Reconnecting in a Connected World: Nature, Technology and the Next-Generation Library

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Abstract

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Alone. It is not a word that conjures a comforting feeling for most. We are social beings, evolved over millennia to prefer the group over isolation. It is perhaps, in addition to our intelligence, the hallmark of our species. This is evident in the technologies we create that unfailing aspire to bring us ever closer together. Yet in our pursuit to streamline, simplify and expand connection, we have demonstrated how little we understand ourselves. Human relationships are chaotic, complicated, and demanding. They are not meant to be efficient, simple or propagated by algorithms. By allowing us to minimize our personal investment and avoid the tangle of human emotion while also permitting us to prioritize quantity of connections over quality of connections, technology is simultaneously disconnecting us while connecting us. The same is true of our relationship with the natural world, where we create ever larger built environments that streamline and simplify, maybe even allow us to avoid, interactions with nature. We consume food from store shelves, natural light from engineered bulbs and the sounds of the wild via streaming digital tracks. But technology cannot be the villain. We are as inextricably bound to our tools as we are to each other. If we want to reconnect and to connect more deeply, we need to understand and design our creations with fundamental human needs in mind while leveraging technology for its strengths in an intelligent manner.

This thesis proposes that technology, specifically architecture, augmented reality and virtual reality, can be used to deepen our connection to others and to the natural world via the vehicle of storytelling and first-person experience. As an architectural typology, the library for its traditional and revered role as a cultural repository and community hub was chosen. Located within the Denny Triangle district of downtown Seattle, the South Lake Union library is genuinely the next-generation library. On a site that occupies a full city block amidst adjacent office towers, the majority of the South Lake Union Library sits comfortably below grade leaving its roof to be an open woodland amenity for library visitors and the city alike. Since the entire collection of the South Lake Union Library is digital, the architecture is merely the physical threshold from one reality to another. It is within this context that a framework for a deeper, more empathic connection to the world through a intuitively natural relationship to technology is proposed.

To Monica, August, Aspen, and Alba
for their loving patience
and
for inspiring me to never stop trying
to make the world a better place.

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Chapter 1

Together But Alone

Reconnecting in a Connected World

ARCHITECTURE THAT CONNECTS

There is a delicate poetry to life that everyone should experience--an inherent uplifting beauty that once encountered, calmly re-grounds us in the present with new awareness. Architecture can be a conduit to experience such poetry, where the complex is made simple and our connection to the world around us made explicit. We are increasingly consumed by our creations—technologies spawning technologies—that were designed to give us more time to be us, but instead have robbed us of us. To quote Albert Einstein, "It has become appallingly obvious that our technology has exceeded our humanity." We see ourselves as separate, as free entities without tether, but we are inextricably bound to each other and to this biosphere. Our connection to the world is not a luxury, but an unavoidable, necessary, and vital part of our existence. We are truly inter-subjective beings. Imagine now, for a moment, an existence where technology furthers our humanity. And imagine as well an architecture that merges with technology to create spaces that restore and elevate the human spirit—a place of knowledge, a place of understanding, and a place of genuine communication and deep connection that reawakens and delights the senses. This is an architecture for people in a digital world.

HUMAN-HUMAN CONNECTION

> "We are like islands in the sea, separate on the surface but connected in the deep."
>
> –William James

In 1951, Ruth Orkin took a photograph of a female tourist traveling alone in Italy. The work, called "American Girl in Italy," is one of the iconic images of the era (Figure 1.1). A young woman walks down a street in Florence, distressed and enfeebled by the playfully jeers from local men beguiled by her grace and beauty. I have spent hours, an alarming amount of time actually, staring and transfixed by the emotion that this image possesses. It has the power to trigger some latent desire in me to connect with others. I lose myself in the scene, studying every person, trying to understand them, especially the American girl. I empathize with her. I see the world through her eyes and feel what she feels. Alone, tired, intimidated, lost, overwhelmed. I cannot know exactly her experience, but what I am certain of is that I feel close to her and closer to her the longer I stare into her world.

< Figure 1.1
T.S., C, Amanda
Sunrise Between Poppies, 2017

And what about the men taunting her? Six years after one of the most destructive wars in history decimated the Italian economy, unemployment is common. The sense

of purpose is missing. The opportunity to contribute in a clear, meaningful way feels non-existent. Bored, frustrated, unchallenged, competitive, worried, and maybe angry, men are idle. This is their life. And despite the boundaries of time, culture, and geography, I feel like I understand these men on some level. I feel connection, however faint. Such is the human capacity to bridge obstacles and differences to find commonality—an ability simply sparked by a well-composed two-dimensional image.

< Figure 1.2
Orkin, Ruth
American Girl in Italy, 1951

But an image is not prerequisite to connection, nor is it necessarily the most effective means. Narrative and story can be even more powerful. Good storytellers and writers stimulate imagination by focusing on the psychology of characters and their relationships. Similar to real-life, characters are incomplete. Understanding requires that we interpret intentions and motivations and fill in gaps. Good literary fiction will not only simulate social experience, it is social experience. The bond we feel with these characters is as genuine as the bond we feel in the real world.

When Karen and her baby are found embracing one another, frozen to death, at the end of Amalie Skram's short story, *Karens Jul*, the empathy and connection I felt for this mother was distinctly palpable. Skram, in only four pages, dramatically portrays a wretched young girl, orphaned, homeless, and unemployed, who after being sexually assaulted, gives birth to a baby girl. Under a frigid Norwegian winter sky, Karen struggles to keep warm and feed her baby in a tiny, derelict, unheated shack at the city harbor. Society shows her no warmth. They have more important concerns. She is an inconvenience whose death is of little consequence to them. Skram's descriptions fill me with compassion for Karen and anger toward the apathy of those with the power to help her. I feel like I know Karen. I feel the desire to reach through the page to help her—to correct this injustice. Good literature has this power—by exploiting our need to connect to others—to arouse the same brand of intense empathy and connection usually restricted to physical space.

If an image is animated and merged with story, as it is in film, the ability to connect even deeper and more easily is possible. Some of the ambiguity that exists in the photograph fades away in film, affording us a more complete understanding. Good

film taps into more senses and leverages plot and cinematic drama to intensify emotion. In film we see behavior and intent. We hear nuance and degree. We feel mood. At the intersection of story, composition, sequence, timing, and score, we experience connection by momentarily transcending our own realities, sometimes to the point of disorientation. At this point, we are open, uninhibited, and intently focused.

In 2013 I saw the film "Gravity," a story about two people stranded in orbit, tethered to one another, after their shuttle was destroyed. Both characters have felt real loss in life, the type of disconnection that the metaphor of being uncontrollably adrift in the void of space perfectly described. But they have each other. And beyond the connection the tether provides them, they are connected by experience, the Earth below, and a desire to live. The true achievement of this film, in my opinion, is its ability to highlight to crescendo our connection to each other, our planet, and life itself. Even the title of the film, "Gravity," emphasizes our connection to the ground (or any object with mass). By the end of the film, dazed and weak from the harrowing ordeal in orbit, I felt thankful for my life, for having the protective beauty of Earth as my home, and for having others to share it with.

Paramount to the connective power of image, literature, and cinema, is real life, a fully immersive experience where all senses are affected. As social beings, we have evolved to communicate in physical space through face-to-face interactions. Our biology, over millennia, has been honed to receive the mass of information transmitted by those around us: the regard in the eyes, the expressions on the face, the movements and gestures of the body, the intonation of voice, and the syntax and vocabulary in speech. We pick up on these and other less obvious cues as well like ambient energy, scent, and hormones. When it comes to communication, it's hard to surpass the quality and quantity of information available to us in real space. Not only are we highly evolved for this type of interaction, the information we exchange is of vastly higher fidelity and more layered than any cultural or technological medium currently available. The only requirement is that we focus.

Inspired by the performative art piece by Marina Abramovic e Ulay at the MOMA in 2010, The Liberators International, an Australian organization interested in addressing the thread of isolation widespread in today's hyper-mediated society, devised an experiment to explore human communication and connection as a function of attention and proximity.

Figure 1.3 >
Eye-contact experiment.
Warsaw, Poland, 2017

The experiment, called "The Eye Contact Experiment," became immediately popular and was quickly replicated in numerous cities around the world. The concept is simple: two individuals volunteer to maintain eye contact with one another in close proximity for one minute. While the results vary by individual, in general, the emotions the experiment triggers are unexpected and overwhelming. Many feel immediately vulnerable, exposed, self-conscious, and mildly uncomfortable. However, within seconds, participants feel a peace descend over them, followed by a sense of understanding and compassion. Some will cry, some will laugh, and most will embrace afterward. While the majority of participants are strangers, close relations experience the same feelings. One couple who had been married for 50 years claimed to have seen something new in the other. One minute of eye contact can do this—a feedback loop of communication between two people focused on one another in physical space (The Liberators, "The Eye Contact Experiment").

New technology has allowed us to drift away from one another, or at the very least, it's given us an easy excuse to do so. While these technologies are relatively new, the affect they have on us may be long-lasting. For the youngest generation, this is the reality they know. Previously, few considered the value of the opportunity to learn to interact with others. Socialization, as it is called, was a given. There was no option to not interact. However, with the advent of the personal computer, Internet, smart phone, and social media, an increasing number of youth are completely socially illiterate. Some educators are noticing that the empathy and social IQ of teenagers nowadays is roughly on par of those of an eight-year-old (Turkle, "Stop Googling. Let's Talk."). Each year books are published and services developed to help teach the social-media generation how to socialize. And they are obsessed with image, editing and re-editing their online presence to perfection. But for some teens, enough is enough. In 2015, the 19-year-old Australian, Essena O'Neill, posted an emotional video after closing her Instagram account where she sobbed about the destructive effect social media has had on her life, robbing her of all her teenage years as she sat interacting with the world from behind a computer screen, editing and re-editing her digital profile in pursuit of perfection for more hits, likes, and subscribers (O'Neill, "Why I Really Am Quitting Social Media."). Similarly, Stina Sanders, a 24-year-old London model, fed up with society's insatiable obsession with image, posted a slew of unedited images depicting her less glamorous personal routines, from removing unwanted facial hair, to her challenges living with IBS and anxiety. The public responded in disgusting form by attacking her without sympathy. Sanders noted that she lost over half of her subscribers and was shocked by the wanton superficiality of social media (Sieczkowski, "Model Scares Off Thousands Of Followers With 'Real' Photos.").

The problem is not lack of connection, but the lack of empathy and understanding, a deeper form of connection then the ubiquitous type increasingly supplied to us by new technologies today. Humanity has taken (deep) connection for granted. Historically, connection has not been a luxury of which we could opt out. We are social beings, evolved to cooperate for survival. Connection was prerequisite for such survival. Nowadays, technology affords us the choice to connect or not. We have the option to edit our online presence, and by doing so, avoid all the inherent unpredictability and vulnerability of the real world. But vulnerability is feeling. It is what makes feeling possible. To feel is to be vulnerable. To avoid vulnerability is to avoid feeling. As Brene Brown writes, "to foreclose on our emotional life out of a fear that the costs will be too high is to walk away from the very thing that gives purpose and meaning to living. Vulnerability is the birthplace of love, belonging, joy, courage, empathy, accountability, and authenticity. If we want greater clarity in our purpose or deeper and more meaningful spiritual lives, vulnerability is the path" (Brown, "Vulnerability Is the Path.").

Figure 1.4 >
Aid-worker and child
Unknown, 2017

Menachem Mendel of Kotzk once said, "If I am I because you are you, and if you are you because I am I, then I am not I, and you are not you" (Berkowitz and Laurence, 46). We are not separate. I cannot be explained without you, just as day cannot be explained without night. Existence is a function of relationship where we define each other, and as such, we are inextricably bound and interdependent. We are all connected. We are much more alike than we are different.

How often have I found myself unwillingly pulled into conversation with a stranger only to discover after a few minutes how much I had in common with this individual and how much I enjoyed getting to know the person that I initially avoided. How not strange strangers are! Understanding our innate connection to one another is the foundation for love, empathy, and our incessant pursuit for communion.

HUMAN-NATURE CONNECTION

> "Every child is born a naturalist. His eyes are, by nature, open to the glories of the stars, the beauty of the flowers, and the mystery of life."
> –Ritu Ghatourey

The despondency we feel nowadays might not solely result from our waning connection to one another. We are also losing connection to the world around us. With rapid urbanization, many kids are growing up completely without nature. To make matters worse, children are practically taught to fear nature. Their unfamiliarity and fear of nature lead to apathy, under appreciation, lack of respect, and the inevitable devaluing of arguably the most fundamental aspect of our existence.

Nature touches us in small but important ways, even in places where it seems non-existent. Has a ray of sunlight ever caught you in the eye from through the windows?

There are some days where I get so distracted with trivial affairs that the gift of a beautiful day goes tragically unnoticed by me…almost unnoticed that is. At some point, between this and that, I have a moment of clarity: I have not yet left the house! Evening has arrived and the sun is low—low enough for a glimmer of sunlight to pierce directly through the windows, even with the blinds drawn, determined to find its way through some impossible gap as if to remind me to look up: "Hey stranger, remember me?" I stand there for a moment, squinting, letting the shimmer of sunlight hit me in the eyes, enjoying the serenity of the moment. All concern for what I was working on is replaced by a faint twinge of sadness at the loss of a such a unique gift as this beautiful day—gone forever.

Some nights it is the moon that wants my attention. Transmitted through the thin diaphanous fabric draped over the windows, this astral light steals its way into the bedroom, striking the sheets, the pillow, my face. I slowly open my eyes to the sky and stare…and the moon stares back. The brashness of urbanity comes to mind. Such a contrast to the placid heavens. I contemplate the illogic of the fuss of society. Why all the commotion? The moon has it right. It is content to just exist in the silence of space, shining brightly. These experiences make me feel something more profound than what I typically feel. I witness the something that is greater than us of which we are a very small part but seem to often forget. At that moment, I feel deeply connected to the world around me. These experiences are for everyone, abundant, not for sale, customized to the individual, available. The moon reminds me to relish in nature's grace.

Similar feelings are evoked when I step outside for the first time after several hours. The initial breath of air stops me. Such a contrast from inside. The air is often cooler and laden with the scent of rosemary in the garden or the low tide of the sea nearby. I think, "Why have I been inside all day? What could have been so important?" If I'm not hurried, I like to take a moment to enjoy the experience. To breath in as much fresh air as I can. To hear raindrops bouncing off the leaves and into puddles. To listen to the wind blowing through the canopies of tall evergreens. To see mist blowing across the variegated landscape. I at once feel enmeshed in nature as I breathe, witness, taste, feel, and consume the world.

< Figure 1.5
Mist
Unknown, 2017

Ten years ago I embarked on a road trip from Seattle to Fairbanks with my wife and close friend. Our original plan was to only go to Vancouver Island for a weekend kayak excursion, but we impulsively changed plans a few hours into the trip and set a new course. We were not well-prepared. It was October and we were travelling in a soft-top Jeep Wrangler. While this seemed like a non-issue initially, the further north we travelled, the colder it became. We coped with conditions and made the best of them and, as a result, got to experience the breadth of nature first hand with no separation between us and the natural world. One evening was beyond description. At the border between British Columbia and the Yukon Territory we stopped at a hot spring. The days were short so it was already dark when we arrived, but nightfall hardly mattered, for above our heads was one of the brightest undulating blue-green displays of the northern lights I had ever seen. On a wooden boardwalk, we traversed the snow-covered landscape that glowed softly under the vibrant sky. As we approached the springs, the snow receded and a warm mist slowly rose from the reeds like some prehistoric swamp in a lost world. A few minutes later we were submersed to our chins in water that fluctuated from lukewarm to uncomfortably hot. The evening was still—broken only by the occasional howl and hoot from an animal in the surrounding woods. The aurora borealis continued to paint the sky above with colors so vivid that they reflected off the surface of the misting water.

It is rare that I feel as close to nature as I did that night. I was present in the now, in balance and at peace with simply existing. Rooted. No pressing agendas or questions—only clarity. Like a wave is to the ocean, I felt part of nature, not separate from it. The cosmic dust that drifted across the heavens above me I knew was the same dust from which I was created. We are the universe and the universe is us—a world we came out of not into. Our skin is the bridge between these two worlds. And just as we do not know how to run our thyroid gland, nor do we know how to shine the sun. It simply is. We are the universe's means to know itself, to be self-conscious, to be cognitive.

It is these moments of clarity that, by contrast, highlight the discrepancy we feel. Something is missing, or at least not complete. The connection that we know is there and that we rely on for meaning is faint, too faint. We feel adrift. It is easy to blame our new technologies. After all, life was simpler and maybe better before these technologies arrived, right? Maybe. Nevertheless, this might be a moot point since new technology seems only to be responding to an inherent compulsion within us: our need to network. Our uptake of new technology was a pretty easy sell. Almost too easy. Humanity—all cultures, all strata, all ages—are enamored with the connectivity and the easy access to information that new technology provides. We need to understand our drive to network before we condemn new technology. We need to work with our natural inclinations rather than against them. We need to take advantage of new technology to better connect us to each other and better connect us to nature.

A NEW DIRECTION

> "It's the sense of touch. Any real city, you walk, you know? You brush past people. People bump into you. In L.A., nobody touches you. We're always behind metal and glass. I think we miss the touch so much that we crash into each other just to feel something."
>
> –Graham Waters (*Haggis et al.*)

Why is connection so important to us? Why do we crave, or more accurately, need connection? Is there a biological imperative? Much of the research conducted on the subject would suggest so. Connection is fundamental to our survival, both physically and mentally. As one Zulu proverb put it, "Umuntu ngumuntu ngabantu," literally, "a person is a person because of other people." The human species evolved to operate collectively, in small family groups, to pool resources and provide adequate safety for one another, a strategy that increased the chances of survival of us separately as individuals. This group mentality is hard-wired into our psyche and can be seen when you examine the practice of solitary confinement as a form of rehabilitative punishment among incarcerated offenders. While solitary confinement as a rehabilitation tool was initially well-intended, the reality of the punishment is very destructive. According to Terry Kupers, a psychiatrist at the Wright Institute and a prominent critic of solitary confinement, "understanding why isolation is so damaging is complicated, but can be distilled to basic human needs for social interaction and sensory stimulation, along with a lack of the social reinforcement that prevents everyday concerns from snowballing into psychoses" (qtd. in Keim, "The Horrible Psychology of Solitary Confinement."). We are social creatures. Without another person to relate to, our mind decays and atrophies. In the absence of social stimuli, we forget how to be social and become hypersensitive to any contact.

< Figure 1.6
Isolation
Unknown, 2015

Yet there may be a grander explanation for our need to connect—something we might call the cosmic imperative. The cosmic imperative stems from the idea of emergence and the universal pursuit of self-awareness through higher degrees of organization of material systems and energy flows. Simply put, the more high-tech we as species become, the more empathy and nature we need to preserve balance. As we continue to network into more complex systems, we need a proportionate increase in empathy and nature to balance the increase in technology. Maintaining this balance is essential for further technological progress. Nature provides the grounding we need by reminding us of who we are and where we came from while nourishing our bodies and minds. Empathy is the binder that holds us together on a socio-emotional level, because while technology may permit us to communicate across space and time (a technical task), it does not help us care about why we should do so in the first place (an emotional task).

Understanding our obsession with technology is another matter. Similar to connection, at the level of our biology, there is an evolutionary driver. We are tool makers by necessity. Over the millennia, we have evolved to make and use tools for survival. It is who we are, part of our humanity. If we imagine a world where all technology is taken from us—everything from blades to language, and we are not allowed to create any new technologies—we would not live for very long. For better or worse, we are completely and utterly dependent on technology for survival.

At the cosmic level, the end-goal is still the same: emergent self-awareness through increasingly higher degrees of order; however the rationale for how this is achieved is admittedly more unconventional and complex and leans on concepts from information theory, biology, memetics, and metaphysics. In essence, the simplified notion is that information, in addition to energy, matter, entropy, time, etcetera, is one of the fundamental aspects of subjective reality. Information is non-physical in the sense that it does not exist unless perceived and understood/assigned meaning by a perceiver. It is important to note that a perceiver does not need to be conscious or even living—inanimate objects too are capable of perceiving and assigning meaning to information, just not according to conscious free will. Inanimate objects respond to information according to the parameters of physical laws like those of thermodynamics and gravity, while humans, in addition to adhering to the physical laws, will maximize information by storing, retrieving and manipulating it to achieve a chosen outcome, otherwise known as knowledge. Furthermore, this process of perception + meaning = information spawns ideas that aggregate into coded packets of ideas in our minds. Richard Dawkins, a British ethologist and evolutionary biologist, refers to these packets of ideas as memes. Dawkins proposes that memes operate by Charles Darwin's Theory of Evolution by Natural Selection that was advanced in 1859 to explain the diversity of living organisms. According to Dawkins' logic, the meme is born the moment that one contemplates it. At this point, the meme can be spread through communication, mutated and adapted by the individual to higher levels of complexity, diversity, and specialization. The "fittest" memes attract more attention and thereby best promote their reproduction and survival. If we go one step further, we can deduce that technology is the physical manifestation of thousands of memes collectively used to create tools to construct better technological scaffolds to transcend human physical, connectivity, productivity and cognitive limitations. Kevin Kelly, author of the book *What Technology Wants*, proposes that technology, due to evolutionary attributes and behaviors, deserves its own taxonomic kingdom beside those of plants, animals, fungi, etcetera. Kelly calls this kingdom Technium. He contends that technology has roots as far back as the Big Bang and is arguably the most powerful force on the planet, possessing the power to alter the course of one person to that of the entire global climate. What technology wants, according to Kelly,

is progress. And as the quantity of species of technological artifacts surrounding us increases, we seem to have little say in the matter. "Technology is stitching together all the minds of the living, wrapping the planet in a vibrating cloak of electronic nerves. How can this not stir the organ in us that is sensitive to something larger than ourselves?" (Kelly, 358)

Technology and humanity are inextricably bound. We cannot abstain from technology any easier than we can abstain from breathing. We are similarly bound to nature and to one another. If we are to solve this problem and restore well-being, which we must, it has to be through technology. It is said that there are no bad technologies, only good technologies with bad jobs. We need to repurpose our new technologies to serve us better—to support our biological needs not eschew them.

How might this be done? Perhaps our best tool for connecting deeply with others is empathy: "the ability to share someone else's feelings" by projecting one's subjective state into another's objective reality (empathy, n.p.). While first-hand experience might seem like the ideal method to know what it is like to walk in someone else's shoes, this method is limited by the practical boundaries of time (limited to the present moment) and proximity (limited to space that can be reasonably accessed). Additionally, first-hand experience is often not possible without changing the nature of the event, as the mere presence of an observer affects the event itself. Of course these limitations do not preclude all opportunity for empathy through first-hand experience; any type of social interaction in physical space is an opportunity for empathy and can be intensified so long as one fosters a genuine curiosity for others, actively listens, challenges existing prejudices and stereotypes, and accepts vulnerability in order to share one's own thoughts and feelings.

< Figure 1.7
The power of story
Unknown, 2017

A better method for cultivating empathy, which might be surprising, is narrative. Imagine: It is cold, very cold, the type of raw bitterness that leaves you wondering why anyone climbs. Your face, the only exposed part of your body, is taking the brunt of the searing 50 mile-an-hour headwind that threatens to destabilize you from the narrow path. Your lips are chapped and cracking. You are near hypothermic.

But not for much longer.

Ahead you see a hollow on the leeward side of the ridgeline. Excitement and anticipation quicken your steps.

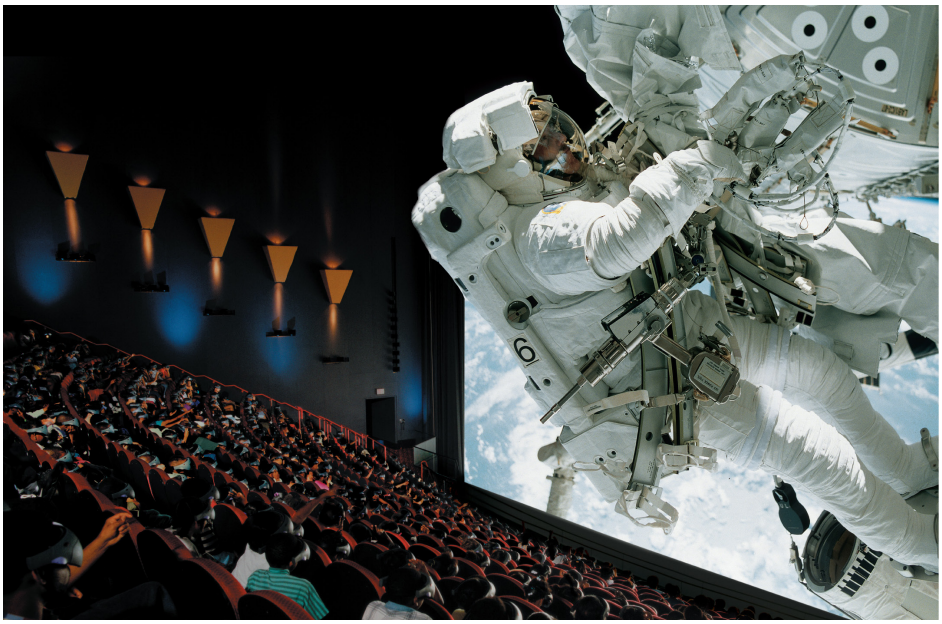
You slide down into the snowy recess and immediately the world is quieter. You feel your body warming slightly now that the piercing wind is not bearing down on you. You tug on your jacket's zippers and check that the draw string on your hood is pulled tight. You curl your body close and notice the heat of your exhaled breath waft across your face. The uncontrollable shivering that had almost overtaken you calms then ceases. Peace.

But like many good things, your contentment is only temporary. Through the fog of airborne snow and ice, you notice a form, small and barely perceptible in the distance heading away from you. A person! The individual is clearly disoriented and in poor shape, arm crooked in front of their face to block the wind. They stumble then fall. No movement. This person needs help.

You consider mobilizing to drag them to cover but suddenly you notice a sharp pain radiating from the tips of your nearly frostbitten fingers and toes as they begin to regain a little feeling. The wind howls above, raking the ridge raw. You are relieved it's not you up there. You justify your decision. What matters is that you're safe.

Compelling stories—those with artful narrative and characters with depth and ambiguity—captivate a reader and enable them to see the consequences of actions through the choices of characters. If the story follows a dramatic arc structure where something new and surprising is beset with tension and difficulties that the characters must overcome, often stemming from past personal crises, and then culminates to a climatic peak where the characters must dig deep to surmount, and if successful, metamorphose and find resolution—this story structure has been shown to efficiently stimulate the areas of our brain that control empathy by triggering the release of cortisol, a hormone responsible for attention and focus, and oxytocin, a hormone responsible for feelings of care, compassion and empathy (Zak, "Why Your Brain Loves Good Storytelling."). In fact, for the brain, great stories can be indistinguishable from reality, a type of hyper-reality imbued with hyperbolized personal meaning derived deep within the imagination that delivers an identical psychosomatic effect. This happens, in part, by way of a process known as deictic shift, whereby a reader identifies with the contextual position of the character or narrator designated by the pronouns and adverbs employed which evoke a sense of immersion for the reader in the conceptual world of the story. "Deictic shift theory proposes that readers conceptually project to the contextual locus of the speaker of deictic cues in order to comprehend them" (Duchan, 384).

It is important to note that prerequisite to all of this is attention. "A story must first sustain attention—a scarce resource in the brain—by developing tension during the narrative. If the story is able to create that tension, then it is likely that attentive viewers/listeners will come to share the emotions of the characters in it, and after it ends, likely to continue mimicking the feelings and behaviors of those characters" (Zak, "Why Your Brain Loves Good Storytelling.").



< Figure 1.8
Immersive cinema
Unknown, 2013

Arguably the best contemporary technology we have for capturing and managing attention through storytelling is the cinema. The cinema is the modern shrine to immersion. Good cinema transports you elsewhere. It dissolves one's sense of self, arrests the perception of time, and re-contextualizes the viewer into the story. As Jason Silva explained in his short film, *Attention: The Immersive Power of Cinema*, "Cinema reflects mankind's historical drive to manifest his consciousness outside of his mind in front of his eyes" (Silva). Our inherent desire to transcend everyday experience is what attracts us to cinema. But while cinema successfully immerses a viewer in a narrative, it falls short at doing so in a collective manner. Sure, the audience is made aware of itself through shared emotional expression like laughter, screams, boos, hisses, etcetera—expressions that do little to communicate new information (the fact that something is funny is usually individually obvious), but rather serve to transform an initially private reality into a shared, "entre nous" reality—yet beyond this awareness, little deeper bond is created.

We can do better than this. We can evolve the immersive, transcendent power of modern cinema to include more profound shared experience, collective empathy, and universal enlightenment. This will require a new, or at least a fundamentally reshaped typology of architecture. In this hyper-mediated era of ubiquitous computing and big data, information, education and entertainment are merging. Our insatiable thirst for information has driven innovations to accelerate and simplify access, which in turn has spawned a culture of immediate gratification. Because of this, we consume most information through personal devices, near instantly and often separately. This trend isolates us and runs counter to our fundamental need for community. Ironically, the consumption of information has historically been a communal activity. One institution alone in society has maintained the responsibility over the centuries to collect and preserve the cultural record and to facilitate free access to this information for all: the library. Despite the destabilizing effect of the Internet and the digital age on the library institution, our biological need for communion with one another in real space is ushering in new directions and exciting possibilities for the traditional library. Caitlin Moran, a British journalist writing for *The Times* in London, once described the community library as "a cross between an emergency exit, a life-raft and a festival. They are cathedrals of the mind; hospitals of the soul; theme parks of the imagination.

On a cold rainy island, they are the only sheltered public spaces where you are not a consumer, but a citizen instead" (Moran, "Libraries: Cathedrals of Our Souls.").

