A CONTINUATION
Of Place and Time...
To those who I have listened to learned and remembered. . .
A Continuation of Place and Time

by

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Elizabeth Preston Moorshead
April 2007
The American barn is an enigma on the landscape. A building that arouses feelings in every person. Whether recollecting a childhood memory of playing in a loft, doing barn chores at all hours of the day or that forever connection to the past wondering what it must have been like to live back then or even architecturally admiring its undeniable form. Yet they are an enigma because this embedded nostalgia we have for them is not merely enough to save a lost culture and the buildings themselves. The foundations and ideals that the barns were built on must be looked at as well. “Until quite recently, the majority of humanity still told time by the sun, organized their lives by the slow rhythms of the seasons, and lived by the traditional knowledge and beliefs of their ancestors, accumulated slowly over the course of centuries and millennia.” This way of life is reflected in older farm buildings and is perhaps the last remnant of that culture in the United States. Technology has changed the way we live, build and identify place, allowing us to do things we once only dreamed.

In many instances the increased mechanization of farming has led to the destruction of soils, water systems and habitats, not to mention fruits and vegetables that are flavorless and covered in pesticides. Yet in recent years there has been resurgence and developing awareness of sustainable farming practices, which are based on a whole system approach whose overall goal is the continuing health of the land and people. The demand for products, such as milk from cows that have not been injected with hormones, can be seen nationwide in grocery stores. There is a growing market for the quality of food. In almost every aspect. For example from how the cow was raised, slaughtered, stored, and finally prepared to how all of these things will effect generations to come. This regard for quality and long term planning can be expressed through buildings as well. Structures and places that have withstood the tests of time show the quality and care that was put into erecting them as well as the cultural phenomena of the time and give a sense of place.

The architecture of these places was derived as a response to its immediate environment and local culture. It is important that we value this intersection because it is here that unique and diverse places emerge and contribute to our quality of life. In today’s world these ideas are being ignored and many of our towns have turned into homogenous, boring, strips, erasing the foundations and ideals that each of our communities were based on. Architects therefore have a responsibility to preserve those buildings that reflect their locality, which is embedded in the culture and environment surrounding them and to adapt them in ways that are relevant to our contemporary world. By doing this we continue to sustain not only our local natural environment and heritage but leave for future generations another layer of place that continues to contribute to the quality of life in a particular location. To me this idea manifests itself in the form of a barn or farm. My strategy therefore is to adaptively reuse an old farm site into a collective sustainable farm. Landscaping and manipulating the buildings thoughtfully to bring the site into a new era that contributes to the quality of life and experience of the community and sets a precedent and awareness for generations to come.
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Life, architecture and nature are evolving processes, moments between what was and what is going to be. Things adapt and change to their environs. Time moves endlessly on and one never completely realizes the impacts he/she has on their world. Yet those things, which one leaves behind, tell a story of who he/she was and give an identity to the past. In academia it is called anthropology, sociology, psychology, archaeology, history. One studies these things because we are naturally self-absorbed and want to learn and understand what others have done before us so we can evolve and “progress,” or simply to pass knowledge from one generation to the next. We do this as a means to understand how we belong or fit in the environment with which we live. The more we understand and are capable of, the easier it is for us to survive and to thrive in a particular environment or location.

This idea begins at the most primal level in time. A caveman seeking a cave for shelter to the numerous human interactions and relationships that take place for survival in a contemporary city. Understanding the dichotomy between our environment and ourselves enables us to look critically at our place in the world. Yet what is that place?

Biologically each of us is changing but our way of thinking is changing too, perhaps much more rapidly than our physiology. This can account for such things as changing fashion, trends, fads, consumption, and buildings. Throughout the world the rate of change is different depending on climate, location, knowledge, available materials, government, or lack there of, religion, creed, ethnicity, economics, education and technology. The variables are infinite and from them distinct and unique places evolve. Yet there are fundamental things that are universal for each of us to live: food, water and shelter. As well there are certain sociological aspects of a culture for example love, hate, jealousy, humor, grief, and compassion that cannot be defined by location. We react to things differently but there are elementary truths or instincts that make us all human.

Shelter is one of those and arises as the simple instinct to protect oneself from his/her environment. However as cultures arose, that need developed into a more direct expression of the builders, one that is defined as architecture today. As Aldo Rossi has stated, “The first men in building themselves dwellings, created a more favourable space for their existance. In building themselves an artificial climate, they followed an aesthetic intention.”

As time passes, cultures change and there is a connection that remains between those who came before us and those that will follow. The connection is most obviously seen through material things such as books, heirlooms, and relics. Yet if one looks closer, those material things give way to reveal a way of life, which reflects not only how a culture dealt with the three fundamental needs, but also “aesthetic intention.” As the human race evolves, buildings become cultural artifacts, which remain as a reflection of those societies. They tell a story not through words, which are limited to a small group of people, but through direct experience. As Alexander Stille has noted, “I found these remnants of the past strangely comforting. They change your sense of time and your place in the world, making the ups and downs of the present seem smaller, while also making you feel a part of a larger continuum.” They change our perception of time and place. Bringing one’s own present and future into a deeper awareness of one’s surroundings.

This thesis project is the same type of evolutionary process. It is evidence of accomplishing a degree but also another layer of thought, in an ongoing theme of interest in my life. Because of this I feel that it is important to include some things that reveal my own past, which have not only helped me to build my thesis argument, but also reveal why I am doing it in the first place.
Fig. 5  Layers of Time - Perugia, Italy
December 12, 2002
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When architects strive to create lasting monuments, some become part of the significant cultural heritage of our age. These successes seem to embody the most socially important values of a city, region, country, or even the world. Other attempts are only the reflection of the vanity of the designer or client and pass into oblivion. Worse, they become a permanent blight on the environment. As an architect, specifically, how can your work simultaneously embody the social values of one place, a particular culture, and universal human concerns?

As an architect I hope to never design a single building that gets built. In expressing this many people have said, “Then aren’t you in the wrong profession.” My reply to them is what is wrong with the buildings and materials that we already have? Old warehouses, granaries, factories, barns and houses are the culture and history of any town, something that should not be forgotten as we move towards the future. And those buildings that have become “blights on the environment” why not transform them, use them to mold new buildings that not only function, but are efficient and aesthetically pleasing. Sure it is expensive but as the world becomes more and more populated and space and resources run out we will have wished we had done it sooner. Is it because we have become so used to a building type serving a specific function that once the function is no longer needed we allow a mass, a space, to cease being used? That space, no matter how old or neglected, can still function and give a certain feeling, a connection to the past perhaps, making people more aware of their future and impact on the world.

There is so much talk about sustainability. Is architecture sustainable? Putting a building, an inanimate synthetic object on and in a natural, living landscape? In this day and age we are very aware how much of an impact we have on the natural world and that we need to minimize our effects. Why not use what we have already created, usually in the heart of what was once a town, instead of sprawling large, consuming boxes, in the middle of fields. We need to rethink as a culture what we are doing. Many of the “sustainable” features that are trends today such as orientation, day lighting, rainwater collection, and renewable materials were a given in older buildings because that was all they had use of. These elemental things should be the basis of any design in any culture and with these there becomes diversity in what is built in different geographic regions. Again this is even more apparent in older buildings. So as an architect I want to redesign where old and new meet, a bridge that takes the world into a healthier future.
Introduction

Three years have passed and I find myself realizing my naiveté, of course I will have to “build buildings” yet I still have a fascination with the idea of re-using those buildings, which have succumbed to time. In particular are the old farm building and barns which dot the American landscape. The lure that I have for them comes from growing up in farm country and spending so much time caring for horses and animals. As Peter Zumthor so eloquently pointed out in his book *Thinking Architecture* our minds cannot help but recollect those things, which are familiar or known to us. “There was a time when I experienced architecture without thinking about it...a particular door handle in my hand, a piece of metal shaped like the back of a spoon.” For myself it is the worn wood ladder that ascended into the loft, each rung having a dip in it and the wood worn so smooth that it appeared as if someone had put a wax finish on it. How many people had gone up and down that ladder? Yet these sentimentalities are not enough to satisfy me. What is even more fascinating is that people who do not share this background have similar emotions. At first I thought maybe I was making this up, but there was a photography contest in the lower gallery in the school of architecture last year and when I asked several people, which was their favorite, I continually got the same answer. The obvious “oh it’s so hard to decide but I really like this one, this one and this one.” The picture of the barn resting in the field was always among their favorites. It startled me because it had very little complexity or interesting composition. Its uniqueness was in the color enhancement, where the sky became bright blue, the grass the greenest green and the barn’s old wood a deep worn brown. But other photographs had used this same technique and so I could not help but think that without the barn the photograph would lose its power. Which brought me back to the never-ending question of what allows a barn to sit righteously on a landscape and not only remain neutral but enhance it?

This thesis is an attempt to explore the lure that people have for older farm buildings and to identify those things, which create place, identity, and experience in a particular geographic location. In many instances we are hardly aware of our surroundings, yet subconsciously know when we feel comfortable in a space/place. Those that came before us shaped these places and in many ways reveal their way of life and time. However many old buildings are increasingly being destroyed by growth and development. With this in mind, older buildings have an important link to our past, and are often the embodiment of a culture that has shaped who we are. **Architects therefore have a responsibility to preserve those buildings that reflect their locality, which is embedded in the culture and environment surrounding them and to adapt them in ways that are relevant to our contemporary world. By doing this we continue to sustain not only our local natural environment and heritage but leave for future generations another layer of place that continues to contribute to the quality of life in a particular location.**

July 8, 2004

Walking through the barn, you could see the wear, the smoothed wood and slight dip on the loft ladder from years of people going up and down. The ribbons now caked with dust and cobwebs that told of horse shows past. The nameplates on stall doors of horses gone as well. Who were those horses and who had won all of those ribbons? I would get snippets of stories from some of the parents who had taken lessons when they were little girls and from Pam, my riding instructor who had grown up on the farm were she still lived, trained and taught. It would send my imagination reeling and I would pick her brain about all the horses that had been in and out of the barn.

