

CREATIVE FORUM AT MONTANA STATE UNIVERSITY

by

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April 2009

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ABSTRACT

The creative process is a key element to generating great architecture, art and science. In order to best utilize this process one must understand different types of creativity, environments that inspire creativity, different processes and techniques and how the conscious and subconscious handle creative thought and creative production. To architecturally explore creative process and production I will design a structure on campus with the purpose of assisting creativity and creative production in the ways that I have come to understand them. Understanding the creative process as it applies to and/or derives from psychology, philosophy, art and/or design is essential to guide and increase creativity. Communicating what is found is equally as important as finding it. A structure with the primary purpose of communicating and allowing creative thought, an architectural muse to inspire creative production, is intended.

Creative Forum at Montana State University

Thesis:

I intend to explore creative methods and processes and how they can enhance our built environment. Understanding and utilizing one's creative process is essential to advancing human achievement. Without aberrant schema there is no mutation, there are no new species of technology or art, no advancement. Environments, processes and methods that cultivate creativity are essential to human progression. Understanding the framework from which these devices derive is fundamental to accepting their validity.

Our built environment shades or tints our character. To a degree we become like our environment and it like us. The built environment can inspire our sense of self, our originality and thus our creativity. Creativity, creation of the novel, is what advances every aspect of humanity. To enhance creativity we need buildings that allow all aspects of the creative process to flourish. Just like a hospital needs clean air, our centers of design and teaching must have inspiration. The Enlightenment offers a starting point to understand what affect the environment can have on creativity.

The Enlightenment:

The period from late 17th to early 18th centuries known as "The Age of Rationalism" or "the Enlightenment" produced many great thinkers and arguably more revolutionary ideas than most other time periods.

Significant works and ideas like Capitalism and Democracy, great symphonies and many other works of import were produced with relative frequency during this time. Could the Scottish philosopher Adam Smith, Thomas Jefferson or Mozart have contributed what they did a century earlier or later? The Enlightenment provided the right mixture of social and physical nutrients essential for creative genius to flourish.

Highly creative societies tend to share several characteristics. Psychiatrist Silvano Arieti calls highly creative societies "creativogenic"¹. A creativogenic society is a culture that promotes creativity.² The factors that compose a creativogenic society range from "liberation from oppression" to "tolerance and interest in unusual viewpoints."³ The Enlightenment shares aspects with each of Arieti's creativogenic criteria but only several are architecturally relevant.

One architecturally relevant factor of creativogenic societies is that they allow free access to information to all members of the society. No one would argue that the Enlightenment provided women the same right to education as men, but a significant change in the distribution of information nevertheless occurred. Improved technology allowed smaller, cheaper printing presses and increased wealth allowed more people to afford books that the presses produced.⁴ As books became more widely available it was no longer the clergy who held the vast majority of information. Because creativity hinges on access to

information⁵ once it was widely released more creative accomplishments became possible.

The influx of new information and the general attitude of man's ability to understand nature (brought about by Newton's discoveries in gravity and light) caused the people of the Enlightenment to value ideas and be extremely interested in their propagation.

Although the peoples' attitude was changing, the clergy and censors' were not. Growing cities like Paris and London (half a million each) offered locations for like-minded people to gather at coffeehouses to discuss their "*new and unorthodox thoughts.*"⁶ The more clandestine of the populous created salons and Masonic lodges to share their ideas with more anonymity. Salons were rooms in people's houses that were open at night to select guests. The only rule that existed was that "people could freely speak their minds."⁷ These forums of communication were important contributing factors to the creative explosion of the Enlightenment.

While it is beneficial to see what makes a sociopolitical environment conducive to spawning creative thought, what exactly does creative thought look like? What process do individuals traverse in creative endeavors?

The Creative Process:

“Most writers- poets in especial- prefer having it understood that they compose by a species of fine frenzy- an ecstatic intuition- and would positively shudder at letting the public take a peep behind the scenes”⁸

–Edgar Allan Poe, The Philosophy of Composition

The path one travels in any creative endeavor is not precise or universal. The uncontrollable illumination that sparks original solutions is at the heart of creativity's mystique. Although creativity is ethereal and some of it subconscious, there are certain steps that have been recognized across creative work. Without knowledge of the creative process itself, design for the spaces that afford this production would be within a vacuum. According to Dacey and Lennon the first step in creative production is "preparation."⁹

Preparation

Preparation is concerned with information gathering, this gathering can be intentional and focused, or unintentional, unfocused. In either case, information coalesces in the individual's mind to form a clear problem and solutions become more apparent. When information collection is in response to a specific problem it tends to be focused and intentional, for this work an ordered environment free of distraction is necessary.¹⁰ IDEO, a leading industrial design firm in America, argues that the first step in their process is to "Understand the market, the client, the technology, and the perceived constraints on the problem".¹¹ IDEO describes this process as being like an anthropologist studying a tribe.¹² Their research is about documenting every detail and understanding the entire situation. Adequate preparation leads to the mind's assimilation by the conscious and subconscious, which is termed incubation.

Incubation

The subconscious rules the process of incubation. Incubation occurs when adequate information has been absorbed and processed by the conscious and subconscious mind.

In architecture this assimilation of information takes the form of study models, renderings or sketches. Recent work in psychology has led to the discovery that much of what humanity does is subconscious. In an article about the brain and the subconscious Carl Zimmer, a writer for Discover magazine, writes that research into the subconscious “raised the disturbing possibility that much of what we think and do is thought and done by an unconscious part of the brain – an inner zombie.”¹³ The subconscious, this “inner-zombie”, is responsible for piecing together seemingly disparate ideas and it does so with no inhibition. Once we have enough information and it has been worked on and assimilated then “gathering more information or mulling over the problem further will prove counterproductive. Efforts to solve the problem must be abandoned and allowed to sink into the unconscious mind.”¹⁴

Illumination

If the information gathered and grappled with, both consciously and subconsciously, ferments into a spark of insight then illumination has occurred. New relations become apparent.¹⁵ The subconscious, having been free to connect and disconnect seemingly unrelated ideas without inhibition, sparks some insight. In this phase new or contrasting stimuli provokes the mind to novel thought.¹⁶

Verification

Dacey and Lennon, describe Verification with the old adage that a million monkeys, with a million typewriters, over an infinite amount of time, would produce Hamlet. Just as an

infinite amount of random ideas would inevitably produce countless invaluable ideas the crucial barrier is to *know* what is valuable. The monkeys would never *know* they produced a great work.¹⁷ The importance of verification cannot be overstated. At IDEO this step manifests itself with renderings and prototypes that settle whether given ideas are viable.¹⁸ Without verification of ideas, without careful thought as to whether they are truly useful, beautiful, novel, etc., sub standard ideas would be elaborated on and undeveloped, superior, ideas forgone. When truly great ideas are tested and verified they need to be elaborated upon.

Elaboration

Csikszentmihalyi and Dacey and Lennon until now agree upon the steps in creative production. *Understanding Creativity*, by Dacey and Lennon, leaves out the last step which is of crucial importance. Elaboration is the slow process of building upon an idea thought worthy of development. This is the step that is most controllable and probably least achievable. It is easy to imagine countless superb ideas thought of out of lifetimes of information gathering and sparks of insight result in nothing for the lack of will and resources to build upon them. It is this last step that requires the most focus and hard work. Environments that foster elaboration are ordered and familiar.¹⁹

In architecture the initial stages of the creative process happen rapidly. Case studies and research leads to sketches and hopefully some sort of spark. After research, incubation and illumination, critiques of the project to test the ideas for practicality, beauty and any other considerations are performed. Finally the slow work of elaborating on an idea brings about truly creative work. Areas that provide for this process must allow for

differing levels of seclusion and interaction to facilitate changing needs along the process.

Environment of Creativity:

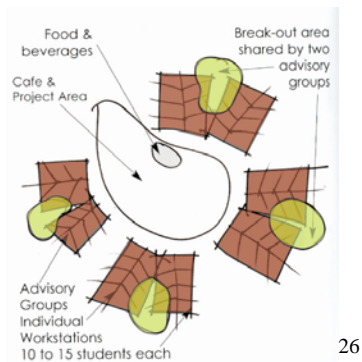
The creative process *is* “so significant and unpredictable as to appear magic”.

–Silvano Arieti²⁰

The space around an individual has the potential to provide every opportunity for creativity; or it could be actively swallowing the thin drifts of inspiration from the air above one’s head. The dichotomy of creativity is that while inspiration absolutely feeds off interaction and novel stimulation; preparation, evaluation or embellishment may need absolute mental silence.²¹

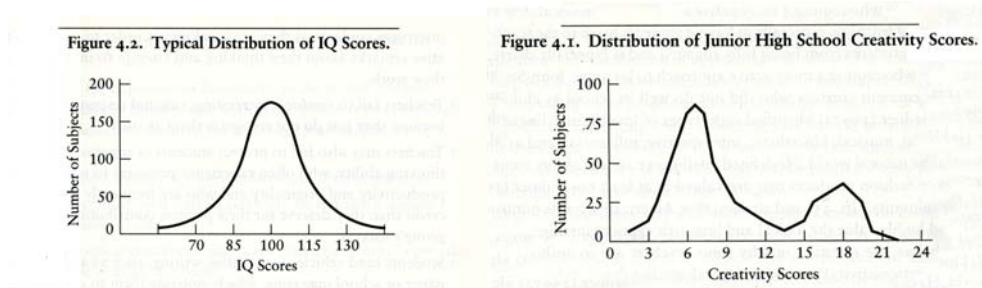
Human interaction creates novel stimulus. When space encourages interaction it encourages creativity. Freeman Dyson, famous for work in theoretical physics, has this to say; “it is only by interacting with other people that you get anything interesting done.”²² Interaction disseminates provocative ideas quickly. One idea coalesces with another to form a variant, a mutation that is unique to itself. Interaction requires a certain proximity, a certain density of individuals. IDEO founder Tom Kelley states, "I've seen the same "density-yields-buzz" phenomenon in our offices around the country. When the body count per square foot was high, the offices seemed to pulse like hot nightclubs on Friday night."²³ IDEO is the leading industrial design firm in the country. They designed apple’s first mouse, the palm pilot, stand-up toothpaste... An enormous part of their continuing success comes from the cross pollination among their staff, the IDEOers. The IDEOers are organized in highly moveable “neighborhoods” of rolling cubicles circling a “park”, which is usually a funky table used for quick meetings.²⁴ These neighborhoods allow

rapid communication between teams and the breakup of teams into new neighborhoods when a project is over.²⁵ Interestingly these “neighborhoods” have begun showing up in schools. In *The Language of School Design: Design Patterns for 21st Century Schools* the authors advocate implementing learning neighborhoods. The figure below is the author’s schematic with “neighborhoods” in red and “parks” in green. Like the offices of IDEO, students are placed into small engaged units that promote learning, interaction, and team work. To illuminate why this freeform, collective approach is conducive to creativity one must look at the previous system.