The potential of the library to again be the figurative, literal, and revered center of the community in the present-day information age is largely unrealized. New technologies, new perspectives, and new methods of organization are now the virtual seedbed for a novel typology of library to develop—one that is not only a cultural repository, but an access node, education and experience center, collaboration and performance forum and maker space. These services could be further augmented by merging the real and virtual worlds into a hybrid reality where a visitor could collectively experience full sensorial immersion into library content and events across space and time to viscerally live the past, present, and future from any perspective. This idea is not as far-fetched as it may seem. Much of the technology to make it a reality already exists. For the library-goer, a piece of wearable technology would be all that is required. This might be a necklace, bracelet, watch, or an electronic tattoo. The wearable device would interface directly with the individual's sensory system through the skin giving the library-goer the most natural, intuitive, and least technologically-intrusive interaction possible. All senses could be directly activated by the story creating an experience that is perceptually indistinguishable from reality—an alternate reality.

Figure 1.9 >
Entering virtual reality
Unknown, 2015

As Seth Godin explains in his book, *Tribes: We Need You to Lead Us*, "people still crave a place where they belong, where they feel accepted and welcome, a place where they meet people with similar interests. They seek a place where they are noticed and where they are missed if they are absent" (qtd. in Lushington, 16). The library can be such a place by offering visitors a sense of connection and community. By expanding this notion beyond the physical walls of the library into the digital landscape, the library becomes the world's library and the community is all peoples.

Chapter 2

Theoretical Framework

Understanding Our Need To Connect

CONNECTED BUT DISCONNECTED

We live in a connected world but feel disconnected. We feel separated from each other and separated from nature. We blame technology. Much has been written recently on the topic of connection in the digital age, and many have proposed reasons for our growing detachment from the world. In this chapter we will look at the works of three authors who discuss the idea of connection in contemporary society. As they will suggest, the feeling of genuine, deep connection derives from a variety of factors. It is possible, for example, that our relationship to technology, rather than technology itself, is responsible for why we feel disconnected. If this is true, we should ask ourselves: can a human-centered relationship with intelligent technology deepen our connection to one another and to nature?

There are good reasons to think that such a relationship is possible. The digital age is young and as a result, the virtual interactions that we engage in daily are undeveloped. These interactions pass as communication but lack the clarity and depth of real, physical interactions. As a species, we have evolved to communicate on multiple levels, verbally and non-verbally, using all senses (Mehrabian). We want connection, but the connection we desire requires clear, multifaceted communication. Technology, at least the way we currently use it, is primarily one-dimensional, failing to employ the full spectrum of human perception. If technology could improve to the point where multi-sensorial communication could happen, would we still feel as disconnected?

We may not even have a choice. We are infatuated by technology. We are a species of tool makers. It is one primary hallmark of being human. Throughout history, we have used these tools to overcome limitations, but we are entering a new era—an era where we surpass all previous limitations, and in so doing, drastically change our humanity. The evidence is mounting that new technology is significantly altering our relationships. We are weak to resist technology's seductive appeal and consequently, should take caution and think critically about this new relationship. While limiting our interactions with technology might be one solution, it runs counter to our evolutionary instinct to use tools. We should work with our predispositions, not against them.

ALONE TOGETHER (Sherry Turkle, 2011)

Technology promises to do many things, not the least of which is helping us to stay in touch. But as Sherry Turkle points out in her book *Alone Together*, technology's promise has a downside: the technologies that are keeping us in touch are also changing how we connect and relate to one another. It is our growing dependence on technology, she proposes, that is fundamentally altering our relationships. While *Alone Together* is accurately a sociological-psychological exploration of disconnection as it correlates

< Figure 2.1

Connected but disconnected
Unknown, 2017

to modern day technological advancements, it is also an informative commentary by one author of what it means to be connected to one another.

As an emotional state with varying degrees of intensity, connection is an elusive, subjective concept. The type of connection referred to in modern parlance is frequently shallow, superficial, and fleeting. Actually, the interactions many of us have on a daily basis barely meet the definition of communication, let alone connection. "We have invented ways of being with people that turn them into something close to objects," Turkle writes (Turkle, 168). Our interactions are more often forms of unabashed self-promotion aimed at maximizing exposure than real attempts to connect. However, as Turkle explains, genuine connection derives from a different source. Genuine connection requires a mental presence, proximity, healthy individualism, and a willingness to brave the messiness of human relationships. It is a state of intimacy between people that she contends is rarely experienced nowadays and increasingly difficult to realize due to the incessant distraction and seduction of technology. As we continue to surround ourselves with technology, Turkle fears we will lose the ability to connect to others in the meaningful way we've evolved to know.

One of the most disturbing aspects to electronic interactions, according to Turkle, is how banal and inhibited they've become. Very little emotional investment is or can be made in this sort of abbreviated, reductive type of communication. We are both limited by our unwillingness to devote time to an exchange and by the communication device itself. We employ typographic symbols, emoticons, and chat acronyms to connote emotion rather than express it. "We aren't happy anymore, we're a semicolon followed by a parenthesis," Turkle writes (Turkle, 233). One student, she describes, complains about the apologies received from friends online: "Saying you are sorry as your status . . . that is not an apology. That is saying 'I'm sorry' to Facebook" (Turkle, 233).

< Figure 2.2

Together but alone
Unknown, 2017

Yet, strangely, we routinely settle for such low-quality relationships and interactions. Why? Turkle offers up a variety of explanations; namely, our growing fear of intimacy. She proposes that our repeated preference for the ease of technology over the challenges of real life is making us emotionally illiterate.

To exacerbate matters, Turkle observes that for all the benefits of recent technological advances, we are increasingly left unable to concentrate. The creation of the Internet—and with it the possibility of having a second, online life—undoubtedly brings new possibilities and freedoms. But for Turkle, the multi-tasking required to maintain multiple identities leaves us incapable of giving the real world our full attention, an obvious obstacle to deep connection with others. Furthermore, the speed at which things can be had makes us addicts of immediate gratification—personalities "so fragile that we need constant support," which leads to a host of "symptoms born of isolation and abandonment" (Turkle, 177).

But perhaps most inhibiting to genuine connection with others is our unwillingness to invest ourselves into relationships—the unwillingness to expend the required effort to develop a meaningful connection. Technology is an easy alternative to the imperfections of human relationships. In the dawn of the robot era Turkle notices that we are looking to robots as risk-free substitutes for the demands of dealing with others. "But when one becomes accustomed to 'companionship' without demands, life with people may seem overwhelming" (Turkle, 66). And it makes sense. Robots respond well to our instinctual need to connect while only requiring a power outlet. However, Turkle believes that by demanding these acts of intimacy from sociable robots we demand less from each other. Rather than try to reconnect and repair the strained relationship with her son, Turkle writes, Miriam, an elderly woman living in a nursing home, copes with her depression by comforting Paro, a robot seal. While this may temporarily alleviate some of Miriam's pain, what Miriam truly desires is connection with her son. During these moments with her Paro, Miriam shares herself with a machine, a depth of emotion neither understood nor reciprocated by the seal. Miriam is ostensibly consoled but this does nothing to amend the poor relationship with her son. Turkle rightly fears that we may further withdraw from the real in favor of the virtual and/or artificial. "We are at the point of seeing digital objects as both creatures and machines" (Turkle, p. 46). Not surprisingly, this scenario opens us up to new emotional vulnerabilities.

Figure 2.3 >
Hugvie, robotic companion
Unknown, 2012

Despite the benefits of connection, having time to be solitary and self-reflect is essential. Yet the tether between people and technology is difficult to sever, even for a moment. We have an unyielding, anxiety-provoking fear of separation from our devices and from one another. We maintain constant contact, albeit preferring quantity of interactions over quality of interactions, but what we don't realize, as Turkle aptly points out, is that separation from the familiar leads to a diversity of new experiences requisite to healthy development. Turkle describes her daughter, Rebecca, who studies in Paris. She and Rebecca communicate daily and it is Rebecca's constant connection to what is familiar that worries Turkle. Might Rebecca be missing out on new experiences by not venturing beyond her sphere of comfort? "Feeling a bit stranded used to be considered a part of adolescence, and one that developed inner resources. Now it is something that the network makes it possible to bypass" (Turkle, 243). Do we fear being alone? "…many find that, trained by the Net, they cannot find solitude even at a lake or beach or on a hike. Stillness makes them anxious." (Turkle, 289) Have we forgotten how to be alone? In the end, it might be our inability to be alone that makes us most lonely.

In *Alone Together*, Turkle does a good job outlining the nature of our increasing disconnection with each other as it correlates to advancing technology. While at first glance one could mistakenly misunderstand her message as anti-technology, she is clear to not advocate that we stop using technology. Instead, Turkle urges us to question our unswerving devotion to technology—our technophilia—to question the underlying belief by society that technology will solve all problems. To further Turkle's commentary, we should ask ourselves the question: can we leverage our love of technology to facilitate and enrich both genuine human connection and connection to the natural world? Turkle's proposal to periodically put technology down is commonsense and deceptively simple as it fails to consider the gravity and magnitude of our predisposition as a species to technophilia. We seem incapable of escaping technology's seductive appeal no matter what the circumstance. And Turkle, as a clinician, understands the therapeutic potential, of genuine human connection. We must bridge the divide between these two aspects by challenging technology to go beyond simply linking us. Perhaps technology might aid us to slow down, come together, and connect deeply.

SOCIAL (Matthew Lieberman, 2013)

In his book *Social: Why Our Brains Are Wired to Connect*, Matthew Lieberman offers an alternate perspective on connection, one based in biology rather than psychology. Lieberman believes that we are innately social animals. Our brains are wired this way, built to tune to the social world and contemplate one's place within it. For Lieberman, being connected isn't something we have a choice about. We are social animals and have evolved to be so. Contrasted to Turkle's opinion of how connection works, connection for Lieberman happens via more passive means. One simply must be aware of the other, nearby or afar, acquainted or not, and connection will develop. We connect by instinct through a variety of cues. If in close proximity, these cues are often non-verbal: body language, symbols of status, etc. If the individuals are separated, knowing context is enough—our brains reach out and connect through empathy.

For Lieberman, connection is a cognitive phase change in response to the other. Sensory input stimulates neurons enabling connection. We witness the other, assimilate and assign meaning, relate, and then connect. Interestingly, Lieberman's research suggests that the default state in our brains is to connect. When our minds are idle

and not mentally engaged in any specific task, an area Lieberman refers to as the 'social cognition network' activates. "This network comes on like a reflex," he writes, and it directs us "to think about other people's minds—their thoughts, feelings and goals. . . It promotes understanding and empathy, cooperation and consideration" (Lieberman, 19).

For both authors, connection is an imperative. "The social motivation for connection is present in all of us from infancy. It is a pressing need, with a capital N" (Lieberman, 99). "Everything we have learned about the social brain tells us that we are wired to make and keep social connections," he writes, "we feel pain when these connections are threatened, and that our identity, our sense of self, is intimately tied up with the groups we are a part of" (Lieberman, 248).

Figure 2.4 >
Left out
Unknown, 2014

So essential is our need to connect, that when others exclude us, our brain responds in the same way it does to physical pain. Lieberman writes about one study he conducted where participants monitored by MRI scanners played a digital game of catch called Cyberball. At some point in the game, and without warning or explanation, one of the participants (the study participant) is ignored by the other participants (the mock participants). The ball is no longer thrown to this individual. Despite the relative unimportance of the game, surprisingly, the excluded participant is clearly disturbed, first attempting to shrug off exclusion, but then complaining about the upsetting experience later. "Looking at scans from two studies side by side, Lieberman says, "without knowing which was an analysis of physical pain and which was an analysis of social pain, you wouldn't have been able to tell the difference" (Lieberman, 59).

But our drive to connect with others, especially friends and family, eclipses self-interest. As we push to satisfy our own natural curiosities about others—to know the thoughts, beliefs, feelings of others by inference—we develop genuine concern for their welfare and well-being. Empathy. "We give to others for many reasons, but one reason is that we are wired to feel empathy and compassion for the plight of others. When we see others in need, at least some of the time we think, 'Something must be done.' Apparently this kind of compassion happens often. In the United States alone, we give an average of $300 billion a year to charities worldwide" (Lieberman, 25).

Despite the inherent beauty in our need be with one another, Lieberman acknowledges there are downsides to our biological inclination to connect; namely, connection lacks a moral compass. It is, by nature, an amoral emotional state of being. The mirror neurons in our brains responsible for empathy do not possess the capacity to determine good and bad. Our instinct to connect can lead us to form unhealthy one-way relationships and destructive addictions. It induces us, as Turkle pointed out, to connect with machines or robots that have yet no capacity to comprehend the full spectrum of human emotion or the arc of human life, let alone reciprocate or relate to it.

Its hard to imagine how the instinctual urge to connect can be a liability to our well-being, but we live in a rapidly-paced era that threatens to destabilize the biological essence of what it means to be human. Turkle wrote extensively about these notions, and Lieberman similarly touches upon them when he writes: "We have limited time, and spending more time working means less time socializing. In 1965, only 45 percent of college freshmen listed being 'very well-off financially' as top of life goal. At that point, 'helping others' and 'raising a family' scored higher. But by 1989, being well-off was at the top of the list, with 75 percent endorsing it. And this is sobering news because the more individuals endorse materialism as a positive life value, the less happy they are with their lives" (Lieberman, 250).

To be innately hard-wired to connect in a society that seems to revel in individual achievement, material wealth, and solitude is a destructive recipe. We are denying ourselves the fundamental need to connect, pursuing it indirectly through recognition of professional achievement and status. "For thousands of years, we lived in small communities where we knew our neighbors and everyone around us because the communities were highly stable. Something has changed dramatically in the last century, something that is making us less happy than we used to be—less happy than we could be" (Lieberman, 248). And so we work, produce, and consume, leaving little time for anything else.

Lieberman builds a strong argument based in cognitive science and empirics to explain our innate urge to connect as a species. Since Lieberman's argument is strongly founded on our genetic nature and its evolutionary underpinnings, it is logical to wonder if we can evolve away from the need to connect? If we ignore these fundamental biological impulses for long enough, will they eventually recede and vanish? Can we actually evolve away from our need to connect? Lieberman gives no consideration to this question in his book.

Additionally, Lieberman does not discuss or even acknowledge the impact of socialization on our need to connect—the "nurture" side of the nature versus nurture debate. Does any portion of our need to connect stem from socialization during upbringing?

Finally, and possibly most relevant to this thesis, is the obvious question: why do we routinely opt for the shallowness of virtual connection over more profound connection in real life? Why do we love technology so? Could our fears of intimacy and our resistance to the demands and messiness of real-time relationships as Turkle writes trump the biological hard-wiring to connect that Lieberman describes?

LAST CHILD IN THE WOODS & NATURE PRINCIPLE (Richard Louv, 2005 & 2013)

In contrast to the previous two works that focused on the connection between one person and another, Richard Louv, author of *The Last Child in the Woods* and *The Nature Principle*, writes about the connection between people and nature. At the heart of Louv's commentary is the premise that we as a society are living in a de-natured environment. Despite our innate predisposition for nature, Louv suggests that our growing lack of familiarity with nature—the unknown—is causing us to fear it. People fear what they don't understand. While the ill-effects of such an unfounded fear affect us all, they are most damaging to children who require regular interactions with the natural environment for proper cognitive development. Several factors have contributed to weakening our connection to nature Louv asserts, but the most notable are irrational fears and technological distractions. The physical, emotional, and cognitive effects that we experience from this disconnect Louv calls the "nature deficit disorder."

Figure 2.5 >
Children in a field of Marigold
Panskura, India, 2017

We all intuitively feel our connection to nature. It is biological, primal, spiritual. It is threaded into our very humanity as part of our collective unconscious with evolutionary origins. We look to nature for nourishment, protection, survival. "As humans, we identify ourselves primarily through relationship—relationship with family, religion, ethnicity, community, town, state, nation." (Harwell and Reynolds qtd. in *The Nature Principle*, 104). Louv, in his book *The Nature Principle*, calls to attention the relationship we have with nature. "It is among the most important and least recognized needs of the human soul," he writes (*The Nature Principle*, 104). This connection is universal. It transcends cultures, geographies, eras. It is one of the few aspects of life, sports is another, that naturally draws people together, regardless of who, on a fundamental level, catalyzing communication and understanding. We recognize without explanation that we are nature and that nature is us. And it is this fundamental understanding of connection that underpins stewardship. "We can truly care for nature and ourselves only if we see ourselves and nature as inseparable, only if we love ourselves as part

of nature, only if we believe that human beings have a right to the gifts of nature, undestroyed" (*The Nature Principle*, 269). Our instinctual bond with nature is echoed in the writings of Lieberman in his book *Social* when he highlights the deep biological connection we have to one another as a species. Our connection to nature is as much a part of us as our connection to each other.

Unfortunately, as Louv describes repeatedly, our lack of familiarity with nature undermines this connection. "While most of us recognize where we live by its cities, buildings, places of business, even sport teams, how many of us identify with and understand the beauty, wonder, and actual functioning of the natural ecosystem which supports us, and of which we are a part?" (*The Nature Principle*, 104) For an increasing proportion of society, nature is little more than an abstraction. We live in conurbations teeming with human activity but nearly devoid of nature. For the nature that does exist, it exists in isolation, separated from a larger ecosystem, placed in artificial settings, dependent on maintenance, and objectified. Louv describes a world where we are detached from our source of food, water, and other essentials of everyday existence. Due to a poor understanding of our connection, or better our dependence, on the natural environment that supports us, we become ambivalent and apathetic to the fate of nature. Oddly, children raised in urban environments nowadays are likely to know more about penguins than the birds nested in their own backyard. How many opportunities do children living in cities get to explore nature unattended, to discover and stoke their natural curiosity? When was the last time they lay beneath the sky staring at moving clouds as the wind rustled the grass around them?

< Figure 2.6
Urban living
Unknown, 2017

The lack of familiarity breeds fear, fear that induces us to protect our kids from nature, keeping them close, and they, in turn, fill their day interacting with technology, logging more time indoors than out. This is similar in effect to the fear of intimacy that Turkle writes about in *Alone Together*. We settle for less. Prior to the 1990's, Louv writes, kids spent a lot of time outdoors climbing trees, building forts, and scavenging for bugs and wildlife in fields and ravines. Kids explored nature on a visceral level with all senses, seeing, smelling, tasting, hearing, and feeling the environment. Nowadays, according to Louv, the pervasive culture of fear robs children of these formative

events. A denatured life is a dehumanized life he remarks. "When the wind in the grass is no longer a part of the human spirit, a part of flesh and bone, man becomes, as it were, a kind of cosmic outlaw" (*The Nature Principle*, 23). Turkle talks of a similar trend in the way we communicate, where our relationships with one another, due to latent fears and technological distractions, have been reduced to mere tweets and texts.

By allowing nature to be pushed away, we deny ourselves a fundamental need. Louv's central idea in *The Nature Principle*, that reconnecting with the natural world is fundamental to human health, well-being, spirit, and survival, is not foreign. We feel that truth instinctually. The benefit that nature has on our health has been felt by all at some point. Naturally we should all be advocates of harnessing nature's restorative effects. "Exposure to natural environments, such as parks, enhances the ability to cope with and recover from stress and recover from illness and injury" (*The Nature Principle*, 48). Lieberman noticed a similar reaction when we are denied connection to one another—our brain reacts as if the body has been physically injured.

Nature not only revitalizes us, it bonds us. It is a social glue, Louv explains, that connects people. Nature relaxes us, calms our minds, and catalyzes healthy communication. Enjoyed together, nature fosters lasting relationships built on common experience and a shared sense of attachment. "Nature can be co-experienced by parent and child in ways that Chuck E. Cheese's just can't" (*The Nature Principle*, 144). Just as Turkle observed that quality time spent together strengthened human connection, the connection formed between people through nature is even more powerful.

Figure 2.7 >

Planting a tree
Unknown, 2017

Perhaps most jeopardized by our disconnect from the natural world are children. Louv worries that without vitamin "N" (for nature) as he calls it, kids will grow up suffering from a nature-deficit disorder manifest in a series of physical and mental health problems. Louv maintains that Nature has an enormous impact on not only children's intelligence, but also on their physical, psychological, and spiritual selves as well. Having grown up bankrupt of experience in the natural world, stewardship of natural places will decline as children cannot value and love what they cannot name. This is comparable to the trend of young people Turkle described who undervalue real-time social interaction and are increasingly disconnected and socially inept for

lack of face time with others in person. Developing and protecting children's familiarity and connection to nature is thus key according to Louv. Children of the technological era, the digital natives as they are called, must have the opportunity to experience the euphoric wonder and awe from connecting with nature. They must be given the creative liberty to experience nature on their own terms, to find, as Louv writes, freedom, fantasy, and privacy distant and separate from the adult world—to embrace the unfamiliar and pursue new experiences just as Turkle desires for her daughter Rebecca who is arguably too comfortably tethered to the familiar across the network while studying in Paris.

In *Alone Together* Turkle emphasized the importance of having time for self-reflection to know oneself. This is similarly important for children in nature who must be allowed the freedom to find solitude and foster a personal connection to the natural world. The concept of solitude—of being alone with the 'self'—is key to the development of creativity. Let nature be the creative well that children can draw inspiration from.

Connecting to nature can happen in small steps. Louv proposes that we drop the notion that we need to trek to a national park to experience and connect with nature. Nature surrounds us and should be taken in and enjoyed daily. It doesn't need to be a large undertaking. It can be as simple as venturing into the backyard or taking the kids on a walk around the block. His point is too simple: get out and start enjoying the incredible experience of being where you are. Turkle advocated for the same simple approach to connect with people: look up and meet those around you.

At the same time, we must balance our affinity for technology with our need for nature. "There's no denying the benefits of the Internet, but electronic immersion, without a force to balance it, creates the hole in the boat—draining out one's ability to pay attention, to think clearly, and to be productive and creative. The best antidote to negative electronic information immersion will be an increase in the amount of natural information we receive. The more high-tech we become, the more nature we need" (*The Nature Principle*, 24). Turkle proposed a similar balance when she asked us to remember that we decide how to keep technology busy, not the inverse. We decide when to live in the moment. For Louv, finding the appropriate balance of technology and nature experience will give rise to a hybrid mind of increased intelligence, creative thinking, and productivity. In this scenario, we use computers to compute and process data and nature to sharpen our capacity to learn, feel, and connect. "We could combine the "primitive" powers of our ancestors with the digital speed of our teenagers" (*The Nature Principle*, 38).

Louv is on the right track to note that the prescription for this new technological era needs to be a combination of natural and virtual experience. But Louv's proposal, like Turkle's is less a fusion of these two concepts than it sounds. We are co-evolving with our technologies. Indeed, it is a simpler analysis (and prescription) to isolate aspects for better understanding, but we must begin to look at technology and biology as more than interrelated, to look beyond the predestined marriage of two converging evolutionary trends, to look to the point where biology and technology are one in the same.

FROM THEORY TO APPLICATION

It is easy to forget how essential nature is to our well-being. We carry on daily amidst our creations, navigating an impressive technological expanse that offers us little

meaningful respite or nourishment. Because we are adaptable and because our built environments are slow to affect us, we loose sight of the fundamental importance of this restorative relationship with nature. Our cities are modern shrines to our technological prowess where our ability to dominate and master nature is celebrated. We see ourselves as separate from a nature that must be controlled—where mind is superior to body—but this is beginning to change. Increasingly we realize that the future of our species depends on our ability to return to a balanced coexistence with the natural world. Society is evolving toward a more holistic perspective.

Similarly, the essence of modern communication has highlighted our deeply hard-wired need to know and empathize with each other. New technologies have allowed us to share without really sharing, where exchanges too often are reduced to shallow, highly-edited transactions that prioritize efficiency, ease, and precise management of one's digital identity. These interactions have left many feeling lonely, disconnected, and mentally depleted, which has in turn stimulated a search to understand the root cause for these feelings (MacMillan, "Why Instagram…"). Society not only wants, it needs a more restorative social life.

In this section we will look at how these emerging trends are manifest and/or have the potential to be manifest in architecture. Can architecture using technology, or as technology itself, elevate human experience so that we are more connected to others and to the world around us? The answer is yes, but doing so requires a keen understanding of how we connect. The four case studies that follow have been selected for their unique ability to connect people to each other, to nature, or to both. For each case study, "connection" is evaluated via five questions intended to, by comparison, highlight the distinct ability of each project to connect.

HUMAN-HUMAN CONNECTION

Coca-Cola Small World Machines (Leo Burnett, 2013)

Lahore, Pakistan and New Delhi, India

In May of 2013, Coca-Cola installed two "Small World Machines," one in a mall in Lahore, Pakistan, and the other in New Delhi, India (Figure 2.8). These machines, resembling a traditional Coca-Cola vending machine, were the result of Coca-Cola's effort to promote authentic, tangible happiness, increase brand awareness, and create connection between two countries that have been at odds for more than sixty years. The concept, to create a real-time, natural, life-like connection between individuals in two different locations, was ambitious and required not only the development and creative use of technology, but also an accurate understanding of the essential characteristics of genuine human connection. Where other similar projects have failed, the Small World Machines succeeded for a few notable reasons; namely, the interface—a flat, human scale, 3D touch screen—was intuitive, playful, and invited interaction and experience. When participants at each end of the virtual portal approached the screen, instructions would display asking the individuals to complete a task together: wave, touch hands, draw a peace sign, or do a dance. Once the task was successfully completed, the screen lit up in celebration and rewarded each with a free Coke. To make experience as natural as possible for participants, the designers hid the 3D camera and stereo speakers behind the screen at eye-level/ear-level. For the participants, the perspective was as if they were standing face-to-face with one another. And since the data connection was prioritized, all interactions were smooth and without hiccup.

The designers of the Small World Machines understood from the outset that technology could only be the vehicle for the experience. The individual's main task was not to operate technology but to be human and connect with another person. When technology was required, it would move from the periphery to the center of attention, and then back to periphery when not. In this way, technology facilitated the experience and nothing more.

< Figure 2.8
Coca-Cola Small World Machine
Lahore, Pakistan &
New Delhi, India, 2013

"Small World Machines solidifies the notion that what unites humanity is far stronger than what sets us apart. The experience evoked many, heartwarming and emotional reactions. One Pakistani remarked, 'It's great to connect with the average Indian who probably knows nothing about the average Pakistani'" (Macleod, "Coca Cola Small World Machines.").

Connection Assessment: Coca-Cola Small World Machines

Type of connection? (i.e. human-human, human-nature, or both?)
Human-to-human.

Connection strategy? (i.e. commonality, shared experience, focused discussion, immersion, captivation)
Perceived commonality and shared experience.

Technologically facilitated or mediated? If so, how?
Yes. Connection is mediated through computers, a camera, and an Internet connection.

Connective potential? (i.e. mild, moderate, or profound?)
Profound. Shared experience is one of the most powerful strategies to connect people. The fact that technology merely facilitated the experience without distracting from it only heightened the effect.

Opportunities for improvement?
The technology could be expanded to include the haptic and olfactory senses.

The Bregenz Festival (City of Bregenz, 1946)
Bregenz, Austria

Each summer, on the shores of Lake Constance, during the months of July and August, the city of Bregenz, Austria hosts a performing arts festival. The festival, originally a small 10-day event that featured one performance—an opera—has grown to be an elaborate, finely-coordinated production spanning two months. The first Bregenz Festival happened in 1946, when the City of Bregenz, in the aftermath of the Second World War, decided to stage a festival to bring people together. Considering the town had no theater, the idea was ambitious, but organizers creatively suggested floating two gravel barges on Lake Constance as platforms for the performance—one as a stage and the other as a "pit" for the orchestra. The inaugural festival was a huge success, attracting visitors from neighboring Germany and Switzerland as well as from France ("History of the Bregenz Festival.").

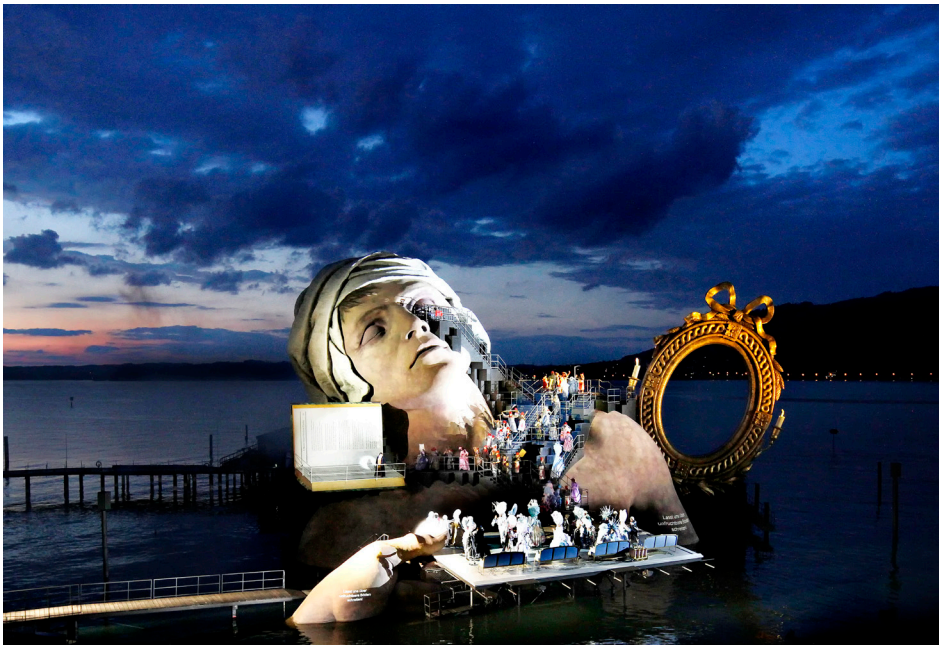


Figure 2.9 >
The Bregenz Festival
Bregenz, Austria, 2012

Four years later, responding to the rising popularity of the festival, a permanent stage was built over the lake on wooden piles (Figure 2.9). To accommodate the audience, an open-air auditorium with a seating capacity of 6500 was installed on the shore facing. From the beginning, the lake (and surrounding countryside) contributed to the experience, however, once the permanent stage was constructed in 1950, both the stage designer and performance director decided that the lake should not just be scenery, but should instead, be a central element in all productions. To do this, the conventional proscenium had to be discarded. Thirty-five years later, endeavoring to make the productions accessible to as many people as possible, the operas' themes, not just the backdrops, began to be built into the set. These have always included the lake ("History of the Bregenz Festival."). "The set was designed to make an emotional impact on the audience and transmit the essence of the opera to those who weren't familiar with it" ("The Floating Opera Stage of the Bregenz Festival, Austria."). For example, for the 2011-2012 production of André Chénier, the set design is modeled after an iconic painting from the French Revolution, The Death of Marat by Jacques-Louis David. In the painting, the radical journalist Jean-Paul Marat lies dead in a bathtub after he has been murdered by the aristocrat, Charlotte Corday. The stage features Marat's head and shoulders emerging from the lake as if it was the bathtub in which he was murdered" ("The Floating Opera Stage of the Bregenz Festival, Austria.").

