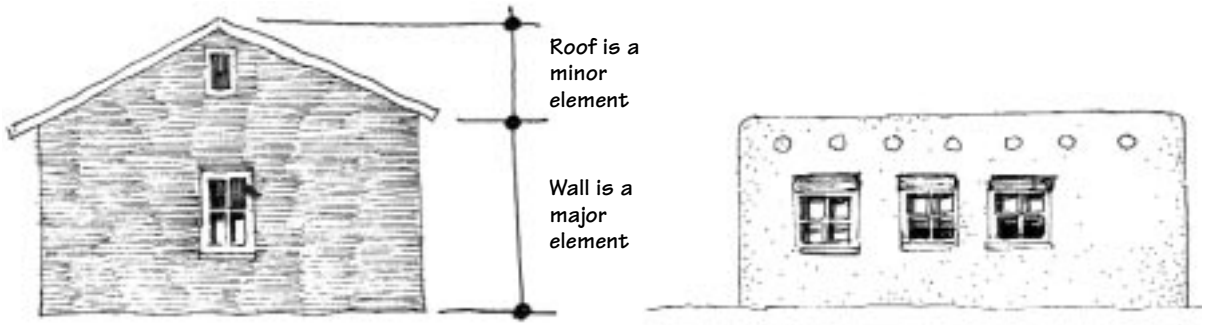
- Walls are thinner.
- Walls are less dominant in composition.
- Resistance to earthquakes is a primary structural consideration.
- Use wood siding if stained rather than painted.
- Limit logs and heavy timbers to structures at higher-elevation sites with more dense vegetation; use moderate-size rather than massive logs.



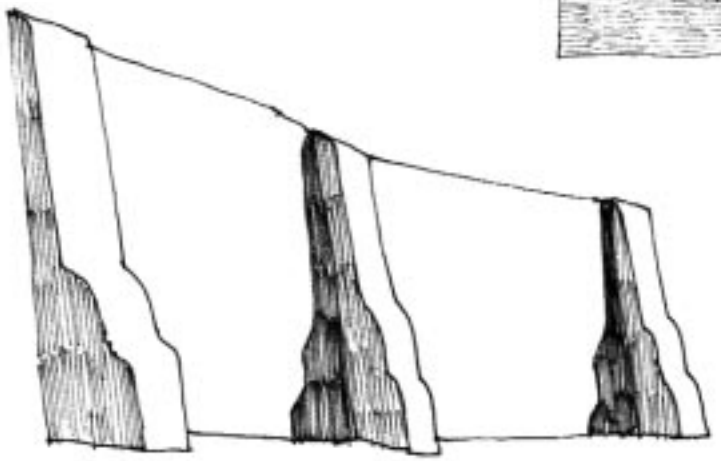
Walls should be thinner in California mountains due to more temperate climate and greater seismic activity

In California mountains, walls are more equal to roofs in proportion

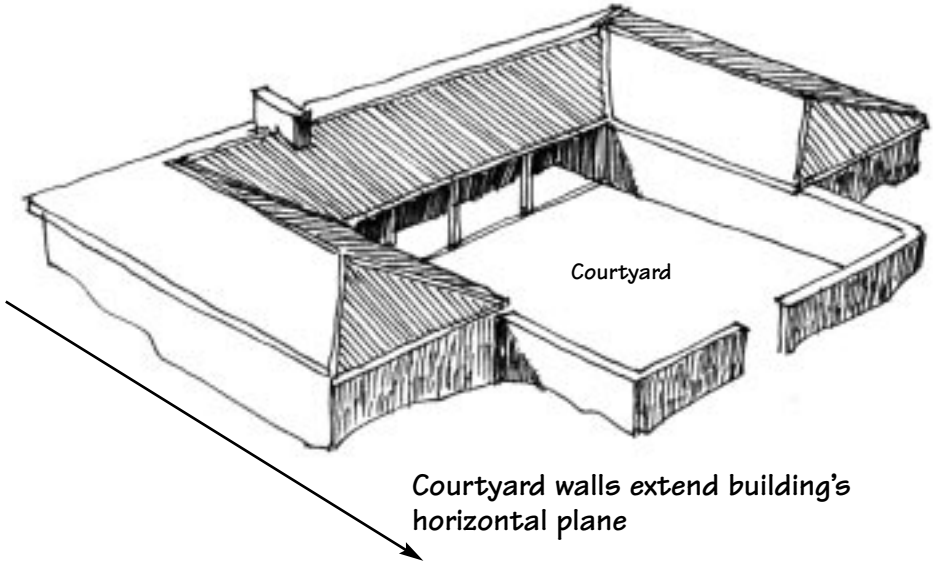




Walls are simple, monolithic without expressed base



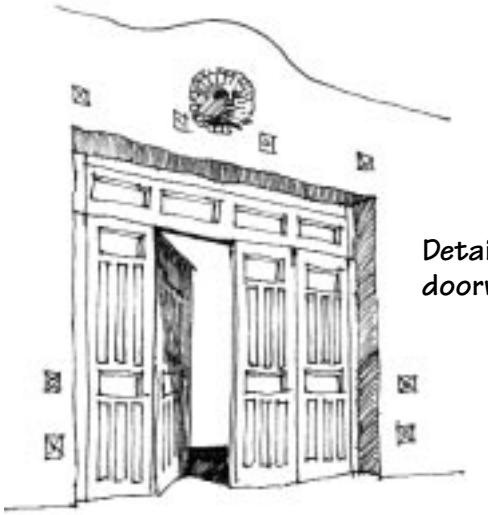
Butresses provide vertical expressions within horizontal wall



Courtyard walls extend building's horizontal plane

Windows and Openings

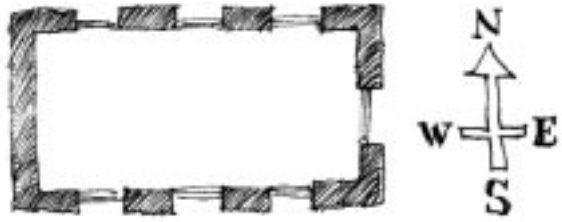
- Use traditional and typical, thick, inset windows, with deep shadows.
- Use smaller, punched openings—more typical than large expanses of glass.
- Place window openings on the northeast and southeast sides.
- Minimize openings on the west side.
- Give preference to operable, double-hung, divided light windows.
- Select tall vertical windows rather than wide, horizontal ones.
- Place windows high on walls to minimize the reflection of light and heat from ground.
- Do not place larger windows on the west or south sides.



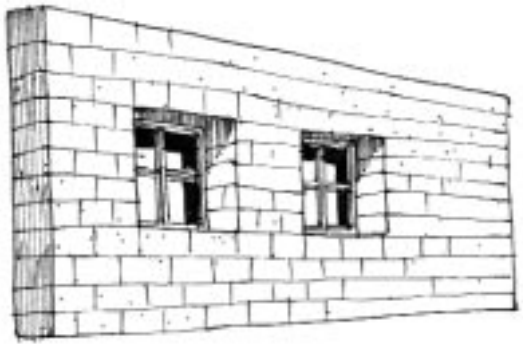
Detail at doorway

Corner windows

Vertically proportioned openings should be created, whether singular or grouped



- **Windows should be placed on north, east, and south**
- **Openings should not be on the west**

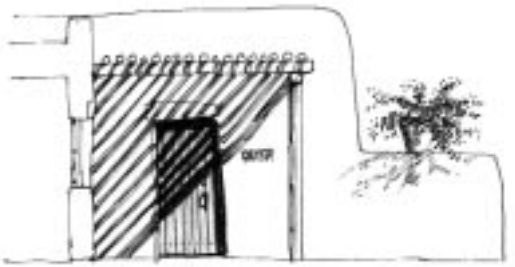


Windows should be recessed within walls

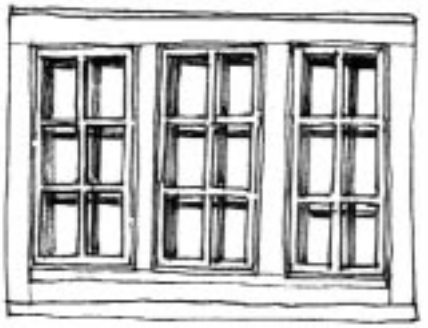
- Include traditional ornament such as decorative tiles and carved wood on doors and windows.
- Avoid horizontal bands of windows.
- Avoid windows at corners.
- Use exposed lintels—a structural element that is also a cultural element—over openings.
- Use shade structures such as trellises and pergolas.
- Avoid awnings.
- Include verandas and porches.

California Variations:

- Arched or detailed doorways and portals are more common.
- Windows are not recessed.
- More and larger windows are suitable.

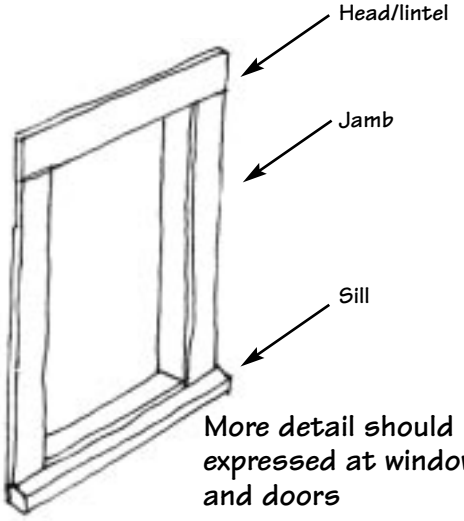


Shade created with trellis elements

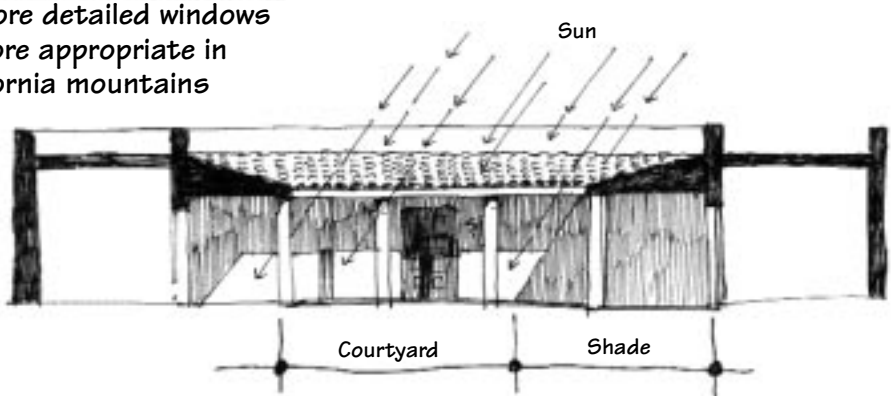


Larger, more detailed windows are more appropriate in California mountains

Door frame flush with wall



More detail should be expressed at windows and doors



Courtyards used to create shaded areas

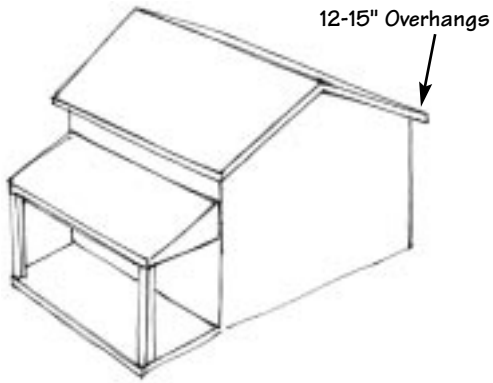
Roofs

Flat roofs are a strong cultural tradition in this province, but there are historical precedents for pitched roofs as well. Pitched roofs can improve ventilation, create attic space, curtail vandalism, and reduce maintenance. A suitable hybrid involves hiding a gently sloping roof behind a flat parapet wall.

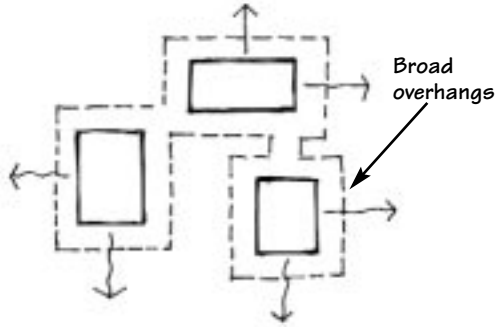
- Use flat roofs within townscapes or in areas with flat topography.
- Use pitched roofs in vegetated areas or within more rolling topography.
- Design roof pitch ranges from 1:12 to 6:12.
- Add shed roofs to create porches.