The shift to “neighborhoods” was necessitated by the turn of the century “cells and bells” method. “Cells and bells” was developed to efficiently input information into children so they would become productive members of industrialized society.²⁷ Schooling also took on aspects of this industrial process by incorporating the principles of the assembly line. Students were parts that moved from one worker to another at the cue of a bell. “It is a philosophy that starts with the assumption that a predetermined number of students will all learn the same thing at the same time from the same person in the same way in the same place for several hours each day”²⁸ This model of learning does everything it can to remove variation from the schooling process. As previously noted, novelty and exposure to different and contrasting stimulus are essential to developing creative thought.²⁹

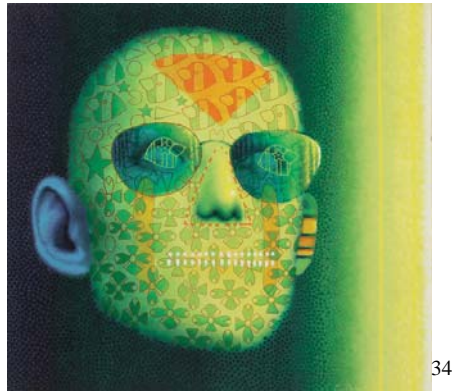
Although schools certainly provide a negative environment for creative development some students appear to be immune.



These two charts illustrate this apparent immunity, and the evidence for schools' destructive effect on creativity. The first figure, Fig 4.2, shows a typical distribution of IQ scores. Nearly every human trait, from hand size to height falls on this same distribution curve. Instead of the typical bell shaped distribution we find a double bell. This distribution is most likely explained by schools dramatically stunting the creative development of three-fourths of students and having no effect on the more gifted upper quarter.³⁰ The current environment of schools is severely detrimental to creativity. The assembly line process is about "vertical thinking", thinking in a logical and sequential order. It stresses knowledge without insight or critical thought. Conventional school environments bestow little value on serendipitous chance or intuitive connections.

One enormously important thing that schools do well is to teach specific domain related knowledge. The flash of insight, the mysterious inspiration that is so hard to predict or control will only surface with understanding of the problem and in-depth knowledge of the domain. Csikszentmihalyi, author of *Creativity: Flow and the Psychology of Discovery and Invention*, makes the case, and employs interviews of many artists, writers and scientists,³¹ to contend that in order to innovate one must understand the field of

work completely.³² What has been done before, what has worked, what has not, knowledge is the loam where creative production grows. The spaces we inhabit can either actively foster the accumulation of knowledge or it can sweep it away. Ed Paschke, a techno-surrealist painter, accumulates hundreds of images from magazines to draw on for inspiration.³³ His painting “Bird Eye” is a perfect summation of his process.



“Bird Eye” contains numerous symbols, materials and textures gleaned from his cache of cultural information and years of experience. The painting achieves its surreal effect by using this cache of images to blend symbol to skin. Like Paschke’s image box IDEO has what they call a “Tech Box”³⁵ that stores intriguing materials, drawings and mechanisms donated by IDEOers. Employees and even clients will go to this “magic box” to inspire “lateral thinking”. Lateral thinking is a psychology term that defines a process of thinking that does not necessarily proceed sequentially or even logically; it tends to make “psychic leaps”³⁶ from one concept to another without figuring out the exact connection. Lateral thinking is essential to original thinking and unique design solutions. Ed Paschke uses a box to store images; IDEO has a large cart of technological wonders. What would found architecture, beautiful imagery and insightful articles gathered in the built environment for storage and retrieval look like? How powerful could it be?

Getting new ideas through interaction, idea exchange or inspiration is critical to the creative process, but equally important are the steps of preparation, evaluation and elaboration. For these processes a stimulating, distracting space is not desirable.³⁷ Mihaly Csikszentmihalyi's book, mostly discredits stereotypical assumptions about creative people. For instance, it is easy to prove that not all artists are promiscuous, only one must be found who is faithful. But one assumption, that of the solitary genius, seems to have merit. There are many tasks, such as practicing an instrument, reading or writing, that require solitude. According to Csikszentmihalyi, "most talented creative people have a high tolerance for isolation."³⁸ At IDEO they have solved the conflicting needs for distinct periods of interaction and isolation. Each cubicle has translucent Lexan doors that can slide closed when concentration is required.³⁹ Freeman Dyson relates how he deals with the embellishment process of his writing, "When I am writing I have the door shut, and even then too much sound comes through, so very often when I am writing I go and hide in the library."⁴⁰ Solitude makes difficult tasks easier by facilitating a state of "flow". When in flow tasks become done for the pure enjoyment of doing them, not for their specific benefits. They become autotelic.⁴¹ One disrupter to flow is distraction. The harder the task the smaller the distraction will have to be to disrupt one's state of enjoyment.⁴²

The Role of Camouflage:

Creativity is synonymous with resistance. The normal, the everyday, these present no resistance from authority or challenge to standard thinking. By definition, something new or different, something creative, is a challenge to the existing. It is a challenge to the self. Csikszentmihalyi states, "we need a supportive symbolic

ecology... and to the extent that the symbols... represent essential traits and values of the self, they help us be more unique, more creative."⁴³

In order to maintain one's self and preserve one's goals it is necessary to assume some form of camouflage. Camouflage, the blending of subject and space, fortifies the individual against the unceasing "unadulterated torture"⁴⁴ that can characterize the creative process. Neil Leach, the author of *Camouflage*, argues that the experience of an architectural space is never a given, never constant.⁴⁵ As we assimilate with a space our experience with that space changes. We become more like the space; the space becomes more like us. To preserve one's self it is necessary to have this connection. The space, self, link evaporates when nature, humanity, and architecture are sliced into separate elements by the sharp knife of rationality. We lose our relation to place, our connection and reinforcement of self. Leach elaborates on this phenomenon:

In the instrumentalized view of the Enlightenment, knowledge is ordered and categorized, valorized according to scientific principles, and the rich potential of mimesis is overlooked. All this entails a loss, a reduction of the world to a reified structure of subject/object divides, as mimesis retreats even further into the mythic realm of literature and the arts. In this sense the rich vein of mimesis that once permeated human existence, and led to a seemingly magical connection between human beings and their universe, has withered away.⁴⁶

Leach later relates this rationalization, this anti-mimetic impulse, to the flaws of modernism. He uses writings by Adorno to make the case that Architecture without direct

mimetic connection to humanity is sterile. It is alien. This architecture is destructive to the self and disallows creativity. At the heart of mimesis is the *relationship* between the user and the space. When modernism took away the humanity from architecture by rationalizing every aspect of function and material to its minimum it greatly hindered the ability for humanity to *relate* to the environment.⁴⁷

Human experience of space is always shifting due to differing levels of assimilation to that space. It is critical to recognize the need to accommodate change. Change is the only constant; buildings are in continuous flux, as are the people who use them. People never enter a building or go through the same experience twice. The people are different, they are influenced by entering once before. The ability to experience a place is the aggregate of previously assimilated experiences. Buildings must accommodate the constantly changing needs and changing character of the people who use them. The solution Leach offers to this tall order is to be predictive:

The task for designers, then, would be to "fast-forward" this process, and to imagine how forms would have evolved in order to be totally adapted to their patterns of colonization. It is an architecture, then, of the "future perfect" tense, which attempts to predict, by exhaustive analyses, the activities that will have happened in order to facilitate those processes through connectivities, and so on.⁴⁸

This fast-forwarded "future-perfect" tense, is required of adaptable buildings that change in response to their users needs. The future is unknown and change is inevitable.

Buildings must have "a framework"⁴⁹ which allows co evolution with ever changing

users. A framework that facilitates change isn't reactionary, an adaptable framework is predictive. Lebbeus Woods talks about the current state of architecture and what it needs to become in order to facilitate human progression:

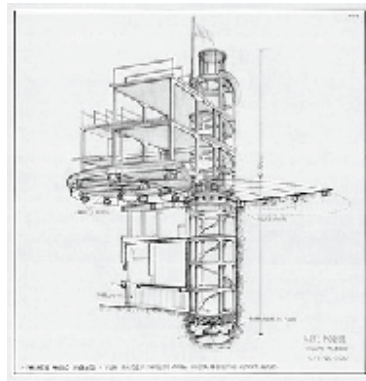
... [In] whatever form, architecture has a greater role to play in the creation of so radiantly human a future than it at present plays. Its present subservience to lesser ends results, I believe, from the understandable confusions of architects as they confront new knowledge, technology and conditions of living. This must end, if architecture is to become the instrument of human emergence inherent in its comprehensiveness and universality; it will end when architects accept that the mandate of architecture today is not the control of change but its invention.⁵⁰

-Lebbeus Woods

If structure can mirror users of the space it will reflect their goals, desires and self. If structure can facilitate change it will "become an instrument of human emergence." Kronenburg contends that, "Truly transformable architecture must go far beyond the minimal changes allowed by moving the chairs around or painting the walls."⁵¹ Architecture that can actually change, truly adapt, requires a built in framework for change. Robert Kronenburg defines three ways which buildings may acquire their flexible nature: adaptation, transformation and movement.