For the audience at the Bregenz Festival, the emotional impact can be profound. There are a few reasons for this. First, the natural environment that surrounds the audience centers and focuses the mind (Bhalla, "It Is in Our Nature to Need Stories."). Second, the audience embarks on a journey via the story, and not just any story, a great story. "Nature shaped us to be ultra-social, and hence to be sharply attentive to character and plot. We are adapted to physiologically interact with stories. They are a key way in which our nature is configured" (Bhalla, "It Is in Our Nature to Need Stories."). And not only are we wired to understand the world through stories, they play an essential role in our ability to empathize and connect with others (Zak, "Why Your Brain Loves Good Storytelling."). Third, the audience enjoys a collective experience. "Sharing experiences—even with a complete stranger—makes people rate those experiences as more intense than people who underwent them alone" (Khazan, Olga. "The Importance of Sharing Experiences."). Fourth, all aspects of the story are heavily dramatized. Drama, or conflict, mirrors real life and everyday experience. Drama is a necessary component to capture and maintain an audiences' attention and helps to highlight and cement the story's main messages with an audience.

The use of technology at the Bregenz Festival is decidedly overt. No attempt is made to conceal technology; rather, technology is quasi-celebrated as the normal is made super normal for dramatic effect. In this application, due to the type and scale of the technology employed, technology has little opportunity to interfere or detract from the audience's experience. Technology merely serves to heighten the experience.

Connection Assessment: The Bregenz Festival

Type of connection? (i.e. human-human, human-nature, or both?)

Human-to-human and human-to-nature.

Connection strategy? (i.e. commonality, shared experience, focused discussion, immersion, captivation)

Commonality (through story), shared experience, immersion (in nature) and captivation.

Technologically facilitated or mediated? If so, how?

Yes. All performances utilize technology heavily to tell the story in the manner desired.

Connective potential? (i.e. mild, moderate, or profound?)

Profound. The Bregenz Festival employs several connection strategies simultaneously which has a greater impact on the audience.

Opportunities for improvement?

As a creative spin on the traditional performance space, The Bregenz Festival performs its role impeccably well. One improvement to the Bregenz Festival's entertainment strategy would be to involve the audience in the story—a more interactive type of theater.

HUMAN-NATURE CONNECTION

Blur Building (Diller Scofidio + Renfro, 2002)

Yverdon-les-Bains, Switzerland

In 2002, the firm Diller Scofidio + Renfro designed a building for the Swiss EXPO. The project's concept was a reaction to society's insatiable appetite for technology and visual stimulation. In effect, the architects designed a space where all references are erased—a dimensionless, depthless, scaleless, surfaceless, formless, and featureless optical whiteout that overturned the normal and expected and obligated visitors to rethink and remap their environment. As Liz Diller described, "it was an exhibition pavilion with nothing on display except for our cultural dependency on vision" (Diller,

"The Blur Building and Other Tech-Empowered Architecture.").

Constructed atop Lake Neuchatel, the Blur Building is a tensegrity structure supported on four delicate columns (Figures 2.10 and 2.11). Amongst the structural network of rods and struts are 35,000 high-pressure fog nozzles that create an 300-foot wide, 200-foot deep, 65-foot tall artificial cloud that enshrouds everything: architecture and visitors alike. The cloud is controlled by an onboard weather station that monitor's and responds to local weather conditions—temperature, humidity, dew point, wind direction and speed—to maintain almost perfect obscurity. Visitors access the pavilion via a 400-foot long ramp leading from the shore to the center of the fog mass. Once inside, visitors navigate, in an unregulated manner, a disorienting environment of hissing nozzles over a series of ramps in near-zero visibility. At some point, visitors will find themselves in the "Glass Box," a volume built of glass on all sides, where an individual can experience the unsettling sensation of physical suspension. If visitors choose, they can climb to the top level of the pavilion, to an area known as the Angel Bar, that sits above the fog mass, where they can enjoy a clear view over the lake while tasting a selection of waters from around the world. The architects thought it fitting that visitors was on the water and in the water would then, naturally, consume the water—effectively drink the building.

Figure 2.10 >
The Blur Building
Yverdon-les-Bains, Switzerland

The Blur Building, by using technology to remove technology succeeded at being the ultimate high-tech no-tech space—"the spectacular anti-spectacle" as Liz Diller calls it (Diller, "The Blur Building and Other Tech-Empowered Architecture."). Not only was the presence of technology not evident, the presence all typical references were absent. The effect demonstrated technology as an invisible but omnipresent scaffold that, in this particular situation, stripped visitors of the familiar and forced them to reevaluate their surroundings and associated assumptions. For the visitor, this action triggered an awakening that reset perspectives and reconnected them to their surroundings, both natural and social.

< Figure 2.11
The Blur Building
Yverdon-Les-Bains, Switzerland

Connection Assessment: The Blur Building

Type of connection? (i.e. human-human, human-nature, or both?)

Both human-to-human and human-to-nature.

Connection strategy? (i.e. commonality, shared experience, focused discussion, immersion, captivation)

Focused attention and shared experience.

Technologically facilitated or mediated? If so, how?

Yes. Connection is mediated with a computer-controlled weather station and a network of high-pressure fog nozzles.

Connective potential? (i.e. mild, moderate, or profound?)

Profound. Seeing the world through fresh eyes is not an easy state to achieve, but if attained, can result in one of deepest types of connection one can experience.

Opportunities for improvement?

While the project does include a social component called the "Braincoat," the Blur Building could develop this idea further to more effectively incorporate the social sphere.

Roden Crater (James Turrell, 1977)

Coconino County, Arizona, USA

Located in the desert northeast of Flagstaff Arizona lies an extinct cinder cone volcano called Roden Crater (Figures 2.12 and 2.13). James Turrell, a light and space artist, purchased the crater in 1977 to develop as landscape art. According to Turrell, Roden Crater is about getting closer to the cosmos by ascending into the sky. The summit of the crater stands approximately 500 feet above the surrounding landscape and in some sense, naturally exists between Earth and the cosmos. Turrell uses a combination of engineered (subterranean) spaces, connecting tunnels, and carefully placed apertures to capture sunlight, sky views, and the movement of the moon, planets, and constellations at night. Roden Crater is also a place to experience and contemplate light. "Light isn't formed like clay or carved away like wood or stone. It's more like sound. One must build an instrument that produces it the way you want" ("James Turrell | Art + Film Honorees.").

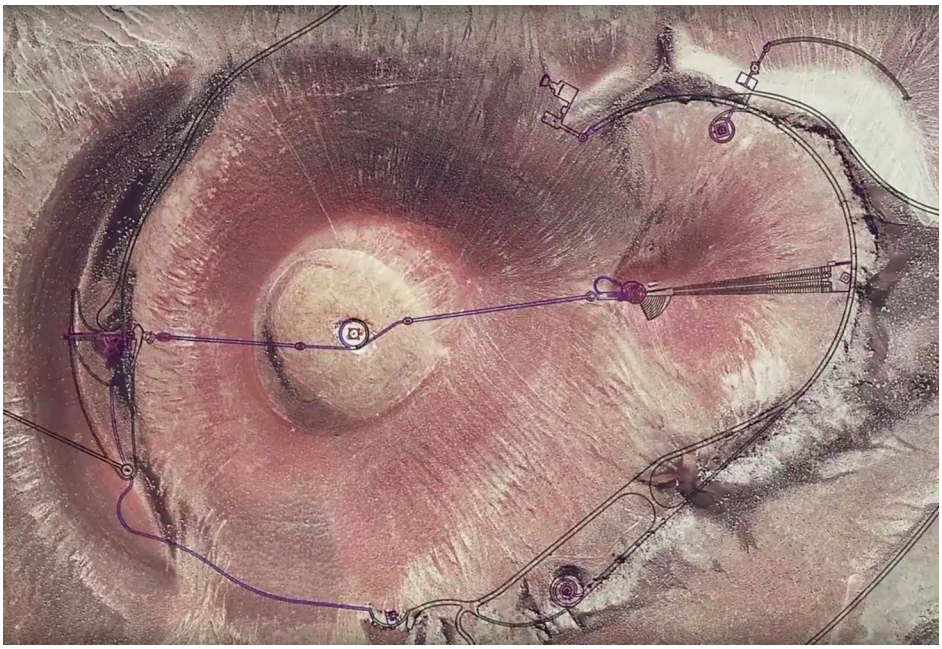


Figure 2.12 >
Roden Crater
Coconino County, Arizona, USA

On a deeper level, Roden Crater endeavors to reveal as Turrell describes, "what is beneath." Just as the spaces at Roden Crater are designed to objectify light itself, the spaces are also designed to give visitors a deeper understanding and appreciation of the nature of visual perception and reality. Every artist aspires to call attention to an aspect or aspects of the world that most of us overlook. Turrell points out that many fail to realize how much a part we play in forming the reality we behold. We think that our perception of world around us is fixed and static, that the sky is inherently blue, but we in fact award the sky its color. Roden Crater, like many of Turrell's projects, highlights this fact by manipulating the context and circumstances of the viewer's perspective. What we think is blue could just as well be yellow. In this way, Turrell takes concepts that we struggle to grasp intellectually and allows us to experience them physically.

Figure 2.13 >
Roden Crater
Coconino County, Arizona, USA

As we increasingly inhabit a digital world without horizon, where concepts of up, down, left and right do not apply, works like Roden Crater connect the intangible to the real by allowing visitors to physically experience a natural landscape without horizon.

Connection Assessment: Roden Crater

Type of connection? (i.e. human-human, human-nature, or both?)

Primarily human-to-nature, although if the experience is collectively enjoyed, it would be powerfully connective to others as well.

Connection strategy? (i.e. commonality, shared experience, focused discussion, immersion, captivation)

Immersion and captivation.

Technologically facilitated or mediated? If so, how?

No. Disregarding design and construction strategies as technology, connection (to the natural world) is achieved through immersion and engineered experience.

Connective potential? (i.e. mild, moderate, or profound?)

Profound. Similar to the Blur Building, Roden Crater overturns one's assumptions and thereby obligates the visitor to reassess what they think they know. The process of remapping the world allows the visitor to build new and deeper connections.

Opportunities for improvement?

While there is a lot of benefit of to a project focusing on one aspect of the sensory experience, Roden Crater could increase its connective power by tapping other senses.

CONCLUSION

We feel disconnected from nature and from one another for good reason. Not only is our drive to connect part of our biology as Matthew Lieberman is discovering, studies by Sherry Turkle, and Richard Louv among others are demonstrating that we increasingly prefer to immerse ourselves in technology rather than engage with each other or with nature. In this rapid-pace era, we opt for the ease and predictability of virtual relationships to the demands of physical relationships. As an era of rapid urbanization and exponential technological growth emerges, we should carefully consider our complacent willingness to abandon Mother Nature and deep human connection in favor of artificial environments with minimal restorative potential and machines that have no ability to comprehend emotion and the arc of human life.

Already we are beginning to feel the consequences of our choice to live contrary to our fundamental essence and overlook our biological need to connect. We need to pause and think critically about the trajectory of our relationship with technology. Technology brings us many benefits, so many in fact, that we often blindly look to technology to solve all of our problems. Technology is no cure-all. Yet, technology has an allure that we can't resist. We are unique as a species in our appetite for extensive tool use.

Logically, one proposal for a new relationship would thoughtfully respond to our intrinsic needs while employing technology for its strengths. More specifically, this can be described as a human-centered relationship with technology—ambient intelligent technology—set in a restorative natural environment. Projects like the Coca-Cola Small World Machines, The Bregenz Festival, the Blur Building, and Roden Crater demonstrate a start toward this end. All four projects put people at the center and leverage technology to deepen the human experience intelligently and unobtrusively. Three of the projects, The Bregenz Festival, the Blur Building, and Roden Crater do so in a natural environment, immersing visitors in a living landscape. One could surmise that these design attributes make projects as popular as they are.

If the combination of human-centered design, ambient intelligent technology and a

natural context is the primer for deeper connection, we need only add the connective substance. As a social species, there is no better medium for people to connect and deeply understand/feel the world then story. And one institution alone—the library—has traditionally maintained the responsibility for collecting and preserving our stories. The library, as a community center, an institution for disseminating human culture through stories, and an innovative architecture for technological integration, is unparalleled as a space typology to ground and deeply connect people to each other and the broader world. The possibilities and depth of what could be experienced are almost limitless.

Technology is, whether we like it or not, an indelible presence in our life. Technology needs to be a better scaffold to reach new heights. Human needs must be more sensitively considered in the design of our rapidly evolving digital world. We crave technology. We need to connect. Let's find a way to have both.

ake Union Library

Chapter 3

The South Lake Union Library

A Next-Generation Library

VISION

> "The best and most beautiful things in the world cannot be seen, heard, or even touched, they must be felt with the heart."
>
> –Helen Keller

The South Lake Union Library is a technological bridge across space and time between people, cultures, geographies, and eras. It is a place of sublime beauty, deep feeling and transcendental experience where perceptual boundaries are expanded to new understandings and deeper connections with others. To this end, the South Lake Union Library leverages nature and natural cues, ambient intelligence, genuine communication, commonality, shared experience and storytelling to bring diverse people closer together. Unlike the conventional library, the South Lake Union Library is exclusively digital. It redefines the relationship between the library user and information through non-linear, random access of digital information where the user is both the consumer and producer of novel perspectives and new ideas. In this way, information is not static but updated in real-time: a living, dynamic, evolving, sensory-rich aggregation of knowledge. Visitors to the South Lake Union Library can experience the past through a visceral immersion into all facets of recorded history, collected research, or works of fiction. They can elevate their experience of the present by trekking to the frontier of current human understanding, thinking and/or sampling the global or local emotional state at any given moment or location. Latent patterns in information, more easily discernible with increasingly sophisticated technology, may afford some predictive capacity as well, allowing visitors a glimpse of the possible evolutionary trajectory of humanity.

The South Lake Union Library is also a bridge between people and natural environments, highlighting the frequently overlooked reality that we are part of the biosphere, not separate from it. Visitors to the library can immerse in nature, a scarce amenity for many residents of urban contexts, and through gentle interactions, learn to see beauty and connection at all scales, for "the moment one gives close attention to anything, even a blade of grass, it becomes a mysterious, awesome, indescribably magnificent world in itself" (Miller, "A Quote by Henry Miller."). For visitors of the South Lake Union Library, nature carries more weight in life, the result of a new, deeper understanding and appreciation of nature's order within chaos. As society's exposure to technology ever-increases, South Lake Union Library offsets such exposure by green bathing visitors in a carbon-based living network that mentally reboots and re-sensitizes each person to the emotionally stirring vibrancy of the world.

< Figure 3.1

Information Market, rendering
Cash, Keith, 2017

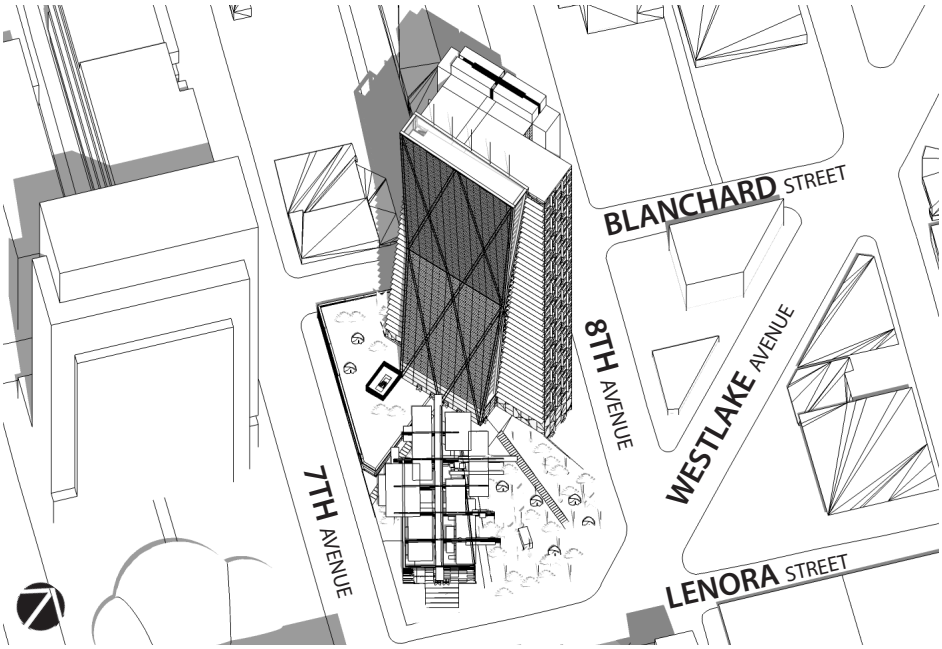
CONTEXT

The South Lake Union Library occupies a 82,250 square foot site located within the western half of the Denny Triangle Urban Center Village overlay and comprises the entire block bounded by Westlake Avenue, Lenora Street, Seventh Avenue, Eighth Avenue and Blanchard Street (Figure 3.2 and Appendix A.1). The site slopes (descends) approximately 19 feet from west to east and approximately nine feet from south to north. Additionally, along both Seventh Avenue and Eighth Avenue, there is approximately five feet of elevation loss between Blanchard Street, at the northwest of the site, and Lenora Street, at the southeast of the site. Similarly, along both Blanchard Street and Lenora Street, there is approximately 15 feet of elevation loss between Seventh Avenue, at the southwest of the site, and Eighth Avenue, at the northeast of the site. The high-point of the site occurs at the graded exterior fore-lobby: approximately 108 feet MSL. The low-point of the site occurs at site's boundary at the intersection of Eighth Avenue and Westlake: 79 feet MSL. The site's gently sloping topography is the result two large regrade efforts in the early 20th Century known as the Denny Regrade. Prior to the Denny Regrade, the 240-foot Denny Hill stood atop the site (Upchurch, "'Too High & Too Steep': When Seattle's Hills Came Falling Down.").

< Figure 3.2
Regional and site context
"Seattle," Google Earth, 2017

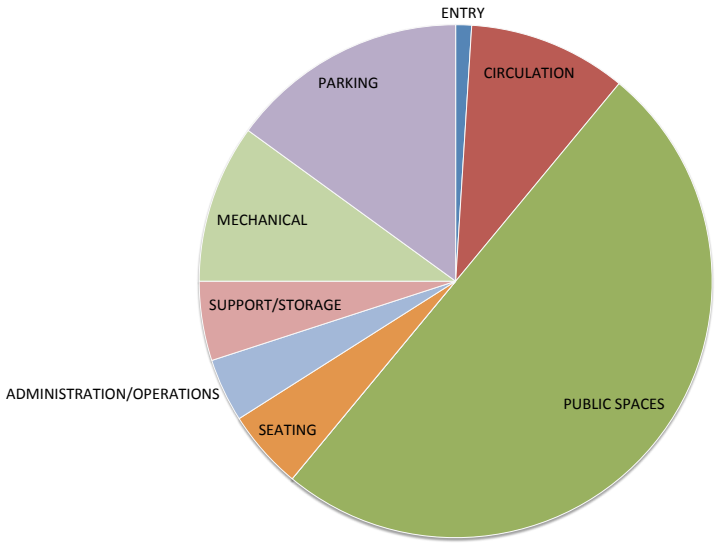
Prior to development, the site was divided by an alley running in the northwest-southeast direction. A one-story car dealership occupied the northeastern half of the site while a surface parking lot covered the other half. Per Acorn Development's Geotechnical Engineering Services report for Block 20 (the site), the soils consist of "fill overlying recent deposits and competent glacially consolidated soils" (Geotechnical Engineering Services, Rufus 2.0…). The fill, approximately 16 feet in thickness, "generally consists of loose to dense/soft to very stiff silty sand and silt with variable gravel and cobble content and occasional brick, charcoal or wood debris" from the 1928-1930 Denny Regrade (Geotechnical Engineering Services, Rufus 2.0…). The recent deposits, approximately 14 feet in thickness, "typically consist of stiff to very stiff silt and clay with occasional sand interbeds and variable gravel content or medium dense to very dense sand with variable silt and gravel content" (Geotechnical Engineering Services, Rufus 2.0…). The glacially consolidated soils were encountered below the fill and recent deposits and can be described as cohesive silt and clay, cohesionless sand and gravel, and till-like deposits (Geotechnical Engineering Services, Rufus 2.0…).

Figure 3.3 >
Axonometric site plan
Cash, Keith, 2017



The land use code analysis indicates that the maximum allowable structure height on the site for non-residential uses to be 500 feet, with mechanical equipment and other small enclosures allowed to exceed the height limit by 15 feet. Rooftop screens can extend up to 50 feet above the height limit. Street-level uses are required along Westlake Avenue unless it is considered exterior public open space. The maximum floor-area-ratio for the site is 14, or 1,151,486 square feet. The minimum floor-area-ratio for the site is 5, or 411,245 square feet. The South Lake Union Library including the office tower above has a floor-area-ratio of 7 (574,433 square feet of total zoned floor area). The code requires that 20 square feet of open space be provided per 1000 square feet of gross office floor area, or 9605 square feet. The South Lake Union Library provides 147,639 square feet of open space. The code requires that parking will be provided at one stall per 1000 square feet for office uses and one stall per 100 square feet of public assembly area not containing fixed seats in a below-grade garage (no parking at street level allowed). This amounts to approximately 650 spaces or 227,500 square feet of required parking area if 350 square feet is provided per parking space. The South Lake Union Library provides approximately 300,000 square feet of parking area—enough for 850 parking spaces if required—distributed on five below-grade

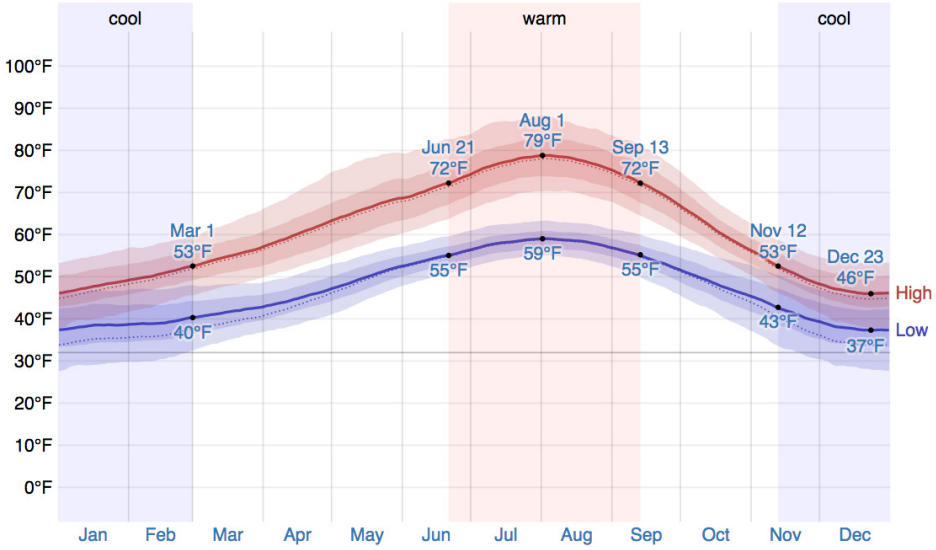
levels. The code requires that one off-street bike space be provided per 5000 square feet of office use, or 96 spaces per the South Lake Union Library proposal. The South Lake Union Library provides space for up to 500 bicycles. The code requirements for street setbacks have largely been waived for the South Lake Union Library due to copious public open space that meets the street satisfying the Downtown Amenity Standards. Code requirements for façade transparency, along with a slew of other zoning requirements, have not been rigidly adhered to or even considered for the purposes of this thesis proposal due to relevance and time constraints. No further code analysis will be discussed in this document.



< Figure 3.4

Preliminary program diagram
Cash, Keith, 2017

The climate at the site—Seattle's climate—is classified as temperate marine. Winters are cool and wet, while summers are warm and relatively dry. The Puget Sound moderates temperatures, so extreme temperatures are rare. Based on a statistical analysis of historical hourly weather reports and model reconstructions from January 1, 1980 to December 31, 2016 compiled by Weatherspark.com, during the cool season, from mid-November to early March, the daily average temperature fluctuates between 37°F and 53°F. During the warm season, from mid-June to mid-September, the daily average temperature fluctuates between 55°F and 79°F (Figure 3.5).



< Figure 3.5

Average high & low temperature
Seattle, Weatherspark.com, 2017

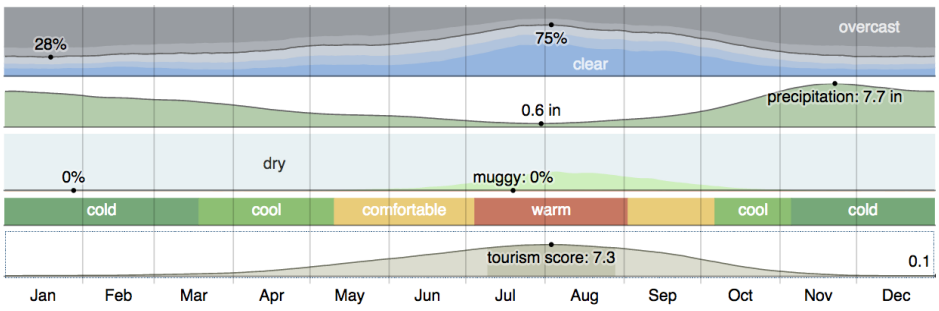
From 1981 through 2010, Seattle had on average 4697 heating degree days annually (Figure 3.6) ("Monthly Degree Day Record Seattle-Tacoma Airport Station.").

Figure 3.6 >
Seattle heating degree days
Seattle City Light, 2017

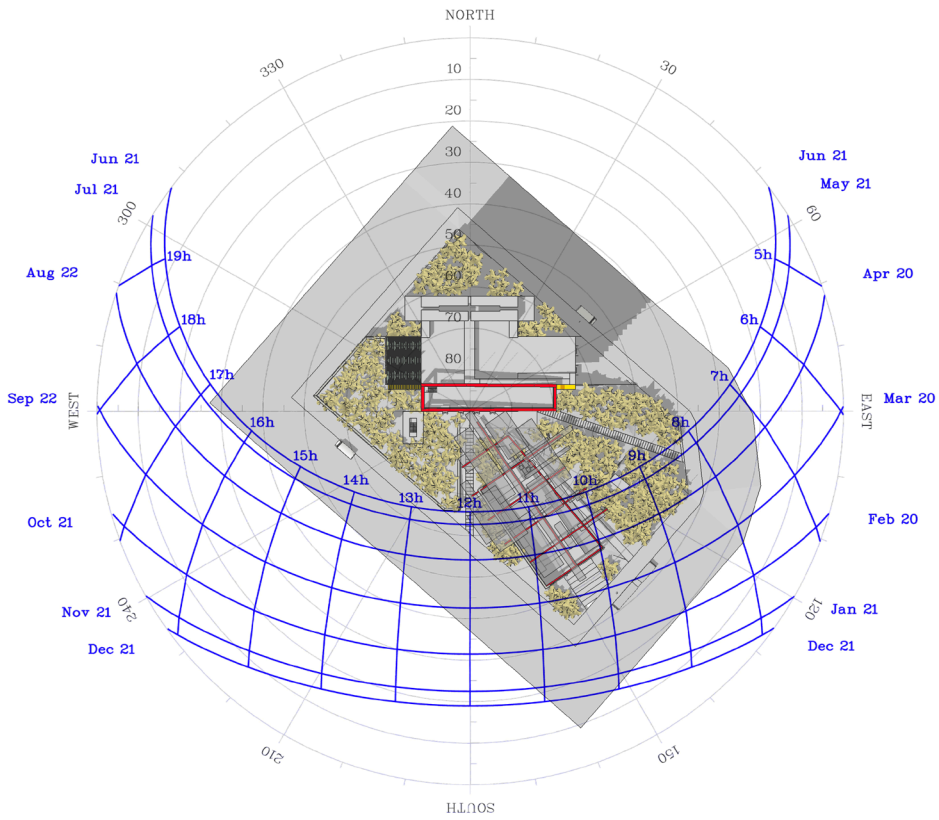
2017 Monthly Degree Day Record				
Month	**Normal HDD**	**% Annual**	**HDD**	**% of Normal**
January	711	15%	836	118%
February	605	13%	656	108%
March	574	12%	580	101%
April	440	9%	424	96%
May	285	6%	230	81%
June	144	3%	99	69%
July	49	1%	6	12%
August	36	1%	1	3%
September	132	3%	78	59%
October	380	8%	359	94%
November	586	12%	545	93%
December	755	16%	769	102%
Annual	**4697**	**100%**	**4583**	**98%**

Cloud cover also moderates Seattle temperatures. Seattle experiences cloudy days approximately 80% of the time. Days vary from fully overcast, a little more than half the time, to mostly cloudy, another 10% of the time, to partly cloudy, another 10% of the time. The clearest part of the year lasts from about mid-June to around mid-October. While Seattle frequently sees clouds, it does not receive as much rain as people might think. On average, Seattle receives approximately 36 inches of rain annually, or an average of 3 inches per month. The wet season in Seattle stretches from mid-October to May (Figure 3.7).