California Variations:

- Use hipped and double-pitched roofs.
- Include larger overhangs.
- Include verandas and porches.

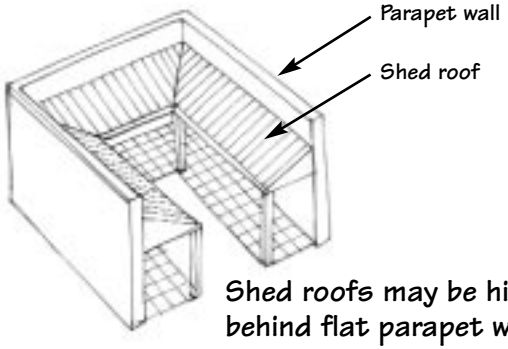


Simple shed forms may be added to steeper-pitched gable forms



In California, broader overhangs should be created that focus views out to the landscape

Flat roofs should be used in flat terrain



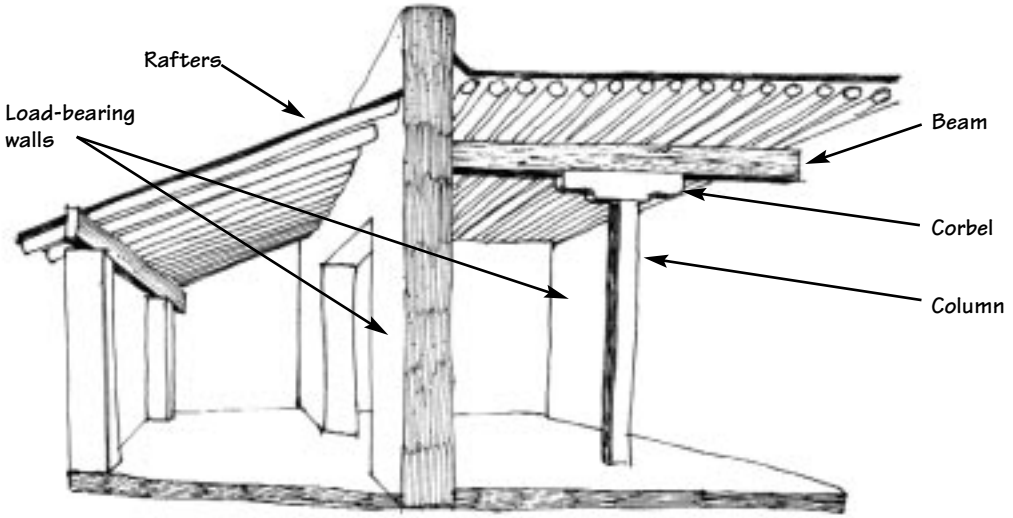
Shed roofs may be hidden behind flat parapet walls

Free-standing sheds

Pitched roofs with a moderate 12–15" overhang should be used in varied mountainous terrain

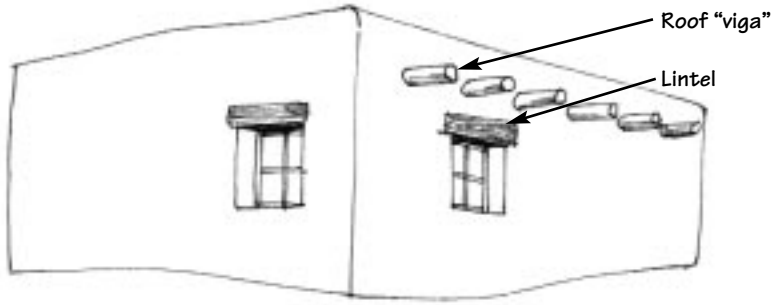
Structure

- Create exterior walls that are load-bearing and should appear massive.
- Enclose wall structure but expose roof beams (vigas) and other roof structure.
- Expose ceiling structure, including corbels, beams, and rafters (often decorative).
- Expose lintels over windows.
- Protrude structural timbers through the building.
- Expose massive structures that have less detail; however, lighter structures have more details.
- Use stout and strong columns on ramadas.



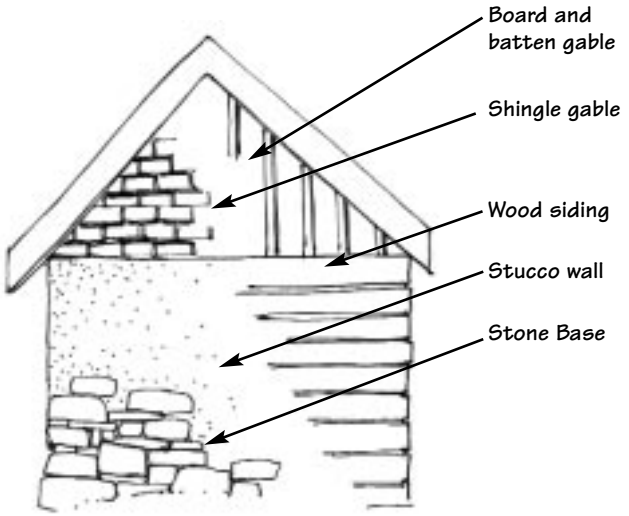
Exposed structure should be limited primarily to roof supports

Structural expression should be limited to roof and possibly window supports

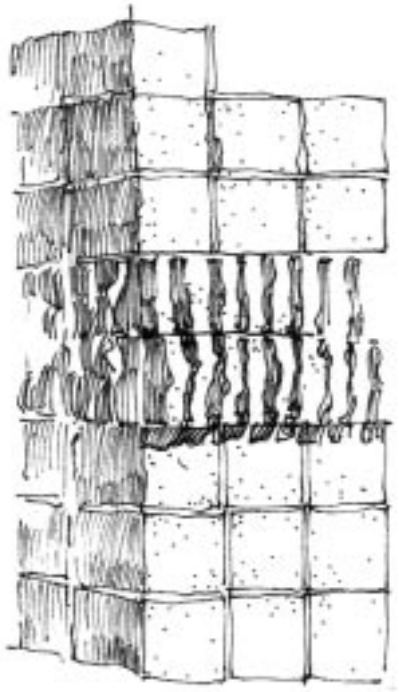


Materials

- Select natural materials with integral colors that do not need to be painted or stained.
- Make walls from stone, adobe, concrete block, or split-face block.
- Use suitable masonry materials including CMU block, adobe, and stacked flagstone.
- Use strongly textured wall materials to create a pleasing play of light and shadow patterns.
- Make a rough or smooth texture wall to match the scale of setting.
- Use anodized steel to reduce maintenance and as an alternative to wood on exposed structures.
- Use fluted materials to disperse heat.
- Use decomposed granite and concrete to match surrounding earth tones for pathways.
- Use pavers for highly developed areas or in urban areas.
- Avoid materials on horizontal surfaces that attract and retain heat.
- Avoid reflective materials that create glare.
- Avoid exposed wood unless protected from sun.
- Use native or locally produced materials when possible.
- Use metal siding for utilitarian structures.
- Make traditional-style fences and shade structures from small-diameter, collected wood—sometimes called coyote, Mormon, or grapestake fences.



Materials may be more varied in the California mountains



Ornamental use of manufactured split-free concrete block, including fluted detailing

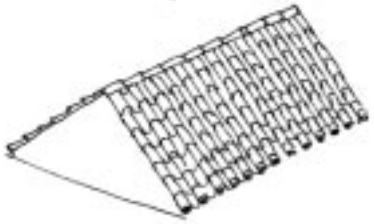
Roof Materials

- Use standing-seam or corrugated metal roofs.
- Use heavy asphalt shingles, concrete tile, and fiber-cement tile.
- Use concrete tile and clay "mission" tile if desired.
- Avoid shake roofs and stamped metal shake roofs.

Appropriate Roofing Materials

Seamed Metal

Composition, concrete, or fiber-cement shingles



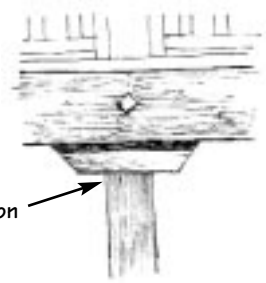
(Mission) clay tile

Corrugated metal

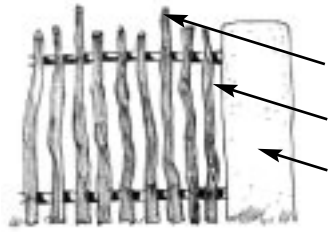
Color

- Make colors slightly darker than landscape precedents as they will fade in the intense sunlight. Dark colors also look lighter in the bright sun.
- Use lighter colors for brightness in interiors.
- Use light, moderate earth tones, including brown, gray, terra cotta, gray-green, olive, and sage.
- Avoid deep, rich greens.
- Avoid reflective colors.
- Use color as an accent in decorative elements such as clay tiles, mosaics, and in door and window frames.
- Use light, bright colors in townscapes.
- Use darker colors in mountains.

Concentrate Details at Focal Points



Corbel intersection of column and beam

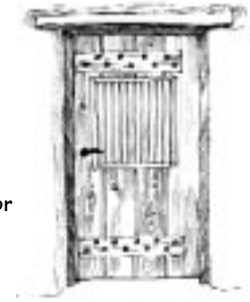


"Coyote" fence

Native cedar

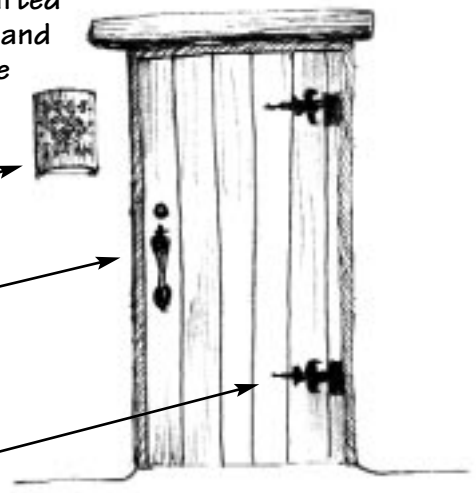
Stucco or stone post

Locating detailing at focal points with handmade tiles



Entry door

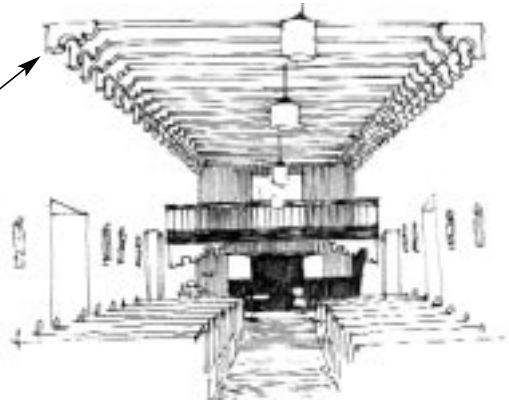
Handcrafted fixtures and hardware



Light Fixture

Hand-wrought door pull

Hand-wrought door hinge

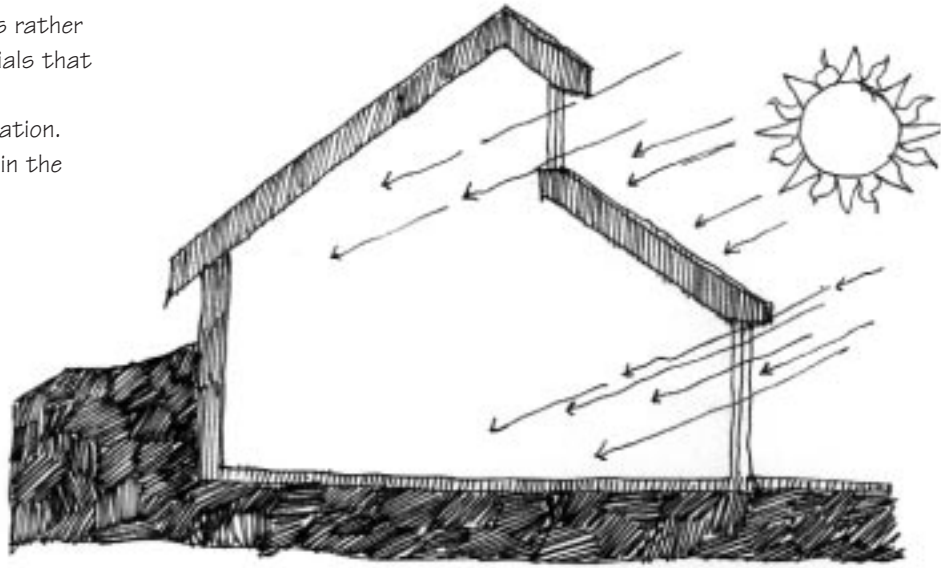


Detail at end of structural members

SUSTAINABILITY

- Use solar heat and energy—an abundant resource in this area.
- Pursue simple technologies such as passive solar as well as active solar such as photovoltaics.
- Employ solar chimneys for cooling.
- Use evaporative cooling ("swamp coolers"), which is preferable to air conditioning.
- Employ "xeriscape" using drought-tolerant plants.
- Use gravel mulch in landscaping.
- Minimize irrigation.
- Minimize site disturbance.
- Harvest water in cisterns.
- Grade to direct water runoff to vegetation.
- Use locally available natural materials rather than synthetic, manufactured materials that must be imported.
- Recycle graywater for landscape irrigation.
- See the "Common Principles" section in the introduction of this chapter for more recommendations on sustainability.