An adaptable building is designed with the realization that future use is unknown. It is comprised of “loose-fit”⁵² spaces capable of housing larger or smaller programmatic elements. Adaptable space, as Kronenburg defines it, will require architects to let go of certain design elements⁵³. It must be realized that adaptable spaces cannot be under complete control. Adaptation requires freedom. If present uses and ideals are cemented into the architecture then the ability for future adaptation is lost.

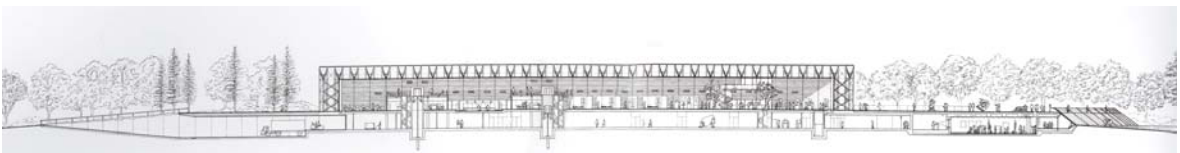
Sunflowers track the sun, vines slowly orbit until a grasping location is found, even one species of arctic flower is formed in a perfect parabola to focus the sun’s rays and attract frosty bugs seeking heat. Buildings do very little in the way of opening or closing, of interacting with their environments. Roofs can open revealing the night sky, colors can adjust to reflect occupant’s particular tastes, and walls can fold or sweep out to create ever changing, flexible spaces. Girasole, an Italian villa designed by Angelo Invernizzi, is much like the sunflower that tracks the sun. In fact Girasole is Italian for sunflower.



Girasole means to rotate (gira) around the sun (sol) in Italian.⁵⁴ To use Kronenburg's terminology it is a flexible building. Girasole is flexible not because of its operable doors or windows but because of its entire operable floors. This structure creates drastically different experiences for the visitor every time they visit it. The views within the building pan constantly, slowly, but noticeably. A ray of light sweeping across a desk in a stationary structure is replaced with a landscape that unfolds millimeters at a time. The ever changing vistas create a constantly novel environment that is responsive to the user's desire for constant sun exposure.



On this proposed skyscraper by David Fisher the independently controlled floors act as individual agents searching for views or certain sun/weather exposure. The whole of the building reflects the desires of the individual floors and the people who control them. At any given moment the unplanned reaction of the individuals creates a constantly novel form that speaks to the personal desires of the people living in the building.



Loose-fit space is straightforward. Walls and columns are eliminated which usually necessitates a long span structure. Floors and walls must provide all service within the building to any location within it. The Sainsbury Centre for Visual Arts designed by Norman Foster employs a crane truss to achieve its vast open space that houses the reception area, coffee bar, exhibition areas, the Faculty of Fine Art and a restaurant. The double layer walls and roof allow easy access to service areas and aluminum louvers below the translucent sections of ceiling/roof are connected to light sensors and allow for an infinite variety of lighting within the space.⁵⁷



A terribly relevant building that is itself a study on novelty and adaptability is a small sushi bar and restaurant in Philadelphia. Mod Pod, designed by David Rockwell, has many aspects that promote creativity. It is always novel, can adapt to its users and serves as an interactive space to hundreds of students from the University of Philadelphia. Mod Pod's name derives from pea pods⁶⁰ but it is easy to see it standing for "modifiable" pods, which the private dining pods certainly are. Large buttons on the wall change the light on the stark white walls of the dining areas. In fact, nearly every surface in Mod Pods is pure white.⁶¹ Only through colored lights does the restaurant come alive with color.

It is described by the Rockwell Group as a nod to Kubrick's 2001, a Jetson's romantic, retro-futurist, asian influenced sushi restaurant.⁶² Most importantly it is about creating lively space that brings people in and creates a wonderful experience. Rockwell's work has been described as "hedonist"⁶³ and it is true, this restaurant is completely about good experience.

Part of that experience is created by ever novel and adaptable colors which paint the space differently every night. What makes this space relevant to creativity is the novel stimulus it produces as well as its ability to adapt to, and become like, the user of the space



Scott Adams, a former cubicled employee started the comic strip “Dilbert” about a worker living in the dull impersonal environment of cubicle life. United Media commissioned IDEO, as part of a Dilbert competition, to design “Dilbert’s Ultimate Cubicle.” This design reflects solutions to “alienation and isolation [in] cubicle-filled office spaces.”⁶⁵ The “Ultimate Cubicle” deals with personalization by allowing users to select the pieces from a kit-of-parts, a collection of stackable cubes that comprise everything from storage to heating. The do-it-yourself approach gives workers a framework to customize their workspace to allow the space to become more like themselves and more responsive to their needs although it fails at any spontaneous adaptation that wasn’t determined when building the cube. The framework of relatively static assets (stackable cubes) assumes that one has predicted every need because adaptation would require rebuilding; the cube’s storage needs must remain constant, so must the heating or seating requirements. This criticism aside, Dilbert’s Ultimate Cubicle represents thousands of workers’ requests for, essentially, a more customizable space.



66

A building in Austria solves the problem of meeting constant needs for adaptation by allowing different planes to slide open and closed. The “GucklHupf” house was built to be a “question on the landscape” as part of a festival called “Strange(r)”⁶⁷ GucklHupf allows users to react to different needs for light, privacy and views. In a studio if someone desired interaction their space could open up. Differing needs would result in differing levels of openness and transparency.



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How can a workspace have such a high degree of adaptability? What happens when someone needs to work with different people at different times? Movement and adaptation of a workspace seems somewhat trivial when examining “Crate House.” Crate

House was designed as an art piece by Alan Wexler. Wexler, an architect by training, said this piece is about questioning the true nature of home.⁶⁹ This home in a box, a home as furniture, could be applied to the need to move studios around. If the same principles were applied to studios they would be adaptable and able to accommodate a host of needs present in a community of students that will change every semester, and whose projects and groupings could change daily.

Movable architecture like Yurts, Tipis, and other nomadic architecture has been the norm for the majority of human history. Our static buildings will once again gain the lost transient qualities. Lightweight, durable materials are becoming more affordable. Solar panels and bioreactors allow energy and waste to become mobile as well. The ultimate in personalizing a built environment will be to pick it up and place it in your ideal location.

The Case for Creative Studios

“I have become convinced that architectural designing is a prototype of the kind of artistry that other professionals need most to acquire.”⁷⁰

- Donald Schön, an influential writer on professional development

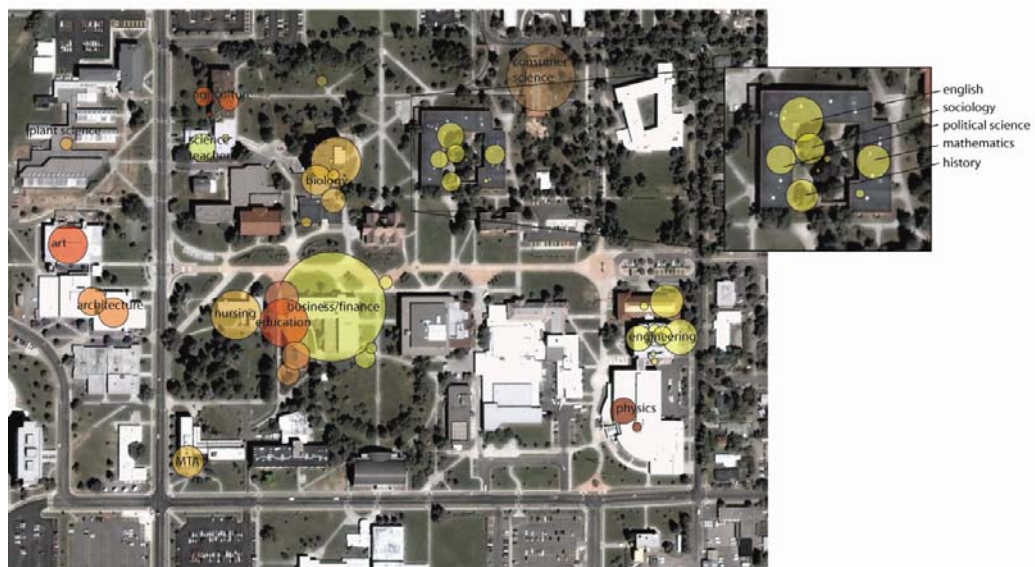
The term studio has been misunderstood. It has been taken to mean a place for artists, an area reserved for the mysterious caste of creators. In our efficiency of industrialized learning the sometimes inefficient studio has been excised to make space for classrooms that program knowledge in a one directional way. The architect, artist or dancer deserves a studio, a place to work and interact with others in their own field, but the writer the philosopher or the business major does not deserve the same?

MSU has over five-hundred graduate students⁷¹ alone whose departments are in either Reid or Wilson Hall and not one of these students has access to a place dedicated to work, much less a work space that fosters any kind of creative production. The logical testing ground for a study on creativity is a program that supplies a place for many students to interact, to critique each others work in an adaptable studio space. The location for such a studio needs to be at a nexus of activity to encourage interaction between diverse people.

“Usually something interesting happens when you take people from different realms or artists from different places and try to put them into something totally different...”⁷²

-Jack White, talking about writing and performing the first Bond film duet.