Warm in the winter cooler in the summer. The sleigh and buggy in the loft, abandoned and never moved because so many other things had to be done. Sliding across the loft floor on hay. The smell of manure, feed, dust and leather one only notices if not accustomed to. The tack boxes lining the aisle, each person getting a little piece of the barn to their own. Things come and go but many still remain.
As my thoughts tend to drift and I allow myself to wonder when I am drawing. I begin to think about, what makes a place. My opinion of course is biased and I think about the places I have been and recall a moment when crossing the border from Italy to Switzerland. How within such a short distance an entirely different culture had emerged with a different language, religion, government, and society. All that I saw out the window of the train was trees. Are Italian trees different from Swiss trees? There was no differentiation between the two countries. Until the sign told us, and the houses began to change shape. Where was that invisible, abstracted line that defined the border and had been so ingrained in me since my 5th grade geography class?
To begin this discussion I am going to reiterate the idea that the world is in constant flux and that people adapt to and with their surroundings in order to meet the three fundamental needs for survival; food, water, and shelter. Yet in this day and age those needs have become blurred and are often taken for granted. We go to the grocery store because we want a banana, not thinking twice about where it came from. What if it came from the Philippines where it has been sprayed with numerous fungicides and the people picking them only earn $1.50 a day. Knowing this would you still buy the same banana? We have slowly become detached from the resources we use and need. And instead of making ourselves aware of these things we simply say, “Great, they are on sale!”

Historically humans evolved from being hunter/gathers roaming with the animals they sought, to understanding the principles of natural growth, settling, and beginning the practices of husbandry and farming. This in turn led to a need for sheltering livestock and crops. No longer were humans completely dependent on nature but were now able to manipulate their environment for the benefit of survival. That is not to say that humans have total control. Then and now, we are always at the mercy of Mother Earth, as demonstrated by the devastating tsunami that hit the south Pacific or hurricane Katrina that obliterated the Gulf Coast. However, we have the ability to predict and be aware of her power and to take precautions, which can firmly establish our own survival. How we do that needs to be looked at critically. What have others done before us to solve the same problems? Or rather what problems have those in the past made for us? Yet one can not dwell on what if’s. “Too much made of the past fosters a determinism that limits the future.”

And as Eric Sloane has pointed out, “New things are not always improvements on the old; often they are sad imitations. And many old things are obsolete—even bad and consequently, of no value whatsoever.”

Yet sheltering animals and storing crops is not a new idea and today is still a necessity for survival. Farming is supposed to have begun over 10,000 years ago in several different parts of the world. Native Americans grew crops, as did the Europeans who brought their knowledge of building barns to America. However “husbandry was not a business but a way of life...closeness to the soil and awareness of nature were inherent part of American living.” Eric Sloane writes, “Although a man might be a doctor or printer or lawyer by profession, he was also, of necessity, a farmer.” In the development of our country, “Jefferson’s agrarian vision so inspired the fledging nation that at the beginning of the nineteenth century close to 80 percent of all Americans lived on farms.” With rich soil to provide food for families, barns began to spring from the American landscape and those that are left are a memory of a way of life.
Times have changed, however and little evidence remains except for our romantic notion of the family farm. These subsistence farms have slowly become obsolete and the farmer, who now grows two, maybe three crops at most, goes to the grocery store to buy vegetables. This disappearing culture of farming was brought on by the onset of mechanized labor and the demand for mass production food, which in turn has led to a less diverse yield in crops and livestock. Eric Sloane has commented that “farmers have become business men and farms have become factories.”

New barns have been built, wood has been replaced by aluminum siding and stacked stone foundations replaced by piles and footings. Farming has become an industry. “In just 20 years, it is predicted, a mere 3 percent of all farms will control two-thirds of farm production.” Donald Paarlberg, a highly regarded agricultural economist has warned, “We are developing a wealthy hereditary landowning class, which is contrary to American tradition.” It is such things that lead farmers to produce those crops, which are market driven, often soybeans and corn for livestock. The continual growth of these plants over and over leaches the soil of needed nutrients and added fertilizers must be used. These fertilizers are often not absorbed and have detrimental effects in groundwater and watersheds. As well farmers are forced to spray herbicides and pesticides in order to keep harvested yields, which have also been known to have adverse effects on the environment, not to mention humans. Yet today many farmers are not even able to meet such demands and must sell their land in order to survive. It is estimated that one to two million acres of agricultural lands are converted to urban uses each year. This can account for much of the rising sprawl and development that has increasingly begun to take over the United States. And with it there is a seemingly diminished value that we place on the farm landscape as open space.

Slowly succumbing to the industrialization and rise in “monoculture” and development, agricultural barns of North America are in a sad state of decay. “The startling visual impacts of farm modernization indicate the profound changes in the way crops and livestock are produced. Bigger and different machinery and the obsolescence of draft animals has resulted in a need for larger yet simpler out buildings and an abundance of obsolete farm structures on most farms.” “We know of farms where cows stand on concrete floors and remain in their stalls during their life time, and others where hogs, turkeys and chickens by the ten thousands are fattened by their brief span on one fixed and narrow spot.” Barns and the small farms they housed have lost their place in our working society and so have been left to fall to the wayside. And with their destruction much of what our culture today is based on will be lost as well. As Lucy Lippard explains,” Americans willingly forget our past in favor of our futures which, without the past, are houses built on sand.” This project therefore is an attempt to bring an older place into a new era. In order to do so we must look at what place is. And those places we value.
A Klee painting named “Angelus Novus” shows an angel looking as though he is about to move away from something he is fixedly contemplating. His eyes are staring, his mouth is open, his wings are spread. This is how one pictures the angel of history. His face is turned toward the past. Where we perceive a chain of events, he sees one single catastrophe which keeps piling wreckage upon wreckage and hurls it in front of his feet. The angel would like to stay, awaken the dead, and make whole what has been smashed. But a storm is blowing from Paradise; it has got caught in his wings with such violence that the angel can no longer close them. This storm irresistibly propels him into the future to which his back is turned, while the pile of debris before him grows skyward. This storm is what we call progress.”

Walter Benjamin, *Illuminations*
Just imagine the millions of cities, towns, and wilderness that cover the earth, approximately 195,697,400 square miles. With the sheer size that the earth is, place becomes a rather overwhelming occurrence, and takes on multiple meanings. It is constantly changing with time, as are our interactions with it. So our definition changes with it as well. The idea of place therefore becomes something that a person holds true in his/her own heart. It is not something that any book or map can truly define but is a feeling, or connection to what is. This connection is drawn through the interactions and experiences one has and those instincts which each of us has as humans.

A familiar way that place is often described is by a name, or address, given to a particular location. As the dictionary defines it, place is "a particular town or district or building etc." The philosopher Norberg-Schulz goes further to describe place as, "A totality made up of concrete things having material substance, shape, texture, and colour" [that is] "evidently an integral part of existence." This is true that tangible things help define place as a locality. But it becomes more when we assign value and importance to these things. The house on the corner is the house on the corner until we meet its inhabitants and then it becomes Joe Smith’s house. There is an identity that we assign with place, which is different for each of us. It therefore takes on more than a geographic location and becomes a return to our senses, a recollection of experience. Our ability to feel, see, smell, hear, and taste subconsciously takes over and triggers our memory.

As numerous as they are both singular and specific, and fully realizable across great distances, relationships with places are lived whenever a place becomes the object of awareness. In many instances, awareness of place is brief and unselfconscious, a fleeting moment (a flash of recognition, a trace of memory) that is swiftly replaced by awareness of something else. But now and again, and sometimes without apparent cause, awareness is seized-arrested-and the place on which it settles becomes an object of spontaneous reflection and resonating sentiment.

The awareness and value that this author discusses is based upon our perception of our senses as well as to a memory of our past. "Hence, as numerous writers have noted, places possess a marked capacity for triggering acts of self-reflection, inspiring thoughts about who one presently is, or memories of who one used to be, or musings on who one might become." In this sense the Yi-Fu Tuan explains that, “What begins as undifferentiated space becomes place as we get to know it better and endow it with value.” This can occur at two distinct levels, the individual and social.

Individually, each of us has those places, which we like or feel drawn to without any human interaction. For instance, walking down a particular street in a city or a room in a house where one is completely content to sit, observe and reflect. These examples, however, still have a connection to others. The street is there because people have built houses and stores along it and the room exists because of an idea and action that someone had. It is only when we are in nature that we return to our instinctive selves, and place becomes defined by those things, which are a unique change, such as a fork in the river, a large rock, a tree that has been struck by lighting. These things are different, unique not out of place but a differentiation of the norm, a variation. They provide us with a glimpse of our place in the world and bring a certain sense of humility and inspiration. As Karsten Harries explains, “The region of all regions is the world understood now not as the totality of all things but as the context of contexts that assigns everything its place.” These experiences of “place, or nature” are capable of “providing nourishment that social life cannot.” Yet while taking a walk in the woods, or hiking in the mountains, one can crutch the idea that they will be able to return to civilization and be able to take a hot bath to ease the aches and pains from the excursion.
Therefore it is undeniable that we have a social link to place as well. Towns and cities are a reflection of that and were historically created as a means of living and working together in order to survive. Buildings then are a link between the individual and society. And “Place as an Aristotelean phenomena, arises at a symbolic level with the conscious signification of social meaning and at a concrete level with the establishment of an articulate realm on which man or men may come into being.” The individual is compelled to create, to make his/her “place,” yet that which he/she thinks or is able to achieve is scrutinized by society’s ideals. At the moment our societal ideals are at a standard in which most cannot keep up. Things come and go so quickly that place can no longer be established. “The receptivity and sensitive resonance of a place...depends first on its stability in the everyday sense and second, on the appropriateness and richness of the socio-cultural experiences it offers.” Place therefore becomes more defined the longer it remains and the more people that it affects in a society. “Each time we enter a new place, we become one of the ingredients of an existing hybridity, which is really what all ‘local places’ consist of.” Some may have more impact than others and with time place evolves into history. Henry Glassie has noted, “History is the essence of the idea of place. In place the person is part of the history.” It is “...our personal relationships to history and place [that] form us as individuals and groups, and in reciprocal ways we form them.” It is then critical that one looks at how place is changing and realize that what we do today will impact generations to come.