Solar gain and daylighting should be maximized



SYNTHESIS

Although the structures of the Southwest are powerfully simple in form, they contain a strong tradition of ornament. This is usually highlighted in doors, gates, light fixtures, and handcrafted building hardware. The courtyard tradition, a logical response to the climate, creates opportunities for U-shaped and L-shaped structures as well as comfortable entryways and gardens.

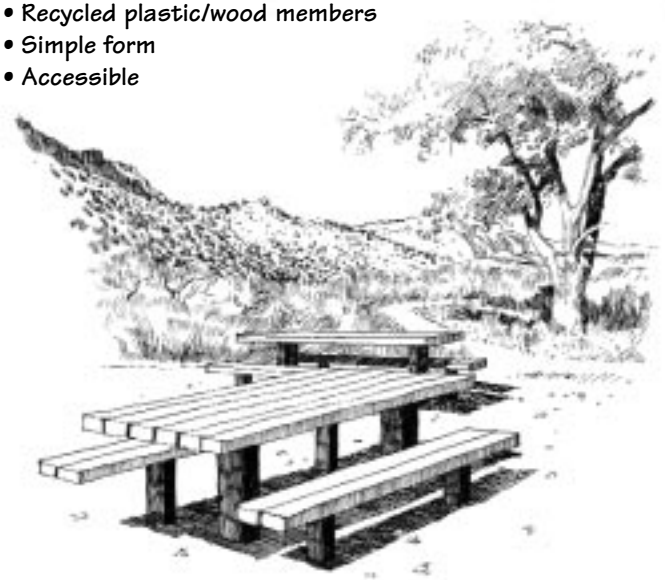
The province's strong light offers high potential for sustainability as the ever-present sun can be harvested for heating and energy. Designers and builders throughout the Southwest have returned to the area's historic roots. From San Diego to Albuquerque, people seek architecture that defines the Southwest as special and distinctive.

Sign kiosk characteristics:

- Open roof with lattice for shading
- Organized graphics

Picnic tables characteristics:

- Recycled plastic/wood members
- Simple form
- Accessible



Visitor/interpretive facility characteristics:

- Low cluster of horizontal buildings
- Structure creates shading

Pueblo, Territorial, and Spanish Colonial Revival designs are now the norm in new housing, commercial, and civic projects. Chain restaurants and motels have also appropriated these styles. As we strive to define the Forest Service's identity, we must be aware of the potential to trivialize the province's distinct design. Care must be taken to incorporate elements of Southwest style without resorting to clichés or quasi-historical replicas.

Ramada picnic structure characteristics:

- **Exposed structure, lattice for shade**
- **Split-face block**
- **Stepped walls**

Administration/interpretive facility characteristics:

- **Long, open porch**
- **Horizontal form**

Toilet characteristics:

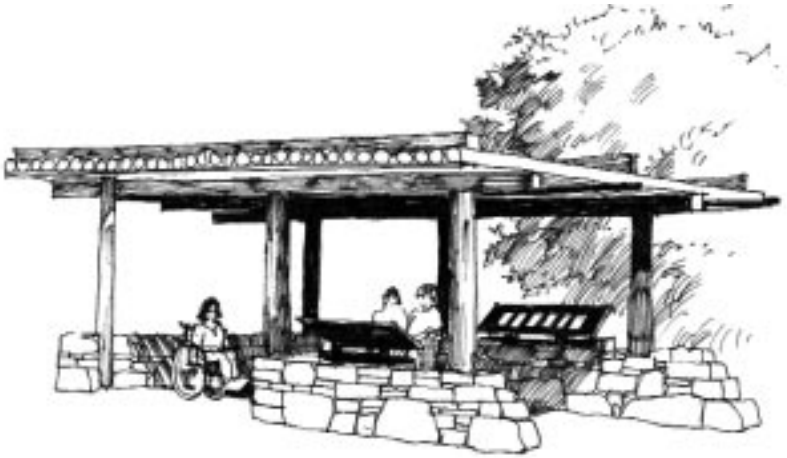
- Split-face concrete block with ribbed block details
- Native plant materials

Administration/interpretive facility characteristics:

- Soft stucco edges
- Territorial influences
- Punched, vertical windows

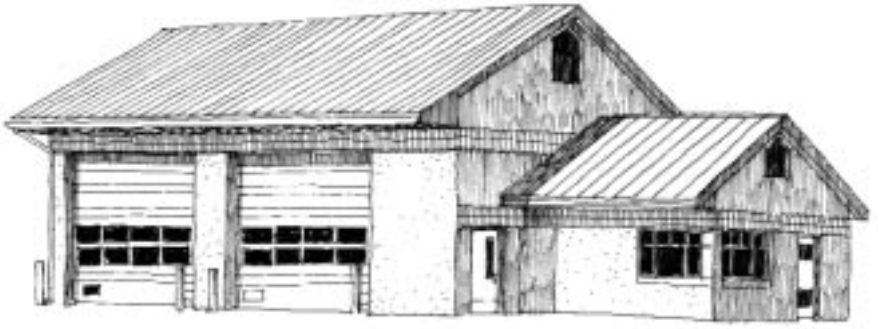
Maintenance/work facility characteristics:

- Low, horizontal form
- Pueblo influences



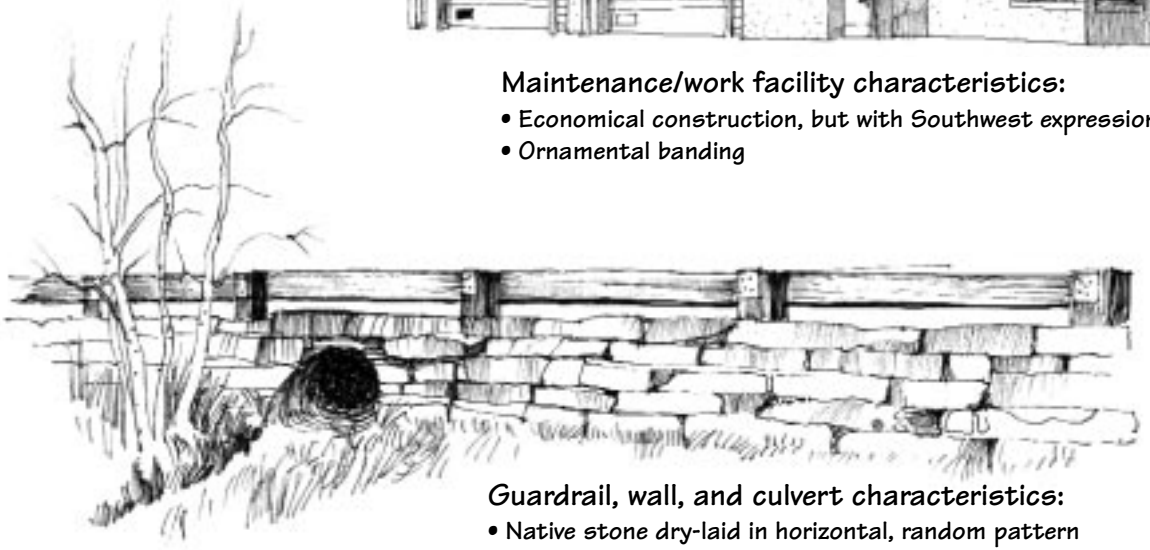
Interpretative/shade structure characteristics:

- Native stone matching local geology
- Indigenous influences
- Open lattice roof for shade only



Maintenance/work facility characteristics:

- Economical construction, but with Southwest expression
- Ornamental banding



Guardrail, wall, and culvert characteristics:

- Native stone dry-laid in horizontal, random pattern
- Finished culvert end

Chapter 5

Integrating Architectural Character With the Facility Management Process

"The championing of ideas to bring together the visual, economic, and political resources in the building process is an index of our culture, a major factor in our quality of life, and is the heart of our concept of civilization."

—William Speer

To sustain a quality design image, we must identify a design theme, convey this theme to future managers, and maintain the theme over the lifetime of a facility or development complex. This means that everyone involved in the management of the facility or complex throughout its life must understand and support the architectural character theme.

Architectural character and sustainability are a component of all phases of facility management, including:

- Conception.
- Planning.
- Design.
- Construction.
- Maintenance.
- Reconstruction to meet updated needs.

Figure 5.1 displays the process for integrating architectural character and sustainability into the facility management process. The process begins with consideration of the national character guidelines described in part 1 of chapter 4. Next we consider architectural character guidelines for each province, as described in part 2 of chapter 4.

As a project evolves, the architectural character becomes more detailed and specific to the individual national forest, grassland, or special designated area. Ultimately, it becomes tailored to the exact site and program.

Figure 5.1 Architectural character input in the facility management process

Facility Management Step	Architectural Character & Sustainability Input
1. Concept Planning • Forest management plan • Watershed analysis • Facilities master planning	General/province architectural character guidelines statements • From BEIG, chapter 4, part 1
2. Project Initiation • Needs analysis • Market analysis • Concept/vision	General/province architectural character guidelines and vision from BEIG, chapter 4, part 1. General sustainability, architectural character guidelines and vision.
3. Project Planning • NEPA • Scoping • Alternatives • Public involvement • Decision/plan • Documentation • Budget/costs	General architectural character concept and sustainability guidelines • Tie to province and forest theme (if applicable) from BEIG, chapter 4, part 2 • Get public feedback from meetings, etc. • Line officer decision on architectural character and sustainability
4. Design Narrative • Site analysis • Detailed market analysis • Design guidelines • Budget/costs	Define site specific project architectural character and sustainability guidelines • Tie to province and forest theme (if applicable) • Develop chapter 4 broad BEIG architectural character guidelines further to specific site and program; tier chapter 4, part 2 guidelines • Site and program analysis create more specific guidelines for major projects
5. Project Design • Agency • Consultant • Plans/specs • Cost estimate	Specific graphic/drawings for architectural character and sustainability • Implement architectural character and sustainability guidelines from design narrative into plans and specs • Retain for development of O&M manual
6. Project Implementation/Construction • Guideline control	Monitor construction to ensure meeting plans and specs • Ensure construction change orders do not alter or compromise architectural character or sustainability
7. Evaluate Completed Project	Monitor completed project for adequacy of meeting guidelines
8. Usage • Operations • Maintenance	Develop specific O&M manuals/guidelines that include architectural character and sustainability considerations: paint color, materials, etc. • Educate users of O&M manual
9. Monitor Usage • Regular intervals • Needs met • Objectives met	Evaluate project's acceptance, usability, relevance of architectural character, and sustainability
10. Reconstruction/Removal • Recycle to Facility Management Step 1	Recycle or create steps 1-5 architectural character and sustainability input

INTEGRATING ARCHITECTURAL CHARACTER IN RECONSTRUCTION, RENOVATION, AND EXPANSION

The process of planning for reconstruction, building additions, and major maintenance must include the evaluation of architectural character and sustainability.