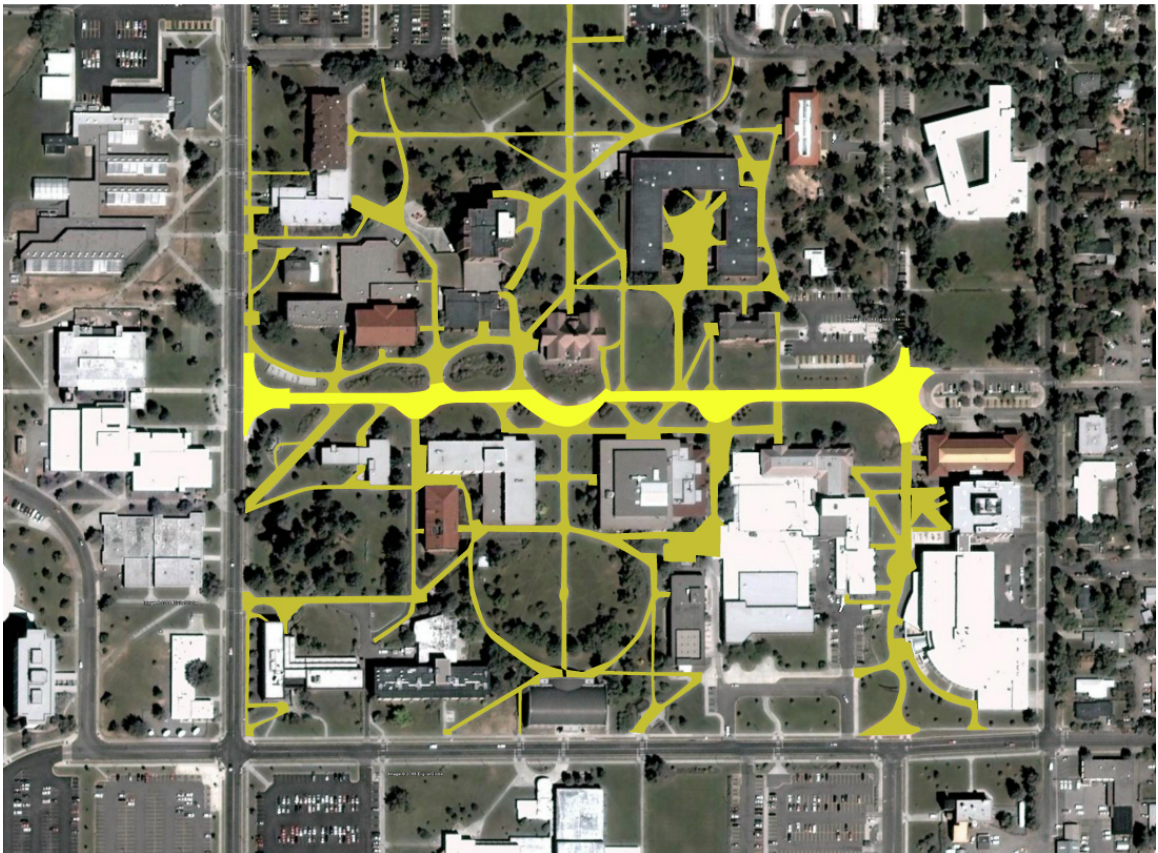
The below diagram represents different groups of graduates at MSU and their relative sizes. For a sense of scale, business/finance has about two hundred and fifty graduates per year.



student density and distribution

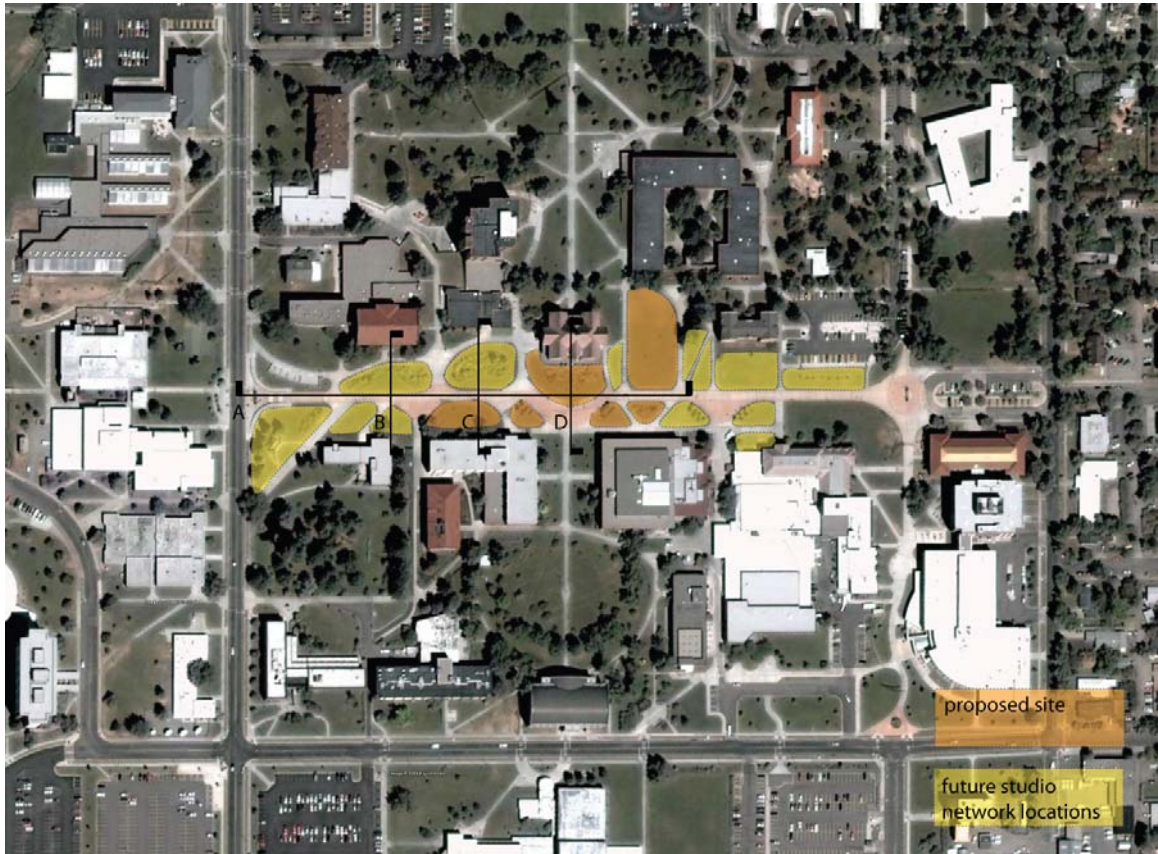
Site Analysis

The Mall at MSU is the principle hub that connects buildings. It is the datum that orients people and is the main thoroughfare which they travel. There are usually ten to twenty people passing Montana Hall at any time during class hours. The nearer the hour the more people that utilize the Mall. Within fifteen minutes of the hour there can be hundreds of people passing near Reid hall and Renne Library. The Mall in the below diagram is represented by the bright yellow secondary pathways are shaded darker.



Since the Mall is the hub, the datum which connects students it is the ideal place for the studios that would serve them. The areas in orange on the next page are optimal points along the datum of intense student traffic because they are open and near Reid, Wilson and Montana Hall as well as the library. These sites are in the center of campus

on the most trafficked path. The future studios are locations that, as the campus expands, could be connected to the initial creative studio to create further interaction and accommodate more students.



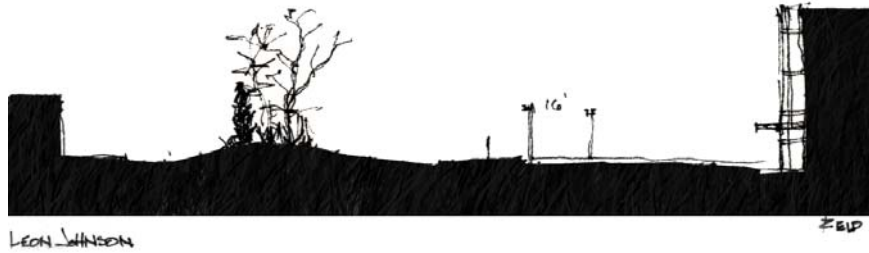
Section A



Section B



Section C

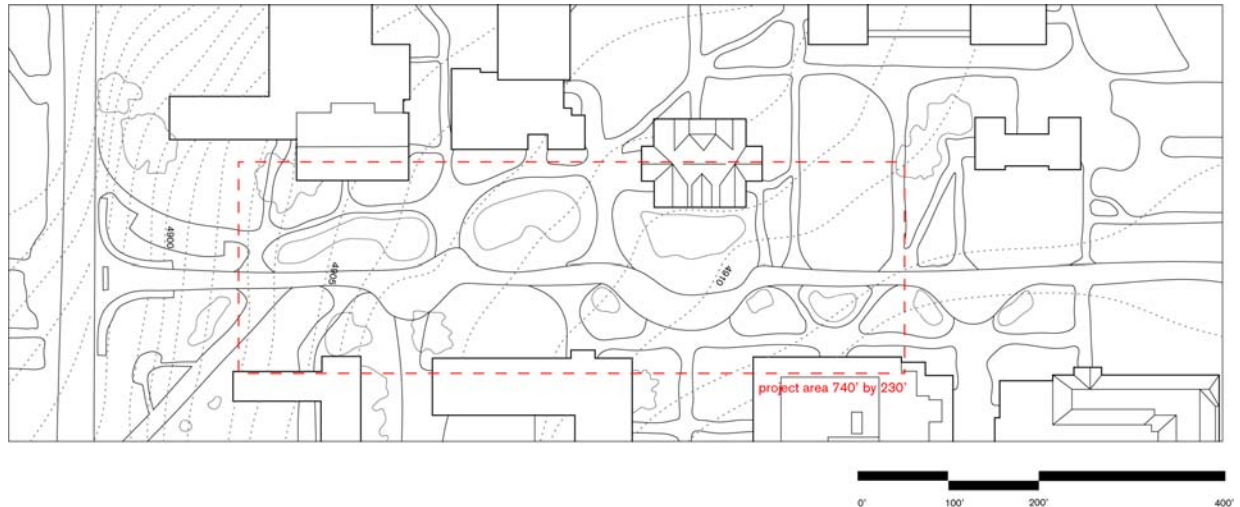


The area where section “C” was taken has always felt too open or unfinished. The section of the area reveals why. Leon Johnson’s small stature in relation to the area between it and Reid hall creates a low, unimportant space which does not fit well along the Mall.