Figure 3.7 >
Seattle climate summary
Weatherspark.com, 2017



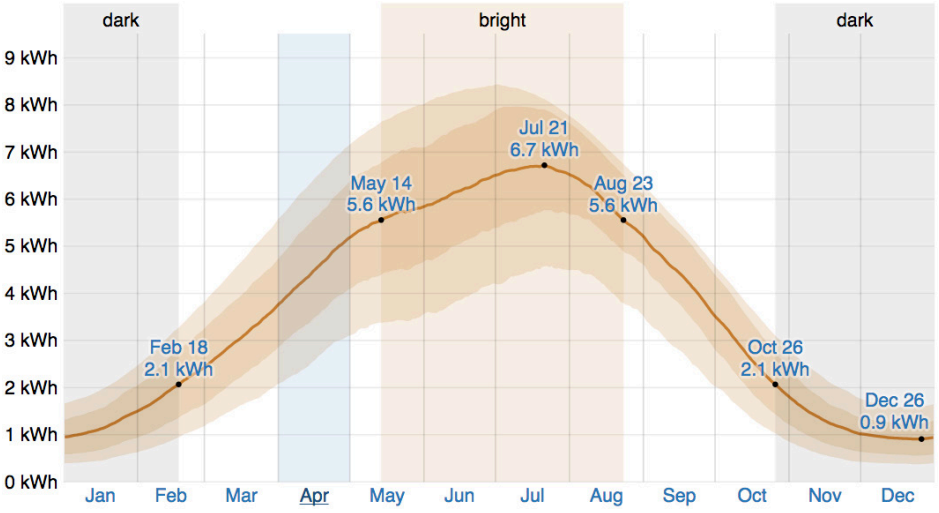
Seattle also boasts both more (in the summer) and less (in the winter) daylight than most U.S. cities due to its northern latitude. The longest day of the year, the summer solstice on June 21, has 15 hours, 59 minutes of daylight. The shortest day of the year, the winter solstice on December 21, has 8 hours, 26 minutes of daylight (Figure 3.8).



< Figure 3.8

Site sunpath diagram overlay
Cash, Keith, 2017

Correlated to the amount of daylight, from mid-May to late August, Seattle receives on average 5.6 kilowatt hours of incident solar energy per square meter each day. From mid-October to mid-February, this number drops to 2.1 kilowatt hours per square meter per day. Between mid-February and mid-May, the average daily incident shortwave solar energy striking the surface increases to 3.9 kilowatt hours per square meter (Figure 3.9).



< Figure 3.9

Average daily incident shortwave solar energy (kwh/m2)
Seattle, Weatherspark.com, 2017

In terms of wind, Seattle is not a windy city. The average wind speed in Seattle is 4.7 miles per hour, with the windiest part of the year lasting from mid-October to late April (Figure 3.10). For almost ten months of the year, from mid-September to July, the wind blows from the south ("WeatherSpark.com.").

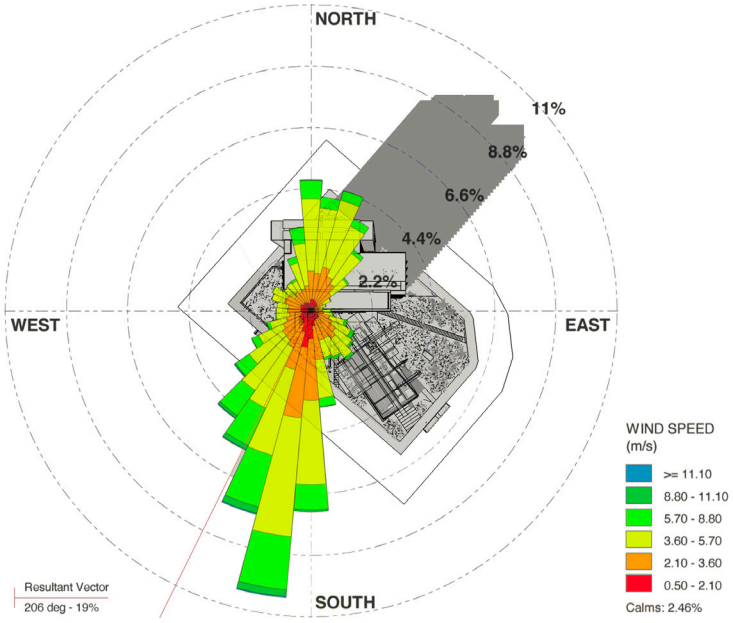


Figure 3.10 >
Site windrose diagram overlay
Cash, Keith, 2017.

The Denny Triangle took its name from Arthur Denny, one of the founding pioneers of Seattle, and from the 143-acre triangular-shaped area that the neighborhood occupies—a result of streets converging from differing bearings (Figure 3.11). The Denny Triangle is sometimes referred to as the "Gateway District" due to its location on a straight path between downtown Seattle, along Westlake Avenue, and the burgeoning South Lake Union district. As a neighborhood, the Denny Triangle is distinctly urban. Formerly an industrial, low-rent area, new development, especially in the last five years, is quickly transforming Denny Triangle into one of the most densely populated neighborhoods in Seattle. Compared to Belltown, the bordering neighborhood to the west, Denny Triangle hosts more office towers—most notably the three towers of Amazon's Seattle headquarters—and fewer trendy restaurants, boutiques, and art galleries, although new shops continue to open along Westlake Avenue. The neighborhood atmosphere might be best described as professional yet playful, energetic but mellow, dense but open.

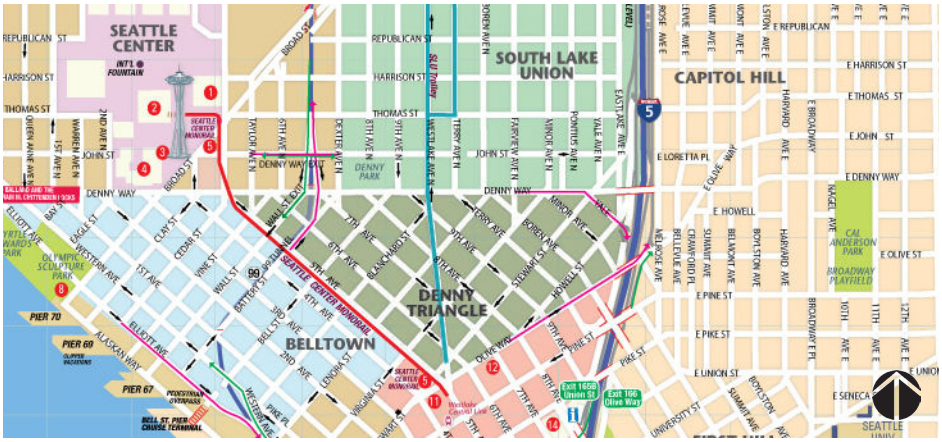
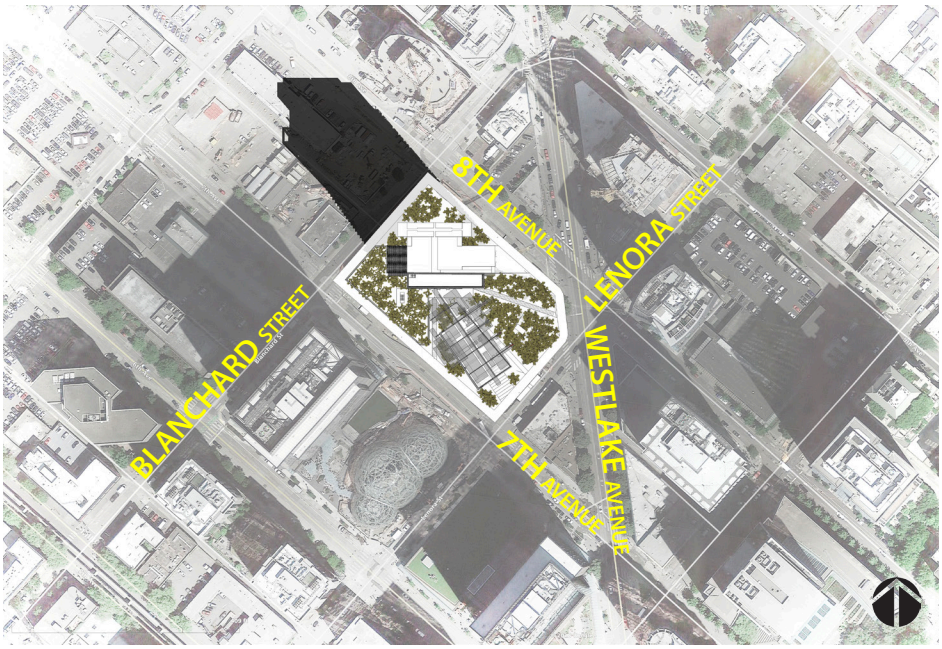


Figure 3.11 >
Denny Triangle (at center)
Where Traveller, 2016

DESIGN FRAMEWORK

Together but alone
Consumed by technology
Ubiquitous
Craving human connection
Deeper, more meaningful experiences
Knowing each other better
Empathetic
Compassionate
Uplifted by technology not smothered by it

The South Lake Union Library is a new type of world forum for Seattle, where cultures meet both in physical and virtual space, express themselves, gain understanding, and bridge differences. The library is not only a library for all peoples, like the network of other libraries scattered across the global datascape to which it connects, but it is also a landmark building for Seattle, expressing the unique personality, history and aspirations of the Seattle community.



< Figure 3.12
Project context plan
Cash, Keith, 2017

The Approach and Circulation

Most visitors to the South Lake Union Library will enter through the Information Market and Reading Room located at the corner of Seventh Avenue and Lenora Street (Figure 3.44). From here, visitors have a choice to ascend the west ramp one half-level through the Reading Room to the Visualization Workshop, or to descend the east ramp one half-level to the Techshop Entry and elevator to the Meditation Space 42 levels above at the top of the tower. Both ramps pass elevators within the Information Market and Reading Room that can take visitors from the market into the core of

the library—the Techshop, the Augmented Reality Performance Space and the Virtual Reality Space—two levels below. If a visitor heads up the ramp to the Visualization Workshop, at this level, one level directly below the Tower Lobby, they will find to the west of the ramp's exit, the studio workspaces of the Visualization Workshop and Café, and to the east of the ramp's exit, the 50-foot tall Visualization-Exhibition Space. The Visualization Workshop and Café can also be accessed from Seventh Avenue (Figure 3.20). Similarly, the Visualization-Exhibition Space can be accessed from Eighth Avenue after coming up an open flight of stairs.

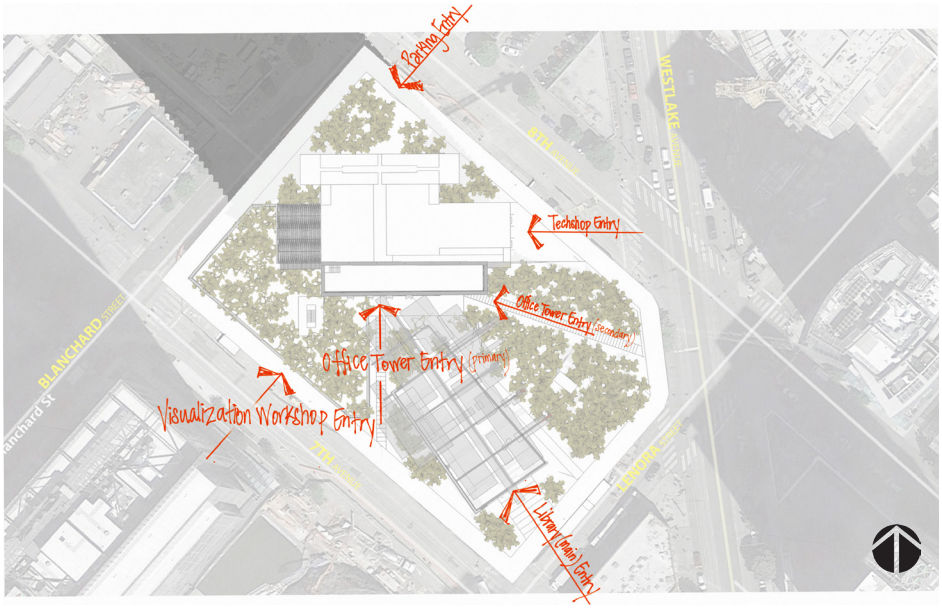
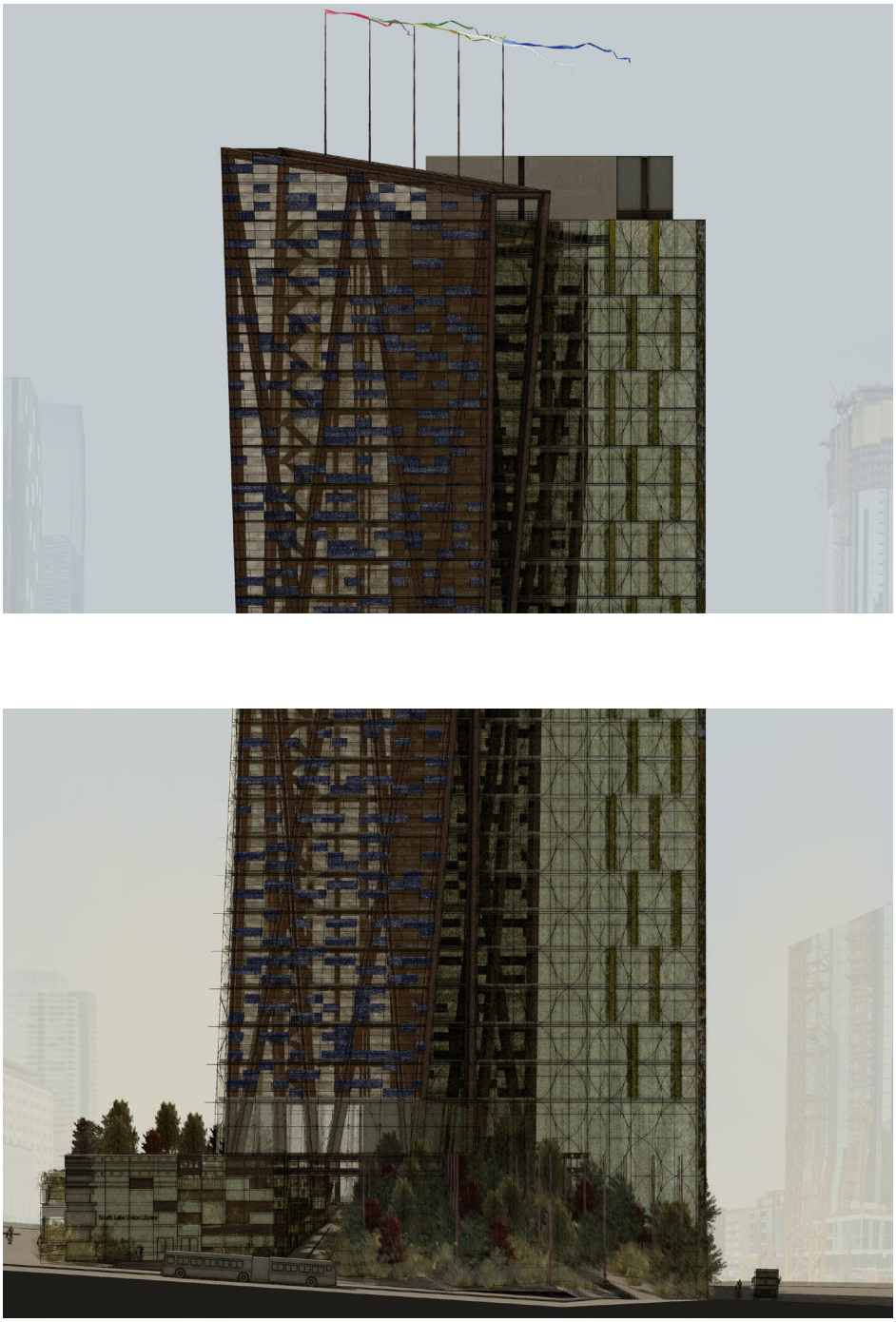


Figure 3.13 >
Circulation diagram
Cash, Keith, 2017

The Visualization-Exhibition Space, as mentioned, is visible from the Tower Lobby where two catwalks connect the front lobby to the back lobby. At the back lobby, an elevator core connects the tower spaces above to the library spaces and parking levels below. If a visitor in the Information Market heads down the ramp to the Techshop Entry, they will have the option to take an elevator up to the tower spaces (depending on security) and/or the Meditation Space at the top of the tower, or down to the Techshop and other library spaces one level below. They also have the option of using the open stair to connect to the Visualization-Exhibition Space above or the Techshop and library spaces below. From the level of the Techshop Entry, visitors have a view from open balconies to the library spaces one (tall) level below. The library spaces can also be viewed from both the ramps leaving the Information Market and from the balcony in the Visualization-Exhibition Space, one level above the Techshop Entry space. For most visitors, access to the core library spaces will occur via the elevators adjacent to the ramps in the Information Market. Upon exiting the elevators into the main spaces of the library at Level -1, visitors can make their way north past the information and wayfinding screens into the Techshop (Figure 3.49) or turn southeast to enter the Virtual Reality Space. If visitors want to enjoy a work in the Augmented Reality Performance Space, they must navigate northwest around the elevator core. Additionally, the Augmented Reality Meeting spaces, separate from the performance space, are located one half-level above the Virtual Reality Space (Figure 3.55). To access these meeting spaces, visitors go up the flight of stairs and down the catwalk that runs parallel to the Augmented Reality Space to the most southern corner of the library volume. For those that need only access the office tower, there are three approaches: one from Seventh Avenue, the main approach (Figure 3.19); another from Lenora Avenue, the secondary approach (Figure 3.44); and the last from West-

lake Avenue, a tertiary approach (Figure 3.18. All approaches lead to the Tower Lobby where office personnel use the elevators to access levels 3-41, the office spaces, or 42 and 43, the Meditation Space. The parking levels and loading bay are accessed from entrances and the corner of Eighth Avenue and Blanchard Street. The west ramp descends to five levels of parking, both vehicular and bicycle. The east ramp descends to the loading bay.



< Figure 3.14

Lenora Street elevation
Cash, Keith, 2017

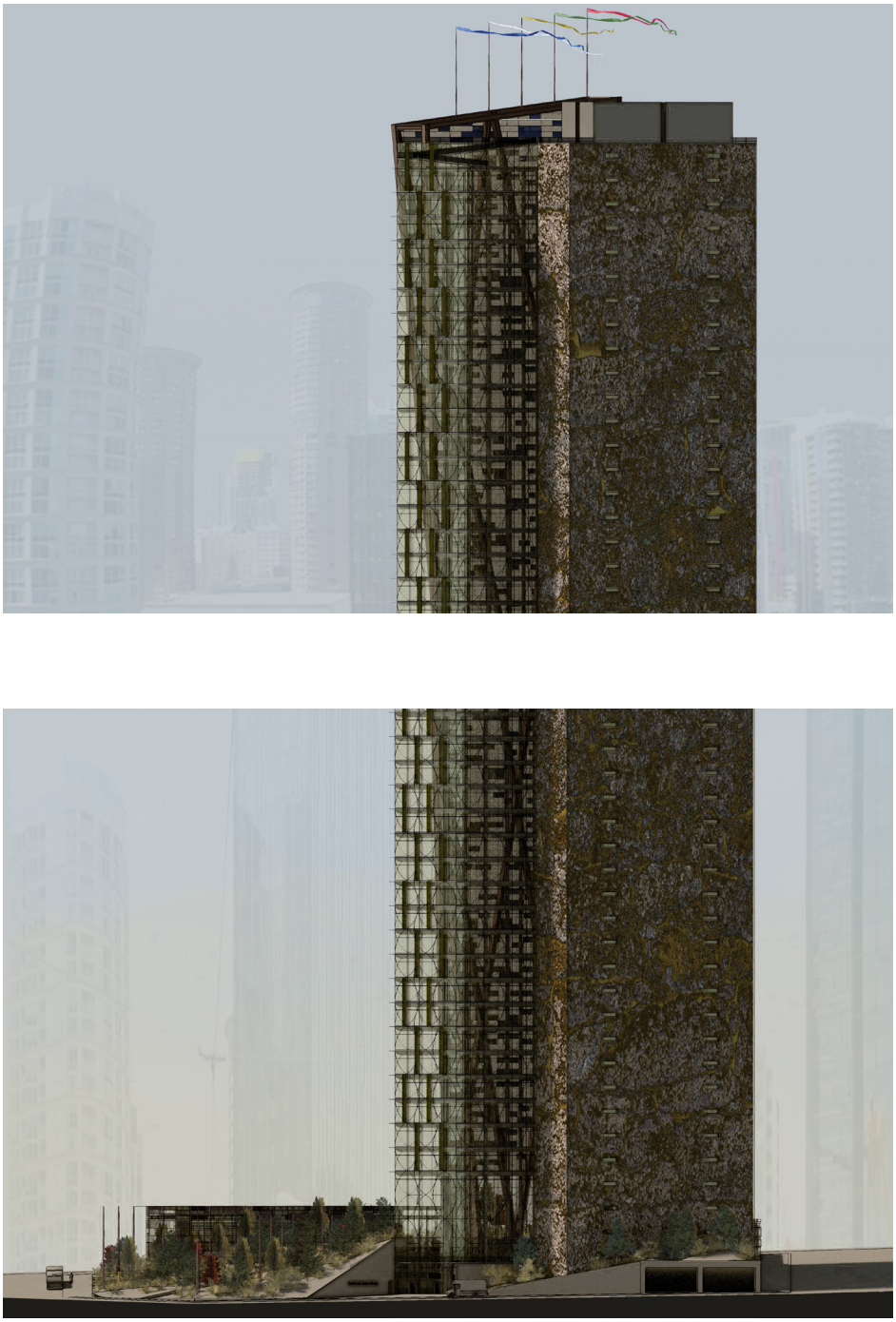
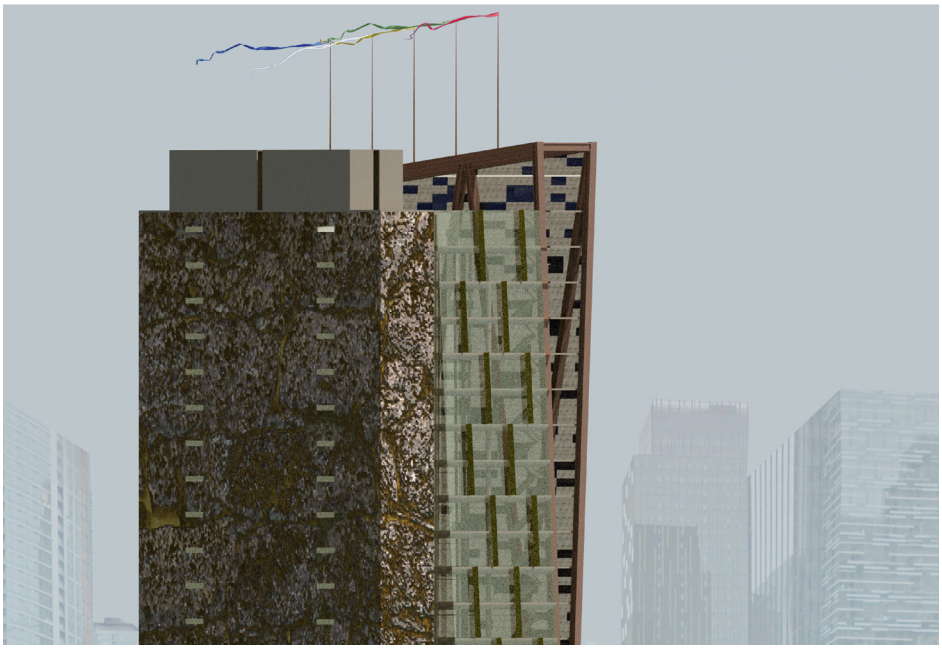
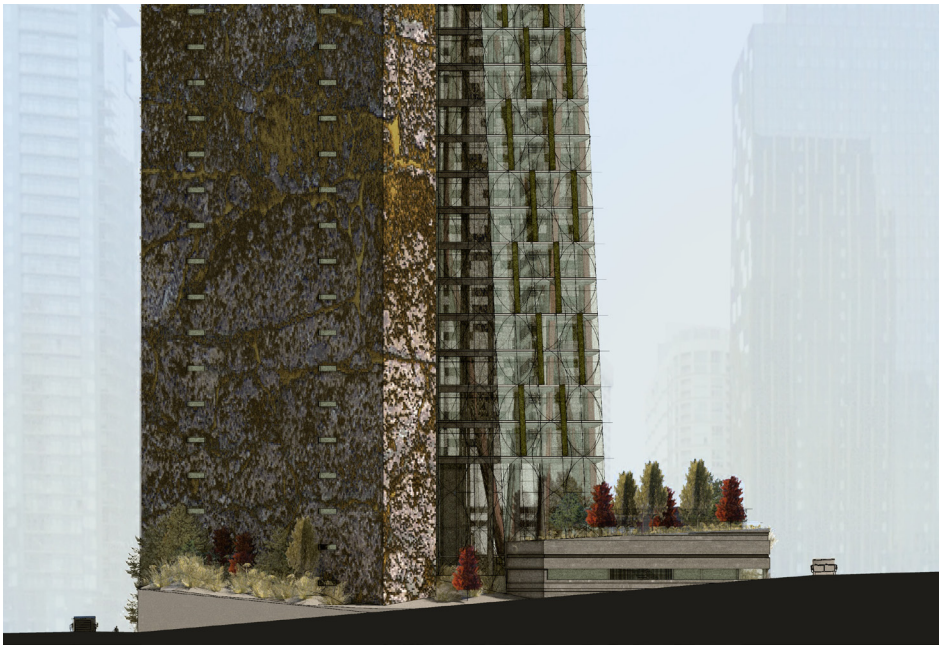


Figure 3.15 >

8th Avenue elevation
Cash, Keith, 2017





< Figure 3.16

Blanchard Street elevation
Cash, Keith, 2017

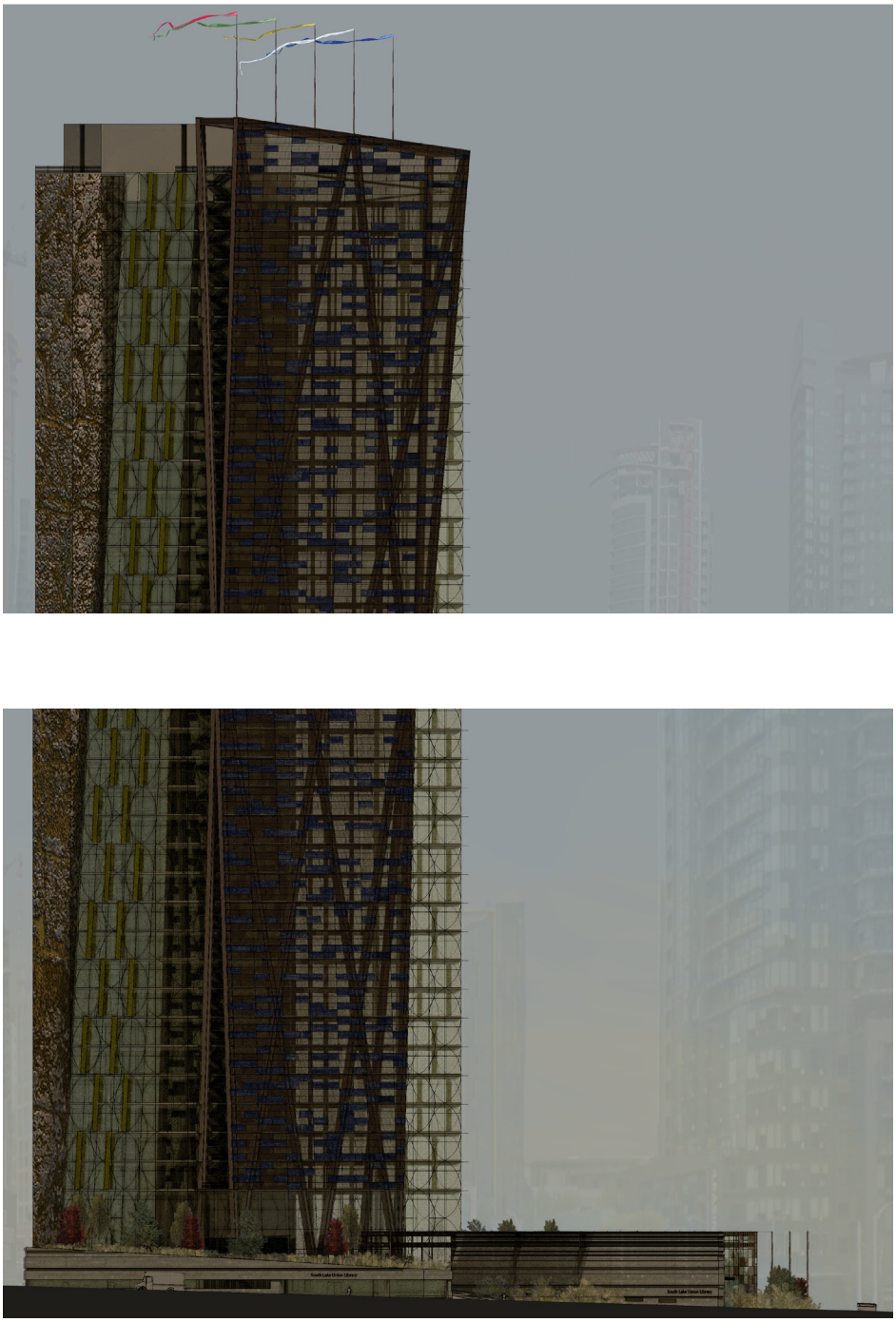
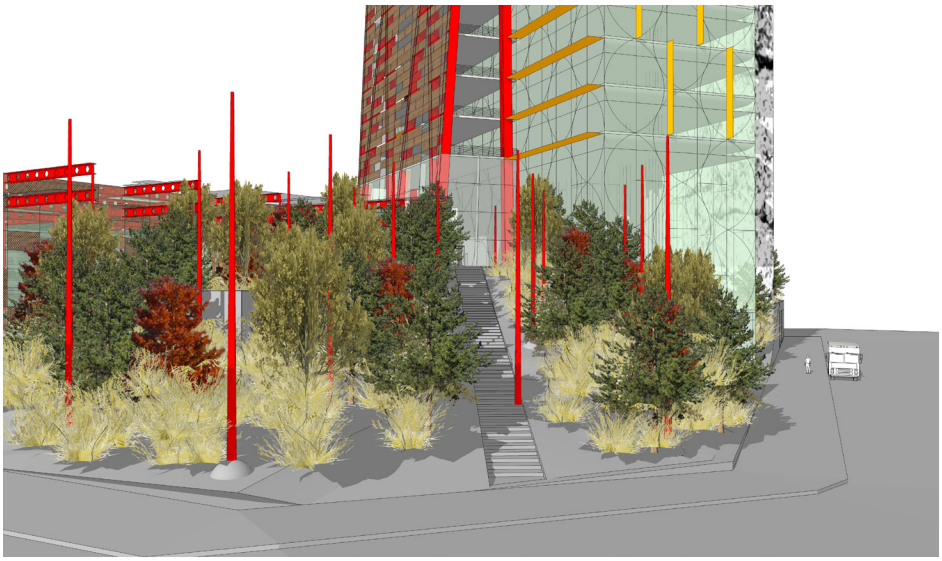
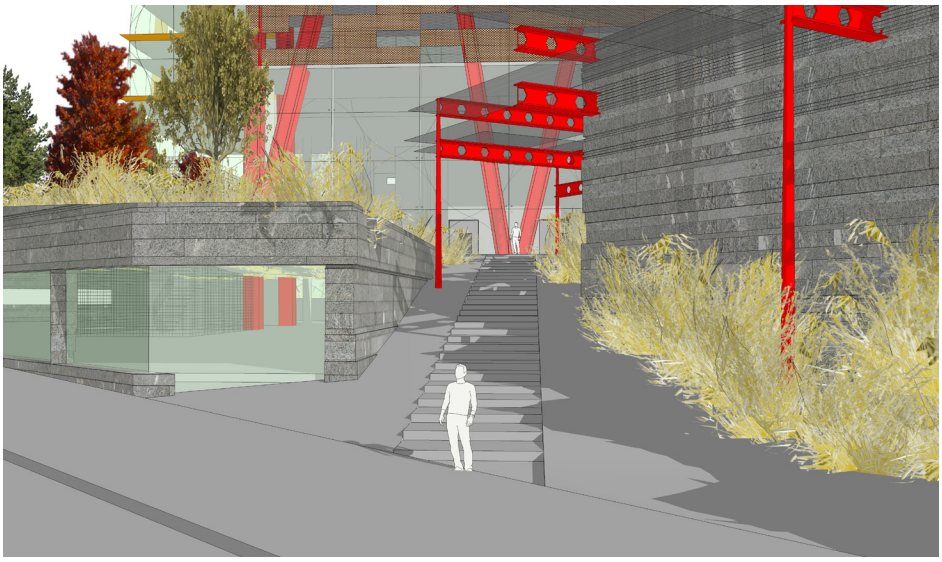