Imagine it is a bright, sunny day, the sun sparkles and heats the pavement to the point of creating heat puddle mirages just at the horizon. This vast, unique country is laid out before you connected by hundreds of thousands of miles of highway and the freedom to go wherever your “Explorer” will take you. You’re gone, free to roam at leisure, an American nomad if you will. You’ve always wanted to see, experience New Orleans, Louisiana, Topeka, Kansas, Reading, PA, Athens, Georgia, Walla Walla, Washington, haven’t you? Why not, you have the ability to go wherever the road will take you and further if you choose? And like others before who were searching for something new, settled and created these places you want to visit. But why are they a destination, a home, a vacation spot, a hole in the wall? You exit the highway to see if you can find something to eat and are bombarded by signs, screaming “pick me, pick me.” McDonalds, Burger King, Taco Bell, Arby's, Wendy's, White Castle, Pizza Hut, Papa John's, Taco John's, Subway, Hardee's, Sonic, In and Out Burger, Dairy Queen, Taco Del Mar, A&W, Carl’s Jr.(which used to be Roy Rogers), Quizno’s, Dominees, Chick-Fil-llet, Bojangles, Dunkin’ Donuts, Starbucks, and yes of course even Wal-Mart can provide you with a fast food staple. You recognize all of the signs. You’ve had their food before and can remember the tastes of each item on the menu and know that you would get the same thing if you went again. But you are in a new place 600 miles from home, you yearn for something more, something different a new experience, if you had wanted a McDonald’s hamburger couldn’t you have just driven ten minutes in your own town to get one? Why have you come all this way to find the same things in this town that you have found in every other town in the United States. Your heart sinks wishing you could try the great seafood that you thought the coast was known for. What happened to the town that used to be here or was there even a town at all? Kenneth Frampton has noted,
Our Town by Iris Dement

And ya know the sun’s settin’ fast
And just like they say, nothing good ever lasts
Go on now and kiss it goodbye
But hold on to your lover ’cause your heart’s bound to die
Go on now and say goodbye to our town, to our town
Can’t you see the sun’s settin’ down on our town, on our town
Goodnight

Up the street beside the red neon light
That’s where I met my baby on one hot summer night
He was the tender and I ordered a beer
It’s been forty years and I’m still sittin’ here

But ya know the sun’s settin’ fast
And just like they say, nothing good ever lasts
Go on now and kiss it goodbye
But hold on to your lover ’cause your heart’s bound to die
Go on now and say goodbye to our town, to our town
Can’t you see the sun’s settin’ down on our town, on our town
Goodnight

It’s here I had my babies and I had my first kiss
I’ve walked down Main Street in the cold morning mist
Over there is where I bought my first car
It turned over once but then it never went far

And I can see the sun’s settin’ fast
And just like they say, nothing good ever lasts
Go on now and kiss it goodbye
But hold on to your lover ’cause your heart’s bound to die
Go on now and say goodbye to our town, to our town
Can’t you see the sun’s settin’ down on our town, on our town
Goodnight

I’ve buried my Mama and I’ve buried my Pa
They sleep up the street beside that pretty brick wall
I bring ’em flowers about everyday
But I just gotta cry when I think what they’d say

If they could see how the sun’s setting fast
And just like they say, nothing good ever lasts
Go on now and kiss it goodbye
But hold on to your lover ’cause your heart’s bound to die
Go on now and say goodbye to our town, to our town
Can’t you see the sun’s settin’ down on our town, on our town
Goodnight

Now I sit on the porch and watch the lightin’ bugs fly
But I can’t see to good, I got tears in my eyes
I’m leavin’ tomorrow but I don’t wanna go
I love you, my town, you’ll always live in my soul

But I can see the sun’s settin’ fast
And just like they say, nothing good ever lasts
Go on, I gotta kiss you goodbye
But I’ll hold on to my lover ’cause my heart’s ’bout to die
Go on now and say goodbye to my town, to my town
I can see the sun has gone down on my town, on my town
Goodnight, Goodnight
Place is being erased, devalued and ignored. The numerous geographical differences that occur through our large country are slowly disappearing. “Globalization may well raise the standard of living and introduce democratic reforms to countries around the world, but it is also bringing about an unprecedented homogenization of culture and will almost certainly accelerate the disappearance of thousands of regional dialects, languages, and distinct cultures.”

Family farms and homesteads were a symbol of man’s freedom to choose his destiny and rely on the earth to provide him with food. In today’s world this is no longer the case and barns are quickly disappearing along with a significant part of America’s past. This changing phenomena of the American landscape is not a new thing and several authors have addressed it. James Howard Kunstler in his book The Geography of Nowhere points out that “eighty percent of everything ever built in America has been built in the last fifty years, and most of it is depressing, brutal, ugly, unhealthy, and spiritually degrading.” By more deeply appreciating the values intrinsic in a barn, we might more thoughtfully guide our own future creating places, which are unique and diverse.
From the clayey soil of northern Wyoming is mined bentonite, which is used as a filler in candy, gum, and lipstick. We Americans are great on fillers, as if what we are, is not enough. We have a cultural tendency toward denial, but being the affluent, we strangle ourselves with what we can buy. We have only to look at the houses we build to see how we build against space, the way we drink against pain and loneliness. We fill up spaces as if it were a pie shell, with things whose opacity further obstructs our ability to see what is already there.

-Gretel Ehrlich, *The Solace of Open Spaces*
Living to work  Working to live  Working as a way of life
Numerous books have been written almost as an ode to the barn in an effort to save them. They have been put on endangered building lists as if animals. And it seems as though many of them will return to the earth from which they came. Swallowed back into the landscape. The wood will rot and decay, get eaten by worms and return to the soil. The stone foundations will sink further into the ground, the rocks scattering with time. Little trace will be left. These buildings that once stored hay and grain and were used for housing livestock and equipment will be forgotten. Or will they?

That is the beginning of their lure. They seem to lie paradoxically in time, place, nature, construction and use. They have a reverence to where they are and what they stand for and do it boldly in the landscape. "It is amazing and significant that a simple barn in the country, even in a state of ruin, can continue to benefit and enrich its surroundings after two centuries." A building that becomes more than a utilitarian structure but reveals a time and a way of life.

They grew out of a time when man and nature were able to coexist harmoniously. "A building where it was okay to meld the earth, dirt, manure, grain, and dust with it." They were an "unselfconscious accommodation of needs." Yet I speak of these things in the past. They are still able to do the same.

They are a place that becomes a link to our connection to the earth and our ability to understand our belongings to the greater sense of things. They become defined not just from the individuals that live there, but by what they give back to society, providing us with one of our fundamental needs, food. They arise from a functional process, from the land, like those things, which they represent and house.

"[Their] design [therefore] consults nature to give presence to the elements." The barn lumbers in the landscape fastened securely to the ground by a strong concrete or stone foundation, seeming as if it emerged from the ground itself. Yet they are brittle and light, their wood siding warped and missing. They become, according to Frampton, a tectonic object, one that,

Contrasts between the culture of the heavy-stereotomics, and the culture of light-tectonics. The first implies load-bearing masonry and tends towards the earth and opacity. The second implies the dematerialized A-frame and tends toward the sky and translucence.

In this sense then the barn righteously sits and unifies the weight of the earth and the lightness of the sky, a very natural expression for an inanimate object.

Many barns have a raw feeling, nothing is hidden, their structure is clearly exposed for all to see. As Kenneth Frampton has explained in his argument The Case for the Tectonic, "We may return instead to the structural unit as the irreducible essence of architectural form. Needless to say, we are not alluding here to mechanical revelation of construction but rather to a potentially poetic manifestation of structure in the original Greek sense of poesis as an act of making and revealing." The hand of the builder is there, always present and aware, revealing to those that enter the thought and skill that went in to every connection. Use and wear compliment these buildings and are apparent on the surfaces and materials. "Constructed as great storehouses for the bounty of the land, barns were built to last long after those who fashioned them."

They then can be seen as a symbol of nostalgia for the American past, but those who do not know that history would not understand and so there must be more. They shape our union with place and sustain a profound concurrence between the depth of sensed experience and reality itself. Boundaries become blurred between nature and man, outside and in, controlled and wild. Our senses are heightened at times to an almost instinctual level and on is left understanding a plain sense of things.
“The builder avoided unusual forms because they were difficult to make and served no purpose that would not be equally well served by a square door.”

—Howe
The Plain Sense of Things

After the leaves have fallen, we return
To a plain sense of things. It is as if
We had come to an end of the imagination,
Inanimate in an inert savior.

It is difficult even to choose the adjective
For this blank cold, this sadness without cause.
The great structure has become a minor house.
No turban walks across the lessened floors.

The greenhouse never so badly needed paint.
The chimney is fifty years old and slants to one side.
A fantastic effort has failed, a repetition
In a repetitiousness of men and flies.

Yet the absence of the imagination had
Itself to be imagined. The great pond,
The plain sense of it, without reflections, leaves,
Mud, water like dirty glass, expressing silence

Of a sort, silence of a rat come out to see,
The great pond and its waste of the lilies, all this
Had to be imagined as an inevitable knowledge,
Required, as a necessity requires.