Section D



Site plan



The Need to Go Underground

The very reason the Mall is an excellent site, its high traffic and density, is also the reason for the fragmented open space that accompanies it. Pathways that allow students to cut across open ground and travel from one building to another necessitate some amount of below grade building for a program that aims to serve any substantial amount of people.

Building below grade has the added benefits, aside from extra space, of lowering energy costs fifty to eighty percent⁷⁴. HVAC requirements are less in below grade buildings because of less air infiltration and more stable temperatures. Building maintenance is also reduced because the exterior of the structure is shielded from UV light, freeze thaw

cycles, rain, wind and ice. Typical costs in thirty years are 75% of what they would be for an above ground building.⁷⁵

Not everything about below grade and partially below grade building is beneficial. There are significant design problems including day lighting, ventilation, exiting and egress as well as people's psychological predisposition to feel claustrophobic underground. Day lighting and ventilation problems were solved in this underground house by John Barnard by creating an open courtyard based on the Roman courtyard house typology. A simple cut in the ground is a powerful move that creates a very clear separation of natural and manmade. The handrail detracts from this powerful statement because it has zero integration with the walls defining the courtyard. Sunlight is able to pierce the interior of the house by controlling the length and depth of the opening.



Lorreta Hall, author of *Underground Building's: More than Meets the Eye*, outlines several strategies to “decrease perceptions of danger or discomfort that might accompany

the thought of descending into the earth.”⁷⁷ Entrance into a below grade building is critical. If the descent is abrupt it provokes uneasy feelings in the people using the building. One technique to soften the descent underground is to slope the earth to a below grade entrance or to provide an above grade lobby or atrium that allows for a transition between above grade and below.⁷⁸



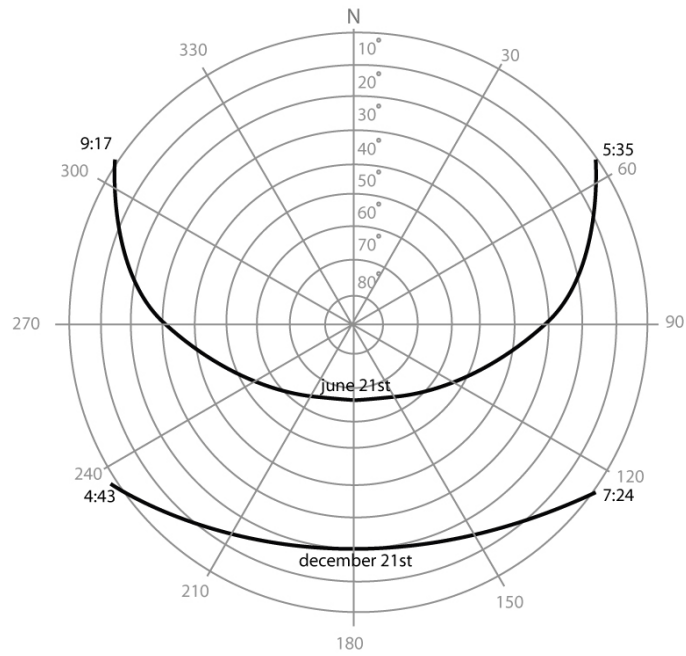
These two subway entrances were designed by Foster and Guimard a hundred years apart in response to the same problem of transitioning below grade from above with limited site space. Both entrances celebrate the transition from above to below by emphasizing a light, airy structure which allows natural light in.

People’s natural predisposition to feel claustrophobic below ground necessitates spacious areas “especially in the vertical direction.”⁸¹ Skylights and atriums are effective at creating spaciousness while also allowing natural light into below grade structures. Fear of the unknown predisposes below grade structures to create visual cues at the surface in order to inform users about their form and nature.



Going underground, paradoxically, creates a focus on the sky. From the vantage point surrounded by walls of earth the sky alone is visible. James Turrell, an artist who studied psychology and mathematics and is a recipient of many prestigious awards⁸³, has approached the sky by going underground. Turrell is concerned with light. Going underground helps Turrell explore some of the “very fine qualities of light”⁸⁴. Things like shadows cast by Venus and “old” light from the “galactic planes”⁸⁵ can be captured without luminary interference underground. Turrell seems to use razor thin apertures to create the illusion that the sky is a plane pasted onto the ceiling. This effect brings the sky closer to the viewer and removes the everyday perception of sky which allows one to see the sky, and the objects in it, in a novel way.

Climate



Sun angle diagram

jan feb mar april may june july aug sep oct nov dec

Insolation, kWh/m²/day	1.46	2.27	3.38	4.45	5.24	5.89	6.29	5.37	3.99	2.62	1.65	1.26
Clearness, 0 - 1	0.47	0.49	0.50	0.49	0.49	0.51	0.57	0.55	0.52	0.48	0.46	0.46
Temperature, °F	19.94	22.73	30.97	40.44	49.82	58.08	64.94	63.70	52.43	41.00	28.18	19.99
Wind speed, mph	12.75	11.61	10.54	10.89	10.40	10.22	9.78	9.66	10.58	11.43	12.08	12.30
Precipitation, in	1.15	0.85	1.49	1.89	3.12	2.95	1.47	1.58	1.93	1.58	1.28	0.99
Wet days, d	9.1	7.6	9.7	9.3	11.4	10.2	7.1	7.3	7.3	5.8	7.4	8.8

Bozeman Average monthly statistics

Creative Studios Must:

The program of these studios must be entirely conducive to creative production. This means that several things must happen at the macro (building) scale. The building must provide space for interaction. This can occur in a restaurant/café/bar or lounge that would bring in people from outside the studio and also give students within the studio a place to relax and work through ideas subconsciously. The building's location, near the library, is already conducive to information gathering as well as interaction among the hundreds using the Mall daily. The density required to create "buzz" and a rapid transfer of ideas must be controlled at the building level. Some other building device should allow for a semiautomatic activity, an activity "that takes up a certain amount of attention, while leaving some of it free to make connections among ideas below the threshold of conscious intentionality."⁸⁷ Greek philosophers used the "peripatetic method", which consisted of discussing ideas while walking the grounds of the academy, to stimulate creativity.⁸⁸ A walkway that allowed for novel stimulation along it would be useful. So would a system that permitted varying sizes of groups to meet, brainstorm and discuss projects. IDEO takes brainstorming seriously, one requirement of their brainstorming sessions are large amounts of paper on the walls to write on. When ideas are written in a specific location on a wall it allows people to recall the discussion and information better when returning to that location; this is called "spatial memory."⁸⁹

At the micro (personal) scale requirements for individual mimetic assimilation and extensive environmental control of light, sound and distraction are paramount. Also important will be to have some permanence in the studio; meaningful interaction will

require that people in the studio have the opportunity to run into the same people and get to know them.

Program:

Each programmatic element is thought of with a belief that it is open to change. This change could occur by shrinking or enlarging final square footages and also that elements of the program may be adaptable on different time scales. One day, month or year could facilitate different programmatic needs than the next. This structure will be adaptable to its users and one way this will likely take form is in a changeable program. With that in mind, here is a framework of programmatic needs to facilitate creative production.

- [8,000 sq ft] at least 2 separate studio spaces for a total of 180 students
- [120 to 450 sq ft] Several somewhat reserved (flexible) spaces within the studio for critiques, discussions, project meetings etc. (groups 2-30)
- [300 sq ft] Lounge areas, about 10 students each
- [100 sq ft] Information storage/display space (this would be displayed on walls and thus have small sq ft requirements)
 - Posting boards (for selling, events, projects, jobs etc.)
 - Digital projection of projects or information from students (pictures, short stories or philosophical problems)
 - Personal workspace display area for 2 dimensional and 3 dimensional work (this would occur at individual's workspaces and is considered in the studio space)

[800 sq ft]	Peripatetic Space (circulation space)
	Space for taking a walk when working, or for people using the studio as a short-cut across campus, this space would provide novel stimulation along it and possibly be connected to the studio space
[600 sq ft]	8 water closets 4 lavatories
[150 sq ft]	Supply Loading
[500 sq ft]	Mechanical space
[100 sq ft]	Cleaning Storage
[3,200 sq ft]	Restaurant/Café/Bar with seating for 100
(800 sq ft)	kitchen
(500 sq ft)	6 water closets 2 lavatories
(600 sq ft)	restaurant seating
(200 sq ft)	counter
(500 sq ft)	café
(300 sq ft)	circulation
(300 sq ft)	lounge seating
[14,200 sq ft]	Total

Code Analysis: IBC-2003

303.1 Assembly Group A

A-2 Assembly uses intended for food and/or drink consumption

A-3 Assembly uses intended for worship, recreation or amusement

602.2 Types I and II

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

503 : Allowable Height and Building areas (for type I construction sprinkled)

Occupancy Type	Maximum Height	Maximum Area
A-2	Unlimited	Unlimited
A-3	Unlimited	Unlimited

504.2 Automatic sprinkler system increase.

Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503">503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story. These increases are permitted in addition to the area increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503">503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story, but shall not exceed four stories or 60 feet (18 288 mm), respectively.