Figure 3.17 >
7th Avenue elevation
Cash, Keith, 2017



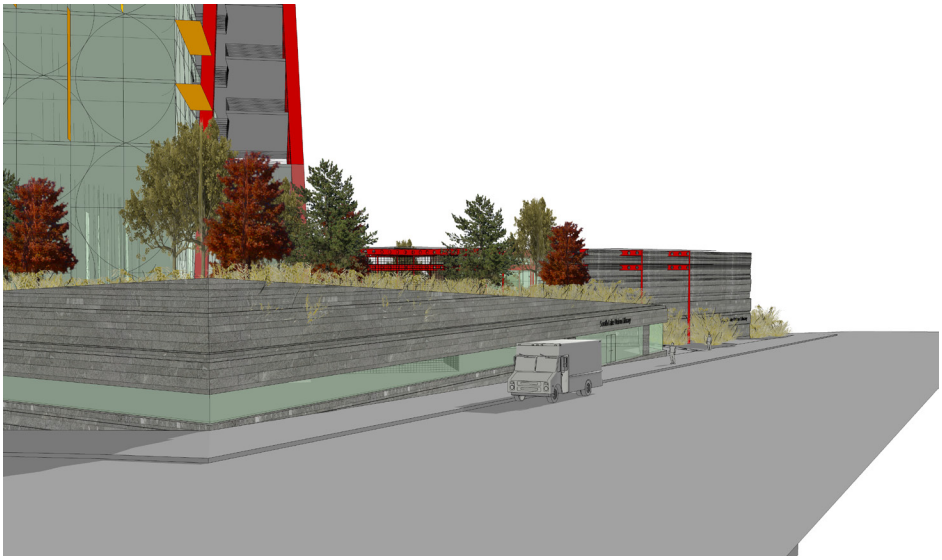
< Figure 3.18

Westlake Avenue approach
Cash, Keith, 2017



< Figure 3.19

7th Avenue approach
Cash, Keith, 2017



< Figure 3.20

Perspective looking east;
Visualization Workshop entry
Cash, Keith, 2017

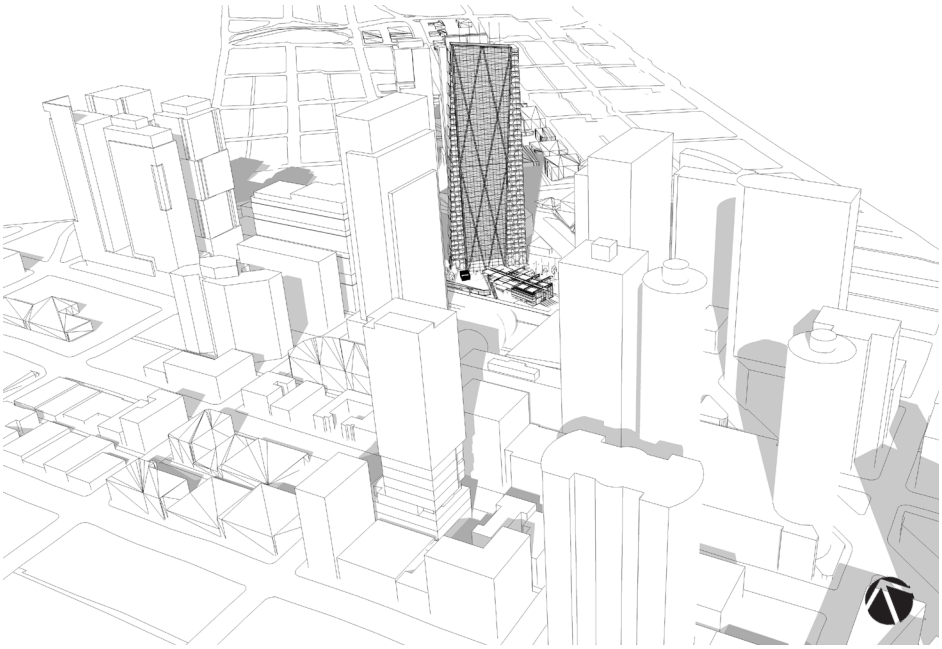
The Landscape

The South Lake Union Library program, which is primarily below grade, is covered by 66,000 square feet of open green space. The landscape is designed to promote natural literacy and reconnect people to nature through a diversity of native plantings at all scales, a vibrancy of color, a fragrant atmosphere, varying topography, natural textures, and the songs of birds and hum of bees. The landscape is also designed to blur the line between architecture and the natural environment. Nature, ever recalcitrant, coexists with the architecture on the site to highlight the important partnership and connection between humans, our creations, and the nature that surrounds us.

Figure 3.21 >
Concept palette, library roof
Cash, Keith, 2017

The Tower, Garden Levels and Meditation Space

The tower is designed to maximize the opportunity offered by the site without impacting on surrounding buildings or the amenity of the area. It is identifiable from afar, yet sits comfortably within the surrounding urban context and city skyline (Figure 3.22). The tower is more wide than deep allowing daylight to easily penetrate the shallower floor plates from three sides. In plan, the length of the central fenestrated massing faces directly south, while the majority of the opaque surfaces face north. Vertical shading devices protect the east and west façades while horizontal shading devices, in tandem with the Garden Levels, protect the south façade. The tower consists of essentially three components: the opaque service core, a rectangular massing at the north side of the structure; the fenestrated office core, a wider and slightly deeper rectangular massing connected to the service core; and the Garden Levels, a semi-open, unconditioned, narrower massing that is the primary south face of the tower.



< Figure 3.22

Bird's eye perspective over site, looking north
Cash, Keith, 2017

The service core, as the name implies, houses the tower's services. These include both the freight and passenger elevators, two stairwells, two mechanical spaces (per floor), bathrooms, and several service chases. The service core is also the structural core for the building. It is made of reinforced site-cast concrete that extends from the lowest parking level (Level P5) to the roof. It stands on a thick concrete mat which is supported by an array of deep concrete piles. The service/structural core is designed to resist both vertical and lateral loads (Figure 3.23). Thin north-facing windows, two per floor, punch through the core at regular intervals. Through these windows, views of the South Lake Union neighborhood, Lake Union, and Wallingford can be seen to the north.

The stairwells, flanking the service core, are glazed with fire-rated glass at the east and west façades respectively. From the stairwell, views east toward Capitol Hill or west toward Belltown can be seen. The service core is clad in stone native to the region, granite or similar. This stone is purposely left rough in texture, giving colorful lichen ample opportunity to take hold.

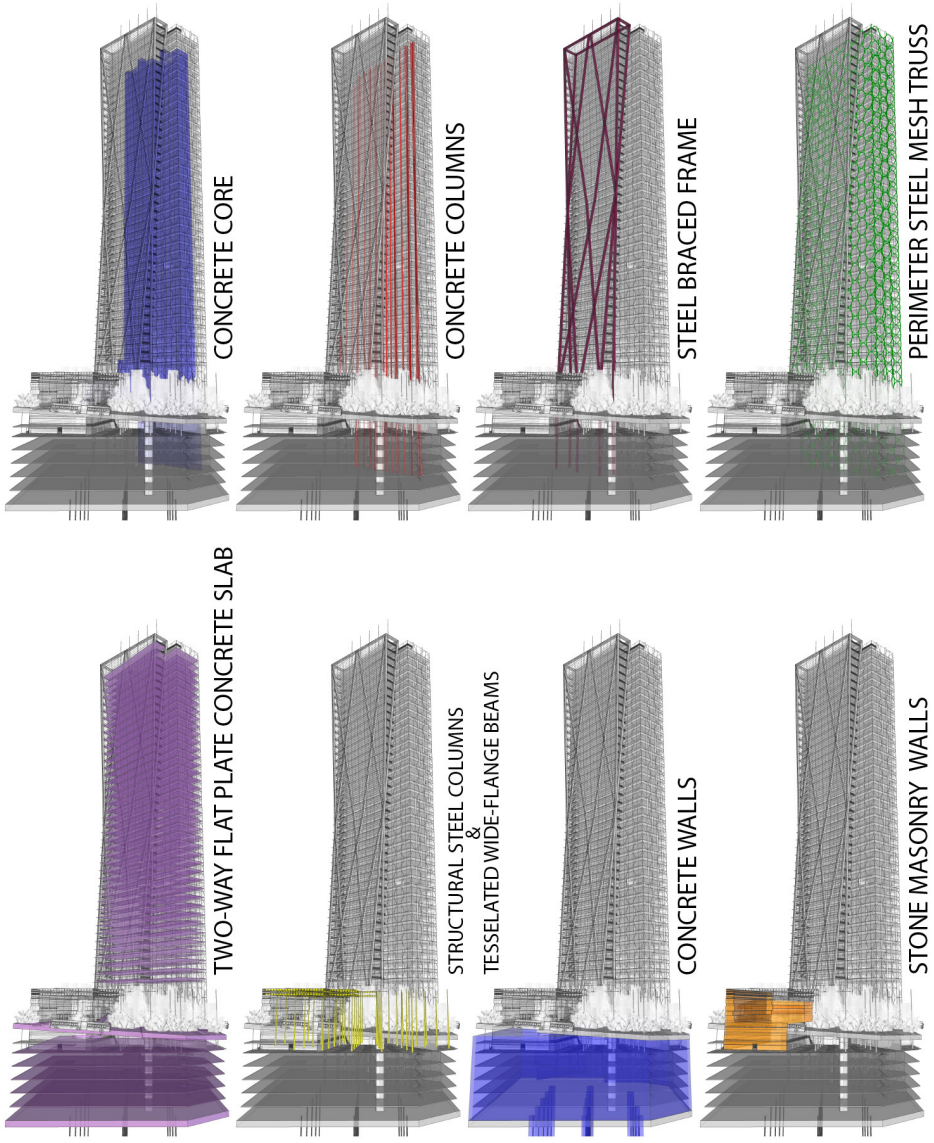
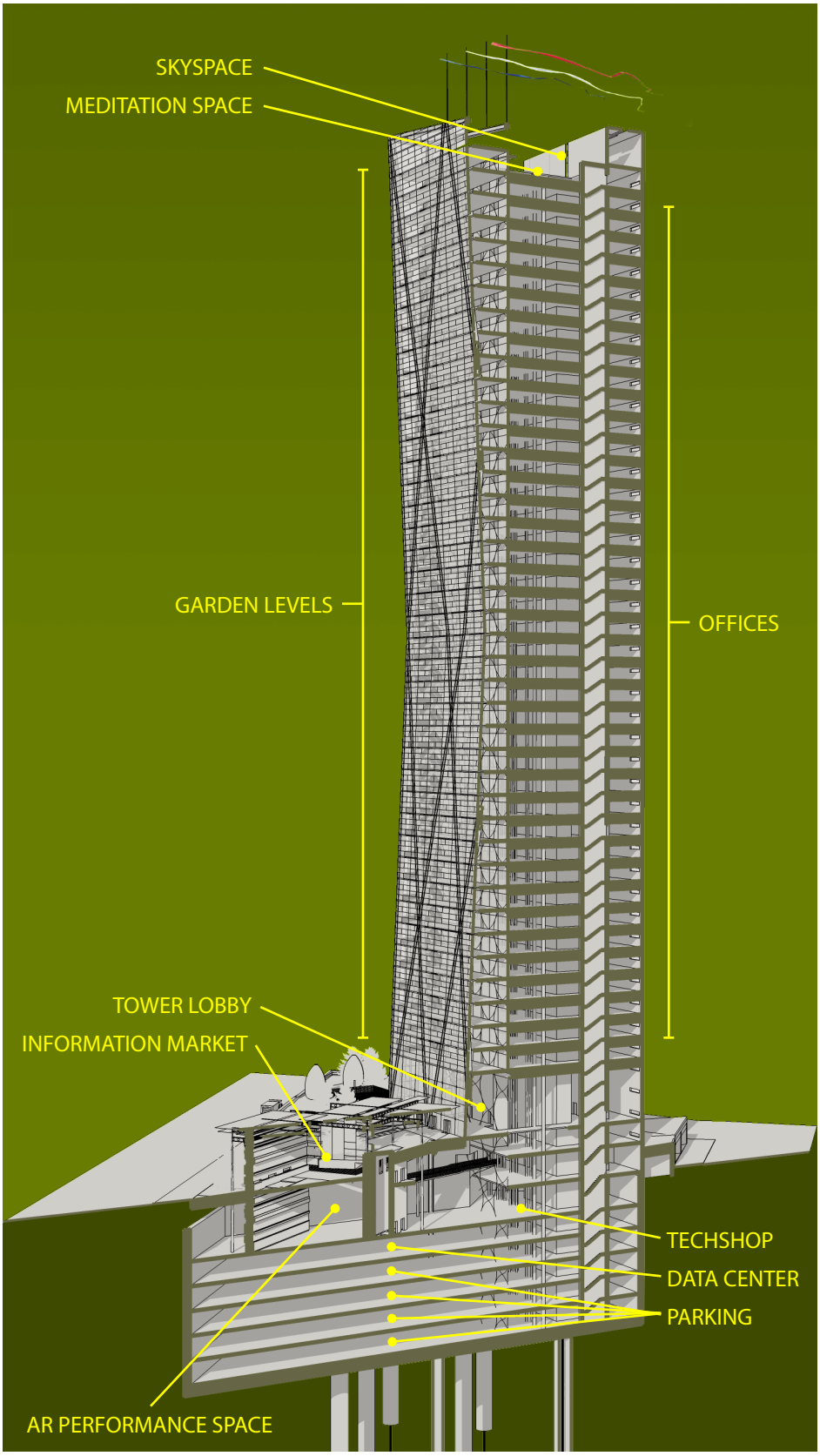


Figure 3.23 >

Structural diagram
Cash, Keith, 2017



< Figure 3.24

Building section cut, N-S
Cash, Keith, 2017

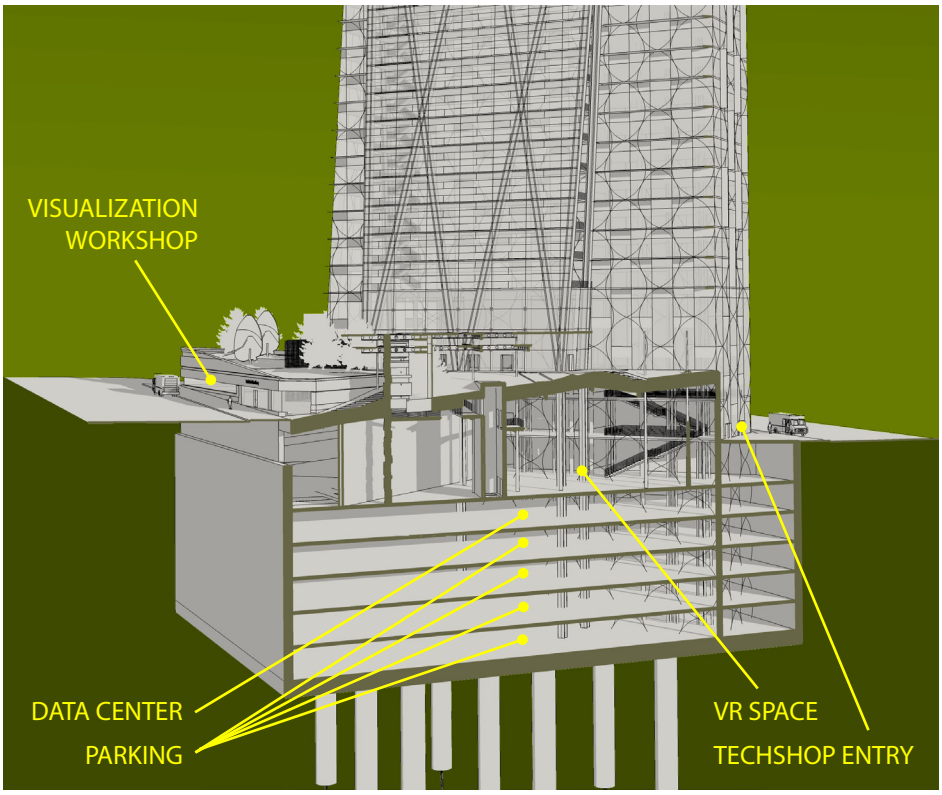


Figure 3.25 >
Building section cut, NE-SW
Cash, Keith, 2017

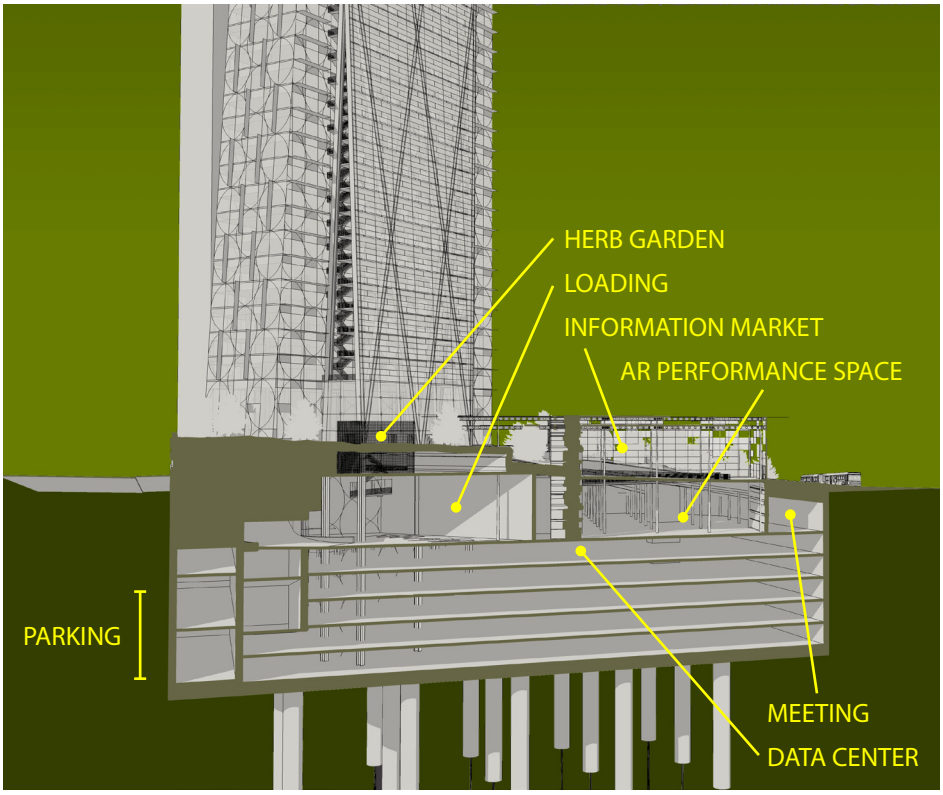
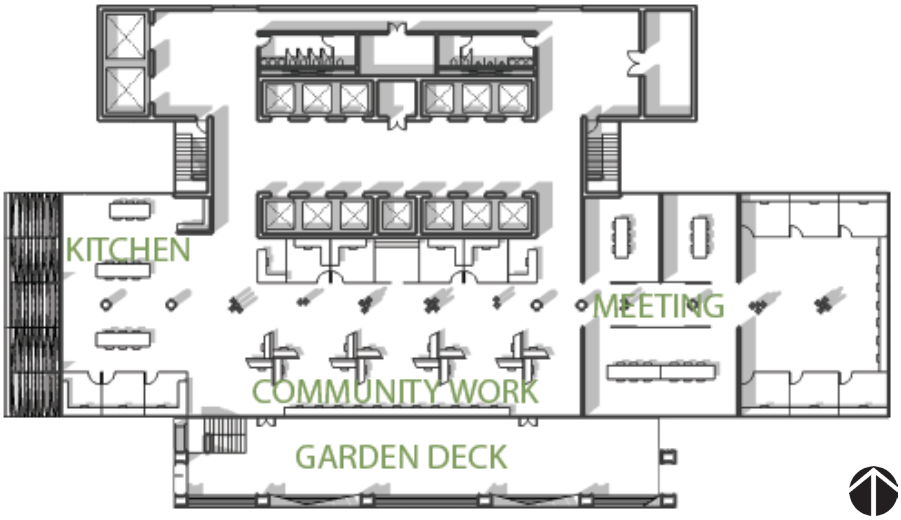


Figure 3.26 >
Building section cut, NW-SE
Cash, Keith, 2017

The office core is glazed on three sides and houses the 38 levels of office program of the tower. Sandwiched between the service core and the Garden Levels, the office core benefits from the shaded southern exposure from the Garden Levels and the thermal mass of the north-facing service core. Further internal heat gain is mitigated with shading devices on the exposed east, south, and west façades and could be improved by employing electrochromic glazing to block some or all wavelengths of light during the hottest times of year and day. Structurally, the office core is supported at the north by the service core, at the center by 13 groups of slightly canted, varying quantity, varying diameter, site-cast concrete columns that extend from the concrete mat below Level P5 to the roof, and at the east, south, and west perimeters by a structural concrete mesh/grid that extends from Level P5 to the roof as well. Two-way flat-plate concrete slabs tie into the vertical structure to create the floor diaphragms (Figure 3.23). The typical office is entered from either side of the elevator lobby.

The typical office has a mix of private offices, shared offices, community work areas, and meeting rooms (Figure 3.27 and Appendix A.3a). Additionally, there is area for reception, a kitchen, employee dining, copy services, and storage. The central, Garden Level-facing volume is a community workspace. This community workspace has two exits onto the unconditioned Garden Level for respite and repose. From the office core, through the concrete mesh/grid and/or the Garden Level, there is a 270-degree sweeping panoramic view over the city.



< Figure 3.27
Office plan (typical), L13
Cash, Keith, 2017.

Another notable feature of the office core are the wind turbines that reside within the interstitial space between floors (Figure 3.28). Located behind the exposed heavily perforated spandrel screens between each of the tower's floors from Level 3 (above the Tower Lobby) to the roof, are low cut-in wind turbines, four foot in diameter each. These turbines are designed to harness wind energy as a renewable power source for the tower. Preliminary calculations suggest that if the turbines were stacked in rows of two and wind velocities were increased using Bernoulli's principle of fluid dynamics by decreasing intake diameters, the network of efficient wind turbines at the exposed perimeter at the east, south, and west façades of the office core could in fact generate a significant amount of the building's power requirements provided the building's energy use index was maintained at 15 or below. Furthermore, Bernoulli's principle could be used to evacuate excess internal heat gain accumulated at the ceiling through the interstitial space as a passive ventilation strategy.

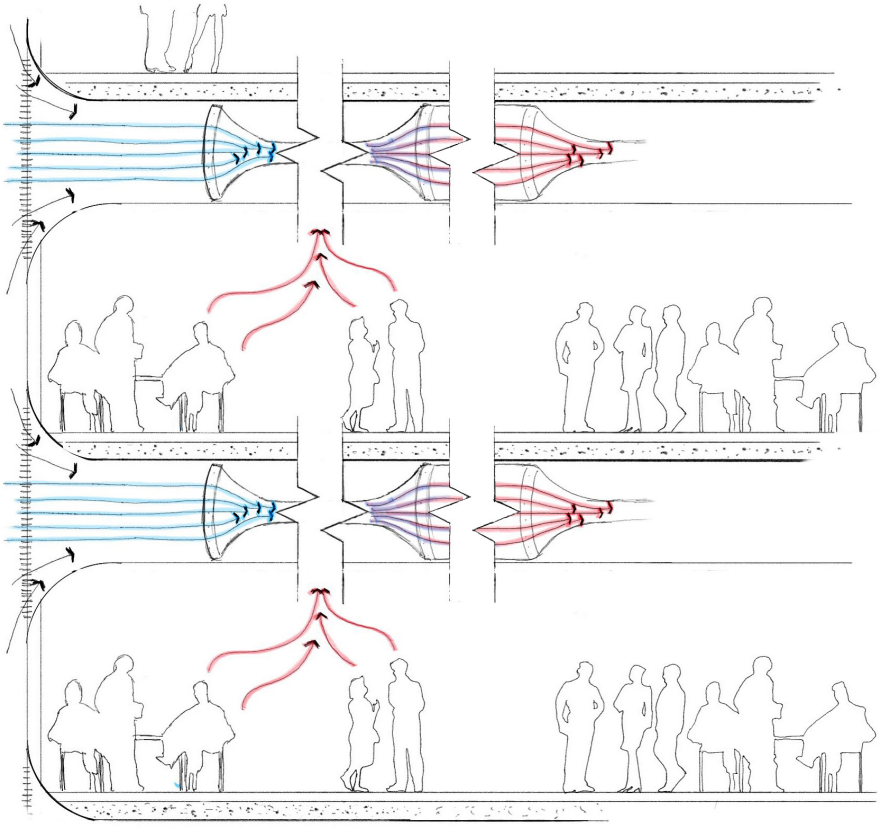


Figure 3.28 >
Wind turbine diagram
Cash, Keith, 2017.

At the top of the landscaped site sits the Tower Lobby (Figure 3.29 and Appendix A.3b). The lobby is divided into two areas: the front lobby and the back lobby. The front lobby resides underneath the Garden Level stack. This is the space that one enters into initially and is where reception, information, and the security desk are located. The back lobby is located within the service core and houses the elevators, stairwells, and bathrooms.