This is the time to reevaluate and update the original design theme and principles. If the original design theme was sound, it will endure for decades, even if some materials and configurations must be changed. Reconstruction and renovation present opportunities to restore historic character or to revise the character consistent with the chapter 4 recommendations. Frequently, this can be achieved economically with current technology and building materials. For example, concrete form liners can be employed to create realistic rock textures. Other current techniques include wood and stone veneers, composite timbers, and simulated-wood concrete shakes for roofing.

ROLES AND RESPONSIBILITIES FOR ARCHITECTURAL CHARACTER

Architectural character guidelines are the responsibility of everyone involved in a project, including:

- Line officers.
- Engineers.
- Architects.
- Landscape architects.
- Technicians.
- Operation and maintenance personnel.
- Program managers.

Each profession brings its own valuable perspective. Designers may represent and interpret the national and provincial character guidelines. Line officers ensure that the proper guideline is selected and maintained over time. Operation and maintenance (O&M) personnel have practical knowledge that ensures what is designed can be maintained efficiently and economically.

After construction is completed, the building maintenance staff becomes responsible for the facility. It is vital to convey, through a documented process, the original design's architectural character or theme to the operation staff. The following recommendations will help make this happen:

- Involve O&M staff in initial design.
- Include architectural character guidelines in O&M manuals for roof material, paint colors, and so forth.
- Train O&M staff to maintain character over time during such activities as repainting, reroofing, administrative sign placement, and plant and landscape maintenance.
- Review facilities to evaluate architectural character and sustainability at routine intervals.
- Survey potential users for their ideas about the project character.

Figure 5.2 illustrates the roles of the various players and their involvement in character or image defining and implementation.

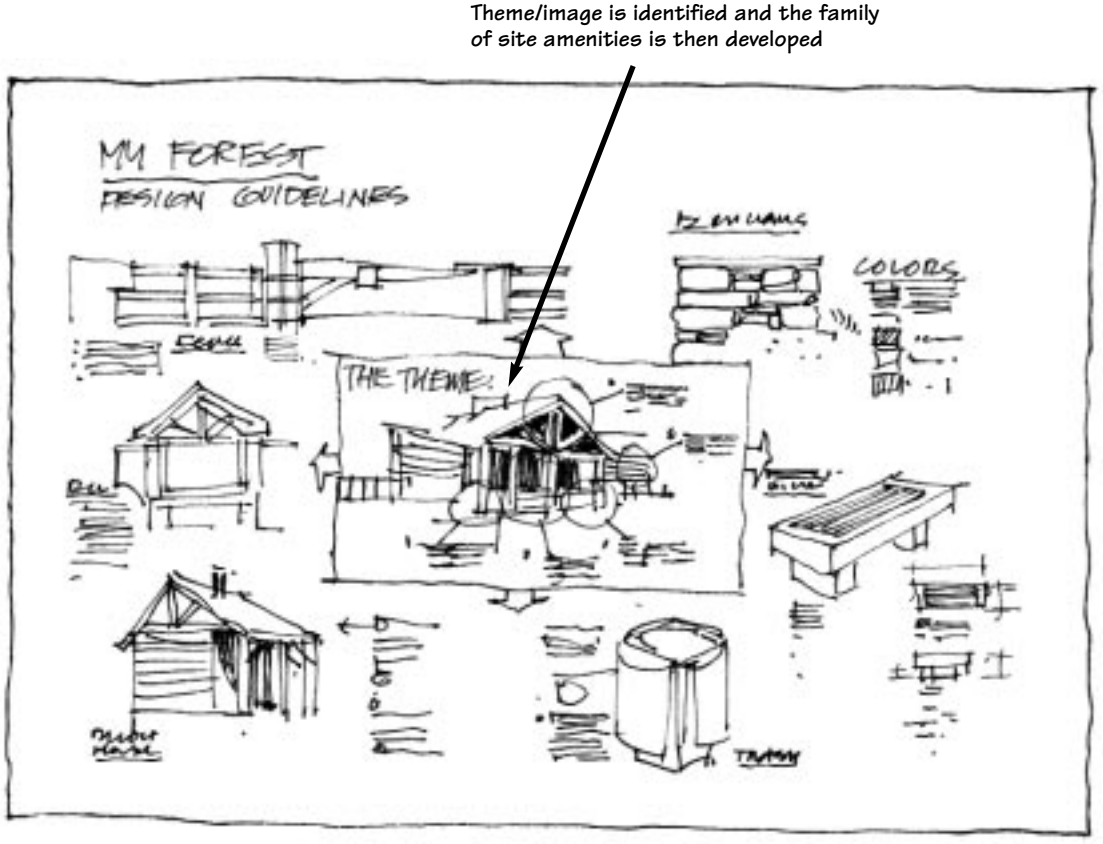
Figure 5.2 Project leadership and management—guiding the facility management process

Position	Skill Area	Degree of Involvement In Image (Tasks at each Phase)				
		Planning	**Design**	**Construction**	**Usage**	**Evaluation**
Forest Supervisor	Management & Leadership	Prioritize need/ Obtain funding			Maintain adequate O&M funding	Understand image
District Ranger	Management & Leadership	Identify need/Obtain funding/Input into design narrative		Involvement in commissioning	Maintain adequate O&M funding/ Implement image intent	Evaluate original need against image implementation
Staff Officers Engineering & Recreation	Management & Leadership	Identify need/Obtain funding/Match image	Review for Overall image match		Maintain adequate O&M funding	Evaluate funding needs at each phase/understand image implementation
Resource Specialists	Technical	Perform and document NEPA analysis				Evaluate NEPA Analysis
Landscape Architect	Technical	Understand need/ Develop design narrative/Match image	Implement Design Narrative	Manage construction activities to meet design intent	Aid in O&M and follow-thru on image intent	Evaluate design narrative and image implementation
Architect	Technical	Understand need/ Develop design narrative/Match image	Implement Design Narrative	Manage construction activities to meet design intent	Aid in O&M and follow-thru on image intent	Evaluate design narrative and image implementation
Engineer	Technical	Understand need/ Develop design narrative/Write engr. report	Implement design narrative	Manage construction activities to meet design intent	Aid in O&M and follow-thru on image intent	Evaluate design narrative and image implementation
Maintenance Technicians	Technical		Input previous experience	Manage construction activities to meet design intent	Perform O&M to meet original image intent	Evaluate O&M activities
Users	Technical	Input into NEPA & design narrative		Involvement in commissioning	Utilize facility	Provide feedback on use

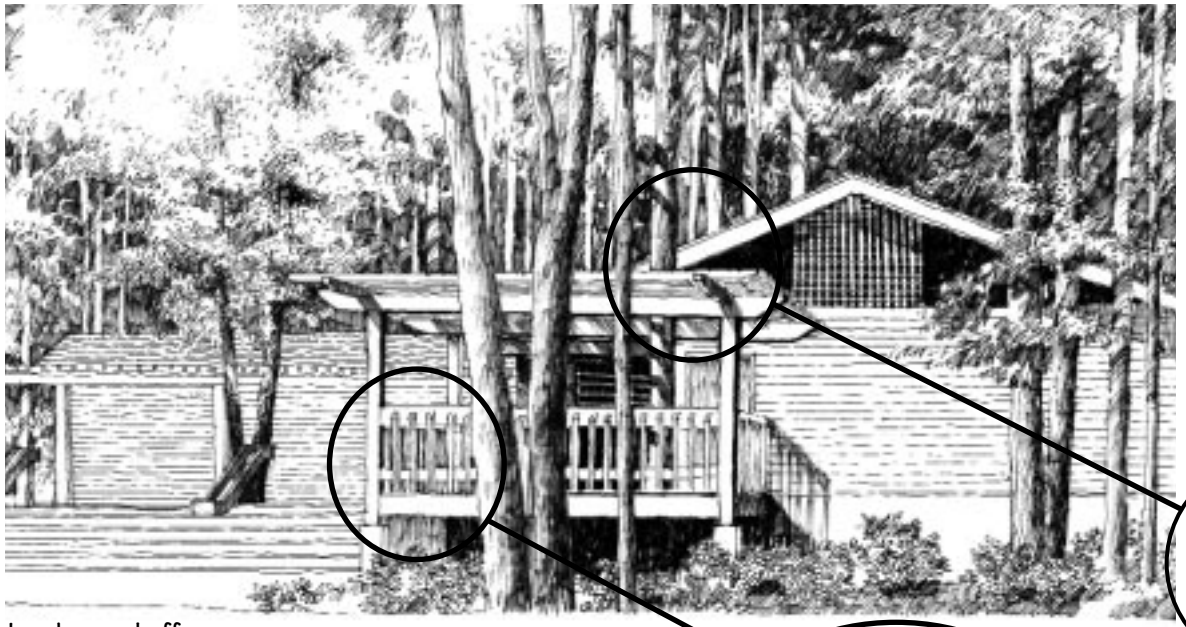
SYNTHESIS

All structures within an individual development complex or logical geographical area should relate within a design "family." This family of designs derives from characteristics unique to that development or area while complementing the surrounding landscape. We can create harmonious design by studying the landscape and then relating the line, form, color, graphics, and materials of all buildings and structures to an architectural design theme. We can consistently apply this design theme to everything from trash receptacles, water fountains, and fences, to trails, campgrounds, and visitor centers.

Each element of the built environment contributes to the identity of a particular place, as well as to the positive image of the Forest Service as stewards of the land.

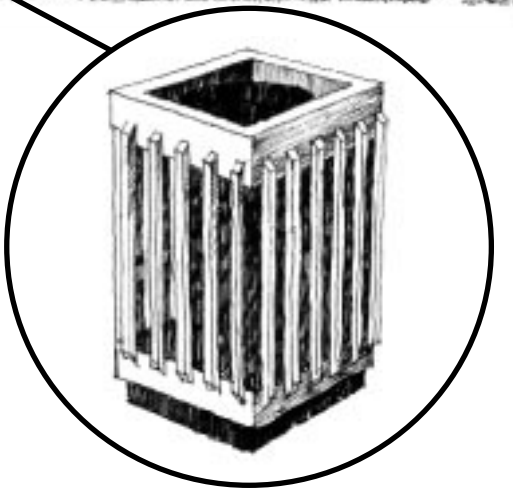


Theme Board for an Individual Development Complex or Geographical Area

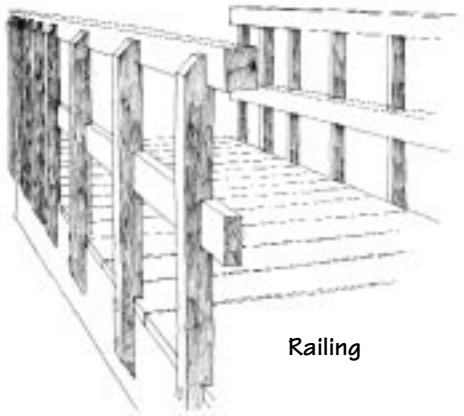


Landscape buffer

Site Amenities Reflect Architectural Character of Structures



Trellis screen for tanks



Railing

Family of Site Amenities

Family of site amenities, each contributing to the overall built image of that forest

Appendix A

Built Environment Case Studies

1. LOWER JEMEZ RECREATION COMPLEX

Location:	Southwestern Province, Jemez Ranger District, Santa Fe National Forest
Project Type:	Developed recreation facility construction
Year Completed:	1992
Budget:	Contractor's estimate—$604,417.00 Actual costs (with change orders)—$640,771.00

Project Team: The core design team consisted of the Santa Fe National Forest landscape architect, the facilities engineer, and civil engineer technicians. The landscape architect directed and coordinated the project. Other specialists who provided input and technical assistance during project planning and design included the district recreation staff, forest hydrologist, forest and district archaeologists, and the district fisheries/wildlife biologist.

As with other recreation projects on the Santa Fe National Forest, the core design team was also responsible for contract administration. This provided continuity between design and construction phases and ensured that any field changes were made in keeping with the original design intent.