1004.1.2 Occupant Loads

Assembly spaces

Studio Space:

Unconcentrated (tables and chairs) 15 net for 8,000 sq ft = 533

Lounge Area:

Unconcentrated (tables and chairs) 15 net for 300 sq ft = 20

Restaurant seating:

Unconcentrated (tables and chairs) 15 net for 1,900 sq ft = 126

Meeting areas:

Standing Space 5 net for 450 sq ft = 90

Kitchens (commercial)

200 gross for 800 sq ft = 4

Total Occupant load: 769 people

1005.1 Minimum required egress width.

The means of egress width shall not be less than required by this section.

The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by the factors in Table 1005.1 and not less than specified elsewhere in this code.

Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

From **Table 1005.1**

For assemblies I and II, sprinkled:

stairways require .2 inches per occupant (12'10" for 769 occupants)

Other egress components require .15 inches per occupant (9'8" for 769 occupants)

From **Table 1015.1**

For occupancy A, sprinkled, maximum distance is 250'

1018.1: Minimum Number of Exits

TABLE 1018.1 : Minimum number of exits for occupant load

OCCUPANT LOAD MINIMUM NUMBER OF EXITS	
1-500	2
501-1,000	3
More than 1,000	4

Conclusion:

We become like our environment. If it is static, unchanging and isolated we gain those qualities. If it is devoid of information, so, eventually, are we. If it cannot adapt to become like us we become solely like it. Conversely, spaces that encourage interaction, provide novel stimulus and make provisions for our focused work will promote the self, our originality and put no limit on our creativity.

The Creative Forum at Montana State University

peripatetic space

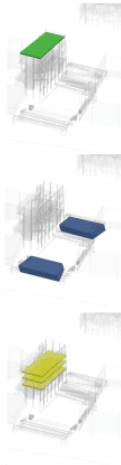


Greek philosophers used the **peripatetic method** which consisted of discussing ideas while walking the grounds of the academy, to stimulate creativity. Because walking takes up a certain amount of conscious brain power, more thought starts in the unconscious which is then free to make novel connections between seemingly unrelated ideas. These novel connections are often interpreted as the mysterious spark of creativity.

The Creative Forum utilizes the peripatetic method by having a large **courtyard** and long **processions** to it.

Illustration: A. Vonder

novel environments

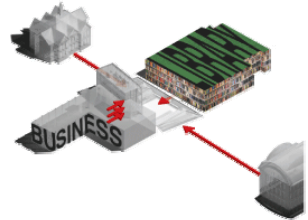


Completely open, the **sky garden** will always be changing. Lenses will change colors, temperature will swing dramatically and the sky will be in constant motion. The first stage in the creative process is **preparation** which requires novel **stimulation** and new **situations**. The sky garden provides, both spatially and practically, these requirements.

The **subterranean studios** allow for a variety of work environments and levels of interaction. With a **accessible** rail system and table partitions many different environments are possible to allow for **tailor-made** the needs of the space used in order to do their creative work.

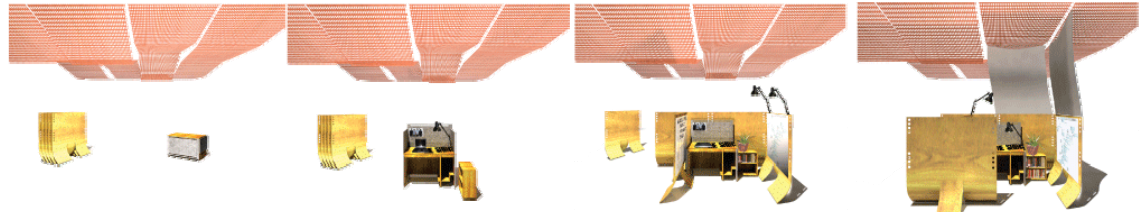
Tower studios overlook the central courtyard and have views of the Baldy Mountain range. The glass enclosure allows for more concentration than the sky garden, but this area still provides a fair amount of novel stimulation **due to the ever-changing panel facade** and **visibility** below. The floor plans are smaller and would create a solitary and reflective environment.

connections



Connections between previously unthought-of areas leads to **novel ideas**. The creative forum is situated at the **heart** of Montana State University in order to draw in **diverse disciplines**. To be creative in any particular area one needs knowledge of that area. The creative forum is **physically attached to the library** in order to encourage as much information gathering as possible.

customization

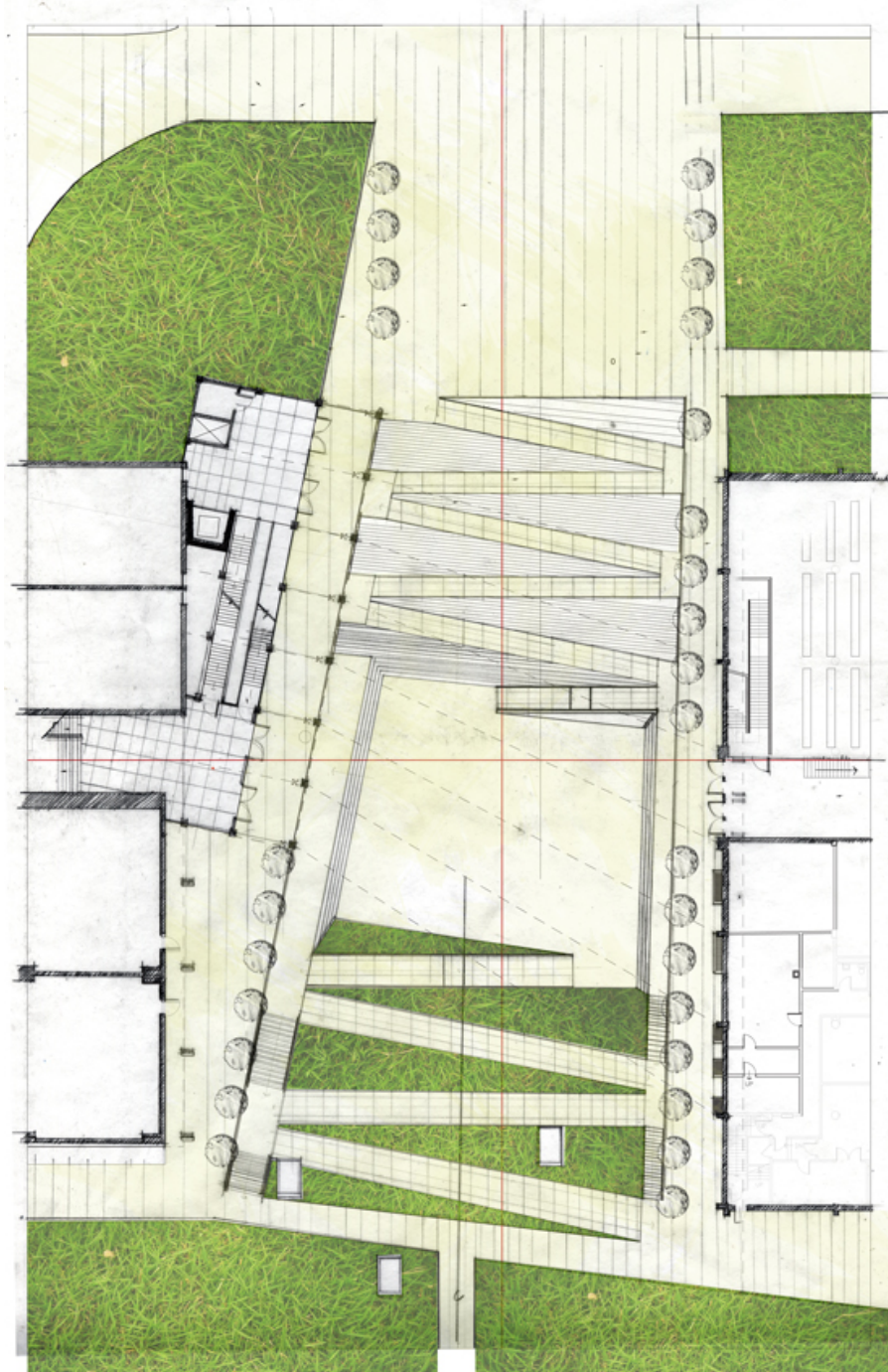


Hypothetical work space progression. This progression illustrates the customization of space possible at the individual level.