-Wallace Stevens
This poem reflects the somber tone of losing something which one deems important or values. Yet with it there is hope and an understanding that in order to move on or “progress” one makes mistakes and learns from them. Time being continual yet always changing. I like to think of this project as a reflection of this idea. Growth and decay in a relationship side by side. Its not about keeping traditions alive but more about keeping identity, culture and sense of place, unique and diverse.

Yet even with a recognized and recorded old barn, a financially viable solution must be found in order to be competitive in today’s economy. The project then becomes a transformation of one type of farm into another. It becomes a place where there is a, “wise use of management of natural resources to achieve the greatest good for the greatest number of people [in a local area] for the longest period of time.” Close to an urban market this farm will be able to sell produce to local grocery stores as well as directly to consumers. The question of where and how “the banana” is produced is eliminated and there is a connection made to a particular place.

Sustainable farming meets environmental, economic, and social objectives simultaneously. Environmentally sound agriculture is nature-based rather than factory-based. Economic sustainability depends on profitable enterprises, sound financial planning, proactive marketing, and risk management. Social sustainability results from making decisions with the farm family’s and the larger community’s quality of life as a value and a goal.

Those who live and help on this site will be contributing to the community and the idea of place. While some may stay and others go, the place changes and evolves to and with them. They form us and we form them. It is my intention then that my project will do many of the things that I have mentioned in the previous pages. Yet as a designer I hope that it becomes more, “...a new historical sensibility that lay outside the sentimental agendas of restoration and revival, and reawakens architecture to its lyric potential - its capacity to write, on the ground, a sort of lyric poetry.”
The Project Proposal

Open Buckle Farm
A Collective Sustainable Farm just outside of Sun River, Montana

If “place” or “region” is defined by what, most scholars of regionalism argue is the intersection of land and people, or culture and environment, then local food and agriculture together constitute a profound expression of place. For it is toil of human activity on the local landscape that food and other tangible products are created that reflect the cultural uniqueness of a place. 52 - Duncan Hilchey
Go West Young Man!

Fig. 21
There is always a story to anything old, yet often enough those stories slip away with time and are forgotten. My proposal is a continuation of a story, which began December 11, 1846 in Morgan County, Kentucky where a man named James C. Adams was born. It is the all-American narrative a struggle to overcome that which you have been born into in search for your own identity, wealth and place.

His life began hard, orphaned at the age of ten and then a Civil War prisoner at age 16, he headed west driving teams of bulls in the freighting business. He arrived in Virginia City, Montana in 1864, the same year Montana was organized as a territory. By 1865, he was a wagon boss for the Diamond R Company in Fort Benton. He would travel to and from Fort Benton to Helena making “The Crossing” along the Sun River Valley. “In 1872, he choose a prime piece of property along the Sun River and turned his attention to stock raising in the year 1875.”

His plan was to supply livestock to the nearby Fort Shaw, which was becoming a stronghold in the valley. He bolstered this idea by marrying Evangeline Strong, the daughter of a pioneer stock growing family, the same year.

He proved to be a successful businessman and additional barn space was need for his livestock. He hired two stoncutters, to help design and build the barn at a cost of $10,000.00 over two years. The stone was quarried from the nearby Belt Mountains and according to the Sun River Press “it looks as if it would stand the storms and decay of century at least.” It was called the “Marvel of Montana” and became a local landmark. “The roof was handcrafted red cedar shinge with agate trimmed weather vanes...one a cow, the other a horse.” With the many friends that Adams had made in his business dealings the barn became a hub for travelers and gatherings. The hardwood floors of the loft it is said were ideal for dancing and even roller skating parties. In 1886, Evangeline Adams died leaving five children. A year later Adams remarried, to a Miss Laura B. Morrow, the daughter of a successful stock grower in Virginia City and Fort Benton.

“J.C. continued to amass property by having settlers take out small parcels of land with his already-established home and barn in the center of the area.” He dabbled in inventions and mercantilism and left for Chicago when those adventures left him in debt. In his absence his wife and children turned the ranch around and another brand was adapted, “the steeple” named for the pinnacle of the barn. He returned to the farm and died in 1913 of an unidentified illness. “The man was so highly regarded that the Great Northern Railroad sent a special train down the spur to pick up his body and take it to Great Falls for burial.”

The farm remained in the family until 1919 but was then split into homesteads by the state. The Los Angeles Sheep Company obtained part, and Fred Woehner another. “Mr. Woehner spent nearly 20 years in building the ranch back to 5,200 plus original acres” In 1940, the Christensen family purchased the land and barn and kept in use until 1975. In 1970 the Barn was added to the National Registry of Historical Places and structural work was done in hopes of preserving it for historical use. From there the story dwindles. The land has been parceled again and the barn remains unused and for sale.
This is a speculative site plan of what the property may have looked like in the 1890’s after the barn was completed. From sources who live in the area and an appraisal done on the property in the 1970’s I was told the original house was located in the lot in front of the barn but later moved to the town of Vaughn approx. 5 miles away. As well the building to the left of the barn is supposed to have been built on a foundation that was part of the original site plan. It is currently being used as a residence that is for sale.
Surrounding Area

This Sun River Bridge is situated on a crossing that has been crossed for -

historic times. When Captain John Mullan built a military road through Montana

in the early 1850s, he utilized portions of already existing trails employed by

indigens of Native Americans. Although Mullan covered the Sun River Crossing

in 1860, it was already the site of the Blackfoot Indian Government Farm, located

about one - half mile north of the existing bridge. Second Division member Fort Mullan

served as an outpost, and Henry Plummer at the farm in 1861. John Henry established a

trading post near here in the early 1860s to exchange furs and cloths with his

neighbors, the Blackfeet. You can still see a portion of Hall's trading post just

east of bridge on your left. The construction of the Mullan Road and the discovery

do gold in southwestern Montana over the next several years made Sun River

a crossing an important place in the state's early history. Early and pioneer John

Largent built a toll bridge at the approximate site of the existing bridge in 1897.

Founded by Largent in 1897, the community of Sun River was ideally situated to

take advantage of the heavy traffic between the steamboat port of Fort Benton

and nearby Fort Shaw, the gold camps and the Gallatin Valley. Realizing the poten-
tial for quick money, enterprising individuals built two other toll bridges south of

the existing bridge. The arrival of the railroad in Great Falls in 1906 did not

diminish the importance of the Sun River Crossing and it continued to thrive

until after 1910. Today, the community and the bridge in its fourth incarnation

attest to the strategic importance of this place to the history of Montana.
Driving home one summer afternoon with the windows down and the clean dry air cooling her skin Jennifer Smith sighs, thinking to herself how much she loves Montana. She and her husband have just spent the weekend in Glacier National Park and are headed back to her parents house in Bozeman. Traveling along highway 89, she feels so removed from the rest of the world watching as the vast plains roll by and the fields extending to the horizon, the cattle standing lazily swatting flies. The terrain is vast and sobering. They’ve just passed through Sun River a town that if you blink you might miss it. She feels as if she has traveled back in time, a bar, a general store, a truck stop cafe, and a Farmers Union Service Center. The things you need to get by. But Great Falls is just twenty minutes away with all the modern amenities.

She thinks of her once hectic life in California and takes a deep breath glad that she and Jim can finally retire back to Montana where they both grew up. Driving, Jim, has been thinking similar thoughts and remarks, “This is what living is all about.”

In their retirement they are looking to purchase property to start a small farm. Jim was a horticulturalist in California and worked landscaping and consulting. Jennifer was a lawyer but had an avid green thumb and large garden. They would have liked to have moved back sooner but kids, work, bills to pay, they stayed putting money away each month to someday pursue this dream. Now in their mid fifties they would like to start a sustainable farm. They have seen the impacts that mechanical farming has had on the environment and in their retirement want to have a farm where they can continue to grow and study plants but in a way that will give back to their community and set an example of how sustainable farming principles can be implemented. But where?

Being startled out of a day dream, Jennifer says to her husband, “Stop turn around, did you see that barn back there?” Jim glances in his rear view mirror and sees an older aluminum agricultural building, a Quonset hut, a house and some other buildings. “No,” he replies. She makes him turn the car around excitedly exclaiming that she saw what appeared to be a gorgeous old stone barn. They enter the site cautiously aware they are trespassing on what appears to be three different homes. But there set further back is the J.C. Adams stone barn resting peacefully with broken windows, flaking red paint and a resonating wisdom. A blown over for sale sign lies in the driveway. She gasps, “This is it!”
The site proposal is located just 20 miles outside of Great Falls, Montana making it easily accessible and providing a market for the produce being grown. It is located on Highway 89N that connects East Glacier Park with Great Falls. It is a heavily traveled road and the old stone barn is a landmark to passers by. Missoula, Helena, Butte and Bozeman are all within 4 hours away, making the transport of fresh produce not a problem. The soil is rich and has been used most recently as grazing for cattle and so little preparation would have to be done to it. The Sun River runs a half mile from the old barn and is a natural south boundary providing water and views. There are several old trees located on the immediate site, which my clients would like to try and preserve. There are strong westerly and northwestern winds which sweep over the northern hills and into this small plain. The site itself is almost entirely flat with little deviation.
Topography
This site plan was drawn from this aerial picture as well as from measurements and observations from the site. The aerial picture is dated 1995. As you will notice some of the dirt drives have grown over and are no longer there.
A The J.C. Adams Stone Barn (built 1883) The old stone barn is to remain on the site because of its historical importance and background to the location. It is to become the hub or center of the site and program. The building will be adapted to become a public commercial space for selling produce, as well as educating consumers about sustainable practices and displaying local exhibits.

B The Quonset Hut (built c.1950) The quonset hut is the largest building on the site and is still in good condition. This building will be adapted into a greenhouse for starting plants in the spring, growing flowers and extending the growing season.