Project Description: The Lower Jemez Recreation Complex consists of a picnic area, a campground, an information/rest area, and five small parking areas for fishing access. These sites are distributed along the Lower Jemez River from the mouth of San Diego Canyon to just south of the town of Jemez Springs, New Mexico. The Forest Service acquired the land from private landowners in the early 1980's through Land and Water Conservation funds.

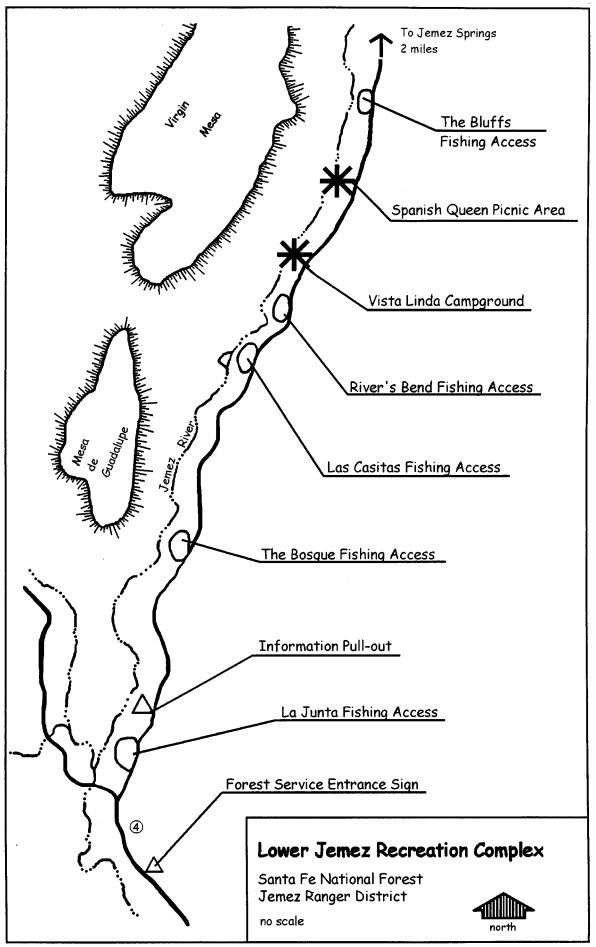
Mountains and rivers are natural attractors, and this area is no exception. It is the backyard playground to a population base of well over 600,000. The Lower Jemez Complex is key to providing many recreation opportunities along heavily traveled New Mexico State Highway 4 and serves as a gateway to the Jemez Mountains.

Large-Scale Planning: Long before Lower Jemez came into public ownership, access to the river and related activities were tolerated by the private owners, which established a pattern of heavy use. The area features a beautiful and sensitive riparian zone, endangered species, and numerous heritage resources. All of these elements were being severely impacted by unmanaged and uncontrolled use.

An area-wide recreation opportunity study conducted during project initiation and planning highlighted the need for additional camping and picnicking facilities on the Jemez District. Providing additional facilities along the Lower Jemez Corridor, while managing use and controlling vehicular traffic, would address recreation demands as well as extend the season of use. Because the elevation of the corridor is considerably lower than the rest of the Jemez Mountains, recreation developments in the area would allow for early spring and late fall use.

Project Scale Planning/Implementation: One of the challenges facing the design team was how to make eight separate recreation sites spread out over a 6-mile corridor cohere as a single unit. A strong architectural or design theme was needed to connect all sites while allowing each site's unique characteristics to shine. The most dominant constructed features in the area are the homes made of stucco and slump block with corrugated metal roofs. Rough, craggy textures and horizontal and vertical layers of red, brown, and beige define the surrounding dramatic mesas. The inherent beauty and massiveness of the natural environment overpower most human intrusions. Because of this, the recreation developments needed to complement the natural features rather than compete for attention.

The landscape architects took the lead in developing the design theme and worked primarily with the engineers to ensure the theme translated to the ground with the structures, road alignment, and facility layout. The toilet and water treatment buildings are constructed of split-face block topped off with chocolate brown metal roofs. These elements echo the natural color and rich texture of the vernacular architecture and landscape. The picnic area and campground carry this theme further with the block wall/tubular steel shade structures. Split-face block is also



used in the low walls surrounding the bulletin boards, trash containers, benches, and fishing pads at each site. Facilities were located to take advantage of natural openings and minimize removal of the scarce riparian vegetation.

Another design element repeated at each site was the fencing material. A smooth wire fence runs along most of the corridor between sites to restrict indiscriminate vehicular traffic. However, to give a sense of arrival and act as a backdrop to each site's entrance sign, a more welcoming post-and-rail fence defines either side of the entrance drive to the sites.

Universal design—making the facilities, programs, and river accessible to all visitors—was an important design objective from the earliest planning phases and has been achieved throughout the complex. All picnic and camp units, for example, are equipped with accessible site furnishings, and are easily accessible to parking, toilet buildings, and drinking water. Most of the trails have gently rolling grades and are hardened. Retained, hardened fishing pads have been provided along trails at the river's edge.

To ensure that anglers using the fishing pads would find their time well spent, log structures (V-dams) were installed adjacent to and immediately downstream of the pads to create pools and enhance the fisheries habitat. In addition, a small rest node, including a bench, niche for strollers or wheelchairs, and space for interpretive signing, was located within sight distance of each fishing pad for nonanglers accompanying their fishing partners.

The design and location of facilities is also sensitive to concerns of the Pueblo Indians of Jemez. An additional parking area, a second picnic ground, and trail to a petroglyph, included in the original proposal, were ultimately deleted after negotiations with the tribe regarding potential impacts to sacred areas.

Use/Evaluation: Maintenance and repair are important considerations, especially whenever developments are provided along a river. The design team recognized early on that building facilities in the annual floodplain could be problematic and require heavy maintenance. To minimize this to the extent possible, asphalt was used to surface trails, picnic and camp units, and the fishing pads.

A post-occupancy review after the first season of use and the first major flooding revealed that much of the trails and some of the fishing pads had washed out. The forest and district recreation staffs and maintenance crews met on site to assess the extent of the damage and determine the best course of action. Corrective measures taken included placing boulders downstream of the fishing pads for protection from the scouring action of flooding waters and placing substantial amounts of riprap along trail fill slopes. For the most part, these measures appear to be working, although monitoring and addressing the effects of flooding and the occasional vandalism and graffiti is a continuous process.

This recreation development has been very well received and supported by visitors to the area as well as local residents who appreciate an increased Forest Service presence. It has also received regional recognition for its design and implementation. Lower Jemez Complex represents one of the best multiple-resource projects on the Santa Fe National Forest. Although recreation was the driver behind this project, many other staffs were actively involved during the planning and design phases. Close coordination among the different resources resulted in a project that continues to meet the needs of the growing number of recreationists while minimizing impacts to the natural environment.

2. SAN JUAN NATIONAL FOREST TOILET CONSTRUCTION

Location, Province: Rocky Mountain Province, San Juan National Forest

Project Type: Toilet Construction

Year Completed: Chimney Rock Phase 2 completed in calendar year 1997
Haviland Lake Campground Toilets completed in calendar year 1997

Budget (Design and Constructed): Chimney Rock Phase 2

Contract Award	$349,111.50
Final Contract Price	$358,121.82
Contract Award Toilet Item 1	$88,660.06
Final Toilet Item 1	$98,637.72
Contract Award Toilet Item 2	$85,660.06
Final Toilet Item 2	95,637.72

Haviland Lake Composting Toilets

Contract Award	$114,750
Final Contract Price	$128,394.43
Contract Award Toilet Item 1	$57,375
Final Toilet Item 1	$67,604.02
Contract Award Toilet Item 2	$57,375
Final Toilet Item 2	$60,790.14

Project Team: San Juan National Forest: Engineer Technician, Landscape Architects, Forest Landscape Architect, and the Forest Engineer, plus an architect from the Rocky Mountain Regional Office.

The San Juan National Forest leadership team, on the recommendation of the forest design team, approved a standard toilet design that would be constructed at recreation facilities identified with a Recreation Opportunity Spectrum (ROS) of Roaded Natural through Rural. Forest maintenance personnel and the forest design team designed and recommended a masonry building because of the long-term durability and ease of maintenance of masonry. The standard building design features two barrier-free compartments, a separate storage area, a full-width stairway (7 feet 4 inches wide), a full-depth basement, and a compost/evaporative waste management system.

The standard toilet design allows for minor alterations to meet specific site characteristics. Minor alterations are primarily color selection of the following elements: metal roof, masonry block, gable ends, soffits, trim, and doors. In addition, the option of photovoltaic power or electric power may be selected. In some cases, special alterations may be implemented, in addition to the minor alterations, to meet sites classified as "special places." These special alterations include the addition of stone veneer and/or special siding materials.

Chimney Rock Archeological Area may be identified as a "special place." The site offers outstanding scenic beauty and contains the remains of a significant pre-Columbian Indian Culture as well as other historic uses. The area is located in a diverse landscape, rich with interesting geological features and landforms composed of mesas, valleys, and hills. It is associated with dry ponderosa pine and pinyon-juniper forests, as well as native grasslands and sagebrush lands.

The archeological area has a range of targeted ROS classifications. The range is from Primitive to Rural. The target ROS of toilet structure one, located at the primary public contact point, is Rural; the ROS of toilet structure two, located at the main archeological interpretive area, is Roaded Natural.

Both sites are well-suited for the standard toilet design with both minor and special alterations. In addition to selecting a suitable color scheme (minor alterations), extensive stone veneer was incorporated into the base of both building facades and stucco was utilized in the midwall sections (special alterations). The addition of the special alteration elements enable these modern buildings to harmonize with the existing stone character of the archeological sites and the historic fire tower.

In addition to the implementation of the minor alterations, special alterations were incorporated into the design. The use of a stone veneer base at toilet structure one, the primary public contact, anchored the structure to the landform. In addition, it introduced the visitors to the archeological and historic use of stone. The use of stucco (color selection) in the midwall section allows the structure to further blend with existing site colors as well as provide a textural change. In addition, the implementation of the elements identified in minor alterations reinforced specific site characteristics (color). Electric power was selected for this structure, as it permits a higher evaporative capacity. As the first and primary public contact point, the need for maximum evaporative capacity was identified.

The use of a stone veneer base at toilet structure two, the primary archeological interpretive area, enabled the structure to blend with the abundant archeological and historic sites. The use of stucco (color selection) in the midwall section allows the structure to further blend with existing site colors as well as provide a textural change. In addition, the implementation of the elements identified in minor alterations reinforced specific site characteristics (color). Photovoltaic power was selected for this structure. The anticipated evaporative needs at this site would be less, as most users would have used structure one. Moreover the specific site characteristics, that is, elevation and vegetation cover, create an ideal opportunity for photovoltaic power.

Haviland Lake Campground is a heavily used campground facility located in southwestern Colorado. The site is located in the upper Animas River Valley, under the backdrop of the scenic Hermosa Cliffs and at an approximate elevation of 8,200 feet. It is part of a mountainous landscape, composed of ponderosa pine forests and glacial landforms. The campground is located in a diverse microecological setting, composed of park-like ponderosa pine forest and gambrel oak hillsides intermixed with riparian and wetland areas.

The campground has a ROS classification of Roaded Natural, and is therefore well-suited for the standard toilet design with minor alterations.

A split face masonry block was used in the base section to attempt to solidify the connection between site and building through the use of texture. A smooth face masonry block was used in the midwall sections to diversify the visual mass through a change in materials. In addition, a suitable color scheme (minor alterations) was selected and implemented for the proposed site structures. The color scheme allowed the buildings to merge with the existing site character and created a consistent architectural theme.

Photovoltaic power was selected for both structures. However, as the facilities were used, one of the structures was converted to electric power as it required greater evaporative capacity than the photovoltaic power would supply.