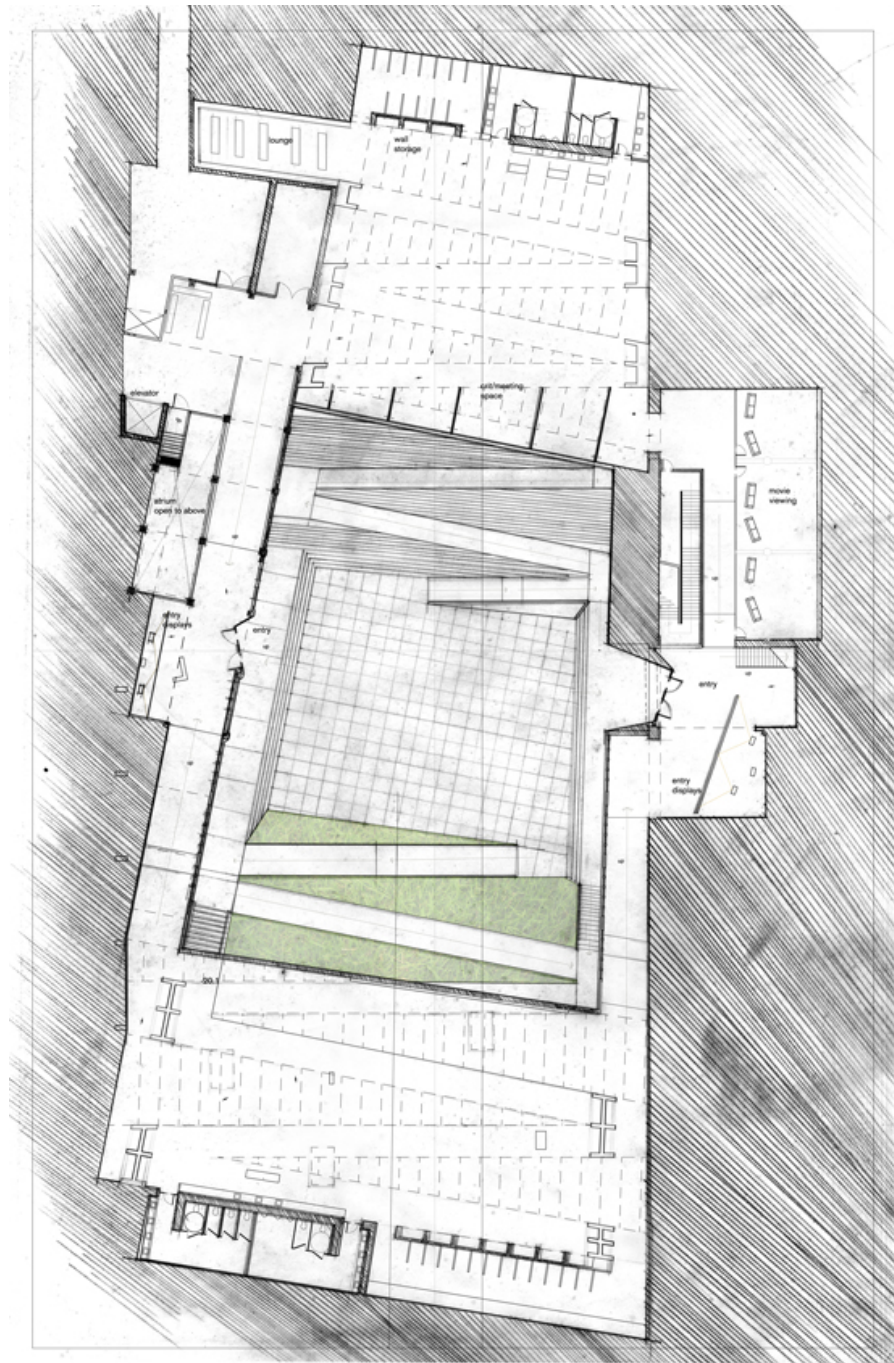
Initially the desk is set up for work while allowing for **interaction**. This desk setup would be **conducive to the first three stages of the creative process** (preparation, incubation and illumination) because these steps require less concentration and benefit more from interaction.

As a project progresses, **micro reduction** would be beneficial. The above setup corresponds most to the fourth stage of the creative process which is **verification**. Verification is concerned with checking to see if ideas developed during the **first three stages** are viable. This step requires **more focus**, but a certain amount of interaction would be advantageous.

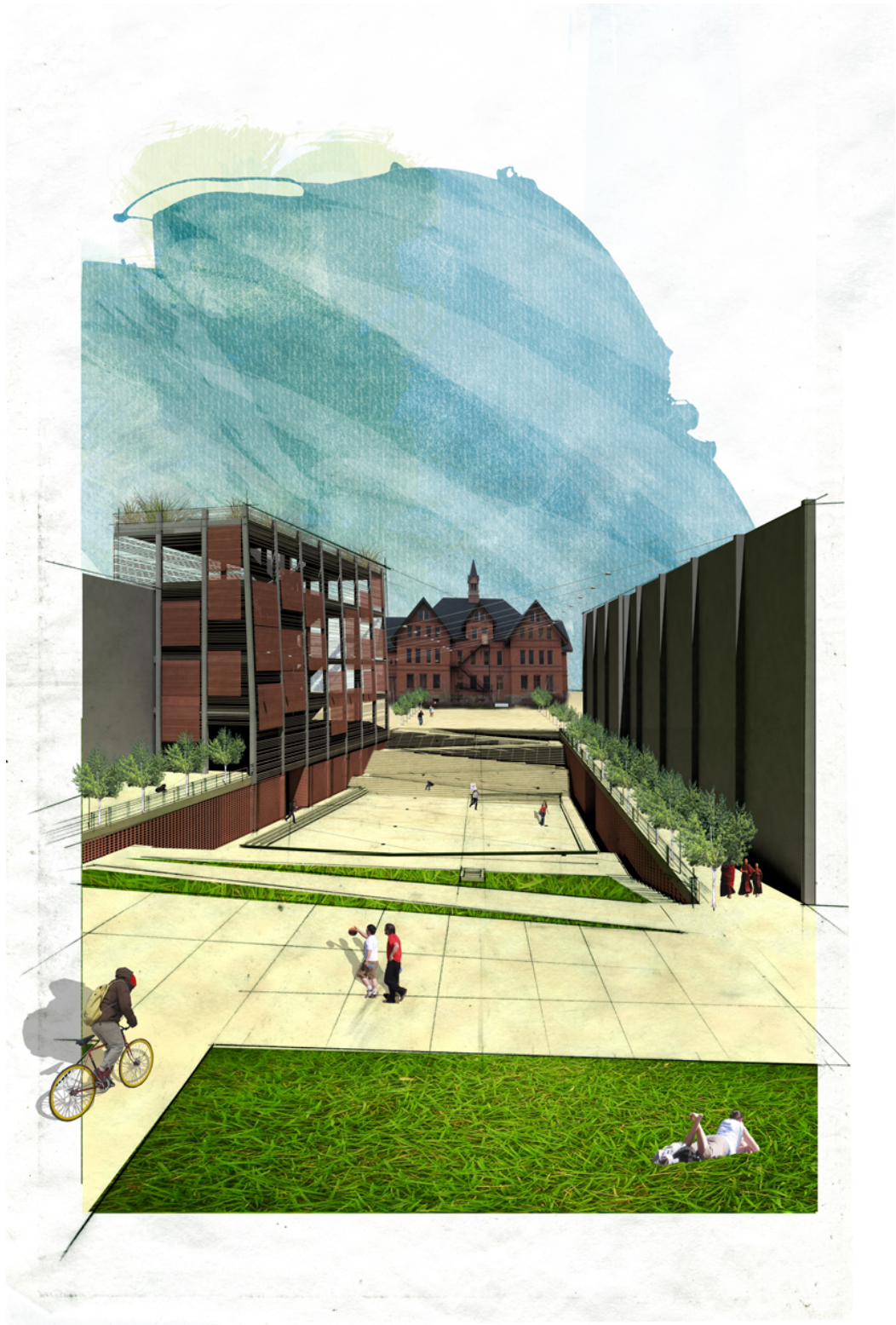
After ideas are verified the long and challenging process of **elaboration** begins. The longer the task, the more **isolation** one will require for focus. This setup, which reflects the fifth step, is nearly completely enclosed in order to further isolate the space and allow for a high degree of concentration.