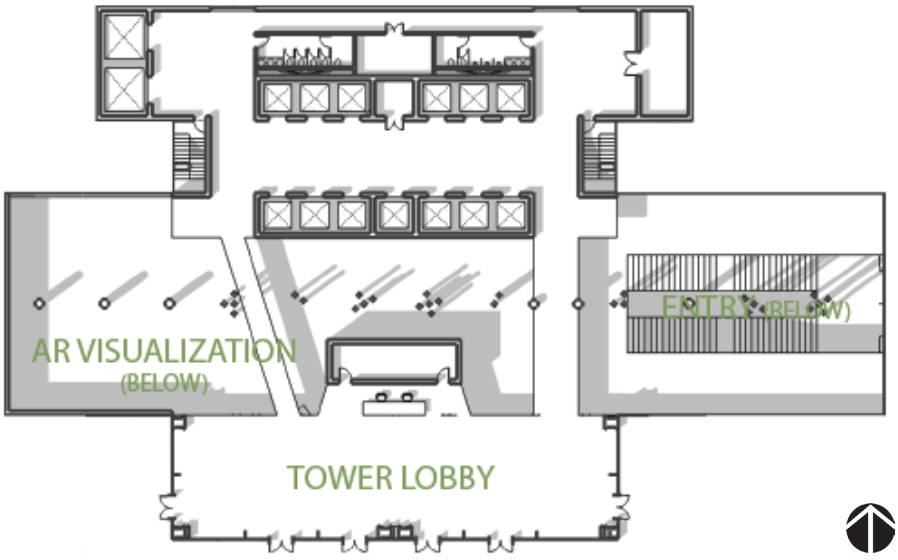
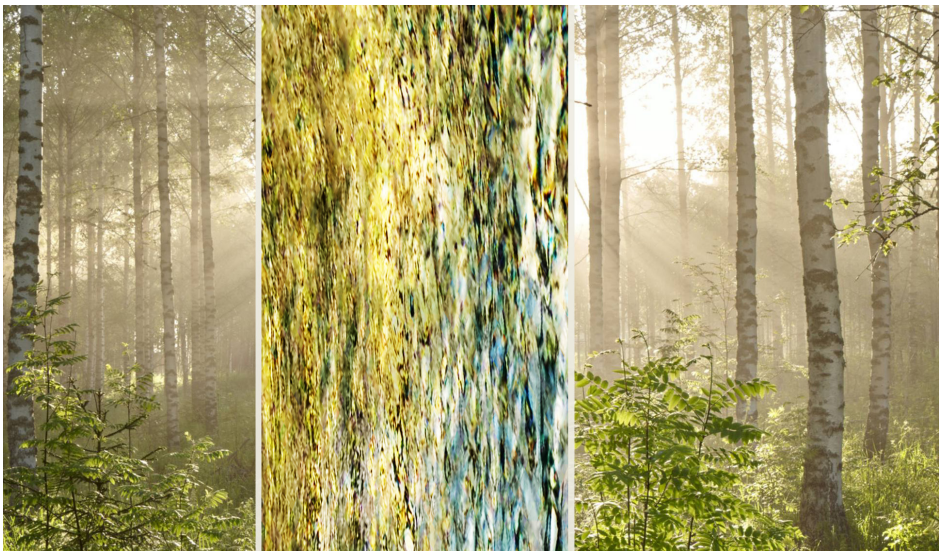


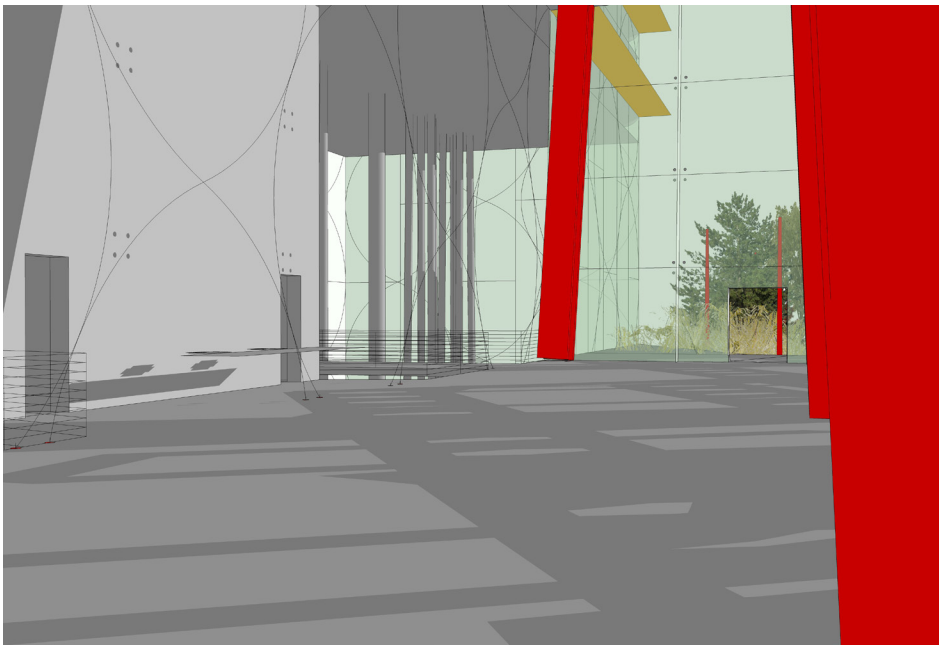
Figure 3.29 >
Tower Lobby plan, L2
Cash, Keith, 2017.

The two areas of the lobby are connected by catwalks that traverse the Visualization-Exhibition Space one level below. The Tower Lobby is a triple-height space punctuated by the stands of canted structural columns. These columns, grouped to biomimic nature, are seemingly arbitrarily arranged, but in fact are organized to brace one another and efficiently transfer loads from above without buckling (Figure 3.23). Like the offices above, the Tower Lobby is glazed on the east, south, and west sides. The structural concrete mesh/grid that supports the floors above passes through the lobby to below at the intersection between the front lobby and the open space to the Visualization-Exhibition Space. Above the front lobby hangs an iridescent chandelier reflecting and redirecting light. The organic form of the concrete mesh/grid along with the canted columns and the deciduous tree canopy visible through the lobby's windows on all sides create a palpably natural space (Figure 3.30). One can imagine the visual interest the space would have on a sunny winter day when the sun sits low in the sky and dappled, variegated light dances across the floor, over the walls, and off the thin metal strips of the chandelier hanging from the ceiling.



< Figure 3.30

Tower Lobby concept, structure and chandeliers
Cash, Keith, 2017



< Figure 3.31

Tower Lobby, rendering
Cash, Keith, 2017.

The Garden Levels are a vertical extension of the landscaped site. At 82,000 square feet in total, the Garden Levels provide more green square feet than the landscaped site. The Garden Levels commence on Level 3 and continue to the roof level. Stairs at the east and west ends of each level connect the floors to one another. Structurally, the Garden Levels are nearly free-standing, save the connection to the office tower at the concrete mesh/grid. The Garden Levels are supported on an exposed steel braced frame that penetrates through the ground plane and continues below five levels to rest on the concrete mat. The floors of the Garden Levels consist of two-way flat-plate concrete slabs connected to the vertical steel (Figure 3.23). The Garden Levels are open at the east and west ends—no enclosure—only a guard railing (Figure 3.33). The south façade or screen of the Garden Levels is characterized by a random composition of perforated weathering steel panels, quantum dot photovoltaic panels, and clear openings. The perforated weathering steel panels may be left exposed or may become the support framework for climbing vines. These panels are perforated in such a way that differing wind directions and velocities produce different audible tones—a type of natural music. The quantum dot photovoltaic panels, thanks to the quantum dot technology, can be translucent or even transparent. Solar energy collected by the matrix of embedded microscopic quantum dots is directed to the panel's frame at the periphery for harvesting, leaving the panel's field open. At the Garden Levels, these panels have a translucent, iridescent, hydrophobic/self-cleaning layer with spectral properties similar to the wing of the Morpho Didius butterfly that allows color-washed light to both refract through and reflect away and for the surface to remain perpetually clean of airborne debris at all times. Additionally, the photovoltaic panels pivot on a horizontal axis permitting adjustment to face the current position of the sun or to be used as a light shelf to bounce light into the Garden Level space. The clear openings can be left open or may be eclipsed by flowering vines.

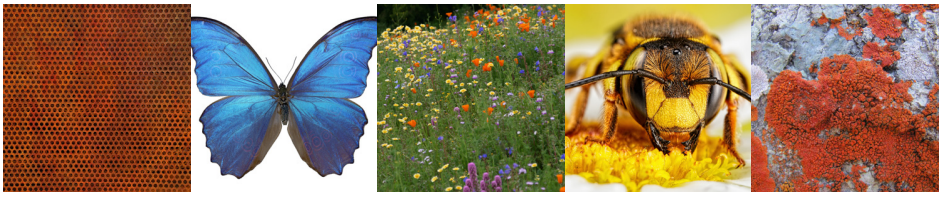
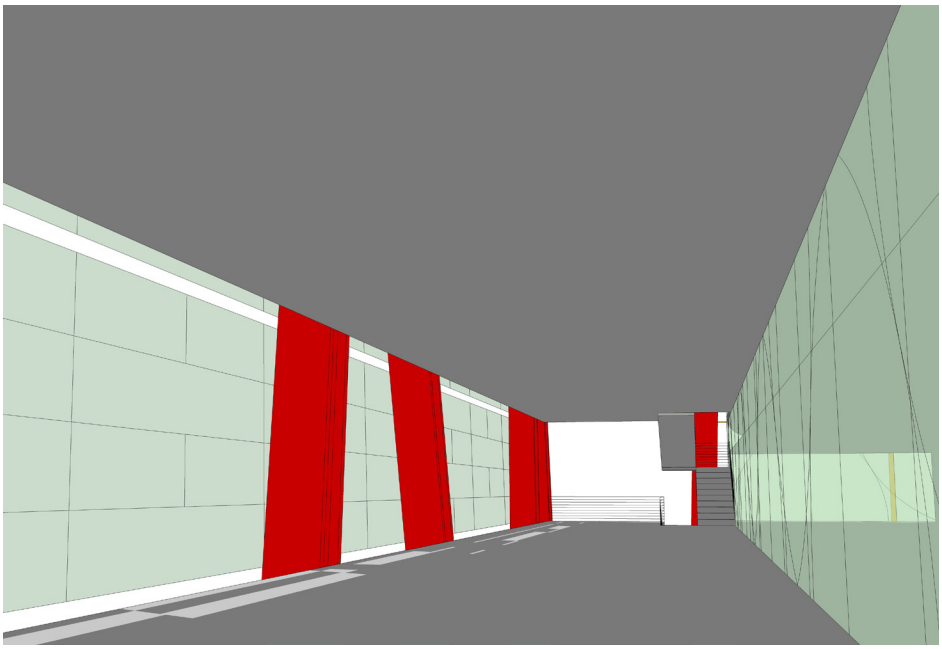


Figure 3.32 >
Concept palette, Garden Level
Cash, Keith, 2017.

On the floor of the Garden Levels is the growing area where a wide variety of native plants are cultivated. Bird and insect life teems. During the summer months the connection between the offices and the Garden Levels is open and permeable, allowing cool fragrant scents from the flowering screen and garden beds and the sounds of rustling foliage and teeming life to penetrate into the office interior. For those in the office who venture outside onto the Garden Level, the immersive experience combined with the expansive views is breathtaking.



< Figure 3.33
Garden Level, rendering
Cash, Keith, 2017.

The Meditation Space occupies the top two levels of the tower. It is the final destination or culmination of a visitor's journey to empathy and understanding on the virtual reality-physical reality spectrum at the South Lake Union Library and arguably the space that employs the least amount of technology on the site. For an individual seeking deep connection through understanding, depending on the severity of disconnection they feel currently, their journey might begin at the deepest level of the library program, the virtual reality space, where the use of technology to facilitate connection is the most intense. With practice, an individual progressively learns to connect to the world with less technology by honing skills of mental discipline and awareness. As this happens, the individual exits from full immersion or virtual reality, into partial immersion or augmented reality, into full reality at the Reading Room and then ultimately into a deep, enlightened reality at the Meditation Space.

The design concept of the Meditation Space stems from a Tibetan Buddhist worldview. This branch of Buddhism, the Dzogchen tradition as it is known, holds that reality, the reality we experience of light/energy, form/matter, movement, emotion/perception, thought and intellect is only an ephemeral veneer over true reality: the boundless primordial emptiness/space that is everything. It is from and within this vast space that the reality we know arises and disperses, spontaneously manifesting and de-manifesting. Because the notion of true reality as an infinite, referenceless, empty space stirs immediate fear in our unenlightened being, we spend our lives chasing form in belief that it will consolidate our sense of self, when in truth, it does just the opposite. The Dzogchen tradition asserts that the reality we know is comprised of five inseparable elements: earth/matter, water/bonds/connections, fire/energy, wind/movement and space/emptiness or everything that is not. While these elements are fleeting and in constant flux, they are a gateway for us to know the true reality beyond what we think we know and thereby achieve pure awareness or enlightenment and peace. In this way, the Dzogchen worldview provides visitors with a framework to connect the digital reality that we increasingly inhabit, but struggle to comprehend, via our physical reality, to the cosmic true reality (Gareth, "Institute for Ethics and Emerging Technologies.").

Figure 3.34 >
The five elements
Unknown, 2017

The five elements or gateways to awareness—earth, water, wind, fire and space—occupy separate but connected areas in the Meditation Space, metaphorically symbolizing the reality we know and providing visitors a path through higher consciousness to connect to a deeper, more universal reality where subjective needs and desires vanish as we discover that I am you and you are me and we are everything.

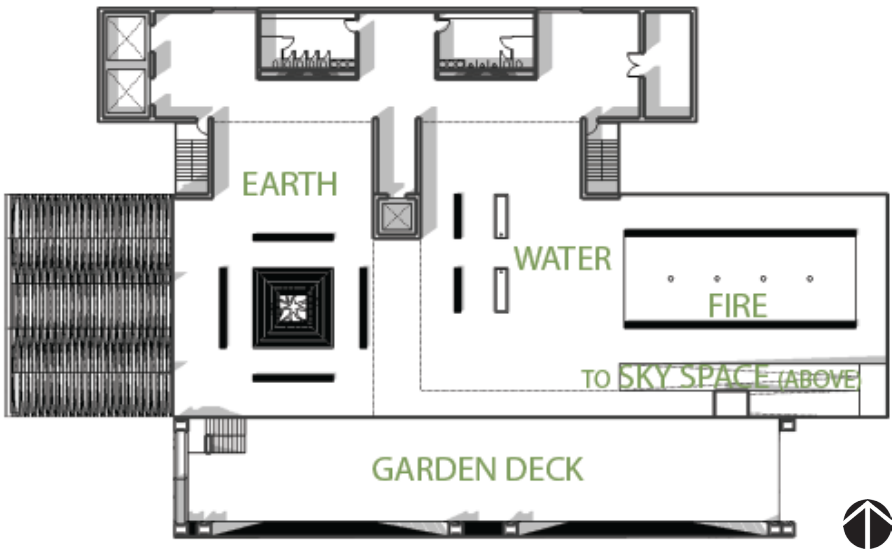
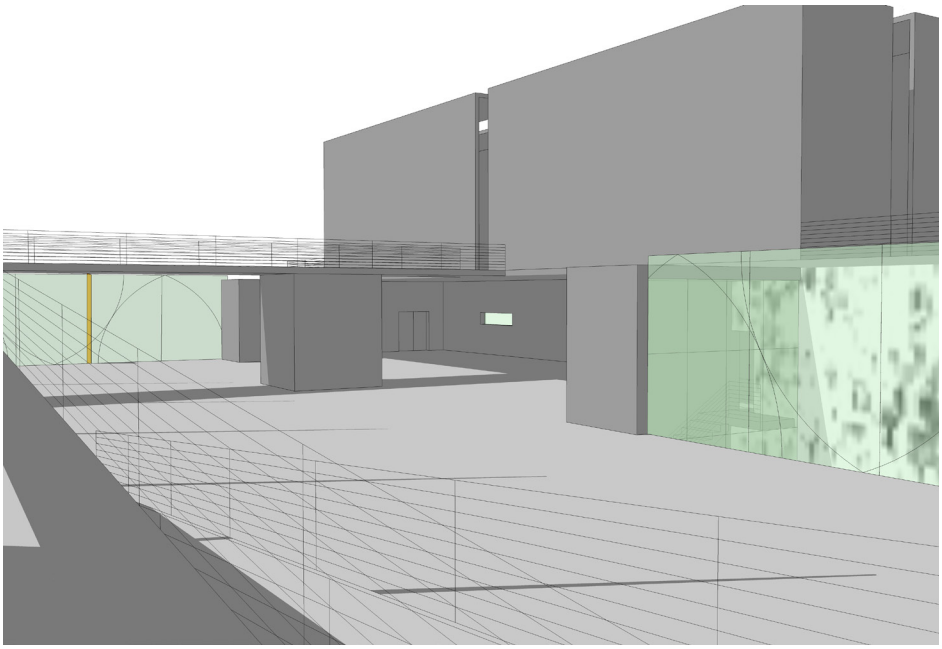
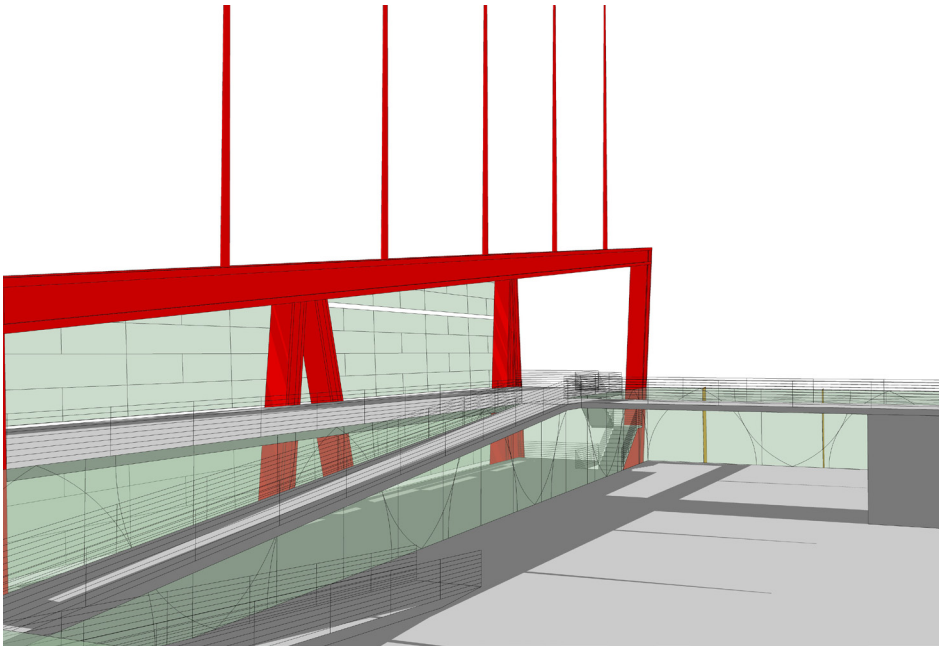


Figure 3.35 >
Meditation Space plan, L42
Cash, Keith, 2017



< Figure 3.36
Meditation Space, rendering, looking northwest
Cash, Keith, 2017.

On Level 42, the lower of the two levels of the Meditation Space, visitors exit the elevator into a narrow, covered corridor that leads to the vestibule for the men's and women's changing rooms (Figure 3.35 and Appendix A.2b). Opposite this changing vestibule, visitors leave the covered area into either the earth gateway at the west, an open space with benches and a raised wooden deck surrounding a solitary tree at its center, or the water gateway at the east, an open space with two benches facing matching linear water features. From either space, visitors proceed east to the fire gateway where four flames calmly flutter from a smooth bed of sand. Long benches capture the space at the north and south sides (Figure 3.36).



< Figure 3.37
Meditation Space, rendering, looking west
Cash, Keith, 2017.

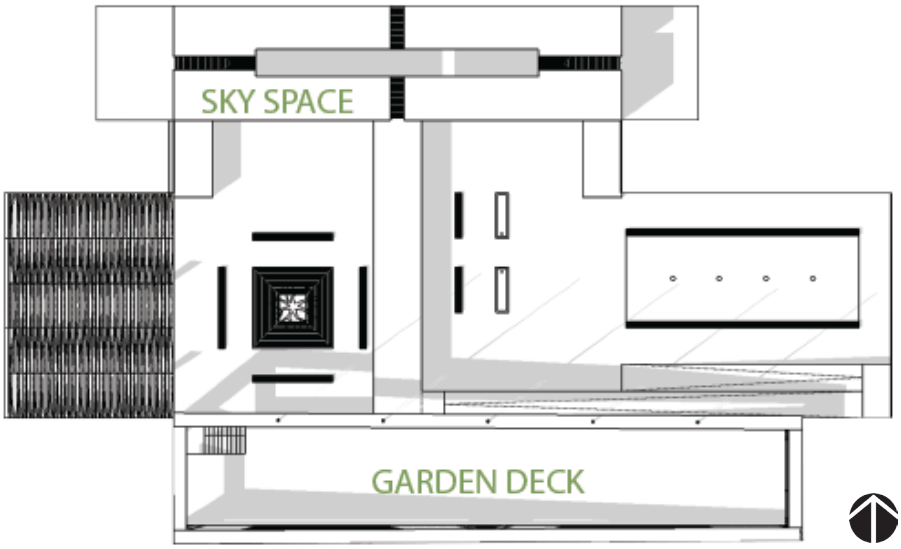
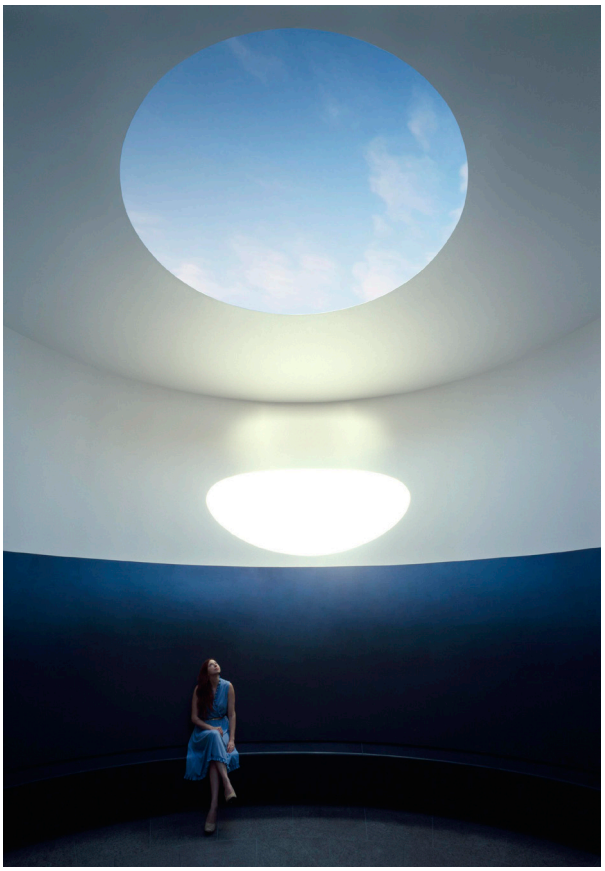


Figure 3.38 >
Meditation Space plan, L43
Cash, Keith, 2017

To the south of the fire gateway visitors can follow a ramp that switchbacks to Level 43 where a bridge connects to the sky gateway, an enclosed rectangular volume with a long, narrow ceiling aperture intersected by slits originating from the four sides of the structure (Figures 3.37, 3.38 and Appendix A.2a). At the center of this enclosure, directly under the ceiling aperture, stands a shallow pool of water. A wooden deck surrounds the pool. At the exterior of the enclosure, on the east and west ends, are two viewing platforms from which to observe the urban landscape below.

Figure 3.39 >
Skyspace concept
University of Texas, Austin
Turrell, James, 2014



< Figure 3.40
Views diagram
Cash, Keith, 2017.

The Visualization Workshop and Exhibition Space

At the base of the tower, one level below the Lobby in the same triple-height volume, is the Visualization-Exhibition Space (Figure 3.41 and Appendix A.4). There are four ways to access the Visualization-Exhibition Space: the stairway leading in from the entry off of 8th Avenue, the ramp originating from the Library Reading Room, the pass-through from the Visualization Workshop to the south and/or from the elevators at the back of the Lobby above. The Lobby consists of a front lobby and a back lobby connected via two catwalks that pass over and through the Visualization-Exhibition Space (Figure 3.42). From these catwalks, visitors and office workers in transit to floors above can view and possibly interact with virtual art installations and active research that dynamically occupies either part of or the entire height of the space. The Visualization-Exhibition Space, as the name implies, is designed for visualizing highly complicated data sets and exhibiting virtual creations in a collaborative atmosphere. It is a space for overcoming limitations of complexity where the power of computer computation merges with the application-of-meaning power and emotional intelligence of humans.

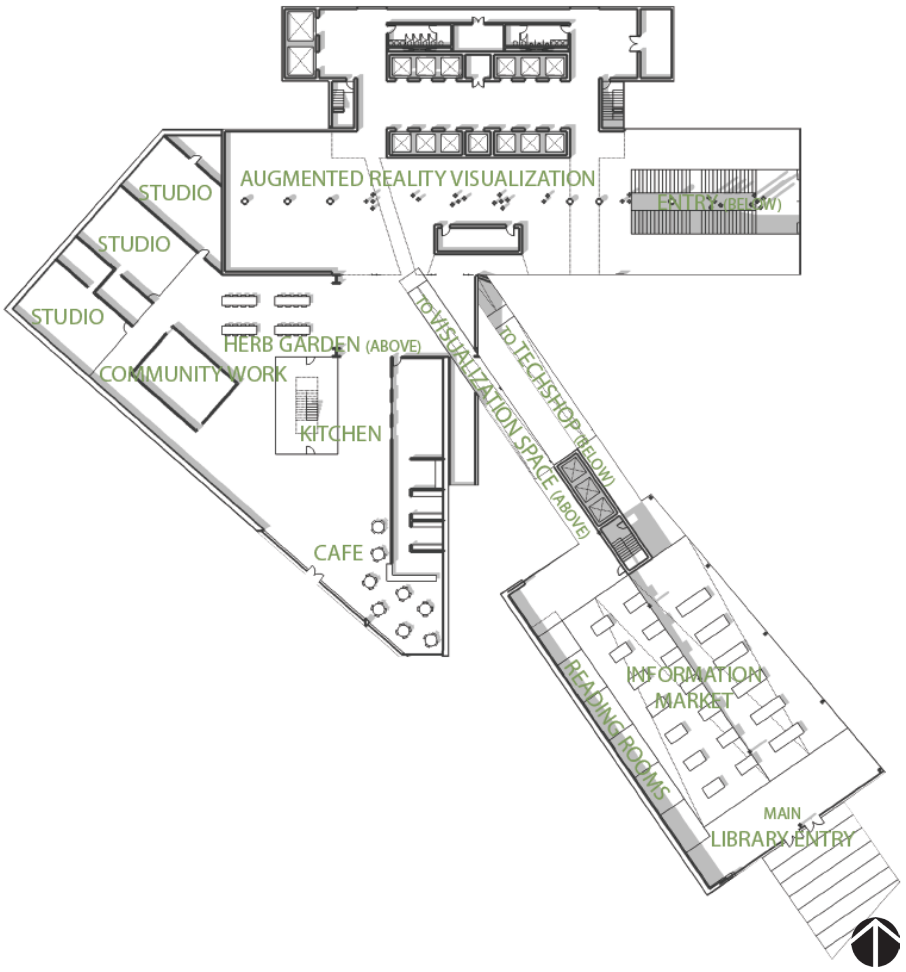
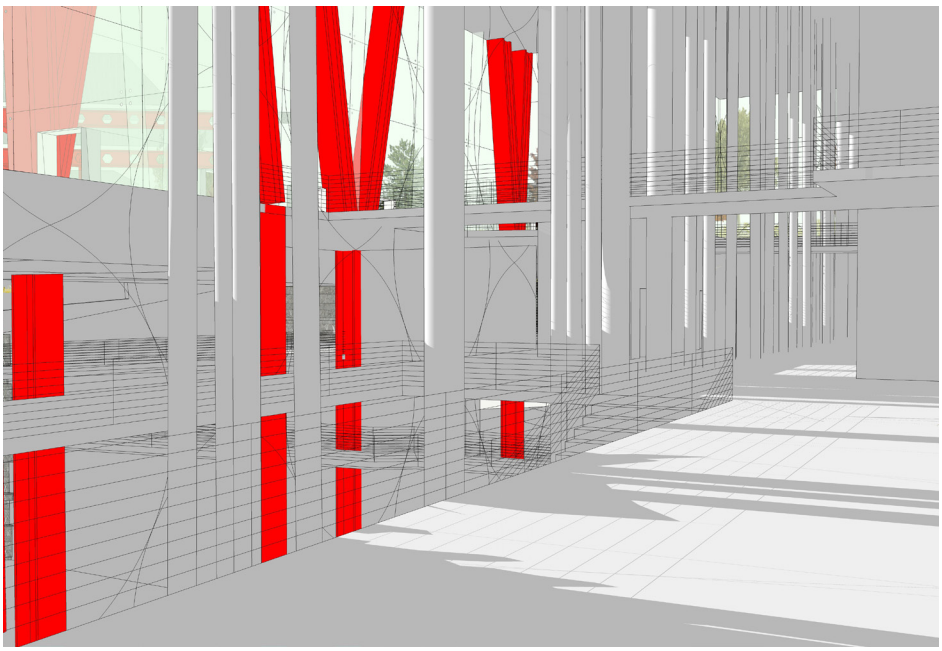


Figure 3.41 >

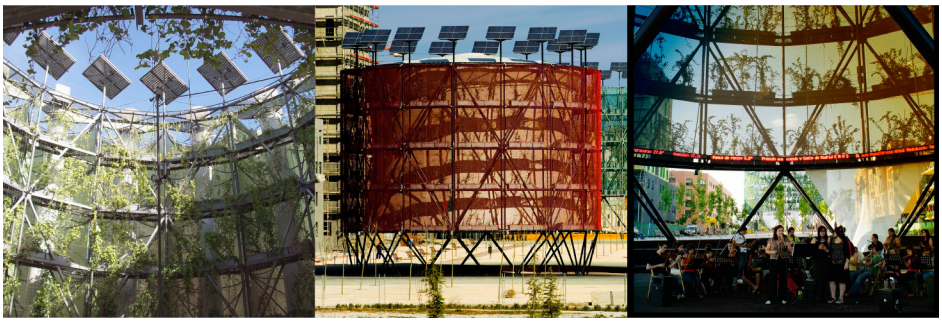
Visualization Level plan, L1
Library (main) Entry plan, L.5
Cash, Keith, 2017

Figure 3.42 >

Visualization Level, rendering, looking west
Cash, Keith, 2017



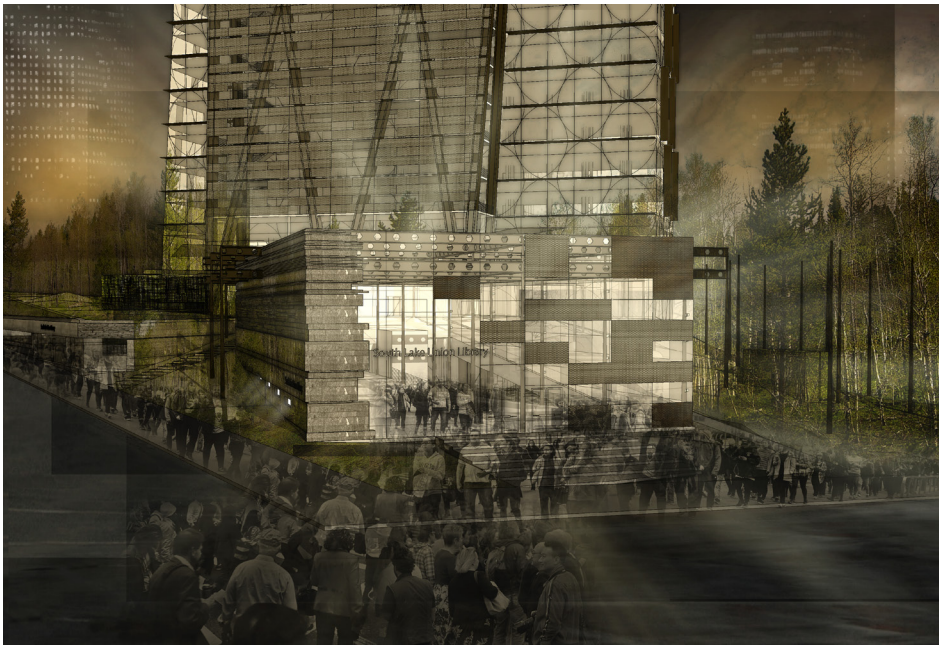
Much of the preparation and support work for the big-data computations and virtual installations conducted in the Visualization-Exhibition Space occurs in the Visualization Workshop. The Visualization Workshop, a single-height volume, is located directly to the south of the Visualization-Exhibition Space underneath the roof garden at the corner of 7th Avenue and Blanchard Street. The two spaces are connected via an open pass-through adjacent the ramp leading to the Reading Room. The Visualization Workshop houses artists' studios, private and public community work areas, a café, kitchen and enclosed herb garden. The café, located next to the 7th Avenue entry, is more than just an amenity for library visitors and office workers; it is a welcome stop for passersby on the street as well. The café is served by a connected kitchen, the herb garden at the center of the Visualization Workshop and a rooftop garden (Figure 3.43). The herb garden is an enclosed, unconditioned volume that connects the kitchen to the rooftop garden. As part of the library program, the kitchen, herb and rooftop garden are community resources where on-premise growing systems and the culinary arts can be observed and practiced and in so doing, reconnect people with nature, food and each other through shared experience.