Use/Evaluation: The two examples discussed, Chimney Rock Archeological Area and Haviland Lake Campground, attempt to illustrate how a "standard design" can be utilized throughout while permitting alterations to suit sites with special needs. The toilet structures at Chimney Rock Archeological Area have been positively received. The appealing aesthetics, the use of a biological waste management system, and the appropriate selection of both electric and photovoltaic power are the basis for the high approval rate. The toilet structures at Haviland Lake Campground have received mixed opinions; the use of masonry block, the scale of the building, the biological waste management system, and the use of a power source, either photovoltaic or electric, deviate from the historic Forest Service outhouses. However, initial public reaction is positive.

3. SKAMANIA LODGE

Location:	North Pacific Province Stevenson, Washington, Columbia River Gorge National Scenic Area
Project Type:	Lodge and Conference Center
Year Completed:	1993
Budget:	Construction $24.5 million • Forest Service: $5 million • Skamania County: $5 million • John Gray (developer): $14.5 million
Project Team:	Ankrom Moisan, Architects Walker Macy, Landscape Architects Welborn Reimann Assoc., Engineers Forest Service technical assistance, review

Project Description: The lodge includes a 12,000-square-foot conference center, a Forest Service information center, 195 guest rooms, a restaurant, and an 18-hole golf course. It is connected to the city of Stevenson by hiking and biking trails. The project was made possible by a Forest Service grant through the Columbia River Gorge National Scenic Area.

Project Planning: The architect defined the Cascadian theme by researching regionally historic lodges, cabins, and Forest Service buildings. This theme was illustrated in a design document used for environmental planning, marketing, financial decisionmaking, and establishing public acceptance and support.

The planning stages described energy efficiency, use of recycled materials, and site restoration objectives as an integral part of the program. The site had been a sanitary landfill, which was transformed into a wildflower meadow adjacent to the lodge. Environmental documents identified community economic enhancement and flora and fauna protection as important project aspects.

Design/Implementation: The Cascadian theme was carried out through building massing, steep roof slopes, heavy timber, extensive use of natural finished wood, rock walls, and muted green and brown earth tone colors. While very large, the building blends into the site. Regional artwork with naturalistic themes is used extensively throughout the building. Grand landscape views are focused outward from the building. Exterior walls are simulated board and batten and cedar shingles. The roof is architectural-grade heavy-textured asphalt shingles.

Native plants, wildlife habitat, and wetlands were protected, restored, and enhanced with the site development. Native plants also are used extensively in landscaping. Parking is screened from entry roads and main highways.

Recycled building materials include 200-year-old wood flooring and 100-year-old large timber columns from a closed salmon cannery. Fluorescent lights are used throughout the lodge, including guest rooms, saving more than $11,000 annually. Rock came from local quarries or the site itself. Local woodworkers made much of the furniture. Rugs and upholstery were custom made in the Northwest.

Use: Energy objectives and building and landscape design themes have been maintained through the facility operation.

Evaluation and Modification: While the facility has been very successful, minor internal and external modifications have been undertaken. These modifications have adhered to the original design theme.

Appendix B

Forest Service Manual (FSM) and Handbook (FSH) Direction

ADMINISTRATIVE FACILITIES

Architectural Image, Style, and Materials

FSM 7310:

Ensure that integration of wood into architectural design is consistent with the setting and architectural style in which the building or facility is to be placed.

Guide to Forest Service Office Design, Identification, and Location:

The guide discusses the basic design schemes and illustrations, provides guidelines for appropriate office locations, and describes the importance of projecting the Forest Service image and style to visitors.

Site Development and Building Design Responsibility

FSM 7310:

In general, Regional Foresters, Station Directors, or Area Directors are responsible for approving the site development and building design unless delegated to next level of organization.

FSM 7313:

The Regional Directors of Engineering (NFS) or the Assistant Station Directors for Administration (Research) are responsible for approving design drawings.

Skills and Design Standards

Skills

FSM 7313:

Qualified professionals and/or qualified technicians shall accomplish or direct all planning, design, and construction of Forest Service buildings and related facilities. Qualified professionals include professional architects, landscape architects, or engineers who have the required training, experience, and knowledge of the following: site planning; vehicle and pedestrian circulation; and various applicable building, electrical, mechanical, safety, and related codes normally associated with the design, construction, and operation of structures, buildings, water and wastewater treatment plants, mechanical systems, and similar facilities.

FSH 9309:

Facility designers and managers shall use the criteria, procedures, and practices established within the professional design disciplines.

Design Standards

Guide to Forest Service Office Design, Identification, and Location

FSM 7313.3

FSH 7309.11, Chapter 34

RECREATION FACILITIES

Objectives and Policy

FSM 2330.2 Establishes as objectives for the provision of recreation facilities:

1. To maximize opportunities for visitors to know and experience nature while engaging in outdoor recreation.
2. To develop and manage sites consistent with the available natural resources to provide a safe, healthful, aesthetic, nonurban atmosphere.
3. To provide a maximum contrast with urbanization at National Forest sites.

FSM 2330.3 sets policy for the development and administration of sites and facilities, including:

1. Use recreation opportunity spectrum guidelines (FSM 2310) when developing sites.
2. Develop sites and facilities that will provide recreation experiences toward the primitive end of the spectrum. Do not provide urban class facilities (ex. 01).
3. Use the land and resource management planning process (36 CFR 219, FSM 1920, and FSM 2310) to reach decisions to develop recreation sites.
4. Develop sites and facilities to enhance natural resource-based activities normally associated with a natural environment.

5. Seriously consider the element of cost efficiency when developing and operating sites and facilities.
6. Establish priorities for the development and management of sites in the following order:
   a. Ensure public health and safety.
   b. Protect the natural environment of the site.
   c. Manage and maintain sites and facilities to enhance users' interaction with the natural resource.
   d. Provide new developments that conform to the National Forest recreation role.
7. Allow concession operation of National Forest campgrounds and related recreation facilities (FSM 2340).
8. Strive to make it possible for persons with disabilities to be included in the mainstream of life when pursuing outdoor recreation opportunities.
9. Prepare site designs and environmental assessments for all sites before undertaking construction or major rehabilitation efforts.

Authorities

FSM 2330.42a - Regional Forester. (At the Regional Forester's discretion, the following responsibilities may be delegated to the Forest Supervisor unless specifically reserved to the Regional Forester.) In the area of site planning and development, the Regional Forester has the responsibility to:

1. Review and approve design narratives and site designs.
2. Seek partnerships with other entities to share in the development, cost, and/or labor of providing recreation opportunities and ensure compliance with requirements on authorizing instruments (agreements, memoranda of understanding, and so forth) in FSM 1580 and FSH 1509.11.
3. Identify and update regional priorities for the recreation capital investment program. This responsibility is reserved to the Regional Forester.

2330.42b - Forest Supervisor. The Forest Supervisor has the responsibility to:

1. Prepare design narratives, site plans, and final drawings. Develop sites and facilities in accordance with established objectives and policies and land and resource management plans.
2. Monitor operation and maintenance actions.

2330.42c - District Ranger. The District Ranger has the responsibility to:

1. Prepare operation and maintenance plans. This includes fee compliance plans and vegetative management plans.
2. Operate and maintain recreation sites and facilities in accordance with plans.
3. Enforce payment of recreation fees.

Site and Facility Planning and Design

FSM 2333. The guidelines in this section apply to all recreation sites on National Forest System lands.

2333.03 - Policy.

1. Prepare site plans before construction, rehabilitation, or expansion of a site. Site plans must show the specific location and design of facilities and must provide for control of traffic, sanitation, public safety, site protection, grading, landscape planting, and use distribution.
2. Use the recreation opportunity spectrum class and development scale established in management plans in site designs (ex. 01, FSM 2330.3). Accommodate environmental concerns identified in the environmental assessment in site designs. Carefully consider the cost of installing facilities, as well as future operation and maintenance costs.
3. Design facilities, such as roads, barriers, paths, and water and sanitation systems, so that they are as natural, simple, and unobtrusive as possible. Design and build rustic-looking facilities so that they become

part of the attraction. For example, use hand pumps rather than hydrants, plantings of berry bushes for barriers, and wood posts rather than steel posts.

4. Design and install facilities that are:
   a. Simple and durable in nature, adequate for the intended function, and devoid of unnecessary frills and personal preference options.
   b. Cost-efficient both from the standpoint of initial installation and continued operation and maintenance.
   c. In close harmony with the surrounding environment.
   d. Safe to use and in conformance with all applicable standards.
   e. Suitable for both traditional and nontraditional users.
   f. Devoid of barriers to persons with disabilities to the degree specified in "Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped." (American National Standards Institute, Inc. ANSI-A117.1-1961. New York.)
   g. Suited to the desired experience opportunity selected for the site.
   h. Vandal-resistant.

Appendix C

Recreation Opportunity Spectrum (ROS)

The following reflects information contained in FSM 2330.3; the Recreation Opportunity Spectrum Color Poster (R6-REC-118-94); and ROS Primer and Field Guide (R6-REC-021-90). The color matrix shows by ROS Setting the kind of "on-site development" that can be considered "normal," "fully compatible," "inconsistent," or "unacceptable."

ROS Setting	On-Site Development				
	No facilities for user comfort; rustic and rudimentary ones for site protection only. Synthetic** materials excluded. Use undimensioned native* materials only. No site modifications for facilities.	Rustic and rudimentary facilities primarily for site protection. Use undimensioned native* materials. Avoid use of synthetic** materials. Little or no site modifications for facilities. Limited and subtle site modification.	Rustic facilities providing some comfort for the user as well as site protection. Contemporary/rustic design usually based on use of native* materials. Synthetic** materials should not be evident. Moderate site modification.	Some facilities designed primarily for user comfort and convenience. Some synthetic** but harmonious materials may be incorporated. Design may be more complex and refined. Moderate to heavy site modifications for facilities.	Facilities mostly designed for user comfort and convenience. Synthetic** materials are commonly used. Facility design may be highly complex and refined but in harmony or complementary to site. Heavy site modifications for facilities.
Primitive (P)	Normal	Inconsistent	Unacceptable	Unacceptable	Unacceptable
Semiprimitive nonmotorized (SPNM)	Fully compatible	Normal	Inconsistent	Unacceptable	Unacceptable
Semiprimitive motorized (SPM)	Fully compatible	Normal	Inconsistent	Unacceptable	Unacceptable
Roaded Natural (RN)	Inconsistent	Fully compatible	Normal	Inconsistent	Unacceptable
Rural (R)	Inconsistent	Inconsistent	Fully compatible	Normal	Inconsistent
Urban (U)	Inconsistent	Inconsistent	Inconsistent	Fully compatible	Normal

* Native refers to materials found naturally in nature. It needn't come from or near the project site.

** Synthetic materials should not be used in primitive settings. Where possible, they should be avoided in semi-primitive settings, but if used, they should not be evident to the user. In roaded natural settings, native materials are usually used, and synthetics, if used, should not be evident to the user.

Legend

Normal

"Normal" describes "normal" conditions found in the ROS Setting

Fully compatible

"Fully compatible" describes conditions that meet or exceed the norm for the ROS setting

Inconsistent

"Inconsistent" describes conditions not generally compatible with the normal setting conditions, but which may be necessary under some circumstances to meet management objectives. The more removed from the "norm" shown in the above matrix, the more questionable the condition would be. For example, a pit toilet acceptable in a SPNM setting would be very questionable in a rural or urban setting. Use of metal or plastic siding or roofing that appears obviously synthetic to a visitor would be inconsistent in a roaded natural setting.

Unacceptable

"Unacceptable" describes conditions that, under any circumstance, do not permit the creation or maintainance of an ROS Setting, and which will cause a change in that setting towards one that is more developed. For example, moderate or heavy site modification and development of facilities for user comfort would change a primitive ROS setting into one that is more developed.

The following example describes typical ROS settings as described in the "1986 ROS Book." Acreages and distances described may vary somewhat between regions.

Primitive

Generally, it is on a setting of at least 5,000 acres and 3 miles away from all roads and trails with motorized use (or has sufficient spatial or topographic characteristics to allow a sense of solitude). Access is via nonmotorized trails or cross country. Very low interactions with other visitors. Very high chance of solitude; unmodified natural or natural-appearing environment.