C The Dairy (built c. 1950) The old dairy is in very poor condition. Most of the windows are gone, the roof leaks, which has collapsed the inside and the smell of cow manure still lingers. I therefore intend to take it down, recycling the aluminum siding and using the footprint to build a new building. It will be used for vegetable preparation, refrigeration, storage, and will have a loading dock for transportation of the produce.

D The Dairy Shed (built c. 1920) The dairy shed is in fairly good condition and with minor renovations and changes will become the managers office. With close proximity to the barn and the new vegetable prep area it is in a good location for supervising.

E, F Ranch Houses (built c 1970) The two small ranch houses are in good condition and therefore will be used for housing for those coming to live and work at the farm in particularly families.

G The Taging Shed (built c. 1950) The taging shed is in poor condition and since cows will no longer be a part of the farm. It will be taken down.

H Shed (built c. 1930) The shed is in good condition with the exception that the windows need to be repaired and it needs paint. It will continue to be used as a tool shed for the gardens which are located just behind it.

I The Loafing Shed (built c 1930) The shed is in good condition but is blocking the back elevation of the barn. It is therefore intended to be taken down and sold if possible.

J Corrugated Shed (built c 1950) The corrugated shed’s use is unknown however its size and location would make a good tractor shed and so adjustments would be made for its use.

K The Grain Silos (built c.1950) The grain silos are still in operation and used by a nearby neighbor. Having no particular use for them on the new farm and will continue to be leased and used by the neighbor.

L The Garage (built c. 1950) The garage is in good condition and will continue to be used as a garage for repairs of farm machinery as well as storage.

M The Main House (foundation built c.1880) The main house is in good condition and believed to be built on a foundation of the original homestead property. It will become the Smith’s.

N The Shed (built c.1950) This shed is in an awkward position on the site and is to come down to allow for a new entrance to the barn.
Site Pictures

(1) Looking North East towards houses from Grain Silos

(2) Looking North across Highway 89

(3) Looking West towards neighbors

(4) Looking West at Barn, Grain Silos, Garage and Main House

(5) Looking West down driveway parallel with Highway 89

(6) Looking South Toward Fields

(7) Feed Bunks looking East

(8) Behind Barn

*Reference Numbers on site map on page 42*
SITE CONTEXT

The site's context is crucial for understanding the potential for development. Key aspects to consider include:

- **Existing Site Conditions**: Evaluate the current state of the site, considering the physical layout, existing structures, and environmental factors.
- **Buildings to be Removed Based on Value System**: Identify buildings that are not aligned with the site's value system, ensuring they are removed for a more efficient layout.
- **Scope of Project**: Define the scope of the project, focusing on what needs to be done to achieve the desired outcome.
- **New Site Layout with Altitude and Topography**: Plan the new layout, taking into account the altitude and topography of the site to ensure functionality and aesthetics.

**VALUE SYSTEM**

- **Does the building have historical significance for the site?**
- **Through its connection to the culture of the larger area?**
- **Through its relationship to the functions of the site?**

**UNIQUE AGE/STYLE**

- **Does it take into account the local natural conditions (weather, vegetation, water, etc.)?**
- **Is it an appropriate use to modify for contemporary programming?**

The implications of these evaluations determine:

- Buildings to remain on the site
- Buildings to be altered for a new use
- Buildings to be removed
Considering the scope of this project the main focus of design will be on redeveloping the site to meet small-scale agricultural needs keeping the focus on the following three buildings; the old barn, the quonset hut, and the vegetable prep. building that will replace the dairy. As with any adaptive reuse project a thorough structural analysis would have to be done on each building before design work could begin to ensure structural integrity.
The J.C. Adams Stone Barn

Fig. 36

Dimensions: 130' x 40' x 33'
The Quonset Hut

The quonset hut will be reused and adapted into a greenhouse for starting and growing plants when the weather is still too cold outside.
The dairy will be torn down salvaging as many materials as possible. The concrete footprint will be used to build the new vegetable preparation area.
Other Things To be Used

The Shed adjacent to the dairy will be adapted into an office for the manager of the farm.

The Cow Cribs will become a pick your own garden for tomatoes and pepper plants that need to be tied to something for stability. The old fence will remain in place creating small gardens that need to be protected from pests.
Site Analysis
Analysis: While Great Falls receives less rainfall than other parts of the state, it is still considered one of the main agricultural regions. The growing season begins in late April and lasts until mid September or the first frost, approximately 115 days. This is typical of Montana and for such reasons, the project will have a large greenhouse for starting plants in early spring. The soil in the Sun River Valley is rich and varies from sandy conditions near the river to heavy-clay like gumbo on the outer most edges. The site itself is level and has a silty-clay loam that has washed in over years as the Sun River has flooded and deposited rich top soil from the area up river starting at the continental divide. The water table is approximately 36 inches below ground level during irrigation although the Sun River is typically a main irrigation source. As well subsurface soils are stable and will support all buildings provided typical footings are constructed. It is in a seismic 2 zone and so appropriate building and structural precautions are necessary.
Average Annual Precipitation
Montana

This is a map of annual precipitation averaged over the period 1961-1990. Rainfall observations were collected from the NWS A Cooperative and USDA-SCS System networks plus other state and local networks. The PRISM modeling system was used to create the gridded maximum from which this map was made. This map is not intended to be specific for seasonal or monthly rainfall. For information on the PRISM modeling system, visit the SCAS web site at http://www.prism.oregonstate.edu or the EPA web site at http://www.epa.gov/nrd-1.

Average Monthly Precipitation
- Great Falls, Montana -

Fig. 43
Fig. 44
Harvesting Issues

Fig. 45

Avg Annual Minimum Temperatures

<table>
<thead>
<tr>
<th>Zone</th>
<th>Fahrenheit</th>
<th>Celsius</th>
<th>Example Cities</th>
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<tbody>
<tr>
<td>1</td>
<td>Below -50 F</td>
<td>Below -45.6 C</td>
<td>Fairbanks, Alaska; Resolute, Northwest Territories (Canada)</td>
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<tr>
<td>2a</td>
<td>-50 to -45 F</td>
<td>-42.8 to -45.5 C</td>
<td>Prudhoe Bay, Alaska; Flin Flon, Manitoba (Canada)</td>
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<td>-40.0 to -42.7 C</td>
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</tr>
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<td>-37.3 to -39.9 C</td>
<td>International Falls, Minnesota; St. Michael, Alaska</td>
</tr>
<tr>
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<td>-34.5 to -37.2 C</td>
<td>Tomahawk, Wisconsin; Sidney, Montana</td>
</tr>
<tr>
<td>4a</td>
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<td>Minneapolis/St.Paul, Minnesota; Lewistown, Montana</td>
</tr>
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<td>-28.9 to -31.6 C</td>
<td>Northwood, Iowa; Nebraska</td>
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<td>12.3 to 14.0 C</td>
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<td>Houston, Texas; St. Augustine, Florida</td>
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<td>above 40 F</td>
<td>above 4.5 C</td>
<td>Honolulu, Hawaii; Mazatlan, Mexico</td>
</tr>
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United States Zone Average Frost Dates

- Zone 1 Average dates for last frost - 1 Jun / 30 Jun Average date of for first frost - 1 Jul to 31 Jul vulnerable to frost 365 days per year
- Zone 2 Average dates for last frost - 1 May to 31 May Average dates first frost - 1 August to 31 August
- Zone 3 Average dates for last frost - 1 May to 31 May Average dates first frost - 1 September to 30 September
- Zone 4 Average dates for last frost - 1 May to 30 May Average dates for first frost - 1 September to 30 September
- Zone 5 Average dates for last frost - 30 March to 30 April Average dates for first frost - 30 September to 30 October
- Zone 6 Average dates for last frost - 30 March to 30 April Average dates for first frost - 30 September to 30 October
- Zone 7 Average dates for last frost - 30 March to 30 April Average dates for first frost - 30 September to 30 October
- Zone 8 Average dates for last frost - 28 February to 30 March Average dates for first frost - 30 October to 30 November
- Zone 9 Average dates for last frost - 30 January to 28 February Average dates for last frost - 30 November to 30 December
- Zone 10 Average dates for last frost - 30 January or before Average dates for first frost - 30 November to 30 December

Fig. 46

http://www.montana.edu/wwwpb/pubs/9308.pdf
http://www.extension.iastate.edu/Publications/pm731.pdf
"I can clearly see... the sun streaming through the clouds, in all its glory, a long way off from the earth. I see just as clearly, out there in the plain, horses steaming as they plow; then, in a rocky place, a weary man, whose grunts have been audible since this morning, who is trying to straighten up a minute to catch his breath. The drama of these things has its splendors. It is no invention of mine, and the expression "the cry of the earth" was coined long ago.

- Jean-Francois Millet
The Open Buckle Farm - A Collective Sustainable Farm

working together as for a common good

Having fallen in love with the barn and site Jennifer and Jim are going through the process of purchasing the farm and putting together their own farm plan. While researching the barn’s history Jen comes across a newspaper clipping that reads, “In 1889, J.C. recorded the first brand for his ranch called the “open buckle.” Word has it that the old square buckles used on harnesses, halters etc., meant you were always welcome when left in an open, unbuckled position.”

Wanting to continue this idea Jen and her husband decide to name the farm the “Open Buckle.” Another article reads, “The ruts of the wagons, which brought the pioneer and his belongings to the Sun River Valley are plowed under and gone, as are the historic forces and glories of gold in Helena and Virginia City. Only the great stone barn remains... a landmark, a thing of beauty, and an enduring tribute to man’s desire to create something functional, beautiful and lasting.”