< Figure 3.43
Herb garden concept
Ecosistema Urbano, 2008
Eco Boulevard, Madrid, Spain.

The Library Reading Room and Information Market

For most people visiting the South Lake Union Library, you will enter the library at the corner of 7th Avenue and Lenora Street, directly into the Reading Room and the Information Market (Figures 3.41, 3.44 and Appendix A.4).



< Figure 3.44
Library (main) Entry, rendering
Cash, Keith, 2017.

The Information Market is not unlike most markets: there are market stalls with people of all ages perusing, discussing and transacting. The atmosphere is alive with the din of conversation and activity. Variegated natural light washes over the space, emanating through the translucent photovoltaic array on the roof and the patchwork of perforated metal and glazed panels that form the walls. While technically enclosed, the Information Market is actually an outdoor market as the perforated walls allow air to naturally flow through the forty-foot tall space. What distinguishes the Information Market from other markets however, is that en lieu of selling raw goods, the Information Market is a place for the free exchange of knowledge and information. This information might be exchanged in a hardcopy format (i.e. the book or digital drive) or it might be exchanged virtually in an augmented reality environment where virtual objects embedded with information are both handled like objects in physical space adhering to physical laws or objects in hyperspace where anything is possible. In this environment, even select market stalls and some of the librarians would be virtual, visiting the Information Market virtually from another library across the globe.

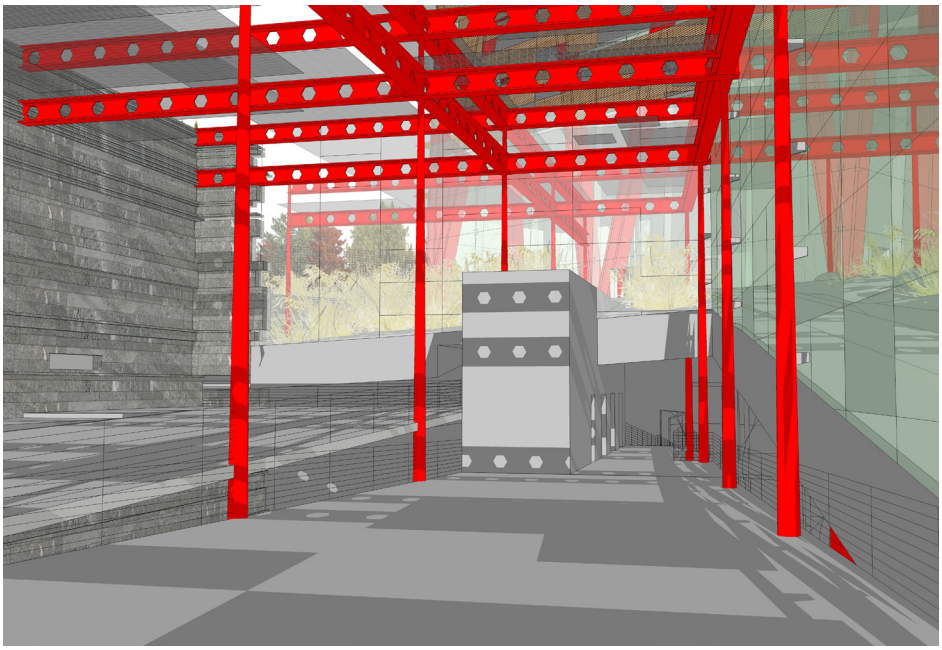
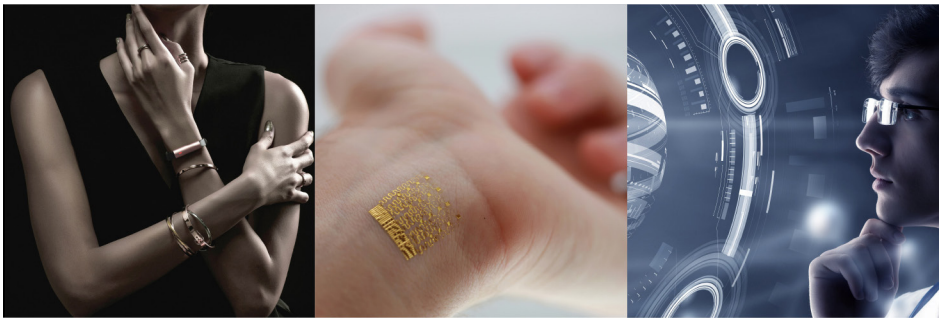


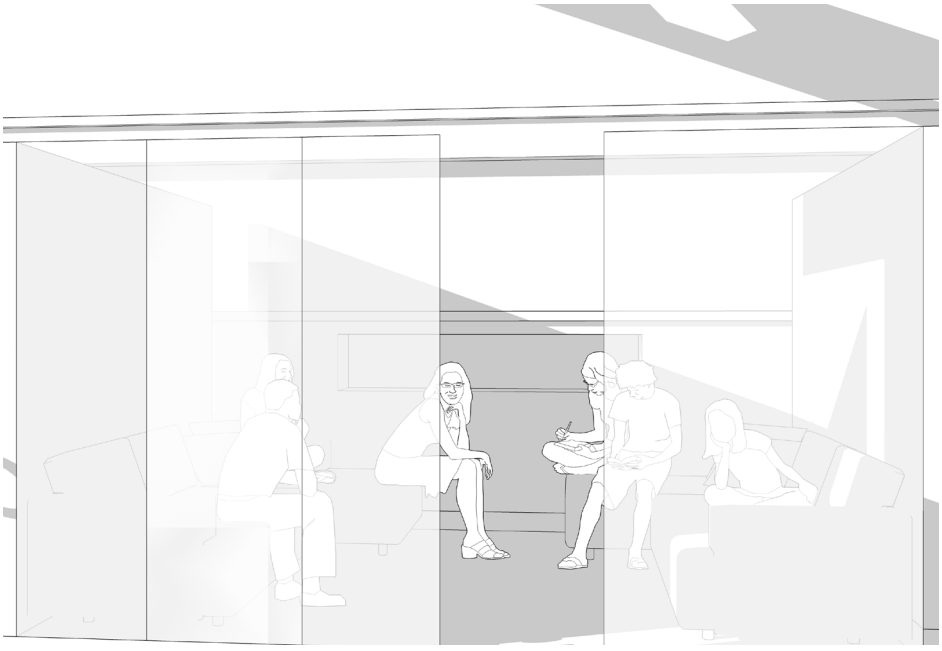
Figure 3.45 >
Information Market, rendering
Cash, Keith, 2017

Tapping into the breadth and depth of the Information Market requires a device to connect the visitor's sensory faculty to virtual stimuli. This device might be something as simple as AR-enabled glasses with earbuds allowing a visitor to see and hear the virtual world, or it could be something more elaborate like an item of wearable technology, such as a bracelet or necklace, or even an temporary electronic tattoo that interfaces directly with an individual's sensory system (Figure 3.46). There are many discreet and fashionable methods to connect, but the key point is that once the connection is made, the virtual world will be as tangible as the real world itself as an individual's sense of sight, smell, hearing, taste, and touch are all engaged.



< Figure 3.46
Concept for connectivity:
wearable technology,
electronic tattoo,
AR glasses
Cash, Keith, 2017.

The Reading Room and the Information Market share the same hall. As visitors enter the library, they have a choice to go left and proceed up the ramp through market stalls past the Reading Room en route to the Visualization-Exhibition Space or go right and proceed down the ramp through market stalls en route to the Techshop, Augmented Reality Performance Space and Virtual Reality Space (Figure 3.45). The Reading Room is a not a room per se, but a series of partially enclosed alcoves organized in a terraced fashion against the stone wall at the west side of the library entry hall (Figure 3.47). Each alcove is furnished with comfortable lounge-style seating and lower color temperature task lighting to create a slightly warmer ambience. There is a small window in each alcove to provide readers with a view to the street. The Reading Room benefits from the thermal mass of the stone wall at west that mitigates large diurnal and seasonal temperature fluctuations. Similarly, the orientation of the entire library entry hall gives both the Reading Room and the Information Market access to softer morning light while protecting it from the harsher afternoon sun.



< Figure 3.47
Reading Room, rendering
Cash, Keith, 2017.

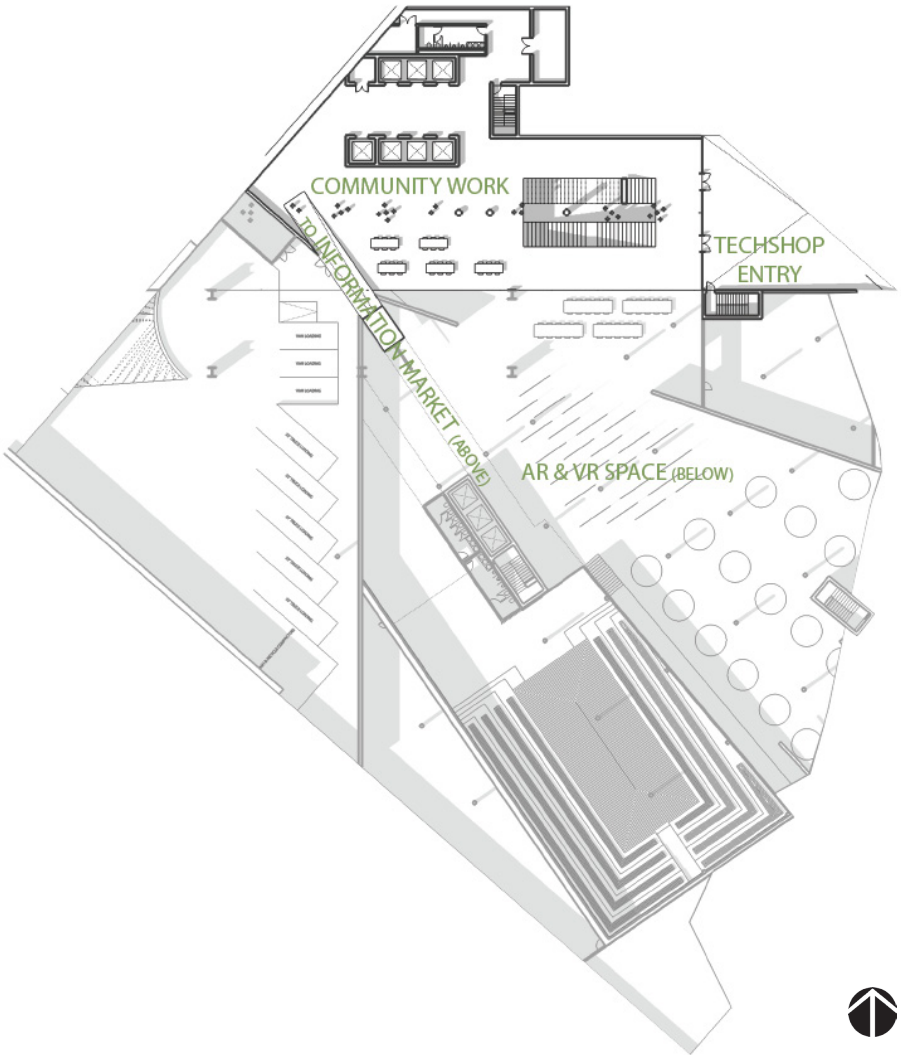
Like most of the spaces at the South Lake Union Library, the Reading Room and the Information Market are designed to connect people to one another and to reconnect them to the natural world. Basic curiosity, the pursuit of understanding and the desire to be truly intersubjective beings brings people to the market to meet others—to meet the world in effect. But the space offers more than that. On any late spring day when the air is cool and the patter of rain drops on the solar array overhead competes with the hum of market conversations for attention while the sun sneaks a ray from

between the clouds through the hall's perforated cladding, the atmosphere of the Information Market is intoxicating. The space brims with culture from every corner of the world, and despite the myriad of apparent differences between people, one feels the strong heartbeat of healthy community. Through empathy and understanding, new concepts are learned that give birth to novel ideas innovations, allowing in one small space the ordinary to coexist with the extraordinary.

The Techshop

The Techshop is the bridge between theory and reality where vision is applied to create the tangible. It is a place to experiment, brainstorm, be interrupted, take risks and find community. The Techshop occupies two levels at the South Lake Union Library: the ground level at the 8th Avenue entrance, Level 1, and the level just below, Level 0 (Figure 3.48 and Appendix A.5 and A.6). The two levels are connected via a grand stairway that continues further up to the Visualization-Exhibition Level. They are also connected via the office tower's elevator core. Access to the Information Market is possible from the ramp that terminates on Level 1. Access to the Virtual Reality Space is possible through the pass-through from the Techshop on Level 0. From Level 1, and from the Visualization-Exhibition Level one level above, vantage over the Virtuality Reality Space is possible from the balcony.

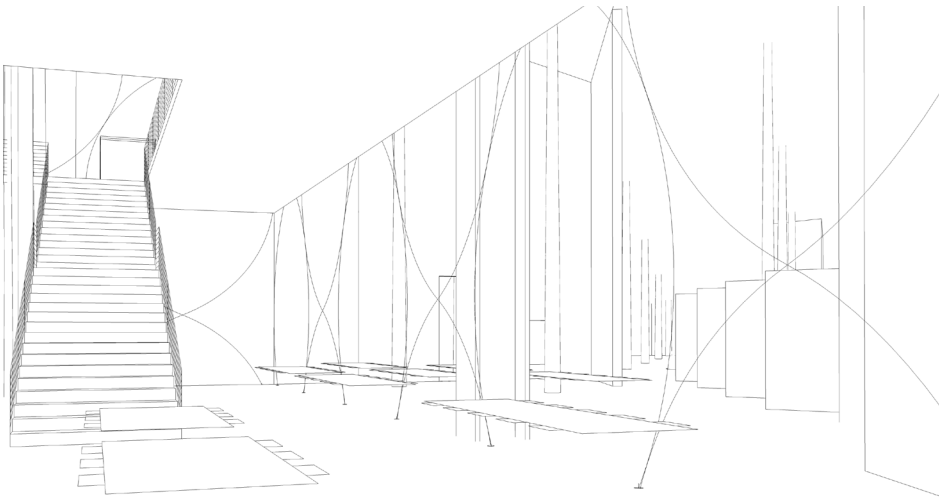
Figure 3.48 >
Techshop Entry plan, L0
Cash, Keith, 2017



As one enters the Techshop from 8th Avenue, the most likely entrance for those visiting the Techshop, they enter into a tall lobby that is actually part of the same volume that the Visualization-Exhibition Space and Tower Lobby share. Directly ahead is the stairway that leads either up to the Visualization-Exhibition Space or down to the lower level of the Techshop. The two flights of stairs are separated by the line of structural columns supporting the tower. To the left or south of the stair is a walkway that leads to a community work area—one of the quieter places to work on a project in the Techshop. From this walkway, over the balcony, visitors can take a break to observe the Virtual Reality Space. If visitors continue through the community work area, they will arrive at the bottom of the ramp the ascends to the Information Market.

Most visitors to the Techshop will head immediately down the stairway to the lower level of the Techshop which houses all of the fabrication shops: wood, metal, textiles, as well as an additional community work area. The Loading Bay/Shipping and Receiving is accessed at the far west end of the space.

The Techshop is similar to other maker spaces except that it heavily incorporates the use of augmented reality to teach (and practice) fabrication concepts within the typical shop workflow. For example, for a student just learning to use the tablesaw, a tool notoriously dangerous to operate, especially for the inexperienced, augmented reality is used to teach the necessary lessons without the risk of bodily injury, damage to the machinery or waste of material. Augmented reality, in this way, in tandem with traditional instruction in real space, is used to teach students the breadth of fabrication virtually, using virtual machines, virtual materials and virtual instructors.



< Figure 3.49

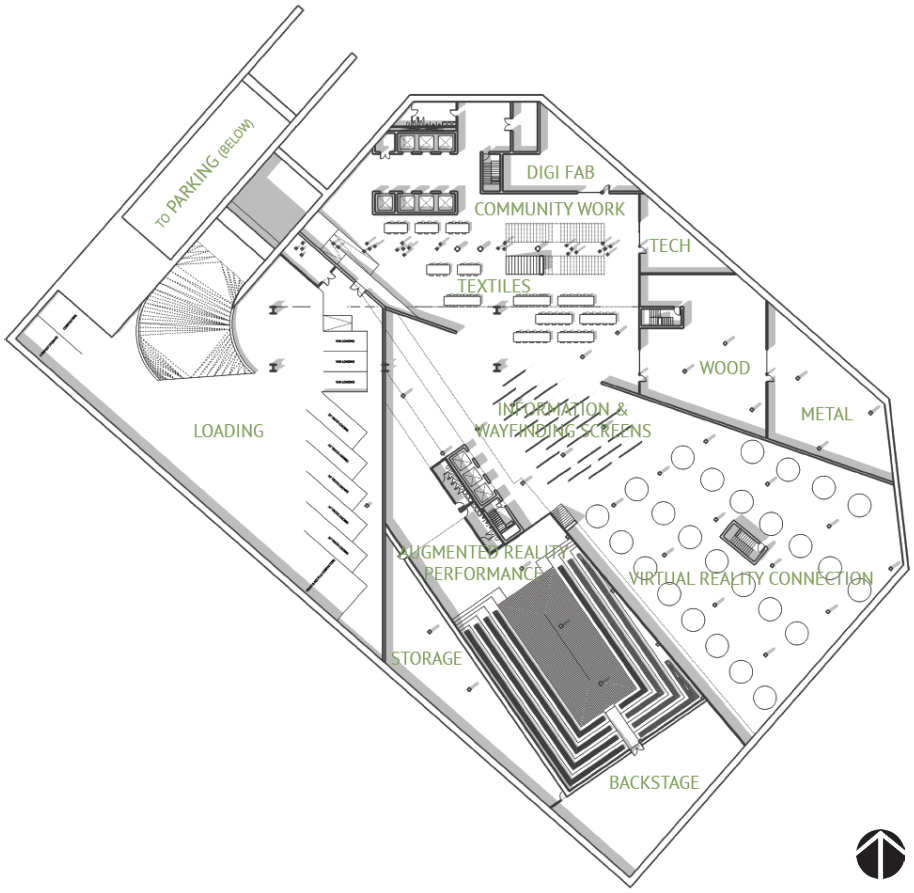
Techshop, rendering
Cash, Keith, 2017.

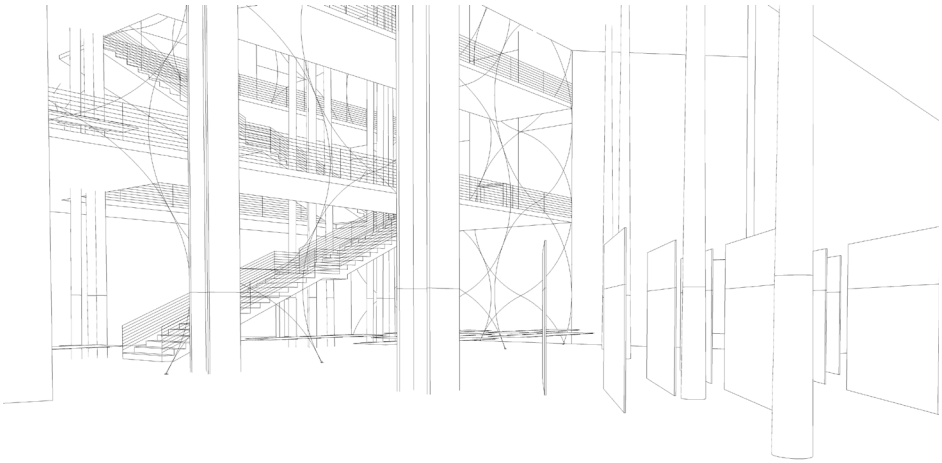
Whether they learn virtually or through traditional methods, students using the Techshop learn the nature of and a respect for materials, connections, assembly, sequence, and collaboration, and in so doing, connect to one another more deeply through experience.

The Augmented Reality Performance Space and Virtual Reality Space

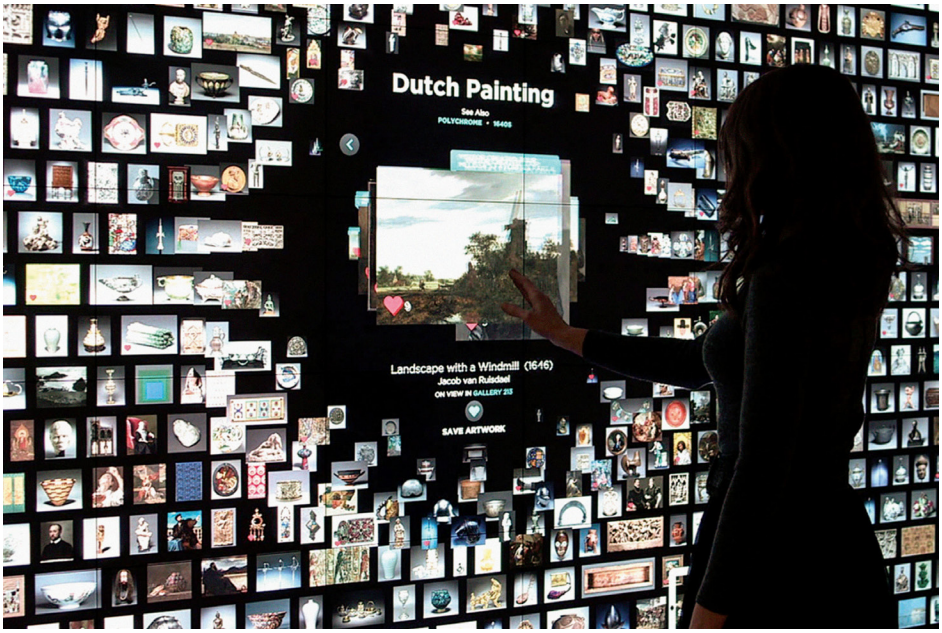
Arguably the most important component of the South Lake Union Library program is the Augmented Reality Performance Space and Virtual Reality Space (Figure 3.50 and Appendix A.6). It is within these two spaces that the majority of the library's content—at least the content meant to be consumed on the library premises—is enjoyed. The Augmented Reality Performance Space and Virtual Reality Space are on the same level, Level 0, approximately twenty feet below grade at the lowest point (the ceiling over Level 0 follows the contour of the site's grade producing a variable-height space that is taller in the middle than at the perimeter). To get to the Augmented Reality Performance Space and Virtual Reality Space, one either enters through the Information Market down the ramp and into the elevators, or by way of the stairway in the Techshop lobby off of 8th Avenue. Visitors can also use the elevators from the parking garage or the office tower's lobby to get to the spaces. The best approach, however, will be through the Information Market, using the ramp and elevators to arrive at the information and way-finding screens in the Virtual Reality Space (Figure 3.51). Once here, visitors use the screens to locate, schedule, and initiate immersion. They then can make their way into either the Augmented Reality Performance Space or to one of the positions in the Virtual Reality Space to immerse.

Figure 3.50 >
Techshop + AR + VR, plan, L-1
Cash, Keith, 2017





< Figure 3.51
View toward information screens
Cash, Keith, 2017.



< Figure 3.52
Concept for information screens
Cash, Keith, 2017.

The Augmented Reality Space and Virtual Reality Space are no different in design intent from the other library spaces: they are designed to deeply connect people to each other and to nature. This intent is immediately obvious once one exits the elevator into the Virtual Reality Space. The tall ceiling seems to undulate across the room, giving visitors the impression that they are standing in some underground grotto rather than a public library. Tapered concrete columns rise from the floor to pierce the ceiling structure like colossal stalagmites. Around these ruptures, light pours in, glancing off the columns' faces to reveal the rough texture of aggregate. On rainy days, raindrops fall through these ceiling/roof openings to the floor, reverberating the sound of the rainfall off the walls of the room. Occasionally, rays of sunlight will shine through the roof apertures to illuminate and transform the falling drops into a shimmering curtain. At other

parts of the ceiling, long, varying-length strands of fiber-optic cables hang over the space in root-like bunches channeling natural light from the rooftop into the depths of the interior (Figures 3.53 and 3.54).

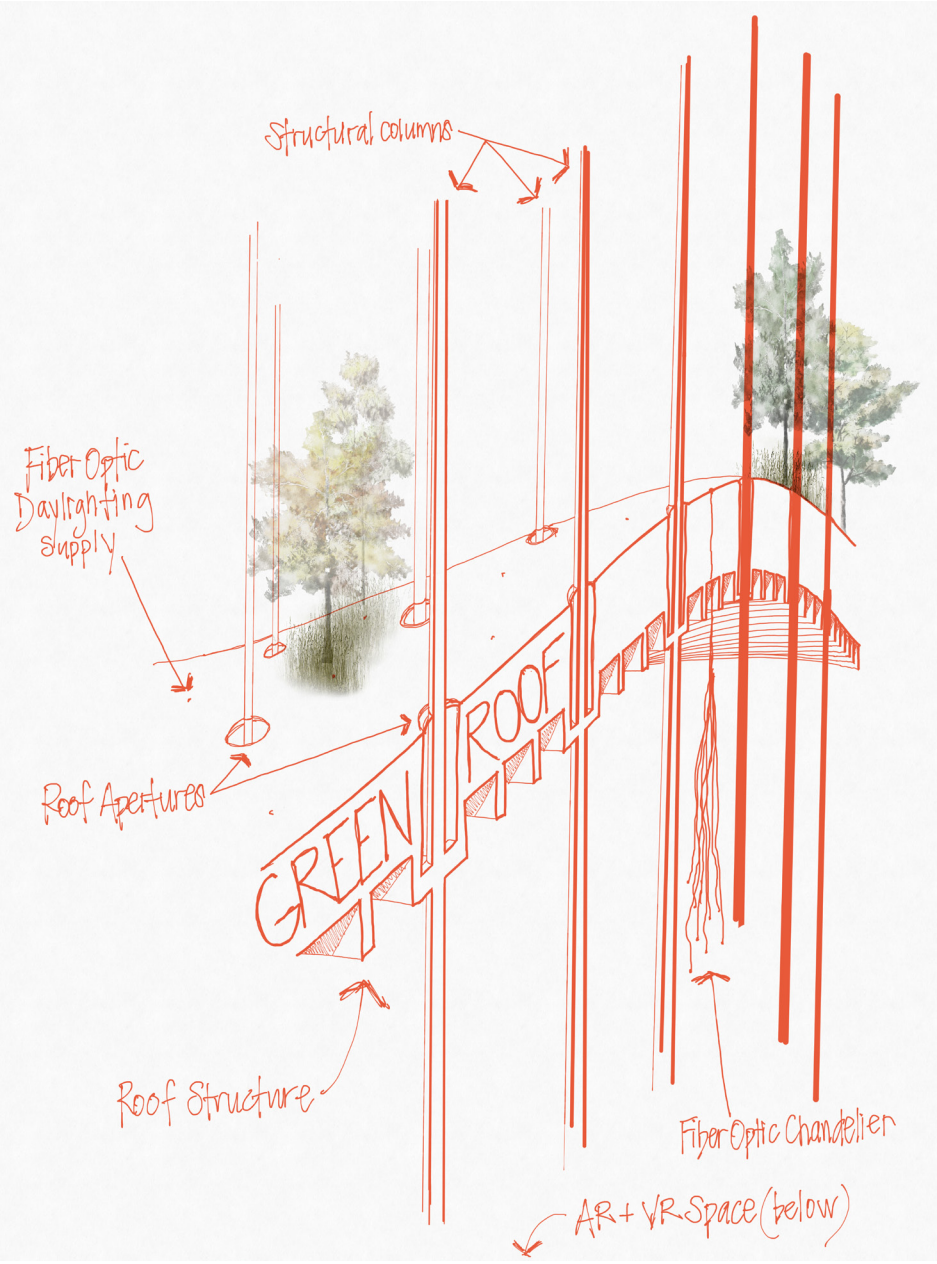


Figure 3.53 >
Section diagram, library roof
Cash, Keith, 2017

< Figure 3.54

VR Space, rendering
Cash, Keith, 2017.