Semiprimitive Nonmotorized

A setting that has an area of primitive roads* or trails that are not open to motorized use; is generally at least 2,500 acres in size; and is between 1/2 and 3 miles from all roads, railroads, or trails with motorized use. Access is via nonmotorized trails or nonmotorized primitive roads or cross-country. Low contact frequency with other visitors. High probability of solitude; natural-appearing environment.

Semiprimitive Motorized

A setting that has an area that allows motorized use, is generally at least 2,500 acres in size, and is at least 1/2 mile from a better than primitive road.** It is within 1/2 mile of primitive roads or trails used by motor vehicles. Access is via motorized trails or primitive roads or cross-country, where terrain and regulations permit. Low to moderate contact frequency with other visitors. Environment may have moderately dominant alterations, but these do not dominate views from trails or primitive roads in the area.

Roaded Natural

A setting in an area that is within 1/2 mile of a better than primitive road. Access is primarily via conventional motorized use on roads. Contact frequency with other users may be low to moderate on trails and moderate to high on roads. Environment is natural appearing as viewed from visually sensitive roads and trails.

Rural

Predominantly a culturally modified setting where the natural environment has been substantially modified, i.e., structures are readily apparent, pastoral or agricultural or intensively managed wildland landscapes predominate as viewed from visually sensitive roads and trails. Access is primarily via conventional motorized use on roads. Contact frequency with other users may be moderate to high in developed sites and moderate away from developed sites.

Urban

Urbanized environment with dominant structures, traffic lights, and paved streets. Access is highly intense, motorized, and often with mass transit supplements. Contact frequency and interaction with large numbers of people is high. Recreation places may be city parks and large resorts.

* Primitive roads are not constructed or maintained and are not generally suitable for highway type vehicles.

** Better than primitive roads are constructed or maintained for the use of highway type vehicles.

The following matrices show in gray shading those portions of the ROS where the well-designed use of material described at the left is either "normal" or "fully compatible." Where not shaded, material use may be "inconsistent" or "unacceptable." Note that Roaded Natural (RN) was enlarged to show more detail, reflecting both the widespread nature and importance of this setting in the national forest built environment. As a rule of thumb, when one-third or less of a setting is shaded, use the material with caution. Check first with FSM direction to determine suitability of certain improvements, e.g. shelters and play equipment.

Buildings

	Primitive		Semiprimitive Nonmotorized		Semiprimitive Motorized		Roaded Natural			Rural		Urban	
Exterior Materials													
Native							■	■	■				
Mix of native and synthetic										■	■	■	■
Exterior Colors													
Earthtones							■	■	■	■			
Complements built environs											■	■	■
Exterior Coatings													
Stains and some paints							■	■	■	■			
Stains or paints									■	■	■	■	■
Exterior Finishing													
Roughsawn/rustic/nonglare							■	■					
Smoothly finished								■	■	■	■	■	■
Site Setting													
Natural surroundings dominate							■	■	■				
Natural/built environment codominate										■	■		
Built environment dominates											■	■	■

Roads
(See FSM 7709.58 for Maintenance Level Definitions)

	Primitive		Semiprimitive Nonmotorized		Semiprimitive Motorized		Roaded Natural			Rural		Urban	
Primitive (User defined)*													
Level 2 (High clearance)													
Level 3 (Passenger car single lane with turnouts)													
Level 4 (Passenger car mostly double laned with aggregate surfacing)													
Level 5 (Passenger car mostly double laned with paved surface)													

* Not necessarily closed to vehicles, so not Level 1. The above does not preclude use of designed drainage and other features to minimize road-caused resource impacts.

Site Circulation and Traffic Control

	Primitive		Semiprimitive Nonmotorized		Semiprimitive Motorized		Roaded Natural			Rural		Urban	
Trails													
Native material													
Gravel													
Asphalt/concrete													
Primary Access Routes to Recreation Facilities													
3'-wide native material													
3'-wide aggregate													
4'- to 6'-wide aggregate													
4'- to 6'-wide asphalt													
4'- to 6'-wide concrete or pavers													

Site Circulation and Traffic Control (continued)

	Primitive		Semiprimitive Nonmotorized		Semiprimitive Motorized		Roaded Natural			Rural		Urban	
4'- to 6'-wide wood boardwalk									■	■	■	■	■
4'- to 6'-wide synthetic boardwalk										■	■	■	■
6'- to 8'-wide surfaced trail or any type boardwalk										■	■	■	■
Fencing*													
Barbed wire with wood posts	■	■	■	■	■	■	■	■	■	■	■		
Woodfence (jackleg, worm, pole)	■	■	■	■	■	■	■	■	■	■	■		
Barbed wire with steel posts			■	■	■	■	■	■	■	■	■		
Electric (portable)	■	■	■	■	■	■	■	■	■				
Wood (dimensional lumber)										■	■	■	■
Metal, chainlink, plastic											■	■	■
Barriers/Walls													
Downed logs, plants, or rocks in combinations	■	■	■	■	■	■	■	■	■	■	■		
Dry rock walls or earth berms				■	■	■	■	■	■	■	■	■	■
Constructed log cribbing or walls			■	■	■	■	■	■	■	■	■		
Mortared rock walls							■	■	■	■	■	■	■
Timber or concrete walls									■	■	■	■	■
All-log or dimensional wood wheelstops/barriers							■	■	■	■	■		
Combination concrete/wood wheelstops								■	■	■	■		
Concrete wheelstops										■	■	■	■
Recycled plastic wheelstops										■	■	■	■

* Although steel fencing materials are synthetic, they may offer less visually impacting solutions that better maintain an ROS setting, especially when not in the immediate foreground.

Water, Sanitation, and Electrical Facilities

	Primitive		Semiprimitive Nonmotorized		Semiprimitive Motorized		Roaded Natural			Rural		Urban	
Drinking Water													
Handpump							■	■	■				
Pressurized water system													
Wood-covered hydrant							■	■	■	■	■	■	■
Wood drinking fountain									■	■	■	■	■
Prefab. concrete/metal fountain										■	■	■	■
Showers, Laundry, Utilities													
Showers/laundry										■	■	■	■
RV Dumps									■	■	■	■	■
Telephone									■	■	■	■	■
Electrical/sewer hookups										■	■	■	■
Garbage Collection													
Pack it in, pack it out	■	■	■	■	■	■	■						
Garbage cans							■	■	■	■	■	■	■
Dumpsters									■	■	■	■	■
Toilets													
Pit toilets		■	■	■	■								
Wood-frame SST w/o screen					■	■	■	■	■				
Wood-frame SST w/screen							■	■	■	■	■		
Precast concrete SST									■	■	■		
Flush toilets (all kinds)										■	■	■	■

Signs for Recreation Sites and Trails (Adapted from EM-7100-15 Sign and Poster Guidelines for the Forest Service)

	Primitive		Semiprimitive Nonmotorized		Semiprimitive Motorized		Roaded Natural			Rural		Urban	
Sign Panel Materials													
Solid wood (or appearing so)	■	■	■	■	■	■	■	■	■	■	■	■	■
Plywood					■	■	■	■	■	■	■	■	■
Metal, fiberglass, synthetics*						■			■	■	■	■	■
Sign Panel Color/Finish													
Natural	■	■	■	■	■	■							
Preservative not evident (if used)	■	■	■	■									
Stained	■	■	■	■	■	■	■	■	■	■	■	■	■
Painted					■	■	■	■	■	■	■	■	■
Etched or decals										■	■	■	■
Reflectorized					■	■	■	■	■	■	■	■	■
Sign Support Material													
Tree	■	■	■	■	■	■							
Rustic wood post (preservative not evident)	■	■	■	■									
Wood post					■	■	■	■	■	■	■	■	■
Metal or synthetic post									■	■	■	■	■
Sign Support Color/Finish													
Natural (or appearing so)	■	■	■	■	■	■							
Preservative not evident (if used)	■	■	■	■									
Stained	■	■	■	■	■	■	■	■	■	■	■	■	■
Painted					■	■	■	■	■	■	■	■	■
Anodized										■	■	■	■

* Limited use in SPM/RN.

Interpretive Facilities

	Primitive		Semiprimitive Nonmotorized		Semiprimitive Motorized		Roaded Natural			Rural		Urban	
No interpretive facilities	■	■	■	■									
Simple signs of native material					■	■							
Simple signs or wayside exhibits of native or natural appearing material with some refinement of design							■	■	■	■	■		
More complex wayside exhibits									■	■	■	■	■
Major interpretive sites (typically staffed)										■	■	■	■

Nonvehicular Bridges

	Primitive		Semiprimitive Nonmotorized		Semiprimitive Motorized		Roaded Natural			Rural		Urban	
Logs	■	■	■	■	■	■							
Logs with dimensional wood*		■	■	■	■	■	■	■	■	■	■		
Dimensional wood								■	■	■	■	■	■
Concrete										■	■	■	■
Steel										■	■	■	■
Wood preservatives not evident (if used)	■	■	■	■									
Synthetic										■	■	■	■

* Use of dimensional lumber for decking of bridges in P and SP settings is often necessary, although such materials in those ROS settings should not otherwise be used.

Appendix D

Glossary

Adobe: A sun dried, unburned brick of clay and straw. The clay of which the brick is made is also referred to as "adobe" clay and used as the mortar for cementing the blocks together.

Architectural character: The distinguishing appearance of a building or structure's architectural features, such as roof slope, materials, openings, massing, color, and scale. The character is based on ecological and cultural influences.

Architectural character type: Based on ecological and cultural influences, the architectural character definition for a distinctive and broad geographic area. An architectural character type with distinct and distinguishing features is defined for each of eight provinces.

Arts and Crafts Movement: A building and design period from approximately 1890 to 1929 that is best characterized by the Craftsman style structure. The movement, which essentially is a style of simplicity and lack of fanciful ornamentation, included design of structures, furniture, textiles, and pottery. Popular architects of this period and design included John Ruskin, Gustave Stickley, Charles Limbert, and Frank Loyd Wright.

Balds: Southern Appalachian mountain balds are meadow-like, essentially treeless openings of grasses, sedges, forbs, and shrubs that occur above 4,000 feet in elevation on mountain gaps, ridges, and crests. When viewed from a distance these areas appear "bald" as opposed to the surrounding taller vegetation.

Bargeboards: The covering of the outside edge of a gable roof that runs parallel with the rafters.

Base: Bottom or lower part of a building; its connection to the ground or land.

Battered: A wall that has been methodically stepped back to form a slope from bottom to top. Typically this treatment is used in retaining walls to use the weight of the wall to resist the horizontal forces.

Built environment: The part of the environment formed by humans, including buildings, structures, landscaping, earth forms, roads, signs, trails, and utilities.

Canales: "Canal" and "Canales" are the Spanish words for a drain or waterspout that takes water from a roof and dispenses it off the side of the building away from the wall.

Chickees: A traditional abode of Southwest Florida's Native Americans; "chickee" in the Mikasuki language means "dwelling." It is an open air structure made from peeled pine or cypress poles with palm fronds nailed to the roof poles in an overlapping circular manner for water tightness.

Civilian Conservation Corps: Formed in the Great Depression, the Civilian Conservation Corps is a national Government work program that operated from 1933 to 1942 to employ 500,000 18- to 25-year-old men from low-income and nonworking families at jobs in forests, parks, and rangelands. It was a joint Government operation: the Army ran the camps; the Departments of the Interior and Agriculture were responsible for work projects and personnel to manage them. The program created many high-quality structures, buildings, and campgrounds; most of which still remain in use.

Cold roofs: A continuous, semi-flexible roof membrane, consisting of plies of felts, mats, or fabrics that are laminated on a roof with alternate layers of cold-applied roof cement and surfaced with a cold-applied coating.

Context: The larger sphere of influence that a facility is considered within and affected by. Three contexts for sustainability are ecological, cultural, and economic.

Corbels: In Southwest style of post and beam building, the corbel is the decorated support capping the post and supporting the beam. Its purpose is to dissipate the load of the beam onto the post, as well as decoration.

Coursed cobblestone: Cobblestones are stones chiseled to roughly rectangular shapes; they are coursed when the bed joints are visible as horizontal layers.

Dependencies: Numerous out buildings associated with farming, such as barns, tool sheds, chicken houses, smoke houses, and corn cribs.