It is the couple’s intention then that the stone barn becomes the center of the site and program and a welcoming place for visitors to enjoy and explore. The farm itself will operate on two levels, public and private. The public space will be intended for visitors wanting to buy fresh sustainably grown fruits and vegetables directly from the source and not only be able to spend time learning about what they are buying and eating, but to experience the farm itself. These users will most likely be tourists coming to and from Glacier National Park in the summer months as well as residents from Great Falls. As well there will be buyers/shippers from grocery stores loading produce. The spaces that I have intended for public use will be the old barn, gardens, greenhouse and vegetable preparation area.

The private aspects of the program are intended for those who will be living and working at the farm including housing, sheds, and the garage. The couple realizes their limited ability to maintain a farm of this size with just the two of them and with interest from friends and family they would like to extend their property and expertise to others. They would like to organize the farm into a collective where the three houses on the site will be used for those who want to live, work and participate. “Community organizing is a path to social change and empowerment. It operates on a scale where it’s possible to appreciate our comrades and still have an impact on a world in which we are often individually helpless. By sharing some skills and resources, frustrations and hopes within a community framework, we create the potential to transcend our isolation.”

The couple would like to remain in the gardens as much as possible and so have positions available for sales, marketing, maintenance, and of course more gardeners. As well there will be a business manager who will take care of expenses and profit and manage the business side of the farm. Those who come and live on the farm are provided with food, housing and depending on sales a weekly stipend. As well chores will be spread throughout all who live there.

A place is in continuous change and reflects the social, political, and natural values of those that interact with it. By adaptively reusing older buildings there is a continuation of the ideals that they were built on. Quality and long-term planning therefore become relevant not just in the farming practices that they will house but in the buildings themselves. The farm’s place in particular the J.C. Adams barn continues and begins to tell a story of our recognition and value that we have to the land, our surroundings and inevitably ourselves and our future.
What is Sustainable Farming?

The following description is taken directly from: Sustainable Agriculture: An Introduction. A publication of Attra: The National Sustainable Agricultural Information Service.

Sustainable agriculture is one that produces abundant food without depleting the earth’s resources or polluting its environment. It is agriculture that follows the principles of nature to develop systems for raising crops and livestock that are, like nature, self-sustaining. Sustainable agriculture is also the agriculture of social values, one whose success is indistinguishable from vibrant rural communities, rich lives for families on farms, and wholesome food for everyone. But in the first decade of the 21st Century, sustainable agriculture, as a set of commonly accepted practices or a model farm economy, is still in its infancy—more than an idea, but only just.

Although sustainability in agriculture is tied to broader issues of the global economy, declining petroleum reserves, and domestic food security, its midwives were not government policy makers but small farmers, environmentalists, and a persistent cadre of agricultural scientists. These people saw the devastation that late 20th-century farming was causing to the very means of agricultural production—the water and soil—and so began a search for better ways to farm, an exploration that continues to this day.

Conventional 20th-century agriculture took industrial production as its model, and vertically integrated agri-business was the result. The industrial approach, coupled with substantial government subsidies, made food abundant and cheap in the United States. But farms are biological systems, not mechanical ones, and they exist in a social context in ways that manufacturing plants do not. Through its emphasis on high production, the industrial model has degraded soil and water, reduced the biodiversity that is a key element to food security, increased our dependence on imported oil, and driven more and more acres into the hands of fewer and fewer “farmers,” crippling rural communities.

In recent decades, sustainable farmers and researchers around the world have responded to the extractive industrial model with ecology-based approaches, variously called natural, organic, low-input, alternative, regenerative, holistic, biodynamic, bio-intensive, and biological farming systems. All of them, representing thousands of farms, have contributed to our understanding of what sustainable systems are, and each of them shares a vision of “farming with nature,” an agro-ecology that promotes biodiversity, recycles plant nutrients, protects soil from erosion, conserves and protects water, uses minimum tillage, and integrates crop and livestock enterprises on the farm.

The Water Cycle

Fig. 48 One of the many cycles affected by farming.
At the center of the program is the J.C. Adams stone barn: (See page 43 for reference) It is to become the commercial market and sales area, where fruits and vegetables are temporarily stored and sold. It therefore will be the focal point of the farm where customers and inhabitants of the farm are able to meet and exchange ideas. As well it sits in the center of the site and becomes the transitional space between the commercial side of the farm and the actual gardens themselves.

Programmatic Elements:

- Private Office/Library for Owners (Upstairs) approx. 800ft.²
- Display Space for Produce approx. 3,000ft.²
- Checkout Area approx. 100 ft.²
- Public Bathroom approx. 100 ft.²
- Educational Area with Displays and Information About Farming 800 ft.²
- Conference Area (Upstairs) approx. 800 ft.²
- Working/Demonstration/Chore Area (Old Horse Stalls) approx. 600 ft.²

New Design Elements:

- New Roof, Cupolas, Windows, and Doors due to Rotten Wood
- Expansion out the back of the wooden facade for added display space as well as to allow for more natural lighting.
- Including transitions from gardens to indoors.
- Simple/Soft Lighting for Displays and Circulation

Fig. 49  The inside of the old barn.
Public Spaces

Please see page 40 & 41 for further reference

**Greenhouse:** approx. 7500 ft.² The corrugated quonset hut located next to the barn will be adapted for a greenhouse. It will be used for storing and growing plants in the winter months as well as for starting seeds in the spring.

Programmatic Elements:
- Off Ground Storage For Plants
- Watering Mist System
- Ventilation/ Fan System already in place
- Lighting System that mimics as closely as possible the sun’s natural rays
- Radiant Floor Heating

Design Elements:
- The structure remains but is enclosed on the southern side by a polycarbonate corrugation that is translucent yet still has thermal insulation.
- Windows to allow for natural light.

**Vegetable Preparation:** approx. 5000 ft.² The old dairy is in poor condition and will have to be torn down however I would like to use the foundation to build a new building where vegetables can be cleaned and prepared for sale and shipment.

Programmatic Elements:
- Large Industrial Sink, with Spray Hose for Cleaning Vegetables
- Small Loading Dock for Filling a Truck
- Box Storage
- Counter Space for cutting and sorting
- Scale Space for measuring weight of mid-size boxes.
- Storage/Refridgeration Space close to Shipping Area approx. 800 ft.²
- General Storage Space
- Bathroom
- Mechanical Room
- Small Meeting Place

**Composting/Natural Fertilizer Storage:** approx. 400 ft.²
- One Located just away from the vegetable prep. area
- Another located in the gardens

**Produce Production:** approx. 20 acres
- Ochards 5 acres total
  - Including: Apples, Plum and Cherry Trees
  - *2 acres of apples yields approx. 800 bushels of apples a season*
- Gardens 15 acres
  - Inside Cattle Bunks for Pick your own/Perimeter Fields
  - Including: Vegetables of different varieties of Asparagus, Broccoli, Radishes, Lettuce, Spinach, Rhubarb, Green Beans, Cucumbers, Potatoes, Squash, Garlic, Tomatoes, Leeks, Carrots, Eggplant, Beets, Onions, Kale, Peppers
  - Fruits such as Serviceberries, Huckleberries, Raspberries, Strawberries
  - Herbs: Fennel, Dill, Cilantro, Basil, Swiss Chard, Thyme, Oregano, Parsley, Rosemary, Chives

Circulation Space:
- Paths, Places to sit that provide shade, Handicap Accesible

**Public Parking:** approx. 20 spaces
*Sheds and Storage: approx. 200 ft.² each There are two small shed that are already on the site. One will be used for storage of tools the other close to the dairy will be converted into a small office for the manager. One or two may have to be added further away from the barn so that tools don’t have to be carried as far.

*Garage/Tractor Truck Storage: The garage that is already on the site will be renovated to meet such purposes. As will the corrugated shed closeby.

*Grain Silos: The Grain Silos are currently being used by a neighbor to store feed for his cows and so will continue to be used for such purpose with an added private entrance so as not to disturb the publicness of the site.

*Housing: There are three houses on site that will be provided and renovated for those who live and work on the farm. I foresee the two houses near the dairy to be family housing while the main house near the garage will belong to the couple with renovated rooms for transient workers.

*While I have mentioned the above things to be part of the overall program of the farm and will be shown on the site plan and considered contextually. I do not intend to include them in the scope of my design work. They are to remain as is with minor repairs and renovations.

Fig. 50 Plan for Laying Out a 160-Acre Farm and Farm Home
Generally speaking all of my precedence show something that I am interested in or an idea that I would possibly like to include in my thesis project. To me almost any barn is precedence for what I am doing as is any picture of suburban sprawl. Included as well are attempts by others who have adaptively reused older buildings. As I have mentioned earlier the most natural way for one to learn is to look at how others have dealt with similar problems and to analyze those things which worked and did not. Yet I also look at my precedence as having a poesis in which to continually aspire.

‘Invention strictly speaking, is little more than a new combination of those images, that have been previously gathered and deposited in the memory: nothing can come of nothing: he who has laid up no materials can produce no combinations.’ - Reynolds, Discourse II
This is a renovation of an alpine farmhouse dating back to 1708. There is quiet respect for the older building in which only modern essentials were added. The aim was to assimilate teh two into a new whole. The heating system is based on a hypocaust principle. The new wood siding is in contrast to the old but will blacken with time and meld in color with the old.
This is an example of adaptively re-using an 1870’s barn into a guest house. The attempt was made to simultaneously “conserve the old while assertively introducing the new.” The old wood from the barn being put in sharp contrast to steel and glass. The design is based on a series of shells enabling the new structure to keep the elements out while allowing the barn siding to continue to weather. The space between new and old becomes a bris-soleil and semi-outdoor passage and porch. A perfect shady spot for a hot summer day. The glass box allows for a seamless affect of lighting that is so characteristic of a barn. Preserved view of old barn from farmhouse, continually linking the barn as it has been seen for decades, a connection of time.
Somas Hay Barn designed by SPF

Somas, California

An open air horse barn that is constantly changing as hay is added or removed from the outside storage shelf. Simple form and construction continues the tradition ideas behind a barn. This building brings the idea of the hay loft to the facade of the building dramatically revealing its utilitarian purpose.
Crabtree Farms is a research and educational project promoting sustainable agriculture. Located near downtown Chattanooga, Crabtree Farms is comprised of a community garden, urban farm, pond, wood lot, mushroom garden and a mandala garden.