Adjacent the base of the columns are a series of circular sand pads, ten feet in diameter where groups of eight to ten people of all ages, ethnicities, and statuses sit in lotus position, shoulder to shoulder, around the perimeter fully immersed in virtual worlds. Steam rises from the warm sand creating a diaphanous blanket of fog that ebbs and flows across the hushed space seemingly standing guard over the meditative group of virtual travelers. The smell of nature—of life—permeates the atmosphere as soft convective currents of moist, lukewarm air waft about.

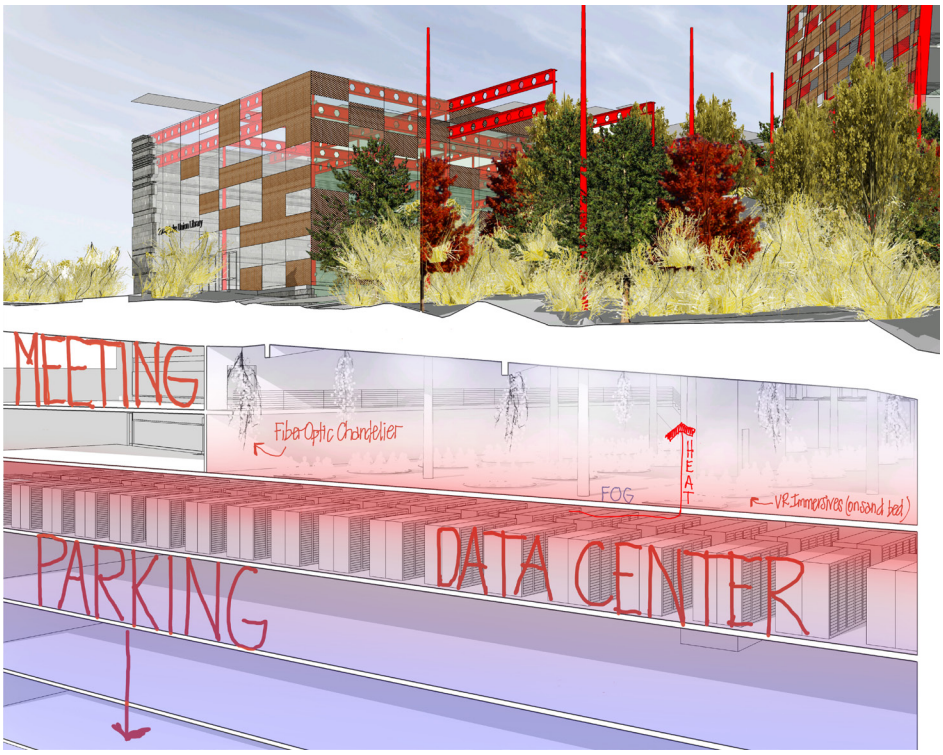
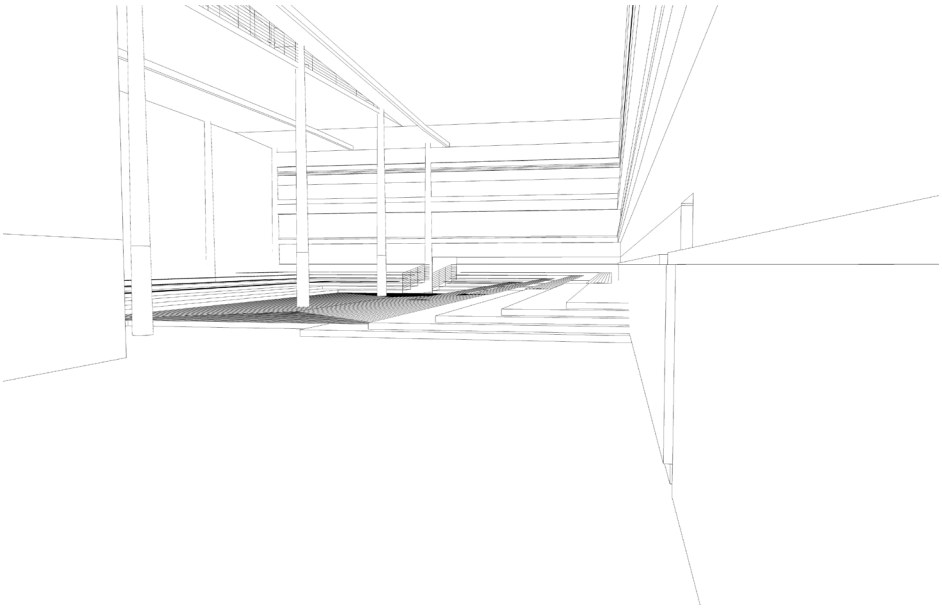


Figure 3.55 >
Section diagram, VR Space
Cash, Keith, 2017

Next to the Virtual Reality Space, in a separate room, lies the Augmented Reality Performance Space, a place to play, relax, go to think and/or be creative (Figure 3.56). In contrast to the quiet, contemplative atmosphere of the Virtual Reality Space, the Augmented Reality Performance Space, as a room between reality and virtual reality, is much more active. At the center of the space is a 30' x 60' open area which can be used for performances, immersive narratives or interactive simulations (i.e. gamification). Surrounding this open area is variable seating. Depending on the event, seating may be simply individual chairs or it might be more elaborate personal pods or tiered bench seating for large groups. The Augmented Reality Performance Space is the most adaptable and most often adapted space in the library. In this space, visitors partially immerse themselves in library content, either singularly or collectively. When immersed, the space, which is decidedly industrial, unadorned and austere by itself, morphs into something else—another place, another time, another designation. The appearance of the space can be as varied as the number of visitors immersed within it, or it can take on one common identity for a collective group. For visitors participating in an interactive simulation in the open area at the center, movement within the hybrid environment is only possible within that area. All elements of the physical reality outside this open area, including other visitors, are cloaked, while everything inside the open area is visible within the simulation. If a visitor steps out of the bounds of the open area, the simulation ceases. For visitors enjoying library content in the

seating area, if they are not viewing a performance as a group (staged in the open area), all elements of the entire Augmented Reality Performance Space, including other people, are cloaked. If a visitor stands, the simulation ceases.



< Figure 3.56

AR Performance, rendering
Cash, Keith, 2017.

Simulations may be entirely created from fictional or non-fictional works of literature, less formal written or spoken content, or they may be projections of living people and actual events happening in real-time within another 3D-mapped space at a connected augmented reality lab elsewhere in the world (Figure 3.57). In this way, library visitors not only experience the past and the imagined, but also the real and the current. On some days, people come to the library to connect with loved ones separated by great distances. On other days, visitors come to enjoy a cultural fair, exhibit, presentation, talk or maybe to simply dance, laugh, know or just exist for a moment with someone seemingly unlike themselves and possibly, if the conditions are right, discover that they, like themselves, with all their vulnerabilities and insecurities, want only to persevere through this life, to find happiness, and most importantly, to love and be loved.

< Figure 3.57

Concept for connecting libraries
Cash, Keith, 2017.

Yet this sort of deep insight is elusive. It is said that "empathy rarely extends beyond our line of sight" (Nolan et al.). The Augmented Reality Performance Space and Virtual Reality Space are designed to extend that line of sight. They are designed to use sophisticated technology to provide perspective, the primary determinant of all outcomes. Albert Einstein once famously remarked, "no problem can be solved from the same level of consciousness that created it. Peace cannot be kept by force; it can only be achieved by understanding." (Einstein, "A Quote by Albert Einstein."). Throughout history we have used a rich tapestry of technologies to share ourselves and try to understand others (i.e. spoken and written language, painting, poetry, music, etc.); these technologies have often been crude. Virtual reality is a huge improvement. The South Lake Union Library believes that technology, leveraged for its strengths, brings humanity closer together through increased empathy and a deeper understanding of others, and in so doing, fosters a more compassionate, beautiful, and connected world.

Chapter 4

Conclusion

Reconnecting the Disconnected

CONCLUSION

While much effort has been expended trying to support and demonstrate the validity of the thesis advanced in this document, the reality is that there are equally valid competing theories that exist for how to reground and reconnect humanity not considered in this analysis. People are complicated, and the cause-and-effect relationship between people and ever-new technologies is even more complicated. It is unlikely that the disconnection society feels stems from only one factor. Similarly, it is unlikely that solving the problem can happen by focusing on only one fix. Varying needs, desires, personalities, cultures, etcetera require a matching multiplicity of approaches. That said, it should be noted that this thesis derives in part from intuition—from observing human nature and deductively working toward a position. While relative perspective and subjective biases should be taken into account, the legitimacy of human intuition as a universal starting point should not be discounted.

The Canadian columnist Stephen Marche once wrote "We were promised a global village; instead we inhabit the drab cul-de-sacs and endless freeways of a vast suburb of information" (Marche, "Is Facebook Making Us Lonely?"). The South Lake Union Library is interested in delivering on that forgotten promise. Residing on a threshold to the digital landscape, the South Lake Union Library is a portal to the world—a community center for the global village. It is a place where people from all walks of life can belong. A place where people can be themselves and be accepted. A place where people can explore, take risks, and learn. The South Lake Union library is an urban nucleus of creativity, innovation, connection, and understanding where intelligent technology fused imperceptibly with architecture transports visitors from reality to virtuality for deep, highly empathic experiences. At the South Lake Union Library, technology is balanced with nature in restorative spaces where visitors green bathe and re-center.

The South Lake Union Library espouses three basic design priorities: 1) all design will be human-centered, taking into account our fundamental human needs; 2) all technology will be sensitive and responsive to people and will seamlessly integrate with the background architecture; 3) nature and natural processes will be made explicit and celebrated. These design principles form the basis for a novel digital age architecture that restores and elevates the human spirit by understanding and respecting who we are—our nature—and smartly leveraging our creations—our technology—to achieve the highest aspirations of who we want to be. The South Lake Union Library is about reconnecting the disconnected.

< Figure 4.1

Wolfe, Art
More Alike Than Different, 2017

Chapter 5

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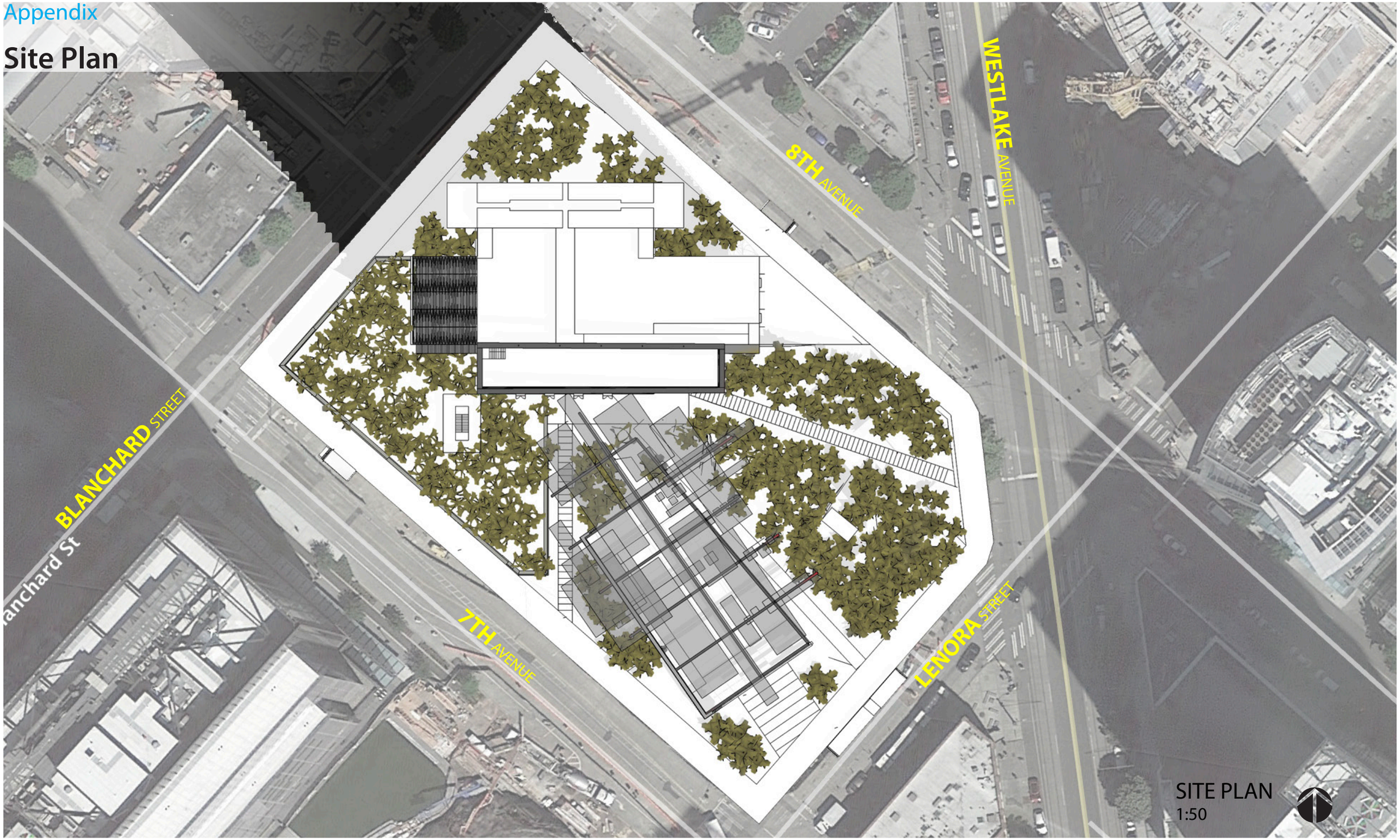
Site Plan


8TH AVENUE
WESTLAKE AVENUE
BLANCHARD STREET
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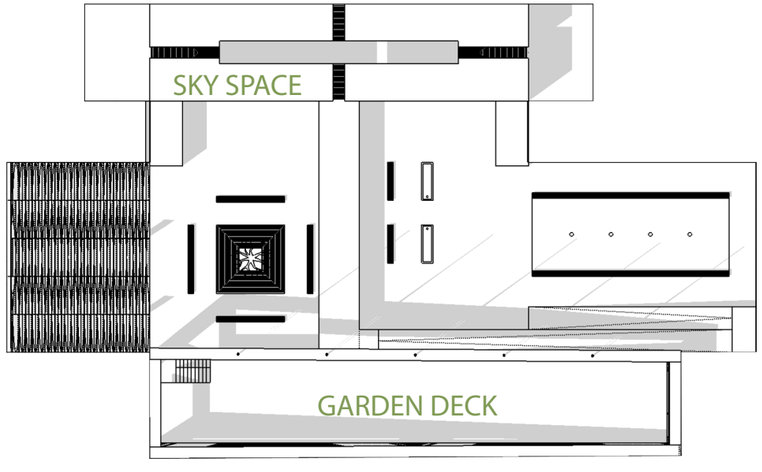
7TH AVENUE
LENORA STREET
SITE PLAN
1:50

Project Floor Plans



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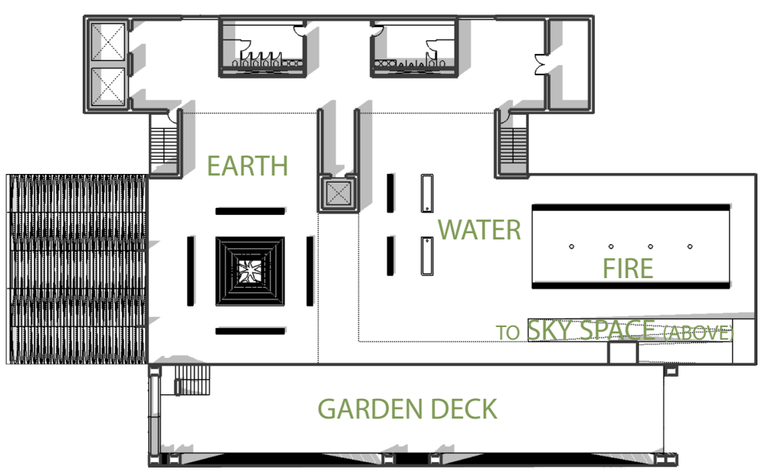

MEDITATION SPACE LEVEL 42
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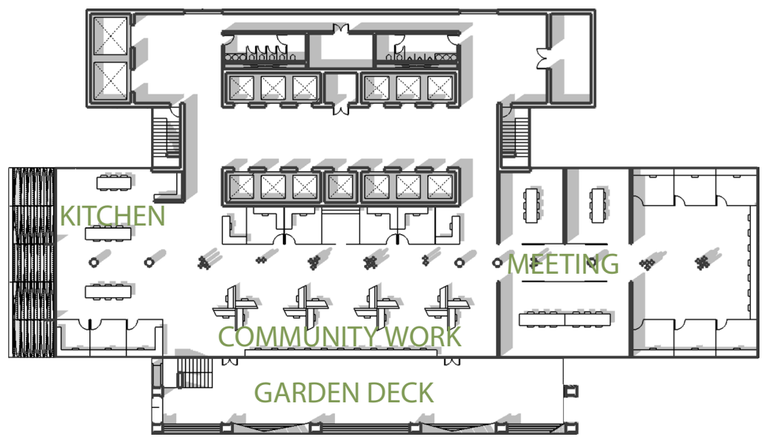
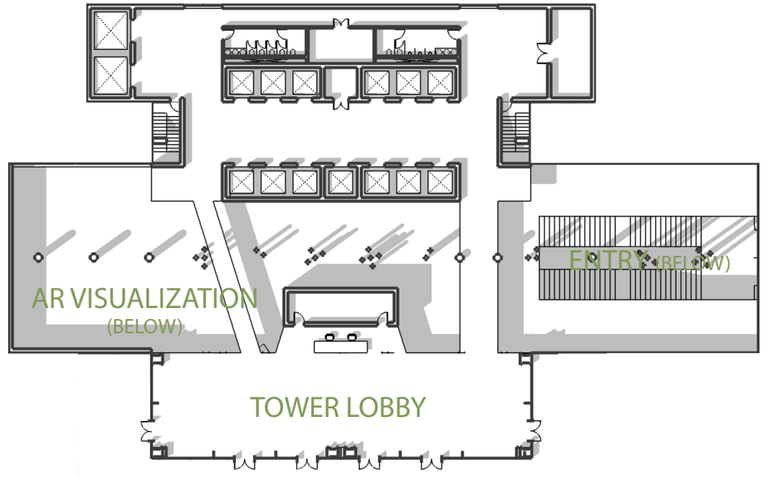
Project Floor Plans



OFFICE (TYPICAL) LEVEL 13
1:40



TOWER LOBBY LEVEL 2
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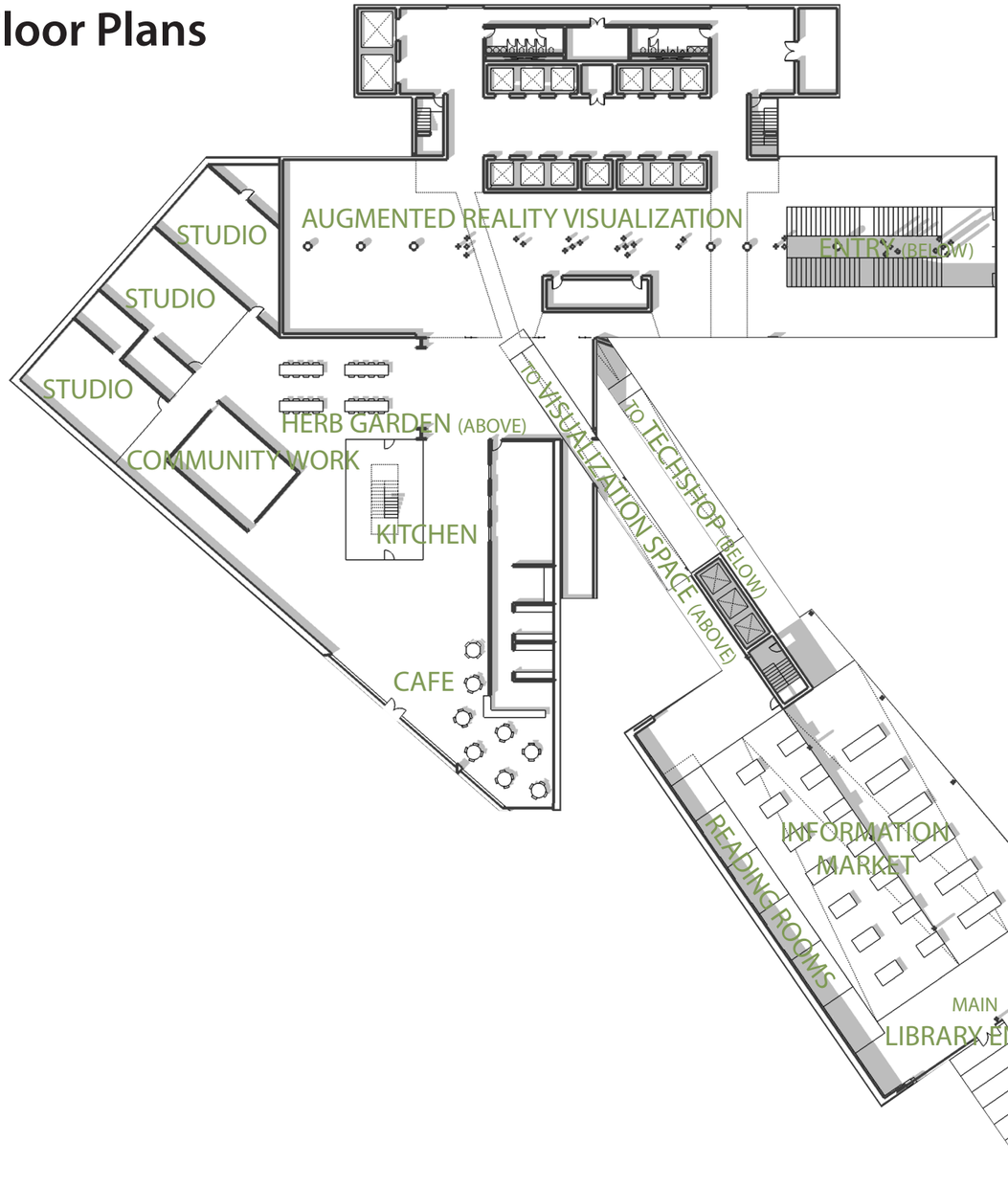
Project Floor Plans



VISUALIZATION SPACE LEVEL 1
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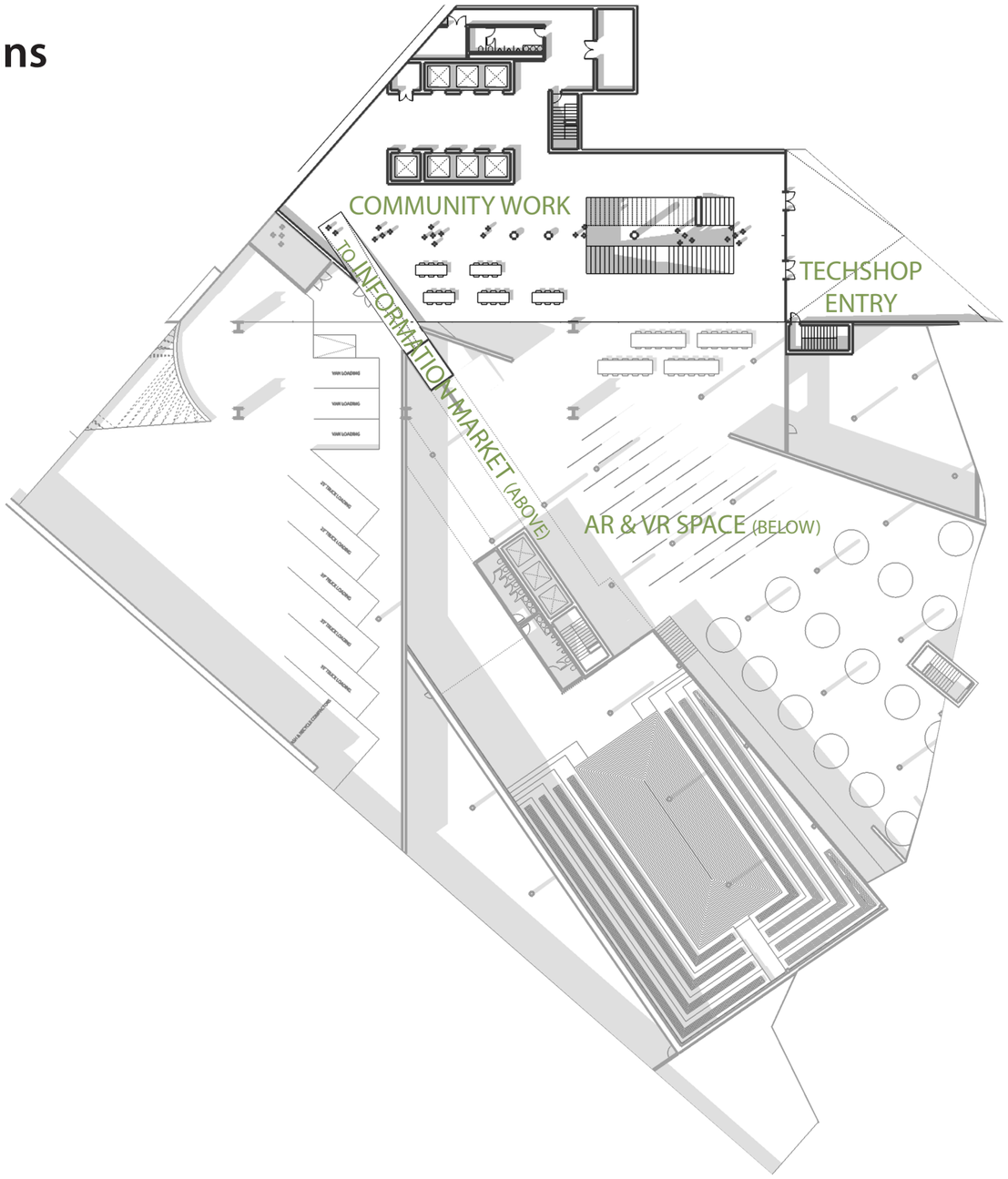
LIBRARY ENTRY / READING ROOM LEVEL .5
1:40

Project Floor Plans



TECHSHOP ENTRY LEVEL 0
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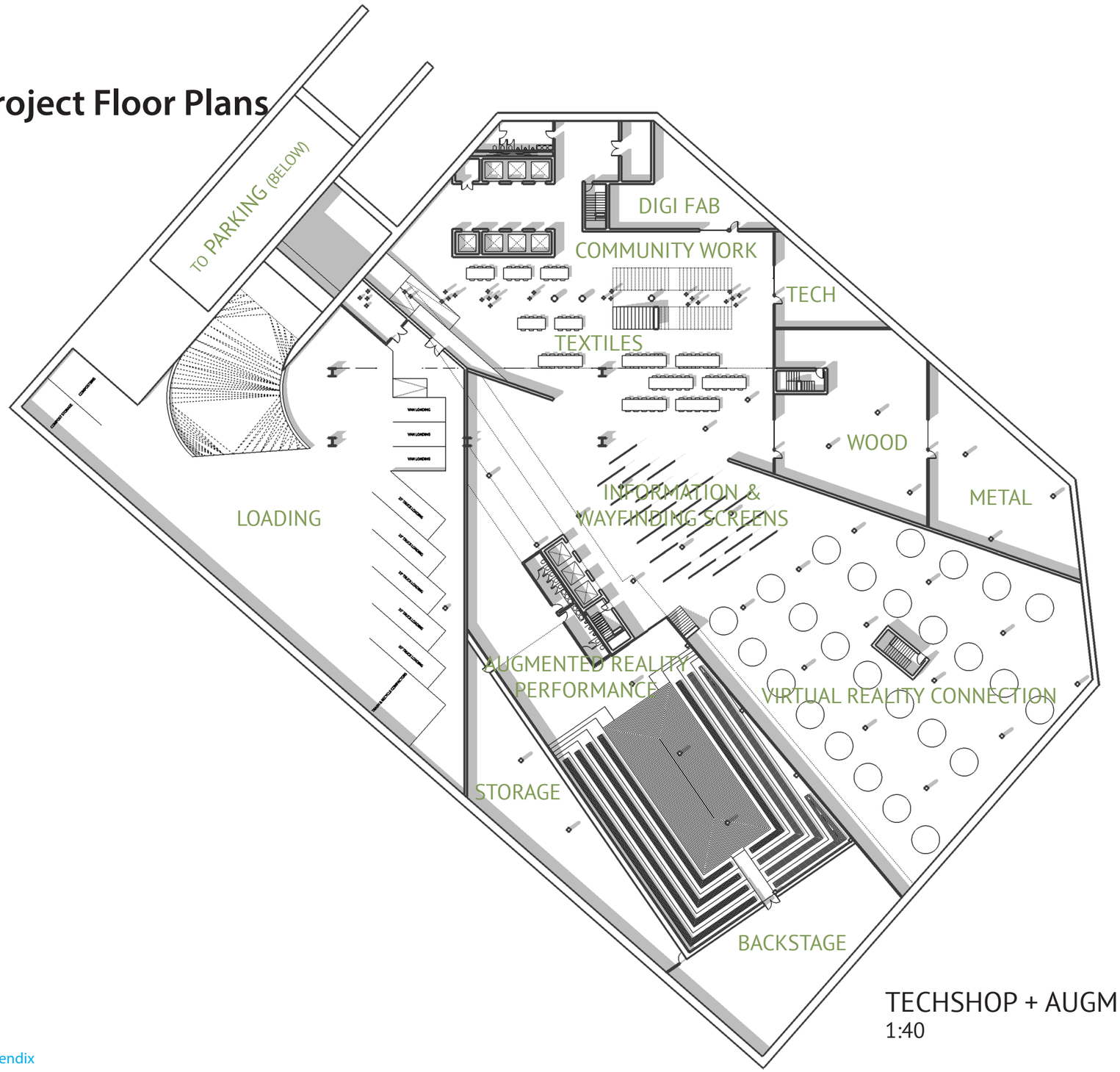
Project Floor Plans



TECHSHOP + AUGMENTED & VIRTUAL REALITY SPACES LEVEL -1
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