Dogtrot house: Simple, long, narrow house of logs with gable roof popular in the old South, some with siding over the logs for better appearance and large doors in the middle of the house on each side to let the breeze blow though. A porch and doors were typically on both sides of the house. Name derived from the fact that not only the breeze went through the middle, but also the dogs.

Dripline: The point at which drainage water drops from a structure of any form or material to fall to the surface below. Examples: drip line of a tree or drip line of a roof.

Eave soffit: A horizontal covering from the underside of the roof edge to the house wall. The soffit would typically cover the rafter ends.

Embodied energy: For buildings, it is the sum total energy required for construction (that is, procurement of materials, on site activity, and, also, maintenance and refurbishment and demolition). It can be compared to the capital cost of the building only in terms of energy measurement, not monetary terms. For materials, it is the total energy measured in units of energy to create for a unit of weight.

Expressed oversized structure: One typical element was enlarged or exaggerated to emphasize it as a major design feature (for example, the front porch of a Craftsman Bungalow style house with very large porch piers).

Fall line: A point where the coastal plain rocks have eroded back to the harder upland rocks that form a barrier in a river. Typically this fall line would create waterfalls for power generation, as well as form the point where boats would have to be unloaded to move their cargo upriver. These points formed natural features around which early towns formed in the 19th century.

Family of signs: A series of signs with a distinctive shape that serve as an informal logo of the Forest Service. The signs have different, but similar, shapes with different sizes and have a protocol of use as delineated in Engineering Management series publication: EM-7100-15, *Sign and Poster Guidelines For The Forest Service*. The signs of dark brown and crème (off white) color are usually entrance signs and readily identify a Forest Service facility.

Fee demonstration: A temporary program authorized by Congress in 1996 to allow certain Government agencies to charge fees for use of developed recreation sites and parking. A condition of the program is that the fees are to be used to maintain the existing sites within the fee area. The program was to last 2 years but has been extended and could possibly be made permanent.

Forest Service region: For administrative purposes, the Forest Service has divided the States and territories into 10 administrative units called regions. Each region has a regional forester with staff to serve as administrator for the forests in the region.

Forest Service shield: This is the official logo/symbol of the Forest Service used to denote official correspondence and property owned or operated by the agency. It consists of a badge-like shield, a single conifer tree between the letters U and S, and the words Forest Service above the tree and Dept. of Agriculture on the lower side.

Gable: The triangular wall section at the ends of a pitched roof bounded by the two roof slopes. The gable is the vertical wall section.

Gable roof: Two pitched roofs back to back forming a triangle on each end called a gable.

Granger-Thye permit: The Granger-Thye Act of April 24, 1954, is a far-reaching statutory authority allowing Forest Service funds and property to be used in specific ways. This act is the basis for the use of Government facilities by private parties (rentals) and expenditures of Government money on other than Government lands and concessionaire programs. The permit is the document outlining the conditions and terms of the action.

Half-timbering: Exposed wood beams on the exterior of the house in between stucco or other materials. This was a feature of some Craftsman homes. Because it is simpler and less complex, it should not to be confused with Tudor style houses.

Head frames: The steel or timber frame at the top of a mining shaft, which carries the sheave or pulley for the hoisting rope, and serves various other purposes. Includes all the raised structure around the shaft that is used for loading and unloading cages.

Hip roofs: A gable roof with the ends brought together at the same pitch as the rest of the roof so all four sides of the roof are the same angle.

INFRA: Acronym for "Infrastructure." A Forest Service corporate database and inventory of the entire national forest and grasslands built environment, including roads, buildings, trails, structures, utilities, and all other improvements.

Landscape character: The distinguishing appearance of a landscape's visual and ecological factors; landscape character is defined in visual aspects of landform, climate, geology, and surfacial rock; water features; vegetation; color; and cultural pattern.

Landscape character types: A subdivision of a province having overall characteristics of the province but having a distinguishing geographically specific landscape character. For example, the Southern Rocky Mountain, Northern Rocky Mountain, and Black Hills landscape character types of the Rocky Mountain Province.

Line officer: Forest Service administrative decisionmaker, for example, the district ranger or forest supervisor.

Lintel: The horizontal beam forming the upper support member for a door or window frame carrying the weight of the structure to the side supports.

Mandan lodges: Earth covered post and beam lodges of the North Dakota Mandan Tribe. All around the perimeter of the lodge were 12 pillars that supported the rafters that radiated down from the smoke hole at the center and the 4 central posts. Across the tops of these posts ran stringers, and slanting down to the ground was an outer wall of vertical-slanted logs. This formed a storage space where firewood was kept and a coral for favored horses, that might be brought in to protect them from enemy raiding or dangerous storms. The log walls and roof were covered with willow poles, then brush, then heaped with dirt. The lodges were arranged in circles around a ceremonial plaza.

Massing: Expanse, spatial enclosure having form or bulk; the resultant shape or form of buildings or a building group.

Meaningful Measures: A Forest Service recreation management system defining measurable quality standards, costs, priorities, targets, and results monitoring reporting.

National Recreation Strategy: Now known as the National Recreation Agenda, the strategy was the fourth element in the Forest Service's Natural Resource Agenda and the plan of action to meet the expanding recreation use and protect the health, diversity, and productivity of the land. The strategy focuses on five key goals: 1) improving the settings for outdoor recreation and enhancing visitor experiences, 2) guaranteeing visitor satisfaction with services and facilities, 3) reaching out to rural and urban communities to capitalize on the social and economic opportunities associated with recreation on the national forests, 4) strengthening our relationships with those who cooperate to improve outdoor recreation for all Americans, and 5) ensuring that recreation use does not impair the land's health.

Naturalness: The level or degree of landscape of modification and the predominance of nature versus human alterations.

Partnerships: A term implying a formal or informal level of cooperation to achieve a certain goal desired by the interested partner and Forest Service. A partnership is a framework to recognize and involve interested parties in cooperating with the Forest Service.

Province: A broad geographic area having similar and distinguishing ecological and cultural characteristics.

Rafter tails: Same as rafter ends; the end of the rafters exposed at the edge of the eave.

ROS: Recreation Opportunity Spectrum, defining six different recreation settings varying from urban to primitive.

Recreation Opportunity Spectrum (ROS): A recreation planning land classification system that defines areas by the probable recreation experience it provides in terms of setting and level of development. The setting is measured by the number of people expected, producing different levels of solitude and the evidence of human use as shown by management activities and degree of development.

Rustic: A historic building style generally employing local native materials and extensive use of unrefined or natural formed wood members and stone.

Scale: Two definitions: (1) in architecture, the size of a building or structure in relation to a human, varying from small intimate to monumental, and (2) the geographic context for relating to and identifying the built environment—these scales are Nation, province, and site; goals such as national identity influence architectural character at a site scale and vice versa.

Scenery Management System (SMS): Provides an overall framework for the orderly inventory, analysis, and management of scenery. Applies to every acre of national forest and national grasslands administered by the Forest Service and to all Forest Service activities, including timber harvesting, road building, stream improvements, special use developments, utility line construction, recreation developments, and fuel breaks.

Shotgun house: Simple, long, narrow, one-story, gable roof house with a narrow, covered front porch in front. A door and back door are on the other end with a small platform. Rooms were as wide as the house and doors continued through the rooms to the end. This was typically a low-cost house for low-income residents.

Structure: Description of the spatial relationship of components parts of a building and their connections. Also, a term for something built having mass and shape (for example, bridge, tower, or building).

Sustainability: An aspect of developments and land uses that (1) minimizes the use of resources, (2) conserves ecosystems, and (3) creates healthy built environments and landscapes for present and future generations.

Tabby: Early cement made from lime, sand, and oyster shells and used mostly on the southern Atlantic coast. Walls were made from this material poured into forms; some walls were then covered with stucco and also scored to appear as blocks.

Townscape: A component of the landscape comprised of a town or city, including a town center, commercial area, and residential area.

Utilitarian building: Buildings tending to be of few functions and not used by the public, for example, warehouse, and well houses.

Universal Design: A term for a public philosophy directing the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. The intent of universal design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities (1997 North Carolina State University, The Center for Universal Design).

Vigas: In the Southwestern United States, a vigas is a tree log often stripped of its bark and used in a room, or throughout a house, for structural roof support or decoration.

Visual Management System (VMS): A guideline process developed by the Forest Service in 1974 to retain a selected level of visual quality in the seen landscape. The landscape is sorted into different areas in terms of distance, relative quantities of persons viewing the landscape for recreation reasons, and quality of scenery. This system was modified in 1996 and evolved into the Scenery Management System.

Works Progress Administration (WPA): An independent agency established by Congress in 1935 to provide jobs during the Great Depression. Although it primarily created major public work construction jobs, it also provided art, music, writing, and theater projects. The need for the WPA ended in 1941; the agency was officially eliminated in 1943.

Appendix E

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Appendix F

Acknowledgments

"Does design matter?" was the first question asked by one person in the small Forest Service group gathered in the Auditor's Building conference room in Washington, DC, in September 1996. That group had come together with a charge from then-Director of Recreation, Wilderness, and Heritage Resources, Lyle Laverty, "to improve the identity, consistency, and quality of USDA Forest Service recreation facilities." The intent was "to better serve our customers and enhance the agency's image as a quality natural resource manager and leading outdoor recreation provider."

Does design really matter to a large multiple-use resource management agency? There were many indications that it did. Very early in the process of development, the scope of the effort was expanded by the then-acting Director of Engineering, Gerald "Skip" Coghlan, to include the agency's administrative facilities. Over the course of the next 3 years, the small group became known as the Built Environment Image Team (BEIT). The BEIT worked with hundreds of employees throughout the Forest Service and beyond, who in sum answered the question with a resounding "YES!" Without that involvement, the Built Environment Image Guide (BEIG) would not have turned out as it did. The BEIT and everyone involved shaped the guide with their questions and ideas, and with their art and inspiration, but mostly with their dedication and caring. They are acknowledged here for their contributions to this guide. Their true reward will come with steady improvement of Forest Service facilities on the ground, over time. That is how the question will truly be answered.

The following were among those who contributed to the preparation of the Built Environment Image Guide:

THE BUILT ENVIRONMENT IMAGE TEAM (BEIT)

The BEIT (pronounced Be-it) evolved from the "small group" described above and served as the driving force for the project. They developed the scope and overall approach of the guide, selected consultants and reviewers, wrote much of the content, and edited the rest. It was a high spirited and dedicated team, representing diversity in expertise, geographical location, and most of all, opinion. Every point and question was subject to rigorous examination and debate (at least once), but always with respect and best intentions for the end products. It is often said that the process can be as important as the product. The BEIT will remember both with pride.

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STRATEGIC ADVISORS FOR THE BUILT ENVIRONMENT (SABE)

The SABE (from the Spanish verb, "to know") was made up of regional directors of two of the program areas most directly involved in the planning and design of facilities-engineering and recreation. Their purpose was to provide counsel to the BEIT on how to successfully integrate, or inculturate, the concepts and approach of the

guide into the Forest Service's normal modes of operation and program of work. This included content, rollout, training, and linkage to other units, such as the Technology and Development Centers.

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A critical juncture in the process of developing the BEIG was the decision to develop representative examples of regional architectural character types, richly illustrated. In order to achieve this, it was decided to hold a series of design workshops, or "charettes" around the country. A consultant group led by OZ Architecture of Denver & Boulder, CO, was selected to lead and facilitate the charettes. In leading the charettes, developing research and content in advance, graphically capturing participants' ideas, and writing the content of Chapters 3 & 4, the OZ team brought continuous excellence, enthusiasm, and professionalism to the process.

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THE CHARETTE TEAMS

Five charettes were held around the country to define the number and coverage of the "provinces," or areas of the country with common environmental and cultural influences on architectural style; provide primary input on the most important influences on design in the province; and develop the architectural character type(s) that fit best within the province and also within the culture of the Forest Service. Participants were asked to bring with them examples of "good" and "bad" design within the area, along with their experience, expertise, enthusiasm, and open minds. The province coordinators performed tedious work in developing much of the background material, as well as the logistics for the charettes. Thanks to all of them, the charettes were productive, fun, and learning experiences for everyone.

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