The project includes an on-site Community Garden and 2.5 acre Urban Farm. Programming at Crabtree Farms features an educational Workshop series and a weekly on-site Locally Grown Farmers Market.

As well Crabtree farms offers Subscription Membership which allows members to order chosen vegetables online throughout the week for pick-up on Saturday. The farm also offers volunteer opportunities as well as lectures and demonstrations.

While the farm I am designing will not offer everything that this farm does it is a good example of the trend in sustainable farming practices and how they can be implemented.

www.crabtreefarms.org
Red Fire Farm prides itself on the diversity of vegetables, fruits and flowers that it grows and sells. This helps to maintain a balanced ecosystem and soil fertility. As well as being an organic farm they are members of a program called CSA or Community Supported Agriculture in which people buy shares into the farm in return for fresh produce each week. As well they sell their produce at several stands throughout Massachusetts including one at the farm. Also in operation is a greenhouse where plants are started and sold to other gardeners. Employment apprenticeships are available where one can learn sustainable growing practices and have a chance to live and work on the farm for an entire growing season.

www.redfirefarm.homestead.com
SITE PLAN/ ROOF PLAN

A   J.C. ADAMS BARN/ COMMERCIAL SALES AREA
B   QUONSETHUT/ GREENHOUSE
C   VEGETABLE PREPARATION
D   MANAGER’S OFFICE
E   HOUSING
F   HOUSING
G  MAIN HOUSE
H  GARAGE/SHOP
I  GRAIN SILOS
J  TRACTOR SHED
K  COURTYARD
L   RAISED BEDS
M  PICK YOUR OWN GARDENS
N  TOOL/GARDEN SHED
O  PICK YOUR OWN FOR POLE PLANTS
P  FENCED GARDENS (PEST CONTROL, CARROTS ETC.)
Q  COMPOST BINS
R  SMALL SCALE GARDENS (HERBS, FLOWERS, LETTUCE, ETC.)
S  LARGE SCALE GARDENS (PUMPKINS, SQUASH, POTATOES, BROCCOLI, ETC.)
T  ORCHARDS

SCALE: 1” = 60’0”
Scope of Project
Evaluation of J.C. Adams Barn

EVALUATION and TRANSFORMATION OF THE J.C. ADAMS BARN

THE J.C. ADAMS BARN

EVALUATION and TRANSFORMATION OF THE J.C. ADAMS BARN

TO MAKE INFORMED DECISIONS OF WHAT AND HOW TO CHANGE THINGS. THAT THE COMPONENT HAD TO THE BUILDING AND HOW IT EFFECTED THE RELATIONSHIP TO THE WHOLE I WAS THEN ABLE TO SYNTHESIZE THEM INTO THE COMPONENTS TO BE SCRUTINIZED USING A VALUE SYSTEM EXPLAINED BELOW. NO SIMILAR EVALUATION AS EACH OF THE BUILDINGS ON THE SITE. THE BARN AND NEW.

WHILE ALSO REVEALING THE OLDER STRUCTURE BEHIND IT. A SYNTHESIS OF OLD AND NEW.

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Evaluation of J.C. Adams Barn
The New North and South Elevations
New Adaptations to the J.C. Adams Floor Plans
New Adaptations to the J.C. Adams Barn
New Adaptations to the J.C. Adams Barn
The Quonset Hut/Greenhouse Details

The corrugated metal on the north side of the Quonset Hut will remain, while the southside corrugation will be replaced with a translucent corrugation, Roofflite, to allow for sunlight and heat to penetrate the new greenhouse.

The vertical structure is composed of steel rib reinforcing laterally with offset horizontal bracing. The skin and structure are closely related because the skin provides shear resistance to the frame, creating an overall very simple yet strong structural system.

Ventilation is key in any greenhouse because you can easily overheat the space. There are strong northwestern winds and soft southern breezes. In the summer the builders of the Quonset Hut will open allowing for most of the heat to escape. As well, the two barn doors on either end of the structure can be opened for cross-ventilation. Exhaust fans located along the ridge add extra air movement.

Watering System
Plants will be held off the ground on metal shelves that will have a drip coil built into them and moved to each row to be watered. This is an effective way of conserving water and making sure that plants won’t be over watered.

The Quonset Hut
Cow Crib Detail
The New Vegetable Preparation Building
The New Vegetable Preparation Building
SECTION 309
MERCANTILE GROUP M

309.1 Mercantile Group M. Mercantile Group M occupancy includes, among others, buildings and structures or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

- Department stores
- Drug stores
- Markets
- Motor fuel-dispensing facilities
- Retail or wholesale stores
- Sales rooms

309.2 Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 414.2.4.

311.3 Low-hazard storage, Group S-2. Includes, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

- Aircraft hangar
- Asbestos
- Beverages up to and including 12-percent alcohol in metal, glass or ceramic containers
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- Gypsum board
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and trim
- Metal parts
- Metals
- Mirrors
Oil-filled and other types of distribution transformers
Parking garages, open or enclosed
Porcelain and pottery
Stoves
Talc and soapstones
Washers and dryers

SECTION 312
UTILITY AND MISCELLANEOUS GROUP U

312.1 General. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:
   Agricultural buildings
   Aircraft hangars, accessory to a one- or two-family residence (see Section 417.3)
   Barns
   Carports
   Fences more than 6 feet (1829 mm) high
   Grain silos, accessory to a residential occupancy
   Greenhouses
   Livestock shelters
   Private garages
   Retaining walls
   Sheds
   Stables
   Tanks
   Towers
SECTION 601
GENERAL

601.1 Scope. The provisions of this chapter shall control the classification of buildings as to type of construction.

SECTION 602
CONSTRUCTION CLASSIFICATION

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall have a fire-resistance rating not less than that specified in Table 601 and exterior walls shall have a fire-resistance rating not less than that specified in Table 602.

602.1.1 Minimum requirements. A building or portion thereof shall not be required to conform to the details of a type of construction higher than that type, which meets the minimum requirements based on occupancy even though certain features of such a building actually conform to a higher type of construction.

602.2 Types I and II. Type I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials.

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.

602.4 Type IV. Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces. The details of Type IV construction shall comply with the provisions of this section. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less.

602.4.1 Columns. Wood columns shall be sawn or glued laminated and shall not be less than 8 inches (203 mm) nominal in any dimension. Framed timber trusses supporting floor loads shall have members not less than 8 inches (203 mm) nominal in any dimension.

602.4.3 Roof framing. Wood-frame or glued-laminated arches for roof construction, which spring from the floor line or from grade and do not support floor loads, shall have members not less than 6 inches (152 mm) nominal in width and have less than 8 inches (203 mm) nominal in depth for the lower half of the height and not less than 6 inches (152 mm) nominal in depth for the upper half. Framed or glued-laminated arches for roof construction that spring from the top of walls or wall abutments, framed timber trusses and other roof framing, which do not support floor loads, shall have members not less than 4 inches (102 mm) nominal in width and not less than 6 inches (152 mm) nominal in depth. Spaced members shall be permitted to be composed of two or more pieces not less than 3 inches (76 mm) nominal in thickness where blocked solidly throughout their intervening spaces or where spaces are tightly closed by a continuous wood cover plate of not less than 2 inches (51 mm) nominal in thickness secured to the underside of the members. Splice plates shall be not less than 3 inches (76 mm) nominal in thickness. Where protected by approved automatic sprinklers under the roof deck, framing members shall be not less than 3 inches (76 mm) nominal in width.

602.4.4 Floors. Floors shall be of noncombustible materials. Wood floors shall be of sawn or glued-laminated planks, splined or tongue-and-groove, of not less than 3 inches (76 mm) nominal in thickness covered with 1-inch (25 mm) nominal dimension tongue-and-groove flooring, laid crosswise or diagonally, or 0.5-inch (12.7 mm) particleboard or planks not less than 4 inches (102 mm) nominal in width set on edge close together and well spiked and covered with 1-inch (25 mm) nominal dimension flooring or 0.5-inch (12.7 mm) wood structural panel or 0.5-inch (12.7 mm) particleboard. The lumber shall be laid so that no continuous line of joints will occur except at points of support. Floors shall not extend closer than 0.5 inch (12.7 mm) to walls. Such 0.5-inch (12.7 mm) space shall be covered by a molding fastened to the wall and so arranged that it will not obstruct the swelling or shrinking movements of the floor. Corbels of masonry walls under the floor shall be permitted to be used in place of molding.