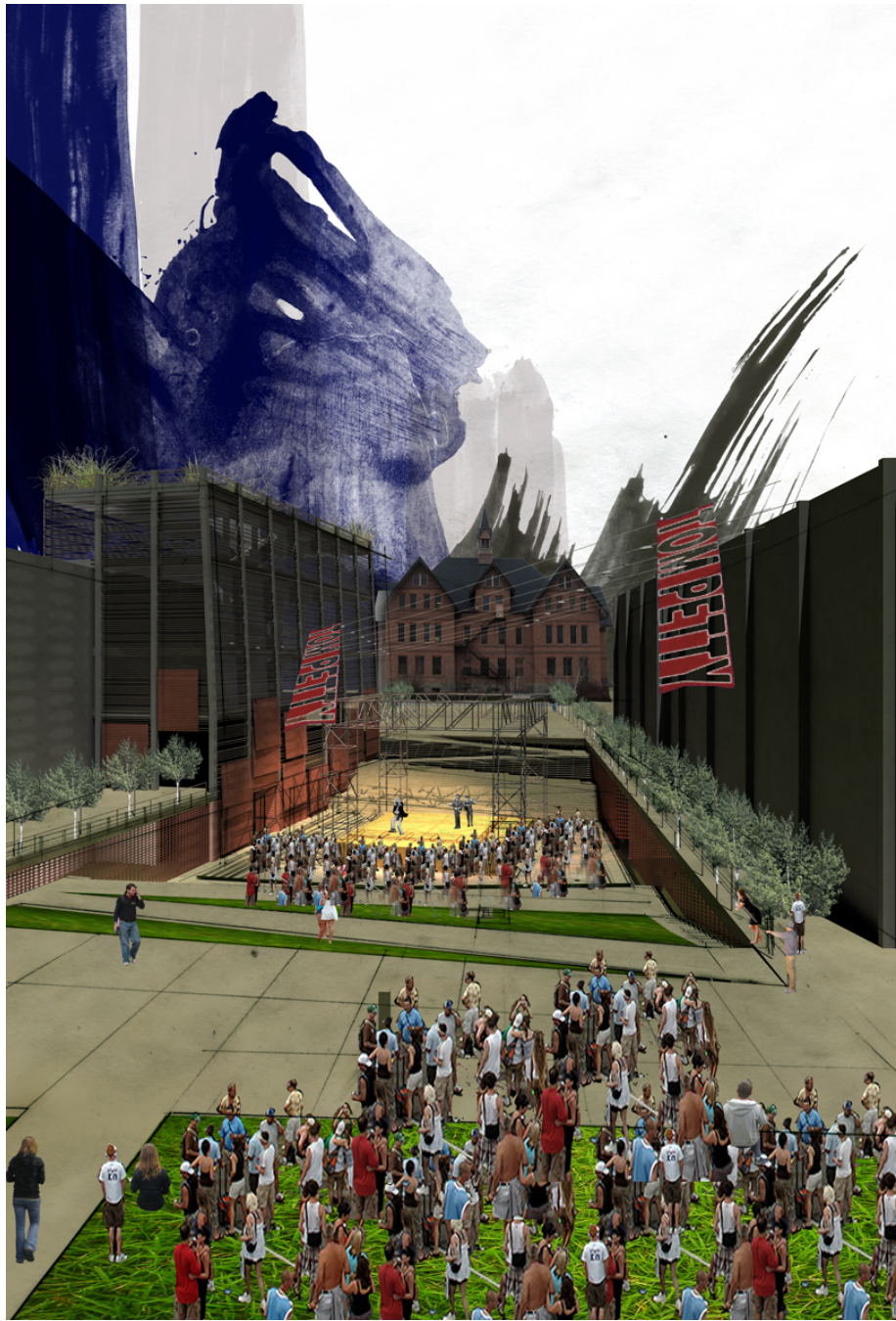


ground floor plan



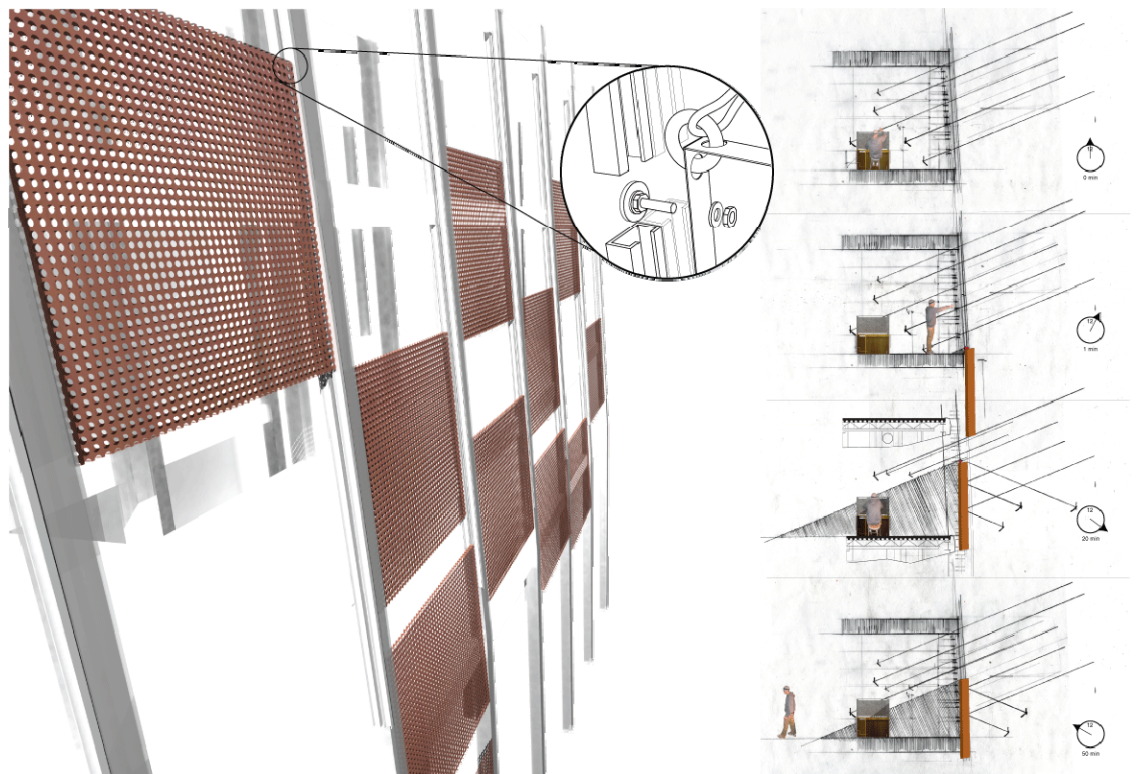
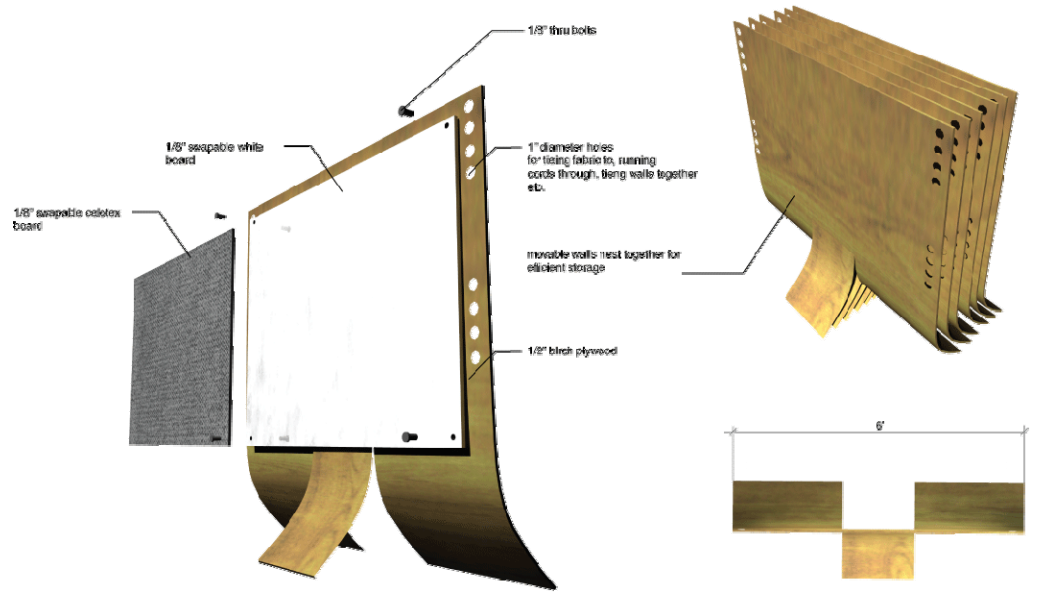
basement plan

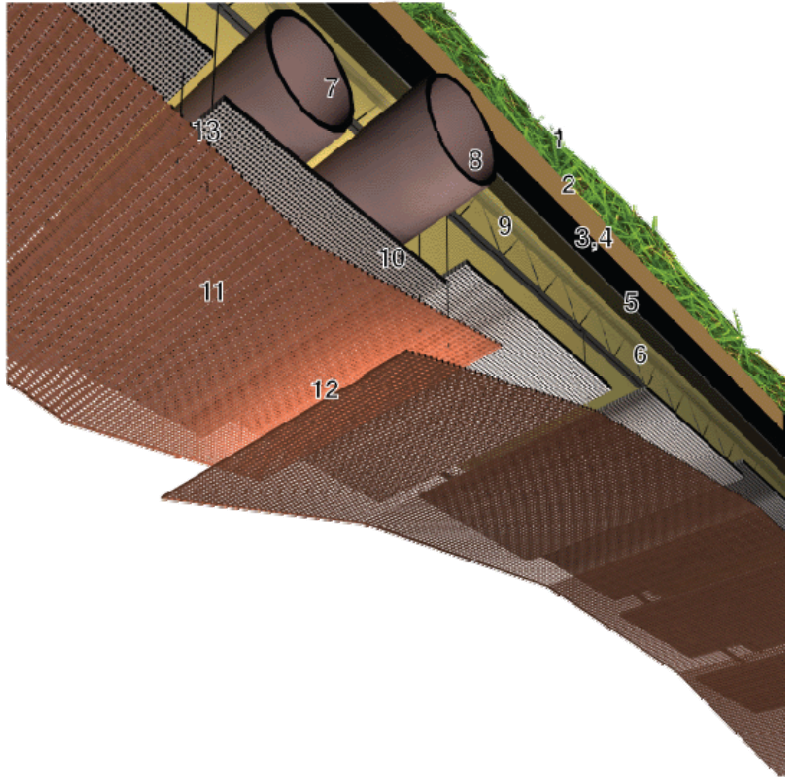




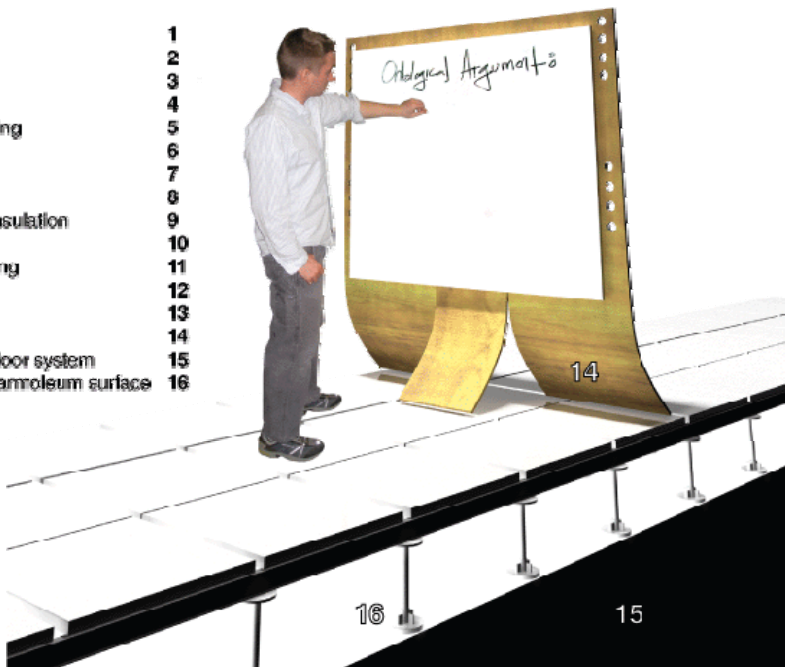








- grass "roof" 1
- 6" soil 2
- root barrier 3
- membrane 4
- 6" composite cellular decking 5
- 12K3 open web steel joist 6
- return air 7
- supply air 8
- 12 1/2" R 36 fiber glass insulation 9
- 1/2" sound board 10
- 22 gauge corten steel ceiling 11
- recessed lighting 12
- 1/8" thru bolts 13
- movable wall 14
- 12" deep aluminum underfloor system 15
- white abrasion resistant marbleum surface 16



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