602.4.5 Roofs. Roofs shall be of noncombustible materials and wood roof decks shall be sawn or glued laminated, splined or tongue-and-groove plank, not less than 3 inches (76 mm) nominal, or of planks not less than 3 inches (76 mm) nominal in width, set on edge close together and laid as required for floors. Other types of decking shall be permitted to be used if providing equivalent fire resistance and structural properties.
### TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)

<table>
<thead>
<tr>
<th>BUILDING ELEMENT</th>
<th>TYPE I</th>
<th>TYPE II</th>
<th>TYPE III</th>
<th>TYPE IV</th>
<th>TYPE V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural frame&lt;sup&gt;a&lt;/sup&gt;</td>
<td>A&lt;sup&gt;b&lt;/sup&gt;</td>
<td>B&lt;sup&gt;b&lt;/sup&gt;</td>
<td>A&lt;sup&gt;d&lt;/sup&gt;</td>
<td>B</td>
<td>HT</td>
</tr>
<tr>
<td>Including columns, girders, trusses</td>
<td>3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Bearing walls</td>
<td>Exterior&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Interior&lt;sup&gt;e&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Nonbearing walls and partitions</td>
<td>Exterior&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Interior&lt;sup&gt;e&lt;/sup&gt;</td>
<td>See Table 602</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonbearing walls and partitions</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Floor construction</td>
<td>Including supporting beams and joists</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Roof construction</td>
<td>Including supporting beams and joists</td>
<td>1 1/6</td>
<td>1&lt;sup&gt;e&lt;/sup&gt;</td>
<td>1&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

- a. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connection to the columns shall be considered secondary members and not a part of the structural frame.
- b. Roof supports: Fire-resistance ratings of structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- c. 1. Except in Factory-Industrial (F-I), Hazardous (H), Mercantile (M) and Moderate-Hazard Storage (S-I) occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- 2. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
- 3. In Type I and II construction, fire-retardant treated wood shall be allowed in buildings including girders and trusses as part of the roof construction where the building is:
  - i. Two stories or less in height;
  - ii. Type II construction over two stories or
  - iii. Type I construction over two stories and the vertical distance from the upper floor to the roof is 20 feet or more.
- d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 306.3 or for an allowable height increase in accordance with Section 304.2. The 1-hour substitution for the fire-resistance of exterior walls shall not be permitted.
- e. Not less than the fire-resistance rating required by other sections of this code.
- f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

### TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE<sup>b</sup>

<table>
<thead>
<tr>
<th>FIRE SEPARATION DISTANCE (feet)</th>
<th>TYPE OF CONSTRUCTION</th>
<th>GROUP H</th>
<th>GROUP F-1, M, S-1</th>
<th>GROUP A, B, E, F-2, I, R&lt;sup&gt;i&lt;/sup&gt;, S-2, U</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5&lt;sup&gt;c&lt;/sup&gt;</td>
<td>All</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>≥ 5</td>
<td>IA</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>&lt; 10</td>
<td>Others</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>≥ 10</td>
<td>IA, IB</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>&lt; 30</td>
<td>HB, VB</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>≥ 30</td>
<td>All</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

- a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- b. Group R-3 and Group U when used as accessory to Group R-3, as applicable in Section 101.2 shall not be required to have a fire-resistance rating where the fire separation distance is 3 feet or more.
- c. See Section 503.2 for party walls.
**TABLE 1004.1.2**

**MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT**

<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>FLOOR AREA IN SQ. FT. PER OCCUPANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural building</td>
<td>300 gross</td>
</tr>
<tr>
<td>Aircraft hangars</td>
<td>500 gross</td>
</tr>
<tr>
<td>Airport terminal</td>
<td></td>
</tr>
<tr>
<td>Baggage claim</td>
<td>20 gross</td>
</tr>
<tr>
<td>Baggage handling</td>
<td>900 gross</td>
</tr>
<tr>
<td>Concourse</td>
<td>100 gross</td>
</tr>
<tr>
<td>Waiting areas</td>
<td>15 gross</td>
</tr>
<tr>
<td>Assembly</td>
<td></td>
</tr>
<tr>
<td>Gaming floors (keno, slots, etc.)</td>
<td>11 gross</td>
</tr>
<tr>
<td>Assembly with fixed seats</td>
<td>See Section 1003.2.2.9</td>
</tr>
<tr>
<td>Assembly without fixed seats</td>
<td></td>
</tr>
<tr>
<td>Concentrated (chairs only—not fixed)</td>
<td>7 net</td>
</tr>
<tr>
<td>Standing space</td>
<td>5 net</td>
</tr>
<tr>
<td>Unconcentrated (tables and chairs)</td>
<td>15 net</td>
</tr>
<tr>
<td>Bowling centers, allow 5 persons for each lane including 15 feet of runway and for additional areas</td>
<td>7 net</td>
</tr>
<tr>
<td>Business areas</td>
<td>100 gross</td>
</tr>
<tr>
<td>Courtrooms—other than fixed seating areas</td>
<td>40 net</td>
</tr>
<tr>
<td>Dormitories</td>
<td>50 gross</td>
</tr>
<tr>
<td>Educational</td>
<td></td>
</tr>
<tr>
<td>Classroom area</td>
<td>20 net</td>
</tr>
<tr>
<td>Shops and other vocational room areas</td>
<td>50 net</td>
</tr>
<tr>
<td>Exercise rooms</td>
<td>50 gross</td>
</tr>
<tr>
<td>H-5 Fabrication and manufacturing areas</td>
<td>200 gross</td>
</tr>
<tr>
<td>Industrial areas</td>
<td>100 gross</td>
</tr>
<tr>
<td>Institutional areas</td>
<td></td>
</tr>
<tr>
<td>Inpatient treatment areas</td>
<td>240 gross</td>
</tr>
<tr>
<td>Outpatient areas</td>
<td>100 gross</td>
</tr>
<tr>
<td>Sleeping areas</td>
<td>120 gross</td>
</tr>
<tr>
<td>Kitchens, commercial</td>
<td>200 gross</td>
</tr>
<tr>
<td>Library</td>
<td></td>
</tr>
<tr>
<td>Reading rooms</td>
<td>50 net</td>
</tr>
<tr>
<td>Stack area</td>
<td>100 gross</td>
</tr>
<tr>
<td>Locker rooms</td>
<td>50 gross</td>
</tr>
<tr>
<td>Mercantile</td>
<td></td>
</tr>
<tr>
<td>Areas on other floors</td>
<td>60 gross</td>
</tr>
<tr>
<td>Basement and grade floor areas</td>
<td>30 gross</td>
</tr>
<tr>
<td>Storage, stack, shipping areas</td>
<td>300 gross</td>
</tr>
<tr>
<td>Parking garages</td>
<td>200 gross</td>
</tr>
<tr>
<td>Residential</td>
<td>200 gross</td>
</tr>
<tr>
<td>Skating rinks, swimming pools</td>
<td></td>
</tr>
<tr>
<td>Rink and pool</td>
<td>50 gross</td>
</tr>
<tr>
<td>Decks</td>
<td>15 gross</td>
</tr>
<tr>
<td>Stages and platforms</td>
<td>15 net</td>
</tr>
<tr>
<td>Accessory storage areas, mechanical equipment room</td>
<td>300 gross</td>
</tr>
<tr>
<td>Warehouses</td>
<td>500 gross</td>
</tr>
</tbody>
</table>

For SI: 1 square foot = 0.0929 m².
1013.4.1 Groups B and M. In Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than 36 inches (914 mm).

Exception: Nonpublic aisles serving less than 50 people, and not required to be accessible by Chapter 11 need not exceed 28 inches (711 mm) in width.

SECTION 1014
EXIT AND EXIT ACCESS DOORWAYS

1014.1 Exit or exit access doorways required. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds the values in Table 1014.1.
2. The common path of egress travel exceeds the limitations of Section 1013.3.
3. Where required by Sections 1014.3, 1014.4 and 1014.5.

Exception: Group I-2 occupancies shall comply with Section 1013.2.2.

<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>MAXIMUM OCCUPANT LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B, E, F, M, U</td>
<td>50</td>
</tr>
<tr>
<td>H 1, H 2, H 3</td>
<td>3</td>
</tr>
<tr>
<td>H-4, H-5, I-1, I-3, I-4, R</td>
<td>10</td>
</tr>
<tr>
<td>S</td>
<td>30</td>
</tr>
</tbody>
</table>

1014.1.1 Three or more exits. Access to three or more exits shall be provided from a floor area where required by Section 1018.1.

1014.2 Exit or exit access doorway arrangement. Required exits shall be located in a manner that makes their availability obvious. Exits shall be unobstructed at all times. Exit and exit access doorways shall be arranged in accordance with Sections 1014.2.1 and 1014.2.2.

1014.2.1 Two exits or exit access doorways. Where two exits or exit access doorways are required from any portion of the exit access, the exit doors or exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a
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Fig.2 David Plowden (The American Barn. New York: W.W. Norton & Company, 2003)

Fig.3 Photograph, Elizabeth Moorshead

Fig.4 Digital Timeline (Photoshop Image), Elizabeth Moorshead

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Fig.16 David Plowden (The American Barn. New York: W.W. Norton & Company, 2003)

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Fig. 59 www.crabtreefarms.org
Fig. 60 www.redfirefarm.homestead.com
Works Cited


4. 2002 Berkeley Prize Competition Statement


9. IBID


12. IBID


16. Landownership in the United States, (U.S. Department of Agriculture, 1978) 1

17. Donald Paarlberg, *Farm and Food Policy: Issues of the 1980’s* (University of Nebraska Press, 1980) 68

18. IBID


Works Cited

21 http://en.wikipedia.org/wiki/Earth

24 “Place,” The New Merriam Webster Dictionary, 1989


27 Steven Feld and Keith H. Basso, eds., Senses of Place. (Santa Fe, New Mexico: School of American Research Press, 1996) 54

28 Yi-Fu Tuan, Space and Place: The Perspective of Experience (Minnesota: University of Minnesota Press, 1977) 6


32 IBID


34 IBID


40 Eric Sloane, An Age of Barns. (Stillwater, Minnesota: Voyageur Press, 2001) 13

41 Maire O’Neil, Montana State School of Architecture

42 IBID


44 IBID, 527

45 IBID, 519

47 Michael Benedikt, For an Architecture of Reality, Taken from Lecture Notes by Peter Kommers


50 ATTRA (Appropriate Technology Transfer for Rural Areas)


53 National Register of Historic Places, January 29, 1979

54 IBID

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58 Real Estate Appraisal Done to Barn, April 20, 1979, By Orville L. Hoover

59 National Register of Historic Places, January 29, 1979

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